Ministry of Health and Family Welfare
Government of India

District Level Household and Facility Survey-4
(2012-2013)
INDIA

Field Operational Manual for Health Investigators /Supervisors

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INTRODUCTION

A. Background of the Survey

Three rounds of District Level Household and Facility Surveys (DLHS) have been undertaken in the past (Round- I in 1998-99, Round-II in 2002-04, and Round-III in 2007-08) with the main objective to provide reproductive and child health database at district level in India. The data from these surveys have been useful in setting the benchmarks and examining the progress the country has made after the implementation of Reproductive and Child Health (RCH) programmes. These surveys findings have been used by the central and state governments in evaluation, monitoring and planning strategies. In view of the completion of seven years of National Rural Health Mission (2005-12), there is a felt need to focus on the achievements and improvements so far. It is therefore, DLHS-4 being conducted in 2011-12 in 26 states and Union Territories (UTs) to provide evidence base for the achievements in Health and Family welfare indicators.

B. DLHS-4 Plan

1. DLHS-4, proposes to complete the field survey in all the districts within a period of 6 months.

2. In DLHS-4, the district-wise sample size will varies from 1000- 1750 households, in contrast to DLHS-3, in which 1000 - 1500 households were covered across the districts.

3. In EAG states, including Assam (total 9 states), IIPS will undertake only the facility survey. In the remaining 26 states and union territories, IIPS will carry out both household and facility surveys.

4. Clinical, Anthropometrical and Biochemical (CAB) tests will be another significant component of DLHS-4 and proposed to be executed in the above mentioned 26 states and union territories.

5. NIHFW has been designated as the nodal agency for carrying out this CAB component of DLHS-4 in coordination with IIPS/MoHFW.

6. NIHFW, in turn, has entered into a MOU with 16 other Partner Institutes located in different parts of the country to execute the plan.

C. CAB component in DLHS-4

CAB component for DLHS-4, has been planned in 336 districts of 26 states and Union Territories (UTs), excluding those covered under Annual Health Survey (AHS) in the Eight Empowered Action Groups (EAG) states and Assam. Around 1400 households with a population of approximately 7000 per district will be covered in this survey. DLHS-4 proposes to undertake a number of CAB tests to produce district level estimates for

nutritional status and prevalence of certain life style disorders. Major constituents of the proposed CAB components are Height, Weight, Blood pressure, Estimation of Haemoglobin, Fasting Blood Sugar and tests for Iodine content in the salt used by the households. As already indicated, National Institute of Health and Family Welfare (NIHFW), New Delhi, along with 16 partner institutions, will undertake the responsibility of checking accuracy and sensitivity of various instruments, training of health investigators (HIs) and testing of Haemoglobin levels from the dried blood spots (DBS) in the filter papers collected from the field. NIHFW as the nodal agency will also be responsible for Training the Trainers (TOT) from each partner institutions (PIs). The faculty from PIs, in turn, will train the HIs of the Field agencies for carrying out all the components of CAB during the last seven days (4 days class room training and 3 days field practice) of the state level training to be conducted by the Field agency.

Parameters for data collection and sequencing of tasks as proposed under the CAB components are:

a. **Length/ Height:** Target Population- All population aged 1 month and above
b. **Weight**: Target Population- All population aged 1 month and above
c. **Blood Test for measurement of Haemoglobin:** Target Population- Population aged 6 months and above
d. **Blood Test for Sugar(Fasting):**Target Population- Population aged 18 years and above
e. **Blood Pressure Measurement:** Target Population- Population aged 18 years and above
f. **Personal Habits:** Target Population- Population aged 15 years and above
g. **Household salt testing for Iodine level:** All Households

For the DLHS-4 data collection from the field, the FAs have to assign a team for each district consisting of the following personnel:

Personnel/district	**No**
a. Supervisor	1 (preferably male)
b. Field Investigators	4 (3 females and 1 male)
c. Health Investigators (HIs)	2 (1 Male and 1 female)
	Total= 7(4 female and 3 male)

Apart from this, two investigators will be appointed exclusively for facility survey, who will work independently and collect the information from the Health facility in each district.

D. Field Protocols to Implement CAB

As mentioned earlier, there are different tests to be done on target population for each CAB test, such as children and adults (male and female).Detailed field procedure and steps to be followed by health investigator for each test and age group are given in each corresponding chapters. HIs will perform weight and height measurement of all eligible children in the selected households.

Below are the outlines of the field protocols for conducting the CAB components.

I. Measurement and testing for children

1. HIs should identify all the children in the household who are eligible for weight and height/length measurement. All children aged one month and above will be included for both measurements.

2. In CAB Questionnaire age of all eligible children and respondents (Question number 79) will be asked by Health Investigators and filled in CAPI.

3. After completing the HH Questionnaire, the Field Investigator will hand over the CAPI (in pause mode) to the HIs to initiate the CAB test.

4. After taking the required measurements, HIs must record child's weight and height measurements in Question number 82 to 86 and also record whether the child was measured lying down or standing up in Question 84, and the final result in Question 86.

5. HIs must also ensure that he/she records the result of child's height and weight measurements in the health result card before handing over to the head of household (respondent).

Recommended steps for Haemoglobin testing

1. Before initiating Haemoglobin test of household member, **HIs must satisfy him/her that child is not less than six months and not more than 17 years**, by referring to Question 79, which indicates the age.

2. Record the Line Number/Name of the parent/responsible adult of the child in Question 87.

3. Obtain the assent and consent from the parent/responsible adult for the Child's Haemoglobin testing and record the outcome of the assent and consent process for each child in Question 88. Obtain consent by reading to the responsible adult the voluntary assent and consent statement provided. The code in Question 88 will confirm that you have read the assent and consent to the responsible adult or not.

4. Collect a capillary blood sample from each child for whom assent and consent had been granted using the Filter paper.

II. Measurement and Testing for Adult Women and Men (18 years and above)

1. HIs should identify all eligible women and men from the household schedule for weighing, measuring of height, and Hb testing.

2. Information on Age for each Women/Men in, Question 79 of the Height and Weight pages, marital status in Question 80, and the women's current pregnancy status in Question 81 will be asked by HIs and recorded in CAPI in CAB Questionnaire.

A. Height and Weight Measurement

1. After the above information is recorded HIs will perform weight and height measurement of the women/men according to instructions.

2. HIs will enter women's and men's weight and height measurements in Question 82 and 85 and the final result in Question 86.

B. Haemoglobin and Blood Sugar (Fasting) Testing

1. Check the age of the respondent recorded in Question79. HIs must check the age because if the respondent age is below 18 years, consent for testing will have to be obtained from the respondent's parent or the responsible adult as well as from the respondent.

2. If the respondent's age is below 18 years, record the line number/name of parent/responsible adult of the respondent in Question 87.

3. If the respondent is below 18 years, seek assent and consent for Haemoglobin testing from the parent/responsible adult. If the parent or responsible adult does not consent to the youth's Haemoglobin test, circle Code '2' for refusal and continues with other respondents until. If the parent /responsible adult agree to the youth's Haemoglobin test read the informed assent and consent statement to the minor and record the outcome of the consent in Question 88, which also confirm that you had read the assent and consent statement.

   If the eligible respondent is age 18 or over, seek direct consent of the respondent separately for Haemoglobin and Blood Sugar (fasting) testing, and record the result in Question 88.

4. After taking assent and consent for Haemoglobin and Blood Sugar (fasting) testing check the next available set (row) of bar code labels, four bar codes with same unique number will be given in a row. First enter the number of first bar code in Question (90), and then stick/paste the first bar code label on a new Small Zip –Lock bag in which the Dried Blood Spot (DBS) sample will be kept for Haemoglobin testing.

Secondly paste/stick the Second bar code label on the Blood Sample Transmittal Form.

5. Obtain a capillary blood sample from the finger prick. Use 20 micro liter of blood to fill the Hb Pipette and then release the whole amount on the filter paper for drying.

6. HIs will Place the filter paper with the blood spot in small Zip lock bag only after satisfying that blood spots are completely dried and turned into chocolate brown in colour.

7. Take another drop of blood on the gluco strip to conduct the Fasting Blood Sugar test, using glucometer.

8. Record the Fasting Blood Sugar level in Question 91a. Again record the Fasting Blood Sugar level result in Question 92.

9. Before leaving, HIs must enter the results in CAB Health Test Result Card and hand over to the respondent and inform him/her fasting sugar level.

10. HIs must instruct the respondent to contact the health facility if the Fasting Blood Sugar level is 110 mg/dl.

C. Blood Pressure and Pulse Rate Measurement

1. To conduct the Blood Pressure and pulse Rate test the health investigators will identify all the respondents who are 18 years and above,

2. To measure their Blood Pressure and Pulse Rate HIs must use Monitor Device and cuff provided in the tool kit.

3. HIs will be taking two separate readings of both Blood Pressure and Pulse rate.

4. HIs should ask the respondent to sit quietly with their legs uncrossed and relax, with feet flat on the floor.

5. HIs will always use left arm to conduct the test, unless the person has problems as cut, injury fracture etc. In case there is problem with left hand, then right hand can be used for testing. Roll up the respondent's sleeve if necessary and make sure the rolled sleeve is not too tight around the arm and does not constrict the flow of blood.

6. Once the device is placed on the left arm, approximately ½ inch above the elbow, tell the respondent to keep her/his arm steady and at the level of the heart.

7. When the test is completed, the arm cuff will deflate completely and the blood pressure and pulse rate will appear on the display. HIs need not remove the device between readings.

8. HIs has to record the readings for each measurement as given below.

- Systolic blood pressure (Question 93)
- Diastolic blood pressure (Question 94)
- Pulse rate (Question 95)

E. Training of Health Investigators on Haemoglobin and Fasting Blood Sugar Testing

Training of Health Investigators and Supervisors of Field agency will be conducted in batches of 15-20 in a scheduled room/place to ensure a smooth uninterrupted flow of training. Training will be conducted for seven days, which will include four days classroom practice and three days field practice.

During the first phase of training, we will review with you various chapters of this manual. You will learn how to identify eligible respondents, record information relating to the testing in the household Questionnaire or on special field forms, handle the technical procedures involved in specimen collection, testing and transporting, and other related instructions.

During the second phase of the training, there will be role-playing for the Haemoglobin and Fasting Blood Sugar testing's in which you will practice by collecting blood samples from other trainees. During the third phase of the training, we will visit a nearby rural and urban village for field practice. Before each training session, you should study this manual carefully.

On completion of the training of HIs, NIHFW and its partner Institutes will certify those HIs/Supervisors who have successfully completed the training and have acquired the adequate skills to conduct the CAB test for survey. In case a HIs/Supervisor is unable to successfully complete the training even after additional training Field Agency will not engage him/her for field work and replace with new staff and given proper training.

Each team will be provided with a bag pack consisting of following items as shown in Table 1

Table 1: Items to be carried in the field (Bag pack items)	
Sl. No.	**Items**
1	Infantometer
2	Height measuring Tape
3	Digital weighing machine
4	Calibration weights
5	Digital BP apparatus
6	Glucometer with strips
7	Salt testing kit
8	Hb Pipette
9	Lancing device
10	Filter paper
11	Metal wire to clean Hb pipette(to be procured by field agency)
12	Gloves (to be procured by field agency)
13	Cotton swab
14	Band aid (to be procured by field agency)
15	Plastic bottle (100 ml) for drabkin reagent
16	Plastic bottle (100 ml) for diethyl ether
17	Plastic bottle (100 ml) for distilled water
18	Plastic bottle (1000 ml), wide mouth for waste disposal
19	Bleaching powder pack (to be procured by field agency)
20	Transmittal sheet
21	Bar codes
22	Self sealing plastic pouch, Small
23	Self sealing plastic pouch, Big
24	Laminated envelope
25	Pencil -used during fixing the height measuring tape (to be procured by field agency)
26	Ordinary Measuring tape/Scale(to be procured by field agency)
27	Bio hazardous waste bag ((to be procured by field agency)
28	Spade for digging (to be procured by field agency)

F. Completing Testing Documents in CAPI

HIs will be responsible for the accurate recording of information that will be used to track the outcome of the testing procedures. Documents that need to be completed during the testing are:

- Height/Weight Question for women, men and children in the Household Questionnaire, Starting from Question 77-**87**. The data has to be entered in CAPI soft ware.
- Haemoglobin, Fasting Blood Sugar, Blood pressure, Personal habits and salt testing Questions for women, men and children in the CAB questionnaire of Household Questionnaire from Question **88-100**.
- Blood Sample Transmittal Sheet.

- After the data collection and cleaning of waste are completed, the Haemoglobin Testing Question needs to be completed containing the unique barcode assigned to the respondent's Haemoglobin blood sample. This number as written in the barcode needs to be entered in Question (90) of CAB Questionnaire.

  The following reviews the various tasks that are associated with using the various materials provided in the kit/ bag pack. The key tasks include:

- Identifying eligible respondents.
- Obtaining informed assent and consent for the testing.
- Recording information in CAPI soft ware relevant to the outcome of the testing in the Household Questionnaire and tracking other documents.

Specific activities that are involved in performing these tasks are described in detail below. Health Investigators will get the household Questionnaire containing information in Question 78 already filled.

- Question (78) Sex of household member
- Question (79) Age of household member(Ask by Health Investigator)
- Question (80 & 81)Marital and Pregnancy Status(Ask by Health Investigator)

Note that for children age 1-5 month only length and weight will be measured but not to be tested for Haemoglobin.

Once the household is identified and data collection for the household survey completed, the eligible subjects **those who are 18 yrs and above** will be asked by HIs to be available the morning of the next day with empty stomach/fasting (without taking any food/snacks/tea etc) till the blood sample for Hb and Fasting Blood Sugar estimation is taken. The idea is to take blood samples for both tests using a single prick.

Personal Habits (Question 97 to Question 99)

These Questions pertain to the personal habits such as chewing practices, smoking and alcohol consumption of the members of the household. The information so collected would help in determining the prevalence of smoking, drinking and chewing. Every effort should be made to ask this Question from each member of the household of age 15 years and above. **Due care should be taken while canvassing these sensitive Questions and one must not enter into any arguments.** Record the response to this Question faithfully as answered by the respondent. Asking direct Question may sometimes offend the respondent. One may therefore improvise their own way of ascertaining the information.

Question 97: Does the member of the household chew? (Code)

Record the appropriate code for the practice from the codes given below:

Code for 97	
Item	**Code**
Pan with tobacco	1
Pan without tobacco	2
Gutka/Pan masala with tobacco	3
Gutka/Pan masala without tobacco	4
Tobacco only	5
Ex-chewer	6
Never chewed	7
Not known	8

Question 98: Does the member of the household smoke? (Code)

Record the appropriate code from the codes given below:

Code for 98	
Item	**Code**
Usual smoker (at least once in a day)	1
Occasional smoker	2
Ex-smoker	3
Never smoked	4
Not known	8

Question 99: Does the member of the household consume alcohol? (Code)

Record the appropriate code from the codes given below:

Code for 99	
Item	**Code**
Usual drinker (at least once every week)	1
Occasional drinker	2
Ex-drinker	3
Never drunk	4
Not known	8

The samples of House hold schedule, informed assent and consent for CAB test and CAB test questionnaire are given below for your information.

HOUSE HOLD SCHEDULE (Respondent may consult to other family member of the household to give correct information about each member)

Now I would like to have some information about the people who usually live in your household and the visitors who stayed last night in your household

Line No.	Name (Start with Head of the Household)	Sex **Male=1 Female=2 Other=3**	Whether Usual Resident **Yes=1 No=2**	Relation-ship to Head (code)	Date of birth D D M M Y Y Y Y	Age **(In completed years)**	Marital Status (code) **(For age 10 and more years)**	**For age group 6-17 years**		Highest educational qualification attained (aged 7 years and above) (code)	Completed Years of schooling	Occupation /Activity Status (for age 5 years. and above)
								Whether currently attending school **Yes =1 No: attended before =2 Never attended = 3**	If no/never attended any school, main reason thereof (code)			
Q02	**Q03**	**Q04**	**Q05**	**Q06**	**Q07**	**Q08**	**Q09**	**Q10**	**Q11**	**Q12**	**Q13**	**Q14**
	01			**01**								(SPECIFY)

INFORMED SHEET AND CONSENT FOR CAB-TEST

As part of this survey, we are also studying anemia condition/status of women, men and children 6 months and above. You may be aware that Low Haemoglobin is a serious health problem that usually results from poor nutrition, infection or chronic disease. This information will assist the government to develop programme to prevent and treat anemia.

We request that (you and (NAME OF RESPONDENT'S CHILD (REN)/ CHILD (REN) IN RESPONDENT'S CARE) age six months and above), participate in the Haemoglobin testing by giving a few drops of blood from a finger. The test uses disposable sterile instruments that are clean and completely safe. The blood will be tested at a designated laboratory. Your results will be kept confidential and will not be informed to anyone else.

I request (you and NAME OF RESPONDENT'S CHILD (REN)/ CHILD (REN) IN RESPONDENT'S CARE) to participate in the Haemoglobin testing. However, if you decide not to have the test(s) done, it is your right and we will respect your decision.

Along with this we will also be testing your:

1) Height
2) Weight
3) Blood pressure (18 YEARS AND ABOVE).
4) Fasting Blood Sugar (18 YEARS AND ABOVE).

From the same finger prick, we will take another one drop of blood for FASTING BLOOD SUGAR testing. The report of FASTING BLOOD SUGAR and other measurements will be given to you within few minutes.

Would you like to ask anything, now? ANSWER ANY QUESTION AND ADDRESS RESPONDENT'S/GUARDIAN'S CONCERNS.

Now, please tell me, if you agree to take the tests.

Now, please you tell me if you agree that (NAME OF YOUTH(S)) also participate in the Haemoglobin testing?

GO TO QUESTION 87, WRITE THE APPROPRIATE CODE. IF THE RESPONDENT'S AGE IS BETWEEN 6 MONTHS AND 18 YEARS AND NEVER MARRIED, ASK THE PARENT/GUARDIAN, IF THE PARENT/ GUARDIAN REFUSES, WRITE CODE IN QUESTION 88.

CLINICAL, ANTHROPOMETRIC AND BIOCHEMICAL (CAB) TESTS SCHEDULE

						For Members one month and above					For members 6 month to Completed 17 years
		Age (on the date of survey) from HHS (Q8)		(FOR AGE ≥10 YEARS)							
Line No. from HHS (Q2)	Sex M = 1 F = 2	D=1 M=2 Y=3 (Code)	AGE	MARITAL STATUS Married=1 Unmarried=2 If code = 2 skip to Q82	PREGNANCY STATUS Pregnant=1 Lactating=2 Pregnant and lactating=3 Non-Pregnant=4 Non-Lactating=5 Non-Pregnant and Non-Lactating=6	Weight (Kilograms)	Measured=1 Not Present=2 Refused=3 Other=6	Length/ Height L = 1 H = 2	Height/ Length (Centimetres)	RESULT Measured=1 Not Present=2 Refused=3 Other=6	Line No. /Name of parent/ responsible adult. Record 00 if not listed in Household Schedule.
Q77	Q78	Q79		Q80	Q81	Q82	Q83	Q84	Q85	Q86	Q87
			AGE								
			AGE								
			AGE								
			AGE								
			AGE								

NOTE:

1. CHILDRENS 1 MONTH AND ABOVE COMPLETED 5 MONTHS = ONLY HEIGHT AND WEIGHT
2. CHILDREN 6 MONTH AND ABOVE COMPLETED 17 YEARS = ONLY HEIGHT, WEIGHT AND HAEMOGLOBIN
3. EIGHTEEN YEARS AND ABOVE = HEIGHT, WEIGHT, HAEMOGLOBIN, FASTING BLOOD SUGAR, BLOOD PRESSURE.

