# Appendix L

# NDNS Years 12-15
# Measurement Protocols

# Contents

# 1. HEIGHT AND WEIGHT MEASUREMENTS

## Project Instructions

You must be accredited to collect height and weight measurements on NDNS. Check with your FPM if you are accredited.

- If you are not accredited, at the start of the height and weight module select "Measurements not being attempted: Self Report". Your CAPI will then route you to ask the participant to provide their self-reported height and weight.
- If you are accredited to take height and weight measurements you should collect height and weight measurements from the participant using your NatCen stadiometer and scales. **Please follow NatCen's COVID protocols on taking height and weight measurements.** See Appendix H and I for Height and Weight protocols respectively.
- If you are accredited to take height and weight measurements but the participant either refuses or the measurements are attempted but not successfully obtained, your CAPI will route you to ask the participant if they are willing to provide their self-reported height and/or weight.

## Measurement Record Card and BMI leaflet

**Please follow Natcen's COVID protocols on handling documents.**

If the participant would like to have their measurements, you can fill in the measurement record card (which includes spaces for their height, weight and BMI (16+ only)). If the participant is aged 16+, hand over the BMI leaflet with the measurement record card, as this provides information about BMI and how to interpret the results.

## Self-reported height and weight measurement

Participants who refuse or are not able to have their height or weight measured in a face-to-face interview will be asked if they will be willing to provide their self-reported height and/or weight. I**f the participant has a weighing scale in the household, you should encourage them to take their physical measurement before reporting their weight.**

# 2. HEIGHT MEASUREMENT PROTOCOL

## 1.1 Assembling the stadiometer


Unlock the blue measuring arm from its secure carrying position in the base plate by sliding it forward (see illustration 1).


Remove the two stabilisers from their storage in the ends of the white uprights. Slot the white uprights firmly together and check that the bottom section (marked with an arrow) sits firmly in the base plate slot.


You need only assemble 2 or 3 sections when measuring young children; use all 4 sections for older children and adults. Slide one of the two white stabilisers onto the upright, then the blue measuring arm and then slide the second white stabiliser above it. Position the stabilisers so that they are clear of the joins on the upright sections.


Place the base plate on a firm, level surface.

## 1.2 Adult height protocol (aged 16+)

1. Both you and the participant must be wearing a face covering before you approach them to lower the head-plate and take the reading.
2. Ask the participant to use their own face covering.
3. If the participant is unwilling to wear a face covering during the height measurement, the bio measure collection will be abandoned and **NOT** carried out.
4. Ask the participant to remove their shoes in order to obtain a measurement that is as accurate as possible.
5. Assemble the stadiometer and raise the headplate to allow sufficient room for the participant to stand underneath it. Double check that you have assembled the stadiometer correctly.

6 The participant should stand with their feet flat on the centre of the base plate, feet together and heels against the rod. The participant's back should be as straight as possible, preferably against the rod but NOT leaning on it. They should have their arms hanging loosely by their sides. They should be facing forwards.

7 Ask the participant to move their head so that the Frankfort Plane is in a horizontal position (i.e. parallel to the floor). The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye (see diagram). This position is important if an accurate reading is to be obtained. An additional check is to ensure that the measuring arm rests on the crown of the head, i.e. the top back half. To make sure that the Frankfort Plane is horizontal, you can use the Frankfort Plane Card to line up the bottom of the eye socket with the flap of skin on the ear. The Frankfort Plane is horizontal when the card is parallel to the stadiometer arm.

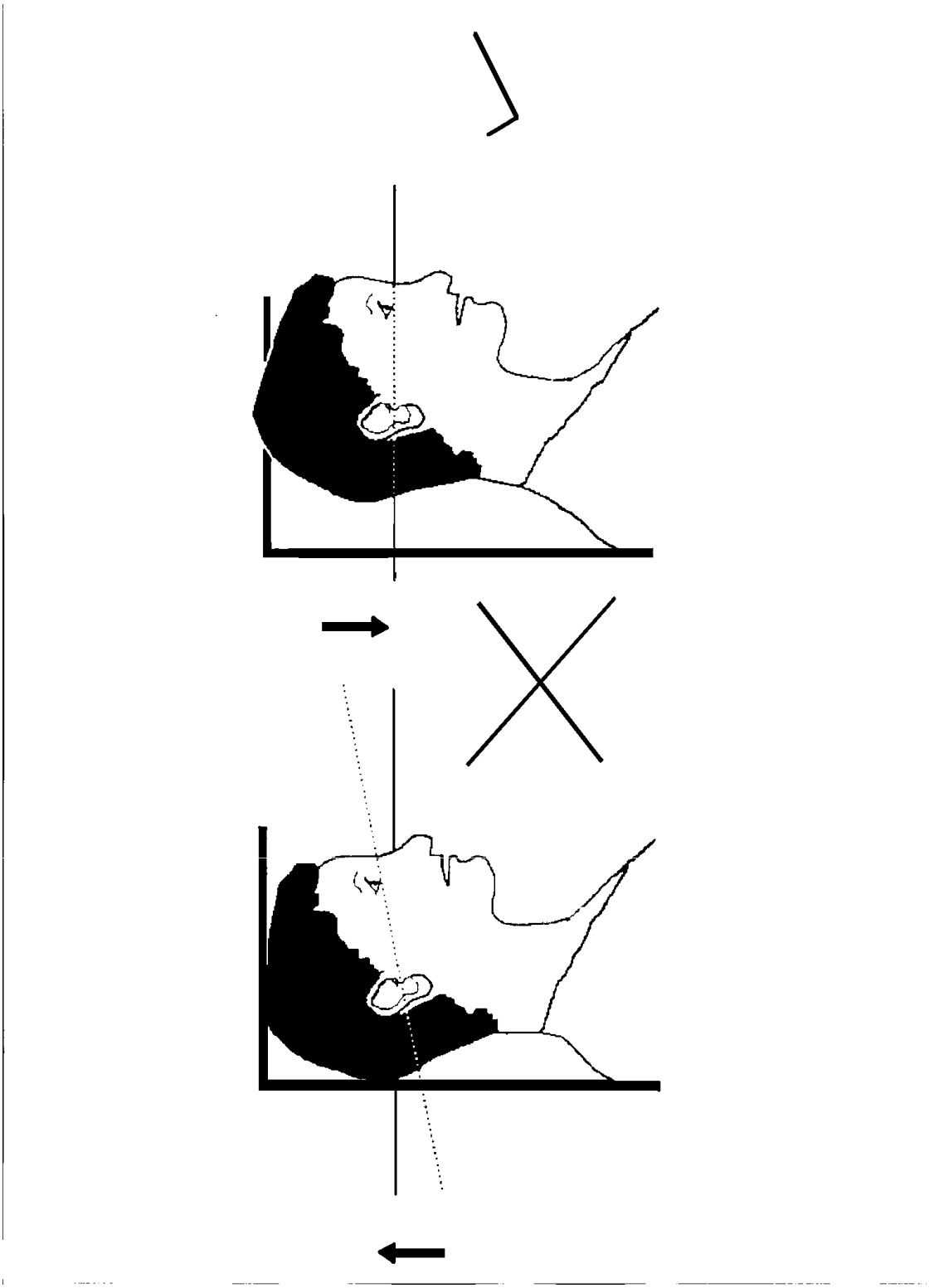
8 Instruct the participant to keep their eyes focused on a point straight ahead, to breathe in deeply and to stretch to their fullest height. If, after stretching up, the participant's head is no longer horizontal, repeat the procedure. It can be difficult to determine whether the stadiometer headplate is resting on the participant's head. If so, ask the participant to tell you when s/he feels it touching their head.

9 Ask the participant to step forwards. If the measurement has been done correctly the participant will be able to step off the stadiometer without ducking their head. Make sure that the head plate does not move when the participant does this.

10 Look at the bottom edge of the head plate cuff. There is a green arrowhead pointing to the measuring scale. Take the reading from this point and record the participant's height in centimetres and millimetres that is in the form 123.4, at the question Height. You may at this time record the participant's height onto their Measurement Record Card. You will be asked to check that you have done so. At that point the computer will display the recorded height in both centimetres and in feet and inches. You will be asked to code whether the measurement you obtained was reliable or unreliable.

11 Height must be recorded in centimetres and millimetres, e.g. 176.5 cm. If a measurement falls between two millimetres, it should be recorded to the nearest even millimetre. E.g., if participant's height is between 176.4 and 176.5 cm, you should round it down to 176.4. Likewise, if a participant's height is between 176.5 and 176.6 cm, you should round it up to 176.6 cm.

12 Push the head plate high enough to avoid any member of the household hitting their head against it when getting ready to be measured.



## 1.2 Child protocol (aged 2-15 years)

The protocol for measuring children differs slightly to that for adults. You can ask the adult if they would prefer to take the measure. If not, both you and the child will need to wear a face covering.

You should try to get the co-operation of an adult household member. You might need their assistance in order to carry out the protocol, and children are much more likely to be co-operative themselves if another household member is involved in the measurement. If possible measure children last so that they can see what is going on before they are measured themselves.
Children's bodies are much more elastic than those of adults. Unlike adults they might need help in order to stretch to their fullest height. This is done by stretching them. This is essential in order to get an accurate measurement. It causes no pain and simply helps support the child while they stretch to their tallest height.

1. In addition to removing their shoes, children should remove their socks as well. This is not because the socks affect the measurement. It is so that you can make sure that children don't lift their heels off of the base plate. (See 3 below).

2. Assemble the stadiometer and raise the head plate to allow sufficient room for the child to stand underneath it.

3. The child should stand with their feet flat on the centre of the base plate, feet together and heels against the rod. The child's back should be as straight as possible, preferably against the rod, and their arms hanging loosely by their sides. They should be facing forwards.

