

## Appendix G

Food types, main and subsidiary food groups

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### Food types, main and subsidiary food groups<sup>1</sup>

Food types consist of one or more food groups.

Food groups are expressed as integers.

Subsidiary food groups are integers with an alphabetical suffix.

#### Food Type: Cereals and cereal products (Groups 1-9)

##### 1 Pasta, rice and other miscellaneous cereals

1A	Pasta	all types - dried, fresh and canned; including egg noodles, macaroni cheese, ravioli, canned spaghetti bolognaise
1B	Rice	fried and boiled, savoury rice, egg fried rice, rice flakes, rice flour. (Not rice pudding)
1C	Pizza	all types - thin & crispy, deep pan, French bread
1R	Other cereals	includes flour, bran, oats, dry semolina, papadums, dumplings, Yorkshire pudding

##### 2 White bread

2R	White bread	sliced, unsliced, toast, fried; includes French stick, milk loaf, slimmers, pitta bread, rolls, chappatis, soda bread
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##### 3 Wholemeal bread

3R	Wholemeal bread	sliced, unsliced, toast, fried; includes chappatis, pitta bread, rolls, hi-bran bread, wholemeal soda bread
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##### 4 Other breads

4A	Softgrain bread	sliced, unsliced, toast, fried, rolls; e.g. Mighty White, Champion, own brands; fortified and not fortified
4R	Other breads	sliced, unsliced, toast, fried; includes brown, granary, high fibre white, rye bread, gluten free, garlic bread, continental breads e.g. ciabatta, oatmeal bread, Vitbe, Hovis, crumpets, English muffins (white & wholemeal), pikelets, brown and granary rolls, bagels, brioche, naan, paratha

**5 Wholegrain and high fibre breakfast cereals**

5R Wholegrain and high fibre breakfast cereals all with non-starch polysaccharide (Englyst fibre) of 4g/100g or more, e.g. All Bran, muesli, Shredded Wheat. Includes porridge & Ready Brek

**6 Other breakfast cereals**

6R Other breakfast cereals all with non-starch polysaccharide (Englyst fibre) of less than 4g/100g, e.g. cornflakes, Coco Pops, Sugar Puffs. Includes Pop Tarts

**7 Biscuits**

7R Biscuits all types, sweet and savoury; includes cream crackers, flapjacks, breadsticks, crispbread, cereal crunchy bars, ice cream cornet

**8 Buns, cakes, pastries and fruit pies**

8A Fruit pies all types, one and two crusts; includes apple strudel, individual fruit pies from takeaways

8R Buns, cakes and pastries includes Danish pastries, currant bun, doughnuts, Eccles cakes, Bakewell tarts, jam tarts, scones (sweet and savoury), sponge cakes, fruit cakes, eclairs, currant bread, malt loaf, gateaux, pastry, mince pies, sponge fingers, scotch pancakes, croissants, custard tart, lemon meringue pie

**9 Puddings**

9A Cereal-based milk puddings rice pudding (including canned), custard (not egg custard), Angel Delight, blancmange, confectioner's custard, semolina, sweet white sauce

9B Sponge puddings steamed, canned, suet pudding, jam roly poly, sponge flan, upside-down pudding

9R Other cereal-based puddings includes trifle, fruit fritters, pancakes, crumble, bread pudding, cheesecakes, tiramisu, rum baba, Christmas pudding

<b>10</b>	<b>Whole milk</b>	
10R	Whole milk	all types of cow's milk including pasteurised, UHT, sterilised, Channel Island
<b>11</b>	<b>Semi-skimmed milk</b>	
11R	Semi-skimmed milk	all types of cow's milk including pasteurised, UHT, sterilised, canned, milk with added vitamins
<b>12</b>	<b>Skimmed milk</b>	
12R	Skimmed milk	all types of cow's milk including pasteurised, UHT, sterilised, canned, milk with added vitamins, Vital, Calcia
<b>13</b>	<b>Other milk and cream</b>	
13A	Infant formula <sup>2</sup>	
13B	Cream	all types, including imitation cream, aerosol, Dream Topping, Tip Top, creme fraiche
13R	Other milk	includes soya alternative to milk, goats, sheeps, evaporated, condensed, dried milk, milk shake, coffee whitener, buttermilk, flavoured milk drink
<b>14</b>	<b>Cheese</b>	
14A	Cottage cheese	includes diet and flavoured
14R	Other cheese	all types, including hard, soft, cream cheese, processed, reduced fat cheeses, vegetarian cheese, cheese spread. (Not fromage frais or Quark)
<b>15</b>	<b>Yogurt, fromage frais and other dairy desserts</b>	
15A	Fromage frais	includes fromage frais mousse, Quark
15B	Yogurt	all types including soya, goats, sheeps, yogurt mousse, yogurt drink, frozen yogurt, custard style yogurt, Greek yogurt

15R Other dairy desserts includes chocolate and fruit cream desserts, mousse, milk jelly, junket, egg custard, buttermilk desserts, fruit fools, creme caramel

**53 Ice Cream**

53R Ice cream all types, including non-dairy, choc ices, ice cream desserts, ice cream containing lollies, milk ice lollies, low fat/low calorie ice cream

**Food Type: Milk and milk products (Groups 10-15 & 53)**

**16 Eggs and egg dishes**

16A Eggs includes boiled, fried, scrambled, poached, dried, omelettes (sweet and savoury)

16B Egg dishes includes quiches, flans, souffles, scotch eggs, eggly bread, apple snow, meringue, pavlova, curried eggs

**Food Type: Eggs and Egg dishes (Group 16)**

**17 Butter<sup>3</sup>**

17R Butter salted and unsalted, butter ghee, spreadable butter

**18 Polyunsaturated margarine and oils<sup>3</sup>**

18A Polyunsaturated margarine margarine claiming to be high in polyunsaturated fatty acids

18B Polyunsaturated oils includes corn oil, sunflower oil, solid sunflower oil

**19 Low fat spread<sup>3</sup>**

19A Low fat spread polyunsaturated spreads containing 40% or less fat, claiming to be high in polyunsaturated fatty acids

19R Other low fat spread spreads containing 40% or less fat, not claiming to be high in polyunsaturated fatty acids

**20 Margarine and other cooking fats and oils not polyunsaturated<sup>3</sup>**

- |     |  |   |
|-----|--|---|
| 20A | Block margarine                                  | all hard margarine  |
| 20B | Soft margarine not polyunsaturated               | tub margarine not claiming to be high in polyunsaturated fatty acids                                |
| 20C | Other cooking fats and oils, not polyunsaturated | includes blended vegetable oil, suet, lard, compound cooking fat, dripping, olive oil, rapeseed oil |

**21 Reduced fat spread<sup>3</sup>**

- |     |                                     |  |
|-----|-------------------------------------|--|
| 21A | Reduced fat spread, polyunsaturated | spreads containing more than 40% and less than 80% fat, claiming to be high in polyunsaturated fatty acids   |
| 21B | Other reduced fat spread            | spreads containing more than 40% and less than 80% fat, not claiming to be high in polyunsaturated fatty acids; includes spreads made with olive oil, rapeseed oil or fish oil |

**Food Type: Fat spreads (Groups 17-21)**

**22 Bacon and ham**

- |     |               |  |
|-----|---------------|--|
| 22R | Bacon and ham | including bacon and gammon joints, steaks, chops and rashers; all types of ham, pork shoulder, bacon and cheese grills |
|-----|---------------|--|

**23 Beef, veal and dishes**

- |     |                       |   |
|-----|-----------------------|---|
| 23R | Beef, veal and dishes | includes beef and veal joints, steaks, minced beef, stewing steak, beef stews, casseroles, meat balls, lasagne, chilli con carne, beef curry, bolognese sauce, shepherds pie, canned beef |
|-----|-----------------------|---|

**24 Lamb and dishes**

- |     |                 |  |
|-----|-----------------|--|
| 24R | Lamb and dishes | includes lamb joints, chops, cutlets, fillets, lamb curries, Irish stew, lamb casseroles and stews |
|-----|-----------------|--|

**25 Pork and dishes**

- |     |                 |   |
|-----|-----------------|---|
| 25R | Pork and dishes | includes joints, chops, steaks, belly rashers, pork stews and casseroles, sweet and sour pork, spare ribs, roast roll |
|-----|-----------------|---|

## **26 Coated chicken and turkey**

26R Coated chicken and turkey chicken and turkey pieces coated in egg and crumb; drumsticks, nuggets, fingers, burgers etc. Includes Kentucky Fried Chicken, chicken Kiev

## **27 Chicken and turkey dishes**

27R Chicken and turkey dishes includes roast chicken and turkey, barbecued, fried (no coating), curries, stews, casseroles, chow mein, tandoori, in sauce, spread, chicken/turkey roll

## **28 Liver, liver products and dishes**

28R Liver, liver products and includes all types of liver - fried, stewed, braised, dishes grilled; liver casserole, liver sausage, liver pate

## **29 Burgers and kebabs**

29R Burgers and kebabs includes beefburgers, hamburgers, cheeseburgers, (with or without roll) doner/shish/kofte kebabs (with or without pitta bread and salad), grillsteaks, steaklets

## **30 Sausages**

30R Sausages includes beef, pork, turkey sausages, polony, sausage in batter, saveloy, frankfurters, sausage dishes

## **31 Meat pies and pastries**

31R Meat pies and pastries any type of meat; includes chicken/turkey pies, vol-au-vents, beef pies, steak and kidney pudding, pork pies, veal and ham pie, pasties, sausage roll, meat samosas, pancake rolls

## **32 Other meat and meat products**

32R Other meat and meat products includes game (e.g. venison, grouse, rabbit, pheasant), duck, goose, all offal (except liver), faggots, black pudding, haggis, haslet, me at paste, tongue, luncheon meats, corned beef, salami, pepperami, meat loaf

## **Food Type: Meat and meat products (Groups 22-32)**

### **33 White fish coated and/or fried including fish fingers**

33R White fish coated and/or fried including fish fingers cod, haddock, plaice, etc. fried without coating, or coated in egg and crumb, batter or flour and fried, grilled or baked. Includes fish fingers and fish cakes - fried and grilled, fried cartilaginous fish, scampi, filet-o-fish, cod roe fried, prawn balls, Fish Feasts, fish pancakes

### **34 Other white fish, shellfish and fish dishes**

34A Other white fish and fish dishes cod, haddock, plaice etc. poached, steamed, baked, grilled, smoked, dried; includes curried fish, fish in sauce, fish pie, kedgeriee

34B Shellfish all types including mussels, prawns, crabs, shellfish dishes

### **35 Oily fish**

35R Oily fish includes herrings, kippers, mackerel, sprats, eels, herrings roe (baked, fried, grilled), salmon, tuna, sardines, trout, taramasalata, mackerel pate, fish paste

## **Food Type: Fish and fish dishes (Groups 33-35)**

### **36 Salad and other raw vegetables**

36A Carrots raw

36B Salad and other vegetables (raw) all types of raw vegetables, including coleslaw, fresh herbs. Not salads made with cooked vegetables or potato salad

36C Tomatoes (raw)

### **37 Vegetables (not raw)**

37A Peas (not raw) includes canned, dried, mushy, frozen, mange-tout, pease pudding canned

37B Green beans (not raw) includes French, runner, green beans; fresh, canned, frozen



37C	Baked beans	canned baked beans in sauce. Includes baked beans with additions e.g. sausages, burgers, pasta
37D	Leafy green vegetables (not raw)	includes broccoli, spinach, cabbage (all types), brussels sprouts; fresh and frozen
37E	Carrots (not raw)	includes fresh, frozen, canned
37F	Tomatoes (not raw)	includes fried, grilled, canned, sundried tomatoes
37G	Vegetable dishes (not raw)	includes curries, pulse dishes, casseroles and stews, pies, vegetable lasagne, cauliflower cheese, vegieburgers, bubble and squeak, vegetable samosas, pancake rolls, ratatouille, vegetable fingers etc.
37R	Other vegetables (not raw)	includes lentils, dried beans and pulses, mushrooms, onion, aubergine, parsnips, sweetcorn, peppers, leeks, courgettes, cauliflower, mixed vegetables, TVP/soya mince, quorn, tofu

### **38 Chips, fried and roast potatoes and potato products**

38A	Chips	fresh and frozen, including oven and microwave, French fries
38B	Fried or roast potatoes and fried potato products	roast potato, fried sliced potato with or without batter; <u>fried</u> waffles, croquettes, crunchies, Alphabites, fritters, hash browns
38R	Potato products <u>not fried</u>	croquettes, waffles, fritters, hash browns, Alphabites, Ketchips, grilled or oven baked

### **39 Other potatoes, potato salads and dishes**

39R	Other potatoes, potato salads and dishes	includes boiled, mashed, baked (with or without fat), canned, potato salad, instant potato, potato based curries, cheese and potato pie
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### **42 Crisps and savoury snacks**

42R	Crisps and savoury snacks	includes all potato and cereal based savoury snacks, popcorn (not sweet), Twiglets
-----	---------------------------	--

**Food Type: Vegetables, potatoes & savoury snacks (Groups 36-39, 42)**

**40 Fruit**

- |     |                             |   |
|-----|-----------------------------|---|
| 40A | Apples and pears not canned | includes raw, baked, stewed (with or without sugar), dried, apple sauce                             |
| 40B | Citrus fruit not canned     | includes oranges, grapefruit, limes, tangerines, ortaniques etc.                                    |
| 40C | Bananas                     | includes baked bananas, banana chips  |
| 40D | Canned fruit in juice       | Includes canned in water  |
| 40E | Canned fruit in syrup       |   |
| 40R | Other fruit, not canned     | includes plums, grapes, apricots (raw and stewed) etc. fruit pie fillings, dried fruit, fruit salad |

**56 Nuts and Seeds**

- |     |                |   |
|-----|----------------|---|
| 56R | Nuts and seeds | includes fruit and nut mixes, salted peanuts, peanut butter, tahini, Bombay mix |
|-----|----------------|---|

**Food Type: Fruit and nuts (Group 40 & 56)**

**41 Sugars, preserves and sweet spreads**

- |     |                                 |   |
|-----|---------------------------------|---|
| 41A | Sugar                           | all types, including golden syrup, fructose   |
| 41B | Preserves                       | includes jam, fruit spreads, marmalade, honey, lemon curd   |
| 41R | Sweet spreads, fillings, icings | includes ice cream topping sauce, chocolate spread, mincemeat, glace cherries, mixed peel, icing, brandy/rum butter, marzipan |

**43 Sugar confectionery**

- |     |                     |   |
|-----|---------------------|---|
| 43R | Sugar confectionery | includes boiled sweets, gums, pastilles, fudge, chews, mints, rock, liquorice, toffees, chewing gum, sweet popcorn, ice lollies (without ice cream) |
|-----|---------------------|---|

**44 Chocolate confectionery**

44R Chocolate confectionery includes chocolate bars, filled bars, assortments

**Food type: Sugar, preserves and confectionery (Group 41, 43, 44)**

**45 Fruit juice**

45R Fruit juice includes 100% single or mixed fruit juices, vegetable juices, canned, bottled, cartons; carbonated, still, freshly squeezed

**57 Soft drinks, not low calorie**

57A Concentrated soft drinks, not low calorie<sup>4</sup> all types including squashes and cordials

57B Carbonated soft drinks, not low calorie all types, including tonic water. Not carbonated mineral water; not alco-pops

57C Ready to drink soft drinks, not low calorie all types of still soft drinks, not carbonated

**58 Soft drinks, low calorie**

58A Concentrated soft drinks, low calorie<sup>4</sup> all low calorie, no added sugar, sugar free types

58B Carbonated soft drinks, low calorie all low calorie, no added sugar, sugar free types, including slimline tonic water. Not carbonated mineral water

58C Ready to drink soft drinks, types. Not carbonated all low calorie, no added sugar, sugar free low calorie

**47 Spirits and liqueurs**

47A Liqueurs includes cream liqueurs, Pernod, Southern Comfort, Tia Maria, Cherry Brandy

47B Spirits 70% proof spirits - brandy, gin, rum, vodka, whisky

**48 Wine**

- 48A Wine white, red, sparkling, rose
- 48B Fortified wine port, sherry, champagne, vermouth
- 48C Low alcohol and alcohol free wine includes fruit juice and wine drinks

**49 Beer, lager, cider and perry**

- 49A Beers and lagers premium and non premium, stout, strong ale (bottled, draft and canned)
- 49B Low alcohol and alcohol free lager and beer includes shandy
- 49C Cider and perry includes Babycham
- 49D Low alcohol and alcohol free cider and perry
- 49E Alco-pops includes alcoholic lemonade

**51 Tea, coffee and water**

- 51A Coffee (made up) includes instant and leaf bean, decaffeinated, vending machine with whitener, coffee essence
- 51B Tea (made up) infusion, instant, decaffeinated, vending machine with whitener
- 51C Herbal tea (made up) includes fruit teas
- 51D Bottled water includes carbonated and still, herbal tonics, (not sweetened drinks or tonic water)
- 51R Tap water includes tap water as a drink or used as a diluent for powdered beverages only. Includes filtered tap water. Not water as a diluent for concentrated soft drinks, instant coffee or instant tea

**Food type: Total beverages<sup>5</sup> (Group 45, 47-49, 51, 57-58)**

**50 Miscellaneous**

- |     |  |   |
|-----|--|---|
| 50A | Beverages (dry weight) <sup>6</sup>          | includes drinking chocolate, cocoa, Ovaltine, Horlicks, malted drinks etc.  |
| 50B | Soups  | includes homemade, dried, condensed, cartons, canned  |
| 50R | Savoury sauces, pickles, gravies, condiments | includes white sauces, cook in sauces, sauce mixes, tomato ketchup, pickles, chutney, stuffing, gravy, mayonnaise, salad cream, dried herbs, spices |

**52 Commercial toddlers foods and drinks**

- |     |   |   |
|-----|---|---|
| 52A | Commercial toddlers drinks <sup>2</sup> | includes powdered, concentrated and ready-to-drink beverages specifically manufactured for young children |
| 52R | Commercial toddlers foods               | includes instant and ready-to-eat foods specifically manufactured for young children                      |

**Food type: Miscellaneous (Groups 50 & 52)**

**54 Dietary supplements**

- |     |                                    |  |
|-----|------------------------------------|--|
| 54A | Tablets and capsules               | vitamin and mineral tablets and capsules; includes cod liver oil and other oil-based capsules  |
| 54B | Oils and syrups                    | includes cod liver oil etc (not capsules), malt extract, multivitamin syrups, iron syrups and tonics   |
| 54C | Drops and powders                  | includes cold relief powders with vitamin C, multivitamin drops  |
| 54R | Nutritionally complete supplements | liquid or powdered supplement drinks containing protein/fat/carbohydrate plus vitamins/minerals. Includes Complan, Build Up, Fortisip, Ensure, Provide, Fresubin |

## 55 Artificial sweeteners

55R Artificial sweeteners tablet, includes granulated table top sweeteners, liquid or mini cube sweeteners

### Notes

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<sup>1</sup> There have been some changes to the structure of the food groups since the last NDNS of people aged 65 years and over. The major changes are as follows:

- New food groups have been created for soft drinks, not low calorie (57) and soft drinks, low calorie (58). New subsidiary groups have been created within these food groups for carbonated, concentrated and ready to drink soft drinks. These new food groups supersede old group 46 - soft drinks.
- A new subsidiary group has been created for alco-pops such as alcoholic lemonade.

<sup>2</sup> Infant formula (13A) and commercial toddlers drinks (52A) were not consumed in this survey, and therefore do not appear in the food consumption tables provided in Chapter 4.

<sup>3</sup> Fats and oils used in cooking are reported with the food they are cooked.

<sup>4</sup> Concentrated soft drinks reported as made up.

<sup>5</sup> Food type 'beverages' does not include powdered beverages (subsidiary group 50A).

<sup>6</sup> Subsidiary group 50A covers only the dry weight of the powdered beverage. The water or milk used to make up the beverage is reported elsewhere.

## Appendix H

### Protocols for making anthropometric measurements

**Appendix H    Protocols for making the physical measurements**

BLOOD PRESSURE AND HEART RATE READINGS ..... 2

THE ANTHROPOMETRIC MEASUREMENTS - HEIGHT, WEIGHT, MID UPPER ARM  
CIRCUMFERENCE, WAIST AND HIP CIRCUMFERENCE..... 7

    HEIGHT ..... 8

    WEIGHT ..... 11

    MID UPPER ARM CIRCUMFERENCE - MUAC..... 13

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## BLOOD PRESSURE AND HEART RATE READINGS

### 1 Purpose

High blood pressure is a known important risk factor in adults for cardiovascular disease. We are collecting information on blood pressure readings in young people, principally to provide information on the range of readings in 'healthy' young people.

### 2 Eligibility and consents

All young people in the survey are eligible to have their blood pressure monitored provided the following consents have been obtained:

- consent to inform the young person's GP of their participation in the survey;
- consent to report the blood pressure readings to the young person's GP.

Young people who are not registered with a GP cannot have their blood pressure measured.

### 3 Timing

The blood pressure readings can be taken at any time during the survey; we recommend that they are taken at one of the checking calls you make during the 7-day dietary recording period.

We are NOT standardising the time of day when blood pressure is measured, but it is important that the young person should not have eaten or drunk anything (or smoked) for at least 30 minutes prior to the measurements being taken. It is also desirable that they have been relatively quiet for about 10-15 minutes prior to the measurement - watching television or listening to music, not running around or playing vigorous games. This will therefore need to be explained at the previous visit and the timing of your appointment will need to take these requirements into account.

### 4 Explaining the procedure

As well as explaining the purpose of the blood pressure measurement - described above - it is important that you briefly outline the procedure to the young person because if they are anxious about what will happen, this may increase their blood pressure. The points to cover are described below (see **Protocol**).

### 5 The equipment

- DINAMAP 8100 blood pressure monitor
- Blue pneumatic hose with connector fittings
- Small adult cuff (17-25 cm)
- Standard adult cuff (23-33 cm)
- Large adult cuff (31-40 cm)
- Child size cuff ( 10-19 cm)
- Power cord fitted with 13 amp plug
- Operation Manual

The DINAMAP 8100 blood pressure monitor measures systolic blood pressure, diastolic blood pressure, mean arterial pressure (MAP) and pulse rate automatically at pre-selected time intervals. For this survey three readings are collected at one minute intervals.

When the monitor is turned on, eights are shown momentarily in the four digital displays ('888') and all indicators flash as a check for the operation of all LEDs. If any of the displays does not show 3 eights when the monitor is turned on, contact HQ at once.

The appropriate cuff (*see below*) should be connected via the blue pneumatic hose to the two cuff connectors at the bottom of the display. It is important to ensure these screw type connectors are properly connected to avoid any air leak. However, do not over tighten. The pneumatic seal is not made by tightening the connector.

## 6 The protocol

It is essential that all interviewers measure blood pressure in the same way otherwise it will be very difficult to compare the results. This protocol must therefore be followed every time you take a blood pressure measurement.

1. Ask the young person to **remove any jumper, cardigan, jacket, etc**. If he/she is wearing a sleeve this should be rolled up, but it should not restrict the circulation of blood in the arm. If this is likely, ask the young person if they would mind slipping their arm out from the sleeve while you take the measurement.
2. **The young person should be seated relaxed with feet flat on the floor for five minutes before measurements begin.** For the youngest children whose feet may not reach the ground, you may have to ask if there is a stool or box that they can rest their feet on.

This is a good time to **explain the procedure:**

the cuff is going to inflate three times and the young person will feel some pressure on the arm while this occurs;

the young person should not be eating or drinking (or smoking) during this time.

The young person ideally will not have eaten, drunk - or smoked in the previous 30 minutes.

3. The young person should be sitting in a comfortable chair with the right arm resting on any suitable support to bring the antecubital fossa (elbow) to approximately heart level.
4. Choose the correct cuff size (acceptable zone is marked on cuff) and place it on the right upper arm. If you have already measured their mid upper-arm circumference then you will know which cuff size is likely to be required.

Use the left arm only if it is impossible to use the right, e.g. right arm is in cast or amputated. If you do not use the right arm, record this on the schedule. The lower edge of the cuff should be about 2 cm above the elbow crease and the arrow placed over the brachial artery (just medial to the biceps tendon). Do not put the cuff on too tightly or bruising may occur upon inflation, nor too loosely as an inaccurate measurement will result. The cuff should be tight enough to admit two fingers between cuff and arm at both the top and the bottom edges of the cuff.

5.
  - a. Switch the monitor 'ON'.
  - b. Press the SILENCE button until the yellow triangle above it lights up.
  - c. Press the AUTO/MANUAL button until the green triangle above it lights up. The cuff will now start to inflate and take the first measurement.

d. Whilst the first measurement is being taken, press cycle SET button until the number 1 lights up in the minutes box. Blood pressure will then be recorded at one minute intervals thereafter. After each interval record the reading on the schedule (see below).

e. After the three measurements have been recorded, switch the monitor 'OFF' and remove the cuff.

If it becomes necessary to stop cuff inflation at any time, simply press the red CANCEL button or the power OFF button and start again.

## **7 Error reading 844**

This is a common error reading and is indicated by a flashing '844' in the PULSE display. The error reading is displayed if time taken by the monitor to take the measurement exceeds 120 seconds, which is usually caused by excessive patient movement and/or erratic pulse rate. Try another measurement ensuring the young person sits still. If it is still not possible to determine the young person's blood pressure abandon the procedure and record this on the schedule.