A. IN QUESTION 80 IF RESPONDENT IS UNMARRIED THEN ASK PARENT/GUARDIAN FOR CONSENT.
B. IN QUESTION 81 IF RESPONDENT IS PREGNANT THEN GO TO QUESTION 88

Code for column 79	CODE	Age
If less than one month	1 (Days)- D	In completed days
If age one month to 11 months	2 (Months)- M	In completed months
If age 1 year and above	3 (Years)-Y	In Completed years

Read Consent statement for Haemoglobin/ Fasting blood Sugar testing to women parent/ Responsible Adult Granted= 1 Refused=2 (code)	Haemoglobin Result (For all members 6 months & above)		Fasting Blood sugar Test (For all members aged 18 years and above)			Blood Pressure Measurement (For all members aged 18 years and above)					Personal Habits (For all members aged 15 years and above)		
	Measured=1 Not Present=2 Refused=3 Other=6	Bar code number	Whether you have consumed anything as a solid or liquid since morning? Yes=1 → Q93 No=2	Fasting Blood Sugar level	RESULT Measured=1 Not Present=2 Refused=3 Other=6	Readings	Systolic	Diastolic	Pulse rate	RESULT Measured = 1 Not Present = 2 Refused = 3 Other = 6	Chew (code)	Smoke (Code)	Consume alcohol (code)
Q88	Q89	Q90	Q 91	Q91a	Q92		Q93	Q94	Q95	Q96	Q97	Q98	Q99
						1							
						2							
						1							
						2							
						1							
						2							
						1							
						2							
						1							
						2							

CODE FOR Q97

Item	code
Pan with Tobacco	1
Pan without tobacco	2
Gutka/Pan masala with Tobacco	3
Gutka/Pan masala without tobacco	4
Tobacco only	5
Ex-chewer	6
Never chewed	7
Not known	8

CODE FOR Q98

Item	code
Usual smoker (at least once every day)	1
Occasional smoker	2
Ex-Smoker	3
Never Smoked	4
Not Known	8

CODE FOR Q99

Item	code
Usual Drinker (at least once every week)	1
Occasional Drinker	2
Ex-Drinker	3
Never Drunk	4
Not Known	8

Q100: **SALT TEST**	**CODE**
Ask respondent for a Teaspoonful of cooking salt currently used and Test Salt for iodine. RECORD PPM (parts per million)	Less than 15 PPM .... 1 More Than 15 PPM .... 2 NO Salt In Household.................. 3 Salt Not tested............................. 6 **(Specify Reason)** 00 PPM (No Iodine)..................... 0
	RESULT OF SALT TEST ....

CHAPTER 1

WEIGHT MEASUREMENT

Weight is one of the most widely used parameters for assessment of nutritional status. It is therefore essential that you ensure accurate recording of weight.

1.1 Weight Measurement

Weight measurement will be carried out with the help of a battery operated digital weighing machine. For recording the weight of infants, difference in the weight of the mother or baby care giver taken along with the baby and without the baby will be considered to calculate the exact weight of the infant.

1.2 Digital Weighing Machines

Accuracy and sensitivity: 100 g - to be tested against SECA electronic weighing scale. Each institution will require a SECA electronic weighing scale for checking the accuracy (described separately for PIs) of the digital weighing machines.

1.3 Weighing

All persons from the selected households who are more than one month of age are to be weighed during the survey.

After getting assent and consent for measuring weight, enter whether weight measured or not in Question 83: (code1 if weight measured, 2 for those not present 3 if refused and 6 for other). The weight has to be record up to one decimal place. (For example, if the weight is 22.35 record it as 22.4, and if weight is 22.35, record it as 22.3)

In the survey separate weighing machines are not being provided to weigh infants and young children. In case a child is unable to stand on the digital balance, ask the mother/any adult or any care given to weigh with the child. To get the weight of the child, subs tract the weight of the mother/adult or care given. It is therefore essential to ensure whether the weighing machine is sensitive to 100grams when an adult carrying a child is weighed.

During the training you will practice how to weigh with other participants, weighing adults and children in clinic/hospital and community settings.

1.4 Steps to be followed when taking Weight of an Individual

- Place the digital weighing machine/balance on a level ground (Fig. 1.1).
- Activate the machine so that it reads 0.0 (Fig. 1.2).
- Accuracy of the digital balance must be checked preferably every day before the start of the survey. It is recommended that the machines are checked at least once a week by the team supervisor using the standard weights provided.

- Check sensitivity of the digital balance daily by using the standard weights provided. Any weighing scale that does not show a difference when 100 grams are added to a person who is being weighed is not accurate enough for the survey. If the digital balances do not show 100 gram sensitivity, please inform the PI immediately through field agencies and get a replacement urgently.
- Adults or older children should be requested to stand erect on the weighing machine.
- . In case a child is unable to stand on the digital balance, ask the mother/any adult or any care given to weigh with the child. To get the weight of the child, subs tract the weight of the mother/adult or care given
- Pictorial depiction to check accuracy and sensitivity of the digital balance is given in the following pages.

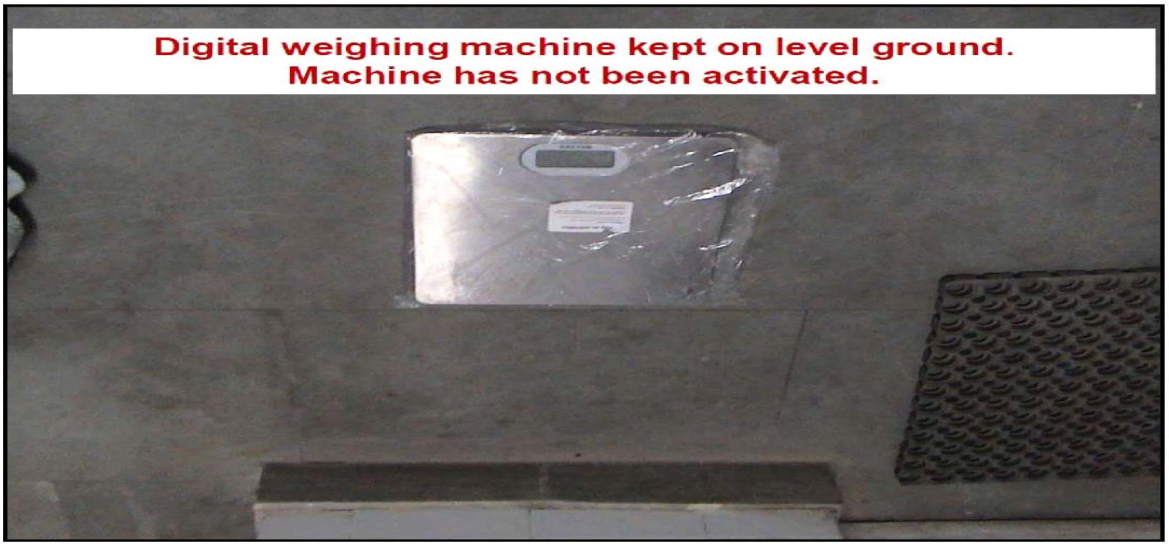


Fig.1.1

Fig.1.2

1.5 Checking Accuracy of Digital Weighing Machine

In order to minimize errors in weighing, the survey team has been provided with a digital weighing machine. Every day before the survey begins; digital weighing machine is to be checked for accuracy. These ISI certified weights are provided with each field team to check the accuracy of the balance.

The simple feasible procedure for checking accuracy of the digital weighing machine in community settings is shown and describe in the following pages (**Fig. 1.3 to 1.16**). The pictorial depictions also have shown how to weigh an adult as well as children.

Fig.1.3

Fig. 1.4 Standard 1 kg added to 5 kg + 2 kg, now the digital balance shows reading 8kg

Fig. 1.5 Standard 500 gm added to 8 kg, now the digital balance shows reading 8. 5 kg

Fig. 1.**6 This balance is capable of measuring weight with a 100 gram**

The Sensitivity of the Instrument may be checked as shown below (Figs. 1.7 -1.11)

Fig. 1.7

Fig. 1.8

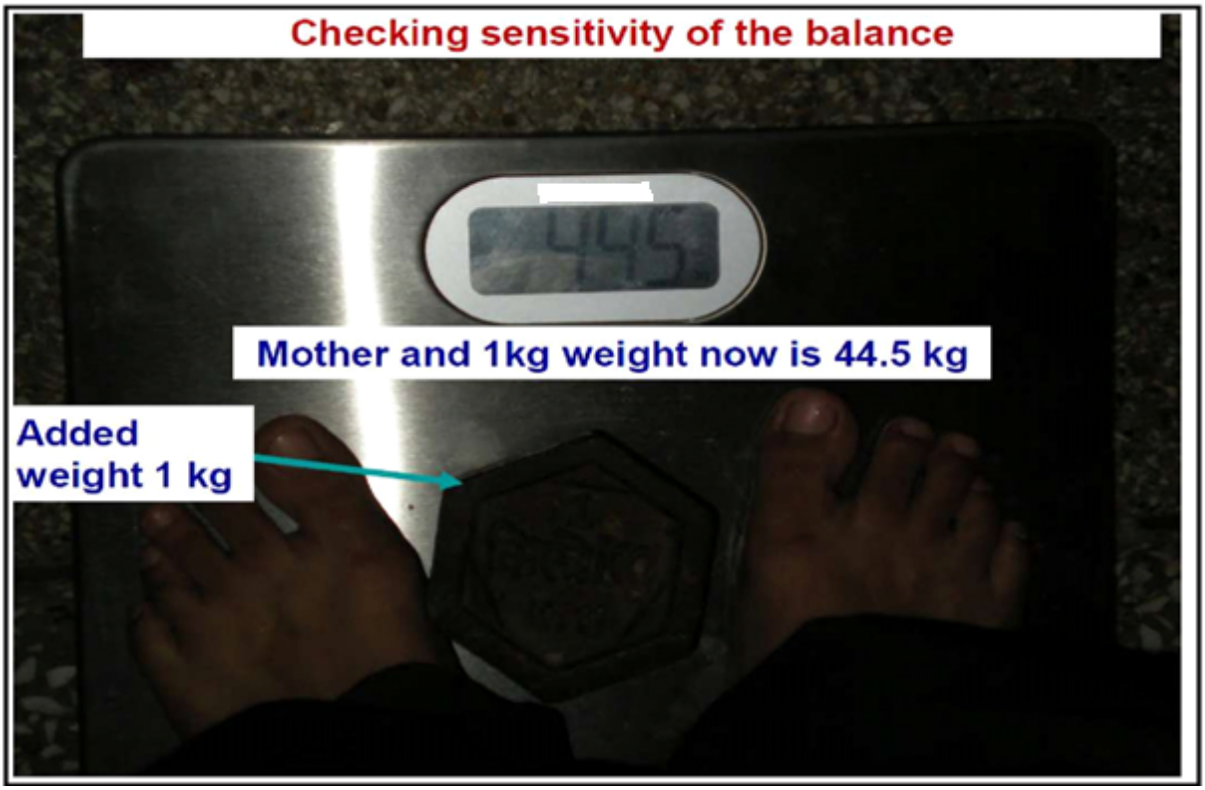


Fig. 1.9

Fig. 1.10

Fig. 1.11

Once the accuracy and sensitivity of the instrument is assured, weight measurements may be initiated as shown below (Figs 1.12-1.16)

Fig. 1.12

Fig. 1.13

Fig. 1.14

Fig. 1.15

Fig. 1.16

CHAPTER 2

HEIGHT AND LENGTH MEASUREMENT

Height measurement of individuals who can stand upright (young, older children and adults) will be carried out using a height measuring tape. For length measurement of infants, infantometers will be used. The respondent who cannot stand on their own/handicapped their height and length will not be taken. In Question 86 of CAB Questionnaire result will be coded other.

Checking of accuracy of these instruments is described in a separate module (specifically meant for PIs) as initial accuracy checking will be carried out by them only and only those instruments found fit and accurate on the prescribed criteria will be handed over to the field Agency for further use in the field.

Allowable margin of difference in measurement for different parameters is given below: Height/length measurement ±0.1 cm.

2.1 Equipment and Methods to be used for Measurements

1. Length: Infantometer- measuring length of the infants (0-16 months): accuracy 0.1 cm

2. Height: wall mounted height measuring tape- accuracy 0.1cm

2.2 Description/Dimensions

Central panels attached to the foldable head plate covered with plastic sheet length 90 cm; breadth 30 cms central sliding panel attached to folding footplate (Fig.2.1). Measuring tape attached to central panel accuracy 0.1 cm (Figs.2.2, 2.3).

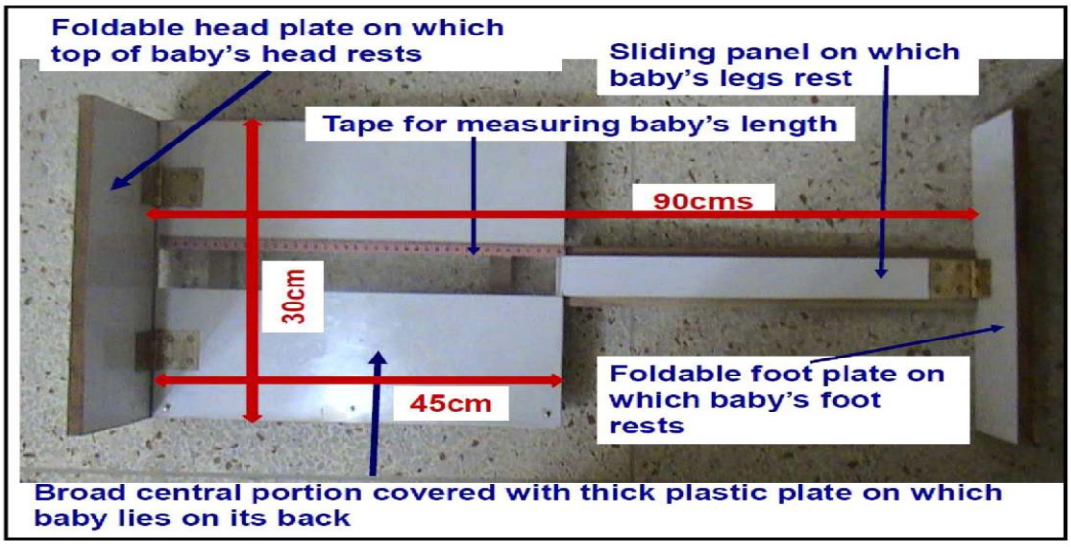


Fig.2.1

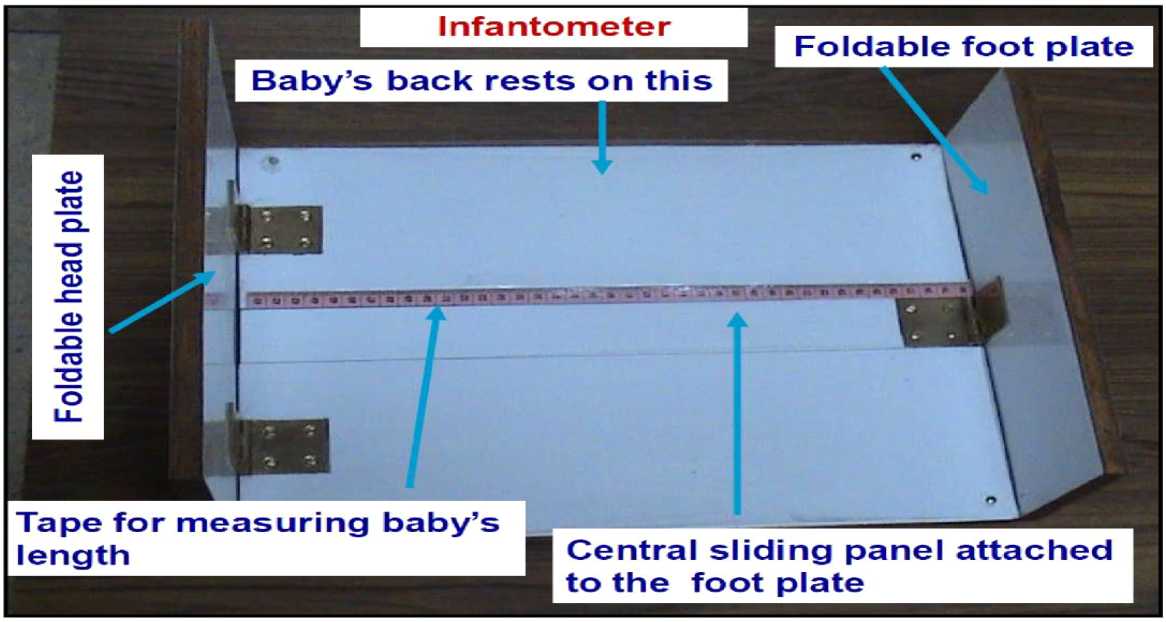


Fig.2.2

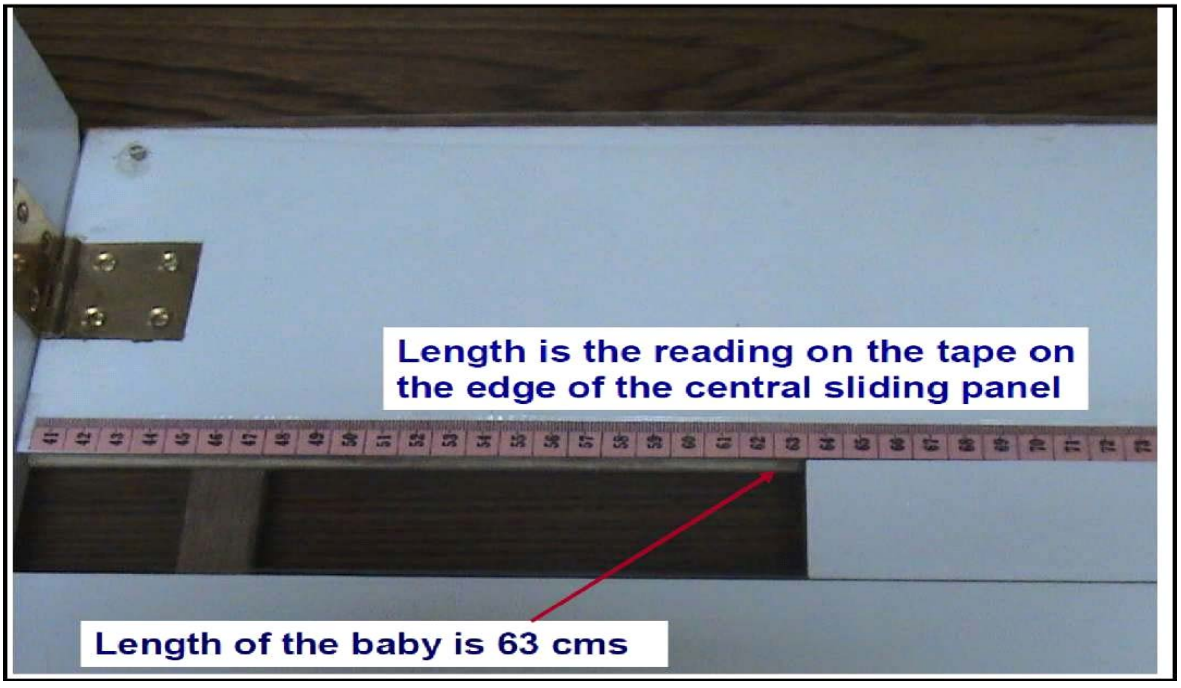


Fig.2.3

2.3 Steps while taking the Length Measurements of Infants by Infantometer

i) Pull the foot board to the desired length (Fig.2.1).

ii) Ask the mother/care giver to place the child flat on the board.

iii) Mother can continue to hold the child while you are adjusting so that child feels reassured **(**Fig.2.4)

Fig.2.4

iv) Place the head straight against the head board (Fig 2.5)

Fig.2.5

v) Place the two feet at right angles to the foot board (Fig.2.6)

vi) There should not be any space between the heel and the foot board (Figs.2.7, 2.8).

vii) Do not try to correct if the legs are slightly bowed.