4. Depending on who is conducting the measure, you/the adult should place the measuring arm just above the child's head.

5. Ask the child to move their head so that the Frankfort Plane is in a horizontal position (see diagram). This position is as important when measuring children as it is when measuring adults if the measurements are to be accurate. To make sure that the Frankfort Plane is horizontal, you can use the Frankfort Plane Card to line up the bottom of the eye socket with the flap of skin on the ear. The Frankfort Plane is horizontal when the card is parallel to the stadiometer arm.

6. If the adult is willing to assist with the child stretch, ask them to wear their own face covering. Instruct them to cup the child's head in their hands, placing the heels of their palms either side of the chin, with their thumbs just in front of the ears, and their fingers going round towards the back of the neck. (See diagram).

7. Firmly but gently, apply upward pressure lifting the child's head upwards towards the stadiometer headplate and thus stretching the child to their maximum height. Avoid jerky movements, perform the procedure smoothly and take care not to tilt the head at an angle: ensure to keep it in the Frankfort plane. Tell the child to stand up straight and tall but not to move their head or stand on their tiptoes.

8. You should then lower the headplate down gently onto the child's head. Make sure that the plate touches the skull and that it is not pressing down too hard.

9. Whilst the adult is still holding the child's head, relieve traction and allow the child to stand relaxed. If the measurement has been done properly the child should be able to step off the stadiometer without ducking their head. Make sure that the child does not knock the head plate as they step off.

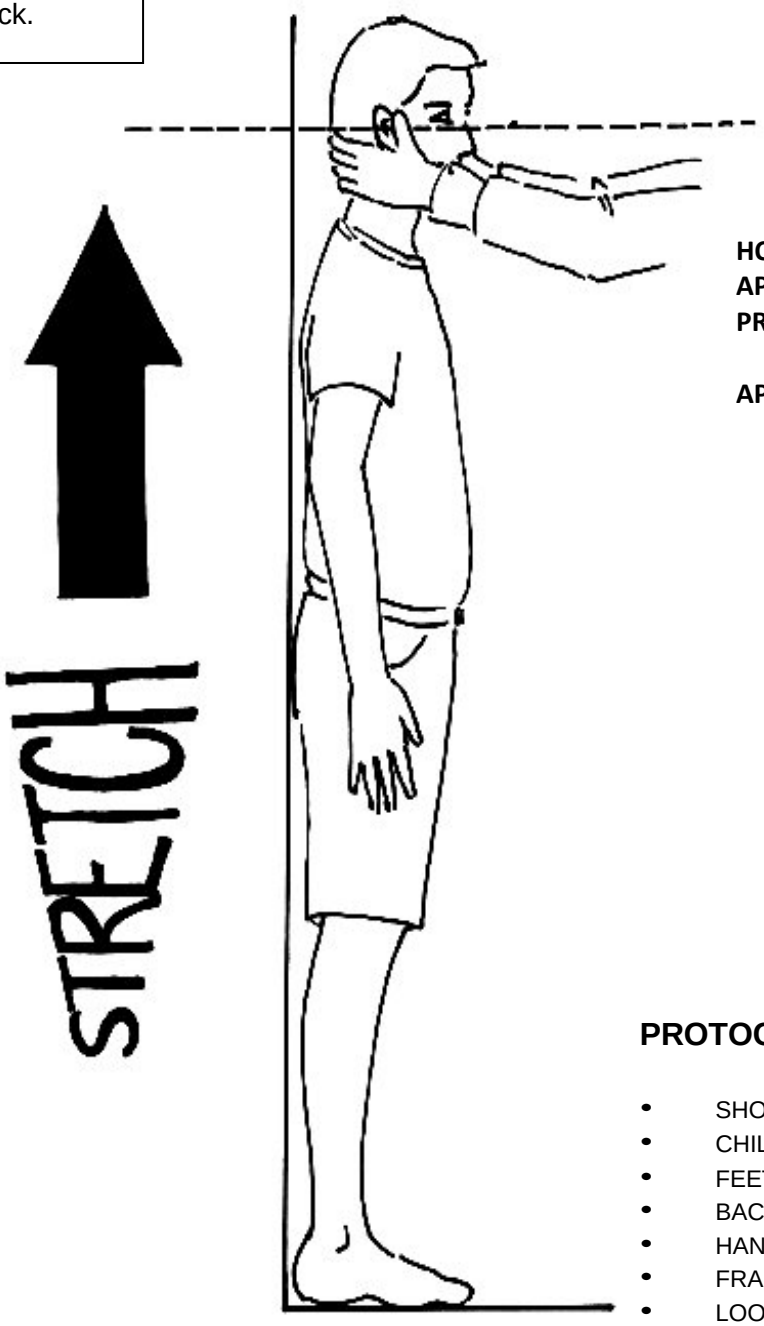
10. If the adult is not willing to perform the child stretch, skip steps 6-9 and simply ask the child to stand up straight and tall but not move their head or stand on the tiptoes. Lower the headplate gently onto the child's head.

11. Read the height value in metric units to the nearest millimetre and enter the reading into CAPI. You will be asked to check that you have entered the child's height onto their Measurement Record Card. At that point the computer will display the recorded height in both centimetres and in feet and inches.

12. Push the head plate high enough to avoid any member of the household hitting their head against it when getting ready to be measured.

**REMEMBER YOU ARE <u>NOT</u> TAKING A HEIGHT MEASUREMENT FOR CHILDREN UNDER 2 YEARS OLD.**

Cup the child's head in your hands, placing the heels of your palms either side of the chin, with your thumbs just in front of the ears, and your fingers going round towards the back of the neck.




**HORIZONTAL**
**APPLY GENTLE UPWARDS PRESSURE**

**APPLY GENTLE UPWARDS**

## PROTOCOL

- SHOES OFF
- CHILDREN – SOCKS OFF
- FEET TO THE BACK
- BACK STRAIGHT
- HANDS BY THE SIDE
- FRANKFORT PLANE
- LOOK AT A FIXED POINT
- CHILDREN – STRETCH & BREATHE IN
- ADULTS - BREATHE IN
- LOWER HEADPLATE
- BREATHE OUT
- STEP OFF
- READ MEASUREMENT

## 1.3 Additional points all participants

1. If the participant cannot stand upright with their back against the stadiometer and have their heels against the rod (e.g. those with protruding bottoms) then give priority to standing upright.

2. If the participant has a hair style which stands well above the top of their head, (or is wearing a turban), bring the headplate down until it touches the hair/turban. With some hairstyles you can compress the hair to touch the head. If you cannot lower the headplate to touch the head and think that this will lead to an unreliable measure, record this in CAPI. If it is a hairstyle that can be altered (e.g. a bun) if possible, ask the participant to change/undo it.

3. If the participant is tall, it can be difficult to line up the Frankfort Plane in the way described. When you think that the plane is horizontal, take one step back to check from a short distance that this is the case.

## 1.4 Height refused, not attempted or attempted but not obtained

In CAPI you will be asked to code whether the measurement was taken, refused, attempted but not obtained or not attempted. If for any reason you cannot get a height measurement, enter the appropriate code at this question and you will automatically be routed to the relevant follow up questions which will allow you to say why no measurement was obtained. CAPI will guide you to ask the participant if they are willing to provide self-reported measurements.

# 3. WEIGHT MEASUREMENT PROTOCOL

## 2.1 The equipment

All interviewers working on NDNS will be issued with Seca 877 scales.

- These scales are accurate up to 200kg (31½ stone).

***IMPORTANT***
**Although the scales are only accurate up to 200kg, we would like you to attempt to measure the weight of ALL participants. If the scales show a figure greater than 200kg, record the weight in CAPI as usual. This figure will then be automatically coded as inaccurate by CAPI.**

- These scales display the weight in a window on the scales.
- The Seca 877 is switched on by pressing the surface of the scales (e.g. with your foot). There is no switch to turn the scales off, they turn off automatically.
- The scales take 6 x 1.5v AA batteries.
- The scales have a fixed battery which cannot be removed.

**When you are storing the scales or sending them through the post please make sure you remove the battery to stop the scales turning themselves on.**

It should not be necessary to have to replace the batteries, but always ensure that you have some spare batteries with you in case this happens. If you need to change the battery, please buy one and claim for it. The batteries used are commonly available.
The battery compartment is on the bottom of the scales. When you receive your scales you will need to reconnect the battery. Before going out to work, reconnect the battery and check that the scales work. If they do not, check that the battery is connected properly and try new batteries. If they do still not work, report the fault to your FPM/Regional Manager or directly to Brentwood.
The reading is only in metric units, but as for height, the computer provides a conversion. If the participant would like to know their weight in stones and pounds you will be able to tell them when the computer has done the calculation. You also have a conversion chart on the back of the coding booklet.

## 2.2 The protocol

1. Turn the display on by using the appropriate method for the scales. The readout should display 888.8 momentarily. If this is not displayed check the batteries, if this is not the cause you will need to report the problem to Brentwood. While the scales read 888.8 do not attempt to weigh anyone.

2. Place the scale on the ground, wait for the display of 0.0 and step away to maintain a 2 metre distance.

3. Ask the participant to remove shoes, heavy outer garments such as jackets and cardigans, heavy jewellery, loose change and keys.

4. Ask the participant to stand with their feet together in the centre and their heels against the back edge of the scales. Arms should be hanging loosely at their sides and head facing forward.

5. The posture of the participant is important. If they stand to one side, look down, or do not otherwise have their weight evenly spread, it can affect the reading.

6. Ask the participant to tell you their reading. The scales will take a short while to stabilise and will read 'C' until they have done so. (The Seca 870 displays alternate flashing lines in the display window. With the Tanita scales the weight will flash on and off when stabilised). If the participant moves excessively while the scales are stabilising you may get a false reading. If you think this is the case reweigh, but first ensure that you have erased the memory.

7. The scales have been calibrated in kilograms and 100 gram units (0.1 kg). Record the reading into the computer at the question XWt1 before the participant steps off the scales. You will be asked to check that you have entered the participant's weight into their Measurement Record Card. At that point the computer will display the measured weight in both kilos and in stones and pounds.

