

Part 2: Planning and Set Up

Overview

In this Part

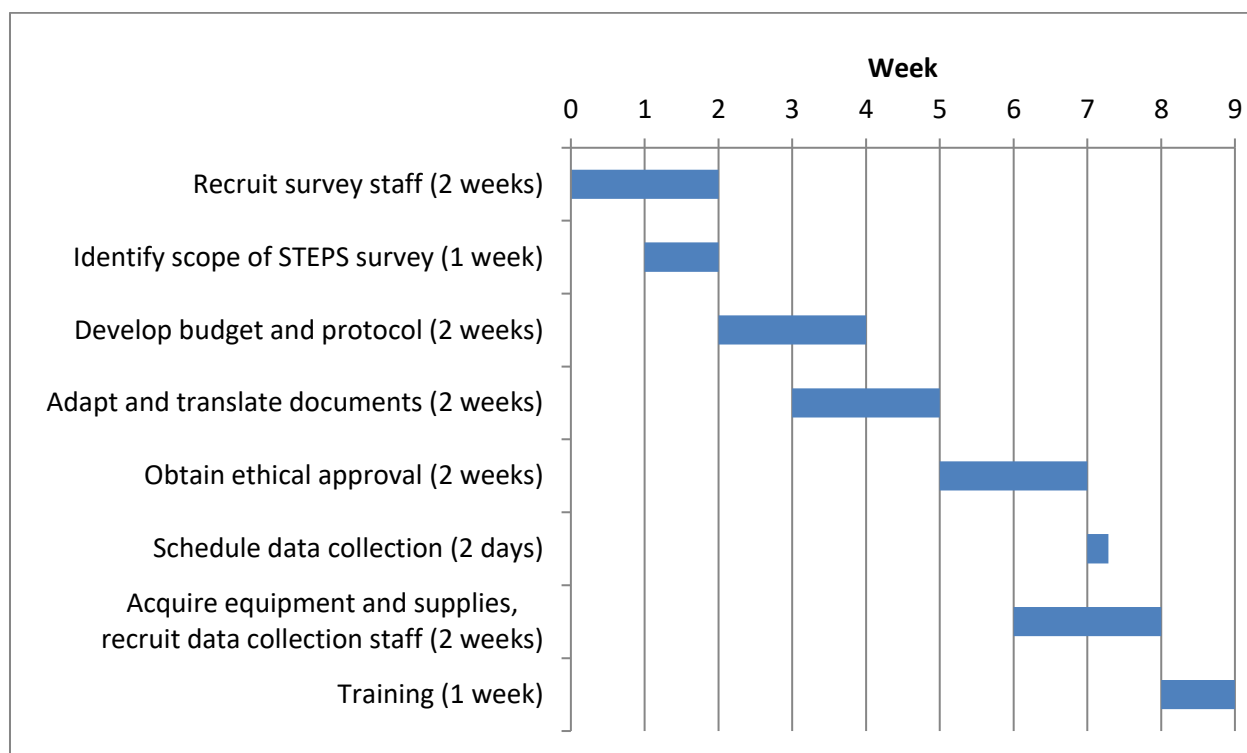
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Section 1: Planning and Preparing a STEPS Survey

Overview

Introduction	This section covers the tasks that need to be undertaken for planning your STEPS NCD risk factor survey.
Intended audience	This section is primarily designed to be used by those fulfilling the following roles: • STEPS Survey Coordinator • STEPS Coordinating Committee.
Tasks and timeframes	The chart below shows the main tasks and indicative timelines covered in this section.



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Overview, Continued

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Recruiting Staff

Introduction

The number and qualifications of staff will depend on the scope of the STEPS survey and the size of the sample as well as the type(s) of data to be collected, e.g. whether the country is implementing Steps 1, 2 and 3, and if optional modules are added. See Part 1, Section 2 for further details on the roles and responsibilities described below.

Timeframes for recruitment of staff

Recruitment of the members of the STEPS Coordinating Committee, including the STEPS Survey Coordinator, the Statistical Adviser, the IT Specialist/Data Manager, as well as other experts should be separate from the recruitment of the staff for the data collection activities, and should take place at the very early stages of the preparation of the STEPS survey.

Staff for the data collection activities, including field team supervisors, interviewers, Step 3 data collectors, drivers and administrative staff should only be recruited once the scope of the survey has been identified, and the field work has been planned.

Where to recruit people from

In many countries, recruitment is likely to be an informal process where data collection staff are 'seconded' from other duties within the MOH or other health authority responsible for undertaking the STEPS survey. In this situation, arrangements for their release and scheduled participation may need to be negotiated and explicitly agreed upon.

Where there is not sufficient available staff or specific skills are required (e.g. for data analysis) formal recruitment may be necessary.

Statistical adviser

The core tasks of the statistical adviser include:

- drawing the sample and documenting the sampling method;
 - applying weights to the survey data and providing statistical advice during data analysis and reporting.
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Recruiting Staff, Continued

IT specialist/ Data manager and analysis team

The core tasks of the IT specialist/data manager and the analysis team include:

- assisting with set-up of Android devices for data collection;
 - providing support during the data collectors training on issues related to the Android devices;
 - providing support to the field teams during the field work on issues related to the Android devices;
 - downloading completed records from the Android devices;
 - compiling the final dataset;
 - pre-cleaning of the dataset;
 - weighting of the survey data in collaboration with the statistical adviser;
 - cleaning, analysis and assistance with reporting of the survey data.
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Data collection team

The core roles within the data collection team include the following:

- field team supervisors
 - interviewers
 - Step 3 data collectors, if separate from the interviewers
 - drivers
 - administrative staff.
-

Gender considerations for the data collection team

For the data collection team, a mixture of staff of both sexes may be required for situations and communities where:

- there are strict rules about contact with members of the opposite sex
 - there is individual preference.
-

Language, ethnic and religious considerations

For the data collection team, a mixture of staff who are fluent in several local languages and/or dialects and represent varied cultural, ethnic and religious groups may be valuable.

Laboratory technician

The core tasks of the laboratory technician include:

- check and analyse urine samples
 - record results and PIDs.
-

Number of Staff Required

Estimating numbers for the data collection team

The number and mix of staff requires careful calculation, based on the sample size and the geographical scope of the survey. Typically, one field interviewer is expected to complete 4-6 interviews in one day.

For data collection, multiple teams should be recruited and trained to enable completion of interviews within the planned timeframe. All teams should have back-up staff available to cover for illness and other absences among members of the team.

Data collection staff

Use the following table as a guide to help determine the number of data collection staff required to interview. A final sample size of 5,760 participants and a timeframe of approximately 3 months of data collection was used to determine the numbers in the table below. The numbers may need to be adjusted depending on the final sample size and field implementation plan of your survey.

Average number of interviews per day per interviewer	Number of inter-viewers*	Number of Step 3 data collectors	Number of field teams and supervisors	Team composition
4-6	24-32	6-8	6-8	1 Supervisor with 4 interviewers and 1 Step 3 data collector

Note:

- * The average number of interviews represents the number of interviews conducted or measurements taken by one interviewer during an eight hour working day.
 - If the size of the survey increases or decreases, or this timeframe for data collection is extended, these indicative numbers would change accordingly.
-

Field teams

The following factors need to be considered when putting together the field teams:

- Consider allocating between two and four interviewers and one Step 3 data collector per team, with each interviewer assigned to different households.
 - In some countries, male and female interviewers may be paired.
 - One supervisor should be responsible for between one and two teams.
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Identifying the Scope of the STEPS Survey

Introduction

To develop a STEPS implementation plan, the scope of the STEPS Instrument being covered must be clearly defined.

The WHO STEPwise Instrument

The focus of the WHO STEPwise approach to surveillance of NCD risk factors is reflected in the core modules of the STEPS Instrument.

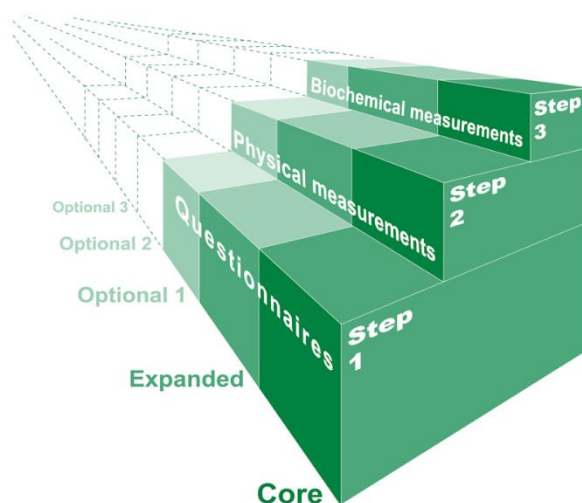
Step 1 core and expanded information will provide basic data on behavioural risk factors. Including Step 2 core and expanded physical measurements will provide useful additional data on excess body fat, raised blood pressure and heart rate.