The monitor can display a number of other error readings. Fortunately these do not occur frequently. However, if necessary, you can find an explanation of all possible error readings in the manual on pages 33 to 35.

## **8 Difficulties in wrapping the cuff :**

You may experience problems in fitting a cuff as described above if the young person has a obese upper arm, or the upper arm is conical - the sides are not parallel.

### Obese arms:

With an obese upper arm you might find that you have to use a large circumference cuff, adult size or large adult. As the circumference of the cuff increases so does the depth, and you may find that while the circumference wraps correctly, the depth of the cuff is too great for the length of the upper arm. In these circumstances you should continue to use the larger size cuff and make notes.

### Conical arms:

Here you will find that you can correctly fit the lower circumference of the cuff around the arm, but that the upper circumference of the cuff will be loose. There is little that can be done about this, but it should be noted on the Measurements Schedule.

## 9 Recording

### Documents required:

- Measurement schedule (M1) Part A
- Young person's record card (M2 and M3)
- Consents summary card (Z7)
- Blood pressure consent form (Z3)

Information about the blood pressure measurement should be recorded at the time the measurements are taken, on the paper Measurements Schedule, and subsequently transferred into the lap top program before transmitting the completed case.

The Measurements Schedule when completed should be returned to ONS with other documents for the serial number.

Each young person taking part in the survey should be given a Young Person's Record Card completed by the interviewer with all their measurements.

- Record card M2 is for young people aged 11 years and over
- Record card M3 is for young people aged under 11 years

You also need to copy the blood pressure measurements onto the blood pressure consent forms. The top copy of this form should be sent together with the completed blood consent form, immediately the outcome of asking for consent to take a blood sample is known to the Dunn Nutrition Unit (DNU) in the white pre-addressed, pre-paid envelope (*see Appendix B*).

Finally indicate on the consents summary card (Z7) that you have taken the blood pressure measurements (or have not, as appropriate).

### Recording information about blood pressure on the Measurements Schedule M1:

**A1** Ring the appropriate codes to show which consents have been obtained. Note that if the young person is not registered with a GP then each part should be coded 2 'No'; blood pressure cannot be taken, and there is nothing more to complete in this section of the Measurements Schedule.

Only if all three parts are coded 1 'Yes' can the measurements be taken.

**A2** As explained above (ideally) the young person should not have eaten or drunk anything (or smoked) in the previous 30 minutes because this could affect the blood pressure measurements. However, some young people may have forgotten or ignored the request.

At the beginning of your visit, before you start measuring blood pressure you should therefore check whether the young person has eaten or drunk anything in the previous 30 minutes. If you know that they are a smoker, and can do so without breaching confidentiality, then please also check this, and make a note on the schedule if they have had a cigarette in the last 30 minutes.

**A3 and 4** Record the date and time of the first measurement taken on the schedule.

- A5** Record the blood pressure readings in the boxes on the schedule. The layout of the boxes on the schedule is comparable to that on the DINAMAP machines.
- Make sure that you copy the correct readings into the correct boxes; do not write the systolic reading in the diastolic boxes - or *vice versa*.
- Irrespective of their behaviour in the 30 minutes before you take their blood pressure, the young person must not eat or drink (or smoke) while the measurements are being taken. In the unlikely event of them wanting to do so, you should try to persuade them to stop. If you are unable to stop them then, as a last resort, you should continue with the measurement but record details of their behaviour at A9 code 4.
- A6** Check the three systolic readings:
- if they are all equal to or above 160 mmHg then ring code 1. You will then need to report these readings to the Survey Doctor and to the young person's GP as soon as possible.
- Check all three diastolic readings:
- if they are all equal to or above 100 mmHg then ring code 1. You will then need to report these readings to the Survey Doctor and to the young person's GP as soon as possible.
- The instructions to interviewers on reporting high blood pressure readings, BP1, and the letter for GPs reporting a high blood pressure reading, BP2, are reproduced at the end of this appendix.***
- A7** Record which size cuff was used.
- A8** Were there any difficulties in wrapping the cuff? If so, please ring the code to indicate what difficulties you had.
- A9** Different types of problems could occur while measuring blood pressure. The most common difficulties are listed on the schedule. There are two possible causes for the DINAMAP 8100 to show a flashing '844' in the pulse display. Either the young person has an erratic pulse or he/she moved excessively while the measurements were being taken. Repeat the measurements ensuring that the young person is sitting still. If '844' still shows ring code 2 at A9(a).
- If the young person has eaten, drunk (or smoked) while the measurements were being taken, ring code 4 and give full details, as explained above.
- A10** This question applies only if all the necessary consents to take blood pressure were obtained, but the measurements were not made.



BP1

**THESE INSTRUCTIONS ARE TO BE KEPT IN THE CASE WITH THE DINAMAP AT ALL TIMES**

### **Informing young people of their blood pressure measurements**

You may be asked by the young person what their blood pressure measurements are. In any case, you should write down the three readings for the systolic and diastolic pressures for them on the card provided - M2/M3.

You will probably then be expected to explain or comment on the readings. It is very important that you avoid giving any interpretation or advice on the measurements. Because you have recorded the blood pressure you may be regarded by the young person or their parent as a medical professional; however you do not have any medical training or qualifications and therefore must not offer advice. You should explain this to the young person and their parent and suggest that their GP is the best person to help them.

### **Reporting blood pressure results**

The measurements should be copied onto

- the paper Measurement Schedule (M1) - and subsequently entered in the lap top program
- the Blood Pressure Consent Form (Z3) - copy immediately sent to the Dunn
- the young person's record of their measurements (M2 or M3)

There may be situations where you need to take action because the young person's blood pressure is sufficiently raised that their GP needs to be informed as soon as possible. These situations are extremely rare, but you must know how to deal with them hence you should always have this document with you when you make the measurements.

### **Action on your part is required as follows**

If all three **systolic** readings are  
**equal to or above 160mm**                      **and/or**

If all three **diastolic** readings are  
**equal to or above 100mm**

**These ranges are the same for all ages.**

**For instruction on reporting raised blood pressures see over page ®**

## **Reporting raised blood pressures**

In these circumstances you should:

- Contact the young person's GP surgery or health centre
- Contact the Survey Doctor.

Contacting the GP surgery or health centre:

You should do this either by phone, or in person, as soon as possible. You have a record of the GP's name and address and telephone number on the GP participation consent form. If the young person did not know their GP's telephone number then you will have to get it from a local phone book or Directory Enquiries.

NOTE: if the surgery is closed, wait until the next day - it is not necessary to leave a message on an answer phone or with a deputising service.

You have been given a form (B2) with a standard wording that you can use when you phone the surgery, or you can complete the form, put it in an envelope addressed to the GP, and drop it into the surgery. You should report all three systolic and diastolic readings; MAP (mean arterial pressure) and pulse readings should not be reported.

NOTE: you do not have to insist on speaking to or seeing the GP - it is acceptable to leave the information with the receptionist.

If the surgery has any questions then they should be referred to the Survey Doctor - your responsibility is fully discharged once you have taken the readings and passed on the information.

Contacting the Survey Doctor

The Survey Doctor will ask you for the following information:

- details of the young person - full name, serial number, date of birth and sex
- their BP readings
- their height and weight
- GP's name, address and telephone number.

If there were any unusual circumstances relating to the blood pressure measurement - for example, you could not get the cuff to wrap around the arm properly, the young person's arm was too large for the cuff, but the next size cuff was too deep, then you should also report this to the Survey Doctor.

Please make a note in your notebook of the time you phone or call at the surgery and the time you call the Survey Doctor.



**NATIONAL DIET AND NUTRITION SURVEY OF YOUNG PEOPLE AGED 4 TO 18 YEARS**

**IN CONFIDENCE**

As you will be aware, your patient..... is taking part in the National Diet and Nutrition Survey of young people aged 4 to 18 years. As part of the survey, consent was given to measure his/her blood pressure and to inform you, as the GP, of the result.

When measured today/yesterday, the blood pressure readings were outside the normal range for a young person of this age and were recorded as given below.

Should you have any queries or wish to discuss the situation further, please contact the Survey Doctor, *name*, on *telephone number*. Please leave your number and the Survey Doctor will call you back.

**BP readings**

*1st reading*

--	--	--

Systolic (mmHg)

--	--	--

Diastolic (mmHg)

---

*2nd reading*

--	--	--

Systolic (mmHg)

--	--	--

Diastolic (mmHg)

---

*3rd reading*

--	--	--

Systolic (mmHg)

--	--	--

Diastolic (mmHg)

**BP2**



## **THE ANTHROPOMETRIC MEASUREMENTS - HEIGHT, WEIGHT, MID UPPER ARM CIRCUMFERENCE, WAIST AND HIP CIRCUMFERENCE**

### **Purpose**

Obviously what young people eat affects their weight, so we are interested in the weight of young people. By itself though, weight is of little use because taller young people will probably weigh more. Hence we need weight in relation to size - not just height, but bone size and the amount of muscle and fat and its distribution. The circumference measurements will give us some information on body and bone size and growth; the waist to hip ratio will tell us about the distribution of fat in the body.

It is important that you practice these measurement techniques on any young people among your family or friends as the more practice you get before going into the field the better your technique will be.

We have produced a purpose leaflet (L3) which explains why the measurements are being taken. This can be left with the young person at whatever point you feel is most appropriate.

The anthropometric measurements can be taken at any visit. We suggest you take the weight measurement first as generally this is the measurement for which it is easiest to gain co-operation from the young person. Height is the most difficult in the younger age groups, so try taking this measurement at a later call, when you have built up a rapport with the young person.

As many of the measurements require the young person to be partially undressed (and hair not to be plaited etc), you should let the young person know when you intend taking them so they can be prepared. All measurements should be recorded on the Measurements Schedule M1 at the time they are taken, and subsequently entered into the lap top program. They should also be added to the Young Person's Record Card - M2 or M3, depending on their age.

Each measurement needs to be made twice at the same visit. However, if you are unhappy with any measurement then you should repeat it until you are satisfied that it has been done correctly. You can repeat the measurements at a subsequent visit.

The purpose of taking the measurements twice is to improve the accuracy by taking an average of the two readings. For waist and hip circumferences, the difficulty of taking accurate and consistent measurements is widely acknowledged. Methodological work has shown that there is significantly more variation on these measurements than on measurements such as height or weight. However, the best way of minimising the error in any measurement is to give careful training in the measurement procedure and then to take the measurements twice and use the average of the two readings as the best estimate of the 'true' value. You may like to mention that we have done this on other surveys (for example the Health Survey and at the feasibility stage for this survey) and found that the averages had less variation and error than if we used the single readings.

Please record the date on which the successful measurements were made, and note on the paper record any problems with the "successful" attempt. Please also record on the Measurements Schedule if you think a recorded measurement is inaccurate and the reasons.

The anthropometric measurements being taken are as follows: standing height, weight, mid upper-arm circumference and waist and hip circumferences. If any measurement is not taken you should ring the appropriate code to explain the reasons.

## **HEIGHT**

**1 Equipment:** the Leicester Height Measure  
Frankfort Plane card

**2 Eligibility:** applies to all young people.

### **3 Using the Leicester Height Measure**

#### Construction

The Measure consists of a base plate, four measuring rods, two white stability bars and a blue head plate. The head plate is constructed so that it moves up and down the vertical measuring rods. A frame on the head plate, with black arrows, indicates the point at which measurement should be read from the vertical rods.

Each measuring rod is marked in metric (centimetres and millimetres) and imperial (feet and inches) units; recording is made in metric. At the ends of each rod are pairs of symbols - stars, squares and circles. The rods slide together, and by matching the symbols at the top of one rod with those at the bottom of the next you will ensure that the rods are put together in the correct sequence.

Notice that for younger children all four rods will probably not be needed, only slot together as many as you need to measure the young person.

Place the base plate on a flat, level surface, preferably not carpeted.

Push the first rod into the post on the base plate, ensuring that it is pushed in as far as possible. If this first rod is not pushed fully into the base plate then the measurement of height will be inaccurate. Slide the second measuring rod fully onto the first rod, matching the symbols, and ensuring that it is fully pushed into the first rod.

Slide one of the white stability bars over the top of the second rod, with the longer edge to the back of the rod. When the fully constructed Measure is placed against a wall or door, and the young person stands on the base plate, if this stability bar is against the wall or door it stops the rods flexing.

Slide the third measuring rod fully onto the second rod, matching the symbols, and ensuring that it is fully pushed into the second rod.

Slide the round blue head plate over the third rod, with the rounded head plate facing forward and the flat surface of the plate facing downwards.

If needed, slide the fourth and final measuring rod onto the third rod, above the head plate, matching the symbols and ensuring that it is fully pushed into the lower rod.

Slide the second white stability bar over the top measuring rod - third or fourth depending on height required - above the head plate. Position as for the first stability bar, with the longer edge towards the back and space the two stability bars along the vertical length of the now fully constructed measure.

Position the constructed Measure against a wall, door or other vertical surface, such that when the young person stands on it, the back of the stability bars will touch the wall, door, etc.

To take the Measure apart reverse the above procedure. Take care not to bend the measuring rods. To remove the bottom rod easily from the base plate, stand on the base plate and pull upwards. Store the parts of the Measure securely in the case supplied.

PLEASE TAKE CARE WITH THE MEASURE. It is considerably more robust than previous equipment we have used but will not tolerate misuse; do not force the parts into each other, they fit quite easily, and do not bend the rods when taking the Measure apart after use. If any part should get damaged please let the Field Office know immediately, stating exactly which component is damaged and needs replacing. As the Measure is of modular construction, replacement parts are available for the separate sections. PLEASE ALSO TAKE CARE WITH THE CARRY CASE AND CARDBOARD SLEEVE. These are needed for safely despatching the equipment to other interviewers at the end of your quota of work.

The young people will be standing on the base plate of the Measure in bare feet; to avoid the possibility of Verruca or other skin infections being passed on, it is advisable for you to wipe the base plate with a mild disinfectant solution (e.g. Dettol, dilute solution of Dettol etc) after use.

#### **4 The correct head position**

The correct head position for the measurement of standing height is known as the Frankfort plane.

Position the young person's head so that the bottom of the eye socket (top of the cheek bone) is in line with the protruding flap of firm skin on the front edge of the ear above the ear lobe, and parallel to the floor (for standing height). In medical terms so that the lower orbit is in line with the external auditory meatus. This position is very important if an accurate measure is to be obtained. Use the card provided to check that the correct 'line' has been achieved. In this position the head plate of the Height Measure should rest on the crown of the head.

For fidgety young people the assistance of the mother is vital in keeping the head in the correct position.

#### **5 Protocol**

The young person should be wearing as few clothes as possible; shoes and socks should be removed. Socks make little difference to actual height, but loose or baggy socks may disguise the fact that a young person has lifted their heels off the floor. Hairstyles which are non-permanent, such as braids or buns, should be rearranged. Ask the young person if they can avoid putting their hair in such styles on the day you call. 'Permanent' hair styles such as dreadlocks and plaits should be dealt with as suggested later in these instructions.

Raise the head plate so that it is well above the height of the young person.

The position of the young person is crucial to obtaining an accurate measurement. The simplest approach to ensure correct positioning is to start at the feet and work upwards. Stand the young person on the base plate with their back against the rod. The feet should be together and flat on the ground. The legs should be straight, as should the back. Arms should hang loosely at the side of the body. The head should be in the correct position. Gently lower the head plate until it is resting on the top of the young person's head. Check the position of the head, and then with your hands either side of the young person's jaw bone and your fingers just under their ears, firmly but gently apply traction to extend the young person to their maximum height. At the same time as you do this ask the young person to take a deep breath in, and without moving their head or lifting their heels off the ground, to stand as tall as possible.

Once you have applied 'the stretch', check that the young person's feet are still flat on the base plate and that they have maintained the Frankfort position. You can then read the measurement from the vertical rod.

To read the measurement accurately the black arrows indicating the point of measurement must be at your eye level; if necessary, ask the young person carefully to step off the measure and then move the Measure until you can read the measurement line at your eye level. For your own health and safety we are not asking you to stand on a chair, or stool to obtain this alignment. Any

interviewer who has particular difficulties because of the height of a young person, should ring the field office for advice.

Repeat the procedure to take the second measurement; you will need to reposition the head plate, and correctly position the young person before you take the second measurement.

With the youngest group of children, you will find it helpful to get their mother involved in the positioning of the young person. Actively encourage mum to get involved; you will probably find it helpful if she can hold the young person's heels flat on the base plate while you adjust the head position and apply 'the stretch'.

You may find it reassuring and helpful to demonstrate what you are going to do with the mother (or a brother or sister).

#### Dealing with 'permanent' hairstyles

You may come across young people who have 'permanent' hairstyles, such as dreadlocks or braids, which will affect the accuracy of the height measurement you take as the head plate will not rest on the crown of the young person's head but on a thickness of hair. However, such permanent hairstyles tend to be found amongst particular ethnic groups, and so for many of you they will not be a problem.

If you find that your quota has a significant number of young people with 'permanent' hairstyles you should contact the Field Office. Arrangements will then be made to train you in how to measure the thickness of the hair between the head plate and the crown of the head. If you only come across one or two young people with such hairstyles, you should take the height or length measurement in the way described and record at B3 on the Measurement Schedule M1 the type of hairstyle the young person had.

### **6 Recording the height measurement on the Measurement Schedule M1**

Record the date the measurements were made at B1.

Record the two measurements of height at B2. The measurement should be shown in centimetres, for example, entering leading zeros, e.g. 103.1 (cm) or 099.5 (cm). If you are not used to dealing with centimetres remember that 100 cm is just over 3 feet, so always check that the measurement you have recorded is correct and sensible - 995.0 cm would be over 27 feet; 099.5 cm is about 3 feet.

Indicate anything which might have affected the measurement, for example a hairstyle, at B3(a).

If you are unable to measure the young person please code the reason at B4.

Copy the height measurement onto the Young Person's Record Card, M2 or M3.

When all the measurements are complete, transfer the information from the Measurements Schedule to the lap top program.

You should also make a note of the young person's height in your notebook.

### **7 Height of 'birth' parents**

Please record at B5 and B6 the height of the young person's 'birth' mother and father, if known. You do not have to measure the parent(s) height, just ask and record it.

Note that the Schedule allows you to record this information as metres and centimetres entering leading zeros e.g. 1m 57 cm or as feet and inches e.g. 5 feet 02 inches.

## **WEIGHT**

**1 Equipment** the personal weighing scales  
'Clothing Record' - pages 19 and 20 of the Measurement Schedule M1

**2 Eligibility** applies to all young people.

### **3 The scales**

The scales are calibrated in kilos and 100 gram units. When recording the weight, the decimal point has been printed on the schedule for you.

The young person should ideally be weighed nude; as this is not possible, then as much clothing as possible, without causing embarrassment, should be removed. You should warn the young person and/or parent of this at a previous visit, asking the young person to wear light clothing such as shorts and a T-shirt for this visit.

#### To use the scales:

Insert one 9v battery into the battery compartment underneath the scale. During particularly cold weather it is advisable to keep the batteries in a warm place - or the scales will not work. Keeping the battery in your pocket will be adequate, but please ensure that it is not next to coins or keys (or it may discharge).

Turn on the scale.

If - - - appears then the maximum weight the scale can read has been exceeded. This is unlikely to occur with this age group.

If a series of digits and letters are displayed, i.e. 6AE, the battery needs replacing.

### **4 Protocol**

Place the scales on a hard, flat level surface, preferably not carpeted. If this is not available continue to take measurement but record at C4 on the Measurement Schedule.

Ask the young person to step onto the scales, with his/her heels towards the back edge; check that both feet are fully on the scales. The young person should look ahead, not downwards, and their arms should be by their sides. Ask the young person to stand perfectly still - ask the younger children to "be a statue". Weighing mother or a brother or sister will help show the young person what is required.

Having recorded the measurement, ask the young person to step off the scales; allow the scales to switch off. Switch on the scales for the second measurement and before weighing the young person stand on the scales yourself and allow the scales to register your weight In this way you will clear the memory (of the young person's weight) from the scales before re-weighing the young person. If the young person is re-weighed without this procedure being followed then the scales will automatically reproduce the previous measurement. Make the second measurement of the young person.

When you have taken the second measurement of the young person, clear the memory of this young person's weight from the scales as before, by weighing yourself This is to ensure that when you weigh the next young person in your quota the scales display his/her weight, and not the weight of the previous young person measured.

After weighing the young person, hand them the Clothing Record in the Measurement Schedule and ask them to tick all the items of clothing they were wearing while being weighed; the Record on page 19 is for girls and has female items of clothing listed; on page 20 the items of clothing are for males.

### **5 Recording the measurement of weight on the Measurement Schedule M1**

Record date weighed at C1.

Record the two weight measurements at C2, entering leading zeros e.g. 013.8.

Indicate any special circumstances which might have affected the measurement, for example whether the young person was wearing heavy clothes at C5(a).

If you are unable to weigh the young person code the reasons at C6.

Copy the first weight measurement onto the Young Person's Record Card, M2 or M3. Note that there is a chart on the back of the Measurements Schedule which converts metric measurements, kilograms, to imperial, stones and pounds. Most young people will be more familiar with the metric values.

## **MID UPPER ARM CIRCUMFERENCE - MUAC**

You will probably find it helpful to take this measurement before attempting to take the young person's blood pressure, as you will then have an idea of the size of blood pressure cuff that will be needed.

**1 Equipment** the small LASSO insertion tape in an empty film spool container  
the standard (insertion) tape with a metal buckle at one end  
the dermatological marker pen

**2 Eligibility** applies to all young people.

### **3 Protocol**

The young person must have a bare arm and shoulder for this measurement to be made accurately. This measurement **MUST** be taken very accurately as results are compared by age and small differences can make a significant difference to their interpretation.

The measurement is made in two stages. First find the length of the young person's upper arm. The young person should be standing, with their left arm across their body, with a 90° angle at the elbow. Using the standard tape, measure the upper arm length, that is the distance from the top of the left shoulder to the tip of the elbow, in medical terms, from the top of the acromium to the tip of the radius. Without removing the tape, divide the length of the upper arm in half; this will be the mid-point of the upper arm. With the tape still in its original position on the arm, use the dermatological marker pen to mark the point on the young person's arm.

To measure the arm circumference the young person should now have their left arm hanging loosely at their side, just away from the body.

Thread the tapered end of the LASSO tape up through slot 1 in the tape, down through slot 2, and then up again through slot 3.

Position the LASSO tape around the circumference of the arm, centred on the mid-point you have marked. Check that the tape is passing horizontally around the arm (not sloping) and that it is in continuous contact with the skin. The tape should be under tension, but not compressing the tissues of the arm. Read the measurement from the tape at the point indicated by the words 'READ HERE'. The measurement is recorded in centimetres (add leading zeros where necessary) e.g. 18.7 (cm), 09.9 (cm). If you are not satisfied with your first attempt, repeat the complete procedure until you are.

Having made a satisfactory first measurement, repeat the procedure to obtain a second measure.

Please always keep the LASSO tape in the film spool container provided to protect it when not in use.

### **4 Recording MUAC on the Measurements Schedule M1.**

Record the date the measurements were taken at D1.

Record the two measurements in centimetres, with any leading zeros, e.g. 16.0 (cm), 13.4 (cm), 09.9 (cm) at D2.

Indicate any special circumstances which might have affected the measurement at D3.

If you are unable to measure the young person's arm the reasons should be coded at D4.

Copy the first MUAC measurement onto the Young Person's Record Card, M2 or M3.



## **MEASUREMENT OF WAIST AND HIP CIRCUMFERENCES**

Only applies to young people aged 11 years and over

### **1 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 the 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).

To calculate the waist-to-hip ratio we need to have the waist circumference and hip circumference measured twice. At HQ the average measurement of the waist circumference will then be divided by the average measurement of the hip circumference giving us the waist-to-hip ratio.

### **2 Eligibility**

Applies only to young people aged 11 years and over.

You cannot measure waist and hip circumference if the young person is chairbound or bedfast or, which is even more unlikely in this age group, has a colostomy.

If any of these apply, record this on the Measurement Schedule (E3). If you do not attempt these measurements for any other reason, please code the reason on the Schedule at E4.

### **3 Equipment**

Plastic tape calibrated in centimetres and millimetres on one side and inches on the other, with a metal buckle at one end.

To use the tape:

Pass one end up and then down through the buckle on the other end, ensuring that the metric measurements are on the outside facing surface of the tape loop that you are making.

To read from the tape:

The metric measurement is read from the furthest outside flat edge of the metal buckle.

### **4 Protocol**

#### **A Preparing the young person**

- 1 At a previous visit you should have asked the young person not to wear thick or baggy clothing, or anything tight, which might compress the waist or hips, for the visit when you make this measurement. Studies have shown that taking the measurement over light clothing does not affect the waist-to-hip ratio significantly. It is therefore important that where possible you ask the young person in advance to wear clothing which will not significantly alter the measurement, e.g. shorts and a T-shirt. As the index is a ratio - waist to hip circumference - it is important that both measurements are made over the same thickness of clothing. So, for example the

young person is wearing jeans, do not measure the waist above the jeans, on bare skin or a T-shirt; make both measurements over the same thickness of the jeans. Remove any belt from the jeans for the waist measurement.

