Part 3: Training and Practical Guides

Overview

In this Part

This Part covers the following topics

Section 1: Trainer's Guide

Overview

Introduction

The trainer's guide provides guidance on how to plan, prepare for and deliver training to the data collection team, data entry team and data analyst.

Intended audience

This section is designed for use by people that fulfil the following roles:

- STEPS Site Coordinator
- data collection team supervisor
- data entry supervisor
- data analyst.

Purpose

The purpose of the training is to:

- explain the rationale of the STEPS surveillance
- ensure a uniform application of the STEPS surveillance materials
- motivate interviewers and survey staff
- ensure good overall quality of data
- ensure useful and meaningful results are reported.

In this section

This section covers the following topics:

Training Courses

Introduction

A combination of formal classroom training and hands-on experience is required to adequately train staff that have been recruited to work on STEPS survey.

Training courses to follow

The following three separate trainings will need to be conducted to ensure each member of the recruited teams and the data analyst receives appropriate training:

- interviewer training
- data entry training
- data analysis training.

Training course phases and durations

The table below provides a guideline for each of the training phases and durations to cover the material and train participants to a good level of understanding and proficiency in their specific area. Three training courses are provided, one for each team and one self-study schedule for the data analyst:

- data collection
- data entry
- data analysis.

Training phases	Recommended durations
Classroom training	2-4 days
Pilot test	1 day
Refresher prior to start (optional)	1 day
Total	**4-6 days**

Notes: Refresher training is optional but may be useful if:

- there is a significant gap between when the classroom training was completed and the start of the survey, or
- the pilot test shows up lots of knowledge gaps and some aspects of the training need to be repeated.

Training content and module durations

Suggested course content and training delivery timeframes for each module of learning are provided in the lesson plans below.

These may need adaptation for individual sites, for example some modules in the data entry course may be shorter if participants already have relevant experience, or longer if the participants have not used computers before.

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Training Courses, Continued

Participation

The training courses are intended primarily for members of the respective teams. To help with coordination, you may wish to consider having the team supervisors attend one or more of the training courses.

It is recommended that the statistical adviser complete at minimum the first day of the training for the data analyst and, if possible, he/she should attend the data entry and data collection trainings as well.

Training Preparation

Introduction

Training preparation involves the following tasks:

Task	Description
1	Finding and setting up a suitable training room
2	Scheduling training sessions
3	Coordinating training tasks and events
4	Preparing, printing and distributing training materials
5	Informing participants about course content, date, time and location details and prerequisite requirements

Note: Each of these tasks is described further below.

Training location requirements

A training room will need to be located and arrangements made for use over a three to four week period to train all recruited members of the data collection and data entry teams as well as the data analyst.

The room (or rooms) should be able to accommodate the number of people being trained, the number of trainers or facilitators, plus several extras, at a time.

Requirements for	Details
All rooms	• tables • chairs • blackboard, white board or flip chart • chalk, marker pens, or crayons • multi media projector (optional) • overhead projector (optional)
Data collection	• sufficient room to practice taking physical measurements • props to help with scenarios
Data entry	• computers (minimum 1:2 ratio) loaded with site-specific data entry software (EpiData)
Data analysis	• computer loaded with site-specific data analysis software (Epi Info)

Scheduling training sessions

You will need to schedule training sessions for data collection and data entry staff in advance to ensure each course is well attended and training is provided to all team members before the survey begins.

Provide each participant with a letter confirming the course agenda, including date and place of training.

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Training coordination

You may need to plan for and arrange some or all of the following coordination tasks:

- selection of a pilot community;
- order and arrange teas/coffee and lunches for classroom training sessions;
- book accommodation and arrange transport (if necessary);
- develop and set up exercises to be used during classroom training;
- determine, develop and compile training and reference materials that will need to be used by course participants;
- obtain maps or list of households.

Preparing materials

Prior to training sessions, you will need to print out one set per participant of the relevant materials from the STEPS Manual. You may choose to print the whole manual for each participant. If you wish to print only relevant selected sections, use the table below as a guide.

Team Training	Topics	Part, Section
Data Collection	Introduction	Part 1, Section 1
	Planning and Preparing a STEPS Survey	Part 2, Section 1
	Preparing the Sample	Part 2, Section 2
	Preparing a STEPS Site	Part 2, Section 3
	Interviewer's Guide	Part 3, Section 2
	Guide to Physical Measurements	Part 3, Section 3
	Data Collection	Part 4, Section 1
	STEPS Instrument	Part 5, Section 1
	Question-by-Question Guide	Part 5, Section 2
	Show Cards	Part 5, Section 3
	Interview, Blood Collection and Data Entry Forms	Part 6, Section 2
Data Entry	Introduction	Part 1, Section 1
	Preparing the Data Entry Environment	Part 2, Section 4
	Data Entry Guide	Part 3, Section 5
	Data Entry	Part 4, Section 2
	STEPS Instrument	Part 5, Section 1
	Question-by-Question Guide	Part 5, Section 2
	Interview and Data Entry Forms	Part 6, Section 2
Data Analysis	Introduction	Part 1, Section 1
	Preparing the Sample	Part 2, Section 2
	Preparing the Data Analysis Environment	Part 2, Section 5
	Data Analysis Guide	Part 3, Section 6

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Training Preparation, Continued

Preparing materials (cont.)

Team Training	Topics	Part, Section
Data Analysis cont.	Data Analysis	Part 4, Section 3
	Reporting and Disseminating Results	Part 4, Section 4
	STEPS Instrument	Part 5, Section 1
	Question-by-Question Guide	Part 5, Section 2
	Interview and Data Entry Forms	Part 6, Section 2

Participant preparation

Prior to attending a training session, all training participants will need to study the STEPS Instrument and appropriate sections in the STEPS Manual.

Training Lesson Plan: Data collection team

Introduction The following lesson plan is a guide for people responsible for delivering the data collection team training. This may be the STEPS Site Coordinator or the data collection team supervisor.

Training topics	Duration	Section reference	Outcomes or competencies	Exercises
Day 1				
Introductions, warm up, agenda and expectations	9.00-10.00	3-1-15	Establish a new team, set expectations and course agenda.	
Overview and Rationale of the WHO STEPwise approach to chronic disease risk factor surveillance	10.00 -12.30	1-1	Understand chronic diseases and their key risk factor, importance of surveillance framework, get an overview of what STEPS is and how it works.	
Lunch				
The data collection team	14.00 - 14.30	1-2 3-2-3 4-1-2	Understand staff core roles and responsibilities as well as the organization of the data collection team.	
Sampling	14.30 - 15.30	2-2	Understand how households are being sampled, understand the imperative of a random sample.	Talk through how the sample is being selected. Consider possible concerns or questions & how they could be handled. Explain that interviewer must stick to sample and not select a neighbour if their selected person is not at home.
Approaching selected households	15.30 - 16.30	4-1-7 6-2-2	Competently follow procedures for approaching households.	Scenarios, moving from simple to more difficult.

Day 2				
Review of day 1, warm up	9.00-9.30		Recognize previous day's learning. Identify and handle any queries.	
The Kish method	9.30-10.00	2-2-25 6-2-11	Understand how an individual within selected households is selected, know how to use the Kish method.	Explain the Kish method, participants to use the Kish method in practice exercises.
Interview tracking	10.00-11.00	2-2-28 4-1-12 6-2-12	Understand the importance of interview tracking (e.g., tracking of non-response) and know how to use the Interview Tracking Form. Understand how the information from the Interview Tracking Form will be used in data analysis.	Talk through examples on how to fill in the Interview Tracking Form.
Informing participants and obtaining consent	11.00-12.00	4-1-9 4-1-11 6-2-3 6-2-6	Know why and how to inform participants in detail. Understand ethical considerations and their relevance for interviewing. Follow guidelines to obtain consent.	Practice how to inform participants and obtain consent. Scenarios with e.g. reluctant, objecting, unwell, or over-busy respondents.
Lunch				
Interview skills	13.30-14.30	3-2-4	Understand and demonstrate good interview practices.	Use scenarios to demonstrate how responses can be swayed by different interview techniques.
STEPS Instrument, Question-by-Question Guide and show cards	14.30-16.00	3-2-10 5-1 5-2 5-3	Understand the Instrument, the different risk factors and what they aim to measure, response options (including don't know and refuse), skip instructions and show cards. Understand how to use the Question-by-Question Guide and the show cards.	Talk through the STEPS Instrument and Question-by-Question Guide section by section.

Day 3				
Review of day 2, warm up	9.00-9.30		Recognize previous day’s learning. Identify and handle any queries.	
Recording information and checking paperwork	9.30 - 10.30	4-1-14	Understand how to record information on the STEPS Instrument and to do all paperwork properly.	Explain how to record information on the STEPS Instrument.
Collecting demographic and behavioural risk factor information (Step 1).	10.30 - 12.30	3-2	Understand the questions, know how to clarify. Record responses clearly and accurately, deal with different people, resolve inconsistencies and incomplete Instruments.	Explain how to collect demographic and behavioural risk factor information, demonstrate various difficulties and strategies. Practice interviews.
Lunch				
Collecting demographic and behavioural risk factor information (Step 1), cont.	14.00-15.00	3-2	Understand the questions, know how to clarify. Record responses clearly and accurately, deal with different people, resolve inconsistencies and incomplete Instruments.	Explain how to collect demographic and behavioural risk factor information, demonstrate various difficulties and strategies. Practice interviews.
Taking and recording physical measures (Step 2)	15.00 - 16.30	3-3	Assemble equipment and supplies for Step 2 measurements. Measure blood pressure, height, weight, waist and hip circumference (if applicable). Clearly and accurately record participant results.	Learn and practice on team members, all participants' measure independently then compare results.

Day 4				
Review of day 3, warm up	9.00-9.30			
Taking and recording physical measures (Step 2), cont.	9.30-11.00	3-3	Assemble equipment and supplies for Step 2 measurements. Measure blood pressure, height, weight, waist and hip circumference (if applicable). Clearly and accurately record participant results.	Learn and practice on team members, all participants' measure independently then compare results.
Completing the Participant Feedback Form (Step 2)	11.00-12.00	4-1-16 6-2-8 6-2-10	Understand how to record information on the Participant Feedback Form. Know how to use the BMI Classification Chart.	Explain how to record information on the Participant Feedback Form and how to use the BMI Classification Chart.
Lunch				
Referrals and procedures for biochemical measures (Step 3)	13.30 - 14.30	3-4 4-1-17 6-2-13 6-2-14	Know how to make appointments for those selected for Step 3, know what interviewees need to know for Step 3, know how to use forms related to Step 3.	Explain referrals and procedures related to biochemical measures.
Check-list for equipment and supplies, checking paperwork	14.30-15.30	2-2-28 2-3-4 4-1-6	Know what documents, equipment and supplies are needed for field work. Know how to organize the material.	Explain all equipment, supplies and documents and how to organize the material.
Preparing pilot test, Review of most important issues that arose during training, discussion	15.30-16.00	4-1 2-1-21	Clarification of final questions before interviewers do the pilot test.	Wrap-up, clarify all questions that have not been answered during the training.
Day 5				
Pilot test	9.00 - 16.00	2-1-21	Major aspects of data collection thoroughly tested. Identify weaknesses or failures in current systems and processes.	Go to a residential area, with a pre-determined sampling plan. Participants do a complete run-through of whole data collection process.
At a later date				
Refresher	9.00 - 16.00			

Training Lesson Plan: Data entry staff

Introduction The following lesson plan is a guide for people responsible for delivering the data entry staff training. This will usually be the data entry supervisor.

Training topics	Duration	Section reference	Outcomes or competencies	Exercises
Day 1				
Introductions, warm up, agenda and expectations	9.00 - 10.00	3-1-15	• establish new team • set expectations • review course agenda	
The data entry team (office setup and workflow)	10.00 - 11.00	3-5-5, 4-2-2	• understand main roles and organization of personnel • discuss data privacy issues • understand office workflow	Label computers, assign staff to computers for 1st & 2nd keying, create folders and coversheets for each computer.
Computer basics	11.00-12.00	3-5-3	• familiarization with computer parts and terms • address ergonomic considerations • review computer basics: logging on & off, using the keyboard and mouse, printing, etc.	Have staff sit at assigned computer for 1st keying and have them log on, take a small tour, create a text document, print, log off.
Lunch				
Data flow and the data entry process	14.00 - 15.30	3-5-5, 4-2-6	• understand overall data entry process • understand importance of good data flow in the office • review how instruments will flow through office • review data tracking forms • practice filing and retrieving instruments	Distribute copies of the Data Entry Tacking Form and Data Entry Log and show how to fill them out. Use a set of dummy instruments with only a participant ID completed to practice distribution, flow and tracking of instruments.