Including Step 3 biochemical measurements will provide data on salt intake, raised blood glucose and cholesterol levels.

Note: The STEPS Instrument can be found in Part 5, Section 1.

STEPS diagram

The diagram below shows each of the Steps.



Note: For guidance on implementing each of the Steps, please refer to the pages that follow. To fully understand each item covered in the STEPS Instrument, please see the Question-by-Question Guide in Part 5, Section 2.

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Identifying the Scope of the STEPS Survey, Continued

Step 1 core questions

Step 1 core items will provide basic demographic information and measures of:

- tobacco use;
 - alcohol consumption;
 - fruit and vegetable consumption;
 - salt and processed food consumption;
 - physical activity;
 - history of raised blood pressure, diabetes, raised total cholesterol and cardiovascular diseases;
 - lifestyle advice;
 - cervical cancer screening.
-

Step 1 expanded questions

Countries should include Step 1 expanded questions to:

- describe demographic breakdowns (e.g., level of education, ethnicity, marital and employment status, and household income);
- collect information on cessation of tobacco smoking, and exposure to environmental tobacco smoke;
- capture information on alcohol use disorders;
- collect information about awareness of too much salt as a health problem, and control of salt intake;
- capture sedentary behavior.

Collecting this information is recommended for countries that wish to capture this level of detail.

Step 2 core

Step 2 core items can be done at the same time as Step 1, using the same data collection staff. Step 2 core will provide measures of:

- blood pressure
 - height and weight
 - waist circumference.
-

Step 2 expanded

Step 2 expanded will provide measures of:

- hip circumference
 - heart rate.
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Identifying the Scope of the STEPS Survey, Continued

Step 3 core

Countries should undertake Step 3 core items if they have a need to detect the prevalence of high urinary sodium concentration, raised blood glucose and raised cholesterol. Step 3 core will provide measures of:

- urinary sodium and creatinine
- blood glucose
- total cholesterol.

Step 3 expanded

Countries should undertake Step 3 expanded if they need to know about abnormal lipid profiles as a risk factor for cardiovascular diseases. Step 3 expanded will provide measures of:

- triglycerides
- HDL cholesterol.

Optional questions and measures

Some countries may wish to go beyond the core and expanded items of STEPS to describe the prevalence of other specific health problems.

This may be achieved by asking the additional 'optional' questions in Step 1 from the available optional modules, by including additional country-specific questions, or by adding objective measurement of physical activity with pedometers or accelerometers as part of Step 2.

Step 1 and 2 optional

If a country wants to capture the prevalence of a particular health problem, optional modules can be added to Step 1 or Step 2. For example:

If you need to	Then add
Assess a particular health problem, such as: • Cervical cancer • mental health/suicide • oral health • tobacco policy • violence and injury. • household energy use • sensory function	Optional modules to Step 1.
Link the STEPS survey to other population surveys.	Appropriate optional questions.
Get more information on population physical activity levels	Optional objective measurement of physical activity to Step 2.

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Identifying the Scope of the STEPS Survey, Continued

Considerations When countries add additional questions to Step 1 to tailor the Instrument to a local context, the time of the each interview increases, in turn leading to higher costs of collection, analysis and presentation of the information.

Adding more questions and local information also adds to the burden on participants in the surveys, and thus threatens the level of participation in future surveys in the same population.

The STEPS Implementation Plan

Introduction Each country conducting STEPS will need to create a detailed STEPS implementation plan for all stakeholders involved in the surveillance process.

Purpose The purpose of the implementation plan is to:

- outline the scope of the survey and desired goals;
- outline the roles and responsibilities of national and international teams involved in the survey;
- describe the survey methods including sample size and sampling design;
- describe the plans for training, field work and data management;
- identify required human and financial resources;
- create an action plan and timeline;
- develop a communication strategy; and
- provide a well-planned budget as a basis for funding.

Requirement The content of the implementation plan should be developed using the guidelines in the sections below. Once complete, it should be approved by the STEPS Coordinating Committee after wide consultation and discussion with in-country subject matter experts, and sent to the WHO Regional Office and Headquarters STEPS team for review.

Core topics The topics that should be covered in the implementation plan and references to appropriate sections in the manual where guidelines can be found are listed in the table below:

Topics	Detail	Reference
Executive Summary	Provide a high level summary of main points including: • current situation of NCD risk factors in the country • goals of the survey • scope and methods planned to be used • required resources • budget.	
Current Situation	Specify: • the rationale for conducting NCD risk factor surveillance; • if a risk factor survey was conducted in this country previously; • the availability of risk factor data in this country; • if there is an infrastructure (human capacity, equipment, etc.) on which STEPS could be built.	Part 1, Section 1

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The STEPS Implementation Plan, Continued

Core topics (cont.)

Topics	Detail	Reference
Goals and Objectives	• Identify planned goals and the use of collected information to: – describe the current levels of NCD risk factors in this population; – track the direction and magnitude of risk factor trends; – plan or evaluate a health promotion or preventive campaign; – collect data from which to predict likely future demands for health services. • Specify objectives that support gathering 'essential' information only.	
Scope	• Specify the scope of surveillance to be conducted (Step 1, Step 2 and Step 3, plus coverage of core, expanded and optional items). • Specify if future STEPS surveillance can be assured.	In this Section
Survey methods	• Describe the survey design; • Identify the geographical coverage; • Identify the sample size and sample frame that will be used*; • Describe the sampling methodology; • Describe broad timeframes; • Specify how STEPS sustainability can be assured and plans for future surveys.	Part 2, Section 2
Organization of field work	• Describe the number and roles of the field staff; • Describe the composition of field teams; • Describe the logistics of the field work, including the flow of Step 1, 2 and 3; • Specify equipment to be used for electronic data collection, as well as Step 2 and 3 measurements; • Describe organization of training of field staff and pilot testing.	In this section; Part 4, Section 1
Data management	• Describe how data quality will be checked during field work; • Describe data management, analysis and reporting.	Part 4, Section 3

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The STEPS Implementation Plan, Continued

Core topics (cont.)

Topics	Detail	Reference
Resources	• Specify required resources in terms of all personnel and equipment required for STEPS surveillance. • Describe resources that have already been committed from within the country or which are expected (in-kind or financial commitments). • Specify resources expected from other organizations involved, including support from WHO.	In this Section
Action Plan	Provide a chart of the main tasks, with roles and responsibilities of each agency involved, with estimated start dates and timeframes for completion of each phase.	
Communication strategy and publicity	Specify methods for informing and involving community leaders, members of the public, and the media in the STEPS survey project to gain commitment and support during the field work.	
Reporting and Disseminating Results	Describe to whom and how the results will be reported and disseminated.	Part 4, Section 4
Budget	Provide a detailed budget that includes: • total funds required for each year planned to implement all STEPS activities as identified in the Scope (including future surveys); • source of funds; • funding gap.	In this Section

* During the planning phase of the survey, it is fundamental to determine the size of the sample as this will impact operational considerations, such as the number of interviewers required and days of field work. There will have to be a compromise in which the precision requirements of the estimates are weighted against various constraints such as available budget, resources and time.

Implementation plan template A STEPS Implementation Plan Template can be found in Part 6, Section 1.

Developing a Budget

Introduction

Each country conducting STEPS will need to create a detailed STEPS budget including realistic costs for all tasks and items needed during the STEPS surveillance process.

Budget template

The items and subline items that should be covered in the calculation of a realistic and detailed budget are listed in the Budget Template in Part 6, Section 1. However, items or subline items may need to be added or removed as the template is adapted to the local context.

An excel tool with integrated formula and examples is available on the WHO STEPS website, and on request from the WHO STEPS team.

Use of the template

For each subline item in the Budget Template in Part 6, Section 1, the following information should be listed in a table:

- quantity or number required (units)
 - unit cost (in local currency)
 - unit cost (converted to USD)
 - total cost (in USD)
 - responsible organization
 - comments.
-

Costs for personnel

A STEPS survey is usually an activity implemented by the NCD Unit of the respective MOH, and is expected to be part of the core activities of national NCD Programme. Therefore, usually, the salaries of the STEPS Coordinating Committee members involved in overall planning and coordination of the survey should not be included in the survey budget.

Adapting the STEPS Instrument

Introduction

Use of a standardized STEPS Instrument enables comparisons both within the country over time and also in-between countries. However, the degree to which the Instrument can be standardized across cultures or settings can be limited.

When to adapt the Instrument

Adaptations may need to be made to the STEPS Instrument to provide valid data for the country or to address the needs for information on other risk factors.

The following table provides guidance on when the Instrument can be adapted to local requirements.