Fig.2.6

Fig.2.7 **Infant being measured - head vertical against the head plate; back straight on the infantometer: knees straightened and foot positioned vertically against the foot plate.**

Fig.2.8

viii) Once the adjustments are done ask the mother to lift the child without disturbing the foot board.

ix) The length of the child is then read (Fig.2.9) and entered in centimeters in Question 85 (Please see page no. 12) of this manual.

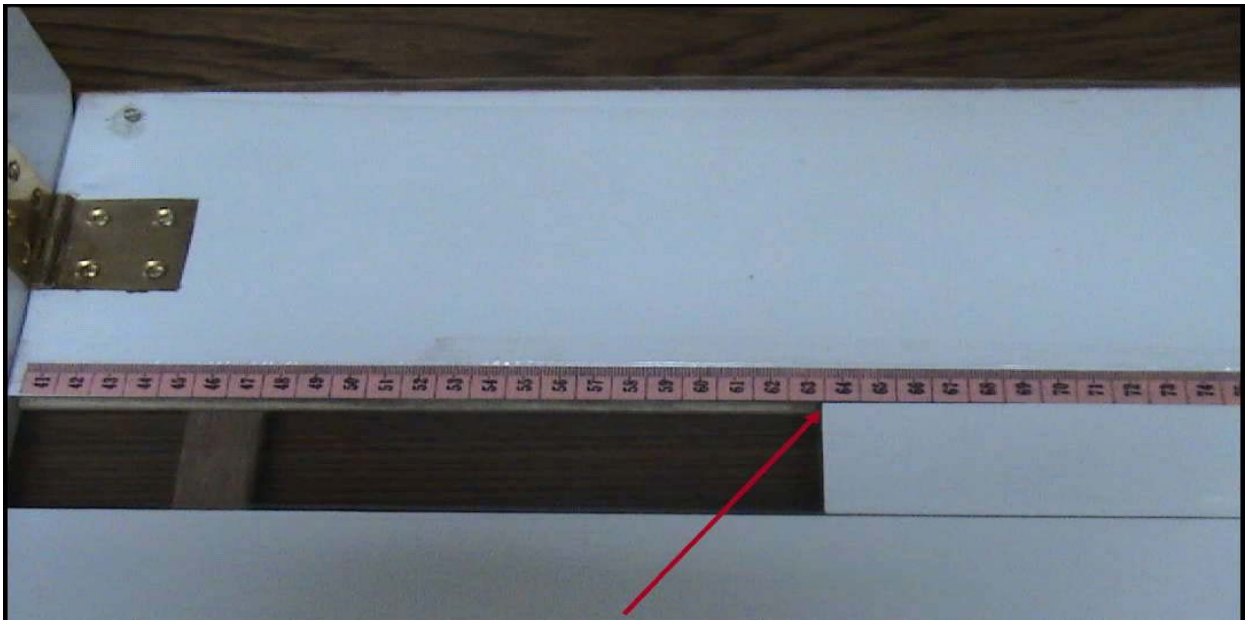


Fig. 2.9 Showing Length of the baby 63 cms

During the training you will practice measuring the length of children in clinic/hospital and field settings.

Pictorial depiction (Figs.2.10- 2.14) of measuring length in children is given in the following pages.

Fig.2.10

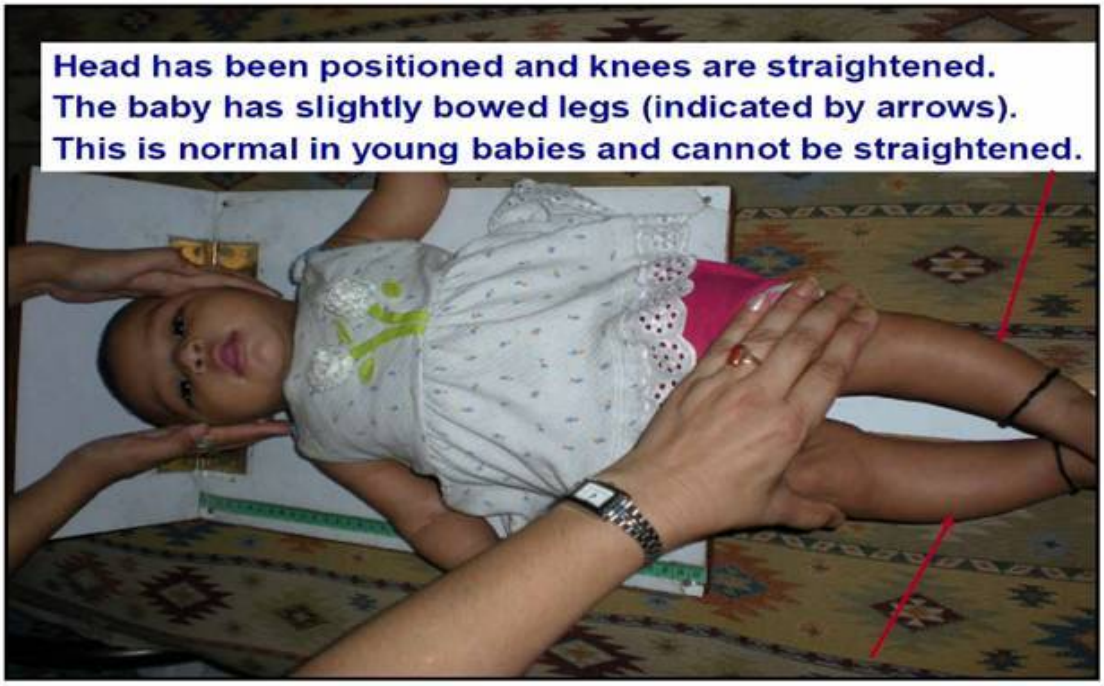


Fig.2.11

Fig.2.12

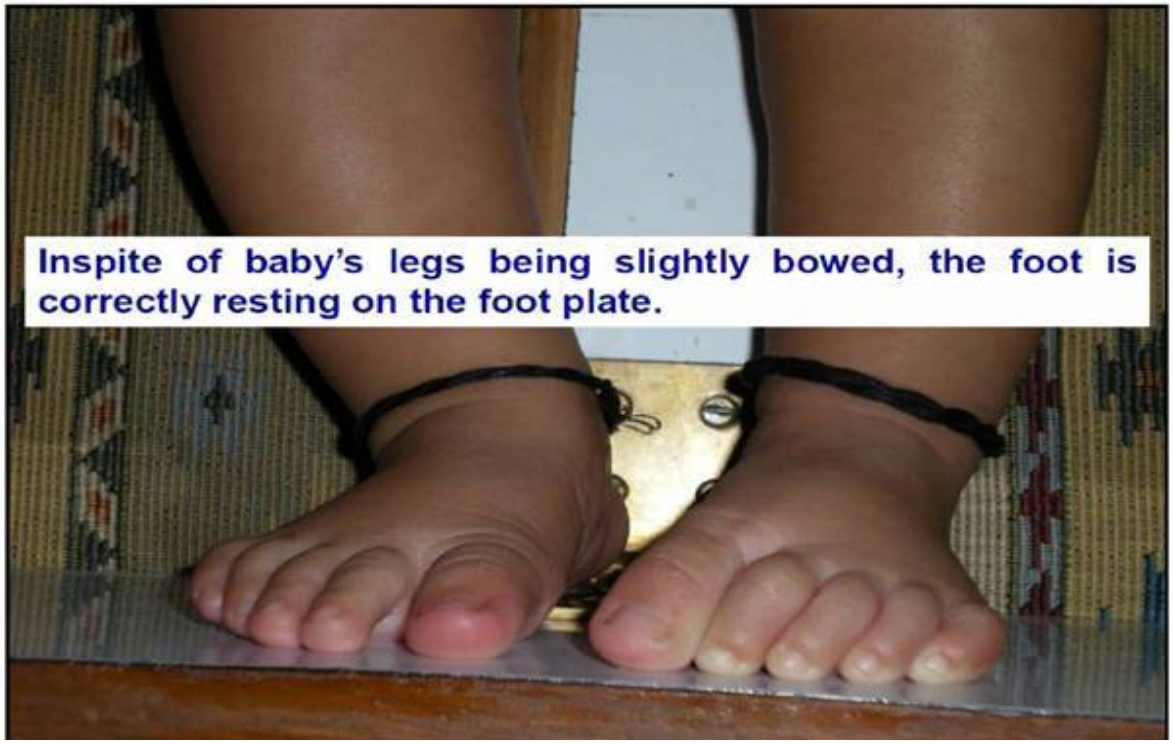


Fig.2.13

Fig.2.14

2.4 Measuring Height in Older Children and Adults

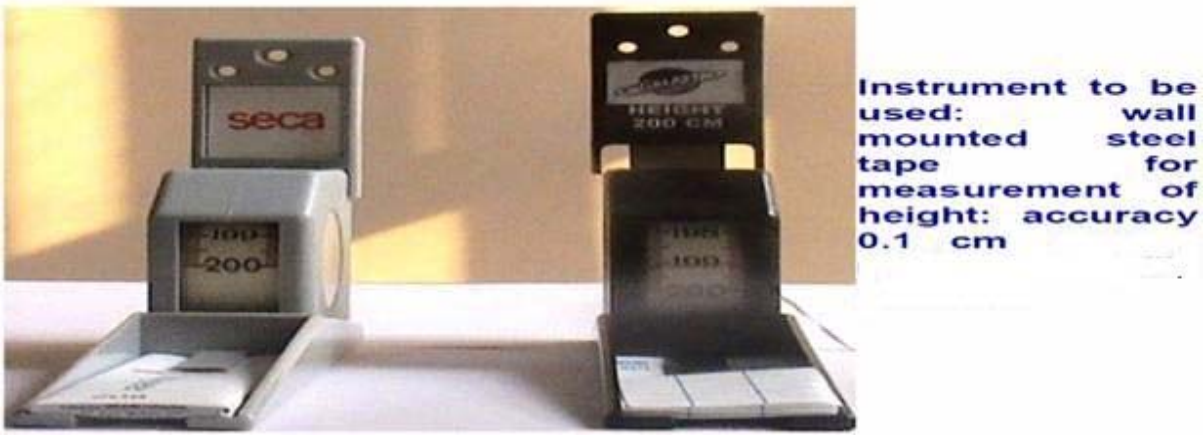


Fig.2.15

Instrument to be used: Wall mounted height measuring tape (As shown above)

Steps to be followed while taking height of Children and adults.

I. Identify a level floor and a vertical, smooth wall. In the absence of such a wall, select a level floor where a tree/pole or any straight object is available to hold the tape.

II. Fix the wall mounted tape firmly to a vertical surface in this area – e.g. wall if available.

III. The tape must be fixed accurately to a height of 200cm or 2meter from the ground.

IV. Pull down the tape at 90 degrees and mark on the wall with pencil the two margins of the tape; while taking height measurements ensure that the tape is rolled down only between these vertical lines (see fig 2.19 and 2.20)

V. Ask the individual adult or child to stand against the wall (see fig 2.22).

VI. The individual must stand straight, eyes facing forward and chin up; heels, knees, buttocks, back, shoulders and back of the head should touch the wall and head should be held in straight in such a way that lower margin of the eye socket stays in the same line at par with the top of the ear lobe (Frankfurt plane). The horizontal limb of the instrument rests on the top of the individual's head (see fig 2.23).

VII. Read the height indicated in the tape measure (see fig 2.25).

VIII. Enter the reading (in centimeters) in Question 85 (please see page 12) of this manual.

During the training you will practise taking height with other participants and measure height of adults and children in clinic/hospital and in community settings.

Pictorial depiction of fixing the tape to the wall when there is skirting (some elevated margin in the wall at the base/floor level, Fig.2.16), ensuring tape is winding down vertically and measuring height correctly in older children and adults is given in the following pages (Figs.2.16-2.30).