2. If possible, without embarrassing you or the young person, ensure that the following items of clothing are removed: all outer layers of clothing, such as cardigans, jumpers or waistcoats; any tight garments such as belts, corsets, support tights or lycra body suits. Pockets should be emptied.
3. If any heavy outer garments or tight garments have not been removed and you are of the opinion that this will significantly affect the measurement of waist-to-hip ratio, record this on the schedule.
4. Ask the young person to empty their bladder, if possible, before taking the measurements.
5. The young person should be standing erect in a relaxed manner, weight evenly balanced on both feet and the feet about 25-30 cm (1 foot) apart. The arms should be hanging loosely at the sides.

B. Using the insertion tape

6. All measurements should be taken to the nearest millimetre.
7. You should kneel or sit on a chair to the side of the young person while taking both measurements. This allows you to make sure that the tape is horizontal all the way around the body.
8. Pass the tape around the body of the young person and insert the plain end of the tape up and then down through the metal buckle at the other end of the tape.
9. Hold the buckle flat against the body and flatten the end of the tape to read the measurement from the **outermost edge** of the buckle. Do not pull the tape towards you as this will lift it away from the young person's body, affecting the measurement.

C. Measuring waist circumference

10. The waist is defined as the point midway between the iliac crest (top of the hip bone) and the lower rib. The most acceptable way of locating this point is to ask the young person to bend to one side and mark, with their hand, the crease where they bend. Note that that in adults, men's waists tend to be above the top of the waist band of their trousers whereas women's waists are often under the waistband of their trousers or skirts. Bearing in mind that both measurements need to be made over the same thickness of clothing you may have to try to adjust the way the waist band on trousers, jeans and skirts are sitting in order to achieve this.
11. Ensure that the tape is horizontal. If the tape needs adjusting at the front or back then ask the young person or their parent to make the adjustment, under your directions. It is not advisable for you to be making these adjustments. Carefully allow the tape to move as the young person breathes in and out. Take the measurement at the end of a normal expiration. Record the measurement on the schedule to the nearest millimetre, with leading zeros, e.g. 089.5 (cm).
12. If you are of the opinion that clothing, posture or any other factor is significantly affecting the waist measurement, record this on the Schedule.

D. Measuring hip circumference

14. The hip circumference is defined as being the widest circumference over the buttocks and below the iliac crest (top of the hip bone). To obtain an accurate measurement you should measure the circumference at several positions and record the widest circumference.
15. Ensure that the tape is horizontal. Again, if adjustments at the front or back are required, instruct the young person or a parent; do not make the adjustments yourself. Pull the tape, allowing it to maintain its position but not to cause indentation. The young person should stand without contracting the gluteal (buttock) muscles. Record the measurement on the Schedule to the nearest millimetre, with leading zeros, e.g. 095.3 (cm)
16. If you are of the opinion that clothing is significantly affecting the hip measurement, record this on the Schedule.

**5 Recording waist and hip circumferences on the Measurement Schedule M1.**

- E1 Record the date you make the measurements.
- E2 Record the waist and hip circumferences in cm and to the nearest mm in the boxes provided on the schedule, e.g. 064.6 (cm). The decimal point has been printed on the schedule for you. Note that you must measure one waist and one hip circumference before measuring each for a second time.
- E3 and E3(a) Studies have shown that taking the measurements over light clothing does not affect the ratio significantly. However if the clothing is very baggy or very tight, or the thickness of the clothing is not the same at hip level as at waist level this could affect the ratio. Please give full details if you think this is the case. Also note anything else that could have affected the waist/hip ratio measurements, e.g. poor posture, difficulty in keeping the tape horizontal or in holding the tape flat.
- When recording special circumstances please always distinguish between factors which tend to increase or overestimate the measurement and those which tend to decrease or underestimate the measurement.
- E4 If any young person (or their parents) refuses to have their waist and hip circumferences measured, please code the reasons for refusal.
- It is possible (though unlikely) that the young person allows you to measure his/her waist and hip circumferences once but refuses the second measurements. Explain the purpose of taking the measurements twice (see above) but if they still refuse, ask them why and give full details on the schedule.

Copy the weight measurement onto the Young Person's Record Card, M2.

(Record Card M3 is for young people aged 4 to 10 years and waist and hip circumferences are not measured for this age group.)

## THE BLOOD SAMPLE

### 1 Documents

- consent form - Z4 + pre-addressed and stamped envelope
- purpose leaflet - L4
- list of blood analytes - L5
- phlebotomist availability card - T
- measurements schedule - M1

### 2 Purpose

All the surveys in the NDNS programme so far have included blood sampling, even for children aged 1½ to 4½ years. The results from the analysis of the blood sample will provide information for a range of needs:

- they will provide results which indicate the range of values for a normal healthy population; most blood analyses are carried out on samples from people who are unwell;
- they will provide information on the nutritional status of the individual which can be related to their diet; for example their haemoglobin levels as related to their intake of dietary iron;
- they will provide information on a variety of indicators which can be used to monitor the 'health' of the group; for example, changes in mean blood cholesterol levels over time in response to health education messages;
- they will allow the identification of possible 'at risk' groups; for example the characteristics of groups with low levels of a particular vitamin can be identified. Health education can then be specifically targeted to such 'at risk' groups, or remedial or preventative measures can be developed.

Having the results from both a dietary survey and the blood samples adds considerably to the value that would have been obtained from the two independent sets of data.

A good example of the value of taking blood samples in a dietary survey is the results for haemoglobin from the Toddlers' Survey. The results showed that 1 in 12 of all toddlers in the survey who provided a blood sample had haemoglobin levels which defined them as anaemic; this rose to 1 in 8 for those aged between 1½ and 2½ years. Without the survey it is possible that these children's deficiency might not have been identified at such an early stage; in every case their GP and the family were informed and they were advised to see their GP so that, if necessary, some treatment or dietary advice could be given to improve their haemoglobin level. The extent of the iron deficiency in this group was such that the Department of Health are now considering the implications of this incidence of iron deficiency anaemia in pre-school children.

The above should give you sufficient information to develop an introduction which hopefully will gain high levels of co-operation with this aspect of the survey.

### 1.1 What is being measured

Everything that is being measured in the blood sample is related to nutritional status: blood lipid (cholesterol) levels, vitamin status; iron status, etc.

It is more important to know what will NOT be measured (either now, or if there is any residual sample, in the future). The samples will not be analysed for the HIV virus, nor for evidence of any other infection. This should be made clear to the young person and their parents when explaining the purpose of the blood sample.

You should also emphasise that, apart from to themselves, ONS, their GP and the Dunn Nutrition Unit, the results will only be provided in an anonymised form, so that no one else will be able to see the results of the blood analyses with the name of the young person.

### 1.2 Outline procedure

All young people will be asked to consent to a fasting blood sample being taken. Interviewers will explain why a blood sample is being requested, and the procedure. The interviewer will also obtain all the necessary signed consents and make an appointment to call with a phlebotomist, who will attempt to take the sample. The interviewer will accompany the phlebotomist to the home. If blood is obtained, the phlebotomist will pack and despatch part of the sample to Great Ormond Street Hospital for a haematological profile analysis, and take the remainder to a local hospital where it will be prepared for freezing and storage. When all possible samples have been obtained in an area, the frozen samples will be taken by courier to the DNU laboratory in Cambridge. A portion of the sample will then be sent to Southampton University for some analyses, the remainder being analysed at the DNU. Any remaining sample after all the analyses are complete will, with consent, be stored at the DNU.

The young person and their GP will be informed of the results of the analyses by the DNU.

### 1.3 Why do we need a 'fasting' sample

Part of the blood analyses is the measurement of triglycerides - blood lipids - an important set of analyses. The measurements are much more reliable if the sample is taken after fasting.

By 'fasting' we mean that the young person should not have eaten or drunk anything for about 8 hours - overnight. It is important to know that there is no risk to the young person if they have eaten or drunk something (unlike having a general anaesthetic) it simply means that some of the results will be less reliable than they might otherwise be.

In the feasibility study nearly all young people who consented to the blood sample were able to comply with the constraints imposed by a fasting sample.

You, the interviewer, have the task of explaining our need for a 'fasting' sample, the reason it is desirable and what is required. Effectively it means that the young person must be bled between getting up in the morning and having breakfast. You have to allow time after you and the phlebotomist have arrived at the home for the parent/young person to ask any questions they may have, for any outstanding consents to be completed, for the phlebotomist to prepare his/her equipment and for the young person to be settled. You should also be aware that after the sample has been taken, the young person will need to have breakfast and then get to school or work.

If the young person/parent feels unable to comply with the request for a 'fasting' sample, or having agreed to this condition you find on arrival that the young person has had something to eat or drink, THEN IT IS STILL ACCEPTABLE TO TAKE A BLOOD SAMPLE. This must be noted on the documentation (*see later*).

## 2 Eligibility

All young people are eligible to provide a blood sample, providing the necessary consents have been obtained (see below).

## 3 Timing

The blood sample should be taken as soon as possible after the end of the 7-day dietary recording period - preferably within 10 days. If there are exceptional circumstances why this is not possible, please contact the Field Office to explain the position before making an appointment.

If a dietary record is not being kept, then the blood sample may be taken as soon as possible after the initial interview.

Blood can only be taken Monday to Thursday.

Blood cannot be taken:

- on any Friday or weekend day;
- on any day when the local hospital or processing laboratory is closed - for example on Bank or other Public Holidays;
- when the following day is a Bank or other Public Holiday.

Since a fasting sample is required - *see later* - appointments will need to be made for early in the morning, before the young person has eaten or drunk anything.

## 4 Consents required

The following are ALL required before a blood sample can be taken:

- consent to inform the young person's GP of their participation in the survey; if this is refused, or the young person is not registered with a GP then a blood sample may NOT be taken;
- signed consent from a person with legal parental responsibility for the young person and/or young person (depending on their age);
- this/these signatures must be witnessed by an independent witness - not yourself or the phlebotomist - and the witness must also sign the consent form.
- consent to inform the young person's GP of the results of the blood analyses.

We are also asking for consent to store any residual sample. If this is refused, provided ALL the above consents have been obtained, then a blood sample may still be taken.

## 5 Results

The Dunn Nutrition Unit will report all results back to the young person and, with consent, to their GP. Initially the results for haematology will be reported, with results for other analytes following. The DNU expect that the young person should receive their first results within 2-3 weeks.

## 6 Interviewer role

### Your responsibilities are:

- to inform the young person/parent as part of the introduction to the survey that we will be asking at a later stage whether they would be willing to provide a blood sample;
- at an appropriate point to give a full explanation of the purpose of the blood sample and what is involved;
- to obtain the necessary signatures on the consent forms;
- to explain that ideally we are seeking a fasting blood sample, and explain what that means and why it is preferable to a non-fasting sample;
- to arrange an appointment suitable for the young person and their family, bearing in mind the constraints imposed by the request for a fasting sample, the days when samples may not be taken and the availability of the phlebotomist;
- to liaise with the phlebotomist regarding the time for the appointment;
- to collect and take the phlebotomist to the young person's home;
- to pass the phlebotomist a copy of the signed, witnessed consent form;
- to confirm, prior to blood taking, that the young person and their parent still assent to the procedure;
- to provide the phlebotomist with the necessary standard and cryo - serial number labels for the sample;
- to record on the Measurement Schedule, M1, details of the blood taking procedure, and subsequently to enter these details into the Blaise object;
- to take the phlebotomist to the local hospital/laboratory where the blood sample will be processed prior to being stored;
- to ensure that at the end of the blood taking procedure the young person and the family are satisfied with the procedure, that any questions they may have had have been answered, that they know where to get any further information; and that good 'public relations' have been maintained.

### YOU ARE NOT RESPONSIBLE FOR

- labelling the blood samples;
- despatching or in any way handling the blood samples;
- disposing of any of the equipment used to take the blood samples;
- physically assisting in any of the blood taking procedure; obviously you may offer reassurance to the young person or the parent as necessary;
- providing or storing any of the equipment needed for blood taking.

If you are asked to do any of these please ring HQ.

## **7 The documentation**

### 7.1 The 'phlebotomist availability calendar' (T)

You have been given two copies, one for you, one for your blood taker to record details of when you are both likely to be available, contact telephone numbers, mileage/time to collect phlebotomist and get to the local hospital/laboratory. If your phlebotomist is at the briefing then these calendars should be completed while you are together; if your phlebotomist is unable to attend the briefing you should take the initiative to make contact, and set up a meeting, prior to your arranging appointments, to sort out these details.

### 7.2 Consent forms (Z4)

These come in 4 parts - top copy plus 3 carbonised sheets. Please ensure that the signatures and other information are clearly visible on all the carbonised copies.

When complete:

- the top copy should be returned to the Dunn Nutrition Unit in the white pre-paid, pre-addressed envelope;
- the first carbon should be left with the young person;
- the second carbon should be handed to the phlebotomist;
- the third and final carbon should be returned to ONS tagged to the back of the Measurement Schedule with all the other documents relating to that serial number.

### 7.3 Blood purpose leaflet (L4) and list of blood analytes (L5)

This leaflet which explains the blood procedures and the information on the analytes being measured should be left with the family after you have given a full explanation of the purpose, procedures etc.

### 7.4 Measurement Schedule M1

Details of the blood taking procedure should be recorded at Section F of this document. The information in this section is the same as the details that the phlebotomist will need to record on his/her documentation. Before leaving the phlebotomist you must ensure that you have the information necessary to complete this record.

### 7.6 Cryo-labels

These are labels which will withstand very low temperatures in a freezer. There are a set of 24 labels for each serial number. One cryo-label is used to label the spot urine sample (*see separate instructions*) and the remaining 23 cryo-labels for that serial number should be passed over to the phlebotomist.

Please note that the phlebotomist will also require some standard serial number labels for his/her documentation which you should provide from your set of labels for that case. You will therefore need to have these with you at the visit you make to the home with the phlebotomist.

The phlebotomist does not need, and should not be passed, any address labels (with serial number).



## **8 Other things you should know**

- NHS Local Research Ethics Committees (LRECs) have given their approval for the phlebotomy in their area;
- Letters have been sent to Directors of Social Services, Education, Public Health and Chief Constables in the areas informing them that the survey will be taking place in an area for which they have responsibility;
- the British Paediatric Association and the BMA are aware of the survey;
- the phlebotomists all have recent paediatric experience, and have their own insurance cover;
- each interviewer should have his/her own phlebotomist allocated to them;
- a maximum of two attempts at blood taking is allowed;
- the maximum volume of blood to be taken is prescribed; this is 10ml for children aged 4 to less than 7 years, and 15ml for those aged 7 years and over;
- the phlebotomists will use a 'butterfly' procedure to bleed the young person;
- the phlebotomist must take all waste away from the home to dispose of at the local hospital/laboratory; nothing must be left at the home;
- if at any time the young person no longer wishes to co-operate then the procedure should not be attempted, or should stop immediately, even though written consent has been obtained.
- if, after two attempts, bleeding is unsuccessful, then, even if the parent or young person requests further attempts, they cannot be made.

LRECs may have imposed special conditions for their area, for example, variation from the standard protocol regarding the maximum volume of blood to be taken from the youngest age group - 4 to 6 year olds; where this is the case separate instruction sheets will be issued;

IF YOU HAVE ANY CONCERNS ABOUT ADHERENCE TO THE BLOOD TAKING PROCEDURE, AS DESCRIBED HERE, ANY OTHER CONCERNS ABOUT THE PROTOCOL, OR ABOUT THE YOUNG PERSON'S OR FAMILY'S REACTION, YOU SHOULD RING HQ - FIELD OFFICE OR RESEARCH - AS SOON AS POSSIBLE. IT IS IMPORTANT THAT YOU ALSO MAKE FULL NOTES IN YOUR NOTEBOOK.

THESE PROCEDURES HAVE BEEN USED SUCCESSFULLY ON THE TODDLERS' SURVEY AND IN THE FEASIBILITY STUDY CARRIED OUT IN SPRING 1996.

## THE BLOOD PROTOCOL

These instructions guide you through the procedures to adopt depending on whether the young person wishes to have Emla Cream applied before the blood sample is taken.

Note:

- if the young person/parent does NOT want Emla Cream applied, then a blood sample can still be taken; Emla Cream does not have to be used in all cases;

**Please read these instructions carefully and make sure that you fully understand the protocol before starting your quota.**

There are 6 sections to these instructions; sections A to E describe the procedure depending on the option chosen. Section F deals with recording information about the blood sample in the paper documentation and in the lap top program.

In this format the instructions can be used by you as a step-by-step guide.

The sections are as follows:

### SECTION A

Applies in all cases where consent to notify the young person's GP of their participation in the survey has been given - even if consent to take a blood sample is subsequently refused

### SECTION B

Applies in cases where the young person/their parent consents to a blood sample being taken and does NOT wish to have Emla applied.

### SECTION C

Applies in cases where the young person/their parent consents to a blood sample being taken:

- wishes to have Emla Cream applied, AND
- has NO allergic reaction to anaesthetics, AND
- wishes the phlebotomist to apply the cream.

### SECTION D

Applies in cases where the young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- has NO allergic reaction to anaesthetics, AND
- wishes to apply the cream themselves.

### SECTION E

Applies in cases where the young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- HAS an allergic reaction to anaesthetics.

## **SECTION F**

Instructions on documentation and entering information into the lap top program.

## SECTION A

Applies in all cases where consent to notify the young person's GP of their participation in the survey has been given.

- 1 When giving full explanation of purpose and procedures for obtaining blood sample, before seeking consent for the sample to be taken:
  - explain that there is the option of using Emla Cream - but that a sample can be taken without using Emla;
  - give parent/young person the information sheet about Emla - **X1**;
  - answer any questions about use of Emla, advantages and disadvantages - side effects, time taken to work, etc;
  - explain that Emla cannot be used if young person has a known allergic reaction to anaesthetics (local or general);
  - explain that the phlebotomist is a person trained and skilled in taking blood, but that neither you nor the blood taker are a doctor or nurse.
- 2 Seek consent for taking blood as described in the '*Consents*' section of these Interviewer Instructions and obtain necessary consents - signed and witnessed.
- 4 If necessary consent to blood sample obtained:
  - ask if wishes to have Emla used.

IF NO: → GO TO SECTION B

IF YES, WISHES TO HAVE EMLA APPLIED:

Ask:

***Has the young person ever had a bad reaction to a local or general anaesthetic bought over the counter at a chemist, or given by a doctor, dentist or in hospital?***

IF YES, HAS HAD A BAD REACTION: → GO TO SECTION E

IF NO, NO BAD REACTION:

Note: Although it is possible for the young person or their parent to be given the Emla Cream to apply themselves, this option should NOT be offered; we would generally prefer that the Emla is always applied by the phlebotomist.

However, the 'Information about Emla cream for parents and young persons' (**X1**) does mention that the cream may be applied by themselves. If this is spontaneously requested then it is acceptable and you should follow the procedure given in SECTION D.

If the cream is to be applied by the phlebotomist go to SECTION C.

Phlebotomists have been given supplies of Emla Cream, dressings to cover the area where the cream has been applied and instructions by the DNU.

## **SUMMARY OF OPTIONS**

young person/their parent consents to a blood sample being taken:

- does NOT wish to have Emla applied:

→ GO TO SECTION B

young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- has NO allergic reaction to anaesthetics, AND
- wishes the phlebotomist to apply the cream.

→GO TO SECTION C

young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- has NO allergic reaction to anaesthetics, AND
- wishes to apply the cream themselves.

→GO TO SECTION D

young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- HAS an allergic reaction to anaesthetics.

→GO TO SECTION E

## **SECTION B**

**Applies in cases where the young person/their parent consents to a blood sample being taken and does NOT wish to have Emla applied.**

Follow basic procedure for taking a fasting blood sample, making appointment to call with phlebotomist. There are no special procedures except to remember that the phlebotomist must ask screening questions about epilepsy and blood clotting disorders before attempting to take the sample.

## SECTION C

Applies in cases where the young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- has no allergic reaction to anaesthetics, AND
- wishes the phlebotomist to apply the cream.

1 Complete the top part, Part 1, of the 'Prescription for Emla' - **X3**

- serial number label
- full name of young person
- address, including postcode
- date of birth
- interviewer signature to confirm that the young person has been asked about any known allergy to anaesthetics, and has no such allergy;
- date

2 Send the form immediately to the Survey Doctor in the envelope provided; this envelope is stamped and addressed to the Survey Doctor at her home address; do NOT send the Prescription to the Dunn.

The Survey Doctor will sign the form and post it back to you immediately; it should get back to you within 4 working days.

3 Make an appointment to call with the phlebotomist to administer the cream, and take blood.

This appointment must be made for:

- Monday to Thursday only;
- after you expect to have received the returned and signed prescription form from the Survey Doctor;
- at least 1 hour before you need to take the sample - to allow time for the Emla to take effect.

4 Visit with the phlebotomist to take blood

- the phlebotomist must ask screening questions about epilepsy and blood clotting disorders;
- you must take the prescription form, **X3**, which has been signed and returned to you by the Survey Doctor with you when you visit;
- you should detach the lower part of the form, Part 2 - where indicated; give the top half of the form, Part 1, to the young person/parent for them to keep, pass to their GP or throw away;
- give the bottom part of the form, Part 2, to the phlebotomist; check that the serial number is written in the lower part of the form, or attach a serial number label;
- after the cream has been applied you should wait one hour before the phlebotomist attempts to take the sample; you do not have to remain in the home, but should be prepared to do so, if the family wish. If you can leave, you may both be able to visit a second young person to apply the cream, or if Emla Cream was not requested, to take the blood sample.

NOTE: Emla must only be applied to healthy skin; if the phlebotomist finds that the young person has sore or broken skin areas, or eczema on both arms then Emla should not be applied, and hence a blood sample cannot be attempted.



## SECTION D

Applies in cases where the young person/their parent consents to the blood sample being taken:

- wishes to have Emla Cream applied, AND
- has NO allergic reaction to anaesthetics, AND
- wishes to apply the cream themselves.

1 Complete the top part, Part 1, of the 'Prescription for Emla' - **X3**

- serial number label
- full name of young person
- address, including postcode
- date of birth
- interviewer signature to confirm that the young person has been asked about any no known allergy to anaesthetics, and has no such allergy;
- date

2 Send the form immediately to the Survey Doctor in the envelope provided; this envelope is stamped and addressed to the Survey Doctor at her home address; do NOT send the Prescription to the Dunn.

The Survey Doctor will sign the form and post it back to you immediately; it should get back to you within 4 working days.

3 Make an appointment to call with the phlebotomist to leave the cream with the young person/parent for them to apply. Only the phlebotomist should hand over the cream.

This will be an additional call at the household.

This appointment must be made for:

- after you expect to have received the returned and signed prescription form from the Survey Doctor;
- preferably the day before the blood sample will be taken; we wish to avoid leaving the Emla Cream with the family for long periods.

4 At the visit with the phlebotomist to hand over the cream the phlebotomist will reassure him/herself that the parent/young person is competent to be left with the cream; will advise on routine safety precautions for keeping the cream while it is the home (away from small children, pets etc), and explain where and how to apply the cream.

The phlebotomist must ask the screening questions about epilepsy and clotting disorders.

You must:

- agree what time you will be calling with the phlebotomist to take the blood sample, so that the time for applying the cream can be determined;
- take with you the prescription form, **X3**, which has been signed and returned to you by the Survey Doctor;

- detach the lower part of the form, Part 2 - where indicated; give the top half of the form, Part 1, to the young person/parent for them to keep, pass to their GP or throw away;
- give the bottom part of the form, Part 2, to the phlebotomist; check that the serial number is written in the lower part of the form, or attach a serial number label;

NOTE: Emla must only be applied to healthy skin; if the phlebotomist finds that the young person has sore or broken skin areas, or eczema on both arms then Emla should not be applied, and hence a blood sample cannot be attempted.

5 Visit with the phlebotomist to take blood

No special procedures.

## SECTION E

**Applies in cases where the young person/their parent consents to the blood sample being taken:**

- **wishes to have Emla Cream applied, AND**
- **HAS an allergic reaction to anaesthetics.**

1 If the young person has a known allergic reaction to a local or general anaesthetic you must:

Record details of that reaction in your notebook against their serial number. Include any reaction that the young person/parent wishes to report, i.e. this should be treated as an opinion question.

Probe fully for details of the reaction:

- if vomiting; check whether young person actually was sick, or just felt sick
- whether it was a reaction to a local or general anaesthetic;
- how long ago it happened;
- whether it happened on only one occasion or subsequently.

2 Explain that it may not be advisable for Emla Cream to be used and that you must seek guidance from the Survey Doctor:

3 Telephone the Survey Doctor; when she returns your call give the following information

- serial number
- sex and date of birth of young person
- name and telephone number of young person's GP (from your copy of Consent form Z1 'GP notification form')
- nature and details of the allergic reaction.

4 The Survey Doctor may be able tell you there and then whether Emla may be used; or may need to speak to the young person's GP before making a decision. Please make sure that the Survey Doctor has a number where she can call you back.

5 If Emla can be applied then:

if young person/parent wish phlebotomist to apply Emla proceed as in SECTION C

if young person/parent wish to apply Emla themselves proceed as in SECTION D

6 If Emla cannot be applied then explain reason to young person/parent:

if they wish to proceed with blood sample WITHOUT Emla, then proceed as in SECTION B.

if they are unwilling to have sample taken without Emla, then blood cannot be taken.

## SECTION F

On the paper Measurements Schedule (M1) in the Blood Record section will you please make notes on the following:

- if a fasting sample is refused, or if there is an outright refusal to attempt to take blood:

whether the refusal is associated with the option to use Emla Cream, and what it was about using Emla that was of concern - e.g., inconvenience, applying it, safety, makes blood taking seem more serious etc.