Item	If...	Then...	Notes
Terminology	The terms used in some core questions do not fit the cultural setting (e.g. occupations).	Alter the term for local relevance, but ensure the original meaning is retained.	Changing the wording can easily alter the meaning of a question. Seek advice before changing questions.
Additional information	You require additional data on certain risk factors (e.g. exposure to indoor smoke at public places) and you have available resources.	Add selective, but limited questions as optional items.	Inserting them in the middle of the core/expanded sections may alter the meaning of the questions. Insert them where they best fit so that they work with the flow of the other questions.
Link to previous data	You require specific data to link to previous surveys.	Add selective, but limited questions as expanded or optional items.	Insert the questions where they best fit so that they work with the flow of the other questions.
Questions that are considered less relevant	Questions asking about a particular health behaviour that is less relevant in your setting, (e.g. type of smokeless tobacco).	Drop these questions.	Look first at the fact sheet analysis guide and data book to see the impact on removing questions on the analysis.

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Adapting the STEPS Instrument, Continued

Rules

The list below provides some fundamental rules that must be observed when tailoring the STEPS Instrument to create your country-specific instrument.

- Never delete a question or measure from the core sections (unless question is not applicable in your setting).
 - Never change the standard coding numbers (last column in the survey instrument).
 - Place additional questions or measures where they best fit within relevant section as an expanded or optional item.
 - Do not place additional questions or measures in between core questions or measures.
 - Code all added questions or measures with the letter 'X' plus a number (e.g. X1, X2...).
 - Remove the expanded sections and Steps (i.e. Step 3) that are not being covered by your country from the Instrument.
 - Amend the skip instructions if expanded or optional items are removed from or added to any section.
 - Review all skip instructions.
 - Send a draft of your adapted STEPS Instrument to the WHO Regional Office and the Geneva STEPS team for review before finalizing.
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Process

The process of adapting the STEPS Instrument involves the following key stages:

Stage	Description
1	Identifying questions that require local adaptation.
2	Adapting wording or adding questions or response options and adjusting skip instructions.
3	Adapting other forms as appropriate.
4	Seeking feedback and advice.
5	Translating and back translating the country-specific instrument.
6	Pilot testing the country-specific instrument.
7	Adapting the data analysis code and reporting templates as appropriate.

Note: Further details on each of these stages are provided in the following pages.

Available support

The WHO STEPS team is available at all stages of this process for consultation and technical advice. To enable the WHO STEPS team to assist with data analyses and weighting of the data, please ensure that they receive a copy of the Instrument prior to finalization.

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Adapting the STEPS Instrument, Continued

Common questions for adaptation

The table below provides information on questions and items in the STEPS Instrument that most commonly require local adaptation:

Question Code	Standard wording	Guidance for adaptation
I6	Interview language	• Insert languages as appropriate. • Question can be removed if all interviews will be conducted in one language.
C5	What is the highest level of education you have completed?	• The education categories (taken from the World Health Survey) are designed to translate national education programmes into an internationally comparable set of categories. • If you use other categories you should document the definitions and how they relate to those in the Instrument.
C6	What is your <i>[insert relevant ethnic group/racial group/cultural subgroup/others]</i> background?	• Insert a list of terms that best define differences in health and health related outcomes in your country, e.g. race, religion, ethnicity, etc. • Base ethnic groups on the census definition.
C8	Which of the following best describes your main work status over the past 12 months?	• Insert categories appropriate to your setting. • Document the list of the new categories and how they relate to the Instrument.
C11	If you don't know the amount, can you give an estimate of the annual household income if I read some options to you? Is it less than... <i>[Insert Quintile Values]</i> ?	Insert 20, 40, 60, 80% of average national income distribution obtained from an authentic source (e.g. National Income and Expenditure surveys, etc).
T1, T5	• Do you currently smoke any tobacco products, such as cigarettes, cigars or pipes? • On average, how many of the following products do you smoke each day/week?	• Add/modify examples as appropriate. • Develop a show card that covers all smoked tobacco products used in your country (see example in Part 5, Section 3).
T12, T14	• Do you currently use any smokeless tobacco products, such as <i>[snuff, chewing tobacco, betel]</i>? • On average, how many times a day/week do you use...?	• Add/modify examples as appropriate. • Develop a show card that covers all smokeless tobacco products used in your country (see example in Part 5, Section 3).

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Adapting the STEPS Instrument, Continued

Question Code	Standard wording	Guidance for adaptation
A1	Have you ever consumed any alcohol such as beer, wine, spirits or <i>[add other local examples]</i> ?	• Add/modify examples as appropriate. • Develop a show card that covers all alcoholic products used in your country (see example in Part 5, Section 3).
A11, A12	• During the past 7 days, did you consume any homebrewed alcohol, any alcohol brought over the border/from another country, any alcohol not intended for drinking or other untaxed alcohol? • On average, how many standard drinks of the following did you consume during the past 7 days?	• Add/modify examples as appropriate. • Develop a show card that covers all alcoholic products used in your country that are untaxed (see example in Part 5, Section 3).
D7	How often do you eat processed food high in salt? By processed food high in salt, I mean foods that have been altered from their natural state, such as packaged salty snacks, canned salty food including pickles and preserves, salty food prepared at a fast food restaurant, cheese, bacon and processed meat <i>[add country specific examples]</i> .	• Add/modify examples as appropriate. • Develop a show card that shows processed food high in salt typically consumed in your country (see example in Part 5, Section 3).
P1	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like <i>[carrying or lifting heavy loads, digging or construction work]</i> for at least 10 minutes continuously?	• Add/modify examples as appropriate. • Develop a show card that shows examples of typical local vigorous-intensity activities at work (see example in Part 5, Section 3).
P4	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking <i>[or carrying light loads]</i> for at least 10 minutes continuously?	• Add/modify examples as appropriate. • Develop a show card that shows examples of typical local moderate-intensity activities at work (see example in Part 5, Section 3).

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Adapting the STEPS Instrument, Continued

Question Code	Standard wording	Guidance for adaptation
P10	Do you do any vigorous-intensity sports, fitness or recreational (<i>leisure</i>) activities that cause large increases in breathing or heart rate like <i>[running or football]</i> for at least 10 minutes continuously?	• Add/modify examples as appropriate. • Develop a show card that shows examples of typical local vigorous-intensity activities during leisure time (see example in Part 5, Section 3).
P13	Do you do any moderate-intensity sports, fitness or recreational (<i>leisure</i>) activities that cause a small increase in breathing or heart rate such as brisk walking <i>[cycling, swimming, volleyball]</i> for at least 10 minutes continuously?	• Add/modify examples as appropriate. • Develop a show card that shows examples of typical local moderate-intensity activities during leisure time (see example in Part 5, Section 3).
B5, B8, B16, B17	Measurements of • Fasting blood glucose • Total cholesterol • Triglycerides • HDL cholesterol	• Choose if measurements will be reported in mmol/l or in mg/dl.

Note: For further guidance and details about each item in the STEPS Instrument, please see the Question-by-Question Guide in Part 5, Section 2.

Skip patterns If the content of the Instrument has been adapted, you will need to review and update all the skip instructions to ensure they are accurate.

Note: The skip instructions may look complicated on paper, however, skips are performed automatically by the Android STEPS app.

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Adapting the STEPS Instrument, Continued

Adapting forms, procedures and show cards

Some forms, procedures and show cards may also require tailoring to ensure local relevance.

The table below shows some common adaptations that may be required.

Item	What to adapt (or create)
Show Cards	Adapt (or create) examples used for: • list of work status; • tobacco products; • standard drink sizes for alcohol consumption; • local fruit and vegetables with standardized servings; • local foods that are high in salt; • physical activities. See Part 5, Section 3 for examples.
Interview Tracking Form	May require adjustment according to variations in sampling design.

Note: The Interview Tracking Form needs to be used during the interview process. This form is needed to weight the data during data analysis.

Translating STEPS Documents

Introduction

Many countries will require that the most important STEPS documents are available in more than one language. These materials are to be translated into the language(s) used in the countries by a translator and then back-translated into the original language by a different translator to ensure accurate reproduction of meanings.

Documents to translate

The table below lists some of the documents that may need translating and includes the reference to their location in the manual.

Documents	Manual reference
STEPS Instrument	Part 5, Section 1
Question-by-Question Guide	Part 5, Section 2
Show Cards	Part 5, Section 3
Training and Practical Guides	Part 3
Forms for STEPS Field Work	Part 6, Section 2

Purpose

The purpose of translation and back-translation is primarily to produce a locally-understandable country-specific Instrument and all supporting documents, and that the original intent of the questions is maintained.

This will ensure that all interviewers ask the questions in a standardised way and all STEPS documents are clear and understandable to participants.

Language selection

There may be several recognised languages within a country. In this situation:

- interviewing materials may need to be translated into each of these languages
- trained translators and interviewers will have to be available.