8. Once the reading has been taken, ask the participant to step off the scales and step back 2 metres.

9. You should clean the stadiometer and scales with disinfectant wipes immediately before and after each measurement and sanitise your hands.

## 2.3 Weighing Children

You must get the co-operation of an adult household member. This will help the child to relax and children, especially small children are much more likely to be co-operative themselves if an adult known to them is involved in the procedure.
Children wearing nappies should be wearing a dry disposable. If the nappy is wet, please ask the parent to change it for a dry one and explain that the wetness of the nappy will affect the weight measurement.
In most cases it will be possible to measure children's weight following the protocol set out for adults. However, if accurate readings are to be obtained, it is very important that participants stand still. Ask the child to stand perfectly still - “Be a statue.” For very young children who are unable to stand unaided or small children who find this difficult you will need to alter the protocol and first weigh an adult then weigh that adult holding the child as follows:

1. Code as “Weight obtained (child held by adult)” in CAPI

2. Weigh the adult as normal following the protocol as set out above. Enter this weight into the CAPI when prompted.

3. Weigh the adult and child together and enter this into CAPI when prompted.

The computer will then calculate the weight of the child and you will be asked to check that you have recorded the weight onto the child's Measurement Record Card. Again the computer will give the weight in both kilos and in stones and pounds.

## 2.4 Weight refused, not attempted or attempted but not obtained

You will be asked to code whether the measurement was taken, refused, attempted but not obtained or not attempted. If for any reason you cannot get a height measurement, enter the appropriate code at this question and you will automatically be routed to the relevant follow-up questions which will allow you to say why no measurement was obtained. CAPI will guide you to ask the participant if they are willing to provide a self-reported weight.

# 3. BLOOD SAMPLING

## Introduction

Blood sample donation and subsequent sample transport are very important parts of NDNS. One of the main objectives of the survey is to measure indicators of blood function, nutrition and other measures of health and relate these to dietary and social data.

The blood will be analysed for a large number of analytes including haematology measures (white blood cell count, haemoglobin, platelets etc.), serum lipids (cholesterol, triglycerides), markers of inflammatory status and markers of mineral and vitamin status.

For the purposes of NDNS, the samples will not be tested for any viruses or for bacterial infections, nor will they be used for genetic testing.

## Eligibility criteria

Participants aged 4 years and over will be asked to give a fasting blood sample wherever possible (if not excluded from fasting). Participants who are aged under 4 years old will be asked to give a non-fasting sample. Those aged 4+ who are unwilling to fast may give a non-fasting sample, although **wherever possible fasting samples should be sought**.

**Note - the option of providing a non-fasting sample is available to participants aged 4 years and over who are willing to provide a sample but are not prepared to fast.**

**Anticoagulant medication:**

Participants are not eligible to provide a blood sample if they are taking any anticoagulant medication. However, if they are taking antiplatelet medication then they can still provide a blood sample. When that question is reached in CAPI, press the F9 key for more information on the names of anticoagulant and antiplatelet medication to assist in coding related exclusion criteria.

**Fitting, convulsions or febrile fits:**

Participants 16 years and older are not eligible to provide a blood sample if they have had a fit or convulsion or convulsion associated with high fever in the previous 5 years. For children aged under 16 years further questions will be asked regarding the type of fit/convulsion experienced in the last 5 years if they answered yes to the first screening question. This will differentiate febrile related fits from any other fit/convulsion and will enable more children who experienced febrile fits only to give a blood sample, if they wish to. These participants will be able to provide a blood sample if the febrile fits did not occur in the last 2 years. CAPI will guide you through the screening questions.

The interviewer will have checked whether the participant falls into either of these exclusion criteria. However, as circumstances could have changed between then and your contact/visit, you must recheck eligibility during your initial telephone contact and again at the start of your visit. If, at that point, the participant informs you they are ineligible to provide a blood sample, code at the start of the individual biomedical fieldworker schedule that the interview will not be done and use the individual outcome code “833- Ineligible for blood sample (anticoagulants and/or fits/convulsions)”.

**Obtaining blood samples from diabetics:**

Most diabetics can provide a fasting blood sample, but there are some precautions to take into account (outlined below). The preference is to obtain a fasting sample, if possible. You will provide reassurance about this, but if the participant remains anxious, a non-fasting sample can be taken. CAPI will take you through the relevant questions.

**Acceptable procedures according to diabetic medication:**

- Participants on oral hypoglycaemic medication should be able to fast without complications.
- Participants on a combination of night-time insulin and daytime tablets should also be able to fast unless they are known to have low blood sugar levels first thing in the morning. If they do have low blood sugar levels in the morning, they could still fast but should reduce their night-time insulin by a small amount and have breakfast as soon as possible after the blood is taken.

- Participants on insulin alone can also provide a fasting sample but should be given special consideration. They should postpone their morning insulin and should be seen as early in the day as possible.

  **In every case, diabetics who have fasted should have breakfast as soon as possible after blood is taken.**

## Overview of blood collection

CAPI includes questions about whether the participant has had something to eat or drink that morning, to ascertain whether it is a fasting or non-fasting sample. However, fasting participants should be encouraged to drink water upon waking, while waiting for your visit.

**A maximum of two attempts at blood taking, one on each arm, are permitted with both adults and children.**

The volume of blood taken will vary according to the age of the participant, as follows:

| Age | Volume | No. of blood tubes to be filled |
|---|---|---|
| Adult 16+yrs | 30 mL | 6 |
| Child 7-15yrs | 20 mL | 4 |
| Child 1.5-6yrs | 12 mL | 3 |

The volume differs to abide by guidelines for taking blood from children for research purposes. To keep children's blood sample volume as low as possible, some analytes will not be measured in younger children.

Please see Appendix B for a list of the analytes that will be measured, and which analytes participants/their GP will obtain feedback on if they consent to receive their results.

## Who should take the sample?

| Age group | Considerations |
|---|---|
| Age 1.5– 5 years | For these participants, biomedical fieldworkers will need to be accompanied by a **paediatric phlebotomist**. |
| Aged 6 – 10 years | For participants aged 6-10 years, biomedical fieldworkers (if they are not an extended role nurse already), will need to be accompanied by a **paediatric phlebotomist or an extended role nurse.** |
| Age 11 years and over | For those aged 11 years and over **biomedical fieldworkers** can take the blood sample. |

**Please note**: if the child has turned 11 since the main interview and is 11 years when you are gaining agreement for blood sampling, you, the biomedical fieldworker, should take the blood from this child. Likewise, if the child has turned 6 since the main interview, if you're an extended role nurse you should take the blood from this child. Blood sample collection responsibility is the **only** scenario where you should base age on actual, current age rather than the age set at the

main interview. CAPI will allow you to take blood if the child has turned 11 years since the interviewer stage.

**With regards to the blood tube pack, you should use the relevant pack for the age the participant was at the main interview.**

## Liaison with the extended role nurse or paediatric phlebotomist

Blood from young children aged 10 years or younger will be taken by someone with the necessary and relevant phlebotomy skills. If this is not you, you will be allocated an extended role nurse (for children aged 6-10 years) or a paediatric phlebotomist (for children aged 1.5- 5 years), who will accompany you on visits to take blood from young children.

As soon as you know you have a child aged 1.5 - 10 years to contact, you should contact the Biomedical Centre, to tell them you will need an extended role nurse or paediatric nurse to be available for you:

**The Biomedical Centre: 01277 690061 or email biomedicalcentre@natcen.ac.uk**

The Biomedical Centre holds the list of extended role nurses / phlebotomists authorised to work on NDNS. They will be able to tell you the name, phone number and address of the best placed phlebotomist or extended role nurse.

You should then call the phlebotomist or extended role nurse to make them aware that you potentially have an address where there might be some work for them to do. At this initial contact, you should ascertain the nurse/phlebotomist's general availability during the fieldwork period (e.g. any days when they are on holiday or otherwise engaged). This will help when arranging blood-taking visits.

**When you have an agreed time and date, please let the Biomedical Centre know so they have a record of the visit taking place and can deal with the relevant paperwork.**

**Important points when working with a phlebotomist or extended role nurse:**

- You, the NDNS nurse, are responsible for:
  - Providing and taking all equipment, including tubes, labels and needles to the participant's address
  - Obtaining written consent and making sure signed consents are obtained in the consent booklet
  - Following the CAPI questions and entering information into the laptop
  - All labelling, despatch and delivery of samples
- The phlebotomist or extended role nurse will be asked to complete and sign a paper version of the venepuncture checklist. You will need to enter this information into the CAPI and post the paper version to the office.

**In essence – the phlebotomist or extended role nurse will take the blood sample only – you, the NDNS nurse will do everything else.**

## Scheduling appointments

As the vast majority of participants will be asked to provide a fasting sample and also due to delivery restrictions, **blood sampling can only take place on Monday-Friday mornings.**
In order to minimise the number of visits (i.e. usually 1 visit to each household), if a household contains two or three participants you should, wherever possible, schedule appointments for when all participants are available at the same time.
When a household contains a participant aged 1.5-10 years, you also need to schedule the blood taking appointment to fit in with the availability of your extended role nurse (if this isn't you) or paediatric phlebotomist.

The rules around dealing with situations when a blood sample is not initially agreed to, on first contact can be found in Appendix C.

## Cancellation of blood sampling appointments

If you have visited for a booked blood sampling appointment (fasting / non-fasting) which then doesn't go ahead due to the participant not being available, then **only one** further reappointment for the blood sample may be made. You will need to code this information into CAPI so that the programme will generate a further blood sampling schedule (i.e. Nurse Schedule 2) to use on the rescheduled visit.

If you visit a participant for a fasting blood sampling appointment and they have not fasted, then you should take a non-fasting sample.