Training topics	Duration	Section reference	Outcomes or competencies	Exercises
Consulting your supervisor	15.30 - 16.00	3-5-7	• understand when to ask for clarification from supervisor • review roles and responsibilities of each team member • review data entry rules and guidelines	
Day 2				
Review, warm up, agenda and expectations	9.00-9.30		• review previous day and today's agenda	
EpiData templates	9.30-10.30	2-4-8, 3-5-10	• understand the purpose of different templates and the file structures	Relate site-specific instrument to the data entry templates.
Using EpiData (data entry software)	10.30 - 12.30	3-5-9, 3-5-10	• review how to open and navigate EpiData and how to open a data entry template in EpiData • review steps in process of 1^{st} keying, 2^{nd} keying preparations, and 2^{nd} keying • review how to create consistency reports	Have staff practice on assigned computer opening and navigating EpiData and opening a data entry template for data entry. Have trainer demonstrate creation of consistency report on one computer with entered data.
Lunch				
Rules and guidelines for data entry	14.00-14.30	3-5-7	• understand and demonstrate rules and guidelines for data entry • be able to identify and correctly handle any problems that may arise during data entry	Present several examples of potential data entry problems (e.g. missing pages, illegible writing, out-of-range responses) and review as a group how each should be handled.

Training topics	Duration	Section reference	Outcomes or competencies	Exercises
First and second keying data entry	14.30 - 15.30	3-5-10	• review in-depth how to do 1st keying and prepare for 2nd keying • assign staff 2nd keying computers and review how and when staff should swap computers • review in-depth how to do 2nd keying (data validation)	Have staff practice on assigned computer: completing first key and preparing for 2nd keying using a small number of completed dummy instruments. Have staff change seats so they are seated at computers for 2nd keying. Have staff practice 2nd keying on these computers.
Backing up data	15.30 - 16.00	3-5-16	• explain need for file protection and safety • demonstrate back-up procedures	Have staff practice backing up entered data on assigned computer.
Day 3				
Pilot testing	9.00 - 16.00	2-4-19, 3-5-17	• thoroughly review entire data entry process with set of completed dummy instruments • gain further practice handling instruments containing errors • identify any difficulties faced and discuss how to handle them	See 3-5-17 for exercise description.
At a later date				
Refresher training	Weekly meetings		• review procedures for processing and tracking all instruments • identify weaknesses/problems in current system and devise solutions • check consistency reports	

Training Lesson Plan: Data analyst

Introduction The following Lesson Plan is a self-study guide for the data analyst.

Training topics	Duration	Section reference	Outcomes or competencies	Exercises
Day 1				
Become familiar with relevant sections of the STEPS Manual.	9.00 - 10.30	2-2, 2-5, 3-6, 4-3	• understand what information is available and where it is located	
STEPS Instrument	10.30 - 11.30	5-1, 5-2	• become familiar with the site-specific instrument and the generic STEPS Instrument • become familiar with types of data collected and generic question codes	Print out both instruments and identify differences.
Preparing the fact sheet and data book	11.30-12.30	4-4-9, 4-4-12, 6-3	• become familiar with the Fact Sheet and Data Book • develop a basic understanding of how to complete these documents	Print out and review Fact Sheet, Fact Sheet Analysis Guide and Data Book.
Lunch				
Sample design and scope of STEPS survey and weighting your survey data	13.00 -15.00	2-1-5, 2-2, 4-3-19	• understand the sample design and scope of the survey • understand how to create weight and sample design variables for a weighted analysis	Review sections of manual listed and review all materials related to sample design of survey (e.g. Implementation Plan).
Introduction to Epi Info (data analysis software) and accessing survey data	15.00-16.00	3-6	• install Epi Info • perform basic tasks in Epi Info using Part 3, Section 6 as a guide	Create small dummy data set and practice basic commands in Epi Info.
Day 2				
In-depth Epi Info training	9.00-17.00	Epi Info Training Guide	• complete all exercises in Epi Info Training Guide • perform more advanced tasks in Epi Info	Follow exercises in Epi Info Training Guide using training files available from STEPS CD or STEPS website.

Training Delivery Tips

Introduction

The training delivery tips below may be useful for those that have been assigned the role of training, but are not in fact trained trainers.

Introductions and warm up

Before you start the training, it is important for team development to introduce yourself and find out a little about the people in the room. Use the table below to help with the introductions.

Step	Action
1	Introduce yourself and any other co-trainers to the participants.
2	If you don't already know everyone in the room, or they don't know each other, get each participant to briefly introduce themselves (or a person beside them).
3	Ask participants and adapt according to the class: • what they understand by 'chronic noncommunicable disease risk factors'; • what they think the biggest chronic disease health issues are in their country or area; • in what ways do those diseases impact on the health and welfare of the people in their communities. **Note:** Write the responses on a board. Acknowledge that there is not necessarily a 'correct' answer, it varies by time and community. Encourage discussion so you can gauge the level of understanding that the staff already have. The staff can begin to learn on what they and their colleagues will be working.
4	Ask participants if they have any questions or topics they would really like to have covered in the training. **Note:** Write the responses on the board and try and answer them during the training course.

Course agenda and setting expectations

Participants will need to know what to expect in terms of training content, how long it will take and what is expected of them during the course. Use the table below (and lesson plans) to help explain the agenda and set expectations:

Step	Action
1	Explain the aim of the training.
2	Outline what will be covered.
3	Tell them how long the training will take.
4	Explain what is expected of them during training.

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Training Delivery Tips, Continued

Using material

The STEPS Manual has been structured into modular sections that can be easily extracted and recompiled to provide customised manuals for training.

The manual content has been designed for use as both training material and in the field reference.

Exercises

You will need to create exercises that:

- are relevant to the local environment
- support the training material
- work through typical problems and issues that are likely to be encountered
- allow for hands on practice.

Encouraging participation

The course is not about how much you as the trainer fill it with content, but how much the participants take away in new learning and understanding of skills.
Continually encourage all attendees to participate. Use the table below for guidance.

Topic	Guidance
Comfort zones	Acknowledge that participants may be asked to do things out of their comfort zone (particularly in the interviewing course where scenarios are an important part of training).
Criticism	Ensure participants are not criticised or demoralised when offering comments and questions.
Experience	Develop or build on participants own experiences and understandings.
Fears	Recognize fears and concerns and offer strategies to handle them.
Support	Offer praise when appropriate and support when participants demonstrate feelings of inadequacy or difficulty.
Strengths and weaknesses	Assure everyone that we all have strengths and weaknesses and that they have been selected as a team, with skills that complement those of others.
Team work	Encourage teams to work together and communicate well.
Being self reliant	Once the survey starts, there will not always be an "expert" available to answer questions. Participants must understand enough to be self reliant and know when to seek advice or help from others.

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Beginning and ending sessions

It is always helpful to introduce each session with an introduction covering:

- the previous work that builds a foundation for this session
- the content and purpose of the session
- briefly the resources and format to be used.

At the end of the session, summarise:

- what topics and skills have been covered;
- whether that is the end of that topic or a future session will cover further material;
- acknowledge areas of good progress, but also areas where further work will be required.

Handling problems and participation issues

Use the guidance in the table below to help with some typical problems encountered in the training environment.

Problem/ situation	Guidance
Late arrivals	Recap briefly what has just been covered and politely make it clear that you want all participants to be punctual.
Interruptions	Remain patient at all times.
Participant does not seem to follow and understand.	Show patience and understanding. Repeat the point/topic in a different way and then ask if the participant understands better.
A participant is dominating the sessions, making it difficult for others to participate and learn.	First try commenting during discussions that you'd like everyone to contribute, even use the phrase "let's hear from someone else this time". If that does not achieve anything, take the staff member aside during a break and suggest that others also need to participate. Give a little praise, if warranted, about their grasp of the topic, but state that, as the trainer, you need to hear from other participants, too.
Participant is not keeping up with the others, or appears unable to "engage".	During a break, seek out the staff member to see whether anything is wrong, or if they are finding anything particularly difficult. If so, a short "catch-up" session may help. If the participant is unwell or troubled it might be best if they leave.

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Training Delivery Tips, Continued

Celebrating milestones

Within the context of the training course, as in the conduct of the survey itself, recognize milestones to encourage the participants and to help develop a sense of "team-ship".

Think particularly of those who may be regarded as outsiders in any way – perhaps they are from out-of-town, are not known to other members of a group, or are of a different language group or cultural background – who may be more hesitant to participate.

You may like to have markers of effort, mastery, achievement or other contribution - use your imagination to select small gifts, snack food treats or certificates to award to participants.

Section 2: Interviewer's Guide

Overview

Introduction

The quality of STEPS surveillance results and their usefulness for intra- and intercountry comparisons largely depends on the quality of the interviews. This section provides generic guidelines for interviewers. It does not cover step-by-step instructions on approaching households, informing participants and obtaining consent. This is covered in Part 4, Section 1. The following sections in this part, Section 3 and Section 4, give information on how to undertake the physical and biochemical measurements (Step 2 and 3).

Intended audience

This section is designed for use by those fulfilling the following roles:

- interviewers
- data collection team supervisors
- STEPS Site Coordinator
- data entry staff.

What you will learn

In this section, you will learn:

- the structure of the data collection team
- how to interview participants
- how to complete participants' instruments
- how to use the Question-by-Question Guide
- how to use the show cards.

Learning outcomes

The learning outcome of this module is to conduct consistent and effective interviews and record accurate data.

Instructional material

For the full process of an interview from knocking at the door to leaving the household, see Part 4, Section 1.

Other data collection materials

This Guide is to be used in conjunction with the following sections in the STEPS Surveillance Manual. These sections provide full instructional material on the following topics.

Topic	Part, Section
Preparing a STEPS site	Part 2, Section 3
Guide to Physical Measurements	Part 3, Section 3
Guide to Biochemical Measurements	Part 3, Section 4
Data Collection	Part 4, Section 1

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Overview, Continued

In this section

This section covers the following topics:

Data Collection Team

Introduction	You will be assigned to work with a team of other interviewers in a specified area for the duration of data collection.
Interviewer identification	Each interviewer will have a unique ID. This Interviewer ID will be filled in on all data collection forms (see Part 2, Section 2).
Supervision	Each team will work with a supervisor. The supervisor is responsible for: • tracking your progress • ensuring instruments are completed correctly • keeping data collection to the specified timeframe • handling any issues you encounter. **Note:** For further details on the supervisor's role, please see Part 4, Section 1.

Interview Skills

Introduction

The STEPS interview is about finding out and recording a list of facts and behaviours relating to selected participants.

The participant needs to feel comfortable about the survey and can refuse to be interviewed as participation is voluntary. Your interview should therefore be as natural as possible and conducted politely, like a normal conversation.

Behaviour and tact

The table below provides guidelines on appropriate behaviour during an interview:

Behaviour	Guidelines
Respect confidentiality	Maintain the confidentiality of all information you collect.
Respect participants time	You are asking participants for their time so be polite and prepared to explain.
Tact	If you feel that a person is not ready to assist you, do not force them but offer to come back later.
Friendly disposition	Act as though you expect to receive friendly co-operation and behave accordingly.
Body language	Maintain good eye contact and adopt appropriate body language.
Pace of interview	Don't rush the interview. Allow the participant enough time to understand and answer a question. If pressured, a participant may answer with anything that crosses their mind.
Patience	Be patient and polite at all times during the interview.
Acceptance	No matter what the responses to questions, do not be judgemental of a participant's lifestyle. Expression of any criticism may lead to refusing or concealing important information.
Appreciation	Thank them for their help and cooperation.