Notes:

- Check if another country has already translated the STEPS Instrument into your local language and is willing to share it.
 - Your census office or another government department may help with determining other languages you need to use.
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Translating STEPS Documents, Continued

Translation process

Follow the guidelines below to select appropriate translators and ensure accurate and appropriate translation of the country-specific Instrument and all other interviewing materials.

- Initial translation of material should be conducted by at least one translator, ideally a linguistic expert who can explain the terms used and suggest alternatives and has experience in health surveys.
 - The Instrument must then be back-translated into the original language by another translator to ensure accurate reproduction of meanings.
 - Do not use ‘interpreters of convenience’, such as members of the participant’s family or household, the village headman or any other convenient person present, as it may lead to incorrect data being recorded.
-

Quality standards for translation

Recommended guidelines for translation are listed below.

- Translate the original intent of the questions with the most appropriate equivalent term in the local language.
 - Develop an inventory of local expressions used as well as comparisons of expressions in other languages.
 - Where there are many dialects and/or languages that are not available in written format, carefully plan specific translation protocols.
-

Applying for Ethical Approval

Introduction

Every STEPS survey proposal should undergo technical and ethical review and approval. This is to ensure that the STEPS survey:

- is conducted in a technically and ethically sound manner
 - recognizes and protects the rights of participants
 - obtains access to information used in the sampling frame.
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Process

Ideally, ethical approval should be sought by submission of a proposal and application to a national ethics review committee or other relevant body.

Where no such established process exists, it is recommended that an application for ethical review be prepared and submitted through an ad hoc local mechanism within the Ministry of Health.

Informed consent

Informed consent needs to be obtained from every survey participant before conducting the interviews. See Part 4, Section 1 for more details on gaining informed consent.

Making a submission

Follow the steps below to make a submission.

Step	Action
1	Determine if the ethics committee has a template for proposals which they require researchers to use.
2	Draft a formal submission (See Part 6, Section 1 for guidance on what to include in an ethical clearance submission).
3	Identify and contact the relevant committees, seeking guidance on rules, submission processes and procedures, and committee sitting times.
4	Adapt submission as necessary and submit to the appropriate committee, requesting guidance on expected timeframe for approval.
5	Follow up with the committee to gain clearance.

Note: The STEPS regional focal points and the WHO Geneva STEPS team can provide further advice on making a submission.

Expected timeframes

Preparing and obtaining approval for submissions to ethics committees can take weeks and even months depending on their rules of operation in the country and how often the committees sit.

Equipment and Supplies for Step 1 and 2

Introduction

Most countries will conduct Step 1 and 2 within households, although in rare cases, countries may choose to invite participants to attend a central location for Step 2.

General supplies for the household interviews

For the interviews, the following general supplies should be prepared for the interviewer to take with him/her when collecting the data:

Materials	Quantity	Location of template
• district and maps of the selected clusters; • household lists for each selected cluster; • name tags for interviewers; • pens, pencils; • clipboards.	1 of each	
• Interview Tracking Forms	2-3 per interviewer, depending on the number of interviews	Part 6, Section 2
• Notification Cards of WHO STEPS survey visit	1 per participant	Part 6, Section 2
• Script for Data Collectors	1 per interviewer	Part 6, Section 2
• Participant Information Forms	1 per participant	Part 6, Section 2
• Consent Forms Step 1 and 2 and Step 3	2 per participant, one stays with the participant	Part 6, Section 2
• STEPS Instruments	2-3 per interviewer as a back-up	Part 5, Section 1
• Question-by-Question Guides	1 per interviewer	Part 5, Section 2
• Show cards	1 per interviewer	Part 5, Section 3
• Participant Feedback Forms Step 2	1 per participant	Part 6, Section 2
• Body Mass Index Classification Charts	1 per interviewer	Part 6, Section 2
• Step 3 Appointment Cards	1 per participant	Part 6, Section 2
• Instructions for Spot Urine Collection	1 per participant	Part 6, Section 2
• Fasting Instructions	1 per participant	Part 6, Section 2

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Equipment and Supplies for Step 1 and 2, Continued

General supplies for the household interviews (cont.)

The following documents should be prepared and partly filled in prior to the field work:

- Notification Cards of WHO STEPS survey visit (it is helpful for the interviewer if the contact details on the Notification Cards are already filled in prior to data collection);
- Interview Tracking Forms;
- Instructions for urine sample collection;
- Step 3 Appointment Cards.

Note: See Part 2, Section 2 for instructions on how to prepare the Interview Tracking Forms, and Step 3 Appointment Cards.

Stickers with Quick Response (QR) codes

Due to the fasting requirement for Step 3 measurements, data collection for Step 1 and 2 generally takes place a day before data collection for Step 3. The unique ID of the participant (see Part 2, Section 2, for assigning IDs) will help match the Step 1 and 2 data with Step 3 data. In order to exclude errors during this matching process, it is recommended to also use Quick Response (QR) codes.

In preparation of the field work, the codes are printed on stickers. It is recommended to put one sticker on each container for urine collection or on each Step 3 Appointment Card as they are prepared, before handing them out to the interviewers.

During data collection, the QR codes are scanned for each participant with the Android device: once during data collection for Step 1 and 2, and once during data collection for Step 3.

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Equipment and Supplies for Step 1 and 2, Continued

Equipment and supplies for Step 2 measurements

For Step 2, you will need the following specific equipment:

- digital, automatic blood pressure monitors with universal cuffs, or sets of small, medium, large and extra-large cuffs (e.g. Bosch & Sohn Medicus UNO with universal cuff, or OMRON M6);
- adult, portable height-length measuring devices and weighting scales (e.g. SECA); or a BMI scale measuring both height and weight;
- constant tension tape measures (e.g. MyoTape Body Tape Measure or Figure Finder Tape Measure);
- spare batteries for each of the above-mentioned devices.

Note: A document with specific recommendations on equipment to be used for Step 2 is available from the STEPS team upon request.

Note: Use of mercury sphygmomanometers is **not recommended** for general use but may be made available for use if the digital blood pressure monitor:

- is not functioning properly;
- needs calibration;
- if the largest cuff available on the digital device is too small for the participant.

Location for Step 2 measurements

Where STEPS is conducted entirely in a household setting, equipment and all supplies must be carried and set up as best as possible in each household. Each data collection team will carry the sets of equipment which are required.

If it is not possible to conduct the survey in each household, you may be able to identify a central location and schedule participants to visit at specified times.

Room setup for Step 2 measurements

Where a central location or public hall for taking Step 2 measurements is available, set up tables, chairs and equipment to optimize the flow of participants through the following steps:

Step	Action
1	Registration
2	Blood pressure measurement (and heart rate, if applicable)
3	Height measurement
4	Weight measurement
5	Waist circumference measurement
6	Hip circumference measurement, if applicable
7	Handover of the participant feedback form with filled information
8	Check out (to ensure all measures are complete and that participants are properly thanked for their participation before departure)

Note: Provide seating near where blood pressure will be measured to allow 15 minutes of relaxation before blood pressure measurement.

Continued on next page

Equipment and Supplies for Step 1 and 2, Continued

Other factors to consider Some other factors to consider include:

Topic	Factors to consider
Equipment availability	Equipment necessary for collecting physical measurements should be readily available and in good condition to ensure results are as accurate as possible.
Lighting	Lighting needs to be adequate to read tape-measures, scales and blood pressure meters.
Weighing scales	Weighing scales need to be set up on a flat, hard surface. Some households may have uneven floors in which case an alternative location may need to be found or a rigid board should be placed under the scales.
Privacy	Areas used for taking measurements should be screened off or separated in some way to provide some privacy for participants.

Pre-survey cluster visits

It is advised that all proposed clusters/data collection sites are visited prior to conducting the survey.

This will allow a thorough understanding of operational issues that may impact the survey, and initiate the communication strategy with the communities and other local stakeholders.

Equipment and Supplies for Step 3

Introduction

Step 3 of the STEPS survey includes urine and blood testing. Due to fasting requirements for glucose and triglycerides measurements, blood testing is usually done in the morning of the day after Step 1 and 2 were done. A convenient central community location is necessary for the blood tests. This could be a community center, a local health facility, school, place of worship or house of the local health worker. Urine samples will have to be collected in a non-fasting state, and it is therefore recommended that the participants collect them in the evening before they commence the fasting.

Room and location requirements

The following table lists the general requirements and set up considerations for the room and location chosen for taking the blood samples of Step 3.

Item	Description
1	The room needs to be of adequate size to accommodate staff and the flow of the expected number of participants (and accompanying people).
2	Separate areas (if possible) for: • registration • waiting • blood tests • checkout
3	Consider privacy requirements for taking blood tests
4	Provide hand washing and toilet facilities for participants and data collection staff
5	Clearly signpost the area of blood collection
6	Ensure easy and adequate parking or transport provision for participants (if necessary)
7	Set up the room according to the sequence of tests and for proper disposal of the sharps and bio-hazard materials.