- if Emla was used:

any comments or reactions to its use - favourable or otherwise. Please make full notes at F12; continue on the inside back page (blank) of the Measurement Schedule if necessary.

who applied it - parent, young person or phlebotomist; this should be recorded at F13(b)

## COLLECTION OF A SPOT URINE SAMPLE

### 1 Equipment and materials required

- young person's instruction leaflet - **W3**
- nylon laundry bag, containing collection and despatch equipment
- disposable plastic cups, to give to the young person for collecting the sample
- Sarstedt 'Urin-Stabilisator' syringes, containing boric acid stabiliser, and extension tubes
- plastic postal containers, for the filled syringes
- pre-labelled, pre-stamped Jiffy bags, to post the samples to the Dunn
- cryo-serial number labels - freezer proof serial number labels
- spot urine record forms - **M4**
- disposable gloves for your use when packing the samples
- measurement schedule - **M1**

These instructions should be read in conjunction with the young person's instruction leaflet - **W3**.

### 2 Purpose

The main purpose of collecting and analysing a sample of the young person's urine is to estimate the amount of salt (sodium and potassium) in their diet. Although information on the amount of salt in processed and other food items is available, the survey cannot collect reliable information on the amount of salt that is added either at the table or in cooking. We would therefore like every young person to provide a small sample of their urine. Because the amount of salt in urine varies quite widely in response to the level of consumption, a sample of urine from the first-void-of-the-day, is most likely to give a reasonable estimate of 'average' levels of sodium and potassium.

### 3 Eligibility

All young people are eligible to provide this sample - even if the dietary diary is refused.

### 4 Timing

The sample can be collected at any time during the 7-day dietary recording period - EXCEPT FRIDAYS. The sample must be picked up for despatch by you, the interviewer, **on the same morning as it is collected by the young person**. Although the sample will be in a syringe containing preservative it is important that it is received at the Dunn no later than the day following the day of collection. However, in the interest of economy, please do not make a special visit just to collect a urine sample; arrange for the collection to be made on a day when you will be calling to check on the entries in the diaries, or make anthropometric measurements.

### 5 Consent

Only verbal consent is required; there are no written consent forms for the urine sample. The young person should still be invited to provide a urine sample even if they refuse consent to notify their GP of their participation in the survey.

### 6 Procedure:

(i) Each young person must be given:

- one disposable, plastic cup
- one syringe
- one extension tube

- one set of instructions - **W3**

The young person should be asked to collect a single, 'first-void-of-the-day' urine sample in the plastic cup provided. He or she should be asked to transfer a sub-sample of this urine to the syringe, using the extension tube on the syringe to replace the syringe cap, and then discard the remaining urine, plastic collection cup and extension tube.

(ii) Please go through the procedure with the young person (or their parent/guardian):

- make sure the requirement for a first-void-of-the-day-sample is understood, that is the first urine passed after getting up in the morning;
- demonstrate how to use the syringe with the extension tube;
- explain that the white powder in the syringe is a preservative and should not be emptied before the syringe is filled.

(iii) You must collect the filled syringe on the same morning it is collected. You must then:

- if the young person has not already done so:
  - make sure the plunger is pulled right the way back to a fixed position (practice on a couple of empty syringes beforehand);
  - break off the plunger stalk by turning it through a right angle until it snaps and discard the stalk;
- stick a cryo serial number label on the syringe containing the sample;
- place the filled, labelled syringe inside the plastic postal container. Make sure the screw cap is tightly closed. There is no need to put a cryo label or serial number label on the postal container.
- complete the Spot Urine Record form - **M4** (see *6 Documentation* below) and the corresponding questions in the Measurements schedule -**M1**;
- place the postal container containing the labelled syringe and the completed urine record form in the Jiffy bag.
- post as soon as possible at a post box with frequent collections or at a post office - to arrive at the Dunn the next day.

(iv) Keep the remaining cryo serial number labels to hand to the phlebotomist for the blood samples - together with some standard serial number labels.

## 7 Documentation

(i) Spot urine record form - **M4**

- attach a standard (non-cryo) serial number label to the form and complete the details.
- make sure that you record the approximate time of posting - even though this form has to be completed before you post the sample (and this form).
- use the space on the form indicated to note any unusual circumstances, difficulties or other information which may be of use. (ii) Measurement schedule - **M1**

- Part G should be completed for every young person; this is our record of the information on the Spot Urine Record form, so please copy it over onto the Measurements Schedule at the same time as you complete the Record form.

## **8 Results**

The results of the analysis of the urine sample will not be reported to the young person or their GP.

Appendix I

Master coding dietary diary page



**PLEASE START A NEW PAGE FOR EACH DAY EVEN IF ONLY SOME OF THIS PAGE IS USED . PLEASE USE A SEPARATE LINE FOR EACH ITEM EATEN OR DRUNK**

\*DAYOFWK\*  
Today is.....day

\*DAYNO\*  
Recording day: 1 2 3 4 5 6 7  
*ring one*

Serial number:

Today the young person is Well ..... \*WELL\*  
(tick one box) Unwell...

Today's date is:      
A

A	B	C	D	E	F	G	OFFICE USE ONLY				
							Est weight? *ESTIMATE* Tick if yes	Food *FOODCODE*	Brand *BRAND*	Food source *FOODSRCE*	
*PLATEWT* Weight of empty plate? .....	EMPTY PLATE - CUP - BOWL - CONTAINER			*TOTLEFT* .....g		*HOMEGROW* Yes No Ring one					
*MEALTIME* Time eaten? am/pm .....			*WTSERVED* .....		*SPILLAGE* .....	1 2					
*WHEREAT* Where eaten? at home 1				*LEFTIND* .....		1 2					
(ring one) at school 2						1 2					
other place 3						1 2					
*WEIGHBY* Who weighed? young person 1						1 2					
(ring one) other 2						1 2					
Weight of empty plate? .....	EMPTY PLATE - CUP - BOWL - CONTAINER			.....g							
Time eaten? am/pm .....						1 2					
Where eaten? at home 1						1 2					
(ring one) at school 2						1 2					
other place 3						1 2					
Who weighed? young person 1						1 2					
(ring one) other 2						1 2					
Weight of empty plate? .....	EMPTY PLATE - CUP - BOWL - CONTAINER			.....g							
Time eaten? am/pm .....						1 2					
Where eaten? at home 1						1 2					
(ring one) at school 2						1 2					
other place 3						1 2					
Who weighed? young person 1						1 2					
(ring one) other 2						1 2					

Please use as many pages as you like for each day  
Have you included everything eaten and drunk today  
Use the back of this page for any notes, recipes and/or queries

\*..\* Variable names are enclosed in asterisks.

## Appendix J

### Specifications for SIR and SPSS derived variables

## **Appendix J List of figures**

### Derived variables – interview data

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- Figure J.14 SPSS derived variables: specifications for blood and urine analytes

## Figure J.1 Derived variable specification for age variables

The following age variables need to be derived for each case and added to the SIR database.

### 1 Method:

- subtract date of event (in days) from date of birth (in days)
- for each age derived variable take date of birth from variable **DoB00**
- divide by 365.25
- store as decimal number of years

### 2 Derived variables

<u>Variable label</u>	<u>Variable name</u>	<u>Date of event variable</u>
AGEBP	Age at BP	DateBP
AGEHT	Age at height	DateH
AGEWT	Age at weight	DateW
AGEMA	Age at MUAC	DateM
AGEHIP	Age at waist hip	DateHp
AGEBLD	Age at blood	BIDate
AGEUR	Age at urine	UrDate4
AGEINTD	Age at dietary interview	IntDate
AGEDIET	Age at diary	(Diary start date)
AGEEXAM	Age at oral examination	IntDate (as entered on Oral Exam)

### 3 Missing values

set value dv = -9  
if non-response to whole event (eg blood not taken), or ineligible for event eg waist/hip measurement

set value dv = -8  
if date of event = NA

set value dv = -6  
if rec type does not exist

## Figure J.2 Derived variable specification for region variables

### 1 Method:

- SIU selection number identifies region; selection number (SELNO) forms first 3-digits of case number (CASEID)

### 2 Derived variables:

Variable name: Region

Variable label: REGION

If SELNO = 001, 002, 034, 035, 067, 068, or 100 then	REGION = 01
If SELNO = 003, 004, 005, 036, 037, 038, 069, 070, 071, 101, 102 or 103 then	REGION = 02
If SELNO = 006, 007, 008, 039 to 042, 072 to 075, 104 to 107 then	REGION = 03
If SELNO = 009, 010, 011, 043, 044, 076, 077, 108, 109, or 110 then	REGION = 04
If SELNO = 012, 013, 014, 045, 046, 047, 078, 079, 080, 111, 112, or 113 then	REGION = 05
If SELNO = 015, 048, 081, 082, or 114 then	REGION = 06
If SELNO = 016 to 019, 049 to 052, 083 to 086, 115 to 118 then	REGION = 07
If SELNO = 020 to 025, 053 to 059, 087 to 092, 119 to 124 then	REGION = 08
If SELNO = 026, 027, 028, 060, 061, 093, 094, 095, 125, 126 or 127 then	REGION = 09
If SELNO = 029, 030, 062, 063, 096, 128 or 129 then	REGION = 10
If SELNO = 031, 032, 033, 064, 065, 066, 097, 098, 099, 130, 131 or 132 then	REGION = 11

### Value label

REGION	= 1	North
REGION	= 2	Y & H
REGION	= 3	N West
REGION	= 4	E Midlands
REGION	= 5	W Midlands
REGION	= 6	E Anglia
REGION	= 7	London

REGION = 8 S East  
REGION = 9 S West  
REGION = 10 Wales  
REGION = 11 Scotland  
Missing values: none

Variable name: Region1

Variable label: Region grouped

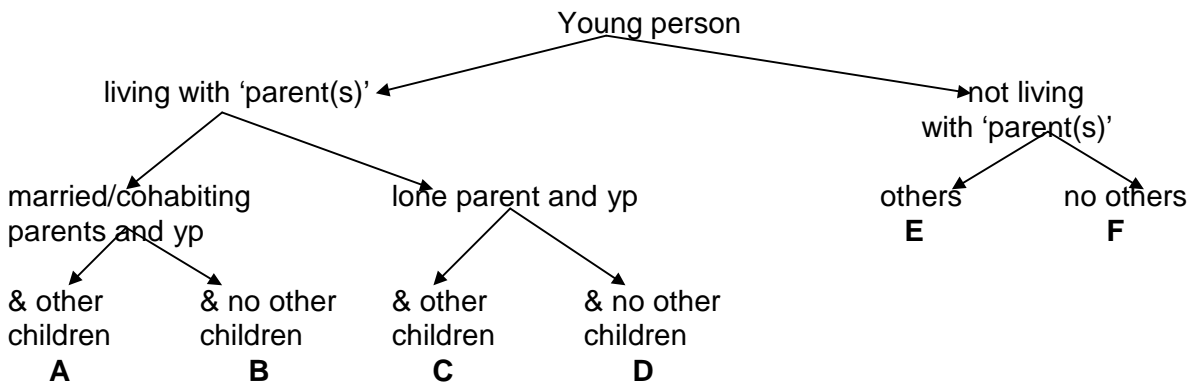
If REGION = 1 then Region1 = 2  
If REGION = 2 then Region1 = 2  
If REGION = 3 then Region1 = 2  
If REGION = 4 then Region1 = 3  
If REGION = 5 then Region1 = 3  
If REGION = 6 then Region1 = 3  
If REGION = 7 then Region1 = 4  
If REGION = 8 then Region1 = 4  
If REGION = 9 then Region1 = 3  
If REGION = 10 then Region1 = 3  
If REGION = 11 then Region1 = 1

Value label

Region1 = 1 Scotland  
Region1 = 2 Northern  
Region1 = 3 C, SW & Wales  
Region1 = 4 London & SE

Missing values: none

**Figure J.3 Household type classification for analysis in SPSS**



1 Method

- three-stage derivation in SIR
- identify whether young person was living with/without parents
- identify whether other children in household
- identify whether young person has children and marital status
- at SPSS derive final groups

2 Derivation

**HTYPE1: Whether living with parents**

<u>If</u> NPERSON = 1	HTYPE1 = 1	Living alone: F
<u>else if</u> (MANO = 0) <u>and</u> (PANO = 0) <u>and</u> (GANO = 0)	HTYPE1 = 2	No parents, others: E
<u>else if</u> (MANO = 1) <u>and</u> (PANO = 0)	HTYPE1 = 3	Lone mother: C/D
<u>else if</u> (MANO = 0) <u>and</u> (PANO = 1)	HTYPE1 = 4	Lone father: C/D
<u>else if</u> (MANO = 0) <u>and</u> (PANO = 0) <u>and</u> (GANO = 1)	HTYPE1 = 5	Lone g/parent: C/D
<u>else</u>	HTYPE1 = 6	Others: A/B

## HTYPE2: Other children in household

<u>If</u> HTYPE1 = 1 or 2	HTYPE2 = -9	DNA
<u>else if</u> (any RELTOY01-13 = 3,4,5,11,12 ,13, 14, 15 <u>or</u> 16) <u>and</u> (AGE of that person <16)	HTYPE2 = 1	Other children: A/C
<u>else</u>	HTYPE2 = 2	No other children: B/D

## HTYPE3: Whether young person has own family

<u>If</u> (MARSTA00 = 1, 2 or 7) <u>and</u> (any RELTOY01-13= 3 or 4)	then HTYPE3 = 1 young person is married, with child(ren)
<u>else if</u> (MARSTA00 = 1, 2 or 7) <u>and</u> (all RELTOY01-13 ne 3 or 4)	then HTYPE3 = 2 young person is married, no child(ren)
<u>else if</u> (MARSTA00 ne 1, 2 or 7) <u>and</u> (any RELTOY01-13 = 3 or 4)	then HTYPE3 = 3 young person is lone parent
<u>else</u>	HTYPE3 = 4 Other.

## SPSS derivation HTYPE4

if HTYPE1 = 1	HTYPE4 = 1 Living alone
if HTYPE1 = 2	HTYPE4 = 2 Living with others, not 'parents'
if (HTYPE2 = 1) and (HTYPE1 = 6)	HTYPE4 = 3 With both 'parents' and other children
if (HTYPE2 = 2) and (HTYPE1 = 6)	HTYPE4 = 4 With both 'parents', no other children
if (HTYPE2 =1) and (HTYPE1 = 3,4,5)	HTYPE4 = 5 With lone 'parent' and other children
if (HTYPE2 = 2) and (HTYPE1 = 3,4,5)	HTYPE4 = 6 With lone 'parent', no other children

### 3 Notes:

parent = birth, step, adoptive, foster or, if none of these present, grandparent

children = birth, step, adoptive, foster, brothers and sisters (in law) aged under 16; other relatives and non-relatives under 16; and young person's own children (under 16)

Young person married – includes those co-habitant with opposite or same sex partner



HTYPE3 cross-tabbed with HTYPE4 will show cases in HTYPE4 where young person is married/  
has own children

HTYPE1 = 3 and 4 Young person living with lone parent, with/without grandparent(s)

HTYPE1 = 5 Lone grandparent and no mother or father

HTYPE1 = 6 Others; including living with both parents, or no parents but both  
grandparents

HTYPE1 = 2 Young person not living with parent(s), with others; including young person  
married/cohabiting with/without children and lone parent young person

### Figure J.4 SPSS derived variables

N.B. These variables have been added to the SPSS data files for the initial interview, physical measurements and physical activity diary

Variable name	Description	Notes
casewgt1	weight for differential probability of selection to correct number of decimal places	see Figure 4.15
casewgt2	scaled weight for differential probability of selection	see Figure 4.15
iwgt	intermediate variable to derive icasewgt	
icasewgt	weight for differential probability of selection and differential non-response for initial dietary interview data	see Figure 4.15
icaswgt2	scaled weight for differential probability of selection and differential non-response for initial dietary interview data	see Figure 4.15
dwgt	intermediate variable to derive dcasewgt	
dcasewgt	weight for differential probability of selection and differential non-response for dietary diary data	see Figure 4.15
diaryind	indicator variable for dietary diary data: 1 = diary kept 0 = no diary	see Figure 4.15
benefit	whether household was receiving certain benefits	see Figure J.5
everjob	intermediate variable required to calculate hohscl	see Figure J.5
hohscl	social class of head of household	see Figure J.5
hhtype4	household type	see Figure J.3
hohecon	economic status of head of household	see Figure J.5
intdate1	date of interview in seconds - intermediate variable to derive fieldwork wave	see Figure J.5
intdate2	date of interview in months - intermediate variable to derive fieldwork wave	see Figure J.5
well	whether the young person was unwell during the 7-day dietary recording period	see Figure J.5
wave	fieldwork wave	see Figure J.5
infogp2	main interview informant	see Figure J.5
lunch	young persons' usual lunch time meal	see Figure J.5
ypecon	economic status of young person	see Figure J.5

**Figure J.5 SPSS derived variables: specifications for common demographic derived variables for initial interview**

This figure gives specifications for the following derived variables:

Benefit	Whether receiving benefit
Msmoking	Mother's smoking habits
Fsmoking	Father's smoking habits
HOHScI	Social class of Head of Household
HOHScIn	Standard social classification for Head of Household
HHType4	Household type
HOHEcon	Economic status of Head of Household
Well	Whether young person was unwell during the 7 day dietary recording period
Wave	Fieldwork wave
YPEcon	Economic status of young person
Lunch	Lunch time meal

Variable name: Benefit

```
missing values all (.).
do if ((fcredit = 1) or (isupp = 1) or (iseek = 1)).
    compute benefit = 1.
else if ((fcredit = -8) or (isupp = -8) or (iseek = -8)).
    compute benefit = -8.
else.
    compute benefit = 2.
end if.
```

```
variable labels benefit 'Whether receiving benefit'.
value labels benefit 1 'Receiving' 2 'Not receiving' -8 'NA'.
```

Variable name: Msmoking

```
missing values all (.).
do if (mcigs = 2).
    compute msmoking = 1.
else if (mcigs = -9).
    compute msmoking = -9.
else if (mcigs = -8).
    compute msmoking = -8.
else if (mcigsa = -8).
    compute msmoking = 99.
else if (mcigsa le 19).
    compute msmoking = 2.
else if (mcigsa gt 19).
    compute msmoking = 3.
end if.
```

```
variable labels msmoking 'Mothers smoking habits'.
value labels msmoking 1 'Nonsmoker' 2 'Light smoker' 3 'Heavy smoker' 99 'Smokes DK
number'
-8 'DK if smokes' -9 'No mother in hhd'.
```

Variable name: FSmoking

```
missing values all (.).
do if (fcigs = 2).
    compute fsmoking = 1.
else if (fcigs = -9).
    compute fsmoking = -9.
else if (fcigs = -8).
    compute fsmoking = -8.
else if (fcigs = -8).
    compute fsmoking = 99.
else if (fcigs le 19).
    compute fsmoking = 2.
else if (fcigs gt 19).
    compute fsmoking = 3.
end if.
```

variable labels fsmoking 'Fathers smoking habits'.  
value labels fsmoking 1 'Nonsmoker' 2 'Light smoker' 3 'Heavy smoker' 99 'Smokes DK number'  
-8 'DK if smokes' -9 'No father in hhd'.

Variable name: HOHscl

comment ' everjob is intermediate variable needed to derive HOHscl because of W1 and W2  
error in lap top program ' .

```
do if ((range(caseid, 0101, 6699)) and (range (worklwk3,4, 8))).
    compute everjob = 1.
else if ((range(caseid,0101, 6699)) and (unemwtj2 = 2)).
    compute everjob = 2.
else if ((range(caseid, 6701,13299)) and (sc0 < 0.00)).
    compute everjob = 3.
else.
    compute everjob = 4.
end if.
```

```
do if range (sc0, 1.00, 3.10).
    compute HOHscl = 1.
else if range (sc0, 3.20, 5.00).
    compute HOHscl = 2.
else if sc0 = 6.00.
    compute HOHscl = 3.
else if sc0 = 0.00.
    compute HOHscl = 4.
else if range (everjob, 2,3).
    compute HOHscl = 5.
else if everjob = 1.
    compute HOHscl =6.
else.
    compute HOHscl = 7.
end if.
```

variable labels HOHscl 'HOH social class gpd'.

value labels HOHscl 1 'Non manual' 2 'Manual' 3 'Armed forces' 4 'Inadequately described' 5 'Never worked' 6 'DK whether ever worked'

comment 'code 6 -no social class information W1 and W2 Blaise error'

Variable name: HOHScIn

```
RECODE
  sc0
  (-9=5) (0=5) (1=1) (2=1) (3.0 thru 3.15555=2) (3.16 thru 3.25555=3) (4=4) (5=4) (6=5) INTO
  hohscln .
VARIABLE LABELS hohscln 'Standard social class'.
VALUE LABELS hohscln 1 'I and II' 2 'III non-manual' 3 'III manual' 4 'IV and V'
  5 'Unclassified' .
EXECUTE .
```

Variable name: HHType4

*N.B. Also see Figure J.\_*

```
do if hhtype1 = 1.
  compute hhtype4 = 6.
else if hhtype1 = 2.
  compute hhtype4 = 5.
else if ((hhtype2 = 1) and (hhtype1 = 6)).
  compute hhtype4 = 1.
else if ((hhtype2 = 2) and (hhtype1 = 6)).
  compute hhtype4 = 2.
else if ((hhtype2 = 1) and (range (hhtype1, 3, 5))).
  compute hhtype4 = 3.
else if ((hhtype2 = 2) and (range (hhtype1, 3, 5))).
  compute hhtype4 = 4.
else.
  compute hhtype4 = 7.
end if.
```

```
variable labels hhtype4 'Hhld type gp 4'.
value labels hhtype4 6 'Living alone' 5 'Others, no parents' 1 'Both parents & children' 2 'Both
parents no children'
3 'Single parent & children' 4 'Single parent no children' 7 'Others'
```

Variable name: HOHEcon

```
missing values all (.).
do if ((worklwk1=1) or (worklwk2 = 1) or (range (govschem,1,3))).
  compute hohecon = 1.
else if ((worklwk3 = 1) or (lookwork = 1) or (ablestrt = 1)).
  compute hohecon = 2.
else if ((range (worklwk3, 4, 8)) or (lookwork = 2) or (ablestrt = 2)).
  compute hohecon = 3.
else.
  compute hohecon = -8.
```

end if.

variable labels hohecon 'Econ status of HOH'.

value labels hohecon 1 ' In employment' 2 ' ILO unemployed' 3 Econ inactive' -8 'NA'.

Variable name: Well

missing values all ( ).

compute well = -9.

do if unwell = 2.

    compute well = 1.

else if unwell = -8.

    compute well = -8.

else if range (which000, 1,7) or range (which001, 1,7) or range (which002, 1,7) or range (which003, 1,7) or range (which004, 1,7) or range (which005, 1,7) or range (which006, 1,7) or range (which007, 1,7) or range (which008, 1,7) or range (which009, 1,7) or range (which010, 1,7) or range (which011, 1,7) or range (which012, 1,7) or range (which013, 1,7) or range (which014, 1,7) or range (which015, 1,7) or range (which016, 1,7) or range (which017, 1,7) or range (which018, 1,7) or range (which019, 1,7) or range (which020, 1,7) or range (which021, 1,7) or range (which022, 1,7) or range (which023, 1,7) or range (which024, 1,7) or range (which025, 1,7) or range (which026, 1,7) or range (which027, 1,7) or range (which028, 1,7) or range (which029, 1,7) or range (which030, 1,7) or range (which031, 1,7) or range (which032, 1,7) or range (which033, 1,7) or range (which034, 1,7) or range (which035, 1,7) or range (which036, 1,7) or range (which037, 1,7) or range (which038, 1,7) or range (which039, 1,7) or range (which040, 1,7) or range (which041, 1,7) or range (which042, 1,7) or range (which043, 1,7) or range (which044, 1,7) or range (which045, 1,7) or range (which046, 1,7) or range (which047, 1,7).

    compute well = 3

else .

    compute well = 2.

end if.

variable labels well 'Whether unwell during 7 day record'.

value labels well 1 ' Not unwell' 2 'Unwell, eating not affected' 3 'Unwell, eating affected' -8 'NA'.

Variable name: Wave

comment ' intdate, date of interview in seconds, and intdate2, month of interview, are necessary transformations of the original date of interview variable, intdate, needed to derive wave' .

COMPUTE intdate1 = intdate \* 60 \* 60 \* 24 .

EXECUTE .

COMPUTE intdate2 = XDATE.MONTH(intdate1) .

EXECUTE .

comment ' Wave is derived from sample allocation i.e. caseid, except where date of interview is more than 1 month after the end of the quarter' .

missing values all ( ).

do if ((range(caseid, 101, 3399)) and (range (intdate2, 1.00, 4.00))).

    compute wave = 1.

```

else if ((range(caseid, 3401, 6699)) and (range (intdate2, 4.00, 7.00))).
    compute wave = 2.
else if ((range(caseid, 6701, 9999)) and (range (intdate2, 7.00, 10.00))).
    compute wave = 3.
else if (range(caseid, 10001, 13299)).
    compute wave = 4.
else if ((caseid = 606) or (caseid =609) or (caseid = 611) or (caseid = 612) or (caseid = 614) or
(caseid =616) or (caseid = 619) or (caseid = 620) or (caseid = 621) or (caseid = 2214) or
(caseid =2215) or (caseid = 2217) or (caseid = 2220)).
    compute wave = 3.
else if ((caseid = 5508) or (caseid =8415) or (caseid = 8618) or (caseid = 8619) or (caseid =
8623) or (caseid =8625) or (caseid = 8629) or (caseid = 8721) or (caseid = 8929)).
    compute wave = 4.
else.
    compute wave = 9.
end if.