Fixing Wall Mounted Height Measuring Tape when wall has Skirting

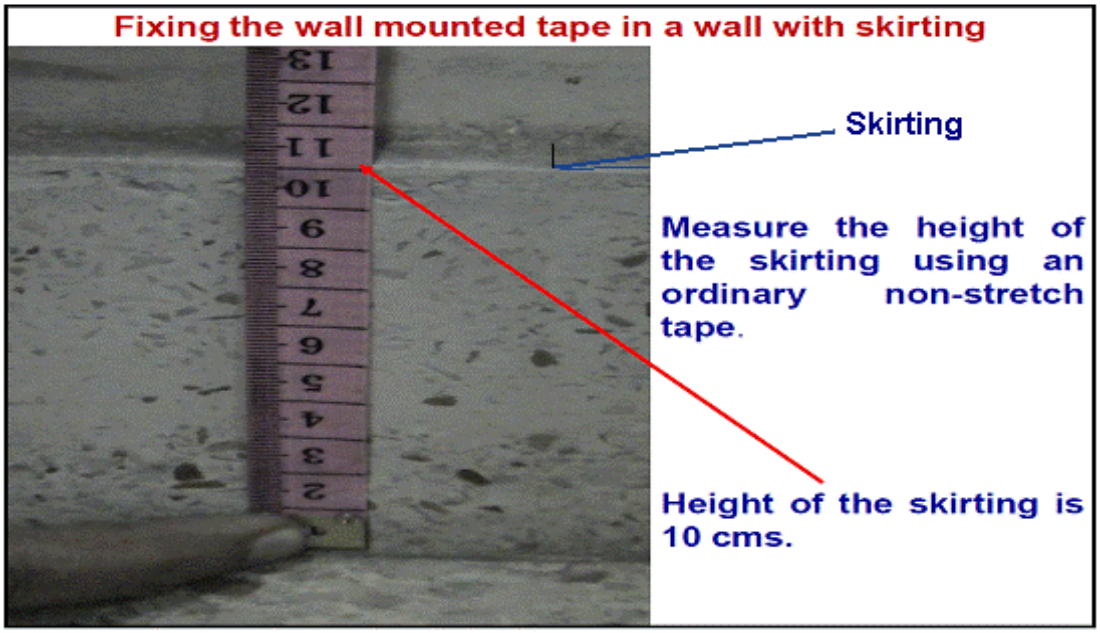


Fig. 2.16

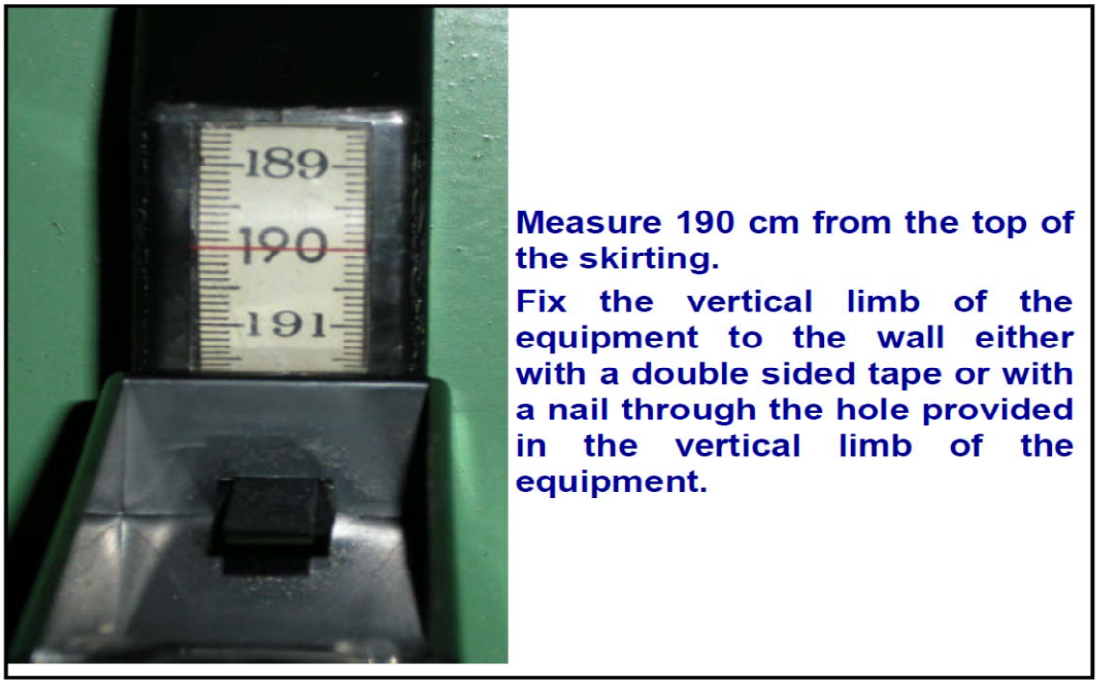


Fig.2.17

Ensuring that the Tape is Winding down Vertically

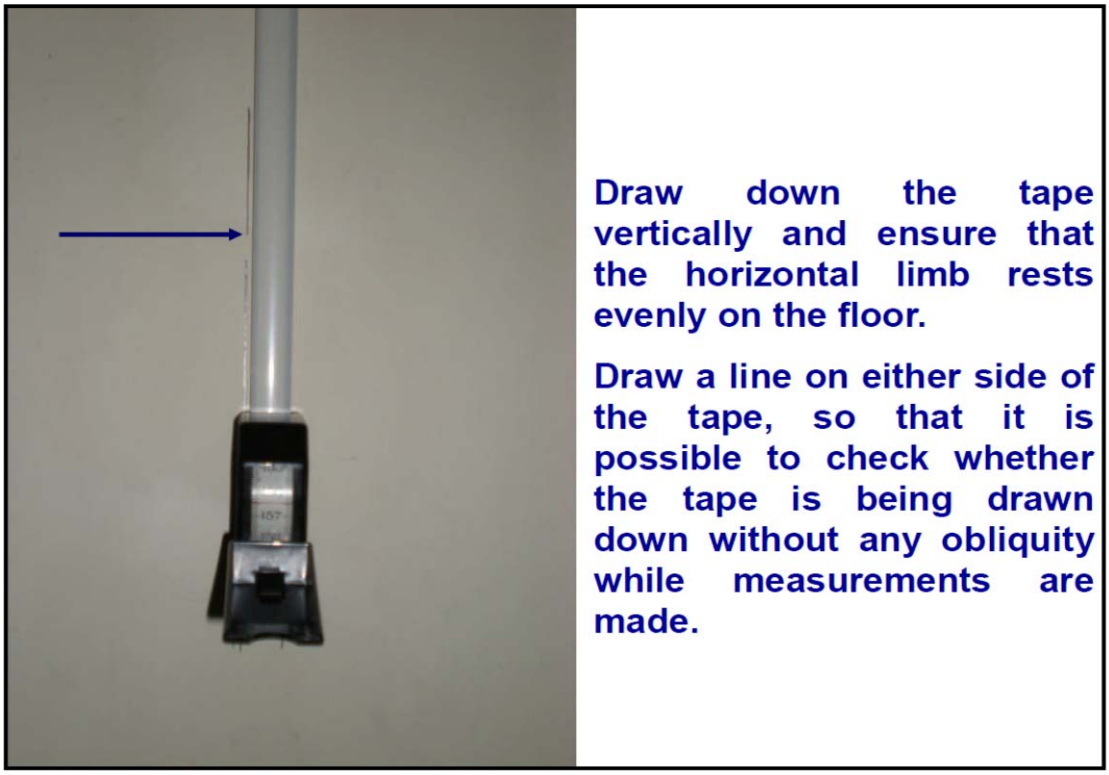


Fig.2.18

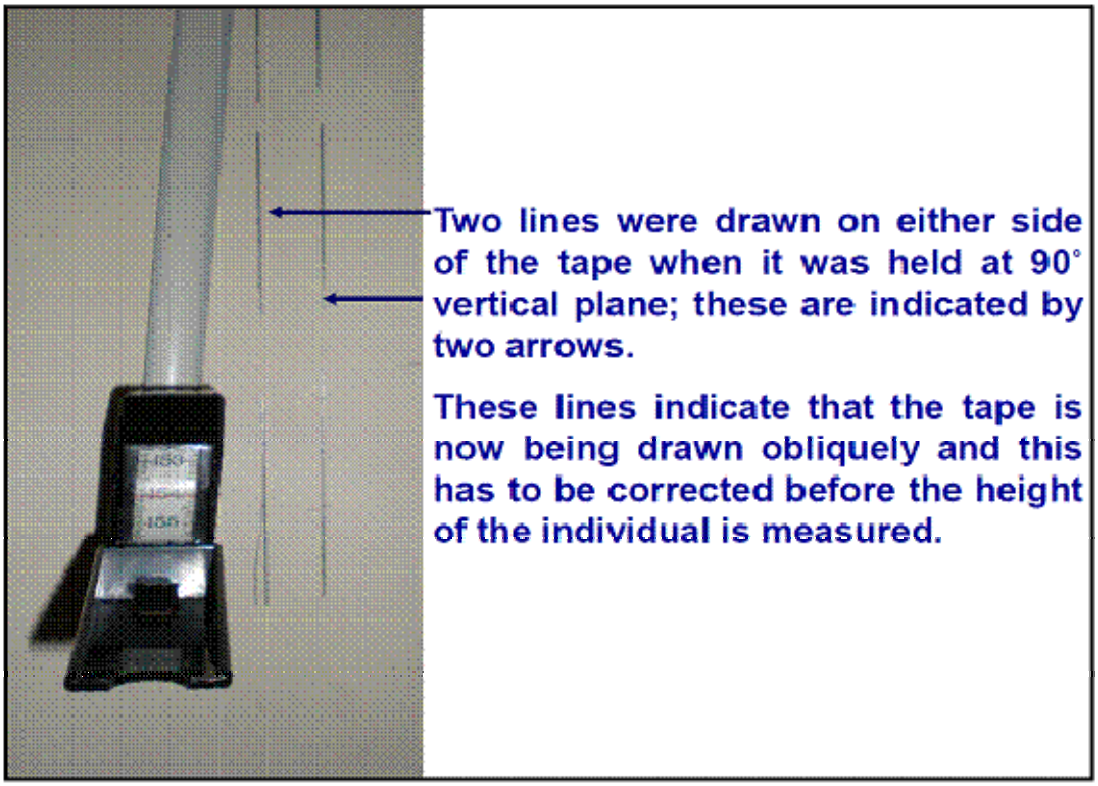


Fig. 2.19

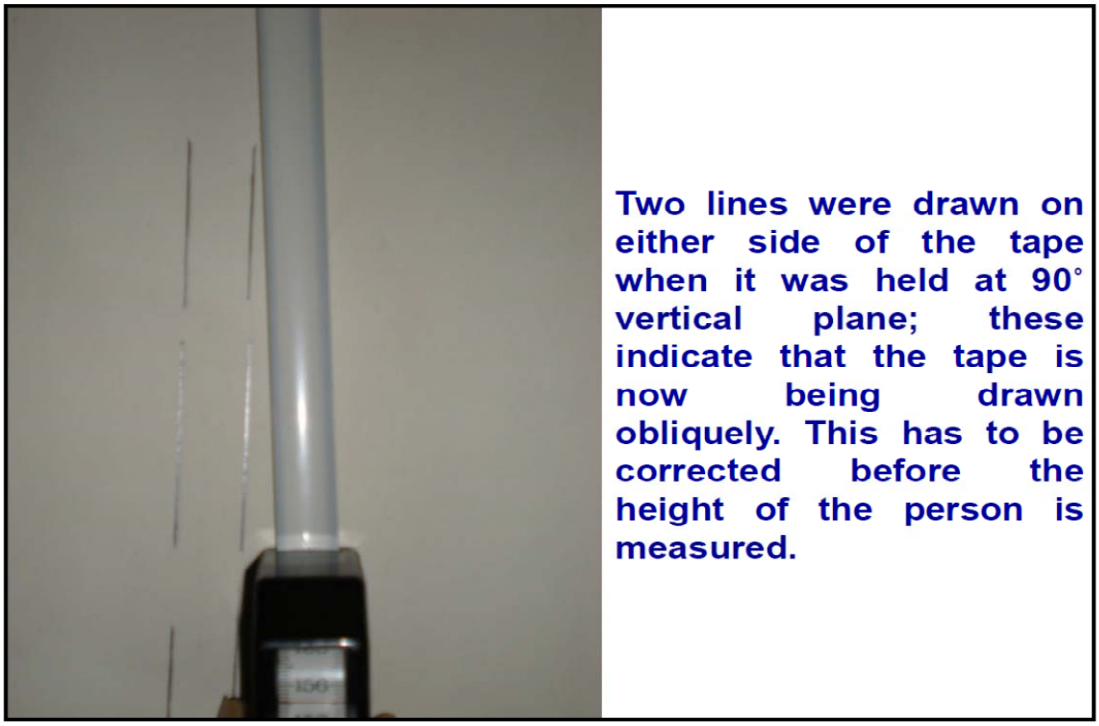


Fig. 2.20

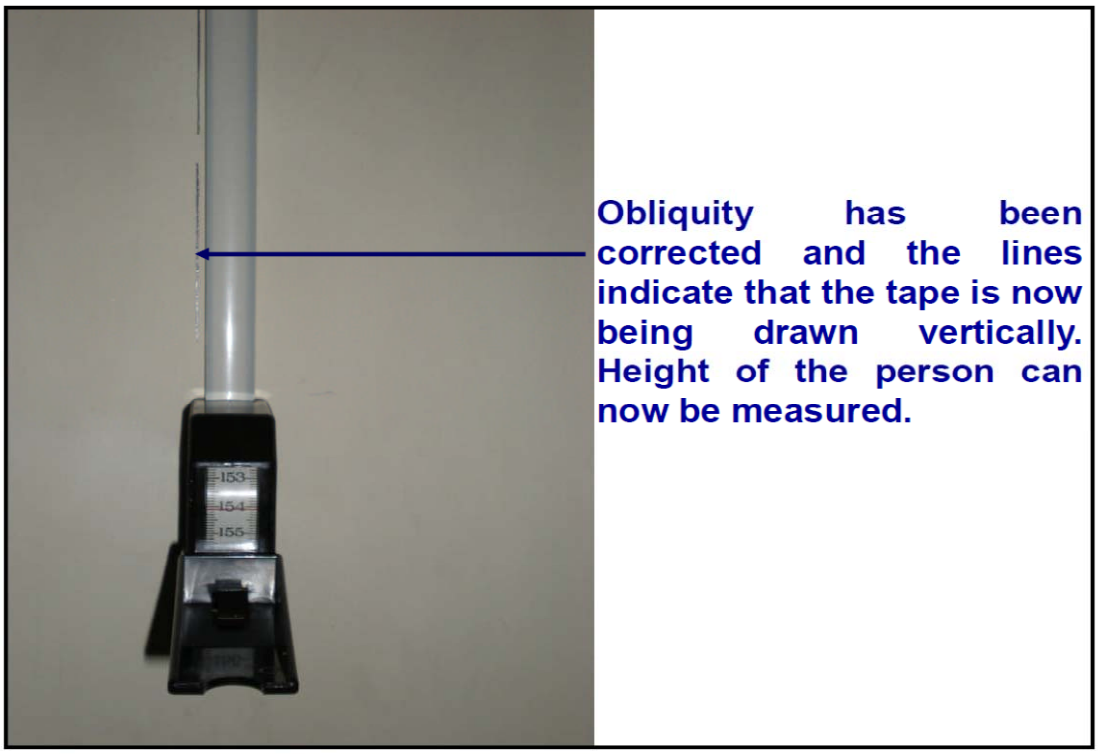


Fig.2.21

Positioning the Person for Measuring Height

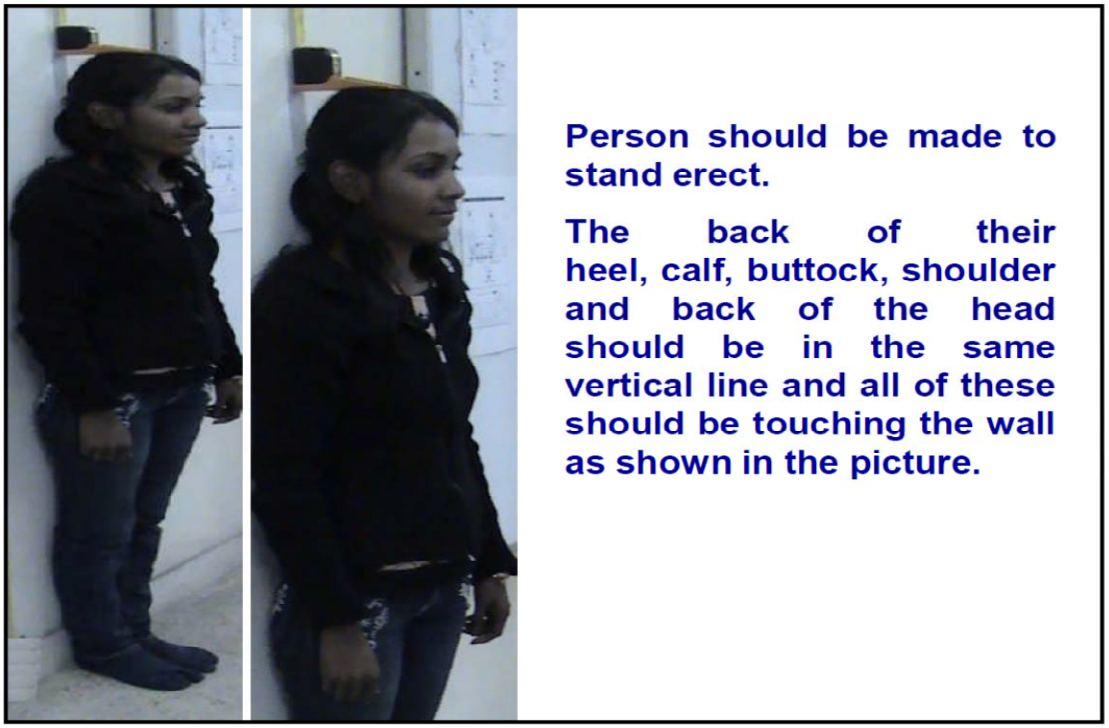


Fig.2.22

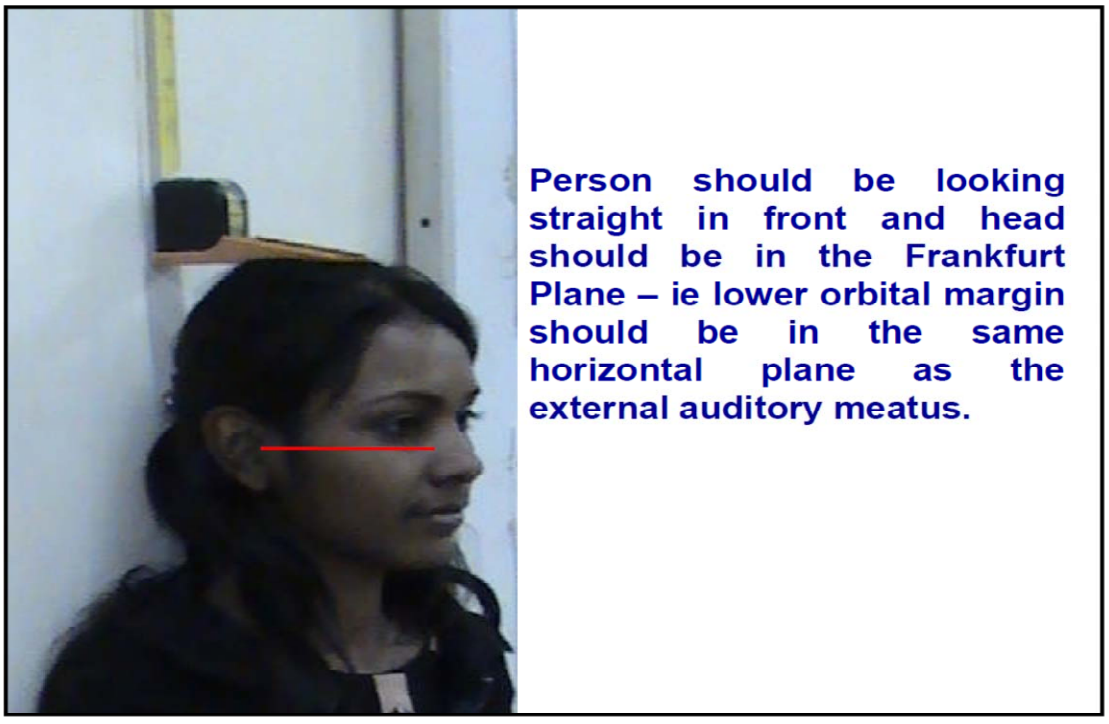


Fig.2.23

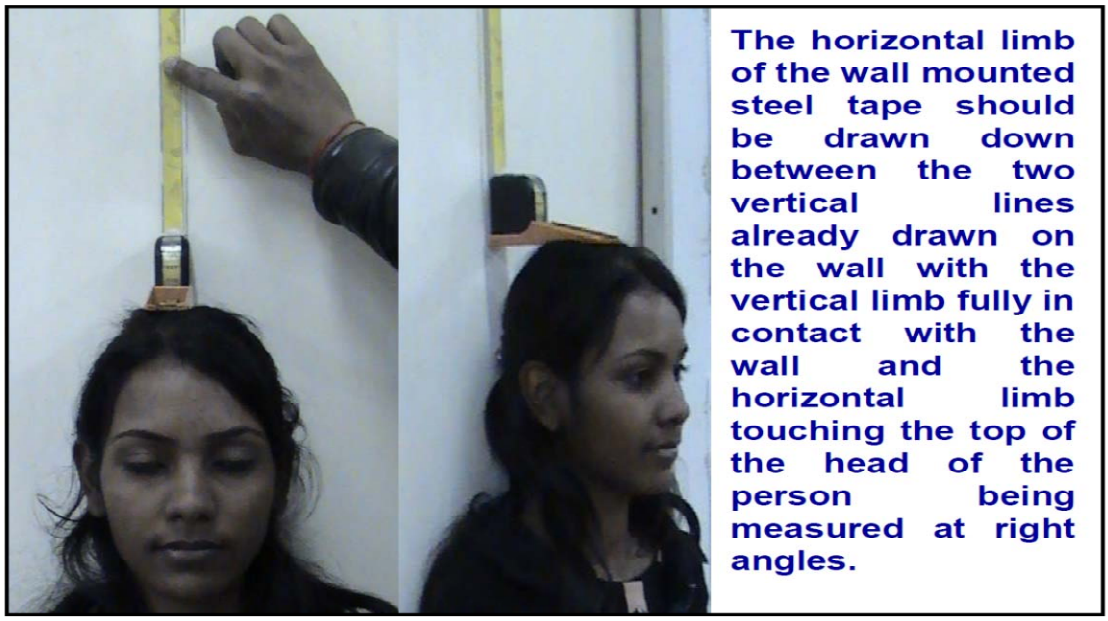


Fig.2.24

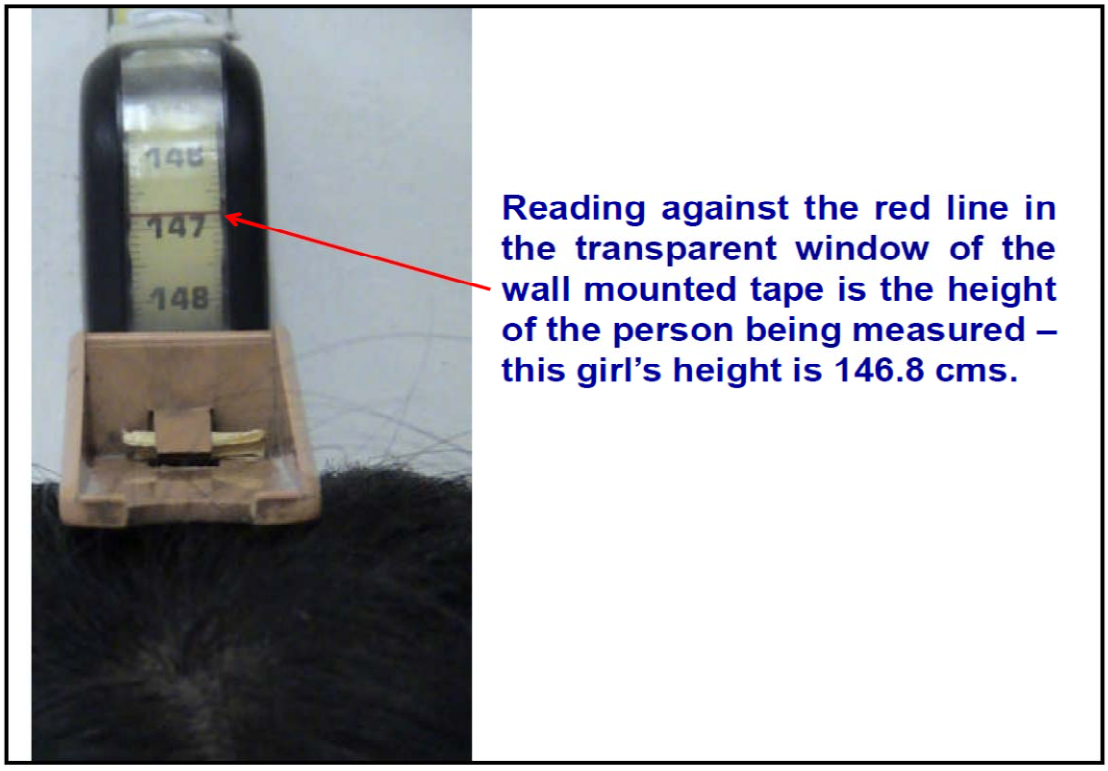


Fig.2.25

Measuring Height in Children

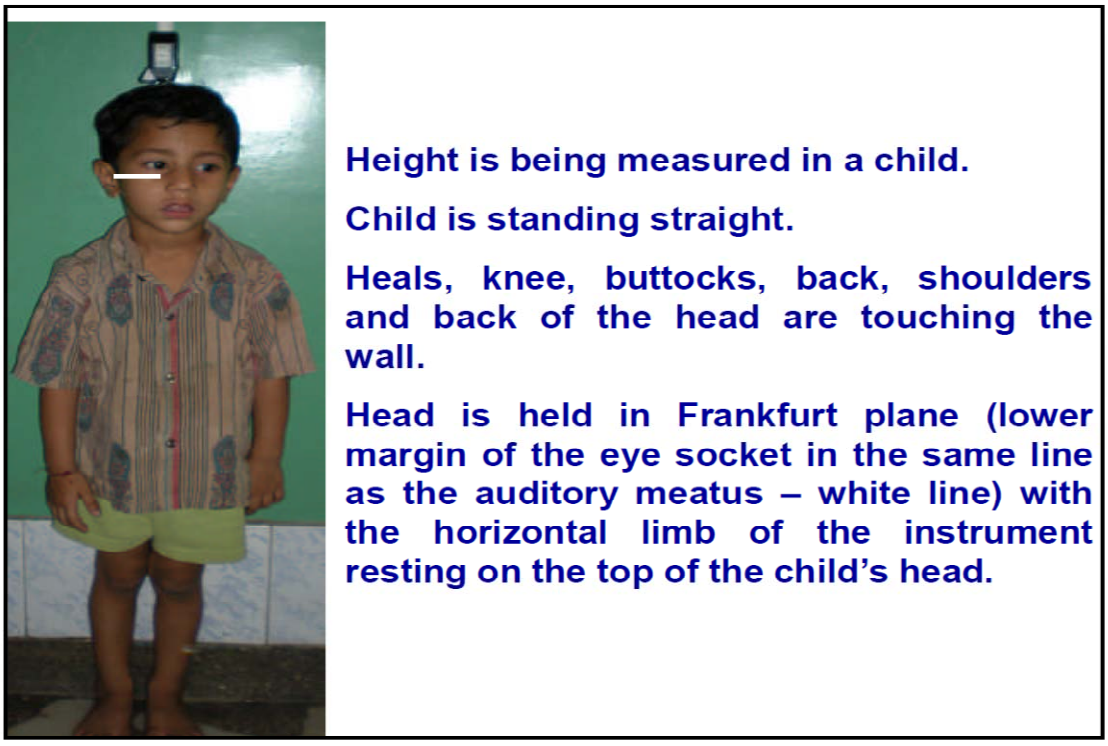


Fig.2.26

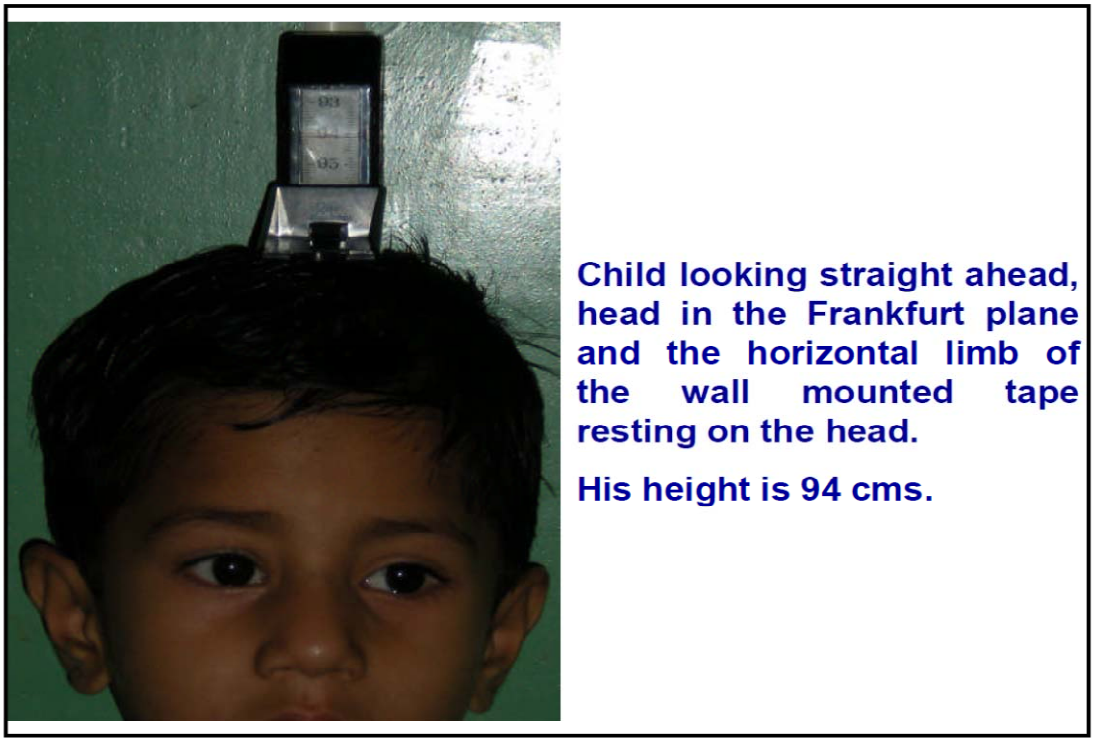


Fig.2.27

Measuring Height in Adults

Fig.2.28

Fig.2.29

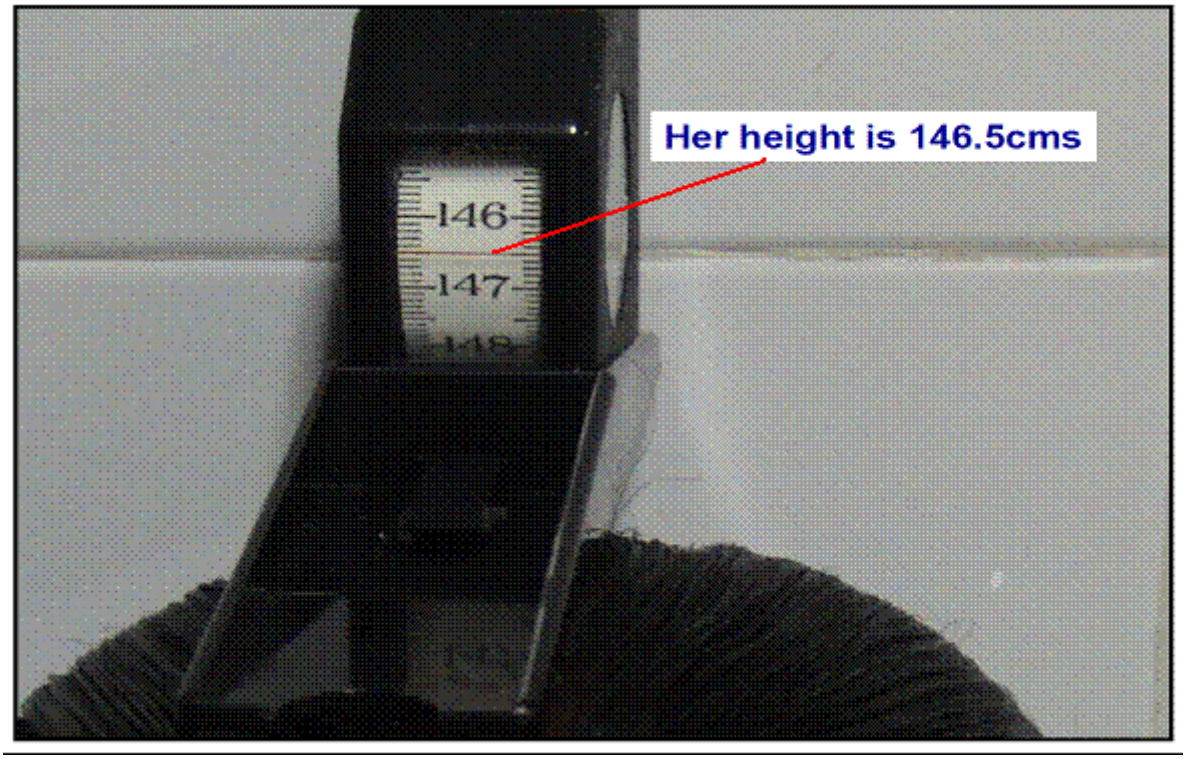


Fig.2.30 shows the height of the respondent in centimeters

As shown above the height and length measurements of infants, older children and adults will be taken and recorded in the specific Questions of the CAB Questionnaire (Please see page no.12 of this manual)

Chapter 3

HAEMOGLOBIN ESTIMATION

Concern for the health of the people entails inclusion of biomarker measurements as part of CAB components of DLHS-4, in which measuring Hb level of individuals is one of the essential components. Besides height and weight measurement, the health investigators will take blood samples from women men and children who are 6 months and above, So as to understand the prevalence of anemia in the country. Blood sample will be collected from ring/middle finger using lancet to prick the finger and pipette to draw the blood. The blood samples will be collected on filter paper (Dried Blood Spots) and sent to designated laboratory for Hb estimation.

3.1. Steps to conduct Haemoglobin Testing For children

- Before starting the blood collection procedure, familiarize yourself with the Haemoglobin section of the house hold Questionnaire. Check Question 79 to see the age of respondent. In case the age is less than 6 months, then this child will not be include for Haemoglobin testing.

- Record the Line Number of the parent/responsible adult of the child in Question 87.

- Obtain consent from the parent/responsible adult for the Haemoglobin testing and record the outcome of the consent for each child in Question 88. Obtain consent by reading to the responsible adult the voluntary consent statement provided. Record the consent status in Question 88which confirms that you read the assent and consent to the responsible adult.

- Once assent and consent for Haemoglobin and Fasting Blood Sugar testing is obtained, and ready for testing, identify the next available complete set (row) of bar code labels. Enter the identified bar code number in Question 90 in CAPI and paste the same bar code label on a new small self-sealing pouch which is meant to store the Dried Blood Spot (DBS) sample for transportation to designated laboratories for Hb estimation.Paste the second bar code label from the same row on the Blood Sample Transmittal sheet. The two other bar code labels, left out in same row , are to be utilized in the same way only against those samples of blood to be collected in duplicate for every 10th respondent .

- Collect a capillary blood sample on filter paper from each child for whom consent has been granted and same may be sent to designated laboratories for Hb testing. If the respondent's age is below 18 years, seek consent for Haemoglobin testing from the respondent as well as from parent/responsible adult. If the respondent is below 7 years, consent from parent/guardian is only needed. If the parent or responsible adult does not give their consent for Haemoglobin test, enter code '2' for refused and continues with other respondent. If the parent /responsible adult agree to the Haemoglobin test read the

informed consent statement to the minor and record the outcome of the consent request in Question 88 to, confirm that you read the statements requesting consent.

- If the eligible respondent is 18 years or over, seek direct consent of the respondent separately for Haemoglobin and Fasting Blood Sugar testing. Record the outcome of the Haemoglobin and Fasting Blood Sugar consent request in Question 88.

For Adult Women/Men

- Check again the age of the respondent as recorded in Question 79. If the respondent's age is less than 18 years, fill the code number of either the parent or a responsible adult in Question 87. This is to document the consent for Haemoglobin testing from the parent or a responsible adult.

3.2. Materials and Supplies for Performing Finger/Heel Prick

The capillary blood drop(s) used for Haemoglobin and Fasting Blood Sugar testing will be drawn from a finger. For children age 6 months to 12 months who are very thin or fingers cannot be used, the drop for Haemoglobin testing may be drawn from the heel. The following supplies and materials will be used in performing the finger (or heel) prick:

Ether: To clean the finger with cotton.

Cotton: To wipe away the first drop of Blood

Gloves: Used to reduce the risk of blood borne diseases. Gloves must be worn by the health Investigators and by anyone else assisting blood Collection of blood.