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Asking questions

The table below provides guidelines for asking questions in an interview:

Topic	Guidelines
Issues relating to chronic diseases and their risk factors	Do not discuss or comment on issues relating to chronic diseases and their risk factors. Participants may not give correct answers to the questions but give the answers they think the interviewer is looking for.
Right or wrong answers	Point out that there are no right or wrong answers and that the interview is not a test.
Biased answers	Ask your questions according to guidelines given in the Question-by-Question Guide to avoid biased answers and ensure comparability of data (see Part 5, Section 2).
Read all options	All options must be read to the participant except for Don't know/Don't remember, Refused, and Other.
Reading questions	Questions should be read: • as they are written in the text; • slowly and clearly emphasizing key words in bold; • in a pleasant voice that conveys interest and professionalism; • entirely to make sure the participant has heard it completely. Do not change the: • wording • order of the questions.
Making assumptions	Don't make assumptions about the participants' answers with comments such as "I know this probably doesn't apply to you, but…". This practice may prevent accurate and unbiased information.

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Providing clarification

You may need to provide clarification when the participant:

- is unable to answer the question asked;
- does not seem to understand the question and gives an inappropriate reply;
- does not seem to have heard the question;
- is taking a long time to answer the question and hesitates;
- asks about a specific part of the question to be repeated (it is acceptable to repeat only that part);
- asks for one option to be repeated (read all options again but you may omit one option if it has clearly been eliminated by the participant);
- asks for one term to be clarified (refer to the explanations provided in the Question-by-Question Guide).

When to probe further

You will need to probe further to get an appropriate response when the participant:

- seems to understand the question but gives an inappropriate response
- does not seem to understand what is asked
- misinterprets the question
- cannot make up his or her mind
- digresses from the topic or gives irrelevant information
- needs to expand on what has been said or clarify the response
- gives incomplete information or an answer is unclear
- says that he or she doesn't know the answer.

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Common responses that need probing

The table below lists some common responses that may need further probing:

If the participant replies…	Then…
"I don't know" (DK)	Repeat the question.
"I still don't know"	Probe once before recording (DK), for example, ask "Could you give me your best estimate".
"I still don't know"	This may mean the participant: • is taking time to think and wants to gain time; • does not want to answer because of personal reasons; • in fact does not know or has no opinion.
"Not applicable" (NA)	• ask him/her why the question does not apply to him/her; • write down NA if it is clear that the question is irrelevant.

Notes:

- Don't know/Don't remember and Refuse should be used only as an absolute last resort.

Probing techniques

The table below provides a few techniques to use when probing further:

Technique	Guidelines
Repeat the question	The participant may come up with the right answer if he/she hears the question a second time.
Make a pause	This gives the participant time to collect his/her thoughts and expand on his/her answer.
Repeat the participant's reply	This is often a very effective way of having the participant reflect on the answer he/she has just given.
Use neutral probes	Avoid biased responses and probes. Never give the impression that you approve or disapprove what the participant says, or that their answer is right or wrong. Instead, if you want more information, ask "anything else?", or "could you tell me more about…?"

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Interruptions

Interruptions may occur during an interview. If they become too long or too many, suggest returning at another time to complete the interview.

Take care that even if interrupted or delayed, you should remain patient and polite at all times.

Refusal to answer

Some participants may refuse to be interviewed. Reasons for this are varied and differ from one participant to another. Some participants may not refuse outright but may express hesitancy, reservation or hostility.

You will learn to distinguish between refusals (e.g. hesitancy from a definite refusal). Success in obtaining cooperation will depend upon your manner and resourcefulness.

Participants must not be forced to respond to the whole interview or to any part of the survey process. However, the more refusals that are made, the less representative the survey is of the whole population.

Handling refusals

Be prepared to obtain cooperation from a participant who does not want to be interviewed. In general, be pleasant good-natured and professional and most participants will cooperate.

Use the table below to help you handle some refusal situations:

If...	Then…
The participant becomes defensive	• show patience and understanding; • provide token agreement and understanding of his/her viewpoint, that is, saying something like, "I can understand that" or "You certainly have the right to feel that way"; • convey the importance of the survey to the participant.
You may have visited at a bad time	Try again later.
The participant may have misunderstood the purpose of the visit	Try to explain the purpose again.
You think you may get a "no"	Try to leave and suggest coming back later before you get a partial or an absolute "no".

Continued on next page

Interview Skills, Continued

Language issues

Be aware that if you use ‘interpreters of convenience’ (such as members of the participant’s family or household, the village headman, or domestic staff), you may get incorrect data being recorded.

If you don't get sufficient cooperation due to a language barrier, report this to your supervisor.

Completing the STEPS Instrument

Introduction

Once the standard STEPS Instrument has been adapted, translated and printed it is ready for use during the survey.

One instrument is to be completed for each participant you interview and measure. All items on the instrument must be completed for the response to be valid.

ID codes

When the interviewer receives the instruments, the following ID codes and information should be filled in already (see Part 2, Section 2, "Preparing Data Collection Forms"):

- Cluster ID
- Cluster name
- Interviewer ID
- Participant ID (on each page, first page twice).

Consent, Interview Language and Name

The second part on the first page of each instrument contains identification information, including the participant names. It is very important that these details are kept confidential at all times and you should tell the participant that they will be kept confidential.

Core and expanded items

The instrument contains **CORE** and **EXPANDED** questions and measurements. You will need to complete both.

Introductory statements

Where a section of items has an introductory statement, read this out to the participant before asking the questions in the section.

Entering the participant's response

For each item on the instrument, there may be one or more possible responses. Each possible response has an associated number. You will need to circle the appropriate response or fill in the appropriate response in the available box for each item. For example:

Questions		Response	Code
24	Do you currently smoke any **tobacco products**, such as cigarettes, cigars or pipes?	Yes 1 No 2 *If No, go to T 6*	T1
45	How many **servings** of fruit do you eat on **one** of those days? (*USE SHOWCARD*)	Number of servings 0 5 Don't Know 77	D2

Continued on next page

Completing the STEPS Instrument, Continued

Skip instructions

Skip instructions are located in the response column just next to the response. You will need to follow the instructions if the participant responds in a certain way to the question.

If you need to record notes, (for example, if the right arm was used instead of the left arm to take a blood pressure measurement) insert them in the left hand side margin.

"Don't know" responses

The table below shows what to enter as a last resort where the participant does not respond with a standard response.

If the participant responds with	And number of └┘ is	Then enter
Don't know Don't remember	└┴┘	77
Don't know Don't remember	└┴┴┘	777
Refused	└┴┘	88
Refused	└┴┴┘	888

Question-by-Question Guide

Introduction

The Question-by-Question Guide (Q-by-Q) is a 'master' version of the standard STEPS instrument. It provides instructions and guidelines for each question.

A copy of the Q-by-Q Guide can be found in Part 5, Section 2.

Purpose of the Q-by-Q guide

The purpose of the Q-by-Q Guide is to provide background information, explanations and examples of correct information to help interviewers accurately complete each instrument with participants.

It is to be used as both a training and data collection tool.

Using the guide

Before conducting the interviews, data collection team staff should:

- read the Q-by-Q Guide many times over until you are comfortable with the information;
- practice asking the questions;
- become thoroughly familiar with the contents of the instrument.

Responding to questions for clarification

If participants request clarification about specific questions, use the Q-by-Q Guide to help, rather than offering your own interpretations.

Show Cards

Introduction

Show cards are useful tools to help explain what is meant by some of the questions on the Instrument. To be useful, they must be adapted to local settings.

Applicable show cards

For each interview you may need to have show cards that cover the following topics:

- list of work status
- list and/or show cards of tobacco products
- alcohol consumption (standard drink)
- diet (typical fruit and vegetables and serving sizes)
- types of physical activities.

Note: These show cards can be found in Part 5, Section 3.

Instructions for use

These cards will have been adapted so they are appropriate for your setting.

Use the show cards to:

- help clarify what you mean and what the terms used on the Instrument mean
- show participants examples of the kind of products you are talking about.

Demographic Information (Step 1)

Introduction

Accurate core demographic information is essential for analysing and reporting on the overall results of the STEPS survey.

If the age and sex of a participant has been missed out, their responses cannot be used in the analysis, as most analyses report results that are grouped by these criteria.

Core demographic information

The core demographic information that is captured with the STEPS instrument includes:

- sex
- age
- years spent at school.

Dates of birth and age

In some countries, some individuals may not know their exact dates of birth and/or age. In these situations their age has to be estimated. To estimate someone's age, you will need to ask them how old, or at what stage in life they were at the time that a number of widely known major local events occurred.

Expanded demographic information

Expanded demographic information includes:

- highest level of education
- ethnic/racial group
- marital status
- work status
- household earnings.

Please note that it will be easier for respondents to answer the question on work status if a list of work status is used (see Part 5, Section 3 "Show Cards".

Some of the expanded demographic questions will have been adapted for your site so the terms and phrases make sense to participants in your environment, e.g., insertion of country specific examples for work status.

Skip instructions

There are two skip instructions in the demographic information section of the STEPS Instrument:

- C2: If date of birth is known, C3 ("How old are you?") can be skipped;
- C10a-d: If average earnings of the household are known, C11 (income quintiles) can be skipped.

Behavioural Measurements (Step 1)

Introduction

The behavioural measures in the STEPS Instrument relate to risky behaviour with regards to chronic diseases. In particular, they are designed to record details about:

- tobacco use
- alcohol consumption
- fruit and vegetable consumption
- use of oil and fat
- physical activity
- history of raised blood pressure and diabetes.

For the rationale for capturing information on these topics, see Part 1, Section 1.

Core questions

The STEPS Instrument includes core questions for each of the following:

- tobacco use
- alcohol consumption
- fruit and vegetable consumption
- physical activity
- history of raised blood pressure and diabetes.

The core questions of each are explained in detail in this section below.

Expanded questions

The behavioural measurements section of the STEPS Instrument includes expanded questions for each of the following:

- tobacco use
- alcohol consumption
- use of oil and fat
- sedentary behavior
- history of raised blood pressure and diabetes.

The expanded questions of each are explained in detail in this section below.

Continued on next page

Core questions on tobacco use

The tobacco-related questions recommended for the STEPS approach are based on the WHO guidelines for tobacco use surveillance (*95*).

Even though in some countries it is only men who smoke, women as well as men must be asked these questions.

The questions in the STEPS Instrument ask about:

- current smoking
- daily smoking
- age when starting smoking
- number of items smoked per day.

The following skip instructions apply:

- T1: If a person does not currently smoke, go to the questions on past daily smoking (T6);
- T2: If a person does not smoke daily, go to the questions on past daily smoking (T6);
- T3: If a daily smoker tells you the age when he/she started smoking, T4a-c ("how long ago was this?") can be skipped;
- T5a-T5other: Once a daily smoker has answered how many items he/she smokes each day, you can continue with T9 (use of smokeless tobacco) and skip the questions on past smoking (T6-T8a-c).

Expanded questions on tobacco use

The expanded tobacco questions focus on past smoking, the use of smokeless tobacco and on exposure to smoke and include questions on

- past smoking and age stopped smoking
- current use of smokeless tobacco
- daily use of smokeless tobacco
- number of times smokeless tobacco is used per day
- past use of smokeless tobacco
- passive smoking.

The following skip instructions apply:

- T6: If a person has never smoked daily, go to the questions on use of smokeless tobacco;
- T7: If a past daily smoker tells you the age when he/she stopped smoking, T8a-c ("how long ago was this?") can be skipped;
- T9: If a person does not use smokeless tobacco, go to T12 (past use of smokeless tobacco);
- T10: If a person does not use smokeless tobacco daily, go to T12 (past use of smokeless tobacco);
- T11a-T11other: Once a daily user of smokeless tobacco has answered how many items he/she uses each day, you can continue with T13 (exposure to smoke) and skip the question on past use of smokeless tobacco (T12).

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Expanded questions on tobacco use (cont.)

In some settings, smokeless tobacco will be more prevalent than smoking tobacco. For these settings, it is strongly recommended to include the expanded questions on tobacco use.

Tobacco use show card

See Part 5, Section 3 for a list of tobacco products as well as tobacco show cards. It is recommended that countries develop their own show cards displaying country specific examples of tobacco products.