If a participant agrees to give a blood sample, but the appointment is subsequently cancelled for whatever reason (**and not rearranged),** you **must** do the following to ensure the case is signed off properly:

1. Using '**Enter / Edit Calls**' enter the CAPI program for the relevant address
2. Using the parallel blocks, select the Nurse visit schedule 2
3. Confirm the date given by CAPI
4. At SumV2/SumV3, enter code 1 – that you are to take the blood sample
5. Code 'No' at TBSWill
6. At TRefBSC, code the relevant reason for the blood sampling appointment not taking place – e.g. if the participant says they've changed their mind because they no longer have time, code 8 'Too busy'; if the participant is under the age of 11 and it wasn't possible to arrange for a paediatric phlebotomist to take the sample, code 6 'No paediatric phlebotomist available'
7. Circle the relevant codes on the front of the consent booklet, as specified at TBSStop
8. Press 1+enter at ThankV2/ThankV3
9. If there is no more work to do at the address, complete the Admin block as normal and transmit back to the office

**Please note:** the above instructions should only be used if you had an appointment JUST to take the blood sample. If you are in any doubt about what to do when a blood taking appointment is cancelled (and **not** rearranged), please contact the Biomedical Centre.

## Blood consent

Written consents are needed for the following:

- Giving a blood sample;
- Notifying GP of clinically relevant blood results;

- Providing clinically relevant blood results to the participant (or parent/guardian of child participants);
- Storage of blood sample.

The appropriate blood consent or assent forms must be signed **at the visit** at which blood is taken, **before** blood is taken.
The different sections of the consent forms should be pointed out to the participant and the form should be given to the participant to read. After the participant (parent/guardian) has read the consent form please encourage them to ask any questions they may have with regards to the procedure. Once they are content to sign, please ensure the participant (or parent/guardian) **ideally initials** all those boxes (procedures) they would like to consent to. Children aged 5-15 years should complete the assent form where able.
You must check that all appropriate boxes are **ideally initialled,** and signatures collected. If a participant is aged 1.5-15 years, you must make sure that you obtain the signature of their parent or the person who has parental responsibility.
If the participant (or parent/guardian of a child participant) does not wish to receive their (or their child's) clinically relevant blood results nor do they want results to be sent to the GP, they must provide written consent to the statement in the grey box at the bottom of the consent form (to allow the Survey Doctor to contact them with any significant results). **If this box is not initialled or ticked, consent is not obtained, and you should NOT proceed with the blood sample.** This is to ensure that they understand that if there are any findings outside the normal range, we will not be able to notify their GP or anyone else as we do not have their permission to do so. For children, it is an ethical requirement for us to be able to inform someone of any clinically relevant blood results that may fall outside of the normal range. Thus, we would not take the sample.

**Summary of Blood Sample Consent Processes for Child Participants:**

- Parent / Guardian agrees to feedback, and to GP – **YES** can take sample
- Parent / Guardian agrees to feedback, but not GP – **YES** can take sample
- Parent / Guardian refuses feedback, but agrees to GP – **YES** can take sample
- Parent/ Guardian refuses feedback, *and* refuses copy to GP, but agrees survey doctor can contact them if necessary – **YES** can take sample
- Parent / Guardian refuses feedback, *and* refuses copy to GP, and refuses allowing survey doctor to contact them – **NO** - **DO NOT** proceed with taking sample.

**Always return consent forms to the office, even if no blood sample has been obtained.**

## Despatching blood tubes

See section 14 on blood delivery protocols.

## Labels: assigning into CAPI

You will be provided with unique but generic/non-personalised sets of barcoded labels sheets for labelling blood tubes and despatch notes. If the participant agrees to provide a blood sample, you will assign a labels sheet to them. If an individual refuses, or is ineligible, to provide a blood sample, do not assign a sheet of labels to them.
**There are separate sets of barcode label sheets for each NDNS year. Ensure that you have the correct label sheets you require for the visit. Label sheets will display the fieldwork year (i.e. Year 13,14 or 15) at the top and the first two digits of the barcode labels will relate to the fieldwork year (i.e. '13' for Year 13, '14' for Year 14 and so on).**

You will also be supplied with a wireless barcode scanner to use on NDNS work. The scanner will be used to assign a labels sheet to the participant by scanning into CAPI the first barcode label on the sheet. CAPI will prompt you to do this. Should the barcode scanner not work for any reason CAPI will instruct you to enter the barcode sheet number manually (you will be prompted to enter

the sheet number twice to ensure the correct number is recorded).
It is very important that the labels sheet you assign in CAPI to a participant is the same labels sheet you use for that participant's blood sample tubes. If you don't use the same labels (e.g. because you mix up sheets between participants in a household or you start a new sheet for tube labelling after having assigned a sheet in CAPI) then there is a real risk that blood results will be matched to the wrong participant. If you think that the barcode labels may have been mixed during your visit please contact the NDNS Research Team (ensuring that no personal information is provided over email address). The participant's GP could therefore be sent the wrong results, possibly leading to unnecessary worry or a problem not being picked up.
**Each label on the sheet will contain the following information:**

- The label purpose code (which tells you where the barcode label should be placed)
- The barcode
- A sheet ID number (each label on the sheet has the same ID number; numbers are unique to that sheet)

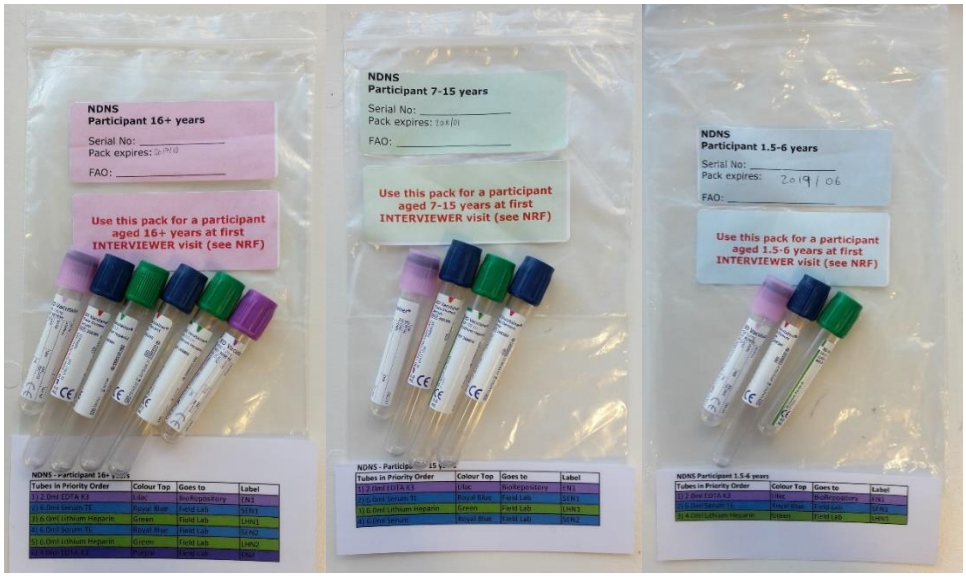

Please ensure you have a sheet of labels for each participant you are going to see **before** you leave your home. Spare labels sheets can be requested by email from the Equipment Unit (equipment@natcen.ac.uk). CAPI will guide you through how the labels are to be used for each participant, and which should be affixed to which tube or despatch note. The table in section 12.11 also outlines which label should be used for each blood tube.
**Please note that it is your responsibility to label blood tubes for all participants, even when blood is being taken from young children by a paediatric phlebotomist or extended role nurse.**

## Blood tubes

Blood will be collected using the BD Vacutainer blood collection system. The following table details the type of blood tubes and accompanying label that must be used for each age group. It also shows the priority order in which the tubes should be taken. Note that if the first EDTA tube (i.e. the first of the draw) fails to fill, use a spare second EDTA to replace this one **before** drawing the rest. Make sure your spare tubes are handy for this reason. You have a copy of this table on a separate laminate.

| **Blood Tube:** | **Label:** |
|---|---|
| *Participants aged 16+ years* | |
| **1.** 2mL EDTA (lilac top)<br>**2.** 6mL Silica Serum Trace Element (royal blue top)<br>**3.** 6mL Lithium Heparin (green top)<br>**4.** 6mL Silica Serum Trace Element (royal blue top) | EN1 PROJ2170<br>SEN1<br>LHN1<br>SEN2<br>LHN2 |

| | |
|---|---|
| **5.** 6mL Lithium Heparin (green top)<br>**6.** 4mL EDTA (purple top) | EN2 |
| *Participants aged 7-15 years* | |
| **1.** 2mL EDTA (lilac top)<br>**2.** 6mL Silica Serum Trace Element (royal blue top)<br>**3.** 6mL Lithium Heparin (green top)<br>**4.** 6mL Silica Serum Trace Element (royal blue top) | EN1 PROJ2170<br>SEN1<br>LHN1<br>SEN2 |
| *Participants aged 1.5 to 6 years* | |
| **1.** 2mL EDTA (lilac top)<br>**2.** 6mL Silica Serum Trace Element (royal blue top)<br>**3.** 4mL Lithium Heparin (green top) | EN1 PROJ2170<br>SEN1<br>LHN1 |




**Sticking barcode labels to tubes**

When sticking the barcoded labels onto the blood tubes, the label should be stuck LENGTHWAYS along tube, covering the manufacturer's label. See image below.

## Taking blood from children

NDNS biomedical fieldworkers will be taking blood samples from all willing participants aged 11 years and over. Extended role nurses can take bloods from those aged 6-10 years; a paediatric phlebotomist will take bloods from those aged 1.5 to 5 years. It is important to make the child feel as comfortable and as at ease as possible. Smiling, making eye contact and speaking so that the child can understand easily are ways to facilitate this. Also, ask the child for permission to do something rather than insisting or telling. This can encourage a sense of control in the child and minimises fear.

**Precautionary Restraint (A.K.A. Cuddle Restraint)**

If the parent/guardian is willing (note this is optional), they can help you to gently restrain the child to reduce any accidents due to pulling away at the pin prick or panicked movements. Ask the child to sit on the parent's lap. The child should be sitting so that their legs are between the parent's legs. The child should have their arm wrapped around the parent's back and vice versa for the parent. This exposes the chosen sampling arm to the nurse/biomedical fieldworker while restraining the child's other arm and legs.