```

```

variable labels wave 'Fieldwork wave'.
value labels wave 1 'Wave 1' 2 'Wave 2' 3 'Wave 3' 4 'Wave 4' .

```

Variable name: YPEcon

missing values all ( ).

```

do if (( ywrklwk1=1) or (ywrklwk2 = 1) or (range (ygovschm,1,3))).
    compute ypecon = 1.
else if ((ywrklwk3 = 1) or (ylookwrk = 1) or ( yablstrt = 1)).
    compute ypecon = 2.
else if ((range (ywrklwk3, 4, 8)) or (ylookwrk = 2) or (yablstrt = 2)).
    compute ypecon = 3.
end if.

```

```

do if (HOH=1) .
    recode hohecon (1=1) (2=2) (3=3) into ypecon .
end if .
execute .

```

```

do if (yage=1) .
    recode school (6=3) into ypecon .
end if .
execute .

```

```

recode ypecon (missing=3) into ypecon .
execute .

```

```

variable labels ypecon 'Econ status of YP'.
value labels ypecon 1 'In employment' 2 'ILO unemployed' 3 'Econ inactive' -8 'NA'.
execute .

```

Variable name: Lunch

```

compute lunch = schmeal .
execute .

```

```
recode lunch (4=5) (5=7) (6=8) .  
execute .
```

```
do if ((wkmeal>0)and(wkmeal<7)) .  
    recode wkmeal (1=12) (2=10) (3=11) (4=14) (5=15) into lunch .  
end if .
```

```
recode lunch (-9=99) .  
execute .
```

```
variable labels lunch 'lunch time meal'.
```

```
value labels lunch 1 'school - free school meal' 2 'school - reduced price or subsidised school  
meal' 3 'school meal bought on premises' 4 'school - meal bought outside premises' 5  
'school - packed lunch' 6 'school - lunch at home' 7 'school - other answers' 8 'school - no  
lunch' 9 'work - free meal' 10 'work - meal bought on premises' 11 'work - lunch bought  
outside' 12 'work - packed lunch' 13 'work - lunch at home' 14 'work - other answers' 15  
'work - no lunchtime meal' 17 'not at school or work - lunch at home' 16 'not at school or  
work - lunch at home' .
```

```
execute .
```

```
recode lunch (99=17) .  
execute .
```



### Figure J.6 SPSS derived variable: main interview respondent

The person number of the main informant was collected when the interviewer completed the household information. This DV uses the household information to produce a variable giving the relationship of the main informant to the young person.

```
do if (info = 1) .
  recode
    info (1=1) into infogp2 .
  end if .
execute .

if (info >= 2) infogp2 = 99 .
execute .

do if (sex01 = 2)&( info=2) & ((reltoy01 = 6) or (reltoy01 = 7) or (reltoy01 = 8) or (reltoy01 = 9)) .
  recode
    infogp2 (99=2) .
  end if .
execute .

do if (sex01 = 1)&( info=2) & ((reltoy01 = 6) or (reltoy01 = 7) or (reltoy01 = 8) or (reltoy01 = 9)) .
  recode
    infogp2 (99=3) .
  end if .
execute .

do if ( info=2) & ((reltoy01 = 11) or (reltoy01 = 12) or (reltoy01 = 13) or (reltoy01 = 14)) .
  recode
    infogp2 (99=4) .
  end if .
execute .

do if (sex02 = 2)&( info=3) & ((reltoy02 = 6) or (reltoy02 = 7) or (reltoy02 = 8) or (reltoy02 = 9)) .
  recode
    infogp2 (99=2) .
  end if .
execute .

do if (sex02 = 1)&( info=3) & ((reltoy02 = 6) or (reltoy02 = 7) or (reltoy02 = 8) or (reltoy02 = 9)) .
  recode
    infogp2 (99=3) .
  end if .
execute .

do if ( info=3) & ((reltoy02 = 11) or (reltoy02 = 12) or (reltoy02 = 13) or (reltoy02 = 14)) .
  recode
    infogp2 (99=4) .
  end if .
execute .

do if ( info=3) & (reltoy02 = 15) .
  recode
    infogp2 (99=5) .
  end if .
```

execute .

```
do if (sex03 = 2)&( info=4) & ((reltoy03 = 6) or (reltoy03 = 7) or (reltoy03 = 8) or (reltoy03 = 9)) ).
recode
    infogp2 (99=2) .
end if .
execute .
```

```
do if (sex03 = 1)&( info=4) & ((reltoy03 = 6) or (reltoy03 = 7) or (reltoy03 = 8) or (reltoy03 = 9)) ).
recode
    infogp2 (99=3) .
end if .
execute .
```

```
do if ( info=4) & ((reltoy03 = 11) or (reltoy03 = 12) or (reltoy03 = 13) or (reltoy03 = 14)) ).
recode
    infogp2 (99=4) .
end if .
execute .
```

```
do if (sex04 = 2)&( info=5) & ((reltoy04 = 6) or (reltoy04 = 7) or (reltoy04 = 8) or (reltoy04 = 9)) ).
recode
    infogp2 (99=2) .
end if .
execute .
```

```
do if (sex04 = 1)&( info=5) & ((reltoy04 = 6) or (reltoy04 = 7) or (reltoy04 = 8) or (reltoy04 = 9)) ).
recode
    infogp2 (99=3) .
end if .
execute .
```

```
do if ( info=5) & ((reltoy04 = 11) or (reltoy04 = 12) or (reltoy04 = 13) or (reltoy04 = 14)) ).
recode
    infogp2 (99=4) .
end if .
execute .
```

```
do if (sex05 = 2)&( info=6) & ((reltoy05 = 6) or (reltoy05 = 7) or (reltoy05 = 8) or (reltoy05 = 9)) ).
recode
    infogp2 (99=2) .
end if .
execute .
```

```
do if (sex05 = 1)&( info=6) & ((reltoy05 = 6) or (reltoy05 = 7) or (reltoy05 = 8) or (reltoy05 = 9)) ).
recode
    infogp2 (99=3) .
end if .
execute .
```

```
do if ( info=6) & ((reltoy05 = 11) or (reltoy05 = 12) or (reltoy05 = 13) or (reltoy05 = 14)) ).
recode
    infogp2 (99=4) .
end if .
execute .
```

```
do if (sex06 = 2)&( (info=7) & ((reltoy06 = 6) or (reltoy06 = 7) or (reltoy06 = 8) or (reltoy06 = 9)) ).
recode
    infogp2 (99=2) .
end if .
execute .
```

```
do if (sex06 = 1)&( (info=7) & ((reltoy06 = 6) or (reltoy06 = 7) or (reltoy06 = 8) or (reltoy06 = 9)) ).
recode
    infogp2 (99=3) .
end if .
execute .
```

```
do if ( (info=7) & ((reltoy06 = 11) or (reltoy06 = 12) or (reltoy06 = 13) or (reltoy06 = 14)) ).
recode
    infogp2 (99=4) .
end if .
execute .
```

```
comment ' only one case where info is 11 and was a mother' .
if (info = 11) infogp2 = 2 .
execute .
```

```
variable labels infogp2 'main interview respondent'.
value labels infogp2 1 'young person' 2 'mother' 3 'father' 4 'brother/sister' 5 'grandparent' -8 'na'.
```

**Figure J.7 SPSS derived variable specifications: derived variables for young person's smoking and drinking behaviour**

Specifications are given for the following variables derived in SPSS:

scurrent	young person's smoking behaviour
sever	"
smokeyp	"
smokeen	"
smokenec	"
smocomp	"
ubeer	young person's drinking behaviour – see Figure J.8
ushandy	"
uwine	"
umartini	"
uspirit	"
ualpop	"
totunits	"
alcomp	"
adialc	"
recunits	"

Variable name: SCurrent

```
RECODE
  soften
  (1=2) (2=2) (3=2) (4=1) (5=1) (6=1) (ELSE=Copy) INTO scurrent .
VARIABLE LABELS scurrent 'current smoker'.
EXECUTE .
```

```
RECODE
  sure
  (1=2) (2=2) (3=1) INTO scurrent .
EXECUTE .
```

value labels scurrent 1 'Smoker' 2 'Non-smoker'.

Variable name: SEver

```
RECODE
  soften
  (1=2) (2=1) (3=1) (4=1) (5=1) (6=1) (ELSE=Copy) INTO sever .
VARIABLE LABELS sever 'ever smoker'.
EXECUTE .
```

```
RECODE
  sure
  (1=2) (2=1) (3=1) INTO sever .
EXECUTE .
```

value labels sever 1 'Ever smoked' 2 'Never smoked'.

Variable name: SmokeEN

```
RECODE
  smokeyp
  (2=2) (3=2) (4=2) (5=2) (ELSE=Copy) INTO SmokeEN .
VARIABLE LABELS SmokeEN 'Smoking - ever or never'.
EXECUTE .
```

```
value labels SmokeEN 1 'Never smoked' 2 'Ever smoked' .
EXECUTE .
```

Variable name: SmokeNEC

```
RECODE
  smokeyp
  (2=2) (3=3) (4=3) (5=3) (ELSE=Copy) INTO SmokeNEC .
VARIABLE LABELS SmokeNEC 'Smoking - never ever or current'.
EXECUTE .
```

```
value labels SmokeNEC 1 'Never smoked' 2 'Ever smoked but not currently smoker'
3 'Current smoker' .
EXECUTE .
```

Variable name: SmokeYP

```
RECODE
  soften
  (2=2) (3=2) (4=3) (5=4) (6=5) (-8=-8) (-9=-9) INTO smokeyp .
VARIABLE LABELS smokeyp 'smoking behaviour of young person'.
EXECUTE .
```

```
RECODE
  sure
  (1=1) (2=2) (3=3) INTO smokeyp .
EXECUTE .
```

```
RECODE
  smokeyp (MISSING=-9) .
EXECUTE .
```

```
missing values smokeyp (-9) .
execute .
```

```
VALUE LABELS smokeyp 1 'Never' 2 'Ever smoked but not current smoker' 3 'Current less than 1 per
week' 4 'Current between 1 and 6 per week' 5 'Current more than 6 per week' -8 'Not answered' -9
'not applicable' .
EXECUTE .
```

**Figure J.8 SPSS derived variable: reported units of alcohol consumed from self-completion questionnaire**

**Self-completion data: look-up table for alcoholic drinks**

NB variables in shaded boxes are those relating to the subsidiary questions for each drink; variables in unshaded boxes contain no data.

		DMuch* (Blaise code)						
		4	5	6	7	8	9	10
Beer	A00	DMuch400	DMuch500	DMuch600	DMuch700	DMuch800	DMuch900	DMuch100
Shandy	A01	DMuch401	DMuch501	DMuch601	DMuch701	DMuch801	DMuch901	DMuch101
Wine	A02	DMuch402	DMuch502	DMuch602	DMuch702	DMuch802	DMuch902	DMuch102
Martini	A03	DMuch403	DMuch503	DMuch603	DMuch703	DMuch803	DMuch903	DMuch103
Spirits	A04	DMuch404	DMuch504	DMuch604	DMuch704	DMuch804	DMuch904	DMuch104
Alcopops	A05	DMuch405	DMuch505	DMuch605	DMuch705	DMuch805	DMuch905	DMuch105
Measured in:		glasses	pints	half pints	large cans	small cans	bottles	cans

**Specification for derived variable:**

IF (dmucha00 = 3) UBeer = (dmuch500\*2)+(dmuch600) + (dmuch700\*2) + (dmuch800) .  
EXECUTE .

IF (dmucha01 = 3) UShandy = (dmuch501)+(dmuch601\*0.5) + (dmuch701) + (dmuch801\*0.5) .  
EXECUTE .

IF (dmucha02 = 3) UWine = dmuch402 .  
EXECUTE .

IF (dmucha03 = 3) UMartini = dmuch403 .  
EXECUTE .

IF (dmucha04 = 3) USpirit = dmuch404 .  
EXECUTE .

IF (dmucha05=3) UAlpop = (dmuch905)+ (dmuch105) .  
EXECUTE .

```
RECODE
  ualpop (-16=1) .
EXECUTE .
```

```
RECODE
  ualpop (MISSING=0) .
EXECUTE .
```

```
RECODE
  ubeer (MISSING=0) .
EXECUTE .
```

```
RECODE
  umartini (MISSING=0) .
EXECUTE .
```

```
RECODE
  ushandy (MISSING=0) .
EXECUTE .
```

```
RECODE
  uspirit (MISSING=0) .
EXECUTE .
```

```
RECODE
  uwine (MISSING=0) .
EXECUTE .
```

```
IF (smoke=-9) ualpop = -9 .
EXECUTE .
```

```
IF (smoke=-9) ubeer = -9 .
EXECUTE .
```

```
IF (smoke=-9) umartini = -9 .
EXECUTE .
```

IF (smoke=-9) ushandy = -9 .  
EXECUTE .

IF (smoke=-9) uspirit = -9 .  
EXECUTE .

IF (smoke=-9) uwine = -9 .  
EXECUTE .

IF (not(smoke=-9))  
TotUnits = ualpop + ubeer + umartini + ushandy + uspirit + uwine .  
EXECUTE.

IF (smoke=-9) totunits = -9 .  
EXECUTE .

IF (EDrink=-8) totunits=-8 .  
EXECUTE .

comment 'deriving alcohol consumption over previous 7 days - this is NOT ADI but total units in 7 days'

IF (totunits=-9) Alcomp = -9 .  
EXECUTE .

IF (totunits=-8) Alcomp = -8 .  
EXECUTE .

IF (totunits=0) Alcomp = 1 .  
EXECUTE .

IF (totunits>0 and totunits<1) Alcomp = 2 .  
EXECUTE .

IF (totunits>=1 and totunits<2) Alcomp = 3 .  
EXECUTE .



IF (totunits>=2 and totunits<4) Alcomp = 4 .  
EXECUTE .

IF (totunits>=4 and totunits<6) Alcomp = 5 .  
EXECUTE .

IF (totunits>=6 and totunits<10) Alcomp = 6 .  
EXECUTE .

IF (totunits>=10 and totunits<15) Alcomp = 7 .  
EXECUTE .

IF (totunits>=15 ) Alcomp = 8 .  
EXECUTE .

VALUE LABELS Alcomp 1 'None' 2 'Less than 1.00' 3 '1.00 to 1.75' 4 '2.00 to 3.75' 5 '4.00 to 5.75' 6 '6.00 to 9.75' 7 '10.00 to 14.75' 8 '15.00 or more' -9 'Not applicable' -8 'No answer' .

EXECUTE .

VARIABLE LABELS Alcomp 'Alcohol consumption in last 7 days - UNITS - qaire data' .

EXECUTE .

comment ' To calculate ADI take 8g as one unit and multiply, then take as average over 7 days '

COMPUTE ADIalc = (totunits\*8)/7 .

EXECUTE .

IF (totunits=-9) adialc = -9 .

EXECUTE .

IF (totunits=-8) adialc = -8 .

EXECUTE .

VARIABLE LABELS ADIALC 'ADI alcohol from questionnaire data (g)' .

**Figure J.9 SPSS derived variable specifications: physical measurements and body size indicators**

For cases where two measurements were taken, the mean of these measurements was used in the analysis. Where it was possible to take only one measurement, this measurement was included in the analysis.

The following variables were derived:

Height	Mean of two height measurements
Weight	Mean of two body weight measurements
Muac	Mean of two mid upper-arm circumference measurements
Hip	Mean of two hip measurements
Waist	Mean of two waist measurements
Weighadj	Body weight for comparison with Health Survey data - adjusted for clothing weight (see Chapter 10 of main report)
WHRatio	Waist to hip ratio (waist[cm]/hip[cm])
BMI	Body Mass Index (body weight[kg]/height[m] <sup>2</sup> )
BMIh	Body Mass Index for comparison with Health Survey data using body weight adjusted for clothing weight
Measind	Indicator that at least one measurement was achieved

Variable name: Height, Weight, Muac, Hip, Waist

```
missing values all ( ).
do if (not(cheight1=-9)) .
    compute height = ((cheight1 + cheight2) / 2) .
else if (cheight1 = -9).
compute height = -9.
end if .
```

```
missing values all ( ).
do if (not(cweigh1=-9)) .
    compute weight = ((cweigh1 + cweigh2) / 2) .
else if (cweigh1 = -9).
compute weight = -9.
end if .
```

```
missing values all ( ).
do if (not(cmuac1=-9)) .
    compute muac = ((cmuac1 + cmuac2) / 2) .
else if (cmuac1 = -9).
compute muac = -9.
end if .
EXECUTE .
```

```
missing values all ( ).
do if (not(chip1=-9)) .
    compute hip = ((chip1 + chip2) / 2) .
else if (chip1 = -9).
compute hip = -9.
end if .
EXECUTE .
```

```
missing values all ( ).
do if (not(cwaist1=-9)) .
    compute waist = ((cwaist1 + cwaist2) / 2) .
else if (cwaist1 = -9).
compute waist = -9.
end if .
EXECUTE .
```

comment ' recoding cases recorded in inches ' .

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid =10018) or (caseid = 13006) hip1cm = chip1*2.54 .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid =10018) or (caseid = 13006) hip2cm = chip2*2.54 .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid = 13006) wst1cm = cwaist1*2.54 .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid = 13006) wst2cm = cwaist2*2.54 .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid =10018) or (caseid = 13006) chip1 = hip1cm .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid =10018) or (caseid = 13006) chip2 = hip2cm .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid = 13006) cwaist1 = wst1cm .
EXECUTE .
```

```
IF (caseid = 4401) or (caseid = 4412) or (caseid = 5705) or (caseid = 10012) or
(caseid = 10017) or (caseid = 13006) cwaist2 = wst2cm .
EXECUTE .
```

Variable name: Weighadj

```
IF ((sex00 = 1 and (agewt2>1 and agewt2<5))) weighadj = weight-0.64 .
IF ((sex00 = 2 and (agewt2>1 and agewt2<5))) weighadj = weight-0.55 .
IF ((sex00 = 1 and (agewt2>4 and agewt2<8))) weighadj = weight-0.76 .
IF ((sex00 = 2 and (agewt2>4 and agewt2<8))) weighadj = weight-0.62 .
VARIABLE LABELS weighadj 'Weight adjusted for clothing' .
EXECUTE .
```

Variable name: WHRatio

```
IF (cwaist1>0) whratio1 = (cwaist1/chip1) .
IF (cwaist2>0) whratio2 = (cwaist2/chip2) .
RECODE
  cwaist1 (MISSING=copy) into whratio1 .
EXECUTE .
RECODE
  cwaist2 (MISSING=copy) into whratio2 .
EXECUTE .
IF (cwaist1>0) whratio = ((whratio1+whratio2)/ 2) .
```

Variable name: BMI

```
IF ( (height>0) and (WEIGHT>0) ) BMI1a = ((cheight1/100)*(cheight1/100)) .
EXECUTE .
IF ( (height>0) and (WEIGHT>0) ) BMI1 = (cWEIGH1/BMI1a) .
EXECUTE .
RECODE
  cheight1 (MISSING=Copy) INTO
  BMI1 .
EXECUTE .
RECODE
  cweigh1 (MISSING=Copy) INTO
  BMI1 .
EXECUTE .
IF ( (height>0) and (WEIGHT>0) ) BMI2a = ((cheight2/100)*(cheight2/100)) .
EXECUTE .
IF ( (height>0) and (WEIGHT>0) ) BMI2 = (cWEIGH2/BMI2a) .
EXECUTE .
```

```
RECODE
  cheight2 (MISSING=Copy) INTO
  BMI2 .
EXECUTE .
```

```
RECODE
  cweigh2 (MISSING=Copy) INTO
  BMI2 .
EXECUTE .
```

```
IF ( (BMI1>0) and (BMI2>0) ) BMI = ((BMI1+BMI2)/2) .
EXECUTE .
```

```
RECODE
  BMI1 (MISSING=Copy) INTO
  BMI .
EXECUTE .
```

Variable name: BMIh

comment ' Create body weight adjusted for clothing weight ' .

```
IF ((sex00 = 1 and (agewt2>1 and agewt2<5))) weighad1 = cweigh1*0.64 .
IF ((sex00 = 2 and (agewt2>1 and agewt2<5))) weighad1 = cweigh1*0.55 .
IF ((sex00 = 1 and (agewt2>4 and agewt2<8))) weighad1 = cweigh1*0.76 .
IF ((sex00 = 2 and (agewt2>4 and agewt2<8))) weighad1 = cweigh1*0.62 .
VARIABLE LABELS weighad1 'Weight adjusted for clothing -cweigh1' .
EXECUTE .
```

```
IF ((sex00 = 1 and (agewt2>1 and agewt2<5))) weighad2 = cweigh2*0.64 .
IF ((sex00 = 2 and (agewt2>1 and agewt2<5))) weighad2 = cweigh2*0.55 .
IF ((sex00 = 1 and (agewt2>4 and agewt2<8))) weighad2 = cweigh2*0.76 .
IF ((sex00 = 2 and (agewt2>4 and agewt2<8))) weighad2 = cweigh2*0.62 .
VARIABLE LABELS weighad2 'Weight adjusted for clothing -cweigh2' .
EXECUTE .
```

```
IF ( (height>0) and (weight>0) ) BMIh1a = ((cheight1/100)*(cheight1/100)) .
EXECUTE .
```

```
IF ( (height>0) and (weight>0) ) BMIh1 = (weighad1/BMIh1a)
.
EXECUTE .
```

```
RECODE
  cheight1 (MISSING=Copy) INTO
  BMIh1 .
EXECUTE .
```

```
RECODE
  weighad1 (MISSING=Copy) INTO
  BMIh1 .
EXECUTE .
```

```
IF ( (height>0) and (weight>0) ) BMIh2a = ((cheight2/100)*(cheight2/100)) .  
EXECUTE .
```

```
IF ( (height>0) and (weight>0) ) BMIh2 = (weighad2/BMIh2a) .  
EXECUTE .
```

```
RECODE  
  cheight2 (MISSING=Copy) INTO  
  BMIh2 .  
EXECUTE .
```

```
RECODE  
  weighad2 (MISSING=Copy) INTO  
  BMIh2 .  
EXECUTE .
```

```
IF ( (BMIh1>0) and (BMIh2>0) ) BMIh = ((BMIh1+BMIh2)/2) .  
EXECUTE .
```

```
RECODE  
  BMIh1 (MISSING=Copy) INTO  
  BMIh .  
EXECUTE .
```

Variable name: Measind

comment ' start with height because most cases have it ' .

```
RECODE  
  ageht1  
  (1=1) (2=1) (3=1) (4=1) (ELSE=Copy) INTO measind .  
VARIABLE LABELS measind 'measurements indicator'.  
EXECUTE .
```

```
RECODE  
  agewt1  
  (1=1) (2=1) (3=1) (4=1) INTO measind .  
EXECUTE .
```

```
RECODE  
  agehip1  
  (1=1) (2=1) (3=1) (4=1) INTO measind .  
EXECUTE .
```

```
RECODE  
  agema1  
  (1=1) (2=1) (3=1) (4=1) INTO measind .  
EXECUTE .
```

**Figure J.10 Mother's height and father's height – calculations to give measurement in cm**

N.B. parent(s) height (if known) were collected either in feet and inches or in m and cm (allowing the respondent to use the units they were most familiar with); the units of measurement were collected at the next question (variable names: mfm and dfm). This syntax converts feet and inches and m and cm into cm.

Variable name: hmumfin

```
COMPUTE ihmumn = ihmum / 100 .
EXECUTE .
RECODE
  ihmum
  (MISSING=Copy) INTO ihmumn .
  missing values ihmumn (-6,-8,-9).
EXECUTE .
```

```
IF ((ihmumn >0) and (ihmumn < 2.0 )) hmumfin = (ihmumn *100) .
EXECUTE .
RECODE
  ihmumn
  (MISSING=Copy) INTO hmumfin .
  missing values hmumfin (-6,-8,-9).
EXECUTE .
```

comment ' multiply feet by 30point48 to make cm ' .

```
IF (ihmumn > 2.0 and ihmumn <4.9999999) ihmum1 = (4*30.48) .
EXECUTE .
IF (ihmumn >= 5.0 and ihmumn <5.9999999) ihmum1 = (5*30.48) .
EXECUTE .
IF (ihmumn >= 6.0 and ihmumn <6.9999999) ihmum1 = (6*30.48) .
EXECUTE .
VARIABLE LABELS ihmum1 "mother's height feet only".
```

comment ' separate inches from feet ' .

```
IF (ihmumn > 2.0 and ihmumn <4.99) ihmum2 = (ihmumn - 4.00) *100 .
EXECUTE .
```

```
IF (ihmumn >= 5.0 and ihmumn <5.99) ihmum2 = (ihmumn - 5.00) *100 .
EXECUTE .
```

```
IF (ihmumn >= 6.0 and ihmumn <6.99) ihmum2 = (ihmumn - 6.00) *100 .
EXECUTE .
VARIABLE LABELS ihmum2 "mother's height inches only".
```

comment ' take inches and divide into groups to make into cm - allowing for various factors ' .

comment ' ASSUMPTION MADE is that 5.10 = 5 feet 1 inch ' .