Core questions on alcohol consumption

The consumption of alcohol varies a lot within and across countries, and different patterns of alcohol consumption are associated with different levels of risk. Alcohol consumption can be episodic, and asking individuals about their average (daily) consumption can be problematic. In addition, while some communities abstain from alcohol entirely or may use alcohol on very rare and specific occasions, others usually consume it rather regularly. Even though in some countries, only men may consume alcohol, women as well as men must be asked these alcohol related questions.

Due to the above mentioned reasons, surveys of alcohol consumption should attempt to capture amount and frequency as well as patterns of drinking.

The questions in the STEPS Instrument ask about:

- lifetime consumption of alcohol;
- past 12 month consumption of alcohol and it's frequency;
- general consumption of alcohol in past 30 days;
- number of occasions of alcohol consumption in the past 30 days;
- average number of drinks per drinking occasion;
- largest number of drinks per drinking occasion;
- number of occasions with five or more (for men)/four or more (for women) drinks in one occasion.

The following skip instructions apply:

- A1a: If a person has never drunk, you don't have to ask the rest of the alcohol questions;
- A1b: If a person has not drunk within the past 12 months, you can skip to D1 (questions on fruit and vegetable consumption);
- A3: If a person has not drunk within the past 30 days, you can skip to D1 (questions on fruit and vegetable consumption).

Continued on next page

Expanded questions on alcohol consumption

The expanded alcohol questions focus on drinking with meals and on drinking in the past 7 days. They will only need to be answered by those who replied "yes " to A3.

Alcohol consumption show card

The definition of a "standard drink" will have to be reviewed and potentially modified by each site on the show cards, included in Part 5, Section 3, to reflect local types of alcohol. This will include:

- types and strengths of products
- common measures
- local terms used for both.

If domestic manufacture of beer, wine or spirits is common, information on the usual ethanol content of such products should also be available to help determine the volume of absolute alcohol that makes a "standard drink".

Core questions on diet

The STEPS questions on diet include:

- the number of days fruit is eaten in a typical week
- the number of servings on one of these days
- the number of days vegetables are eaten in a typical week
- the number of servings on one of those days.

The following skip instructions apply:

- D1: If a person reports 0 days of fruit consumption, go to D3 (vegetables consumption);
- D3: If a person reports 0 days of vegetables consumption, go to D5, if applicable, or to the physical activity questions.

Expanded questions on diet

The expanded diet questions ask about the type oil or fat most often used for cooking, and about the number of meals consumed outside a home.

Diet show card

The diet show card in Part 5, Section 3 will have to be updated to show examples of fruits and vegetables considered most typical for your site. For comparative purposes, serving size is standardized to represent 80 grams.

Continued on next page

Core questions on physical activity

The STEPS physical activity questions represent the Global Physical Activity Questionnaire, version 2 (GPAQ). This questionnaire assesses physical activity behaviour in three different domains: at work (which includes paid and unpaid work, in and outside of the home), for transport (to get to and from places), and during leisure time.

Some people will be physically active in all three domains, others may not be active in any of the settings. In any case, questions from all three domains should be asked.

The GPAQ questions include:

- involvement in vigorous activities at work;
- number of days in a typical week with vigorous physical activity at work, and time spent in this activity on one of those days;
- involvement in moderate activities at work;
- number of days in a typical week with moderate physical activity at work, and time spent in this activity on one of those days;
- involvement in physical activity for transport;
- number of days in a typical week with activity for transport, and time spent in this activity on one of those days;
- involvement in vigorous activities during leisure time;
- number of days in a typical week with vigorous physical activity during leisure time, and time spent in this activity on one of those days;
- involvement in moderate activities during leisure time;
- number of days in a typical week with moderate physical activity during leisure time, and time spent in this activity on one of those days.

The following skip instructions apply:

- P1: If a person has not been involved in vigorous physical activities at work, go to moderate physical activities at work (P4);
- P4: If a person has not been involved in moderate physical activities at work, go to physical activities for transport (P7);
- P7: If a person has not been involved in physical activities for transport, go to vigorous physical activities during leisure time (P10);
- P10: If a person has not been involved in vigorous physical activities during leisure time, go to moderate physical activities during leisure time (P13);
- P13: If a person has not been involved in moderate physical activities during leisure time, go to sedentary behaviour (P16).

Expanded question on physical activity

The expanded question on physical activity assesses the time spent sitting on a typical day.

Continued on next page

Behavioural Measurements (Step 1), Continued

Physical activity show card

The physical activity show cards will have been adapted by each site to show types of physical activities.
See Part 5, Section 3 for a list of typical physical activities as well as a few examples on show cards that have been developed by countries and that display country specific examples of physical activities.

Core questions on history of raised blood pressure

The core questions on history of raised blood pressure include whether a person has ever had his/her blood pressure measured, whether he/she has been told that he/she has raised blood pressure, as well as whether this was in the past 12 months.

The following skip instructions apply:

- H1: If a person's blood pressure has never been measured, the rest of the history of blood pressure questions can be skipped;
- H2a: If a person has never been told that he/she has raised blood pressure, the rest of the history of blood pressure questions can be skipped.

Expanded questions on history of raised blood pressure

The expanded STEPS questions on history of raised blood pressure include:

- treatment of raised blood pressure
- traditional treatment of raised blood pressure.

Core questions on history of diabetes

The core questions on history of diabetes include whether a person has ever had his/her blood sugar measured, whether he/she has been told that he/she has raised blood sugar, as well as whether this was in the past 12 months.

The following skip instructions apply:

- H6: If a person's blood sugar has never been measured, the rest of the history of blood sugar questions can be skipped;
- H7a: If a person has never been told that he/she has raised blood sugar, the rest of the history of blood sugar questions can be skipped.

Expanded questions on history of diabetes

The expanded STEPS questions on history of raised blood sugar include:

- treatment of raised blood sugar
- traditional treatment of raised blood sugar.

Section 3: Guide to Physical Measurements (Step 2)

Overview

Introduction

This section provides information on and is a guide to working with the topics covered under Step 2 of the STEPS Instrument.

Intended audience

This section is designed for use by those fulfilling the following roles:

- interviewers
- data collection team supervisor
- STEPS Site Coordinator.

In this section

This section covers the following topics:

Physical Measurements Overview

Introduction	Step 2 of the STEPS Instrument includes selected physical measures to determine the proportion of adults that: • have raised blood pressure • are overweight and/or obese.
What you will learn	In this section, you will learn: • what the physical measures are and what they mean • what equipment you will need • how to assemble and use the equipment • how to take physical measurements and accurately record the results.
Learning outcomes objectives	The learning outcome of this section is to understand what the physical measures are and how to accurately take the measurements and record the results.

Physical Measurements

Introduction

Blood pressure is taken from the participants to determine the proportion of the population with raised blood pressure. Height and weight measurements are taken to calculate body mass index (BMI) that is used to determine the prevalence of overweight and obesity in the population.

Units of measurement

The table below shows the standard units of measurement for physical measurements used in STEPS and their upper and lower limits for data entry purposes.

Physical Measure	Unit	Minimum	Maximum
Systolic blood pressure (SBP)	mmHg	40	300
Diastolic blood pressure (DBP)	mmHg	30	200
Height	cm	100	270
Weight	Kg	20	350
BMI (body mass index)	Kg/m^2	11	75
Waist circumference	cm	30	200
Hip circumference	cm	45	300
Heart rate	beats/minute	30	200

Sequence of tests

In most sites, the physical measurements (Step 2) are done immediately after the behavioural measurements (Step 1). Since the participant must have rested for 15 minutes before the blood pressure measurement, it is most convenient to start the Step 2 measurements with blood pressure as the participant will have already been sitting for the duration of the interview. The Step 2 measurements should hence be taken from the participant in the following order:

1. Blood pressure (and heart rate, if measured)
2. Height
3. Weight
4. Waist circumference
5. Hip circumference (if measured).

Equipment required for tests

The equipment you will need for taking physical measurements include:

- blood pressure monitor and appropriate cuff sizes;
- height measuring board;
- weighing scales;
- wooden board (in case of uneven surfaces for scales);
- tape measure;
- pen;
- chair or coat rack for participant's clothes;
- curtain or screen to provide privacy if no private area is available for taking measurements.

Continued on next page

Physical Measurements, Continued

Privacy

Where possible, all physical measurements should be conducted in a private area. In some settings, a separate room in the household may be set up with the necessary equipment to take each measurement. Where this is not possible, a separate area should be screened off to provide privacy for waist and hip circumference measurements at minimum.

Allow the participant to select the degree of privacy – some may be concerned about going behind a screen or out of sight of others with people they do not know.

When to take physical measurements and record results

It is recommended that physical measurements are taken immediately after the Step 1 interviews. Results of Step 2 measures are to be recorded on the same participant instruments.

If physical measurements are taken some time after Step 1 interviews (not recommended), care should be taken to ensure data collection forms are correctly matched with their original instruments.

Introductions and explanations

Prior to taking physical measurements, explain that you will be taking the following measurements:

For Core
- blood pressure
- height
- weight
- waist circumference

For Expanded
- heart rate
- hip circumference.

Taking Blood Pressure and Recording Heart Rate

Introduction

Blood pressure is taken to determine the prevalence of raised blood pressure in the population.

Equipment

To take blood pressure you will need the following:

- digital automatic blood pressure monitor, e.g. OMRON
- appropriate size cuffs.

Preparing the participant

Ask the participant to sit quietly and rest for 15 minutes with his/her legs uncrossed. If physical measurements (Step 2) are done immediately after the behavioural measurements (Step 1), as recommended, the participant should have already been seated for at least 15 minutes, and the blood pressure measurements can be done immediately after finishing the Step 1 questions.

Three measurements

Three blood pressure measurements should be taken. During data analysis the mean of the second and third readings will be calculated. The participant will rest for three minutes between each of the readings.

Recording the blood pressure measurements

For recording the results of the blood pressure measurements, do the following:

- record your Interviewer ID (if not already filled in) in the participant's instrument;
- after each of the three measurements, record the results in the participant's instrument;
- check that all readings are correctly filled in the instrument;
- inform the participant on the blood pressure readings only after the whole process is completed.

Recording heart rate measurements

If a country/site decides to include the expanded measurement of heart rate, the recording should be done along with the recording of the blood pressure measurements after each of the three measurements. Heart rate and blood pressure results are displayed simultaneously.

OMRON procedure

The instructions below apply to the use of an OMRON blood pressure monitor. However, more detailed operating instructions are included with the device and should be reviewed before taking any blood pressure measurements.

Note that in case you use a different digital automatic blood pressure monitor, you should also read the instructions for the according machine carefully.

Continued on next page

Taking Blood Pressure and Recording Heart Rate, Continued

Applying the OMRON cuff

Follow the steps below to select an appropriate size and apply the cuff:

Step	Action
1	Place the **left arm*** of the participant on the table with the palm facing upward.
2	Remove or roll up clothing on the arm.
3	Select the appropriate cuff size for the participant using the following table: **Arm Circumference (cm)** – **Cuff Size** 17 -22 – Small (S) 22-32 – Medium (M) > 32 – Large (L)
4	Position the cuff above the elbow aligning the mark *ART* on the cuff with the brachial artery.
5	Wrap the cuff snugly onto the arm and securely fasten with the Velcro. **Note:** The lower edge of the cuff should be placed 1.2 to 2.5 cm above the inner side of the elbow joint.
6	Keep the level of the cuff at the same level as the heart during measurement.

***Note:** If the right arm is used, note this in the right hand side margin on the participant's Instrument.

Taking the measurement with an OMRON

Follow the instructions below to take the blood pressure measurement:

Step	Action
1	Switch the monitor on (dark purple button) and press START (light purple button).
2	The monitor will start measuring when it detects the pulse and the "heart" symbol will begin to flash. The systolic and diastolic blood pressure readings should be displayed within a few moments (systolic above and diastolic below).
3	Record the reading in the participant's instrument.
4	Switch the monitor off, but leave the cuff in place.
5	Wait three minutes, then repeat steps 1-4 two more times.