We have ethical approval for up to two attempts at taking a child's blood, one on each arm if required. The second venepuncture attempt should only take place if the parent is comfortable and agrees with the procedure, the child agrees (if old enough to give assent) and the child is not distressed in any way.

## Blood sampling token of appreciation

All participants will receive a **£15 gift card** as a thank you for providing a blood sample or for at least one attempt at providing a blood sample. This is in recognition of their time and commitment to giving a blood sample which is very important to the study. Remember this should **not** be presented as 'payment' but as a token of appreciation. Whilst you're still in the household, you need to activate the gift card in CAPI.

The CAPI program will automatically prompt you to enter the last **8 digits** of the gift card number that is shown on the front of the card, for each participant.

When prompted by CAPI you should write the relevant voucher amount on the front of the card, give the card to the participant and inform them that the card will be activated and live to use after approximately 48 hours. Please note that this is dependent on you transmitting the case promptly and may take up to 72 hours if the case is transmitted on a Friday.

- Point out to the participant that they can check the value of the card by either going to the Love2Shop website and looking at the card account, or by using a QRL code scanner (e.g. through an app on a smart phone or tablet). The QRL code is usually on the back of the card.

Further supplies of gift cards can be requested from the Incentives team (IncentiveTeam@natcen.ac.uk). Gift cards are supplied direct from the issuing company (Love2Shop) and cannot be sent automatically with each work pack.

If you have left over gift cards at the end of an assignment, **you can use them for subsequent NDNS assignments as long as they are valid for at least 6 months prior to the expiry date**. They are not of any monetary value until activated by Love2shop upon receipt of your transmission of the completed case.

## *POSTED COOL BOX DETAILED INSTRUCTIONS*

*The instructions below outline the procedure for packing one set of samples in one posting cool*

*box. The instructions state in italics, if necessary, the procedure for multiple participants/sets of samples.*

## Number of samples per box:

- Blood samples from two adult (16+ years) participants in the same household **will need to be packed into separate boxes**
- Blood samples from two child (1.5-15 years) participants in the same household **can be packed into the same box** (using separate ziplok bags)
- Blood samples from one adult (16+ years) and one child (1.5-15 years) participant in the same household **can be packed into the same box** (using separate ziplok bags)

Remember that one despatch form must be completed per participant, even if two sets of samples are going in the same box

## On the night before the visit:

1. Place 3x 500g disposable ice packs into a freezer.
2. Open the posting cool box packaging, construct the outer cardboard box and place the two polystyrene inserts inside (with one section for the bottom, top and one of the walls **(Picture A)**, and the other for the other three walls **(Picture B)**). Up to o*ne box per two sets of samples- see above for number of samples per box*

**A>**  **B>**  **C>** 

## On the morning of the visit – before leaving for the appointment:

3. Take the frozen 500g disposable ice packs out of the freezer and place inside the box. (Try to do this as near as possible to the time when you set off to the participant's home).
4. Close the box but do not seal.
5. Ensure you have a TimeStrip®Complete™ temperature indicator to insert just prior to the closure of the box once the visit has taken place. Do not activate nor place inside the posting cool box prior to the visit (See the ***Additional Information*** section for further information to note regarding the TimeStrip®Complete™). You should take some spare temperature indicator to every visit.


## During the visit and once the blood sample is collected:

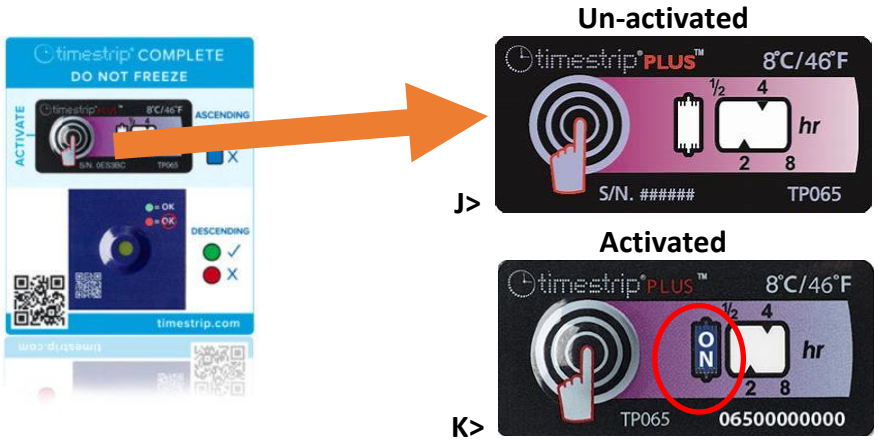
6. Place the relevant blood tube/s into an absorbent pouch *(always use separate pouches for each participant. Adult (16+ years samples) will need two absorbent pouches.*
7. Place the pouch(es) into the sample bag and carefully seal the bag. (**Picture D**) *One bag per set of samples*
8. Wrap the sample bag with 2 layers of bubble wrap sheet supplied, so that the samples are covered top and bottom. **(Pictures E & F)** *Two sample bags going into the same box can be wrapped with the same bubble wrap sheet as long as the samples are covered top and bottom*

**D>**  **E>**  **F>** 

9. Open the delivery box and place the bag of samples between the two frozen 500g disposable ice packs. The order of layering the packaging should follow: frozen 500g disposable ice pack (**Picture G**), bubble wrapped blood sample set, in the absorbent tube pouch and grip bag(s) (**Picture H**), frozen 500g disposable ice pack (**Picture I)**. The final ice pack should be placed down one of the short sides of the box (the opposite side to where you plan to place the tempature indicator). *Remember three* 500g disposable ice packs *per box*

**G>**  **H>**  **I>** 

10. Remove the adhesive backing from the TimeStrip®Complete™ temperature indicator and stick it onto the shorter inside wall of the box (on one of the polystyrene walls), the other end to the third ice pack (**Picture G)**. Press the 'power on' blister to activate the temperature indicator (**Picture J**), making sure the activation window (circled in red) turns blue and the word **ON** appears (**Picture K**).




11. Fold the top polystyrene lid down. Try to do this as quickly as possible after activating the temperature indicator.
12. Complete **the Despatch Form (including label)** and insert into the box ***on top*** of the polystyrene lid (**Picture L)**. *If two sets of samples are including in the same box, two dispatch notes must be filled in, one for each participant.*

L> 

13. Close the outer box lid and carefully seal shut using the sealing tape, taking care not to obscure any of the delivery address or UN biohazard labels.


## If you have no further NDNS appointments in that Trip, drive to the nearest post office.

14. On arrival at the Post Office, send the package by the **Royal Mail Special Delivery Guaranteed by 1pm** service. For a medium parcel under 2kg, this should be £11 (Mondays

- Thursdays). If you deliver on a Friday, this should be £14 (for the delivery to occur on Saturday). You should ensure you receive a receipt which shows the cost of the delivery and the tracking number.

15. Once the parcel is handed over send an email as soon as possible (and by 4pm at the latest) to the Biorepository lab containing the following information:
    a. Email address to: BioRepLab@medschl.cam.ac.uk
    b. Email address C.C.: nursecentre@natcen.ac.uk
    c. Subject Header of: "**NDNS Special Delivery Information**"
    d. Full Serial Number (including person number) e.g.: 13021329X3;
    e. Date and Time parcel given to the post office e.g.: 14/03/2020; 09.30
    f. Tracking Number of the parcel e.g.: 123HQ2145UPJ
    g. 4-digit Nurse ID e.g.: 6319
    h. Do not include any other information (e.g. participant name)
16. *If there are two participant sample sets in one box, then your email message should show this when you cite the serial numbers e.g.: 132030512X1; 132030512X2 (the rest of the information then pertains to both sets of samples as they are packaged in the same parcel delivery).*

## Additional Information about the TimeStrip®Complete™ monitors

**a.** TimeStrip®Complete™ temperature indicator cards require activation when they are to be used. They should not be activated in advance.

**b.** There are no special storage requirements. However, they should generally be stored at room temperature.

**c.** The shelf life is 1 year. The expiry date will be stated on the NDNS workpack package.

**d.** The card contains two measures: the internal temperatures of the package, and the time at those temperatures, when they are below 0°C and above 8°C.


**e.** The **Timestrip®Plus part of the card** has two small indicator windows: an '***activation window***' that is **white** prior to activation and which turns **blue** with the word **ON** emerging**.** If the internal parcel temperature goes above 8°C the white ***'breach window'*** turns blue which shows the time spent at that temperature.

- You should activate the Timestrip®Plus part of the card s at room temperature.
- ***To Activate*** - firmly squeeze the blister located on top of the indicator.
- Once activated, the activation window turns **blue** and the work **ON** appears in the ***activation window***. The ***breach window*** will remain white.

- **Note:** If the Timestrip®Plus windows are blue before activation – discard and use another card



**f.** The **FCP™ part of the card**
is self-activating and the central window shows **green** for temperatures above 0°C and turns **red** when the internal temperature of the package is lower than 0°C.

- **Note:** If the FCP™ indicator is already showing red – discard and use another card

**g.** ***To apply*** the TimeStrip®Complete™ device, remove the adhesive liner on the back and press the device to the inner surface of the package lining. The device can be mounted anyway up.

# 3. SPOT URINE SAMPLE (FACE-TO-FACE VISITS ONLY)

## Background

Spot urine samples are being collected to provide an assessment of iodine levels in the UK population. Iodine is an essential nutrient for being healthy and it is used by the body to make thyroid hormones. Thyroid hormones are important for growth and development and iodine deficiency can lead to an enlargement of the thyroid gland and an increase in the amount of thyroid stimulating hormone (TSH) produced by the pituitary gland.
The best way to determine iodine deficiency across a large population is to measure the amounts of iodine in urine samples. This will provide nationally representative information that will be sufficient to categorise the iodine status of the UK population by sex-age group. As we are only looking at iodine at a population level, no individual feedback will be given to participants.