```
IF (ihmum2 <9.8) ihmum3 = 2.54*ihmum2.
EXECUTE .
```

```

IF ((ihmum2 >=9.8) AND (IHMUM2<10.98)) ihmum3 = 2.54 .
EXECUTE .
IF ((ihmum2 > 10.99) and (ihmum2<11.01))
ihmum3 = (2.54*ihmum2) .
EXECUTE .
IF ((ihmum2 > 14.99) and(ihmum2<15.01)) ihmum3 = 2.54*1.5 .
EXECUTE .
IF ((ihmum2 >16.99)and(ihmum2<17.01) ihmum3 = 2.54 .
EXECUTE .
IF ((ihmum2>19.99) and (ihmum2 <20.01)) ihmum3 = 2.54*2 .
EXECUTE .
IF ((ihmum2>24.99) and (ihmum2<25.01)) ihmum3 = 2.54*2.5 .
EXECUTE .
IF ((ihmum2>26.99) and (ihmum2<27.01)) ihmum3 = 2.54*2 .
EXECUTE .
IF ((ihmum2>29.99) and (ihmum2<30.01)) ihmum3 = 2.54*3 .
EXECUTE .
IF ((ihmum2>34.99) and (ihmum2<35.01)) ihmum3 = 2.54*3.5 .
EXECUTE .
IF ((ihmum2>39.99) and (ihmum2<40.01)) ihmum3 = 2.54*4 .
EXECUTE .
IF ((ihmum2>44.99) and (ihmum2<45.01)) ihmum3 = 2.54*4.5 .
EXECUTE .
IF ((ihmum2>49.99) and (ihmum2<50.01)) ihmum3 = 2.54*5 .
EXECUTE .
IF ((ihmum2>54.99) and (ihmum2<55.01)) ihmum3 = 2.54*5.5 .
EXECUTE .
IF ((ihmum2>59.99) and (ihmum2<60.01)) ihmum3 = 2.54*6 .
EXECUTE .
IF ((ihmum2>64.99) and (ihmum2<65.01)) ihmum3 = 2.54*6.5 .
EXECUTE .
IF ((ihmum2>69.99) and (ihmum2<70.01)) ihmum3 = 2.54*7 .
EXECUTE .
IF ((ihmum2>74.99) and (ihmum2<75.01)) ihmum3 = 2.54*7.5 .
EXECUTE .
IF ((ihmum2>79.99) and (ihmum2<80.01)) ihmum3 = 2.54*8 .
EXECUTE .
IF ((ihmum2>84.99) and (ihmum2<85.01)) ihmum3 = 2.54*8.5 .
EXECUTE .
IF ((ihmum2>89.99) and (ihmum2<90.01)) ihmum3 = 2.54*9 .
EXECUTE .
IF ((ihmum2>94.99) and (ihmum2<95.01)) ihmum3 = 2.54*9.5 .
EXECUTE .
VARIABLE LABELS ihmum3 "Mother's height - inches to cm".
EXECUTE .
      COMPUTE ihmum4 = ihmum1+ihmum3 .
EXECUTE .
VARIABLE LABELS ihmum4 'Mother's height - final cm for those in feet and inches' .
EXECUTE .

      comment ' create new variables ' .

DO IF (missing (hmumfin)) .
      compute hmumfin = ihmum4 .
END IF .
EXECUTE .

```



```

RECODE
  ihmumn
  (MISSING=Copy) INTO hmumfin .
  missing values hmumfin (-6,-8,-9).
VARIABLE LABELS hmumfin 'mother's height in cm'.
EXECUTE .

```

Variable name: hdadfin

```

COMPUTE ihdadn = ihdad / 100 .
EXECUTE .
DO IF (MISSING(ihdad)) .
RECODE
  ihdad
  (MISSING=Copy) INTO ihdadn .
  missing values ihdadn (-6,-8,-9).
END IF .
EXECUTE .

```

```

IF ((ihdadn >0) and (ihdadn < 2.0 )) hdadfin = (ihdadn *100) .
EXECUTE .
RECODE
  ihdadn
  (MISSING=Copy) INTO hdadfin .
  missing values hdadfin (-6,-8,-9).
EXECUTE .

```

```

IF (ihdadn > 2.0 and ihdadn <4.99999999) ihdad1 = (4*30.48) .
EXECUTE .
IF (ihdadn >= 5.0 and ihdadn <5.99999999) ihdad1 = (5*30.48) .
EXECUTE .
IF (ihdadn >= 6.0 and ihdadn <6.99999999) ihdad1 = (6*30.48) .
EXECUTE .
VARIABLE LABELS ihdad1 "father's height feet only".

```

comment ' separate inches from feet ' .

```

IF (ihdadn > 2.0 and ihdadn <4.99) ihdad2 = (ihdadn - 4.00) *100 .
EXECUTE .
IF (ihdadn >= 5.0 and ihdadn <5.99) ihdad2 = (ihdadn - 5.00) *100 .
EXECUTE .
IF (ihdadn >= 6.0 and ihdadn <6.99) ihdad2 = (ihdadn - 6.00) *100 .
EXECUTE .
VARIABLE LABELS ihdad2 "father's height inches only".

```

comment ' take inches and divide into groups to make into cm - allowing for various factors ' .

comment ' ASSUMPTION MADE is that 5.10 = 5 feet 1 inch ' .

```

IF (ihdad2 <9.8) ihdad3 = 2.54*ihdad2.
EXECUTE .

```

```

IF ((ihdad2 >=9.8) AND (IHdad2<10.98)) ihdad3 = 25.4 .
EXECUTE .
IF ((ihdad2 > 10.99) and (ihdad2<11.01)) ihdad3 = (2.54*ihdad2) .
EXECUTE .
IF ((ihdad2 > 14.99) and(ihdad2<15.01)) ihdad3 = 2.54*1.5 .
EXECUTE .
IF ((ihdad2 >16.99)and(ihdad2<17.01)) ihdad3 = 2.54 .
EXECUTE .
IF ((ihdad2>19.99) and (ihdad2 <22.01)) ihdad3 = 2.54*2 .
EXECUTE .
IF ((ihdad2>24.99) and (ihdad2<25.01)) ihdad3 = 2.54*2.5 .
EXECUTE .
IF ((ihdad2>26.99) and (ihdad2<27.01)) ihdad3 = 2.54*2 .
EXECUTE .
IF ((ihdad2>29.99) and (ihdad2<30.01)) ihdad3 = 2.54*3 .
EXECUTE .
IF ((ihdad2>34.99) and (ihdad2<35.01)) ihdad3 = 2.54*3.5 .
EXECUTE .
IF ((ihdad2>39.99) and (ihdad2<40.01)) ihdad3 = 2.54*4 .
EXECUTE .
IF ((ihdad2>44.99) and (ihdad2<45.01)) ihdad3 = 2.54*4.5 .
EXECUTE .
IF ((ihdad2>49.99) and (ihdad2<50.01)) ihdad3 = 2.54*5 .
EXECUTE .
IF ((ihdad2>54.99) and (ihdad2<55.01)) ihdad3 = 2.54*5.5 .
EXECUTE .
IF ((ihdad2>59.99) and (ihdad2<60.01)) ihdad3 = 2.54*6 .
EXECUTE .
IF ((ihdad2>64.99) and (ihdad2<65.01)) ihdad3 = 2.54*6.5 .
EXECUTE .
IF ((ihdad2>69.99) and (ihdad2<70.01)) ihdad3 = 2.54*7 .
EXECUTE .
IF ((ihdad2>74.99) and (ihdad2<75.01)) ihdad3 = 2.54*7.5 .
EXECUTE .
IF ((ihdad2>79.99) and (ihdad2<80.01)) ihdad3 = 2.54*8 .
EXECUTE .
IF ((ihdad2>84.99) and (ihdad2<85.01)) ihdad3 = 2.54*8.5 .
EXECUTE .
IF ((ihdad2>89.99) and (ihdad2<90.01)) ihdad3 = 2.54*9 .
EXECUTE .
IF ((ihdad2>94.99) and (ihdad2<95.01)) ihdad3 = 2.54*9.5 .
EXECUTE .
VARIABLE LABELS ihdad3 "father's height - inches to cm".
EXECUTE .
      COMPUTE ihdad4 = ihdad1+ihdad3 .
EXECUTE .
VARIABLE LABELS ihdad4 'father's height - final cm for those in feet and inches' .
EXECUTE .

```

comment ' create new variables ' .

```
IF ((ihdad2 >=9.8) AND (IHdad2<10.98)) hdadfin = ihdad4 .
EXECUTE .
DO IF (missing (hdadfin)) .
    compute hdadfin = ihdad4 .
END IF .
EXECUTE .

RECODE
  ihdadn
  (MISSING=Copy) INTO hdadfin .
  missing values hdadfin (-6,-8,-9).
VARIABLE LABELS hdadfin 'father's height in cm'.
EXECUTE .
```

## Figure J.11 Physical activity derived variables

**N.B.** SPSS derived variables for diary days 1 to 7 begin with the letters M, T, W, Th, F, S and Sn\* as if they refer to the days of the week, Monday to Sunday. This labelling convention is used ONLY for ease of reference. It should be noted that the data do not refer to a specific day of the week. For day of the week see variables Day1 to Day7 (code 1 = Monday etc.).

N.B. see Figure 4.24 for annotated page of diary giving variable labels.

Variable label	Description
<u>Blaise variables from SIR</u>	
Day1 to Day7	Code 1 = Monday .. code 7 = Sunday
PA[1..7]Res[0..9]	VARIABLE FORMAT: PA[day 1 to 7]Res[up to 10 activities per day] At this variable the code number for the activity is entered
PA[1..7]Hour[0..9]	Hours spent in activity of code number entered at PA*Res*
PA[1..7]Mins[0..9]	Minutes spent in activity of code number entered at PA*Res*
PA[1..7]More[0..9]	Whether the interviewer needs to code another activity for the day (1=Yes; 2=No)
<u>SPSS derived variables</u>	
<b>Pactwgt</b>	<b>Weight</b> for differential sampling probability plus differential non-response. See Figure 4.15.
<b>Pactswgt</b>	<b>Scaled weight.</b> See Figure 4.15.
PActind	Indicator of whether there is data for a full 7-day physical activity diary; 1=diary, 0=no diary. Relates to diary sample - young people aged 7 to 18 years. Select on PActind=1 to do analysis on valid physical activity diary cases only (N=1424).
PCAllind	Indicator of whether there is data on sleep and time spent watching TV; 1=data, 0=no data. Relates to all young people aged 4 to 18 years. Select on PCAllind=1 to do analysis on valid sleep and TV cases only (N=1788).
*Sleep	Total minutes asleep for the day, for days 1 to 7. Includes sleep between midnight last night until get up today <u>plus</u> from go to bed tonight until midnight tonight.
*Act[1..37]	Minutes spent in each of the pre-coded activities (1 to 37) for days 1 to 7.
*Step1A	Minutes spent in precoded moderate intensity activities for the day, days 1 to 7.
*Step2A	Minutes spent in precoded vigorous intensity activities for the day, days 1 to 7.
*Step3A	Minutes spent in very vigorous activities from the precoded list for the day, days 1 to 7.
*Step1	Total minutes spent in moderate intensity activity for the day, days 1 to 7. Includes precoded activities, school and work.
*Step2	Total minutes spent in vigorous intensity activity for the day, days 1 to 7. Includes precoded activities, school and work.
*Step3	Total minutes spent in very vigorous intensity activity for the day, days 1 to 7. Includes precoded activities, school and work.
*Step4	Total minutes spent in very light activity for the day, days 1 to 7. This includes 330 minutes (constant if young person was at school and time spent watching TV, playing video games etc.
*Step6	Total minutes spent in light activity for the day, days 1 to 7. This is calculated by subtracting *Step1,2,3,4 and *Sleep from 1440 minutes.
*Total	Total hours spent multiplied by MET value for level of activity for each day, days 1 to 7.
*Count	Number of activities on each diary day.
<b>Blair</b>	<b>Calculated Activity Score (CAS)</b> according to method developed by Blair (1984). For further details see Appendix E. This is calculated by taking the average of the *Total variables.

Variable label	Description
ZZWeek ZZDay	Total number of hours spent sleeping over full 7 days. Average number of hours spent sleeping per day.
TVWeek TVDay	Total number of hours spent watching TV, playing computer games and listening to music over full 7 days. Average number of hours spent watching TV, playing computer games and listening to music per day.
NoDay	Number of days on which the young person participated in an activity of at least moderate intensity (required for comparison with Health Survey data).
ActMW ActVW	Total number of listed activities of moderate intensity over full 7 days. Total number of listed activities of vigorous and very vigorous intensity over full 7 days.
<b>ActWeek</b>	<b>Total number of listed activities 1..37 in which the young person participated over the full 7 days</b> (=sum of *Count variables)
ActDay	Average number of listed activities 1..37 in which the young person participated per day (=ActWeek/7)**
HourSE	Total hours in week spent in sport and exercise - from list of activities 1..11, 14..19, 21..24
HourAP	Total hours in week spent in active play - from list of activities 12..13
HourWik	Total hours in week spent walking - from list of activities 20
HourHG	Total hours in week spent cleaning room, gardening etc - from list of activities 25
HourOth	Total hours in week spent in other activities - from list of activities 26..37
HourMod	Total hours in week spent in all moderate intensity activities on list
HourVig	Total hours in week spent in all vigorous and very vigorous intensity activities on list
HourWek <b>HourDay</b>	Total hours in week spent in all activities on list 1..37 <b>Average hours per day spent in all activities on list 1..37</b> (=HourWek/7)
SWWeek SWWeekg	Intermediate variable required in the calculation of SWWeekg Whether young person attended: 1 'No school or work' 2 'School only' 3 'School and work' 4 'Work only' during the record-keeping period

\* Where diary day is 1, \* = M and so on until for diary day 7, \*=Sn.

\*\* Where the young person took part in the same activity more than once on the same day, this was recorded as one activity.

## Figure J.12 SPSS syntax for calculated activity score (CAS)

See Figure 4.24 for an annotated copy of a physical activity diary page giving variable and value labels. See Figure J.11 for a detailed list of the derived variables relating to physical activity. This section gives the SPSS syntax to calculate the intermediate variables necessary to create the calculated activity score for one example day, followed by the syntax for the overall calculation of the score using the data for the full 7 days.

### Example day - Day One: intermediate derived variables for the calculated activity score

**comment** ' This section calculates the total minutes spent sleeping for Day One' .

Clear transformations.

DO IF ( (Many = 7) and ((Beda1 >= 12) AND (Beda2 >= 12)) ).

COMPUTE MSleep = ( ((UpA1 \* 60) + UpB1)  
+ (1440 - ((Beda2 \* 60) + Bedb2)) ).

**Comment** 'a: MINUTES ASLEEP midnight last night until get up today and go to bed tonight until midnight' .

ELSE IF ( (Many = 7) and ((Beda1 < 12) AND (Beda2 < 12)) ).

COMPUTE MSleep = ( ((UpA1 \* 60) + UpB1) -  
((Beda1 \* 60) + Bedb1)  
).

**Comment** 'b: MINUTES ASLEEP midnight until get up minus hours midnight to when went to bed . didn't go to bed til tomorrow' .

ELSE IF ( (Many = 7) and ((Beda1 <12) AND (Beda2 >=12)) ).

COMPUTE MSleep = ( (((UpA1 \* 60) + UpB1) -  
((Beda1 \* 60) + Bedb1))  
+  
(1440 - ((Beda2 \* 60) + Bedb2))  
).

**Comment** 'c: MINUTES ASLEEP last night midnight until get up minus hours midnight to when went to bed + tonight go to bed until midnight ' .

ELSE IF ( (Many = 7) and ((Beda1 >= 12) AND (Beda2 < 12)) ).

COMPUTE MSleep = ( (UpA1 \* 60) + UpB1  
).

**Comment** 'd: MINUTES ASLEEP last night midnight until get up. didn't sleep until tomorrow ' .

ELSE .

COMPUTE MSleep = -9 .

END IF .

EXECUTE .

```
DO IF (Missing (MSleep)) .  
    COMPUTE MSleep = -9 .  
END IF .  
EXECUTE .
```

```
MISSING VALUES MSleep (-9).  
EXECUTE .
```

```
VARIABLE LABELS MSleep 'Time spent asleep Day 1' .  
EXECUTE .
```

```
comment ' Time spent in each activity ' .
```

```
comment ' a: Time spent set to zero for each activity [1..37] ' .
```

```
COMPUTE MAct1 = 0 .  
COMPUTE MAct2 = 0 .  
COMPUTE MAct3 = 0 .  
COMPUTE MAct4 = 0 .  
COMPUTE MAct5 = 0 .  
COMPUTE MAct6 = 0 .  
COMPUTE MAct7 = 0 .  
COMPUTE MAct8 = 0 .  
COMPUTE MAct9 = 0 .  
COMPUTE MAct10 = 0 .  
COMPUTE MAct11 = 0 .  
COMPUTE MAct12 = 0 .  
COMPUTE MAct13 = 0 .  
COMPUTE MAct14 = 0 .  
COMPUTE MAct15 = 0 .  
COMPUTE MAct16 = 0 .  
COMPUTE MAct17 = 0 .  
COMPUTE MAct18 = 0 .  
COMPUTE MAct19 = 0 .  
COMPUTE MAct20 = 0 .  
COMPUTE MAct21 = 0 .  
COMPUTE MAct22 = 0 .  
COMPUTE MAct23 = 0 .  
COMPUTE MAct24 = 0 .  
COMPUTE MAct25 = 0 .  
COMPUTE MAct26 = 0 .  
COMPUTE MAct27 = 0 .  
COMPUTE MAct28 = 0 .  
COMPUTE MAct29 = 0 .  
COMPUTE MAct30 = 0 .  
COMPUTE MAct31 = 0 .  
COMPUTE MAct32 = 0 .  
COMPUTE MAct33 = 0 .  
COMPUTE MAct34 = 0 .  
COMPUTE MAct35 = 0 .  
COMPUTE MAct36 = 0 .  
COMPUTE MAct37 = 0 .  
EXECUTE .
```

comment 'b: activity one ' .

**N.B. to complete the calculation, the following set of COMPUTES must be carried out for pa1res0 to pa1res9 (only the calculations for pa1res0 are shown here). For each diary day the interviewer was able to enter up to 10 activities (pa\*res0 to pa\*res9; the feasibility study had shown that no respondent entered more than 4 or 5 activities per day). For each activity they were asked to key the activity code number [1..37] and the hours and/or minutes spent in the activity for the day. This section transforms this data into the total minutes spent in each activity by code number [1..37] for the day; for each activity in which the young person did not participate, the variable remains at zero (see previous section).**

```
DO IF ( pa1res0 = 1 ) .  
    COMPUTE MAct1 = ( MAct1 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct1 = ( MAct1 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 2) .  
    COMPUTE MAct2 = ( MAct2 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct2 = ( MAct2 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 3) .  
    COMPUTE MAct3 = ( MAct3 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct3 = ( MAct3 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 4) .  
    COMPUTE MAct4 = ( MAct4 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct4 = ( MAct4 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 5) .  
    COMPUTE MAct5 = ( MAct5 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct5 = ( MAct5 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 6) .  
    COMPUTE MAct6 = ( MAct6 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct6 = ( MAct6 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 7) .  
    COMPUTE MAct7 = ( MAct7 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct7 = ( MAct7 + 0 ) .  
END IF.
```

```
DO IF (pa1res0 = 8) .  
    COMPUTE MAct8 = ( MAct8 + ((pa1hour0 * 60) + pa1mins0) ) .  
ELSE .  
    COMPUTE MAct8 = ( MAct8 + 0 ) .  
END IF.
```



```

DO IF (pa1res0 = 9) .
    COMPUTE MAct9 = ( MAct9 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct9 = ( MAct9 + 0 ) .
END IF.

DO IF (pa1res0 = 10) .
    COMPUTE MAct10 = ( MAct10 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct10 = ( MAct10 + 0 ) .
END IF.

DO IF (pa1res0 = 11) .
    COMPUTE MAct11 = ( MAct11 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct11 = ( MAct11 + 0 ) .
END IF.

DO IF (pa1res0 = 12) .
    COMPUTE MAct12 = ( MAct12 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct12 = ( MAct12 + 0 ) .
END IF.

DO IF (pa1res0 = 13) .
    COMPUTE MAct13 = ( MAct13 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct13 = ( MAct13 + 0 ) .
END IF.

DO IF (pa1res0 = 14) .
    COMPUTE MAct14 = ( MAct14 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct14 = ( MAct14 + 0 ) .
END IF.

DO IF (pa1res0 = 15) .
    COMPUTE MAct15 = ( MAct15 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct15 = ( MAct15 + 0 ) .
END IF.

DO IF (pa1res0 = 16) .
    COMPUTE MAct16 = ( MAct16 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct16 = ( MAct16 + 0 ) .
END IF.

DO IF (pa1res0 = 17) .
    COMPUTE MAct17 = ( MAct17 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct17 = ( MAct17 + 0 ) .
END IF.

DO IF (pa1res0 = 18) .
    COMPUTE MAct18 = ( MAct18 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct18 = ( MAct18 + 0 ) .
END IF.

```

```

DO IF (pa1res0 = 19) .
    COMPUTE MAct19 = ( MAct19 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct19 = ( MAct19 + 0 ) .
END IF.

DO IF (pa1res0 = 20) .
    COMPUTE MAct20 = ( MAct20 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct20 = ( MAct20 + 0 ) .
END IF.

DO IF (pa1res0 = 21) .
    COMPUTE MAct21 = ( MAct21 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct21 = ( MAct21 + 0 ) .
END IF.

DO IF (pa1res0 = 22) .
    COMPUTE MAct22 = ( MAct22 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct22 = ( MAct22 + 0 ) .
END IF.

DO IF (pa1res0 = 23) .
    COMPUTE MAct23 = ( MAct23 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct23 = ( MAct23 + 0 ) .
END IF.

DO IF (pa1res0 = 24) .
    COMPUTE MAct24 = ( MAct24 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct24 = ( MAct24 + 0 ) .
END IF.

DO IF (pa1res0 = 25) .
    COMPUTE MAct25 = ( MAct25 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct25 = ( MAct25 + 0 ) .
END IF.

DO IF (pa1res0 = 26) .
    COMPUTE MAct26 = ( MAct26 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct26 = ( MAct26 + 0 ) .
END IF.

DO IF (pa1res0 = 27) .
    COMPUTE MAct27 = ( MAct27 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct27 = ( MAct27 + 0 ) .
END IF.

DO IF (pa1res0 = 28) .
    COMPUTE MAct28 = ( MAct28 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct28 = ( MAct28 + 0 ) .
END IF.

```

```

DO IF (pa1res0 = 29) .
    COMPUTE MAct29 = ( MAct29 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct29 = ( MAct29 + 0 ) .
END IF.

DO IF (pa1res0 = 30) .
    COMPUTE MAct30 = ( MAct30 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct30 = ( MAct30 + 0 ) .
END IF.

DO IF (pa1res0 = 31) .
    COMPUTE MAct31 = ( MAct31 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct31 = ( MAct31 + 0 ) .
END IF.

DO IF (pa1res0 = 32) .
    COMPUTE MAct32 = ( MAct32 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct32 = ( MAct32 + 0 ) .
END IF.

DO IF (pa1res0 = 33) .
    COMPUTE MAct33 = ( MAct33 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct33 = ( MAct33 + 0 ) .
END IF.

DO IF (pa1res0 = 34) .
    COMPUTE MAct34 = ( MAct34 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct34 = ( MAct34 + 0 ) .
END IF.

DO IF (pa1res0 = 35) .
    COMPUTE MAct35 = ( MAct35 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct35 = ( MAct35 + 0 ) .
END IF.

DO IF (pa1res0 = 36) .
    COMPUTE MAct36 = ( MAct36 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct36 = ( MAct36 + 0 ) .
END IF.

DO IF (pa1res0 = 37) .
    COMPUTE MAct37 = ( MAct37 + ((pa1hour0 * 60) + pa1mins0) ) .
ELSE .
    COMPUTE MAct37 = ( MAct37 + 0 ) .
END IF.

```

**comment ' calculating minutes spent in moderate, vigorous and very vigorous activity '.**

**comment ' a: minutes spent in moderate intensity precoded activities ' .**

```
DO IF (Many = 7) .  
    COMPUTE MStep1a = (MAct1 + MAct4 + MAct5 + MAct6 + MAct9  
                      + MAct10 + MAct11 + MAct12 + MAct13 + MAct16  
                      + MAct19 + MAct20 + MAct24 + MAct25 + MAct32  
                      + MAct33 + MAct34 + MAct35 + MAct36 + MAct37) .  
ELSE .  
    COMPUTE MStep1a = -9 .  
END IF .  
EXECUTE .
```

**comment ' b: minutes spent in vigorous intensity precoded activities ' .**

```
DO IF (Many = 7) .  
    COMPUTE MStep2a = (MAct2 + MAct3 + MAct7 + MAct8 + MAct17  
                      + MAct18 + MAct21 + MAct22 + MAct23 + MAct26  
                      + MAct27 + MAct28 + MAct29 + MAct30 + MAct31) .  
ELSE .  
    COMPUTE MStep2a = -9 .  
END IF .  
EXECUTE .
```

**comment ' c: minutes spent in very vigorous intensity precoded activities ' .**

```
DO IF (Many = 7) .  
    COMPUTE MStep3a = (MAct14 + MAct15) .  
ELSE .  
    COMPUTE MStep3a = -9 .  
END IF .  
EXECUTE .
```

**comment ' d: total minutes spent in moderate intensity activity including school and work ' .**

```
DO IF ((Many = 7) and (agepact1 <= 2) AND (SCH1 = 2) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 <= 2) AND (SCH1 = 1) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 1) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many=7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 2) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 3) ) .  
    COMPUTE MStep1 = ( MStep1a + ((Worka1*60)+ workb1) ) .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 2) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 1) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 2) ) .  
    COMPUTE MStep1 = MStep1a .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 3) ) .  
    COMPUTE MStep1 = ( MStep1a + ((Worka1*60)+ workb1) ) .  
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 2) ) .  
    COMPUTE MStep1 = MStep1a .
```

```

ELSE .
        COMPUTE MStep1 = -9 .
END IF.
EXECUTE .

```

**comment** ' e: total minutes spent in vigorous intensity activity including school and work '.