Continued on next page

Taking Blood Pressure and Recording Heart Rate, Continued

When to use a Sphygmomanometer

The sphygmomanometer is generally **not recommended**, but may be used in the following circumstances:

- the OMRON is not functioning;
- the OMRON display shows multiple errors;
- to cross check OMRON blood pressure readings in various clinical states such as irregular pulse, peripheral circulatory disturbance, extreme hypotension;
- for calibration of the OMRON Monitor.

Procedure for Sphygmomanometer

Follow the steps below or refer to the operating instructions included with the device to measure the blood pressure of a participant using the sphygmomanometer.

Step	Action
1	Apply the cuff (as detailed above).
2	Put stethoscope earpieces in ear and set to bell.
3	Palpate pulse at either brachial or radial artery. Take a pulse count for one full minute.
4	Pump up pressure and inflate cuff until unable to feel pulse.
5	Continue to inflate cuff 30 mmHg beyond this point.
6	Apply the bell of the stethoscope to the right antecubital fossa.
7	Listen for pulse sounds while deflating the cuff slowly.
8	Record the systolic blood pressure (SBP) when a pulse is first audible.
9	Record the diastolic blood pressure (DBP) when the pulse sound disappears.
10	Deflate the cuff fully and let the arm rest for three minutes (between each of the readings).
11	Repeat Steps 2-10 twice to obtain three readings.
12	Check that all readings are correctly filled in on the instrument.
13	Record your Technician ID code on the participant's instrument.
14	Inform the participant the blood pressure readings only after the whole process is completed.

Measuring Height

Introduction

The height of eligible participants is taken to help calculate their body mass index (BMI), which is their weight relative to their height, and therefore to determine the prevalence of overweight and obese people in the population.

Equipment

To measure height, you need a portable height/length measuring board.

Assembling the measuring board

Follow the steps below to assemble the measuring board:

Step	Action
1	Separate the pieces of board (usually 3 pieces) by unscrewing the knot at the back.
2	Assemble the pieces by attaching each one on top of the other in the correct order.
3	Lock the latches in the back.
4	Position the board on a firm surface against a wall.

Procedures

Follow the steps below to measure the height of a participant:

Step	Action
1	Ask the participant to remove their: • footwear (shoes, slippers, sandals, etc) • head gear (hat, cap, hair bows, comb, ribbons, etc). **Note:** If it would be insensitive to seek removal of a scarf or veil, the measurement may be taken over light fabric.
2	Ask the participant to stand on the board facing you.
3	Ask the participant to stand with: • feet together • heels against the back board • knees straight.
4	Ask the participant to look straight ahead and not tilt their head up.
5	Make sure eyes are the same level as the ears.
6	Move the measure arm gently down onto the head of the participant and ask the participant to breathe in and stand tall.
7	Read the height in centimetres at the exact point.
8	Ask the participant to step away from the measuring board.
9	Record the height measurement in centimetres in the participant's Instrument.
10	Record your Technician ID code in the space provided in the participant's instrument.

Measuring Weight

Introduction

The weight of eligible participants is taken to help determine their body mass index (BMI), which is their weight relative to their height, and therefore to determine the prevalence of overweight and obese people in the population.

Equipment

To measure weight, you will need the following equipment:

- portable electronic weighing scale;
- a stiff wooden board to place under the scales, if you are likely to have problems with uneven surfaces (such as dirt or mud floors or carpet);
- a generator, if electronic scales are being used and electricity is not guaranteed in all survey areas (check if scale can work with batteries).

Set up requirements

Make sure the scales are placed on a firm, flat surface.

Do not place the scales on:

- carpet
- a sloping surface
- a rough, uneven surface.

Electronic scales

Follow the steps below to put electronic scales into operation:

Step	Action
1	Put the scale on a firm, flat surface.
2	Connect the adaptor to the main power line or generator.
3	Turn on the scale.
4	Switch the scale on and wait until the display shows 0.0.

Procedures

Follow the steps below to measure the weight of a participant:

Step	Action
1	Ask the participant to remove their footwear (shoes, slippers, sandals, etc) and socks.
2	Ask the participant to step onto scale with one foot on each side of the scale.
3	Ask the participant to: • stand still • face forward • place arms on the side and • wait until asked to step off.

Continued on next page

Measuring Weight, Continued

Procedures (cont.)

Step	Action
4	Record the weight in kilograms on the participant's instrument. If the participant wants to know his/her weight in pounds, convert by multiplying the measured weight by 2.2.

Measuring Waist Circumference

Introduction

Waist circumference measurements are also taken to provide additional information on overweight and obesity.

Equipment

To take waist circumference measurements you will need a:

- constant tension tape (for example, Figure Finder Tape Measure)
- pen
- chair or coat stand for participants to place their clothes.

Privacy

A private area is necessary for this measurement. This could be a separate room, or an area that has been screened off from other people within the household.

Preparing the participant

This measurement should be taken without clothing, that is, directly over the skin.

If this is not possible, the measurement may be taken over light clothing. It must not be taken over thick or bulky clothing. This type of clothing must be removed.

How to take the measurement

This measurement should be taken:

- at the end of a normal expiration;
- with the arms relaxed at the sides;
- at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest (hip bone).

Continued on next page

Measuring Waist Circumference, Continued

Procedure

Follow the steps below to measure the waist circumference of a participant:

Step	Action
1	Standing to the side of the participant, locate the last palpable rib and the top of the hip bone. You may ask the participant to assist you in locating these points on their body.
2	Ask the participant to wrap the tension tape around themselves and then position the tape at the midpoint of the last palpable rib and the top of the hip bone, making sure to wrap the tape over the same spot on the opposite side. **Note:** Check that the tape is horizontal across the back and front of the participant and as parallel with the floor as possible.
3	Ask the participant to: • stand with their feet together with weight evenly distributed across both feet; • hold the arms in a relaxed position at the sides; • breathe normally for a few breaths, then make a normal expiration.
4	Measure waist circumference and read the measurement at the level of the tape to the nearest 0.1 cm, making sure to keep the measuring tape snug but not tight enough to cause compression of the skin.
5	Record the measurement on the participant's Instrument. **Note:** Measure only once and record.

Measuring Hip Circumference

Introduction

Hip circumference measurements are taken in some sites as an expanded option to measure overweight and obesity.

Equipment

To take hip circumference measurements you will need a:

- constant tension tape (for example, Figure Finder Tape Measure)
- pen
- chair or coat stand for participant's to place their clothes.

Privacy

A private area is necessary for this measurement. This could be a separate room, or an area that has been screened off from other people within the household. Hip measurements are taken immediately after waist circumferences.

Preparing the participant

This measurement should be taken without clothing, that is, directly over the skin.

If this is not possible, the measurement may be taken over light clothing. It must not be taken over thick or bulky clothing. This type of clothing must be removed.

How to take the measurement

This measurement should be taken:

- with the arms relaxed at the sides
- at the maximum circumference over the buttocks.

Continued on next page

Measuring Hip Circumference, Continued

Procedure

Follow the steps below to take hip circumference measurements.

Step	Action
1	Stand to the side of the participant, and ask them to help wrap the tape around themselves.
2	Position the measuring tape around the maximum circumference of the buttocks.
3	Ask the participant to: • stand with their feet together with weight evenly distributed over both feet; • hold their arms relaxed at the sides.
4	Check that the tape position is horizontal all around the body and snug without constricting.
5	Measure hip circumference and read the measurement at the level of the tape to the nearest 0.1 cm.
6	Record the measurement on the participant's instrument. **Note:** Measure only once and record.

Section 4: Guide to Biochemical Measurements (Step 3)

Overview

Introduction

This section provides information on taking biochemical measures required under Step 3 of the STEPS Instrument.

Intended audience

This section is designed for use by those fulfilling the following roles:

- data collection team supervisor
- health professionals (for clinic setting)
- STEPS Site Coordinator.

In this section

This section covers the following topics:

Biochemical Measurements Overview

Introduction

Step 3 includes selected biochemical measurements that require taking blood samples.

Step 3 is usually conducted in a clinic setting. It is only conducted in countries where resources permit as Step 3 approximately doubles the overall cost of the survey.

What you will learn

In this module, you will learn:

- what the biochemical measures are and what they mean
- the fasting process and instructions for participants
- what equipment you will need
- how to take biochemical measurements
- how to record the results.

Learning outcome

The learning outcome of this section is to understand what the biochemical measures are and how to accurately prepare participants, take the measurements and record results.

Recording results

The same participant instruments that have been used for Step 1 and Step 2 should be used to record the Step 3 results. However, the page for collecting results from Step 3 may be separated so that Step 1 and Step 2 results can be sent to the data entry office once those Steps have been completed. The participant ID should already be filled in on the Step 3 results page of the instrument (see Part 2, Section 2 "Preparing Data Collection Forms").

Required forms

Where Step 3 is conducted in a clinic the following forms are also to be used:

- Clinic Registration Form
- Participant Feedback Form Step 3.

Note: These forms can be found in Part 6, Section 2.

Dry vs. wet chemistry

There are two main blood chemistry screening methods: dry and wet chemistry. Dry chemistry means that blood is taken from the fingertip, while wet chemistry means that a venous blood sample is drawn. See Part 2, Section 1 for further information on dry and wet chemistry.

Note: In this section, only the dry chemistry method is described since wet chemistry is done directly at the laboratory.

Blood Collection

Introduction

Blood samples are taken from eligible participants to be used to perform simple tests to measure blood glucose and blood lipids.

Infection control

Follow the infection control procedures appropriate for your facility.

Whole blood is more infective with regard to blood borne disease than centrifuged serum or plasma. There may be an increased risk in handling whole blood and universal precautions should be adopted.

Units of measurement

The table below shows the standard units of measurement for biochemical tests used in STEPS and their upper and lower limits for data entry purposes.

Blood Test	Unit	Minimum	Maximum
Fasting glucose	mmol/L	1	35.0
Random glucose	mmol/L	1	50.0
Total cholesterol	mmol/L	1.75	20.0
HDL	mmol/L	0.10	5.0
Fasting triglycerides	mmol/L	0.25	50.0
Total cholesterol/HDL ratio	mmol/L	1.10	30.0

Participant fasting requirements

To obtain accurate results, participants must fast for at least 12 hours before blood collection. This is particularly important for the measurements of blood glucose as well as triglycerides, if applicable.

Most blood samples are to be taken in the morning. This means participants must not to eat or drink anything (except plain water) from about 8 pm the night before.

Diabetic patients on medication are required to bring their tablets with them and to take them after their blood measurement if possible (if they have not done so, they should inform the relevant laboratory staff).

Note: Fasting Instructions for Step 3 can be found in Part 6, Section 2.

Continued on next page

Blood Collection, Continued

Preparing the participant

After greeting the participant, and asking them to take a seat, follow the steps below to prepare the participant for a blood test:

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Fill in the following details on the Clinic Registration Form:

• Date
• Participant ID (if not already filled in)
• Participant Name (if not already filled in)
• check Consent Form if Consent Form 2 has been signed.</td></tr>
<tr><td>2</td><td>Ask the fasting question (first question on the instrument under Step 3, Code B1) and circle the answer.</td></tr>
<tr><td>3</td><td>If the participant has not fasted correctly, then:
• note "fasting default" on the participant's instrument;
• explain that to get accurate results participants need to fast for a minimum of 12 hours;
• ask if they would try fasting again and come back for a blood test the following day.

If the participant agrees to come back the following day, then:
• give the participant an appointment time and fasting instructions;
• note the time of the new appointment in the Clinic Registration Form;
• inform the supervisor.</td></tr>
<tr><td>4</td><td><table><tr><th>If...</th><th>Then explain to the participant that…</th></tr><tr><td>The participant has fasted correctly</td><td>• blood is going to be collected from a small prick on the finger;
• tests will be done on: fasting blood sugar, cholesterol and fasting triglycerides.</td></tr></table></td></tr>
</table>

Blood Glucose Measurement

Introduction

Blood sugar tests are taken to measure for raised blood sugar levels which are a risk factor for diabetes.

Equipment required

Dry chemistry equipment and supplies required for blood glucose tests include:

- blood glucose measuring device (such as: Reflotron Plus, Accutrend Plus or HemoCue 201 DM);
- test strips;
- lancet;
- cotton balls;
- sterile swabs;
- gloves;
- disposable container.