Lancet: A manual lancet will be used. It is a disposable incision device used to puncture the fingertip or heel. The device is specially shaped to fit easily on the skin surface, thus minimizing skin indentation. In the manual device, the user makes the decision on the pressure exerted through the device depending on the skin type of the individual attending the Hb estimation. The effectiveness of its use comes with practice.

Filter paper: Filter papers (2.5 X 2.5cm) are provided in the pack. With gloved hand, carefully remove a new filter paper from the pack for each respondent. Make sure to handle the filter paper in such a way that you do not touch the areas. Never handle the filter paper with your bare hands as it may transfer sweat, dirt or other contaminants on to the paper.

Band-Aid: After the blood collection an adhesive bandage has to be applied on the puncture site to avoid infection.

Bar code labels. Bar code labels will be used to identify the Dried Blood Spot (DBS) samples. This peel-off, preprinted bar code labels are provided on special sheets. Each row on a sheet includes a number of labels with the same bar code. A different row on the sheet will be used for each respondent for whom a DBS sample is collected.

Instructions for using the bar code labels are included in Step 10 of the present chapter.

Small self sealing pouch (10.5 x 8 cm): You will be given a supply of special small self-sealing pouch to use for storing samples and supplies in the field. These bags are specially manufactured to reduce the exposure of their contents to air and moisture. These bags should not be used for other purposes, like carrying food or a bunch of adhesive bandages. The bags have a "zipper" that is used to close and seal the bag. After the blood samples are completely dry, they will turn into chocolate brown colour then keep it inside the small self sealing pouch. Only one blood sample is to be kept in one small self sealing pouch**.**

Big self sealing pouch (10x 12 inches): A big self sealing bag will be provided to you for each sample PSU in which you will work. These large ziplock bags will be used to hold the DBS samples for storage and transportation to the designated partner institute.

Laminated Envelopes: After completion of the PSU all the DBS samples collected in the big self sealing pouch will be kept in the laminated envelope. These laminated envelopes will be used to hold the DBS samples from the PSU during storage and transportation to the designated partner institute.

Plastic bags for Biohazardous waste. These are big bags that are provided to hold all the biohazardous waste materials during the day and will be discarded appropriately **(See Chapter 8).**

3.3. General Procedures for Collecting Blood Drop on Filter Paper

Capillary blood will be obtained from the palm side of the end of a finger or from a heel. For adults and children six months of age and older, a finger should be used. However, if a child 6-11 months of age is undernourished and skinny, the underlying tissue can be very thin and a lancet is likely to pierce the bone. For such children, a heel puncture is recommended.

Steps in Obtaining Capillary Blood from the Finger

The following describes the steps that are involved in obtaining a capillary blood drop sample from the finger. They apply to both the collection of samples from adults and from children six months of age and above.

Step 1 Complete General Preparation

a) Always, find an indoor site to encourage privacy. The site should have a table or other piece of furniture with a flat surface where you can lay out the supplies. Ensure that a cot, bed or mat should be readily available, in case if the respondent nauseous, feels faint or needs to lie down. You must do the test outdoors; find a site in the full shade and away from rain, dust, and other environmental elements that might affect the sample.

b) Select a clean, flat surface where you can lay out all your supplies.

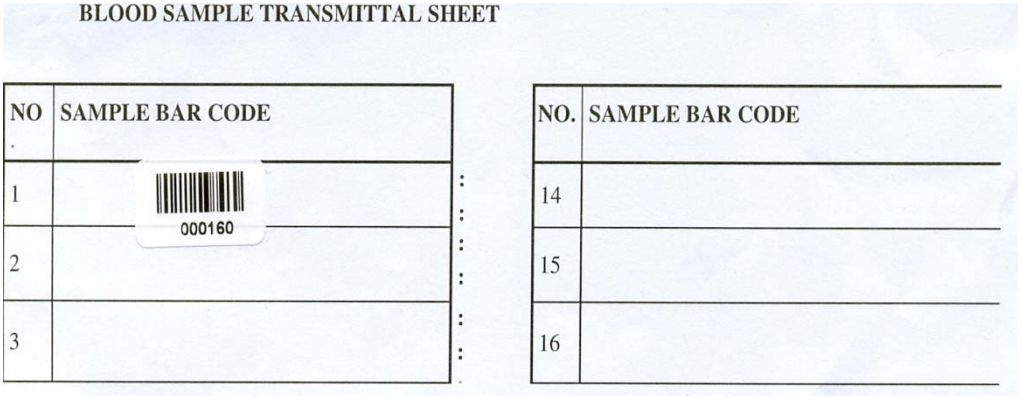
c) Refer to the testing Questions for children and adults in the Household Questionnaire and confirm the number of eligible respondents for whom blood samples will be collected. After you have established the number of respondents to test, take out the appropriate equipment and supplies. You will want to have all materials in easy reach when you begin collecting blood samples from the respondents.

d) Whenever possible, wash and dry your hands. Put on gloves before beginning the collection of the blood sample from the first respondent.

e) If the respondent is a child, describe to the parent/responsible adult exactly what will be done during the collection of the blood sample and how they can assist, e.g., holding the child on their lap and holding the child's hand during the collection of the sample. The child may be scared or anxious about what is going to happen, so it is important to calm or reassure the child before you begin to collect the blood samples. Remember that nonverbal communication is important, e.g., maintain eye contact with the child as you prepare to take the sample.

f) Label the sample by pasting one of the bar codes (out of four) on the small self-sealing pouch (Fig.1.1). Paste the other one on the Transmittal sheet (Fig1.2) and enter the same bar code number in Question 90 (Fig.1.3) **prior to the collection of the blood samples.**

Fig.1.1



BLOOD SAMPLE TRANSMITTAL SHEET

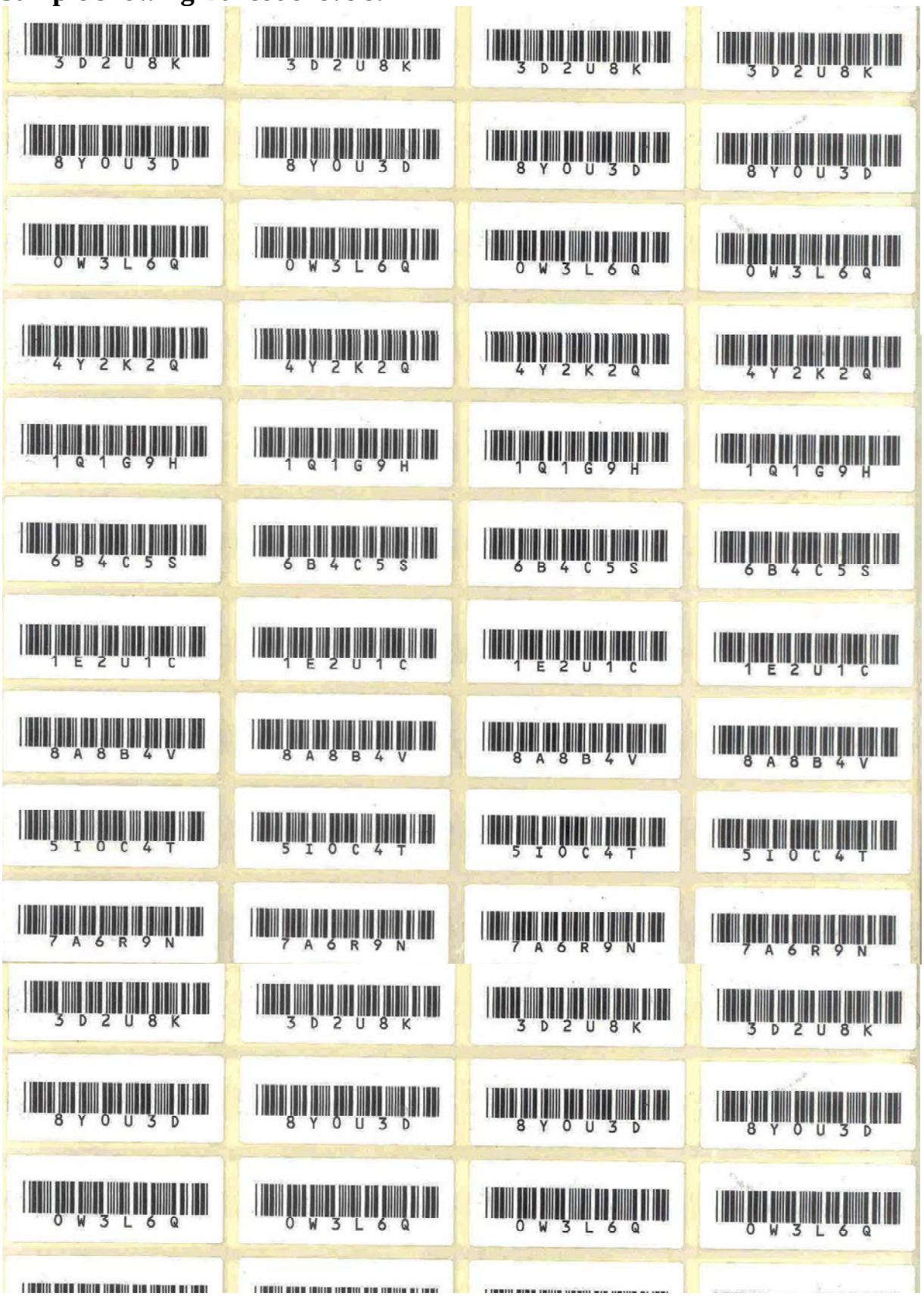
NO.	SAMPLE BAR CODE	NO.	SAMPLE BAR CODE
1	000160	14	
2		15	
3		16	