```

DO IF ((Many = 7) and (agepact1 <= 2)AND (SCH1 = 2) ) .
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7) and (agepact1 <= 2)AND (SCH1 = 1) ) .
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 1) ).
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many=7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 2) ).
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 3) ).
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 2) ) .
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 1) ) .
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 2) ).
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 3) ) .
        COMPUTE MStep2 = MStep2a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 2) ) .
        COMPUTE MStep2 = MStep2a .
ELSE .
        COMPUTE MStep2 = -9 .
END IF.
EXECUTE .

```

**comment** ' f: total minutes spent in very vigorous intensity activity including school and work '.

```

DO IF ((Many = 7) and (agepact1 <= 2)AND (SCH1 = 2) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7) and (agepact1 <= 2)AND (SCH1 = 1) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 1) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many=7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 2) ).
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 3) ).
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 2) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 1) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 2) ).
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 3) ) .
        COMPUTE MStep3 = MStep3a .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 2) ) .
        COMPUTE MStep3 = MStep3a .

```

```

ELSE .
      COMPUTE MStep3 = -9 .
END IF .
EXECUTE .

```

**comment** ' g: total minutes spent in very light intensity activity including school and work '.

```

DO IF ((Many = 7) and (agepact1 <= 2) AND (SCH1 = 2) ) .
      COMPUTE MStep4 = ((TVa1*60) + TVb1) .
ELSE IF ((Many = 7) and (agepact1 <= 2) AND (SCH1 = 1) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1) + 330).
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 1) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1) + ((Worka1*60)+ workb1) ) .
ELSE IF ((Many=7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 2) ) .
      COMPUTE MStep4 = ((TVa1*60) + TVb1) .
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 1) and (WorkCat1 = 3) ) .
      COMPUTE MStep4 = ((TVa1*60) + TVb1) .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 2) and (Work1 = 2) ) .
      COMPUTE MStep4 = ((TVa1*60) + TVb1) .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 1) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1)+ ((Worka1*60)+ workb1) + 330).
ELSE IF ((Many = 7) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 2) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1) + 330 ) .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 1) and (workcat1 = 3) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1) + 330 ) .
ELSE IF ((Many = 7 ) and (agepact1 > 2) and (Sch1 = 1) and (Work1 = 2) ) .
      COMPUTE MStep4 = ( ((TVa1*60) + TVb1) + 330 ) .
ELSE .
      COMPUTE MStep4 = -9 .
END IF .
EXECUTE .

```

**comment** ' h: total minutes spent in light intensity activity including school and work '.

```

DO IF ((agepact1 > 1) and (Many =7)) .
      COMPUTE MStep6 = (1440 - (MSleep + MStep1 + MStep2 + MStep3 + MStep4)) .
ELSE IF ((agepact1 > 1) and (not(Many =7)) ) .
      COMPUTE MStep6 = -9 .
ELSE .
      COMPUTE MStep6=-9 .
END IF .
EXECUTE .

```

```

DO IF (missing (MStep6)) .
      COMPUTE MStep6 = -9 .
END IF .
EXECUTE .

```

```

DO IF (not(Many = 7)) .
      COMPUTE MStep6 = -9 .
END IF .
EXECUTE .

```

```
DO IF (agepact1 = 1) .
    COMPUTE MStep6 = -9 .
END IF .
EXECUTE .
```

**comment** ' i: missing values and variable labels ' .

```
missing values Mstep1 (-9).
missing values Mstep2 (-9).
missing values Mstep3 (-9).
missing values Mstep4 (-9).
missing values Mstep6 (-9).
EXECUTE .
```

```
VARIABLE LABELS MStep1 'Time spent in moderate activities Day 1' .
VARIABLE LABELS MStep2 'Time spent in vigorous activities Day 1' .
VARIABLE LABELS MStep3 'Time spent in very vigorous activities Day 1' .
VARIABLE LABELS MStep4 'Time spent in very light activities Day 1' .
VARIABLE LABELS MStep6 'Time spent in light activities Day 1' .
EXECUTE .
```

**comment** ' j: total hours for each intensity of activity multiplied by relevant MET value'.

```
DO IF ((agepact1 >1) and (Many = 7)) .
    COMPUTE MTtotal = ( (MSleep/60) +((MStep4/60) * 1.5) + ((MStep6/60) * 2.5) +
        ((MStep1/60) * 4.0) + ((MStep2/60) * 6.0) + ((MStep3/60) * 10.0)
    ) .
ELSE IF ((agepact1>1) and (not(Many=7))) .
    COMPUTE MTtotal = -9 .
ELSE .
    COMPUTE MTtotal = -9 .
END IF .
EXECUTE .
```

```
DO if (agepact1 = 1) .
    COMPUTE MTtotal = -9 .
END IF .
EXECUTE .
```

```
DO if (missing (mtotal)) .
    COMPUTE MTtotal = -9 .
END IF .
EXECUTE .
```

```
missing values MTtotal (-9).
EXECUTE .
```

```
VARIABLE LABELS MTtotal 'Total for the day multiplied by METS' .
EXECUTE .
```

**Calculated activity score: using data for all seven days**

**comment ' calculated activity [Blair] score total ' .**

```
DO IF (agepact1 =1) .  
    COMPUTE Blair = -9 .  
ELSE IF ((AGEpact1 >1) and (not (MTotal=-9)) ) .  
    COMPUTE Blair = ((MTotal + TTotal + WTotal + ThTotal + FTtotal + STtotal + SnTotal)/7) .  
ELSE IF ((AGEpact1 >1) AND (MTotal = -9)) .  
    COMPUTE Blair = -9 .  
ELSE .  
    COMPUTE Blair = -9 .  
END IF .  
EXECUTE .
```

```
RECODE  
    Blair (MISSING=-9) .  
    missing values Blair (-9).  
EXECUTE .
```

```
VARIABLE LABELS Blair 'Blair score 7 to 18 years' .
```

```
RECODE  
    Blair  
    (10 thru 70=1) (ELSE=0) INTO Pactind .  
VARIABLE LABELS Pactind 'Pact indicator'.  
EXECUTE .
```



**Figure J.13 SPSS derived variable: whether young person was at school or work during the dietary recording period**

Variable name: schweek

```
DO IF (sch1=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch2=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch3=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch4=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch5=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch6=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (sch7=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (work1=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (work2=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (work3=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (work4=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .  
DO IF (work5=1) .  
    COMPUTE schweek = 1 .  
END IF .  
EXECUTE .
```

```

DO IF (work6=1) .
    COMPUTE schweek = 1 .
END IF .
EXECUTE .
DO IF (work7=1) .
    COMPUTE schweek = 1 .
END IF .
EXECUTE .

RECODE
  schweek (MISSING=2) .
EXECUTE .

VARIABLE LABELS schweek 'Is this a school or working week or a holiday? .
VALUE LABELS schweek 1 'School or work' 2 'Holiday' .
EXECUTE .

```

Variable name: swweek

```

COMPUTE swweek = 0 .

DO IF (work1=1) .
    COMPUTE swweek = 1 .
END IF .
EXECUTE .
DO IF (work2=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .
DO IF (work3=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .
DO IF (work4=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .
DO IF (work5=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .
DO IF (work6=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .
DO IF (work7=1) .
    COMPUTE swweek = swweek + 1 .
END IF .
EXECUTE .

DO IF (sch1=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .

```

```

DO IF (sch2=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .
DO IF (sch3=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .
DO IF (sch4=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .
DO IF (sch5=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .
DO IF (sch6=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .
DO IF (sch7=1) .
    COMPUTE swweek = swweek + 10 .
END IF .
EXECUTE .

```

```

VARIABLE LABELS swweek 'Is this a school or working week or a holiday? .
VALUE LABELS swweek 0 'No school or work' .
EXECUTE .

```

Variable name: swweekg

```

RECODE
  swweek
  (0=1) (10=2) (20=2) (30=2) (40=2) (50=2) (60=2) (70=2) (0.01 thru 9.99=4)
  (ELSE=3) INTO swweekg .

```

```

VARIABLE LABELS swweekg 'grouped week'.
VALUE LABELS swweekg 1 'No school or work' 2 'School only' 3 'School and work' 4 'Work only'.
EXECUTE .

```

## Figure J.14 SPSS derived variables: specifications for blood and urine analytes

See Figures 4.25 and 4.26 for specifications for blood and urine variables. This section gives details of SPSS variables.

See Figure 4.15 for specifications for the weighting variables relating to the blood and urine data.

totptoc	total plasma tocopherol
tocchol	tocopherol : cholesterol ratio
bldate3	quarter of blood sample
nak	sodium to potassium ratio

### totptoc

total plasma tocopherol = plasma alpha-tocopherol plus plasma gamma-tocopherol

### tocchol

tocopherol to cholesterol ratio = total plasma tocopherol/plasma total cholesterol

### bldate3

bldate1 = date of blood sample transformed to seconds

bldate2 = month of blood sample

missing values all ( ).