## 9.2 Documents

**Please follow NatCen COVID protocols on handling documents and equipment.**

### Information leaflets

Your participants have been provided with spot urine leaflets in their interview pack. There is one version for adults and one version for children. These leaflets provide participants with background information, the collection method and contact details should they have any queries or concerns. Encourage participants to read these leaflets as they provide information about the spot urine element.
In order for participants to provide a sample they **must** read the relevant information leaflet and provide written consent.

### Consent forms

Before you collect a sample from a participant you must first obtain written consent. There are 3 spot urine consent forms.

1. Adult consent form for participants aged 16 years and over.
2. Parental/Guardian consent form to be completed by parent(s) of participants aged 4 – 15 years.
3. Child assent form should be completed where possible by participants aged 4 – 15 years.

- You should sign and date the relevant consent forms before handing the documents to the participant.
- Participants **must** initial (or tick) each statement that they agree to
- Participants should then sign and date the form

**The top copy of the consent form will be returned to the Brentwood office and the bottom copy will be left with the participant.**

The agreement of the child should be sought. If disagreement arises between parents and/or parent and

child about whether or not to co-operate, always respect the wishes of the non-co-operator.

## Barcode labels

You will assign a set of barcode labels, through CAPI, for all participants consenting to give a spot urine sample.

**All barcode labels for NDNS Year 15 will begin with the digits '15'.** Please ensure before your briefing and starting fieldwork that you **do not use** any barcode labels beginning '13'. If you have any barcode labels beginning with '13' or '14' please return them to Brentwood. If you do not have labels beginning '15' at your visit you should not proceed with urine sample collection.

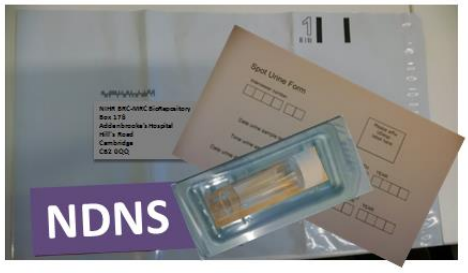
Further details about assigning the labels can be found in section 7.4.

## Home leaflet

If a participant is unable to or refuses to provide a spot urine sample at the visit, at your own discretion, you can ask whether they would be willing to provide the sample at a later time and post it themselves. A home leaflet has been designed to guide participants through the procedure of giving and posting the sample themselves. CAPI will guide you through when and how to introduce this.

There is one home leaflet, to be used for adults and children.

# 9.3 Equipment




You will have the following equipment:

- A spot urine sample pack containing:
  - A universal sample tube
  - A plastic sample despatch pack (clam shell)
  - A pre-addressed lab despatch polylope with R
  - Urine sample despatch form (for MRC Epidemiology Biorepository)
  - Disposable gloves
- An envelope with sets of barcode labels. A set of barcode labels is a strip of 3 barcode labels with the **same** number (one for the sample tube, one for the consent form and one for the despatch form). **All labels will begin '15'.**
- Leaflets
- Consent forms
- Child assent form
- Urine certificate for children
- Barcode scanner

# 9.4 Collecting a spot urine sample

## When to collect the sample

Spot urine will be introduced during CAPI. You will aim to collect the urine sample at the main visit. However, if for any reason the participant is unable or unwilling to provide a sample during your visit, they will have the option to collect a sample at a later date and post the sample back themselves.

# Eligibility

Participants are excluded from providing a sample at the interviewer visit if they are:

- Under 4 years old
- Children aged 4 and over who are not dry during the day
- Using a urinary catheter

For participants aged 4 years and over, CAPI will prompt you to read out the exclusion criteria and ask the participant if they fall into any of the exclusionary categories.
If a participant responds that they fall into one of these categories, the participant will not be able to take part.
If the participant refuses or is unable to provide a urine sample during your visit, CAPI will prompt you, at your own discretion, whether it is appropriate to offer the participant the option to provide a spot urine sample after you leave the household and to post it back themselves.
Please do not attempt to collect spot urine samples outside of the main visit (e.g. when providing assistance with dietary recalls).

# Collection procedures

1. Once eligibility has been confirmed and written consent has been obtained, you can proceed with the urine collection.

2. **Please follow NatCen's COVID protocols on handling bio-samples**.

3. From your envelope of barcode labels take out one strip of labels that will have 3 barcode labels with the same number. (Also check that the labels begin with '15').

4. Using your barcode scanner, enter into CAPI the barcode number of the set of 3 barcode labels you will be using for that participant. **DO NOT MIX LABELS BETWEEN PARTICIPANTS, USE ONE SET (ROW) PER PARTICIPANT.** You should always be using your barcode scanner when entering the barcode number into CAPI. If you have any issues with the scanner, CAPI will prompt you to explain why and ask you to enter the barcode manually.

5. You should sanitise your hands before and after handling the sampling tube.

6. You will need to attach the barcode labels as follows:

    a. U**CON** – affix to the Office Copy of the **con**sent form

    b. U**SAM** – affix directly to the universal **sam**ple tube **lengthways** along the tube (see photo below)

    c. U**DESP** – affix to the MRC Epidemiology Biorepository urine sample **desp**atch note.


7 Place the labelled universal sample tube back into the plastic sample despatch pack (clam shell) and place on an appropriate surface for the participant to pick up (see picture above).

8 Check that they have read the information leaflet and signed the consent form.

9 **The spot urine sample should not be the first urine of the day.**

10 Ask the participant to pass a small amount of urine directly into the container being careful not to touch the inside. There is iodine in some cleaning and antiseptic products so people may have iodine on their fingers. We only want to measure the amount of iodine in their urine. The universal tube does not need to be filled to the top. Participants should aim to three quarters fill the tube. If they are having any difficulties, then they should just try and catch what they can. This applies especially for young children.

11 Once the sample has been collected, the participant should screw the lid back on tightly. Participants can wipe the outside of the container dry using an ordinary piece of toilet paper or a tissue but should not use wet wipes or any cleaning products as these could contaminate the sample. Some participants may be using toilet paper or tissues that are enriched with aloe vera or shea butter for example. This is why it is particularly important for the lid to be screwed back on before the tube is wiped. If not, the sample could get contaminated.

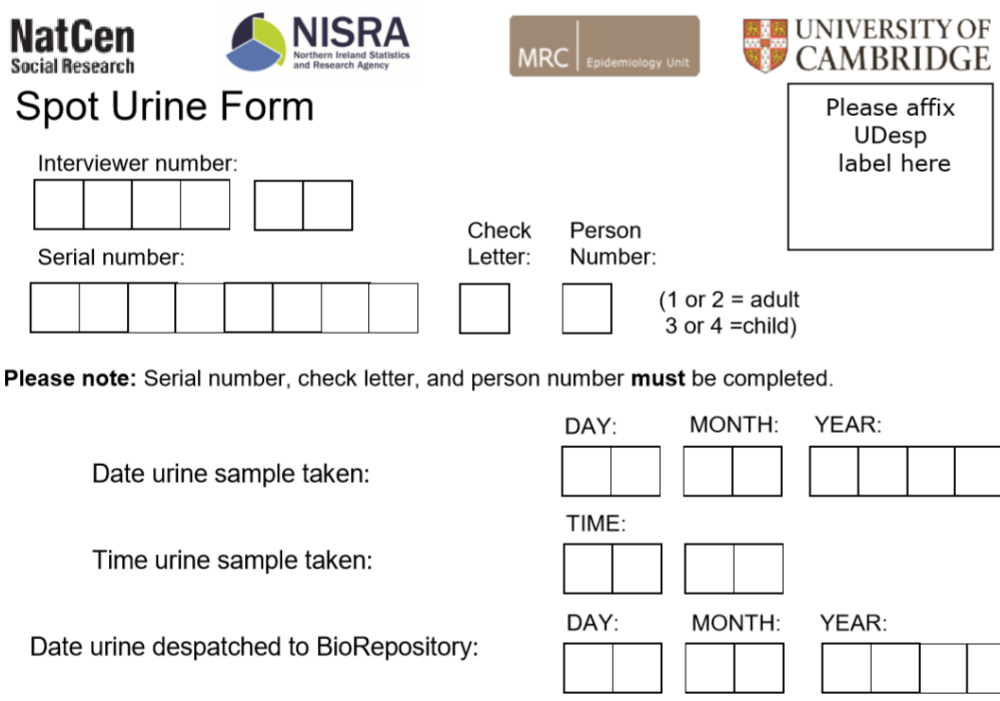
12 After ensuring the lid is screwed on tightly, the participant should pack the sample tube into the plastic despatch pack (clam shell) and place on appropriate surface for you to collect.

13 You will then place the plastic despatch pack (clam shell) into the pre-addressed plastic posting polylope and sanitise your hands.

## Checking that the lid is screwed on tightly

Parents/legal guardians may need to help young children screw on the lid tightly. Elderly people in particular may need help tightening the lid. You should verbally check to ensure the lid is tightly screwed on before asking the participant to place the sample tube into the plastic despatch pack. Ensure the clamshell is properly closed before placing in the plastic posting polylope.
After the completed sample has been securely packed into the pre-addressed plastic posting polylope, please remember to fill in the MRC Epidemiology Biorepository despatch form and place this into the pre-addressed plastic posting polylope.

## Completing the despatch form




A despatch form should be completed for every participant who provides a urine sample.

**It is ESSENTIAL that the full serial number (including check letter and person number) is completed clearly and accurately on the despatch form and on all documents.**

The serial number is 8 digits long and therefore should fill up the 8 boxes underneath the Serial number title. Check letter and person number must be completed too.