General equipment

General equipment required for Step 3 is listed in the following table:

Material	Item
Stationery	• pens • pencils • paper
Paperwork	• Step 3 Registration Form (partly filled in, see Part 6, Section 2) for each participant; • Participant Feedback Form Step 3 (see Part 6, Section 2) for each participant; • Labels for Urine Samples with Participant ID for each participant.

Continued on next page

Equipment and Supplies for Step 3, Continued

General equipment (cont.)

General equipment required for Step 3 is listed in the following table (cont.):

Material	Item
Office equipment	• filing systems • clipboard
Furniture	• tables • chairs

Equipment for urine sample collection

The equipment required for the urine samples of Step 3 should be handed over to the participant after Step 1 and 2 have been completed in the household, along with the instructions for the spot urine collection and the fasting instructions. The equipment needed for the urine samples is listed in the following table:

Material	Item
Urine sample collection	• Plastic container with lid, pre-labeled with Participant ID, name, age and sex of the participant; • Zip closable plastic bag.

Analysis of urine samples

The urine samples will need to be shipped to a previously identified location that is in possession of an analyser, such as the Medica EasyLyte Analyser 2121, Beckman Synchron CX5 ISE chemistry analyser, or ADIVA 1800 or 2400 Chemistry system.

Continued on next page

Equipment and Supplies for Step 3, Continued

Equipment and supplies for blood tests

Different equipment is required depending on which type of chemistry has been selected for biochemical measurements. For further information about types of chemistry see the next paragraph.

The table below provides a list of supplies required for the dry and wet chemistry methods.

Type	Supplies
Dry	• devices for blood testing • batch of sufficient reagent test strips • one time use lancets • capillary tubes and plungers for collection of the right amount of blood • cotton balls • swabs • disposable gloves • disposable container for sharp disposal
Wet	• source of electric power • ice chests (and ice) for temporary storage • tourniquets • needles • syringes • primary and secondary specimen tubes • pipettes • gloves and possibly protective eyewear • centrifuge • facilities for safe disposal of used equipment particularly sharp needles and bloodied swabs etc. • transport of specimens

Choosing a Chemistry Screening Method for Step 3

Introduction

Blood chemistry screening methods are widely used in community-based screening programs and public health surveillance for measurements of:

- glucose
- cholesterol
- triglycerides
- high density lipoproteins (HDL).

Dry or wet chemistry?

Decide whether dry (blood collection from the fingertip) or wet ('gold standard', laboratory-based measurement of blood samples) chemistry will be used.

Staff, training and equipment for blood tests will be dependent on the choice.

The table below lists the advantages and disadvantages of both dry and wet chemistry.

Type	Advantages	Disadvantages
Dry	• rapid results available on-site • small sample volumes • no sample transport required • no pre-analytical variables • convenient to participants • viable option for less-resourced and unstable settings.	• operators need good training and supervision • may be less accurate as compared to wet methods
Wet	• accurate results • centralized laboratory with trained staff and good internal and external quality control	• more costly than dry methods • logistically more challenging due to transport of specimens • lower response rates

Devices for dry chemistry

The table below lists a selection of dry chemistry devices, along with information on which of the Step 3 measurements they perform. Please note that this selection is just a list of examples. For more information on these and other devices, please contact the WHO Geneva STEPS team.

Device	Measurement
Cardiochek PA	Blood glucose, total cholesterol, triglycerides and HDL cholesterol
Cholestech LDX	Blood glucose, total cholesterol, triglycerides and HDL cholesterol
Reflotron Plus	Blood glucose, total cholesterol, triglycerides and HDL cholesterol
HemoCue 201 DM	Blood glucose
Accu-Check	Blood glucose

Timeframes and Data Collection Considerations

Introduction

Data collection should be carefully planned to take place over a defined period of time and within appropriate seasons.

General timeframes

The table below provides a guide to estimated timeframes for each phase in a STEPS survey.

Phase	Suggested timeframes
Planning and scoping	4-6 weeks
Recruitment and training	3-4 weeks
Data collection	10-12 weeks
Data analysis and reporting	4-8 weeks

Data collection

If possible, you should aim to complete data collection within a period of ten to twelve weeks.

Some key factors to consider when identifying an appropriate time to conduct the survey include:

Factors to consider	Guidelines
Seasons	• Confine the survey period to one season to avoid dietary changes. • Avoid festive seasons (Ramadan, Christmas, and other national holidays). • Avoid rainy seasons where it may be physically difficult to get to individual clusters and households. • Avoid seasons when food is in unusually short supply.
Calendar year	Confine the data collection period to one calendar year.
Major events	Avoid data collection during periods prior to local, regional or national elections to avoid confusion with political campaigners.
Civil unrest, turmoil, famine, etc.	It is not appropriate to conduct STEPS during times when more pressing matters occupy the minds and lives of the population. Sometimes it may be necessary to defer or cease a STEPS survey because of an intervening event or natural calamity.
Collection timeframe	Keep timeframe as close as possible (within reason) to the recommended timeframe.

Continued on next page

Timeframes and Data Collection Considerations, Continued

Data collection locations

It is recommended that both Step 1 and Step 2 are conducted in household settings.

Step 3 should be conducted in a convenient setting in the cluster. This is recommended for:

- geographical convenience for the fasting respondents
 - better response rate
 - hygiene standards when taking blood samples
 - quality control
 - more accurate results.
-

Scheduling Data Collection

Introduction

To ensure data collection is completed within the planned 10 to 12 week timeframe, interviews will need to be scheduled carefully.

When to schedule data collection

Ideally, as soon as the implementation plan and funding have been approved, the STEPS materials have been translated, equipment has been acquired, and the sample has been drawn, participant lists should be collated and data collection scheduled.

Considering the size of this task, however, in practical terms it is recommended that data collection is conducted as soon as possible after the recruitment and training of data collection staff takes place. This way trained interviewers can be used to compile the lists and establish contact with individual households.

Step 1 and Step 2 household settings

In some settings, evenings and weekends are generally preferred for interviewing, especially in urban areas.

This needs to be adapted on an individual country basis, as weekends in some countries are not the same days as in others.

Step 3 setting

Schedule participants for blood collection into early morning slots at the chosen setting. This is because of the fasting requirement.

Section 2: Preparing the Sample

Overview

Introduction

This section covers the principles, methods, and tasks needed to prepare, design, and select the sample for your STEPS survey.

Intended audience

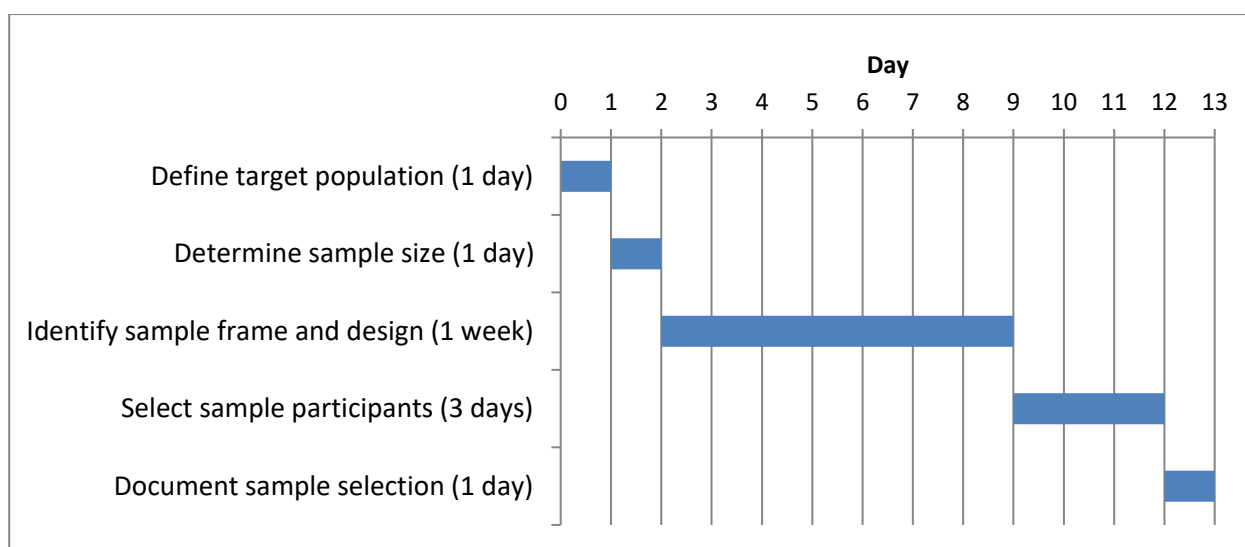
This section is primarily designed to be used by those fulfilling the following roles:

- statistical adviser
- STEPS Survey Coordinator
- STEPS Coordinating Committee.

Tasks and timeframes

The sample is prepared as part of the process of planning and preparing the survey. This process should take between two days to one week, depending on the methods chosen and availability of information needed to draw the sample.