Preparing the device

Follow the appropriate device instructions to set up, prepare and use the meter for blood glucose tests.

Blood glucose measurement procedure

Follow the steps below to take blood glucose measurements and record the results. Note that you should also read the instructions provided with the device carefully.

Step	Action
1	Put on gloves.
2	Remove a test strip.
3	Rub and kneed a fingertip to help withdraw blood (rub the side of the participant's finger closest to the thumb).
4	Wipe or swab the fingertip by using a sterile swab.
5	Lance the massaged place on the fingertip with lancing device.
6	Allow a hanging blood drop to form without applying too much pressure.
7	Carefully apply the drop of blood to the test field on top of the strip without touching the test field directly to the finger. **Note:** The test field must be completely covered with blood. If too little blood is applied, do not rub it in or apply a second drop, but repeat the measurement with a fresh test strip.
8	Give the participant a cotton ball to press on the puncture.
9	Put the test strip into the machine.
10	Wait for the measurement to be displayed (after a series of beeps followed by longer beep). The blood glucose results is usually displayed in mmol/L.
11	Record the results of the fasting blood sugar reading in the participant’s instrument and in the Participant Feedback Form (Step 3). Also tick the corresponding box on this form.
12	Record Technician ID, Device ID, time of day and answer to medication question (B6) in the participant's instrument.

Cholesterol Measurement

Introduction

Blood cholesterol tests are taken to measure total cholesterol and HDL cholesterol levels.

Equipment required

Dry chemistry equipment and supplies required for cholesterol measurements include:

- cholesterol measuring device (such as: Reflotron Plus, Accutrend Plus, or Cholestech LDX);
- test strips;
- lancet;
- cotton balls;
- sterile swabs;
- gloves;
- disposable container.

Preparing the device

Follow the appropriate device instructions to set up, prepare and use the meter for cholesterol tests.

Cholesterol measurement procedure

Follow the steps below to take cholesterol measurements and record the results. Note that you should also read the instructions provided with the device carefully.

Step	Action
1	Put on gloves.
2	Remove a test strip.
3	Rub and kneed a fingertip to help withdraw blood (rub the side of the participant's finger closest to the thumb).
4	Wipe or swab the fingertip by using a sterile swab.
5	Lance the massaged place on the fingertip with lancing device.
6	Allow a hanging blood drop to form without applying too much pressure.
7	Carefully apply the drop of blood to the test field on top of the strip without touching the test field directly to the finger. **Note:** The test field must be completely covered with blood. If too little blood is applied, do not rub it in or apply a second drop, but repeat the measurement with a fresh test strip.
8	Give the participant a cotton ball to press on the puncture.
9	Put the test strip into the machine.
10	Wait for the measurement to be displayed (after a series of beeps followed by longer beep). The blood cholesterol results are usually displayed in mmol/L.
11	Record the results of the blood cholesterol reading in the participant's instrument and in the Participant Feedback Form (Step 3). Also tick the corresponding box on this form.
12	Record Device ID, and answer to medication question (B9) in the participant's instrument.

Triglyceride Measurement

Introduction

Triglyceride tests are taken to measure the fasting levels of natural fats and oils in the bloodstream.

Equipment required

Dry chemistry equipment and supplies required for triglyceride measurements includes:

- triglyceride measuring device (such as: Reflotron Plus, Accutrend Plus, or Cholestech LDX);
- test strips;
- lancet;
- cotton balls;
- sterile swabs;
- gloves;
- disposable container.

Preparing the device

Follow the appropriate device instructions to set up, prepare and use the meter for triglyceride tests.

Triglyceride measurement procedure

Follow the steps below to take triglyceride measurements and record the results. Note that you should also read the instructions provided with the device carefully.

Step	Action
1	Put on gloves.
2	Remove a test strip.
3	Rub and kneed a fingertip to help withdraw blood (rub the side of the participant's finger closest to the thumb).
4	Wipe or swab the fingertip by using a sterile swab.
5	Lance the massaged place on the fingertip with lancing device.
6	Allow a hanging blood drop to form without applying too much pressure.
7	Carefully apply the drop of blood to the test field on top of the strip without touching the test field directly to the finger. **Note:** The test field must be completely covered with blood. If too little blood is applied, do not rub it in or apply a second drop, but repeat the measurement with a fresh test strip.
8	Give the participant a cotton ball to press on the puncture.
9	Put the test strip into the machine.
10	Wait for the measurement to be displayed (after a series of beeps followed by longer beep). The triglyceride results are usually displayed in mmol/L.
11	Record the results of the triglyceride reading in the participant’s instrument and in the Participant Feedback Form (Step 3). Also tick the corresponding box on this form.

Section 5: Data Entry Guide

Overview

Introduction

This section provides general guidelines and training for data entry staff. A suggested schedule for training data entry staff is located in Part 3, Section 1. Instructions for supervising data entry and creating the final data set are covered in Part 4, Section 2.

Intended audience

This section is designed for use by those fulfilling the following roles:

- data entry supervisor
- data entry staff
- STEPS Site Coordinator.

In this section

This section covers the following topics:

Overview

Introduction

Data entry staff play a key role in ensuring that data collected and recorded on the completed instruments is accurately entered into the survey database and all instruments and associated tracking forms are systematically sorted and filed.

Note: Please tailor this training guide according to the baseline level of knowledge of your data entry staff.

What you will learn

During this training, you will learn about:

- using the computer
- the data entry process
- how to enter data and manage instruments
- rules and guidelines for data entry
- using EpiData software and the generic templates
- how to handle problematic (e.g. incorrectly completed) instruments
- how to produce a consistency report on entered data
- how to back up entered data.

Learning outcomes

The learning outcome of this course is accurate, efficient and well-documented entry of STEPS survey data from the instruments and Interview Tracking Forms.

Other data entry materials

This guide is to be used in conjunction with the following Sections in the STEPS Surveillance Manual. These sections provide full instructional material on the following topics.

Topic	Location
Preparing the Data Entry Environment	Part 2, Section 4
Data Entry	Part 4, Section 2
STEPS Instrument	Part 5, Section 1
Interview and Data Entry Forms	Part 6, Section 2

Using the Computer

Introduction

To use the computer for data entry, and to be able to operate the data entry software, you need to know how to:

- work safely
- turn the computer on
- open up the software you will be using
- exit from the software
- shut down the computer.

Work safely

Computers are electrical equipment and must be operated in a safe manner. Guidelines for safely operating your personal computer include:

Safety Issue	Guideline
Water and dust	Ensure that at all times the location of your computer is dry and clean. Any moisture or build-up of dust can increase the chance of electric shocks that can damage you or your computer.
Ergonomics	Ensure that your chair and the immediate environment are ergonomically placed, that your neck and back especially are not twisted or strained while operating the machine.
Food and drinks	Keep food and drinks away from the computer. Drinks spilled onto the keyboard can damage under the keys.
Electrical storms	If electrical storms occur while operating the machines, it is safest for both you and the machine to switch them off and unplug them from the power source, in order to prevent electrical surges or spikes damaging the equipment.

Turning on the computer

Follow the steps below to start using your computer:

Step	Description
1	Check that the computer is plugged in to the wall and the environs seem safe before turning on the main switch of your computer.
2	When turned on, you will hear a whirring from the internal fan inside the box, and the screen should light up. Some screens have an additional switch which needs to be turned on.
3	Ensure that the CAPS LOCK light is **not lit.** If the light is on, press the CAPS LOCK key to **turn it off**.
4	If prompted, enter your user ID and password. The password will be assigned to you by your supervisor and must not be shared with others.
5	The screen will show the software that has been set up for you.

Continued on next page

Using the Computer, Continued

Running your software packages

The icon for EpiData should be located on your desktop. Double click on the icon to open EpiData.

For tracking the stage, location, and comments from instruments as you enter them, you will use the data_entry_tracking.xls Excel file. The data entry supervisor should provide specific directions on how to open Excel on the computers.

Creating folders

While the data entry supervisor should have created all necessary folders on each machine prior to training, it is still important that data entry staff understand how to create a folder on their computers. Follow the steps below to create a folder if you have a mouse that has two buttons:

Step	Action
1	Go to the desktop on your computer.
2	Locate an empty space on the screen and right click on the mouse.
3	Select New>Folder from the list.
4	Type the name of the new folder below the icon for the new folder.
5	To create a folder within the new folder open the new folder and complete steps 2-4.

Note: If your mouse does not have 2 buttons, you can create a new folder by opening Windows Explorer and selecting File>New>Folder from the menu options.

Caring for your computer

Occasional care of your computer may be necessary including:

- wiping the keyboard and external surfaces of the box with a soft cloth (not damp or wet) when the power is off;
- cleaning the screen surface with a lint- and static-free cloth;
- vacuuming external vents to the computer box in dusty environments to reduce chances of dust-caused faults.

Closing down your computer

At the end of the day follow the steps below to safely turn off your computer:

Step	Action
1	Close EpiData and Excel.
2	Use the cursor to go to the lower left corner of the screen.
3	Select 'Start', then 'Shut down'.

Note: The machine may do some processing before shutting down. The screen should turn off and then the noises from the internal fan should cease as it closes down.

Data Entry Process

Introduction

Data entry is a systematic process that covers the following main stages:

- receiving and logging
- data entry
- validation
- error correction
- filing.

Overview of process

The table below gives a very general overview of the data entry process.

Step	Description
1	Completed instruments received, logged, and sorted by content.
2	Instruments are 1st keyed, using EpiData.
3	Instruments are 2nd keyed, using EpiData.
4	Data checked by data entry supervisor and combined into one dataset.

Using several data entry operators

To complete the survey within the given timeframe it is recommended that a team of data entry staff work together. The team needs to be well supervised and managed to ensure:

- each person completes a varied range of tasks each day;
- good workflow to keep up with completed instruments and forms and keep to scheduled timeframes.

Second Keying

It is strongly recommended that all instruments be keyed (entered) twice. A second keying decreases the chance of data entry errors being present in the final dataset. If a team of data entry staff is available, it is recommended to have two different staff members perform one keying of each instrument. With multiple staff members, the second keying process would be implemented as follows:

Step	Description
1	Staff member 1 is assigned to Computer A and completes the 1st keying for all instruments assigned to Computer A.
2	Staff member 1 and Staff member 2 swap computers. Staff member 2 is now assigned to Computer A.
3	Staff member 2 completes the 2nd keying for all instruments assigned to Computer A.

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Data Entry Process, Continued

Overview of handling Instruments

Instruments need to be handled systematically to maintain a good workflow, to make sure all problems and queries have been resolved, and to ensure that originals can be easily retrieved once completed. A system should be developed that provides explicit directions for how:

- instruments are received and logged by the supervisor;
- instruments are sorted and assigned to a data entry computer;
- data entry staff members log receipts of instruments;
- data entry staff members track the data entry process using the Data Entry Tracking Form;
- instruments are filed as data entry is completed for each instrument;
- instruments are locked away each night and redistributed each morning.

Handling queries

All queries should be addressed to the data entry supervisor. When you have a query make sure you:

- collect all necessary information about the query prior to contacting your supervisor;
- log any decision about the query on the Data Entry Tracking Form.

Data Entry Rules and Guidelines

Introduction

To ensure consistently high-quality data and to minimize delays, some general rules need to be observed during the data entry process to handle any difficulties that may be encountered with a given instrument. The table below provides some general guidelines for the data entry team.

<table>
<tr><th>Problem</th><th>Guideline</th></tr>
<tr><td>Instrument not correctly filled out</td><td>The data entry protocols and guidelines will not work if the instrument is not filled out correctly by the data collection team. If you come across an instrument that is not correctly filled out, immediately consult your supervisor.