The person number identifies the person in the household: Adult 1 = 1, Adult 2 = 2, Child 1 = 3, Child 2 = 4 (remember that in a basic address, the child will always be assigned person number 3, and in a Young Person address the first selected child will always be assigned person number 3 and the second child person number 4).
For example, for a basic address - issued in April - with two participants (person 1 and person 3), the serial number for person 1 (Adult 19 + years) might be 15040101X1 and the serial number for person 3 (Child or young person) within that same household would be 15040101X3.
If the wrong serial numbers are entered on documents, data from one person will be matched with those of someone else. **Please check forms carefully and also record time using the 24-hour clock - i.e. 07.00 and19:00 so we can distinguish 7.00am and 7.00pm.**

## 9.5 Packaging and posting

Place the filled sample tube into the plastic despatch pack (clam shell) and secure by applying pressure to each side. Place in the pre-addressed polylope envelope, along with the completed urine sample despatch form and make sure it is posted on the same day that the sample is collected.

- The samples can be posted in a post box. There is no need to send via special or recorded delivery.
- Please ensure the post box you are using has a collection scheduled within 24 hours (or if sample taken on a Saturday / Sunday – make sure the post box has a collection scheduled for the Monday).
- The Office Copy of the Urine Sample Consent form (complete with the UCON label attached to it) should be posted separately to the Brentwood office in the normal pre-paid small

brown envelopes or plastic polylopes. They do not need to be sent by recorded delivery. These consent forms **must be** sent separately from any other documents as they contain personal information.

## 9.6 Gift card

All participants who provide a spot urine sample or agree to provide and post a sample themselves after your visit will receive a £5 gift card as a token of appreciation at the end of the individual interview (see also section 4). CAPI guides you through administering these gift cards.

## 9.7 Leaving spot urine kit with participants

If a participant is unable to or refuses to provide a sample during the main visit, **at your own discretion**, you can offer them the option to collect and post their spot urine sample independently after your visit. If they agree, you will need to assign labels to the tube, despatch note and consent form (as described above in the 'Collection procedures' section) and collect the participant's written consent. You will then leave the spot urine home leaflet, spot urine kit and a pre-paid envelope with the participant and ask them to post the sample within 24 hours (if possible). The participant will receive the £5 at the end of the interview (as part of the cumulative total)- see below. CAPI will guide you through the entire process.

# 4. WAIST AND HIP CIRCUMFERENCES

This measurement is taken from participants aged 11+ years.

**Purpose**

There has been increasing interest in the distribution of body fat as an important indicator of increased risk of cardiovascular disease. The waist -to-hip ratio is a measure of distribution of body fat (both subcutaneous and intra-abdominal). Analyses suggest that this ratio is a predictor of health risk like the body mass index (weight relative to height).

**Equipment**

EasyCheck 150mm length tape calibrated in mm (with push button closure).

The tape is passed around the circumference and the end is secured through the push button

**Eligibility**

Waist and hip measurements will only be carried out on respondents **aged 11 and over.** The respondent is ineligible for the waist and hip measurement if:

- Chairbound
- Has a colostomy/ileostomy
- Pregnant

If (a) and/or (b) apply, record this on the computer (question WHPNABM). If there are any other reasons why the measurement was not taken, record this on the computer and type in the reason.

**Preparing the respondent**

The interviewer will have asked the respondent to wear light clothing for your visit. Explain to the respondent the importance of this measurement and that clothing can substantially affect the reading.

If possible, without embarrassing you or the respondent, ensure that the following items of clothing are removed:

- all outer layers of clothing, such as jackets, heavy or baggy jumpers, cardigans and waistcoats
- shoes with heels
- tight garments intended to alter the shape of the body, such as corsets, lycra body suits and support tights

If the respondent is wearing a belt, ask them if it would be possible to remove it or loosen it

for the measurement.

Pockets should be emptied.

Some respondents may be wearing religious or other symbols which they cannot remove and which may affect the measurement. Do not embarrass or offend the respondent by asking them to remove such things.

If the respondent is not willing to remove bulky outer garments or tight garments and you are of the opinion that this will significantly affect the measurement, record this on the Schedule at questions *WJRel* and/or *HJRel*. Some respondents may be wearing articles of clothing which cannot be removed and will affect the measurement (e.g. saris) – this should also be recorded.

If possible, ask the respondent to empty their bladder before taking the measurement.

**Using the EasyCheck tape**

All measurements should be taken to the nearest millimetre. If the length lies half-way between two millimetres, then round to the nearest even millimetre. For example, if the measurement is halfway between 68.3 and 68.4, round up to 68.4. And if the measurement is halfway between 68.8 and 68.9, round down to 68.8. Please note that you must enter the measurement to one decimal place - do not round it to the nearest centimetre. For example, enter '78.2', not just '78'. If you do not enter a decimal point, the computer will give you a warning. If the measurement is exactly, say, 78cm, then all you need to do is suppress the warning and it will automatically fill in the '.0' for you. Otherwise, you must go back and amend your answer. As a further check, the computer will also ask you to confirm that a measurement ending in '.0' is correct.

Ensure the respondent is standing erect in a relaxed manner and breathing normally. Weight should be evenly balanced on both feet and the feet should be about 25-30cm (1 foot) apart. The arms should be hanging loosely at their sides.

If possible, kneel or sit on a chair to the side of the respondent.

Pass the tape around the body of the respondent and secure the end of the tape with the push button.

To check the tape is horizontal you have to position the tape on the right flank and peer round the participant's back from his/her left flank to check that it is level. This will be easier if you are kneeling or sitting on a chair to the side of the respondent.

Hold the plastic slider flat against the body and flatten the end of the tape to read the measurement at the red line in the plastic slider. Do not pull the tape towards you, as this will lift away from the respondent's body, affecting the measurement.

**Measuring waist circumference**

The waist is defined as the point midway between the iliac crest and the costal margin (lower rib). To locate the levels of the costal margin and the iliac crest use the fingers of the right hand held straight and pointing in front of the participant to slide upward over the iliac crest. Men's waists tend to be above the top of their trousers whereas women's waists are often under the waistband of their trousers or skirts.

Do not try to avoid the effects of waistbands by measuring the circumference at a different position or by lifting or lowering clothing items. For example, if the respondent has a waistband at the correct level of the waist (midway between the lower rib margin and the iliac crest) measure the waist circumference over the waistband.

Ensure the tape is horizontal. Ask the participant to breathe out gently and to look straight ahead (to prevent the respondent from contracting their muscles or holding their breath).

Take the measurement at the end of a normal expiration. Measure to the nearest millimetre and record this on the schedule.

Repeat this measurement again.

If you are of the opinion that clothing, posture or any other factor is significantly affecting the waist measurement, record this on the schedule.

**Measuring hip circumference**

The hip circumference is defined as being the widest circumference over the buttocks and below the iliac crest. To obtain an accurate measurement you should measure the circumference at several positions and record the widest circumference.

Check the tape is horizontal and the respondent is not contracting the gluteal muscles. Pull the tape, allowing it to maintain its position but not to cause indentation. Record the measurement on the schedule to the nearest millimetre, e.g. 95.3. If the length lies half-way between two millimetres, then round to the nearest even millimetre.

If clothing is significantly affecting the measurement, record this on the schedule.

Repeat this measurement again.

**General points**

The tape should be tight enough so that it doesn't slip but not tight enough to indent clothing. If clothing is baggy, it should be folded before the measure is taken.

If the respondent is large, ask him/her to pass the tape around rather than having to "hug" them. Remember though to check that the tape is correctly placed for the measurement being taken and that the tape is horizontal all the way around.

If your second waist or hip measurement differs by 3cm or more from the first, the computer will give you a warning. If you have made a mistake when entering the figures (e.g. typed 78.2 instead of 68.2), you should type over the mistake. If it was not a mistake, you should suppress the warning and take a third measurement.

If you have problems palpating the rib, ask the respondent to breathe in very deeply. Locate the rib and as the respondent breathes out, follow the rib as it moves down with your finger. If your respondent has a bow at the back of her skirt, this should be untied as it may add a substantial amount to the waist circumference.

Female respondents wearing jeans may present a problem if the waistband of the jeans is on the waist at the back but dips down at the front. It is essential that the waist measurement is taken midway between the iliac crest and the lower rib and that the tape is horizontal. Therefore in this circumstance the waist measurement would be taken on the

waist band at the back and off the waist band at the front. Only if the waistband is over the waist all the way around can the measurement be taken on the waistband. If there are belt loops, the tape should be threaded through these so they don't add to the measurement.

**Recording problems**

We only want to record problems that will affect the measurement by more than would be expected when measuring over light clothing. As a rough guide only record a problem if you feel it affected the measurements by more than 0.5cm. We particularly want to know if waist and hip are affected differently.

At WJRel and HJRel, record how reliable the waist and hip measures are, and whether any problems that were experienced were likely to increase or decrease the measurement. This information is important for analysis of the results. As a general rule, if you believe that the measurements you took are 0.5cm more or less than the true measurement because of problems you encountered (e.g. clothing the respondent was wearing), this should be counted as unreliable.

**Respondent feedback**

Offer to write the measurements on the Measurement Record Card.

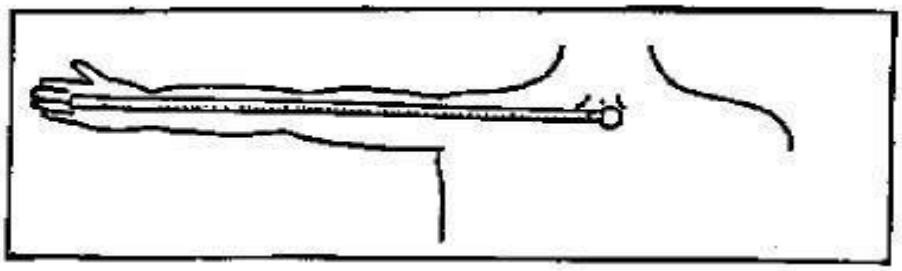
The measurements will be given in inches as well as centimetres by the computer. You can record the measurements on the MRC using centimetres, inches or both.