The chart below lists the main tasks and timeframes covered in this section.



In this section

This section covers the following topics:

Topic	See Page
Sampling Guidelines	2-2-2
Determining the Sample Size	2-2-3
Identifying the Sampling Frame	2-2-10
Choosing the Sample Design	2-2-12
Selecting the Sample	2-2-20
Documenting the Sample Design	2-2-24
Preparing Data Collection Forms	2-2-25

Sampling Guidelines

Introduction	High quality survey techniques can provide a good picture of risk factors for NCDs in a population by using a scientifically selected sample of that population. The sample will represent the entire target population if the sample is drawn correctly. High standards of sample design and selection are essential to achieve valuable and useful results from STEPS.
Reflecting the survey scope in the sample	To achieve a sample that reflects the scope of the survey it is essential to: • define a target population; • scientifically select a sample of the population that is representative of the target population; • plan ahead for reporting of survey results by sex and desired age groups.
Define the target population	Each country needs to define the target population for their STEPS Survey. To define the population, the purpose and use of the survey data need to be taken into account. For example, should the survey to be representative of the entire population or a specific region? It is recommended that the target population for a STEPS NCD risk factor survey be at minimum all adults aged 18 to 69 years residing in the survey area. The age range may be expanded to include additional age groups, but it is not recommended to have a smaller age range.
Sample population	The sample population is a scientifically selected subset of the target population. Once the target population has been defined, the sample of participants within the target population will be selected.
Estimates for age-sex groups	The prevalence of most NCD risk factors tends to increase with age and vary by sex. Therefore it is recommended that survey results include estimates for specific age groups for each sex, in addition to the total survey population estimates, in order to provide a more nuanced picture of the prevalence of NCD risk factors in your target population. To ensure that precise estimates for each age-sex group can be calculated from the survey data, the total number of age-sex groups must be taken into consideration when calculating the sample size. Reporting estimates for a greater number of age groups will require a larger sample size. The STEPS recommended age groups are based on the Global Burden of Disease (GBD) age groups and are as follows: • 4 age groups per gender: 18-29, 30-44, 45-59, and 60-69 years • 3 age groups per gender: 18-29, 30-44, and 45-69 years • 2 age groups per gender: 18-44 and 45-69 years. If resources are extremely limited, estimates may be obtained only for the entire age span of the survey (e.g. 18-69). The next topic explains how to incorporate the number of age-sex groups into sample size calculation.

Determining the Sample Size

Introduction

In order to ensure a sufficient level of precision of the survey results, an adequate sample must be drawn from the target population. To calculate the sample size needed, the following factors must be taken into consideration:

- desired level of confidence of the survey results;
- acceptable margin of error of the survey results;
- design effect of the sampling methodology;
- estimated baseline levels of the behaviours or indicators to be measured.

Additionally, the sample size must be adjusted for:

- number of age-sex estimates
 - anticipated non-response.
-

Helpful Terminology

The following table provides a brief description of several key statistical terms. It is important to develop a good understanding of this terminology before proceeding to calculate the sample size.

Term	Description
Sample Mean / Prevalence	The estimated mean or prevalence of a given population parameter (e.g. mean number of days fruit was consumed in a given week) that is calculated from the survey data.
Population Mean / Prevalence	The true mean or prevalence of a given parameter for the entire target population. The sample mean is an estimate of the population mean.
Confidence Intervals	A range of values around the sample mean or prevalence in which the population mean or prevalence is likely to fall. For example, a 95% confidence interval indicates that for 95 out of 100 surveys, the population mean would fall into this range of values around the sample mean.

Continued on next page

Determining the Sample Size, Continued

Variables used for calculating sample size

The table below provides a description of the variables used in calculating the sample size as well as the recommended values for each variable.

Variable	Description	Recommended Value
Level of Confidence	• Probability value that is associated with a given confidence interval. • Describes the level of uncertainty in the sample mean or prevalence as an estimate of the population mean or prevalence. • The higher the level of confidence, the larger the sample size needed.	• 1.96 • Note: 1.96 is the probability value associated with a 95% confidence interval.
Margin of Error	• The expected half-width of the confidence interval. • The smaller the margin of error, the larger the sample size needed.	• 0.05 • Note: If the estimated baseline levels of the behaviours or indicators you wish to measure is very low (e.g. <0.10), then the Margin of Error should be decreased to 0.02 or smaller.
Design Effect (Deff)	• Describes the loss of sampling efficiency due to using a complex sample design. • The design effect for a simple random sample is 1.00. Sample designs more complex than a simple random sample require a larger sample to achieve the same level of precision in survey results as a simple random sample. Thus the design effect increases as the sample design becomes more complex.	• 1.50 • Note: The value 1.50 is recommended for most STEPS surveys with complex sample designs. If design effect information is available from previous national surveys of a similar design to the proposed STEPS survey, it is recommended to use the previous estimates for design effect.
Estimated baseline levels of the behaviours or indicators we want to measure	• The estimated prevalence of the risk factors within the target population. • Values closest to 50% are the most conservative, requiring the largest sample size.	• 0.50, if no previous data are available on the target population. • The value closest to 0.50, if previous data is available on the target population.

Equation for calculating sample size

The equation for calculating sample size is as follows:

$$n = Z^2 \frac{P(1-P)}{e^2}$$

where:

- Z = level of confidence
- P = baseline level of the indicators
- e = margin of error

Continued on next page

Determining the Sample Size, Continued

Example calculation

Using the above recommendations for each variable, the **initial** calculation for sample size would be:

$$n = 1.96^2 \frac{0.5(1-0.5)}{0.05^2} = 384$$

However, this number **must** be adjusted to account for the design effect of the sample design, the number of age-sex estimates to be reported, and the anticipated non-response.

Adjusting for design effect

To adjust for the design effect of the sample design simply **multiply** the sample size by the design effect. For more information on choosing the sample design for your survey, see page 2-2-12.

Adjusting for number of age-sex estimates

As discussed previously, it is recommended that survey results be reported separately for specific age groups for each sex. In order to have an adequate level of precision for each age-sex estimate, the sample size must be **multiplied** by the number of age-sex groups for which estimates will be reported.

The number of age-sex estimates will vary according to the target age range of the survey and the resources available for the survey. For surveys covering the age range of 18-69, the number of age-sex estimates may be **8** (18-29, 30-44, 45-59, and 60-69 years for men and women), may be **6** (18-29, 30-44, and 45-69 years for men and women), or **4** (18-44 and 45-69 years for men and women).

If the age range of your survey extends beyond the recommended 18-69 years, the total number of age-sex estimates may need to be adjusted accordingly. For example, if the age range of 70+ years were also to be included in the survey, the total number of age-sex estimates would have to be increased accordingly.

Adjusting for anticipated non-response

To adjust for anticipated non-response **divide** by the anticipated **response rate**.

A response rate of 80% is the recommended rate to anticipate. This is a conservative estimate based on response rates of previous STEPS surveys. If response rates have been consistently higher in the country for similar household surveys, a less conservative (i.e. smaller) response rate may be used, such as 90%.

Example: For an anticipated response rate of 80%, divide the sample size by 0.80.

Continued on next page

Determining the Sample Size, Continued

Summary of sample size calculation

The table below provides a summary of the above steps to calculate sample size.

Step	Description
1	Determine the value of all variables needed to calculate sample size.
2	Use the level of confidence, margin of error, and baseline level of the indicators in the above equation to get an initial estimate for n (sample size).
3	Multiply n by the design effect and by the number of age-sex estimates.
4	Divide the result from step 3 by the anticipated response rate to attain the final sample size.

Sample Size Calculation Example 1 (4 age groups)

In this example, the recommended values for all parameters of the sample size equation will be used. Thus, the initial calculation proceeds as follows:

$$n = 1.96^2 * \frac{0.5(1-0.5)}{0.05^2} = 384$$

This initial n is then multiplied by the design effect of 1.5 and, for example, 8 age-sex estimates desired for the survey results:

$$n = 384 * 1.5 * 8 = 4,608$$

Finally, n is divided by 0.80 to adjust for the anticipated 20% non-response rate:

$$n = 4,608 \div 0.80 = 5,760$$

5,760 is the final sample size.

Sample Size Calculation Example 2 (3 age groups)

In this example, the recommended values for all parameters of the sample size equation will be used and the initial calculation proceeds just as in the previous example:

$$n = 1.96^2 * \frac{0.5(1-0.5)}{0.05^2} = 384$$

However, in this example the estimates will only be reported for 2 age groups for each sex as the sample size required for 4 age groups per sex is too large for the resources available. Thus, the initial n is then multiplied by the design effect of 1.5 and 3 age-sex estimates desired for the survey results:

$$n = 384 * 1.5 * 6 = 3,456$$

Finally, n is divided by 0.80 to adjust for the anticipated 20% non-response rate:

$$n = 3,456 \div 0.80 = 4,320$$

4,320 is the final sample size.