Fig.1.2

Haemoglobin Result (For all members 6 months & above) Measured=1 Not Present=2 Refused=3 Other=6	**Bar code number**
Q89	Q90
	3D2U8K
	8Y0U3D

Fig.1.3 Enter the same barcode number in the Question 90 of the CAB Questionnaire

Sample showing Barcode levels:



Step 2 (Select and Prepare the Puncture Site)

a) It is usually easier if you sit on the side of the respondent opposite to the hand that you will collect blood from. For example, if you want to collect the specimen from the left hand, place yourself to the right side of the respondent.

b) Use the third or fourth finger for collecting the blood (Fig 2.1). Do not use a finger with a scar, a wound or cut, an infection, swelling, a deformity, or a rash. Also, do not use a finger on which the respondent is wearing a ring, because the ring may disrupt the free flow of blood to the tip of the finger.

c) If the hand is cold, warm the skin over the puncture site by rubbing it. This will increase blood flow by reducing tissue fluid and will improve the ease with which a sample can be obtained.

d) With cotton ether, clean the skin of the finger thoroughly (Fig 2.2). If the skin is very dirty, use a second swab. Allow the ether to air dry. Do not blow on the area to dry the ether. Blowing may allow bacteria to contaminate the site.

e) Ensure that the lancet is readily accessible.

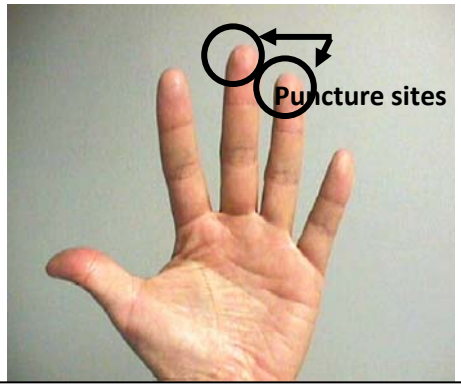


Fig.2.1 Fingers for blood collection

Fig.2.2 Clean the finger with ether swab

Step 3 Prick the Finger

a. Make sure that the finger is below the level of the respondent's heart to increase the flow of blood to the finger. Using a rolling movement of your thumb, lightly press the finger from the top knuckle toward the tip. That action will stimulate a flow of blood to the sample area.

b. For children, it may be helpful if the parent/responsible adult assists you by holding the Child's hand,

c. When your thumb reaches the fingertip (Fig.3.1), maintain a gentle pressure. Place the lancet perpendicular to the palmer surface of the end portion of the finger slightly off center. Avoid the very tip of the finger (Fig. 3.1) or the sides beyond the palm area, because of the risk of piercing the underlying bone,

d. Use the lancet to puncture the skin (Fig.3.2). After puncturing the skin, turn the finger slightly to prevent blood drop from spreading.

e) The used lancet should be put aside while blood collection is being done. After successfully collecting the blood sample, the used lancet should be placed in the plastic bag provided for biohazardous waste along with other disposable materials used for the blood sample collection.

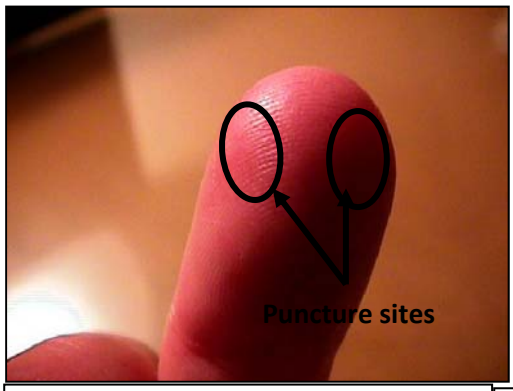


Fig 3.1 Puncture sites on finger

Fig 3.2 Using lancet to prick finger

Step 4 Collect the blood drops

a) When the blood appears, use cotton to wipe away the first drop of blood (Fig 4.1) and collect the second drop for Haemoglobin testing on a filter paper. If the respondent is an adult and the required consent(s) for Fasting Blood Sugar testing have been obtained, the third drop of blood will be collected on Gluco strip Otherwise, if the adult or youth respondent is only participating in the Haemoglobin testing, wipe away the first drop and collect the second drop for Haemoglobin testing in the same manner as for children.

b) If the blood stops flowing before a sufficient amount has been collected, the skin puncture procedure may be repeated with the respondent's (parent's/responsible adults) consent on a different finger. ***Do not reuse any of the supplies used for the first puncture.***

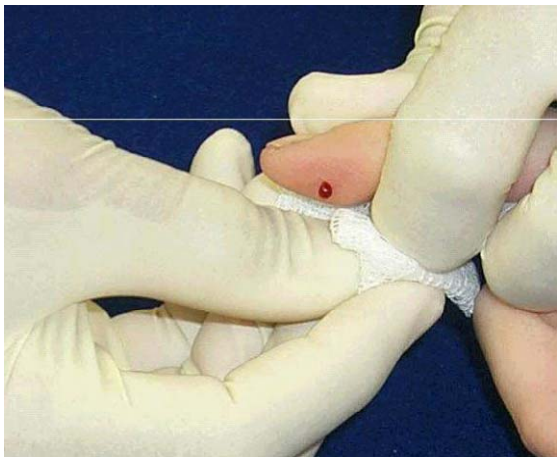


Fig. 4.1 Wipe away the first

Step 5 Obtaining Capillary Blood from the Heel of Infants

The heel (as shown in the fig 5.1) is the puncture site for infants who are age 6 months to one year who are very thin. The following describes the steps that are involved in obtaining a capillary blood drop sample from the heel of an infant.

The puncture should be made from the middle of the big toe to the heel or from the area between the fourth and fifth toes to the heel (Fig. 5.1). Hold the heel as shown in Fig 5.2 and puncture on the side of the heel avoiding the central area which may injure nerves –tendons or bone.

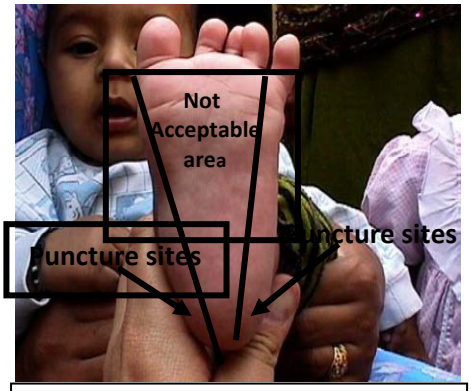


Fig 5.1. Site for heel puncture

Fig 5.2. Holding the infant's

a) Clean the site with an Ether swab. Make sure the site is dry before puncturing the skin with the lancet. In selecting a puncture site, avoid any areas of the skin that are broken or infected.

b) Use the lancet for the skin puncture by placing the blade-slot surface against the area and pressing the trigger. Ensure the free flow of blood.

c) Wipe away the first drop of blood using sterile cotton and collect the second drop for Haemoglobin testing on the Filter paper card.

Step 6 Haemoglobin Testing For Children

The protocol of drawing blood sample for children is the same as for adults. In general, you should try to complete the Haemoglobin testing for all of the eligible children present in the household at the time of your visit for which consent has been obtained. Blood samples from the children may be taken first before proceeding to eligible women and men in the household.

Step 7 Drawing blood in Hb pipette and disposing onto filter paper

- A clean and dry hemoglobin pipette is used to slowly draw blood up to a little above the 20 µl marks on the pipette. Care should be taken to avoid any air bubbles in the blood column (Fig.7.1).

Fig 7.1

- Clean the tip of the pipette using tissue paper/dry cotton. Adjust the volume of blood to 20 µl mark by touching the tip of pipette with the gloved finger with a tissue paper (Fig 7.2).

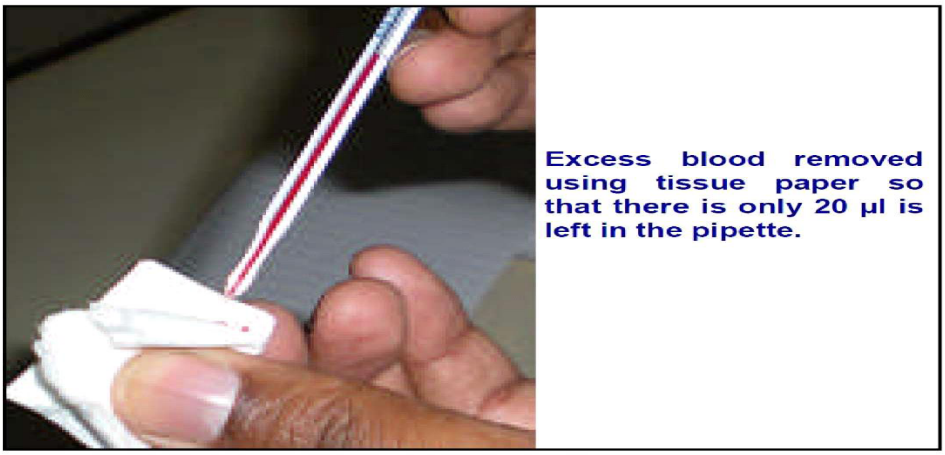


Fig. 7.2

- Transfer the blood from the pipette by slowly blowing it out onto the filter paper, in the form of a circular spot of about 1 cm diameter, by keeping the pipette perpendicular with its tip touching the filter paper and moving in a circle (Fig 7.3). Blow very slowly to take care not to splash the blood. No trace of blood should remain, either in the pipette or on its tip.

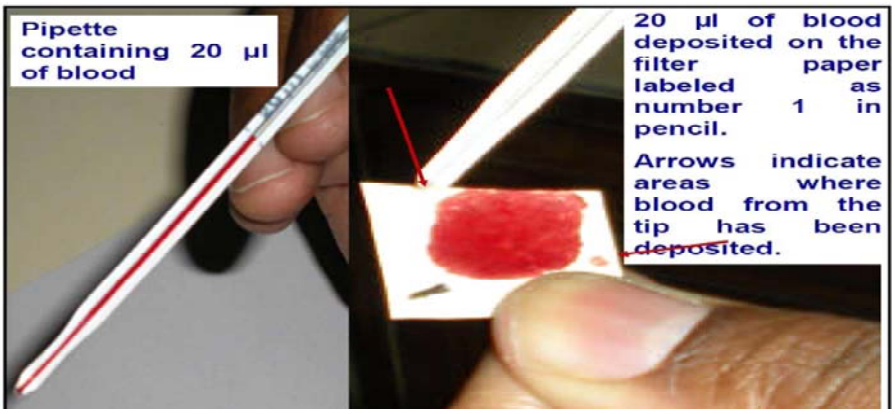


Fig 7.3

- As soon as the sample blood collection is over, press the puncture site of the finger with dry cotton so that the bleeding stops. Put the band aid over the puncture site.

- Discard the sample in case the blood sticks to the inner surface of the pipette (Fig. 7.4) and collect the blood again with a clean and dry pipette following consent from the respondent.

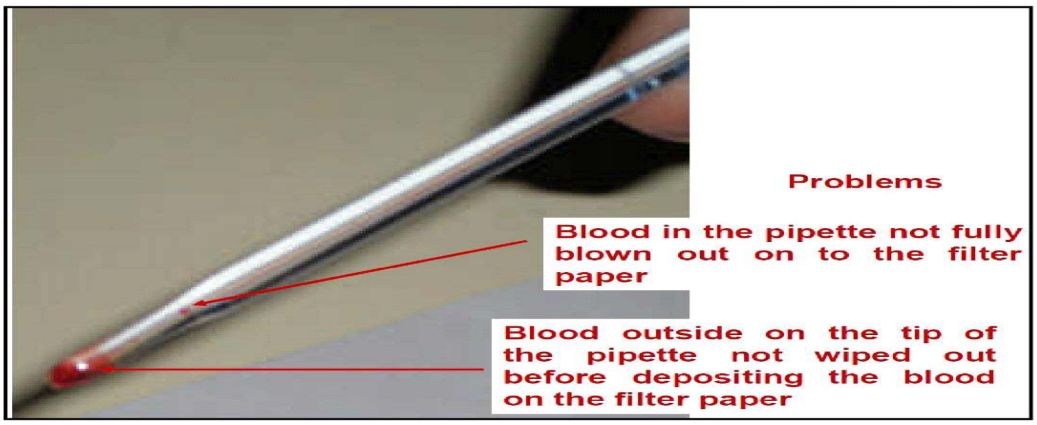


Fig.7.4

- Air dries the blood sample on filter paper.

- After the blood spot has completely dried (color may appear chocolate brown, Fig. 7.5), put the filter paper with the dried blood sample in the small self-sealing pouch bearing the identified bar code for the respondent (Fig. 7.5). Each filter paper containing the blood sample taken from each respondent has to be sealed separately in self sealing pouches.

Fig 7.5

- Small self sealing pouches collected from a single PSU are then placed in a big self pouch.

- The samples are now ready for sending to the designated PI laboratories for Hb estimation. The DBS samples should reach the PI laboratory with in a week's time. Hb estimation from DBS subsequently should be completed in the laboratory by cyanmethaemoglobin method preferably within 7 days of receipt of blood samples.

- After Hb estimations are completed, it is the primary responsibility of the PIs to communicate the results against the blood samples by next day to IIPS/NIHFW.

- **Cleaning of haemoglobin pipettes in the field**: Soon after transferring the blood onto the filter paper, the pipette is rinsed first with Drabkin's solution, followed by distilled water and ether in that order (Fig.7.6 - 7.7). Dry the pipette by blowing air into the pipette (Fig.7.8).

Fig.7.6

Dry the pipette by pipetting ether twice and blowing it out.

Once it is dry, the pipette is ready for use.

Fig 7.7

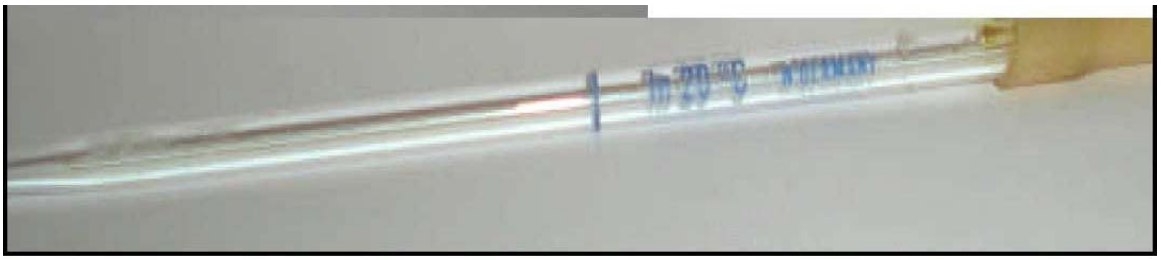


Fig. 7.8 The Hb pipette is ready for reuse

- Blood clots entering into the capillary of the pipette sometimes block the pipette. Clear out the clots from the capillary of the pipette using the copper wire provided. Use the above procedure for subsequent cleaning and drying**.**

Step 8 (Collection of duplicate samples for quality control)

Every 10^{th} blood sample (10% of the samples) is to be collected in duplicates. Two separate filter papers carrying the blood sample of the same individual will be kept in two separate self sealing pouches labeled with same barcode label. The numbers of the bar code labels will also be entered in the Question 90 of the CAB questionnaire.

Step 9 (Precautions)

- Wipe the finger with ether only but not with alcohol.

Alcohol/Spirit should not use for wiping the finger Alcohol denatures proteins. If Alcohol is used for wiping finger then Blood is collected on filter paper, the blood spot will not elute completely.

- Clean the pipette with Drabkin's solution and distilled water after every use and dry the pipette using ether as mentioned above.
- Pipettes should be absolutely dry before use.
- Decontaminate the used lancets, cotton swabs and other potentially infectious material with bleaching solution.

Step 10 Affixing the bar code labels

a) Wearing a pair of latex gloves, carefully remove a new filter paper from the small self -sealing plastic pouch in which you have stored the Filter paper. Make sure to handle the filter paper in such a way that you do not touch the areas. Never handle a filter paper with your bare hands as you may transfer sweat, dirt or other contaminants on to the paper.

b) From the full row of the bar code label sheet enter the first Barcode number in CAPI in Question 90 of the Haemoglobin Testing Page in CAB schedule.

c) Take the same first bar code label from the same row and paste it at the bottom of the small self-sealing pouch containing Dried Blood Spot (DBS) sample.

d) Take the second bar code label from the same row on the sheet of labels. Paste it on the Blood Sample Transmittal Sheet for this Primary sampling unit (PSU) that will be sent together along with the samples to the Testing centers**.**

e) **DO THIS CAREFULLY.** The bar code label is the only means of identifying the blood sample and for eventually linking the final Haemoglobin test results to the interview data. Four identical barcode labels are provided for each sample. Mistakes will result in mismatches later on. Check that the two same bar code labels for a respondent have been placed, 1st in zip lock bag containing filter paper (DBS) and 2nd in the transmittal sheet. Make sure that the number from the same barcode is written in the Haemoglobin testing Question 90 of the Questionnaire before you proceed to collect blood drops from the respondent.

f) If it is a 10th respondent, a duplicate sample needs to be gathered using the same blood. The filter paper containing the dried blood needs to be packed in the same manner in a separate self sealing pouch labeled with the 3rd bar code label and the 4th being affixed on the transmittal sheet. Four identical barcode labels are provided for each sample. Mistakes will result in mismatches later on. Therefore, check that the two same bar code labels for a respondent have been on the transmittal sheet. Write the number of the bar code in the Question 90 as routinely followed.

g) If you have more than one eligible respondent from whom all necessary consents for anemia testing have been obtained, first finish all steps for one respondent before repeating all steps for the next respondent.

h) Taking the filter paper out of the package. Filter paper should be the last item taken out of the package before starting the blood collection procedure in order o avoid exposure to moisture, dirt etc.