# 5. DEMISPAN

This measuremenet is taken from participants aged 65+ years or those aged 16-64 years where the interviewer collected a valid weight measurement but was not able to collect a valid height measurement.

**Purpose**

The demispan measurement is an alternative measure of height. It is the distance between the midline of the sternal notch and the base of the fingers between the middle and ring fingers, with the arm out-stretched laterally (see Figure below).



The demispan measurement is taken when it is difficult to measure height accurately. For example if the respondent cannot stand straight or is unsteady on their feet as is quite often in the case of the elderly and some disabled people. It is used as a proxy for a height measurement as there is a relationship between demispan and 'true height'. Additionally, height decreases with age to a varying degree depending on individuals, and thus the standard measure of height may be less useful for some older respondents. The long bones in the arm do no get shorter however, and thus can be used to estimate accurately a respondent's 'true height'.

**Eligibility**

Demispan measurements will be carried out on respondents **aged 65 and over**. Demispan measurements will be carried out on those aged 16-64 where the interviewer collected a valid weight measurement but was not able to collect a valid height measurement.

**Exclusion criteria**

Respondents are excluded from the demispan measurement if they cannot straighten either arm without pain or discomfort.

**Equipment**

You will need:

- A thin retractable demispan tape calibrated in cm and mm
- A skin marker pencil
- Micropore tape
- Alcohol and non-alcohol swab

**Using the demispan tape**

A hook is attached to the tape and this is anchored between the middle and ring fingers at the finger roots. The tape is then extended horizontally to the sternal notch.

The tape is fairly fragile. It can be easily damaged and will dent or snap if bent or pressed too firmly against the respondent's skin. Also the ring connecting the hook to the tape is arelatively weak point. Avoid putting more strain on this ring than necessary to make the measurements. When extending the tape, hold the tape case rather than the tape itself as this puts less strain on the hook and tape. When placing the tape against the sternal notch, do not press into the sternal notch so much that the tape kinks.

**Preparing the respondent**

Explain to the respondent the purpose of conducting the demispan measurement and explain the procedure. Further explain that the measurement requires minimal undressing because certain items may affect the accuracy of the measurement. The items of clothing that will need to be removed include:

- Ties
- Jackets, jumpers and other thick garments
- Jewellery items such as chunky necklaces/bracelets
- Shoulder pads
- High heeled shoes
- Shirts should be unbuttoned at the neck

If the respondent does not wish to remove any item that you think might affect the measurement, record that the measurement was not reliable in CAPI.

For the purpose of consistency, where possible the **right arm** should always be used. If this is not possible, carry out the measure on the left arm and make a note of this in CAPI.

**Procedure**

1. Locate a wall where there is room for the respondent to stretch his/her arm. They need to stand with their back to the wall but not support themselves on it, standing approximately 3 inches (7cm) from the wall.
2. Ask the respondent to stand with weight evenly distributed on both feet, head facing forward.
3. Have them raise their **right arm** and extend it horizontally to their side until it is parallel with the floor. The right wrist should be in neutral rotation and neutral flexion. Rest your left arm against the wall allowing the respondent's right wrist to rest on your left wrist.
4. When the respondent is in the correct position, mark the skin at the centre of the sternal notch using the skin marker pencil. This mark must be made when the respondent is standing in the correct position. Explain to the respondent that the mark will wash off afterwards.
5. If clothing, jewellery or subcutaneous fat obscures the sternal notch, use a piece of micropore tape on the clothing or jewellery. If the respondent refuses to the use of the marker pen or the tape, proceed with the measurement but record it as unreliable in CAPI.
6. Ask the respondent to relax while you get the demispan tape.
7. Place the hook between the middle and ring fingers of the respondent so that the tape runs smoothly across the arm.
8. Ask the respondent to get into the position they were in previously, with their arm raised

horizontally, the wrist in neutral flexion and rotation. Check they are in the correct position.

9. Extend the tape to the sternal notch. If no mark was made, feel for the correct position and extend the tape to this point.
10. Ask the respondent to stretch his/her arm checking that they remain in the same position, the hook has not moved on their fingers and that the respondent is not leaning on the wall or bending at the waist.
11. Record the measurement in CAPI, in centimetres and millimetres. Always report to one decimal place. If the length lies halfway between 2 millimetres, then round to the **nearest even millimetre** (see section 2.4).
12. Ask the respondent to relax and loosen up the right arm by shaking it gently.
13. Repeat steps 2-11. Explain to the respondent that the measure needs to be taken again for accuracy. If the second measure is significantly different to the first, CAPI will give you an error message. At this point you can check to make sure that you have entered the readings correctly or take a third measure if there is another reason for the measurements being different. This is to be taken in the same way as the previous two. CAPI will work out which two of the three readings to use.
14. If the respondent wishes, record the results on their measurement record card. You can use the conversion chart on your showcards to convert the results into inches.
15. If the skin marker is used, offer the alcohol or non-alcohol wipe to the respondent to wipe the skin mark off.

**Additional points**

- If the respondent is unable to stand in the correct position or finds it difficult to stand steadily, ask them to sit for the measurement. Use an upright chair and position it close to a wall. If a respondent is unable to sit or stand, the measurement can be taken when the respondent is lying down. In both cases still try to support the arm if possible. You may need to sit or kneel to take the reading.
- Record in CAPI how the measurement was taken (i.e. with respondent standing, sitting, etc).
- If there is no wall available for the respondent to stand in front of and extend their arm horizontally, have them stand in front of any other flat surface e.g. in front of a cupboard or window, ensuring that they are not supporting their body weight on this surface.
- If the respondent is much taller than you take the measurement with the respondent sitting.
- If the respondent's arm is much longer than yours is, support the arm close to the elbow rather than wrist level. Your arm must not be between the elbow and shoulder, as this will not provide sufficient support.
- Before packing the tape away ensure the hand hook and length of tape is wiped to reduce potential cross infection between households.

# 7. INFANT LENGTH MEASUREMENT

The measurement is taken for children aged under two years.

**Introduction**

The infant length measurement, when taken in conjunction with other growth parameters, can be used as an indicator of an infant's nutritional status. Taking this measurement across many years allows trends in infant length to be monitored and provides a means for the evaluation of current policies, interventions and treatments relating to infant health and nutrition.

**Equipment**

You will need:

- A Rollameter baby measure mat
- A Frankfort Plane card
- Antibacterial /viral wipes wipes

**Preparing the respondent**

Explain to the parent or legal guardian of the infant the reason for taking the length measurement. Further explain that you will need their assistance in taking this measure and how they can help.

**Procedure**

1. Ask the parent to remove any bulky clothing or shoes that the infant is wearing as it may result in an inaccurate measurement. It is not necessary for them to remove the infant's nappy.

2. Unroll the Rollameter and lay it flat on any suitable flat, firm surface, preferably the floor. It is essential that the Rollameter is fully unrolled and as flat as possible, therefore doing the measurement on a deep pile carpet or rug is not appropriate. If the carpet is too thick, take the measurement in another uncarpeted room, e.g. kitchen or bathroom.

3. Wipe the surface of the Rollameter with a Milton Wipe and allow to dry for 30 secs.

4. The measurement can be taken with the infant on a Rollameter on a raised surface, e.g. a table, ONLY if the baby is held by an adult at all times, even if the baby has never previously rolled over.

4. Place the child on the foam bed of the Rollameter with his/her head touching the headpiece on which the name Rollameter is printed.

5. Move the child's head so that Frankfort Plane is in a position at right angles to the floor/table. The Frankfort Plane is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye (see Figure 1). This position is important if an accurate reading is to be obtained. Ask the parent to hold the child in this position and make sure their head is in contact with the headpiece.

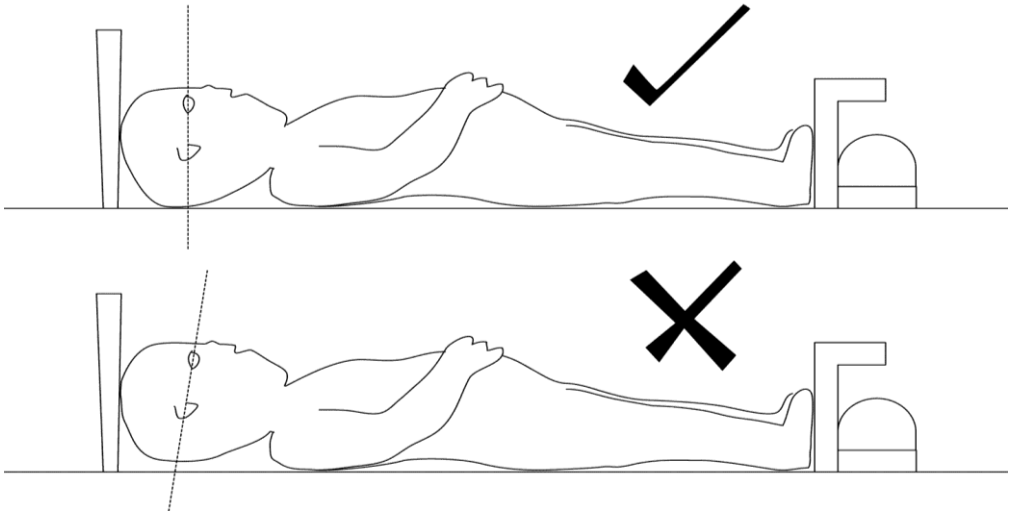


**Figure 1 The infant Frankfort Plane**

6. Straighten the child's legs by holding the legs by the ankles with one hand and applying a gentle downward pressure.

7. With your free hand, move the footrest on which the measuring tape is mounted to touch the child's heels by depressing the red button on the tape measure.

8. The measurement is read from the red cursor in the tape window. The measurement is recorded in centimetres and millimetres to the nearest millimetre. If the measurement lies between two millimetres then you should round to the **nearest even millimetre** (see section 2.4)

9. Wipe Rollamat with Milton wipe before placing back into carry pot.