Continued on next page

Determining the Sample Size, Continued

Sample Size Calculation Example 3 (2 age groups)

In this example, the recommended values for all parameters of the sample size equation will be used and the initial calculation proceeds just as in the previous example:

$$n = 1.96^2 * \frac{0.5 (1-0.5)}{0.05^2} = 384$$

However, in this example the estimates will only be reported for 2 age groups for each sex as the sample size required for 4 age groups per sex is too large for the resources available. Thus, the initial n is then multiplied by the design effect of 1.5 and 4 age-sex estimates desired for the survey results:

$$n = 384 * 1.5 * 4 = 2,304$$

Finally, n is divided by 0.80 to adjust for the anticipated 20% non-response rate:

$$n = 2,304 \div 0.80 = 2,880$$

2,880 is the final sample size.

Sampling very small populations

When the target population is very small (appx. <50,000 people) the sample size can be reduced using a Finite Population Correction (FPC). The steps below describe how to check if the FPC is appropriate for a country and how to apply it to reduce the sample size.

Step	Description										
1	Complete only steps 1 and 2 in the preceding table to obtain the n for each estimate.										
2	Calculate the target population size for each estimate using available census data or a similar reliable data source. Example: If 8 age-sex groups will be the estimates, the number of individuals in each age-sex group (e.g. number of males aged 18-29) must be calculated.										
3	The FPC should only be applied when the sample to be drawn represents more than 10% of the target population. Thus for each estimate the n calculated in Step 1 must be divided by the target population size for that estimate to check to see if the FPC can be applied. Example: n has been calculated as 384. Eight age-sex estimates are desired. The table below shows the target population size for the first four estimates. <table border="1"> <thead> <tr> <th>Desired Estimates</th><th>Target Population Size</th></tr> </thead> <tbody> <tr> <td>Males, 18-29</td><td>2548</td></tr> <tr> <td>Females, 18-29</td><td>2641</td></tr> <tr> <td>Males, 30-44</td><td>3465</td></tr> <tr> <td>Females, 30-44</td><td>3356</td></tr> </tbody> </table>	Desired Estimates	Target Population Size	Males, 18-29	2548	Females, 18-29	2641	Males, 30-44	3465	Females, 30-44	3356
Desired Estimates	Target Population Size										
Males, 18-29	2548										
Females, 18-29	2641										
Males, 30-44	3465										
Females, 30-44	3356										

Continued on next page

Determining the Sample Size, Continued

3 (cont.)	Divide n by the target population for each estimate: $384/2548 = 0.15$ $384/2641 = 0.15$ $384/3465 = 0.11$ $384/3356 = 0.11$
4	If most or all of the quotients from step 3 are 0.10 or higher, then the FPC can be applied (continue to next step). Otherwise, return to step 3 in the preceding table and continue to calculate the total sample size using the n already calculated.
5	Apply the FPC to the n for each estimate using the following equation: $\text{new } n = \frac{n}{1 + \frac{n}{\text{population}}}$ where "population" refers to the target population for a given estimate, not the entire target population.
6	Sum all the "new n 's" together and multiply the sum by the design effect.
7	Divide the result from step 6 by the anticipated response rate to attain the final sample size.

Further modifications to sample size

There are a variety of situations which may require an adjustment to the sample size resulting from the calculations above. The table below describes some of these situations with directions on how to adjust the sample size. For any other situation not listed here, or if any other additional assistance is required, please contact the STEPS team.

If ...	Then ...						
Data for specific subgroups are required (e.g. ethnic groups, urban vs. rural dwellers).	There are two ways to proceed depending on the information desired: <table> <tr> <th>If ...</th><th>Then ...</th></tr> <tr> <td>Data will only be reported for all individuals in each subgroup.</td><td>Set the number of estimates to the larger of: - the number of age-sex estimates desired - the number of new subgroups. </td></tr> <tr> <td>Data will be reported for each age-sex group within each subgroup.</td><td>Multiply the number of age-sex groups by the total number of new subgroups (e.g. total number of ethnic groups) to determine the total number of estimates.</td></tr> </table> Note: It is important to keep these subgroups in mind when allocating the sample to ensure a sufficient number of participants can be drawn from each subgroup (see next topic).	If ...	Then ...	Data will only be reported for all individuals in each subgroup.	Set the number of estimates to the larger of: - the number of age-sex estimates desired - the number of new subgroups.	Data will be reported for each age-sex group within each subgroup.	Multiply the number of age-sex groups by the total number of new subgroups (e.g. total number of ethnic groups) to determine the total number of estimates.
If ...	Then ...						
Data will only be reported for all individuals in each subgroup.	Set the number of estimates to the larger of: - the number of age-sex estimates desired - the number of new subgroups.						
Data will be reported for each age-sex group within each subgroup.	Multiply the number of age-sex groups by the total number of new subgroups (e.g. total number of ethnic groups) to determine the total number of estimates.						

Continued on next page

Determining the Sample Size, Continued

Oversampling is desired for very small sub-populations.	Increase the overall n by increasing the n for the specific estimate(s) by 10%.
Oversampling is desired for specific sub-populations with higher than average non-response.	Increase the overall n by increasing the n for the specific estimate(s) by 10 to 20%.
Oversampling of the 60-69 year age group is desired because obtaining sufficient numbers of respondents from this age group is expected to be difficult due to high non-response and/or small size of this sub-population.	Increase the overall n by increasing the specific estimates for males and females in this age group by 10 to 20%. Oversampling 60-69 year olds within households can be done with the Android STEPS app.

Note: If oversampling is desired, adjustments usually must also be made when allocating the sample (see next topic). Often in addition to increasing the sample size, the sample allocation must take into consideration the location of hard-to-reach groups and allocate a greater proportion of the sample to these areas.

Sample Size Calculator

There is an Excel workbook, [sample_size_calculator.xls](#), that can assist in the calculations needed to determine the sample size for a survey. It is available on the STEPS website. The calculator allows to adjust all variables discussed here and also provides assistance in determining whether the Finite Population Correction (FPC) is applicable to a survey and, if so, how to correctly apply the FPC.

Smaller sample sizes

If the sample size calculations result in a sample size too large for the resources available, consider reducing the number of age-sex estimates desired for reporting of the results. Reducing the age-sex estimates can significantly reduce the sample size required for a survey.

Identifying the Sampling Frame

Introduction

A sampling frame is a list of units or elements that defines the target population. It is from this list that the sample is drawn. A sampling frame is essential for any survey.

Finding available sampling frames

To identify available sampling frames and determine which is best for a country, search for updated lists, databases, registers or other sources that give good coverage of the population to be surveyed. For example, look for population registers or census lists.

Various government departments and national bodies should be consulted to establish what frames exist in a country and, if suitable, whether they may be accessed for STEPS.

Enumeration areas (EAs)

Most often the sampling frame will use enumeration areas (EAs) which are small- to medium-sized geographic areas that have been defined in a previous census. Most countries have this information and it is usually preferable to incorporate this into the sampling frame.

Factors to consider

A sampling frame, or a collection of them, should cover all of the population in the surveyed country. Good coverage means that every eligible person in the population has a chance of being included in the survey sample.

Representativeness for all sub-populations should be considered when deciding which frame(s) to use, since there is a possibility that particular age, gender or ethnic groups or geographical areas are more or less likely to be included in the sampling frame. Bias will occur if there is poorer coverage for some groups.

Multiple Sampling Frames

Due to logistical and financial limitations, most national surveys employ multi-stage sampling, which is discussed in detail in the following topic. A multi-stage sample design will require a sampling frame for each stage of sampling.

Continued on next page

Identifying the Sampling Frame, Continued

Features of a good sampling frame

Some features of a good sampling frame are:

- it does not contain duplicates, or if present they can easily be identified and removed;
- it does not contain blanks, such as empty houses or a deceased individual;
- it contains information enabling all units to be distinguished from all others and to be easily located (e.g. a complete street address);
- at minimum, it contains information about the number of households or total number of individuals;
- it could be made accessible to the STEPS country team within a reasonable timeframe and at no large expense.

Note: Sampling frames must be assessed for all the above features, but particularly for **completeness** and **potential bias**.

Choosing the Sample Design

Introduction

The selection of the sample design is highly dependent on a variety of factors, most importantly the size of the population, the geography of the area to be covered, and the resources available for the survey. All factors must be kept in mind in selecting the sample design for the survey.

Stratification

Stratification is the process of dividing the sampling frame into mutually exclusive subgroups or strata. The sample is then drawn either proportionately or disproportionately from **all** strata. How the target population is stratified depends on the information that is available for the sampling frame and the information that is desired from the survey results.