- Never touch the filter paper. Avoid touching the area on the filter paper before collection. Never touch the blood spots after collection.

- Do not layer. Do not layer multiple drops of blood on the filter paper. If blood flow diminishes and you are unable to take up 20 µl (upto the requisite mark in the Hb pipette), request consent from the same subject (parent/guardian) to repeat the sample collection again using another finger.

- Protect the filter from contamination. Do not allow water or other contaminants to come into contact with the filter paper before or after use.

- Do not place the filter paper in the small self sealing pouch until thoroughly dry (chocolate brown). Insufficient drying adversely affects test results.

- Decontaminate the used lancets, cotton swabs and other potentially infectious material with bleaching solution.

Step 11 (Collection of Biohazardous wastes)

Place all biohazardous wastes (e.g., lancets, Cotton swabs, and gloves) into a plastic bag provided for field disposal of these items. At the end of the day, follow the procedures described in Chapter 8 for the proper disposal of these waste materials

3.4 Storing and Transferring the Dried Blood Spots (DBS) Samples

The dried blood spot (DBS) samples must be carefully maintained until they are picked up and taken to the laboratory. They should never be exposed to sunlight during storage.The following describes the steps that should be followed in storing and transferring the dried blood spot (DBS) samples.

Step 1 Storing the DBS Samples

a) Each morning, before going to the field, you must assimilate all the filter papers with dried blood spot (DBS) that you have collected on the previous day in the small self-sealing pouches and prepare them for dispatch to designated PI laboratories.

b) Put the small self-sealing pouch containing filter paper with dried blood spot (DBS) into a big (low gas-permeable) self-sealing bag. Close the zipper, gently pushing out any excess air in the bag as you are zipping it, being careful not to press on the blood spots. Dried blood spot (DBS) samples should not be allowed to come into contact with other dried blood spot (DBS) samples during handling, shipment or storage.

c) When you have packaged all the small self sealing pouches containing dried blood spot (DBS) inside the big self sealing bag, put them into the laminated envelope representing the PSU for which the samples were collected.

d) The laminated envelopes are to be transported to the designated PI laboratories within a week of date of collection.

Step II Transferring the DBS Samples

Investigators need to ensure that the samples of blood spot are collected on filter papers and dried blood spot (DBS). Each dried blood spot (DBS) samples is to be kept in a separate self sealing pouch, properly labeled. After completion of PSU, all the dried blood spot (DBS) samples is to be kept in large Zip lock bag with original transmittal sheet's, these large zip lock bag containing all the samples and transmittal sheet should be packed in laminated envelope and delivered to the designated laboratory of the Partner Institute in good condition in order to yield accurate results. **These samples should reach the labs of designated Partner institute within seven days from the date of collection**.

Transmittal Sheet

The purpose of the Blood Sample Transmittal Form is to account for the samples at each step of the testing procedures. The transmittal sheet carries the identical barcode labels for each DBS (stored in the small self sealing pouch). This sheet will also account for crosschecking information for DBS collected from each household and later the whole PSU. Fold the Blood Sample Transmittal Form along the dotted lines (so that the barcode labels are not folded), and keep it in the Sample PSU Bag (Laminated envelope) along with the DBS samples for that PSU.

After completion of the PSU and before sending the DBS samples to designated PIs, the team supervisor must make three Photocopies of each transmittal sheet. The original transmittal sheet will go to Partner Institute send with the DBS samples. Of the three copies, one will go to IIPS, second to NIHFW, and the third copy will remain with the field agency for their record. The Transmittal sheet can be fax or send by speed post

On one transmittal sheet only 26 bar codes can be pasted, However if there are more than 26 samples in the selected PSU, use new transmittal sheet and paste the bar-codes accordingly.

Step III Modalities of transport of Dried Blood Spot (DBS) Samples

When you have completed the PSU, remove the packaged DBS samples from the PSU Sample Bag (do not open the small self-sealing pouch). One by one, check the bar codes labels on the small self-sealing pouch containing filter papers vis-à-vis the bar codes affixed to the Blood Sample Transmittal Sheet. For each DBS sample, put a check mark in the column labeled Health Investigator for each corresponding bar code found on the transmittal sheet. Count the number of DBS samples and record in the boxes provided in Column 3 on the transmittal sheet (**Form1, please see Page No.58)** in the row labeled Health Investigator. If there are any remarks, you must attempt to account for them. Use Column 7to explains. Sign your name in Column 4 and the date in Column 6.

The team's health supervisor will re-verify the samples, and sign his name in the same row. Once everything is verified, a sample pick up person/vehicle will visit the teams to collect the DBS samples for the completed PSUs. When he/she collects the DBS samples, he/she will recount the DBS samples for each of the completed PSUs and sign the Blood Sample Transmittal Sheet. The samples and transmittal sheet will be transported to the laboratory for processing.

Before sending the DBS to PIs, the Field Agency(s) needs to ensure that the samples:-

- Blood spot are collected on filter paper are completely dried and chocolate brown in colour,
- Samples are put in a self-sealing bag and properly labelled
- Delivered to the earmarked lab(s) of designated Partner Institute in good condition
- Samples are dried and sealed, in order to yield accurate results.

After completion of the PSU, DBS samples should be sent within one day and it should reach the designated laboratory within one week. In case the samples could not be dispatched within the day of the completion of the PSU, the team supervisor should inform the person designated in PIs and the in charge about the case of the delay and full details. These samples should reach the lab(s) of designated Partner Institute within one week from the date of collection. Any sample reaching beyond one week from the date of collection should be informed to Partner Institute as early as possible.

Each FA will specifically designate a person who will be responsible for taking the Dried Blood Spot (DBS) samples from the survey PSU to designated partner institute. The team supervisor should ensure that the DBS samples are immediately handed over to the designated person before leaving for the next PSU.

Form 1. BLOOD SAMPLE TRANSMITTAL SHEET

STATE CODE	DISTRICT CODE	PSU NUMBER	NAME OF PLACE

FOLD AND KEEP SHEET IN LARGE ZIP-LOCK BAG WITH SAMPLES
UNTIL FINAL SIGNATURE HAS BEEN OBTAINED

PERSON SENDING/ RECEIVING SAMPLES	WHEN TO FILL IN FORM	TOTAL COUNT OF BLOOD SAMPLES	SIGNATURE (CONFIRMING THAT EACH SAMPLE IS PRESENT-SEE BACK OF FORM)	SIGNATURE (CONFIRMING THAT THE NUMBER OF BLOOD SAMPLES MATCHES COL. 3)	DATE	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
HEALTH INVESTIGATOR/SUPERVISOR	AFTER PSU IS COMPLETED					
SAMPLE PICK UP VEHICLE/ PERSON INCHARGE	AFTER SAMPLES ARE PICKED UP IN FIELD					
RECEIVER AT Designated Lab	AFTER ARRIVAL AT THE LABORATORY					

INSTRUCTIONS (FIELD STAFF)

HEALTH INVESTIGATOR (HI): When sample collection for a PSU is completed, account for the number households covered for the PSU. Take out the DBS packaged in small self sealing pouches from the big self-sealing pouch making sure not to open the small self-sealing pouch. Check to make sure that the DBS per house hold kept in a big self sealing pouch tally with the number recorded in the blood sample transmittal sheet. Again, one by one, check the bar codes labels on the small self-sealing pouch vis-à-vis the bar codes affixed on the Blood Sample Transmittal Sheet. For all collected DBS from the PSU, the total number may be entered in column 3, signed by Health Investigator in column 4 (Form1). In case of any discrepancies, recount and use column 7 to explain the same. Sign your name in Column 4 and the date in Column 6.

Fold and store this transmittal sheet in the big self sealing pouch.

FIELD TEAM SUPERVISOR (FTS): After the HI has verified the blood samples, the FTS will conduct a second verification. Verify that the unique bar code (identification) number for each blood sample on filter paper stored in small self sealing pouch. Ensure that they are properly kept in the big self sealing pouch along with blood sample transmittal sheet and subsequently stored in the laminated envelope containing the information details of , State, Dist, PSU etc. Note any discrepancies in Column 7. Count and verify the total number of blood samples in Column 3. Sign your name in Column 5 and the date in Column 6. Refold and store this transmittal sheet in the big self sealing pouch.

DESIGNATED PERSON FOR SAMPLE PICK-UP: Before returning to the sample collection centres after visiting a team in the field, you will verify the number of blood samples collected in each completed PSU that you are carrying back with you. For each completed PSU, count and record the total number of blood samples stored in the large zip-lock bag labeled with that PSU number in Column 3. Note any discrepancies in Column 7. Sign your name in Column 5 and the date in Column 6. Refold and store this transmittal sheet in the large zip-lock bag kept in laminated envelope.

RECEIVER AT THE DISIGNATED PI LABORATORY: For each laminated envelope arriving from the field, the number of blood samples received need to be verified tallying with the number in the blood sample transmittal sheet. Count and record the total number of blood samples as written in Column 3 of the transmittal sheet. Note any discrepancies in Column 7. Sign your name in Column 5 and the date in Column 6. Copy both sides of this transmittal sheet and file the copies in a designated, locking file cabinet. Refold and store the original transmittal sheet in the laminated envelope.

STATE CODE **DISTRICT CODE** **PSU NUMBER** **HEALTH INVESTIGATOR CODE**

BLOOD SAMPLE TRANSMITTAL SHEET

NO.	SAMPLE BAR CODE
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

NO.	SAMPLE BAR CODE
14	
15	
16	
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26	

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CHAPTER 4

BLOOD SUGAR (FASTING) ESTIMATION

4.1 Fasting Blood Sugar Testing for Adults

This chapter focuses on the various steps involved in collecting the blood samples for performing Fasting Blood Sugar test. The survey covers all the respondents who are 18 years and above. Testing process for each respondent includes informing him/her of their Fasting Sugar level (FBS), and with advisory note, before proceeding to the next eligible individual.

4.2 Estimation of Fasting Blood Sugar

It is the Team supervisor/Health Investigator's responsibility to inform the eligible respondent that they will be visiting their house hold next day in the early morning for testing the FBS Level (fasting blood sugar), so that the respondents are available with empty stomach to get the perfect fasting level of blood sugar.

Estimation of the blood sugar from finger prick blood in the field will be carried out using glucometer.

4.3 Fasting Blood Sugar Estimation Using Glucometer.

For estimating blood sugar level, glucometer will be used where the readings are considered equivalent to the sugar levels in laboratory estimations using Sugar Oxidase Method in the range of 20-600 mg/dl. The advantage of the glucometer is that the results will be available in 5 secs on LCD Digital Display (Fig.1).

Fig 4.1. Blood is collected on the test strip inserted into the glucometer

4.4 Steps for Testing Fasting Blood Sugar Level

In order to avoid inconvenience to the respondents, the blood will be taken from a single prick for testing Hb level and FBS.

The principal tasks involved in blood sugar testing for adults and youths include:

a. Find out whether voluntary consent has already been taken.
b. Prick the respondent's finger. Wipe away the first blood drop.
c. Activate the Glucometer by inserting the strip into the Glucometer.
d. Collect the 20 µl of second blood drop from the finger prick with Hb pipette on a filter paper for Hb estimation
e. Collect the third drop in a Gluco strip for blood sugar estimation (Ref to Fig 4.1 on page 60).
f. Record the sugar level in blood sample with the Glucometer.
g. Stop the bleeding at the prick site with cotton swab.
h. Record the FBS level on the Question 91a of the CAB Questionnaire.
i. Inform the respondent of his/her Fasting Blood Sugar level. Record it in the Health result card.
j. Collect biohazardous waste.

4.5 Precautions to observe when collecting Blood samples

This chapter of the manual reviews some of the major precautions that you must observe while collecting samples, both to protect yourself and the subjects from whom samples are collected. Make sure not to collect from the site of injury or infection and take care to prevent contamination of the samples.

4.6 General Precautions when collecting Blood Samples

This section describes the universal (general) precautions to be followed during blood collection for Haemoglobin and Fasting Blood Sugar testing. The person responsible for collecting blood for Haemoglobin and Fasting Blood Sugar testing must take precautions to prevent parenteral (route of administration), skin, and mucous-membrane exposures to blood borne infections, such as hepatitis B, or human immunodeficiency virus (HIV). Under general precautions the following rules should be followed to ensure protection from acquiring blood borne infections.[1]

[1]

- **Wear gloves**. Gloves help to prevent skin and mucous-membrane exposure to blood. Gloves should be worn during blood collection for Fasting Blood Sugar and Haemoglobin measurement until the specimen(s) from a subject is collected and all waste materials produced during the collection are disposed of. At that point, the gloves used with the subject should be treated as biohazard us waste. A new pair of gloves should be used with each subject. **Gloves must never be reused!**
- **Avoid penetrating injuries.** Although gloves can prevent blood contamination of intact and non-intact skin surfaces, they cannot prevent penetrating injuries caused by the instruments used for finger or heel pricks. Self-retractable lancet devices reduce the risk of penetrating injuries.
- Lancets should not be used for purposes other than a single finger or heel prick to collect blood for the Haemoglobin/FBS testing. The lancets should not be broken or destroyed for curiosity or other purposes. Immediately after the testing is completed, the devices should be placed in a puncture-resistant disposal biohazard bag.
- If an accident occurs, any skin surfaces or mucous membranes that become contaminated with blood should be immediately washed thoroughly.
- **Never eat or drink during the testing**. Since eating, drinking, and applying cosmetics may distract from the procedure, they are not permitted during HaemoglobiN blood collection and Fasting Blood Sugar testing.

Properly dispose of all biohazardous materials. All materials coming in contact with blood must be placed in a biohazardous waste container after use and disposed of according to the survey's policy on infectious bio-waste disposal (See Chapter 8). Take precaution when storing and transporting the waste container during the fieldwork.

4.7 Rules for collecting specimens for Haemoglobin and Fasting Blood Sugar Testing

There are a number of specific rules or precautions that you must observe when collecting the samples for Haemoglobin and Fasting Blood Sugar testing. These include:

- **Position well in relation to the respondent.** Position yourself well before you make a puncture on the respondent's finger.
- **Never "milk" the finger.** Excessive massaging or squeezing of the finger or foot will cause tissue juice to mix with and dilute the blood. This will result in erroneous test results, particularly yielding low levels of Haemoglobin concentration in the blood. Instead, the tester should employ only mild pressure by using the thumb and the second and third fingers to make a "pad" at the puncture site. This will make the connective tissue underlying the skin more porous and allow the capillary blood to flow easily after the prick.
- **Never mix ether with the blood**. Ether which is used to clean the puncture site can mix with the blood and cause hemolysis (RBC lysis prior to Hb estimation) of the sample leading to errors in the testing results. To avoid this problem, the finger or heel must be air dried completely (do not blow from mouth) before being punctured.

- **Avoid obstructing blood flow**. It is important to hold the finger properly to allow for the accumulation of blood in the puncture-site area. Holding the finger too tightly can obstruct the blood flow to the finger.

- **Shallow puncture**. A deep puncture should be made for better blood flow and to have a representative concentration of red blood cells.

With respect to **Haemoglobin testing**, there are a number of additional rules that should be carefully observed including:

- **Do not layer**. Do not layer multiple drops of blood on the filter paper. If blood flow diminishes and you are unable to take up 20 µl (upto the requisite mark in the Hb pipette), request consent from the same subject (parent/guardian) to **repeat** the sample collection again using another finger.

- **Never touch the filter paper**. Avoid touching the area on the filter paper before collection. Never touch the blood spots after collection.

- **Protect the filter from contamination**. Do not allow water or other contaminants to come into contact with the filter paper before or after use.

- **Do not place the filter paper in the small self sealing pouch until thoroughly dry** (**chocolate brown**). Insufficient drying adversely affects test results.

- **Taking the filter paper out of the package**. Filter paper should be the last item taken out of the package before starting the blood collection procedure in order o avoid exposure to moisture, dirt etc.

CHAPTER 5

BLOOD PRESSURE

DLHS4 will record Blood Pressure and Pulse rate of individuals aged 18 yrs and above using a Digital Blood Pressure monitor to determine the prevalence of hypertension in the community. Hypertension is one of the major health risks in both urban and rural populations and is on the rise because of change in the work environment and dietary habits in Indians.

5.1 Introduction

Blood pressure is taken to assess whether the respondent has raised blood pressure. Raised blood pressure is a risk factor for a number of chronic, non communicable diseases.

5.2 Equipment

To take blood pressure and pulse rates you will need a Blood Pressure Monitor as shown below in Fig. 5.1.

Fig. 5.1

5.3 Preparations to be done prior taking the measurement

Follow the steps below to prepare the respondent.

- Tell respondent that you would like to measure their blood pressure and pulse rate using this monitor and cuff which will secure around left arm. You will be taking two separate readings.
- Ask respondent to sit quietly with their legs uncrossed and relax, with feet flat on the floor.
- You will be using the left arm unless the person has problems. Roll or push up the respondent's sleeve if necessary and make sure the rolled sleeve is not too tight around the arm and does not constrict the flow of blood.
- Tell respondent that once the device is placed on the left arm approximately ½ inch above the elbow, she/he will need to keep her/his arm steady and at the level of the heart.