(For example: The participant replies that he/she does not currently smoke but then provides values for how many cigarettes they smoke each day.)</td></tr>
<tr><td>Missing data</td><td>Some questions may be blank. Follow the guidelines below to handle missing data:

<table>
<tr><th>If…</th><th>Then…</th></tr>
<tr><td>Data is missing in a field where data is expected.</td><td>Enter 99 or 999 accordingly. Do NOT enter 0.</td></tr>
<tr><td>Complete date of birth or age is not provided.</td><td>Enter what is given. If any date is available, it will usually be the year.</td></tr>
<tr><td>Year of birth (only) is provided</td><td>• Calculate the estimated age of participant (survey year - birth year) and enter into age.
• Log calculation in Data Entry Tracking Form.</td></tr>
</table>
</td></tr>
<tr><td>Surplus data</td><td>If a decimal value (e.g. 7.5) has been entered where a non-decimal value is expected, enter the non-decimal part of the response (e.g. 7). For any other problems, consult your supervisor.</td></tr>
<tr><td>Participant ID (PID) crossed out</td><td>If you come across an instrument where the PID has been crossed out and another has been written in pen, then:

• skip the entire instrument and start entering a new one;
• record both PIDs in the Data Entry Tracking Form and note if you entered any data;
• contact your supervisor.</td></tr>
</table>

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Data Entry Rules and Guidelines, Continued

Topic	Guideline
Value out of range	If an instrument contains a value that is not possible, such as 1600 for height instead of 160, the value needs to be coded as out of range using 99, 999, or in the special case for weight: 666.6. The data entry tool will not allow an implausible value to be entered.
Other problems	You may come across other situations that are not easy to resolve. If your supervisor is not immediately available for consultation, follow the guidelines below: • do not process the form • skip and go on to the next instrument • record the PID number and nature of the problem • consult the supervisor when he/she becomes available.

Special data entry codes

Special codes have been allocated for use in STEPS to show the reasons data are unavailable. The codes include:

Codes	For response
77 or 777	Don't know
88 or 888	Refused
99 or 999	Missing

Introduction to EpiData

Introduction

EpiData is a program for entering data. Although you do not need to be an expert in EpiData in order to use this program, it is important that you are able to navigate the program.

Opening EpiData

Prior to training, the data entry supervisor should have downloaded and installed EpiData on all data entry computers. Instructions for downloading and installing EpiData can be found in Part 2, Section 4.

To open EpiData or any templates associated with EpiData you need to open the EpiData program. To open EpiData either:

- click on the EpiData icon on your desktop, or
- go to C:\Program Files\EpiData and click on EpiData.exe.

EpiData toolbars

The opening screen of EpiData is blank and contains 6 buttons across the top of the screen. These buttons and their functions are described in the table below.

Button	Used to…
1. Define Data	Access the .qes file and make changes to the look/content of the data entry templates.
2. Make Data File	Create data entry template (.rec file) from the .qes file.
3. Checks	Access the .chk file and define the value ranges and skip patterns used during data entry.
4. Enter Data	Enter data. Use this during pilot testing as well as for actual data entry.
5. Document	Print out a codebook to provide all the information associated with a template.
6. Export Data	Export data after data entry is complete.

Using EpiData for Data Entry

EpiData templates

The STEPS team in Geneva has created generic templates for data entry which should be modified by the data entry supervisor to match your site-specific instrument. The table below lists the templates.

Template	To record
Survey	• Cluster (centre/village) Name • Cluster (centre/village) ID • Interviewer ID • date of completion of the instrument • core questions and measures for Step 1, 2 and Step 3, as applicable • expanded and/or optional questions
Consent	Confidential (personal identification) data
Biochemical	Step 3 measurements, if recorded on a separate form

Note: Further details on the templates, including instructions for modifying them, are provided in Part 2, Section 4.

Location of data entry templates

Prior to training, the data entry supervisor is responsible for ensuring that a copy of the data entry templates has been placed on all data entry computers at the following location:

- C:\STEPS\data

Note: Once training is completed, the data entry templates on all data entry computers should be replaced with new copies so that test data is not included with the STEPS survey data.

Performing the first keying

The table below provides step-by-step instructions on how to do the 1st keying for a completed Instrument.

Step	Action
1	Open the EpiData program and click on the "4. Enter Data" button at the top of the screen.
2	Open the appropriate EpiData template (e.g. survey.rec) from the C:/STEPS/data folder.
3	Take the top instrument from your folder containing instruments ready for 1st keying and locate the Participant ID in your computer's Data Entry Tracking Form (either in Excel or Word).

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Performing the first keying (cont.)

Step	Action
4	Beginning with the Participant Identification Number (PID) at the top of the STEPS Instrument, enter data into the database **exactly** as it is written. Use the TAB key to move from one question to the next on the data entry screen. **Note:** Missing values are not allowed for the following items: • PID (Participant Identification Number) • I1 (Cluster Number) • I4 (Date of completion of Instrument) • C1 (Sex) • C2 or C3 (Age)
5	Continue using the TAB key to move from one question to the next until you reach the very end of the data entry form. When the last field is reached, EpiData will prompt you to save the current record. Click "Yes" to save the record and get a clean data entry form ready for entering data from the next instrument.
6	Log all discrepancies, questions and problems (irregularities) that you cannot resolve into the Data Entry Tracking Form. Include: • code (general identifier for a question, e.g. T1, P5…) • brief description of problem • supervisor's decision.
7	When you have completed entering the data from your section of the instrument, move the paper copy to the "second key" folder and update the Data Entry Tracking Form.
8	Continue entering the instruments and repeat steps 3-7.
9	At the end of the day, give the folders to the supervisor to lock up.

Note: At the bottom of the EpiData window is an indicator of how many records (instruments) have been entered in the current .rec file. Initially, this space will read "New/0" but the text will change as more records are entered. It is a good idea to periodically confirm that this number matches the number of records that have been entered (e.g. "New/5" indicates that you have finished and saved 5 instruments and are currently entering your 6th instrument).

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Using EpiData for Data Entry, Continued

Returning to a specific record

Occasionally you may need to return to a specific record in your data file. This may be necessary if you had to set aside a problematic instrument to await your supervisor's assistance or if you notice that you have skipped a section of an instrument you have entered. Follow the steps below to return to a specific record.

Step	Action
1	Open the EpiData program and click on the "4. Enter Data" button at the top of the screen.
2	Open the appropriate EpiData template (e.g. survey.rec) from the C:/STEPS/data folder.
3	Select "Find Record" from the Goto menu at the top of the screen.
4	Enter the Participant ID of the instrument of interest in the Criteria column next to ID.
5	Click "OK".
6	Once all changes/corrections have been made either close EpiData or select "New Record" from the Goto menu at the top of the screen to continue entering instruments. Click "Yes" to save the modified record when prompted.

Preparing for the second keying

A second keying should be done only after a large number of instruments have been first keyed on a given computer. If there is a significant amount of time between the arrival of new sets of instruments from the data collection team, a second keying can be done on all instruments received while awaiting new instruments. Otherwise, it is best to wait until the first keying has been completed on all instruments before proceeding to the second keying.

In order to minimize the potential for error, each instrument should be second keyed on the same computer on which it was first keyed. If multiple data entry staff are available, one staff member should use a given computer to complete the first keying and another staff member should use the same computer to complete the second keying (i.e. staff members should swap computers when doing second keying).

The table below provides step-by-step instructions on how to prepare for the second keying. It is important to keep in mind that the file generated from this process can **only** be used for the second keying of those instruments entered in the .rec file prior to making this file. If more instruments are received at a later time, these instruments should be first keyed and second keyed in completely separate files.

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Using EpiData for Data Entry, Continued

Preparing for the second keying (cont.)

Step	Action
1	Open EpiData and select "Prepare Double Entry Verification" from the Tools menu at the top of the screen.
2	Select the original .rec file (e.g. survey.rec) that needs to be second keyed.
3	Note that the name of the new data file for double entry has been automatically generated in the "File Name" field. It has the same name as your original file except that "_dbl" has been added to the name.
4	In the "Create Data File" dialog window, select the option "match records by field" in the lower left-hand corner. Double click "ID" in the "Select key-field" dialog window.
5	Click "OK" when the "Information" dialog window appears. Note that the name of the file for the second keying is listed at the bottom of this window again.

Performing the Second Keying

The table below provides step-by-step instructions on how to do the 2nd keying.

Step	Action
1	Open EpiData and click on the '4. Enter Data' button at the top of the screen.
2	Select the _dbl.rec file created following the instructions above. A dialog window should appear over the data entry screen stating that you are in data entry verification mode. The window will state which data file you are comparing with and which field is used to match records in each file (i.e. ID). Click "OK".
3	Complete the second keying in the same manner as the first keying, starting with the first instrument in your pile and using the TAB key to move between fields when entering data (refer to steps 3-6 from the instructions for first keying).
4	If a value entered does not match with the first keying, follow the guidelines on the next page.
5	Move completed instruments to the "completed" folder and update the Data Entry Tracking Form.
6	Continue second keying instruments until all instruments in the "second key" folder have been entered and moved to the "completed" folder.

Note: When the second keying is completed, the verified data will be stored in the _dbl.rec file, **not** the original .rec file.

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Using EpiData for Data Entry, Continued

Validation and error correction

During second keying, if there are any discrepancies between the data from the first keying and data from the second keying, the EpiData will immediately highlight the data that does not match. Follow the guidelines below on what to do when discrepancies arise.

If…	Then…	By…
An error is found in the **second keying.**	Keep the original value and continue.	Clicking '3. Original' on data entry screen.
An error is found in the **first keying** and is a minor typing error.	Keep the new value and continue.	Clicking '2. New' on data entry screen.
Neither the **first** nor **second keying** is correct.	Correct the error and continue.	Clicking '1. Edit' on data entry screen.
You are not sure which interpretation of the participant's response is correct.	Notify the supervisor and log any decision in the Data Entry Tracking Form.	
A high number of errors are found in the **first keying**.	Notify the supervisor.	

Consistency Reports

Introduction

At the end of each week, each data entry staff member entering data should run a consistency report on the survey.rec file on their computer to check the data for:

- missing data for Participant ID
- missing data for Cluster ID (I1)
- missing data for date of interview (I4)
- missing data for sex (C1)
- missing data for age (C2 or C3).

Instructions

In EpiData there is a consistency check file that searches for problematic records and provides the Participant ID (PID) (or record number for those records missing PID) for each record that fails the check. Follow the steps below to create a consistency report.

Step	Action
1	Open EpiData.
2	Select "Consistency Checks" from the "Document" menu at the top of the screen.
3	Select survey.rec (or survey_dbl.rec if second keying has been completed) for "data file to check".
4	Select consistency.chk for the "file containing checks".
5	Click "OK".
6	Save report under C:/STEPS/data/reports and use the current date as the file name.
7	Print a copy of the report for your supervisor.

Backing up Data

Introduction

All data files must be backed up on a daily basis to avoid data loss.

Backup

At the end of each day of data entry you must backup all your data files. This is to avoid data loss. Follow the steps below to back up the files electronically using EpiData:

Step	Action
1	Open EpiData.
2	Select "Backup" from the "Data in/out" menu at the top of the screen.
3	Select a .rec file that was used during the day for the "data file to backup" field.
4	Type "D:\STEPS" in "destination directory" (or name of backup directory, see Part 2, Section 4).
5	Click "OK".
6	Repeat steps 1-4 until all .rec files used on your computer have been backed up.

Note: Electronically backing up the data should be enough, however if your computers are not in a safe environment and you need to have another copy offsite, create a copy of the main STEPS folder for each machine on a disk at least once a week.

Pilot Test

Introduction

After data entry staff have been given a brief introduction to EpiData, a pilot test should be done to practice the entire data entry process.

Test Data

Test data will need to be generated for the pilot test. If possible, the instruments completed by data collection staff during their training can be used. Otherwise, the data entry supervisor should fill in enough instruments so that each data entry staff member has several instruments to enter.

Additionally, Interview Tracking Forms should be generated for the pilot test. These should contain the same Participant IDs as are on the instruments used for the pilot test in order to properly simulate actual data collection forms.

Procedure

The table below summarizes all aspects of the data entry process that should be thoroughly tested during the pilot test.