```
do if (range (bldate2, 1.00, 3.00)).
compute bldate3 = 1.
else if (range (bldate2, 4.00, 6.00)).
compute bldate3 = 2.
else if (range (bldate2, 7.00, 9.00)).
compute bldate3 = 3.
else if (range (bldate2, 10.00, 12.00)).
compute bldate3 = 4.
else.
compute bldate3 = 9.
end if.
```

variable labels bldate3 'Qtr when blood sample taken'.

value labels bldate3 1 'Jan to March' 2 'April to June' 3 'July to Sept' 4 'Oct to Dec'.

### nak

sodium to potassium ratio = urinary sodium / urinary potassium

Appendix K

Multiple regression

## Appendix K Multiple regression

The substantive chapters of the Report present results from multiple regression analyses. These analyses were carried out in SPSS version 9.0 using the 'enter' method. In each analysis, age was always included as an independent variable and the regression analyses were run separately for boys and girls. For each regression the procedure was first run to identify any collinear variables. After excluding one from the pair of any collinear variables the procedure was run again. All the regression analyses were carried out using scaled weights for the dependent variable in the analysis<sup>2</sup> and, where necessary, the dependent variable was log transformed.

### 2.1 The multiple regression analysis method<sup>3</sup>

Most of the tables shown in the Report are based on bivariate analysis. These tables show the relationship between two reported or measured variables, for example, the proportion of young people living in different family types with different average daily intakes of protein. What such tables do not show, however, is how much other factors may interrelate with the independent variable; for example, how much age and sex interrelate with family type to explain variations in intakes.

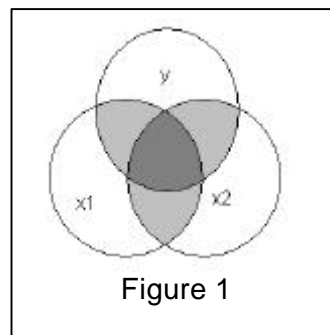


Figure 1 shows how each of the variables  $x_1$  and  $x_2$ , make an independent contribution to the dependent variable  $y$ , but that there is an area of  $x_1$  that overlaps with  $x_2$ . By carrying out a multiple regression analysis the overlap between  $x_1$  and  $x_2$  is eliminated, so that the contribution  $x_1$  makes to  $y$  can be measured after controlling for (eliminating) the overlapping contribution of  $x_2$ .

Multiple regression is a multivariate statistical technique that describes the relationship between one survey variable, the dependent variable, for example the systolic blood

pressure of the young person, and several other variables, the independent variables, for example age, sex and whether the young person was living with both parents. For example Table K.1(a) shows the results of regression where the dependent variable is the systolic blood pressure for a male aged between 4 and 18 years. The regression calculates a coefficient for each independent variable which quantifies the effect that a change in that variable will have on the predicted systolic blood pressure, leaving all other variables in the regression unchanged (see 2.3 below).

When running regression the interest is in testing whether, for a given model, there is a relationship between the dependent variable and the independent variables in the population. This is done by testing whether the coefficient for the independent variable is equal to zero. A variable is judged to be statistically different from zero if it is significant at the 95% level or above. This means that if there were no relationship in the population between the dependent and the independent variable, there would be a probability of 5% or less that the regression would have estimated a coefficient that was different from zero.

### **2.1.1 Assumptions for multiple regression analysis**

The technique of multiple regression requires a number of conditions of the data to be met or assumed; some are appropriate only to the analysis of particular types of dataset, for example time series, and are not presented here. The assumptions made in respect of the NDNS data for multiple regression analysis were as follows:

- *Linearity and normal distribution*

The technique of multiple regression calculates coefficients that describe linear relationships between variables and assume that the residuals (the difference between the actual value of the dependent variable and that predicted by the model) are normally distributed. If the residuals are not normally distributed, the significance tests will not be valid. In order to facilitate normally distributed residuals, where the NDNS data for any of the dependent variables included in the analysis were strongly skewed<sup>4</sup> they were transformed by taking the natural log (ln) before being added to the analysis model.

- *That the values for the independent variables in repeated samples are fixed*

Assumes that if multiple samples are drawn, an independent variable,  $x$ , will take the same values in each sample. Chapter 3 of the Report shows that for several of the socio-

demographic variables used in the multiple regression analysis, the NDNS sample gave comparable results to those found in other surveys.

- *Collinearity (or multicollinearity)*

The assumption that no two independent variables are close or exact linear combinations of one another. When two variables are strongly positively correlated (collinear), the standard errors will be inflated, making the significance tests misleading. In SPSS, the multiple regression analysis produces a Pearson correlation matrix and two 'collinearity statistics'; the *variance inflation factor* (VIF) and the *tolerance*. The *tolerance* of a variable is  $1/R_i^2$  where  $R_i$  is the multiple correlation coefficient when the  $i$ th independent variable is predicted from the other independent variables. The *VIF* is  $1/\textit{tolerance}$ . A value of 10 or more for the *VIF* indicates the presence of significant collinearity between the independent variable against which it appears and one or more of the other independent variables included in the model. The Pearson correlation coefficient matrix gives correlation coefficients for the relationship between each of the independent variables and is used to identify which are strongly correlated.

For each multiple regression analysis carried out, all of the independent variables considered important in explaining the dependent variable were included in an initial regression analysis. The output from this initial analysis identified independent variables with a *VIF* value of greater than 10, and the Pearson correlation matrix was used to show which variables were strongly correlated so that one or more could be excluded from the analysis. The decision which variable(s) to exclude from the regression analysis was made with reference to which might be the more important factor, either in terms of predictive value or in terms of policy relevance.

### **2.1.2 Preparing variables for multiple regression analysis**

In a multiple regression analysis the dependent variable must be continuous and the independent variables either continuous or dichotomous. Independent, categorical variables with more than two categories must be transformed into dichotomous ('dummy') variables before being included in the analysis.

For categorical variables with two categories the two possible 'dummy' variables are complementary, for example, for 'whether the young person was a current smoker' the two possible 'dummy' variables are:



current smoker? yes = 1, no = 0

current smoker? yes = 0, no = 1

The SPSS multiple regression program tests the independent variables for multicollinearity, as described above. Where there is a strong correlation between two variables, the statistics produced by the analysis are not valid and one of the collinear variables must be excluded. However, where there is an exact correlation between two variables, for example where two 'dummy' variables are complementary parts of the same variable, SPSS automatically excludes one from the analysis and uses it as the 'reference category'. For a dichotomous variable the regression coefficient gives the expected difference of being in one category (the category that takes the value 1) rather than the other (the category that takes the value 0).

For categorical variables with more than two categories dichotomous 'dummy' variables need to be created. For example, for region, with four categories, four dummy variables need to be created, each indicating whether or not the young person lived in one region. Thus the first 'dummy' variable is 'In Scotland' or 'Not in Scotland', the second 'In Northern region' or 'Not in Northern region', etc. If all four of the 'dummy' variables for region are included in the analysis, one is automatically treated as the reference category, and the unstandardised coefficients are interpreted with reference to that category. However, to provide correlation coefficients that can be interpreted as deviations from the average effect of all categories, it is necessary to use the 'enter' method for the procedure and to run two versions of each regression analysis.

For example for 'region' in the NDNS dataset two sets of 'dummy' variables were created with one (reference) category coded as -1, and one category excluded:

Set 1:

'Dummy' 1 = (Scotland = 1) (Northern = 0) (C, SW & Wales = 0) (London & South East=-1)

'Dummy' 2 = (Scotland = 0) (Northern = 1) (C, SW & Wales = 0) (London & South East=-1)

'Dummy' 3 = (Scotland = 0) (Northern = 0) (C, SW & Wales = 1) (London & South East=-1)

Set 2:

'Dummy' A = (Scotland = -1) (North = 1) (C, SW & Wales = 0) (London & South East=0)

'Dummy' B = (Scotland = -1) (North = 0) (C, SW & Wales = 1) (London & South East=0)

'Dummy' C = (Scotland = -1) (North = 0) (C, SW & Wales = 0) (London & South East=1)

Note that for the first set, the London and South East category is set to  $-1$  and there is no 'dummy' variable for London and the South East. In the second set Scotland is set to  $-1$  and there is no 'dummy' variable for Scotland. Any two categories could have been excluded.

The same procedure was used for all categorical variables for which there were more than two categories, producing two sets of 'dummy' variables that were run in two versions of the same multiple regression analysis. It is only necessary to run the regressions twice, no matter how many categorical variables are included. Where a 'dummy' variable appears in both versions of the analysis, the coefficients and standard errors are the same and the constant term has increased by the same amount. Having run both versions of the regression analysis, the results can be summarised in a single table.

## 2.2 The interpretation of statistics produced by multiple regression analysis

The constant is the predicted value of the dependent variable when all of the independent variables are held at zero.

The unstandardised coefficient ( $B$ ) quantifies the *effect* that a change in the independent variable will have on the dependent variable, *holding all other variables in the regression analysis constant*. This coefficient should not be used to indicate which independent variable is the best predictor of the dependent variable as the magnitude of the coefficients depends on the units in which the variables are measured.

The adjusted  $R^2$  is an assessment of the overall fit of the model and is interpreted as the percentage of the variance in the dependent variable that is explained by all of the independent variables included in the regression model. The adjusted  $R^2$  is used in place of the  $R^2$  because the number of variables in the model does not affect it.

The standardised coefficient ( $Beta$ ,  $b$ ) is standardised for the units of measurement of the independent variable. It shows what the relative effect of each independent variable would be if they were all measured using the same scale. It indicates which independent variable is the best predictor of the dependent variable, with the highest value being the best predictor.

SPSS also gives  $t$  values and significance levels identifying those variables where the regression coefficients are significantly related to the dependent variable after controlling the

effects of the other variables included in the analysis. The tables given in this Report show the significance level for each coefficient ( $p < 0.05$ ,  $p < 0.01$  or  $p < 0.001$ ). Unstandardised and standardised regression coefficients are only shown in the tables in the Report for variables significantly related to the dependent variable.

### **2.3 Predicting values from a multiple regression analysis**

For categorical variables the coefficients quantify the effect that having a particular characteristic will have on the dependent variable. For a dichotomous variable, the regression coefficient gives the expected difference of being in one category (the category that takes the value 1) rather than the other (the one that takes the value 0).

For categorical variables with more than two categories the constant plus the value of the unstandardised coefficient for the independent variable gives the predicted value of the dependent variable for someone with that characteristic, when the values of all the other independent variables in the regression analysis are set to zero.

For continuous variables the value of the coefficient represents the contribution to the dependent variable per unit of the independent variable. For example, for 'weight' this would be per kilogram, if the unit for the variable 'weight' was kilograms, or per gram, if the unit for the variable was grams. The coefficient is multiplied by the value of the continuous variable for which the prediction is being made before being added to the constant. For example, if weight = 50kg and the value of the unstandardised coefficient  $B = 0.45$ , then  $(0.45 \times 50)$  is added to the constant.

#### **2.3.1 A worked example**

(Taken from Chapter 11, Section 11.3.3 of the Report and Tables 11.15 to 11.18)

This example is given to show how, for boys, systolic blood pressure can be predicted from a multiple regression analysis where age, being a smoker, being unwell, diastolic blood pressure and body weight were all found to be statistically independently related to systolic blood pressure.

## *Characteristics independently associated with variation in blood pressure*

### *The method*

Multiple regression modelling was carried out to find out which combinations of socio-demographic, behavioural and physiological variables were independently associated with blood pressure for young people. Analyses were carried out separately for systolic and diastolic pressures and for boys and girls separately. Tables K.1 to K.4 show the regression coefficients from the regression models for the variables that were entered into the models and found to be significant ( $p < 0.05$ ,  $p < 0.01$  and  $p < 0.001$ ).

The technique of multiple regression calculates coefficients based on the number of cases for which there are valid values for all the variables included in the analysis. Among the behavioural variables of interest was physical activity level, as indicated by the calculated activity level score. However this was only derived for young people aged 7 to 18 years who completed a full 7-day physical activity diary, a total of 711 boys and 713 girls; young people aged 4 to 6 years did not keep physical activity diaries (see *Section 2.5.1*). Additionally for boys, the effect of blood testosterone level on blood pressures was of interest. Blood testosterone concentration was only measured for boys aged 10 to 16 years who provided a blood sample, a total of 260 boys (see *Chapter 12 of the Report*). Including physical activity score and, in the analysis for boys, blood testosterone level, in a single regression would therefore markedly reduce the number of cases available for analysis. It was therefore decided that a number of separate analyses should be run:

for boys:

- all boys aged 4 to 18 years, *excluding* physical activity score and blood testosterone level - Tables K.1(a) and K.3(a);
- all boys aged 7 to 18 years, *including* physical activity score, but *excluding* blood testosterone level - Tables K.1(b) and K.3(b);
- all boys aged 10 to 16 years, *including* physical activity score and blood testosterone level - Tables K.1(c) and K.3(c);

for girls:

- all girls aged 4 to 18 years, *excluding* physical activity level - Tables K.2(a) and K.4(a);
- all girls aged 7 to 18 years, *including* physical activity level. - Tables K.2(b) and K.4(b).

Except for those analyses that included blood testosterone level, the regression analyses were after weighting for differential sampling probabilities and differential non-response. The analyses for boys that included blood testosterone level were not weighted (see *Chapter 12; Section 12.1.2 of the Report*)<sup>6</sup>.

The regression coefficients show the amount by which a factor increased or decreased the blood pressure once all the other factors in the model were taken into account. Thus the coefficients can be used to estimate the blood pressure for young people with particular characteristics by adding the unstandardised coefficients for each relevant characteristic to the constant calculated by the model.

For example, from Table K.1(a), a male aged 16 years, who currently smoked, was unwell and his eating was affected during the dietary recording period, with a diastolic blood pressure of 56 mmHg and a body weight 69.5 kg would have a predicted systolic blood pressure of:

$$65.96 + (0.34 \times 16) + 2.96 - 1.94 + (0.46 \times 56) + (0.29 \times 69.5) = 118 \text{ mmHg}$$

where:

- 65.96 (constant)
- + 0.34 (per year age)
- +2.96 (current smoker)
- 1.94 (unwell and eating affected)
- +0.46 (per mmHg diastolic pressure)
- +0.29 (per kilo weight)

#### *Findings: systolic blood pressure*

It can be seen from Table K.1(a) that for boys aged 4 to 18 years there were very few significant associations between systolic blood pressure and the socio-demographic variables included in the analyses. Overall for boys the most significant associations with systolic blood pressure were with the physiological measurements included in the analysis, that is with diastolic blood pressure and weight (both:  $p < 0.001$ ). Age was also independently related to systolic blood pressure ( $p < 0.05$ ). Taking account of all other variables in the model, there was a significant inverse association with systolic blood pressure for boys who were unwell during the 7-day dietary recording period and whose eating was affected ( $p < 0.05$ ) and a significant positive relationship with systolic blood pressure for boys who

were smokers ( $p < 0.05$ ). Overall being a smoker increased systolic blood pressure in boys aged 4 to 18 years by +2.96 mmHg compared with being a non-smoker.

For girls, as for boys the most significant associations with systolic blood pressure were with diastolic blood pressure and body weight (both:  $p < 0.001$ ) (Table K.2(a)). There was also a significant inverse relationship for girls living in London and the South East but none of the other socio-demographic, dietary or behavioural variables included in the model was significantly related to systolic blood pressure.

Overall these models accounted for 50% of the variation in systolic blood pressure for boys aged 4 to 18 years and 47% for girls aged 4 to 18 years.

As described above the same variables plus calculated physical activity score were included in a regression analysis but restricted to those aged 7 to 18 years (Tables K.1(b) and K.2(b)). For this group of both boys and girls there was no significant association between calculated physical activity score and systolic blood pressure. For boys, this model again identified significant associations with age ( $p < 0.01$ ), diastolic blood pressure and weight (both:  $p < 0.001$ ) and an inverse association for boys who were unwell and their eating affected ( $p < 0.01$ ). For this group of boys being a smoker had no significant effect on systolic blood pressure. For girls the equivalent model only identified significant relationships with diastolic blood pressure and weight (both:  $p < 0.001$ ). This second model accounted for 48% of the variation in systolic blood pressure for boys aged 7 to 18 years and 45% of the variation in systolic blood pressure for girls.

The final model which was for boys aged 10 to 16 years, included blood testosterone tertile, which was not significantly associated with systolic blood pressure (Table K.1(c)). The model accounted for 37% of the variation in systolic blood pressure for this group of boys, mainly accounted for by variation in diastolic blood pressure and weight (both:  $p < 0.001$ ).

#### *Findings: diastolic blood pressure*

Generally, and for boys in particular, less of the variation in diastolic blood pressure was explained by the variables included in the regression analyses. For boys the models explained between 16% and 18% of the variation in diastolic pressure and for the two groups of girls the models explained 32% and 35% of the variation.

For boys aged 4 to 18 years the strongest relationship was between diastolic pressure and systolic pressure ( $p < 0.001$ ). There were however also significant inverse independent relationships between diastolic blood pressure and weight, with the urinary potassium to creatinine ratio and for those interviewed in Wave 3 of fieldwork, July to September (all:  $p < 0.05$ ). Overall this model accounted for 18% of the variation in diastolic blood pressure (Table K.3(a)).

The model for boys aged 7 to 18 years, which included calculated physical activity score, accounted for 17% of the variation in diastolic pressure (Table K.3(b)). As was found overall for all boys there was a significant positive association with systolic pressure ( $p < 0.001$ ) and a significant inverse relationship with weight ( $p < 0.05$ ). None of the other variables included in this model, including the calculated physical activity score was significantly associated with diastolic blood pressure.

The final model for boys, which included only those aged 10 to 16 years for whom plasma testosterone concentration was measured, accounted for 16% of the variation in diastolic blood pressure (Table K.3(c)). In common with the other two models, diastolic pressure was again found to be positively associated with systolic pressure ( $p < 0.001$ ) and, in this model, with whether the boy's parent were in receipt of benefits ( $p < 0.05$ ). There was no significant association between diastolic blood pressure and body weight for this group of boys.

As Table K.4(a) shows overall for girls aged 4 to 18 years systolic pressure was significantly and positively associated with diastolic pressure ( $p < 0.001$ ). There were also significant independent associations with fieldwork wave, positively for those interviewed in Wave 1 (January to March) ( $p < 0.05$ ) and inversely for those interviewed in Wave 3 (July to September) ( $p < 0.01$ ). Living with one parent and other children, usually adding salt to the food during cooking, and body weight were all independently inversely related to diastolic blood pressure for all girls (weight:  $p < 0.01$ ; others:  $p < 0.05$ ). This model accounted for 32% of the variation in diastolic blood pressure for girls aged 4 to 18 years.

In the analysis for girls aged 7 to 18 years which included the calculated physical activity score, the same independent associations were found as in the model for all girls aged 4 to 18 years described above. Calculated physical activity score was not significantly related to diastolic blood pressure and this model accounted for 35% of the variation in diastolic blood pressure for this group of girls.

*(Tables K.1 to K.4)*

## References and notes

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- 1 These weights adjusted for differential sampling probability and differential non-response.
- 2 Multiple regression analyses for boys, which included plasma testosterone concentration as an independent variable, were run on unweighted data. See *Chapter 11, Section 11.3.3* and *Chapter 12, Section 12.1.2*.
- 3 For a more detailed description of multiple regression analysis using SPSS, see Chapter 18 *SPSS for Windows. Base System User's Guide*. SPSS Inc. (Chicago, 1993).
- 4 A skewness (*sk*) value of +1.0 represents extreme positive skewness and a value of -1.0 extreme negative skewness. Loether HJ, McTavish DG *Descriptive and inferential statistics: an introduction*. 2nd Edition. Allyn and Bacon (Massachusetts, 1980).
- 5 In the tables presenting results from multiple regression, variables that are significantly different at the 95%, 99% and 99.9% levels are indicated by one, two and three asterisks respectively.
- 6 The procedure was run in SPSS for Windows v9.0. For further details of the general method used and interpretation of results see Appendix K.
- 7 See 'Glossary' for more details of the definition of fieldwork wave.



**Table K.1(a) Characteristics independently related to systolic blood pressure: males aged 4 to 18 years**

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (systolic blood pressure - mmHg)</b>	65.96	2.63		
<b>Age at time of measurement (years)</b>	0.34	0.16	0.12	2.11 *
<b>Diastolic blood pressure (mmHg)</b>	0.46	0.04	0.31	12.09 ***
<b>Body weight (kg)††</b>	0.29	0.03	0.48	8.70 ***
<b>Reported currently smoking</b>	2.96	1.20	0.07	2.47 *
<b>Whether unwell during dietary recording period</b>				
Not unwell	0.62	0.54	0.03	1.15
Unwell & eating not affected	1.32	0.80	0.05	1.64
Unwell & eating affected	-1.94	0.75	-0.10	-2.58 *
<b>Salt usually added to food during cooking</b>				0.53
<b>Salt usually added to food at the table</b>				0.58
<b>Urinary sodium to urinary creatinine ratio</b>				0.82
<b>Urinary potassium to urinary creatinine ratio</b>				0.12
<b>Reported dieting to lose weight</b>				1.05
<b>Average daily alcohol intake (g)</b>				0.04
<b>Fieldwork wave†</b>				
Wave 1				1.22
Wave 2				-1.32
Wave 3				0.72
Wave 4				-0.64
<b>Region</b>				
Scotland				1.19
Northern				-1.32
Central, South West & Wales				0.39
London & South East				-0.96
<b>Social class of head of household</b>				
Non-manual				0.51
Manual				-0.03
Unclassified				-0.33
<b>Gross weekly household income</b>				
Less than £160				0.20
£160 - less than £400				-0.22
£400 & over				-0.09
<b>Parents were receiving benefits</b>				1.77
<b>Whether living with both parents</b>				
Both parents & other children				0.60
Both parents & no other children				-0.52
Single parent & other children				-0.81
Single parent & no other children				0.71
Percentage of variance explained		50%		
<i>Number of young people</i>		775		

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

†† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

**Table K.1(b) Characteristics independently related to systolic blood pressure: males aged 7 to 18 years***Males aged 7 to 18 who kept a full 7-day physical activity diary*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (systolic blood pressure - mmHg)</b>	68.99	5.77		
<b>Age at time of measurement (years)</b>	0.55	0.21	0.16	2.63 **
<b>Diastolic blood pressure (mmHg)</b>	0.48	0.05	0.32	10.42 ***
<b>Body weight (kg)†</b>	0.28	0.04	0.43	7.58 ***
<b>Whether unwell during dietary recording period</b>				
Not unwell	0.93	0.64	0.05	1.45
Unwell & eating not affected	1.69	0.96	0.06	1.75
Unwell & eating affected	-2.62	0.90	-0.14	-2.92 **
<b>Calculated physical activity score</b>				-1.33
<b>Salt usually added to food during cooking</b>				0.52
<b>Salt usually added to food at the table</b>				0.32
<b>Urinary sodium to urinary creatinine ratio</b>				1.48
<b>Urinary potassium to urinary creatinine ratio</b>				-1.03
<b>Reported dieting to lose weight</b>				1.04
<b>Reported currently smoking</b>				1.90
<b>Average daily alcohol intake (g)</b>				0.12
<b>Fieldwork wave††</b>				
Wave 1				0.89
Wave 2				-0.78
Wave 3				0.68
Wave 4				-0.53
<b>Region</b>				
Scotland				1.06
Northern				-0.75
Central, South West & Wales				0.61
London & South East				-0.93
<b>Social class of head of household</b>				
Non-manual				0.75
Manual				0.21
Unclassified				-0.62
<b>Gross weekly household income</b>				
Less than £160				0.32
£160 - less than £400				-0.78
£400 & over				0.17
<b>Parents were receiving benefits</b>				1.40
<b>Whether living with both parents</b>				
Both parents & other children				0.42
Both parents & no other children				-0.68
Single parent & other children				-1.25
Single parent & no other children				1.33
Percentage of variance explained		48%		
<i>Number of young people</i>		599		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor &gt;10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

† † Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.1(c) Characteristics independently related to systolic blood pressure: males aged 10 to 16 years***Males aged 10 to 16 who provided a blood sample for analysis of testosterone concentration - unweighted data*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (systolic blood pressure - mmHg)</b>	75.84	11.24		
<b>Age at time of measurement (years)</b>				1.82
<b>Diastolic blood pressure (mmHg)</b>	0.49	0.07	0.38	6.61 ***
<b>Body weight (kg)†</b>	0.19	0.06	0.29	3.38 ***
<b>Calculated physical activity score</b>				-1.37
<b>Testosterone concentration - tertile</b>				
Bottom				-0.37
Middle				-1.16
Top				1.36
<b>Salt usually added to food during cooking</b>				-0.42
<b>Salt usually added to food at the table</b>				-1.48
<b>Urinary sodium to urinary creatinine ratio</b>				0.53
<b>Urinary potassium to urinary creatinine ratio</b>				0.06
<b>Reported dieting to lose weight</b>				0.55
<b>Reported currently smoking</b>				-0.68
<b>Average daily alcohol intake (g)</b>				1.30
<b>Fieldwork wave††</b>				
Wave 1				-1.02
Wave 2				0.11
Wave 3				0.71
Wave 4				0.19
<b>Whether unwell during dietary recording period</b>				
Not unwell				0.38
Unwell & eating not affected				0.33
Unwell & eating affected				-0.64
<b>Region</b>				
Scotland				1.25
Northern				-1.42
Central, South West & Wales				0.80
London & South East				-1.44
<b>Social class of head of household</b>				
Non-manual				-0.40
Manual				1.15
Unclassified				-0.48
<b>Gross weekly household income</b>				
Less than £160				1.44
£160 - less than £400				-1.63
£400 & over				-0.70
<b>Parents were receiving benefits</b>				-1.22
<b>Whether living with both parents</b>				
Both parents & other children				-1.81
Both parents & no other children				-1.20
Single parent & other children				0.15
Single parent & no other children				1.71
Percentage of variance explained		37%		
<i>Number of young people</i>		218		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.2(a) Characteristics independently related to systolic blood pressure: females aged 4 to 18 years**

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (systolic blood pressure - mmHg)</b>	59.4	2.59		
<b>Age at time of measurement (years)</b>				0.02
<b>Diastolic blood pressure (mmHg)</b>	0.62	0.04	0.47	16.44 ***
<b>Body weight (kg)†</b>	0.29	0.03	0.47	8.30 ***
<b>Region</b>				
Scotland	1.36	0.82	0.07	1.66
Northern	-0.78	0.53	-0.06	-1.48
Central, South West & Wales	0.49	0.50	0.04	0.98
London & South East	-1.07	0.53	-0.06	-2.02 *
<b>Menarche had occurred</b>				-0.91
<b>Salt usually added to food during cooking</b>				1.56
<b>Salt usually added to food at the table</b>				-0.22
<b>Urinary sodium to urinary creatinine ratio</b>				-0.41
<b>Urinary potassium to urinary creatinine ratio</b>				0.57
<b>Reported dieting to lose weight</b>				-1.50
<b>Reported currently smoking</b>				0.08
<b>Average daily alcohol intake (g)</b>				0.06
<b>Fieldwork wave††</b>				
Wave 1				-1.01
Wave 2				0.48
Wave 3				-0.68
Wave 4				1.25
<b>Whether unwell during dietary recording period</b>				
Not unwell				0.33
Unwell & eating not affected				-0.30
Unwell & eating affected				0.07
<b>Social class of head of household</b>				
Non-manual				0.44
Manual				0.31
Unclassified				-0.52
<b>Gross weekly household income</b>				
Less than £160				-1.22
£160 - less than £400				1.60
£400 & over				0.32
<b>Parents were receiving benefits</b>				1.40
<b>Whether living with both parents</b>				
Both parents & other children				1.04
Both parents & no other children				-0.17
Single parent & other children				-1.29
Single parent & no other children				-1.58
Percentage of variance explained		47%		
<i>Number of young people</i>		725		

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.2(b) Characteristics independently related to systolic blood pressure: females aged 7 to 18 years***Females aged 7 to 18 who kept a full 7-day physical activity diary*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (β)	T - value
<b>Constant (systolic blood pressure - mmHg)</b>	57.89	5.70		
<b>Age at time of measurement (years)</b>				-0.34
<b>Diastolic blood pressure (mmHg)</b>	0.66	0.04	0.52	15.75 ***
<b>Body weight (kg)†</b>	0.27	0.04	0.40	7.41 ***
<b>Calculated physical activity score</b>				0.20
<b>Menarche had occurred</b>				-0.45
<b>Salt usually added to food during cooking</b>				1.72
<b>Salt usually added to food at the table</b>				0.59
<b>Urinary sodium to urinary creatinine ratio</b>				-0.53
<b>Urinary potassium to urinary creatinine ratio</b>				0.32
<b>Reported dieting to lose weight</b>				-0.95
<b>Reported currently smoking</b>				0.30
<b>Average daily alcohol intake (g)</b>				0.10
<b>Fieldwork wave†</b>				
Wave 1				-1.12
Wave 2				-0.19
Wave 3				0.04
Wave 4				1.28
<b>Whether unwell during dietary recording period</b>				
Not unwell				0.52
Unwell & eating not affected				0.12
Unwell & eating affected				-0.49
<b>Region</b>				
Scotland				1.68
Northern				-1.31
Central, South West & Wales				0.61
London & South East				-1.89
<b>Social class of head of household</b>				
Non-manual				0.50
Manual				0.44
Unclassified				-0.66
<b>Gross weekly household income</b>				
Less than £160				-0.21
£160 - less than £400				0.88
£400 & over				-0.40
<b>Parents were receiving benefits</b>				0.62
<b>Whether living with both parents</b>				
Both parents & other children				1.03
Both parents & no other children				-0.40
Single parent & other children				1.16
Single parent & no other children				-1.34
Percentage of variance explained		45%		
<i>Number of young people</i>		568		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor &gt;10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.3(a) Characteristics independently related to diastolic blood pressure: males aged 4 to 18 years**

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (diastolic blood pressure - mmHg)</b>	23.58	3.01		
<b>Age at time of measurement (years)</b>				-1.18
<b>Systolic blood pressure (mmHg)</b>	0.36	0.03	0.52	12.09 ***
<b>Body weight (kg)†</b>	0.06	0.03	-0.16	-2.09 *
<b>Urinary potassium to urinary creatinine ratio</b>	-0.16	0.07	-0.09	-2.24 *
<b>Fieldwork wave††</b>				
Wave 1	0.49	0.46	0.04	1.06
Wave 2	0.41	0.46	0.04	0.89
Wave 3	-1.20	0.48	-0.10	-2.50 *
Wave 4	0.30	0.46	0.03	0.67
<b>Salt usually added to food during cooking</b>				-1.07
<b>Salt usually added to food at the table</b>				-1.25
<b>Urinary sodium to urinary creatinine ratio</b>				-0.73
<b>Reported dieting to lose weight</b>				-0.19
<b>Reported currently smoking</b>				-1.67
<b>Average daily alcohol intake (g)</b>				1.28
<b>Whether unwell during dietary recording period</b>				
Not unwell				-1.49
Unwell & eating not affected				0.71
Unwell & eating affected				0.31
<b>Region</b>				
Scotland				-0.72
Northern				1.06
Central, South West & Wales				0.56
London & South East				-0.44
<b>Social class of head of household</b>				
Non-manual				-0.16
Manual				-0.22
Unclassified				0.24
<b>Gross weekly household income</b>				
Less than £160				1.25
£160 - less than £400				-0.09
£400 & over				-1.54
<b>Parents were receiving benefits</b>				-0.82
<b>Whether living with both parents</b>				
Both parents & other children				0.90
Both parents & no other children				1.05
Single parent & other children				-0.02
Single parent & no other children				-1.26
Percentage of variance explained		18%		
<i>Number of young people</i>		775		

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.3(b) Characteristics independently related to diastolic blood pressure: males aged 7 to 18 years***Males aged 7 to 18 who kept a full 7-day physical activity diary*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (diastolic blood pressure - mmHg)</b>	26.42	5.30		
<b>Age at time of measurement (years)</b>				-0.20
<b>Systolic blood pressure (mmHg)</b>	0.34	0.03	0.51	10.42 ***
<b>Body weight (kg)†</b>	-0.07	0.03	-0.17	-2.25 *
<b>Calculated physical activity score</b>				-0.59
<b>Salt usually added to food during cooking</b>				-0.79
<b>Salt usually added to food at the table</b>				-1.49
<b>Urinary sodium to urinary creatinine ratio</b>				-1.13
<b>Urinary potassium to urinary creatinine ratio</b>				-0.98
<b>Reported dieting to lose weight</b>				0.52
<b>Reported currently smoking</b>				-1.61
<b>Average daily alcohol intake (g)</b>				1.28
<b>Fieldwork wave††</b>				
Wave 1				0.85
Wave 2				0.54
Wave 3				-1.56
Wave 4				0.24
<b>Whether unwell during dietary recording period</b>				
Not unwell				-0.16
Unwell & eating not affected				-0.93
Unwell & eating affected				1.11
<b>Region</b>				
Scotland				-0.61
Northern				-0.18
Central, South West & Wales				0.50
London & South East				0.68
<b>Social class of head of household</b>				
Non-manual				-1.12
Manual				0.18
Unclassified				0.64
<b>Gross weekly household income</b>				
Less than £160				0.17
£160 - less than £400				1.01
£400 & over				-0.97
<b>Parents were receiving benefits</b>				-1.06
<b>Whether living with both parents</b>				
Both parents & other children				1.04
Both parents & no other children				0.30
Single parent & other children				0.49
Single parent & no other children				-1.24
Percentage of variance explained		17%		
<i>Number of young people</i>		599		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.3(c) Characteristics independently related to diastolic blood pressure: males aged 10 to 16 years***Males aged 10 to 16 who provided a blood sample for analysis of testosterone concentration - unweighted data*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (diastolic blood pressure - mmHg)</b>	28.13	11.02		
<b>Age at time of measurement (years)</b>				-1.76
<b>Systolic blood pressure (mmHg)</b>	0.39	0.06	0.50	6.61 ***
<b>Parents' were receiving benefits</b>	4.22	1.20	0.22	2.01 *
<b>Body weight (kg)†</b>				-1.92
<b>Calculated physical activity score</b>				-0.25
<b>Testosterone concentration - tertile</b>				
Bottom				-0.74
Middle				0.73
Top				0.22
<b>Salt usually added to food during cooking</b>				0.01
<b>Salt usually added to food at the table</b>				-0.47
<b>Urinary sodium to urinary creatinine ratio</b>				-0.74
<b>Urinary potassium to urinary creatinine ratio</b>				-0.70
<b>Reported dieting to lose weight</b>				1.18
<b>Reported currently smoking</b>				1.67
<b>Average daily alcohol intake (g)</b>				-0.33
<b>Fieldwork wave††</b>				
Wave 1				-0.22
Wave 2				0.74
Wave 3				-0.69
Wave 4				-0.01
<b>Whether unwell during dietary recording period</b>				
Not unwell				-0.47
Unwell & eating not affected				0.57
Unwell & eating affected				-0.28
<b>Region</b>				
Scotland				-1.86
Northern				1.04
Central, South West & Wales				0.64
London & South East				1.48
<b>Social class of head of household</b>				
Non-manual				0.51
Manual				-0.09
Unclassified				-0.27
<b>Gross weekly household income</b>				
Less than £160				-1.37
£160 - less than £400				1.47
£400 & over				0.73
<b>Whether living with both parents</b>				
Both parents & other children				1.90
Both parents & no other children				0.42
Single parent & other children				-0.06
Single parent & no other children				-1.32
Percentage of variance explained		16%		
<i>Number of young people</i>		218		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor &gt;10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*



**Table K.4(a) Characteristics independently related to diastolic blood pressure: females aged 4 to 18 years**

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (diastolic blood pressure - mmHg)</b>	11.57	2.88		
<b>Age at time of measurement (years)</b>				0.46
<b>Systolic blood pressure (mmHg)</b>	0.45	0.03	0.60	16.44 ***
<b>Body weight (kg)†</b>	-0.10	0.03	-0.21	-3.07 **
<b>Salt usually added to food during cooking</b>	-1.30	0.53	-0.08	-2.44 *
<b>Fieldwork wave††</b>				
Wave 1	1.12	0.45	0.10	2.48 *
Wave 2	0.66	0.44	0.06	1.50
Wave 3	-1.30	0.44	-0.12	-2.97 **
Wave 4	-0.47	0.44	-0.04	-1.08
<b>Whether living with both parents</b>				
Both parents & other children	-0.17	0.46	-0.01	-0.38
Both parents & no other children	0.81	0.59	0.05	1.36
Single parent & other children	-1.28	0.65	-0.07	-1.96 *
Single parent & no other children	0.64	0.77	0.05	0.84
<b>Menarche had occurred</b>				1.78
<b>Salt usually added to food at the table</b>				0.31
<b>Urinary sodium to urinary creatinine ratio</b>				0.02
<b>Urinary potassium to urinary creatinine ratio</b>				-0.65
<b>Reported dieting to lose weight</b>				-0.17
<b>Reported currently smoking</b>				0.29
<b>Average daily alcohol intake (g)</b>				0.76
<b>Whether unwell during dietary recording period</b>				
Not unwell				-0.44
Unwell & eating not affected				1.00
Unwell & eating affected				-0.71
<b>Region</b>				
Scotland				-1.44
Northern				0.90
Central, South West & Wales				-0.17
London & South East				1.49
<b>Social class of head of household</b>				
Non-manual				0.60
Manual				0.38
Unclassified				-0.68
<b>Gross weekly household income</b>				
Less than £160				1.59
£160 - less than £400				-0.71
£400 & over				-1.47
<b>Parents were receiving benefits</b>				-0.50
Percentage of variance explained		32%		
<i>Number of young people</i>		725		

\* p<0.05; \*\* p<0.01; \*\*\* p<0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*

**Table K.4(b) Characteristics independently related to diastolic blood pressure: females aged 7 to 18 years***Females aged 7 to 18 who kept a full 7-day physical activity diary*

Characteristic	Unstandardised coefficient (B)	Standard error of B	Standardised regression coefficient (B)	T - value
<b>Constant (diastolic blood pressure - mmHg)</b>	10.75	5.23		
<b>Age at time of measurement (years)</b>				1.10
<b>Systolic blood pressure (mmHg)</b>	0.47	0.03	0.61	15.75 ***
<b>Body weight (kg)†</b>	-0.09	0.03	-0.18	-2.89 **
<b>Salt usually added to food during cooking</b>	-1.40	0.62	-0.08	-2.27 *
<b>Fieldwork wave††</b>				
Wave 1	1.32	0.51	0.11	2.57 *
Wave 2	0.72	0.50	0.06	1.46
Wave 3	-1.38	0.50	-0.12	-2.74 **
Wave 4	-0.67	0.50	-0.06	-1.33
<b>Whether living with both parents</b>				
Both parents & other children	-0.23	0.50	-0.02	-0.45
Both parents & no other children	0.79	0.64	0.05	1.23
Single parent & other children	-1.50	0.71	-0.08	-2.10 *
Single parent & no other children	0.94	0.81	0.07	1.16
<b>Calculated physical activity score</b>				-0.83
<b>Menarche had occurred</b>				1.12
<b>Salt usually added to food at the table</b>				-1.00
<b>Urinary sodium to urinary creatinine ratio</b>				0.06
<b>Urinary potassium to urinary creatinine ratio</b>				-0.24
<b>Reported dieting to lose weight</b>				-0.55
<b>Reported currently smoking</b>				0.07
<b>Average daily alcohol intake (g)</b>				0.50
<b>Whether unwell during dietary recording period</b>				
Not unwell				-0.24
Unwell & eating not affected				0.42
Unwell & eating affected				-0.24
<b>Region</b>				
Scotland				-1.09
Northern				0.63
Central, South West & Wales				-0.43
London & South East				1.48
<b>Social class of head of household</b>				
Non-manual				-0.14
Manual				-0.29
Unclassified				0.29
<b>Gross weekly household income</b>				
Less than £160				0.48
£160 - less than £400				-0.40
£400 & over				-0.29
<b>Parents were receiving benefits</b>				-0.03
Percentage of variance explained		35%		
<i>Number of young people</i>		568		

\* p&lt;0.05; \*\* p&lt;0.01; \*\*\* p&lt;0.001

† Height and BMI were highly correlated (collinear) with weight (variance inflation factor >10). It is difficult to distinguish the effects in a multiple regression of highly correlated characteristics if both are included and the results may be unreliable. One characteristic of a collinear pair must be dropped. Since weight can be modified by an individual while height cannot, height and BMI were dropped from the regression.

†† Wave 1: Jan - March 1997; Wave 2: April - June 1997; Wave 3: July - Sept 1997; Wave 4 Oct - Dec 1997 see also *Glossary*