5.4 Applying the Arm Cuff

Applying the Cuff on the Left Arm

1. Make sure the air plug is securely inserted in the main unit

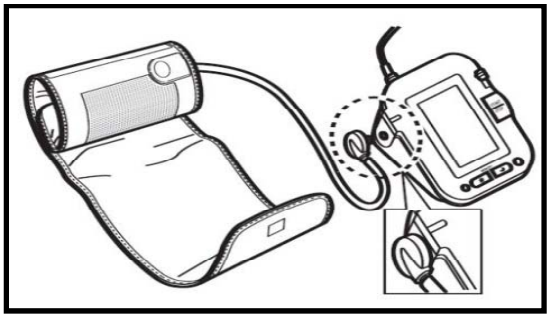

Fig. 5.2

2. Remove tight-fitting clothing from the upper left arm of the participant

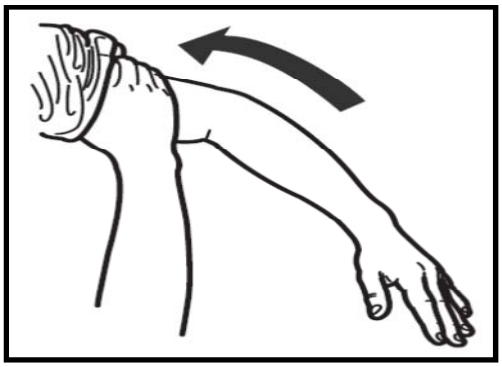

Fig. 5.3

3. The participant should sit in a chair with her/his feet flat on the floor. Place the participant's left arm on a table so that the cuff is level with the heart

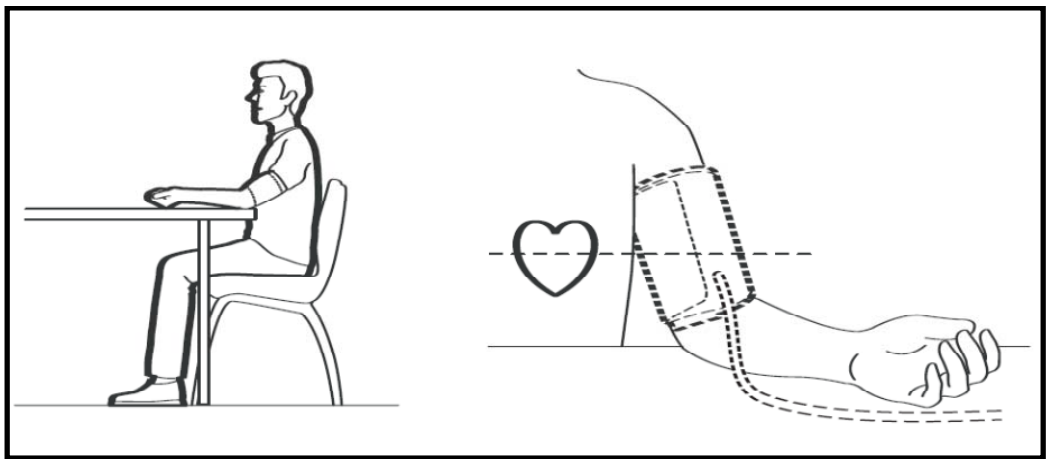

Fig. 5.4

4. Hold the grip on the cuff securely with your right hand, placing your thumb on the thumb grip

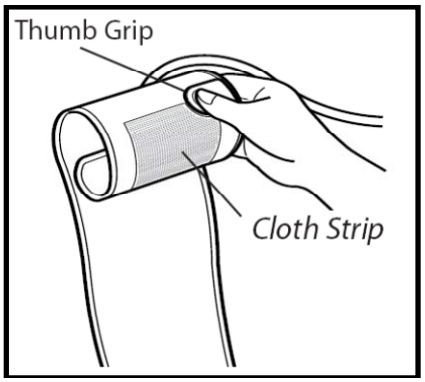

Fig. 5.5

5. Turn the palm of your left hand upward.

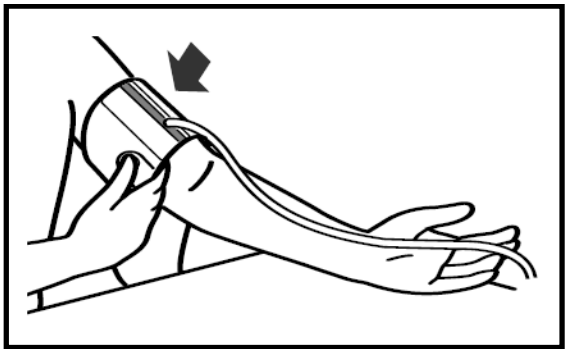

Fig. 5.6

6. Apply the cuff to the respondent"s left upper arm so the blue strip is on the inside of her/his arm and aligned with your middle finger. The air tube runs down the inside of the arm. The bottom of the cuff should be approximately 1/2" above the elbow.

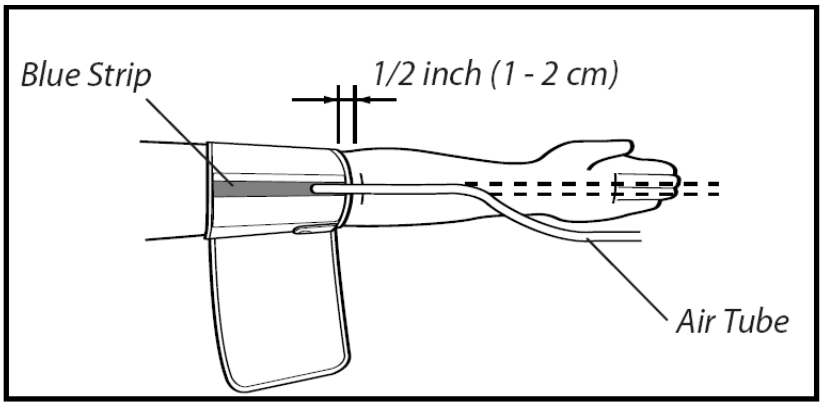

Fig. 5.7

7. Wrap the cuff firmly in place around the participant's arm using the cloth strip.

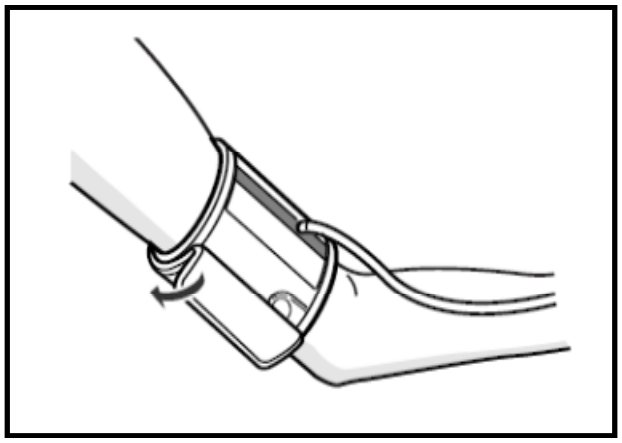

Fig. 5.8

5.5 Taking Measurement

Follow the steps below to take and record two blood pressure and pulse readings.

1. Wrap the cuff (Fig. 5.2) of the device around the respondent's left arm (Fig. 5.2). Secure with the Velcro strap for a snug fit.

   Note: Do not apply the device over bulky clothing.

2. Have respondent place the arm on a flat surface palm facing up so that the centre of the upper arm is at the same height as of the heart (Fig. 5.4). Note: Ask respondent to remain quiet, sit still and not to talk during the measurement. Ask respondent to take 3 deep, slow breaths before you start measuring.

3. Press the START/STOP button.

4. Release the start/stop button. The cuff will start to inflate automatically.

   A. To stop the inflation press the start/stop button

   B. The monitor will stop inflating, start deflation and turn off.

5. Inflation stops and the measurement starts. Wait for the device to finish its measurement before reading and recording the outcome.

6. When the measurement completes, the arm cuff deflates completely and the blood pressure and pulse rate appear on the display.

   You do not need to remove the device between readings.

7. Record the:

- Systolic blood pressure (top number shows in Fig. 5.9)
- Diastolic blood pressure (lower number shows in Fig.5.9)
- Pulse rate (Fig. 5.10)

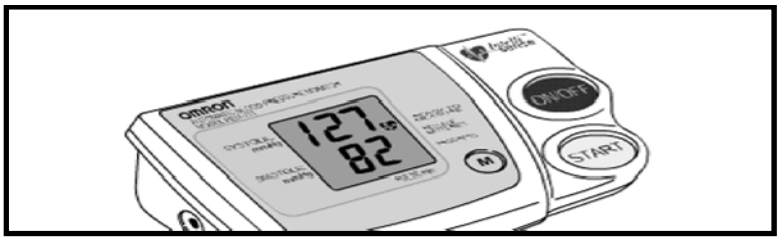

Fig. 5.9

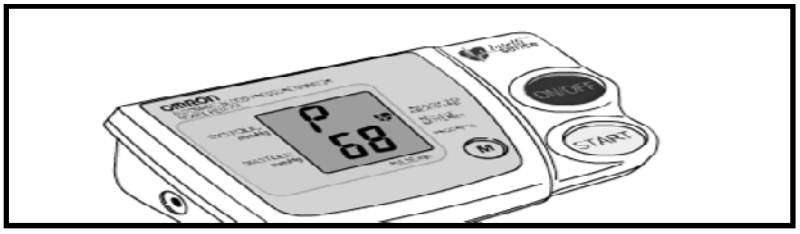

Fig. 5.10

8. Press the stop button to turn off the instrument.

Blood pressure/pulse rate measurements for each individual will be recorded twice as explained in Step B. 6 above. In between these two readings there should be at least 3 minutes gap. Please fill the Question 93 to 95 with values recorded (Please see page 13 of this manual).

Troubleshooting Tips:

Problems	**Cause and Solutions**
No power No display appear on the unit	Replace all the batteries with new ones. Check battery installation for proper placement of the battery polarities.
Measurement values appear too high too low	Blood varies constantly. Many factors including stress, time of day and how you wrap the cuff, may affect you blood pressure. Review the sections “before taking the measurement (5.3 & 5.4) and Taking the measurements (5.5)”.

CHAPTER 6

Quality Control Measures to be adopted by Health Investigators:

- ❖ All instruments being used in the survey have been tested and found to be accurate before being given to the survey teams (HIs).

- ❖ The following are the quality control measures to be followed in the field work during the survey:

  - Accuracy and sensitivity checks on the digital weighing scale outlined in the section on weighing will be carried out daily at the field level by HI under the supervision Supervisor at least once a week. Protocol for testing accuracy of each of the instruments and sensitivity of the balances during the survey has been specified in **Chapter 2.** The instruments are to be handled with due care. In case of problems please ask for repair/replacement of the instruments not meeting the specified accuracy from PIs.

  - Duplicate measurements/estimations for Hb is to be done in 10% of respondent's.

  - Blood pressure and pulse will be measured in duplicate in every individual and both the readings will be entered in the form,

- ❖ Blood sample for Hb estimation: duplicate samples will be taken in 10% and concordance between the duplicates will be checked in the labs; the concordant duplicate readings will be recorded in Form II**(page-77)** if non-concordant that is difference of more than 0.01 OD between the duplicate samples **Hb result in Form II will be coded**. Form II will be used by partner institute to enter the result of Haemoglobin. If there is difference of more than 0.01 OD in two or more duplicate samples collected by an investigator in a week the concerned field investigator will have to be replaced or retrained.

- ❖ The designated PI or its representative will also randomly undertake visits to check on the quality of the CAB data and make a report of the same.

Ministry of Health and Family Welfare
Government of India

International Institute For Population Sciences
Established in 1956
Capacity Building for Better Future

DIRSTICT LEVEL HOUSEHOLD AND FACILITY SURVEY-4
2012-2013

CLINICAL ANTHROPOMETRIC AND BIOCHEMICAL TEST RESULT CARD

MEASUREMENTS									
SL. No	NAME OF RESPONDENT	Sex	Age	Height (cms)	Length (cms)	Weight (kg)	BP systolic (mm of Hg)	BP diastolic (mm of Hg)	Fasting blood sugar (mg/dL)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Please show this card to the ANM/AWW/ Physician and get their advice. If Fasting Blood sugar is over 110mg/dL, or if systolic Blood Pressure is over 140mm Hg and/or Diastolic Blood Pressure is over 90mm Hg, please consult the PHC Doctor or Family Physician.

Average height and weight of boys at different ages			Average height and weight of girls at different ages	
AGE	WEIGHT (kg)	HEIGHT (cm)	WEIGHT (kg)	HEIGHT (cm)
Birth	3.4	50.6	3.3	50.2
3 months	5.8	62.0	5.6	60.7
6 months	6.6	67.4	6.1	64.0
9 months	7.5	69.1	6.6	66.7
1 year	8.4	73.9	7.8	72.4
2 years	10.3	81.9	9.8	80.4
3 years	12.0	89.6	11.4	87.7
4 years	13.7	96.9	13.1	05.3
5 years	15.0	102.7	14.7	102.1
6 years	16.6	109.3	167.3	108.0
7 years	18.4	114.5	17.9	113.3
8 years	20.0	119.8	19.7	118.7
9 years	21.8	124.1	21.6	123.4
10 years	23.8	128.7	24.1	129.1
11 years	26.4	133.9	27.0	134.4
12 years	29.0	138.8	30.5	139.8
13 years	32.7	145.3	34.3	144.5
14 years	36.8	151.4	37.7	148.0
15 years	40.9	156.8	40.1	150.2
16 years	44.0	160.3	41.9	151.3
17 years	46.4	161.2	43.0	151.8
18 years	48.0	163.2	43.1	152.2
19 years	48.8	163.9	43.1	152.6
20 years	49.6	163.9	44.5	152.9

Healthy Tips:-

- Immunize your Child Fully before the age of one against the Vaccine preventable Disease.
- Consume iron-rich complementary foods during pregnancy.
- No girl – so, no mother – ultimately no life.
- Female foeticide is suicide, save the girl child and insure the future.
- Allow life to thrive, don't drink and drive
- If wealth is lost, nothing is lost-If health is lost, everything is lost

CHAPTER 7

SALT TESTING

7.1Introduction:

Iodine is found in seafood, iodised salt and some vegetables. It is important for essential hormone development in the human body. Inadequate intake of dietary iodine can lead to an enlarged thyroid gland (goitre) or other iodine deficiency disorders. Iodine deficiency is the world's leading cause of mental retardation in children.

Iodine is found in foods as iodide. Our bodies need it to make thyroid hormones. The thyroid is a gland in the throat that regulates many metabolic processes, such as growth and energy expenditure. The two main thyroid hormones, thyroxine and tri-iodothyronine, are synthesised from the amino acid, tyrosine, and from iodide.

The thyroid hormones regulate the body's metabolic rate and promote growth and development throughout the body, including the brain. If there isn't enough thyroid hormone circulating in the blood, the brain sends a chemical message to the thyroid gland, which then releases a measured dose of these hormones. If a person's diet is too low in iodine, the brain keeps sending chemical messages to the thyroid in vain. In an attempt to make more thyroid hormone, the gland gets larger and larger. This overgrowth of the thyroid gland is called a goitre.

7.2Sources of iodine:

Iodine is found in seawater, so any type of seafood is a rich source of this element, particularly seaweed (e.g kelp). Despite coming from the ocean, sea salt is not a good source of iodine. Iodised salt is perhaps the most common source of iodine in the Western diet and can provide enough iodine to avoid low thyroid activity. Since an adult only requires around one teaspoonful of iodine over a lifetime, eating fish once a week is enough to fulfil the average iodine requirement.

Some vegetables also contain iodine, but only if they are grown in iodine-rich soils. Certain regions of Australia, such as Tasmania and the Australian Capital Territory, have low levels of iodine in the soil.

Low dietary levels of iodine were thought to be a problem in the past or in developing countries only. To find out how big the problem is and what might be done about it, a nationwide study is done. Some reasons for low iodine intake may include:

- A reduction in the use of salt in cooking and table salt (particularly iodised salt).
- Consuming most of our salt in processed foods, which do not contain iodine.
- Less iodine in milk because of changes in treatment methods.

How much iodine do we need?

- 150 micrograms for men
- 120 micrograms for women (150 micrograms during pregnancy, 170 micrograms during lacatation)
- Children 70-150 micrograms
- Infants 50-60 micrograms

Excessive amounts of iodine can also lead to goitre. This has occurred where foods such as seaweeds, which are rich in iodine, are commonly eaten. However, it is unlikely that any harmful effects would occur with habitual intakes up to 300 micrograms per day.

- One teaspoon of iodised salt provides 150 micrograms of iodine
- 1 serve (100g) of seafood provides about 60 micrograms
- 100g of vegetables or meat or eggs provides about 25 micrograms of iodine
- 100g of dairy products or bread/cereals provides about 10 micrograms.

Anyone on a low-salt diet should consider eating a serve of seafood every week to make sure their iodine levels are adequate, particularly pregnant women, as lack of iodine can retard normal development in their baby. Vegetarians should get iodine from iodized salt or seaweed.

7.3 Checking household salt for Iodine content

Ask the respondent of the household for the sample of cooking salt (enough to fill the small plastic cap in the MBI kit).if the household uses more than one type of salt, make sure that the sample provided is the salt that the household uses in cooking. Spread the salt surface in the plastic cap. If you are using a new test kit for the first time, start by opening the seal of the test solution ampoule (white cap) and the retest solution (red cap) by making pin hole in the seal .To test the salt for iodine content, first shake the vial of liquid from the clear ampoule and gently squeeze two drop of liquid on the surface of salt sample. If salt is iodized, the wet salt should change the colour .If the salt turn a violet/blue colour, match the colour of the wet salt with the colour chart in the test kit.

Record the result [less than 15, more than 15 ppm(part per million)] in Question 100 of CAB Questionnaire in CAPI as appropriate ,depending on the closest match and continue with the next Question. When matching the colour of the wet salt with the colour on the chart, it's important to make sure you have sufficient light to match the colour accurately. It may be necessary to take the salt sample outdoors if the light indoor is inadequate.

If there is no colour change, you need to do a second test. Shake the vial of liquid in the pink ampule and gently squeeze two drops of the recheck solution on the same spot on the salt Finally match the colour of the wet salt with the colour on the chart and record the result in the CAPI.

If the household does not have salt ,Circle '**3'** for **NO SALT IN HOUSEHOLD** .If the household refuse to give salt for testing , Circle '**6'** for **SALT NOT TESTED.** Record the reason for not testing the salt.

CHAPTER 8

BIOHAZARDOUS WASTE DISPOSAL

Any material coming in contact with blood or serum (lancets, ether swabs, cotton, and gloves) is considered to be biohazardous, i.e., hazardous to other humans. Safe disposal of such material is very important to prevent the transmission and spread of various blood borne diseases, such as Hepatitis B and HIV, among survey personnel and within the study community. Biohazardous waste has to be collected in a special polythene bag during the blood collection and testing which should be securely stored, transported and safely disposed off at the end of each day of the fieldwork.

The materials supplied to each team for proper disposal of the biological waste are indicated below.

1. 1 litre wide mouth flat bottom plastic bottle
2. Bleaching powder pack
3. Spade for digging a small pit
4. Polyethylene bags

8.1 Procedure for disposal of Biohazardous waste

At the end of each blood collection, the materials used like lancets and swabs etc are to be decontaminated by disposing them in the wide-mouth plastic bottle (provided) containing bleaching solution (4%). Any other dry biowaste such as gloves and other materials may be collected directly in the polythene bag. The collection of such waste may be continued till the end of the working day.

Preparation of bleaching solution:

The bleaching solution for decontamination may be prepared from the bleaching powder provided (Bleaching powder pack). For preparing a 4% solution, 4 gms of the powder is to be dissolved in 100 ml of water. The wide mouth flat bottom bottle provided for the purpose is of 1litre capacity. Therefore, fill half the bottle with water and approximately add 20 gms of the bleaching powder to make it a 4% solution.

The following are the steps that should be followed while disposing the biohazardous materials.

First, a place has to be identified where such waste is to be disposed. An open field area with loose soil is preferable, since the materials need to be buried.

Steps to be followed:

- At the end of each working day, bring the sharps container (flat bottom, 1 litre wide mouth plastic bottle) having biohazardous materials to the area selected for waste disposal.
- Dig a small hole with the spade provided (Fig.8.1).

Fig.8.1

- Transfer the contents of the wide mouth plastic bottle containing the bleaching solution into the polethene bag (Fig. 8.2).

Fig. 8.2

- Leave the contents to mix for 5 minutes.
- Drain off the bleaching solution from the bag (Fig.8.3).

Fig.8.3

- Put the polyethylene bag containing the biohazardous materials in the pit (Fig. 8.4).

Fig.8.4

- C**o**ver the pit with soil (see Figure 8.5). It is the HI's responsibility to ensure proper disposal of biohazardous waste.

Fig. 8.5

- Make sure that the materials used during the fieldwork for one PSU are not carried by the team to the next PSU. Biohazardous materials must be disposed by end of the days field work as already indicated.

- In case, the nearest PHC has the facility for biowaste disposal, the same may be utilized for the purpose following due permission.

Form-II

Haemoglobin Estimation/Results

Ministry of Health and Family Welfare

In Collaboration with

International institute for Population sciences

&

National Institute of Health and family Welfare

Clinical Anthropometric Biochemical Test of the DLHS-4 Survey

Test Result Format For Haemoglobin Level in DLHS-4 Survey,2012-2013

Date:

1	2	3	4	5	6
State Code	District code	PSU Code	Bar Code ID	Hb Level %	Remarks