Step	Action
1	**Create a full set of data collection forms including:** • Interview Tracking Forms • 10-20 site-specific instruments • if Step 3 data is collected separately: Step 3 data collection forms. **Include some errors in these forms, e.g.:** • torn pages • incorrectly filled out instruments • out-of-range responses • non-existent clusters • invalid participant ID and cluster numbers.
2	**Test all logging and sorting processes.** • Use the Data Entry Log to sort and distribute all instruments. • Use the Data Entry Tracking Form to document data entry.
3	**Test all error correction systems including**: • documentation • creating and reading consistency reports • backing up data • data recovery.
4	At each step, report errors to the supervisor and refine the original EpiData template and instructions for handling different scenarios.
5	When testing is complete and error free, delete all test materials from the computers and replace them with new copies of the finalized data entry files.

Section 6: Data Analysis Guide

Overview

Introduction

This section provides general guidelines for the data analyst as well as a basic introduction to Epi Info. For more specific instructions on how to proceed with the analysis of your STEPS data, see Part 4, Section 2.

Intended audience

This section is designed for use by those fulfilling the following roles:

- data analyst
- STEPS Site Coordinator
- statistical adviser.

In this section

This section covers the following topics:

Overview

Introduction

The data analyst is responsible for :

- creating the database
- cleaning and weighting the data
- producing the completed fact sheet and data book.

What you will learn

In this course you will learn how to setup and use Epi Info to analyse your STEPS survey data.

Learning outcomes

The learning outcomes of this section are to be able to:

- navigate the Epi Info Analysis module
- run basic commands in Epi Info Analysis
- run the generic analysis programs provided by the Geneva STEPS team.

The generic analysis programs perform basic calculations needed to complete the Fact Sheet, Data Book, and site report.

Other data analyst materials

This guide is to be used in conjunction with the following sections in the STEPS surveillance manual. These sections provide full background detail and instructional material on the following topics.

Topic	Part, Section
Preparing the Sample	Part 2, Section 2
Preparing the Data Analysis Environment	Part 2, Section 5
Data Analysis	Part 4, Section 3
Fact Sheet Analysis Guide	Part 6, Section 3B
Data Book Template	Part 6, Section 3D

General Information

Introduction

It is important that the data analyst has some background information on the STEPS survey as this may impact the way they analyse the data. The general information that the analyst needs and where they can find this information is described below.

Scope of survey

The scope of the survey should be available in the implementation plan. The STEPS Site Coordinator will also have this information. The data analyst must understand the scope of the survey so that the results of the analysis reflect the scope.

Sample method

It is essential that the data analyst understands what sampling method was used for the STEPS survey so that the data can be properly weighted. The analyst should be familiar with the Interview Tracking Form Excel workbook (interview_tracking_form.xls) and the STEPS sampling Excel workbook (STEPSsampling.xls).

The sampling information should already be documented in the STEPS Implementation Plan and/or supporting documents and available for the analyst. If it is not documented, consult the STEPS Site Coordinator and make sure the information is documented right away. It is critical information and needs to be documented.

Assisting with fact sheet and site report

The data analyst should also assist the Site Coordinator with the Fact Sheet and site report. Liaise with the Site Coordinator to identify the data analyst's roles and responsibilities, see Part 4, Section 4 for more information.

Introduction to Epi Info

Introduction

For the analysis of data, the STEPS team recommends and supports Epi Info, a purpose-built, free, public-domain software package. While Epi Info has a broader range of functions, this manual will only explain how to perform data analysis in Epi Info using the Analysis module in Epi Info.

Rationale

The decision for choosing Epi Info was made in light of its advantages, some of which are listed below.

- Windows-based
- recent release of Epi Info, supported by developers
- has data analysis capability in line with STEPS requirements
- can appropriately adjust for complex sampling designs.

Topics covered

The following topics are covered in this tour of Epi Info:

- basic terminology
- opening the Analysis module and Analysis module screen components
- software settings and basic commands
- creating a new or derived variable
- displaying a variable
- obtaining basic descriptive statistics on a variable
- recoding a variable
- displaying data in a graph
- running saved programs
- selecting a subset of records in a dataset
- saving and printing outputs.

Downloading & Installing Epi Info

For instructions on downloading and installing Epi Info, please see Part 2, Section 5, Preparing the Data Analysis Environment.

Continued on next page

Terminology

Some of the specific Epi Info terms used are described in the table below.

Term	Description
Command	Predefined term in Epi Info syntax (language) that tells Epi Info how to manipulate or analyse your data (e.g. LIST, SELECT).
Program (.pgm)	Syntax files that can be saved in a separate text file or within an Access database. Contain a series of commands in Epi Info syntax to manipulate and analyse data.
Project	The name of the actual Access database (.mdb) file. All the data and related programs are stored within the project.
Variable	Any characteristic or attribute that can be measured. For STEPS datasets, most variables correspond to one question on the Instrument.

To open Epi Info

To open the Epi Info Analysis module double click on the Epi Info icon on your desktop and click the "Analyze Data" button in the lower left-hand section of the screen.

Alternatively, you can open the Analysis module directly by navigating to your Epi Info program folder (e.g. C:\Epi_Info) and double-clicking on the "analysis.exe" file.

Screen Components

The Analysis module of Epi Info has three main components divided into the following three windows:

Window	Function
Analysis	Contains all the commands that can be used during analysis.
Analysis Output	Displays the results of a program once it has been run.
Program Editor	Displays the code of saved programs and can be used to write new programs.

Continued on next page

Software Settings

Follow the steps below to set Epi Info to exclude missing data and to provide the appropriate output for weighted analyses.

Step	Action
1	In the Analysis window, click on Analysis Commands> Options>Set. It is located at the very bottom the Analysis window.
2	In the SET window, set "Yes as" to "Yes", "No as" to "No", and "Missing as" to "Missing.
3	Ensure all 6 check boxes immediately beneath the "Yes as" drop-down box are checked.
4	Set "Statistics" to "Advanced".
5	Ensure the check box for "Include missing" is NOT checked.
6	Set "Process records" to "Normal (undeleted)".
7	Click "Save all".

Open a dataset

Follow the steps below to open a dataset that is stored as a data table within an Access database.

Step	Action
1	In the Analysis window, click on Analysis Commands>Data> Read (Import) to open the READ window.
2	Set the "Data format" to "Epi 2000".
3	Click on "Change Project" and find and select your Access .mdb file (e.g. STEPS.mdb).
4	Click on the name of your dataset (e.g. MasterDataSet) from those listed.
5	Click "OK".

Note: The file path, number of records and date/time will be displayed in the Analysis Output window once the dataset is opened.

Continued on next page

Create a new or derived variable

Follow the steps below to create and assign values to a new or derived variable (e.g. BMI).

Step	Action
1	In the Analysis window, click on Analysis Commands>Variables> Define to open the DEFINE window.
2	In the DEFINE window, type the name of your new variable in the space provided (e.g. BMI).
3	Ensure "Scope" is set to Standard and click "OK".
4	In the Analysis window, click on Analysis Commands>Variables> Assign to open the ASSIGN window.
5	In the "Assign Variable" field, select your newly defined variable (e.g. BMI) from the drop-down list.
6	In the "Expression" field type the formula to compute the values of your new variable (e.g. weight/height*height). To use existing variables (e.g. weight and height) in your formula, select them from the "Available Variable" drop-down list.
7	Click "OK".

List all variable values

Follow the steps below to list the value of a variable for all records in the analysis output.

Step	Action
1	In the Analysis window, click on Analysis Commands>Statistics> List to open the LIST window.
2	Choose the variable(s) you wish to list from the "Variables" drop-down list or click the check box "All (*) Except" to list all variables.
3	Click "OK". A list of the chosen variables will be displayed in the Analysis Output window.

Create a frequency table for a variable

Follow the steps below to create a frequency table for a variable containing a list of all values for a given variable and the frequency of each value.

Step	Action
1	In the Analysis window, click on Analysis Commands>Statistics> Frequencies to open the FREQ window.
2	Choose the variable(s) you wish to list from the "Frequency of" drop-down list (select * to list all variables).
3	Click "OK". A frequency table(s) will be displayed in the Analysis Output window.

Continued on next page

Create a means analysis for a variable

Follow the steps below to perform a means analysis on a variable. The output of this command provides a frequency table as well as the mean, variance, standard deviation, and quartile values for the variable.

Step	Action
1	In the Analysis window, click on Analysis Commands>Statistics> Means to open the MEANS window.
2	Choose the variable(s) you wish to list from the "Means of" drop-down list (select * to list all variables).
3	Click "OK". A frequency table(s) and means analysis will be displayed in the Analysis Output window.

Recode a variable

Follow the steps below to recode a variable (e.g. age to Agerange).

Step	Action
1	In the Analysis window, click on Analysis Commands>Variables> Recode to open the RECODE window.
2	Select the variable **from** which you want to recode (e.g. age) from the "From" drop-down list.
3	Select the variable **to** which you want to recode (e.g. Agerange) from the "To" drop-down list.
4	Complete one line in the table for each value or range of values for your "From" variable that you wish to recode. It is recommended that all possible values for the "From" variable are assigned a corresponding value in the "To" variable to avoid missing values in the "To" variable. **Example:** To recode age values of 25 to 34 to the Agerange value of "25-34", type 25 for "Value", type 34 for "To Value", and type 25-34 for "Recode Value". To create further values for Agerange (e.g. 35-44, 45-54), complete additional rows in the table as needed.
5	Click "OK" when finished.

Graph variables

Follow the steps below to graph variables.

Step	Action
1	In the Analysis window, click on Analysis Commands>Statistics> Graph to open the GRAPH window.
2	Select "Graph type" from the drop-down list (e.g. bar for binary or points to depict continuous variables).
3	In the "X axis" section, select the X axis variable from the "Main variable(s)" drop-down list.
4	In the "Y axis" section, set "show value of" to "Count".
5	Fill in labels and titles if desired and click "OK".

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Run programs

Follow the steps below to run a saved program.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>In the Analysis window, click on Analysis Commands>User-Defined Commands>Run Saved Program to open the RUNPGM window.</td></tr>
<tr><td>2</td><td>Your program can either be stored in a program file (.pgm) or within an Access database file (.mdb). The table below shows how to run a program depending on the type of file in which it is saved.
<table>
<tr><th colspan="2">Program (.pgm) file</th><th colspan="2">Access Database</th></tr>
<tr><th>Step</th><th>Action</th><th>Step</th><th>Action</th></tr>
<tr><td>2.1a</td><td>Click on the grey box to the right of the "Filename" field to search for your .pgm file.</td><td>2.1b</td><td>Click on the grey box to the right of the "Filename" field to search for your .mdb file.</td></tr>
<tr><td>2.2a</td><td>Set "Files of type" to .pgm.</td><td>2.2b</td><td>Set "Files of type" to .mdb.</td></tr>
<tr><td>2.3a</td><td>Once you have found your file, click "OK" in the RUNPGM window.</td><td>2.3b</td><td>Once you have found the database, select the program from the "Program" drop-down list and click "OK".</td></tr>
</table>
</td></tr>
</table>

Select a subset of a dataset

Follow the steps below to select a subset of a dataset. The SELECT command will stay in effect until another SELECT command is called.

Step	Action
1	In the Analysis window, click on Analysis Commands>Select/If >Select to open the SELECT window.
2	Complete the "Select Criteria" field with the desired equation (e.g. C1=1), use the drop-down list in the "Available Variables" field to select variables in your dataset for your equation.
3	When your equation is complete, click "OK".
4	To cancel the SELECT command, open the SELECT window again and click "OK", leaving the "Select Criteria" field blank.

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Save a dataset

Follow the steps below to save a dataset after you have opened it and modified it.

Step	Action
1	In the Analysis window, click on Analysis Commands>Data> Write (Export) to open the WRITE window.
2	Set "Output Mode" to "Replace".
3	Click on the grey box next to the "File Name" field to search and select your data file (e.g. STEPS.mdb).
4	Select the name of the data table to which you would like to write in the drop-down list (e.g. MasterDataSet) or write the name of a new table in the "Data Table" field.

Save outputs

Follow the steps below to save the output in one file.

Step	Action
1	In the Analysis window, click on Analysis Commands>Output> RouteOut to open the ROUTEOUT window.
2	Define or browse for an output filename where your analysis is to be stored and click "OK".

Print outputs

Follow the steps below to print outputs.

Step	Action
1	In the Analysis window, click on Analysis Commands>Output> PrintOut to open the RPRINTOUT window.
2	Click "OK". The results will be printed.