Strata are often based on the physical location of the sampling units. Some examples of these types of strata are:

- enumeration areas (EAs) or other well-defined geographic regions
- urban vs. rural areas.

Less often, strata are based on the characteristics of the individuals in the sampling frame. This is less common in large national surveys due to a lack of precise data on all individuals in the target population and the difficulties of developing sampling frames for each strata. Some examples of these types of strata are:

- ethnicity
- socioeconomic status
- gender.

Stratification is not required but is recommended for the following reasons:

- increased precision of survey estimates
- guaranteed coverage of all strata
- administrative convenience.

Stratification can be applied in conjunction with other sampling strategies. This section discusses simple random sampling and multi-stage cluster sampling, both of which can be used along with stratification, as described later in this topic.

Stratification and sample allocation

If the decision has been made to stratify the population, it must then be decided whether to sample proportionately from all strata or to sample a larger proportion of individuals from some strata and a smaller proportion of individuals from other strata (disproportional allocation).

Continued on next page

Choosing the Sample Design, Continued

Stratification and sample allocation (cont.)

Proportional allocation means sampling the same proportion of individuals from each strata so that the resulting sample is distributed across the strata similarly to the underlying target population. This type of sample allocation is the appropriate method for surveys which will only be reporting data for all strata combined.

Disproportional allocation means sampling some strata at a higher rate than other strata. Often this is implemented by drawing an equal sized sample from each strata. This type of sample allocation is appropriate when survey results are desired for each individual strata. In this situation, a larger sample size is usually required to ensure adequate precision in the strata-specific estimates. The primary drawback to this method is a loss of sampling efficiency for the estimates for all strata combined.

Note: In some cases where very small strata exist, proportional allocation may be done but oversampling may be required for the very small strata.

Proportional Allocation Example

Because proportional allocation is more likely to be used for a STEPS survey, an example is provided here.

In this example, the sample size has been calculated to be 2,880. The target population has been divided into the 4 government districts of the country. These districts will serve as strata. The target population within each strata has been listed in the table below along with the proportion each comprises of the total target population.

Strata	Target Pop.	Proportion of Pop.
District 1	25,955	0.24
District 2	30,568	0.28
District 3	32,578	0.30
District 4	19,054	0.18
Total	108,155	1.00

$= 25,955 \div 108,155$

To compute the number of individuals from the total sample to be drawn from each strata, multiply the total sample size by the proportion for each strata.

Strata	Target Pop.	Proportion of Pop.	Sample
District 1	25,955	0.24	691
District 2	30,568	0.28	807
District 3	32,578	0.30	864
District 4	19,054	0.18	518
Total	108,155	1.00	2,880

$= 0.24 \times 2,880$

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Choosing the Sample Design, Continued

Simple random sampling

In a small number of settings simple random sampling may be feasible. For household surveys, the following characteristics generally should be met:

- small target population;
- small survey area, the entirety of which can be covered by the resources available;
- detailed sampling frame is available, listing, at minimum, all households in the survey area, or, at best, all eligible individuals in the survey area.

Simple random sampling can be combined with stratification. In stratified random sampling, the population is first stratified and then a random sample is drawn from each strata.

Note: If simple or stratified random sampling is deemed to be feasible in a country, a smaller sample size can be used. In the calculation for sample size a design effect of 1 should be used.

Multi-stage cluster sampling

Multi-stage cluster sampling is one of the most common sample designs for national surveys and it is the recommended method for most STEPS surveys.

"Multi-stage" indicates that sampling is done in several steps. First larger sampling units are selected then smaller sampling units are selected within the selected larger units. "Cluster" refers to the fact that the sampling units are subdivided into mutually-exclusive clusters and, unlike stratification, only a **sample** of these clusters is selected for the survey.

Why use multi-stage cluster sampling?

The table below highlights two primary reasons for using multi-stage cluster sampling. These are very common problems in national surveys that can be overcome with the use of multi-stage cluster sampling.

Problem	Solution
Detailed information does not exist for all households or individuals in the sample population and it is not feasible to create a detailed sampling frame for the entire survey area.	Multi-stage cluster sampling allows for the selection of larger sampling units (e.g. villages) that require less detailed information about the target population. It is only at the final stage of sampling (most often the selection of households) that detailed information needs to be available. However, because only a selection of clusters will be chosen at each stage of sampling, the detailed sampling frames are only needed for a subset of the entire target population.

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Choosing the Sample Design, Continued

Why use multi-stage cluster sampling? (cont.)

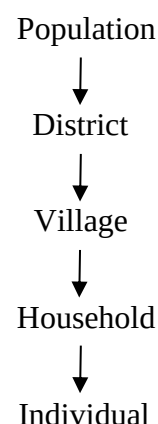
Problem	Solution
The survey area is too large and/or travel costs are too high to draw a sample from the entire country or all regions of interest.	Because the sample is only drawn from selected clusters, multi-stage cluster sampling allows for a reduced area to be surveyed while maintaining a sample that is nationally (or subnationally) representative. Note: Using multi-stage cluster sampling does not <i>guarantee</i> a representative sample. If done incorrectly, it will not result in a representative sample. The design of the clusters and the selection of clusters at every stage must be done carefully and consistently and must be documented in detail.

Preparing a Multi-stage Cluster Sample

In order to implement multi-stage cluster sampling, the population must be divided into clusters, each of which contain either a number of smaller clusters or, at the final stage, households or individuals.

The flowchart to the right is one example of the multiple sampling stages that could be defined for a country.

Most often the first stage uses enumeration areas (EAs) from census information. The intermediary stages, if any, may be comprised of existing geopolitical units (e.g. villages) or artificially-created units (e.g. a specified collection of city blocks).



Important: The number of sampling units at the initial stage must be fairly numerous (i.e. >100) so at least 50-100 of them can be selected. Selecting a smaller number of sampling units at the initial stage of sampling results in more clustered data and a loss of precision in survey estimates.

A sampling frame will need to be constructed for all clusters in the first stage of sampling. At minimum these sampling frames must contain the total number of households or total number of target individuals in the cluster.

Sampling frames will only be needed for **selected** clusters at all subsequent stages of sampling, with detailed information (i.e. lists of households or eligible individuals) only needed for the sampling frames for the last stage of sampling.

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Choosing the Sample Design, Continued

Multi-stage Cluster Sampling Terminology

The table below describes some key terminology for multi-stage cluster sampling.

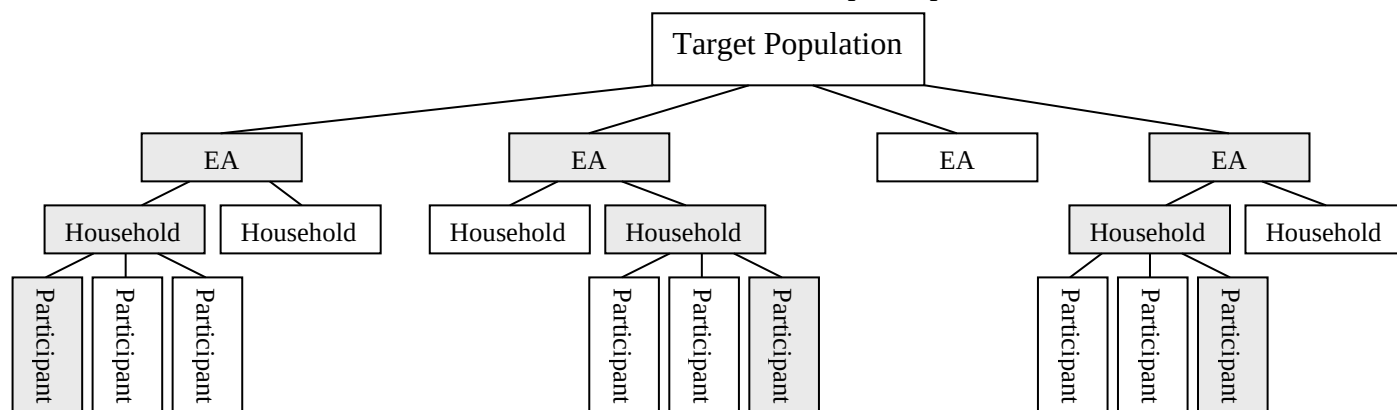
Term	Definition
Primary Sampling Unit (PSU)	These are the clusters that are selected first. Most often the PSUs are enumeration areas (EAs) from a recent census.
Secondary Sampling Unit (SSU)	The clusters that are selected second, separately within each selected PSU.
Tertiary Sampling Unit (TSU)	The clusters that are selected third, separately within each selected SSU.

The list of terms could be extended to describe more levels of sampling as needed.

Example 1

In the following example, there are three stages of sampling. EAs are serving as the PSUs. For each selected PSU, a sampling frame was created comprised of a list of households in the EA. Households were then selected within each PSU and then one participant was selected within each household.

Shaded boxes indicate that the cluster or participant was selected.



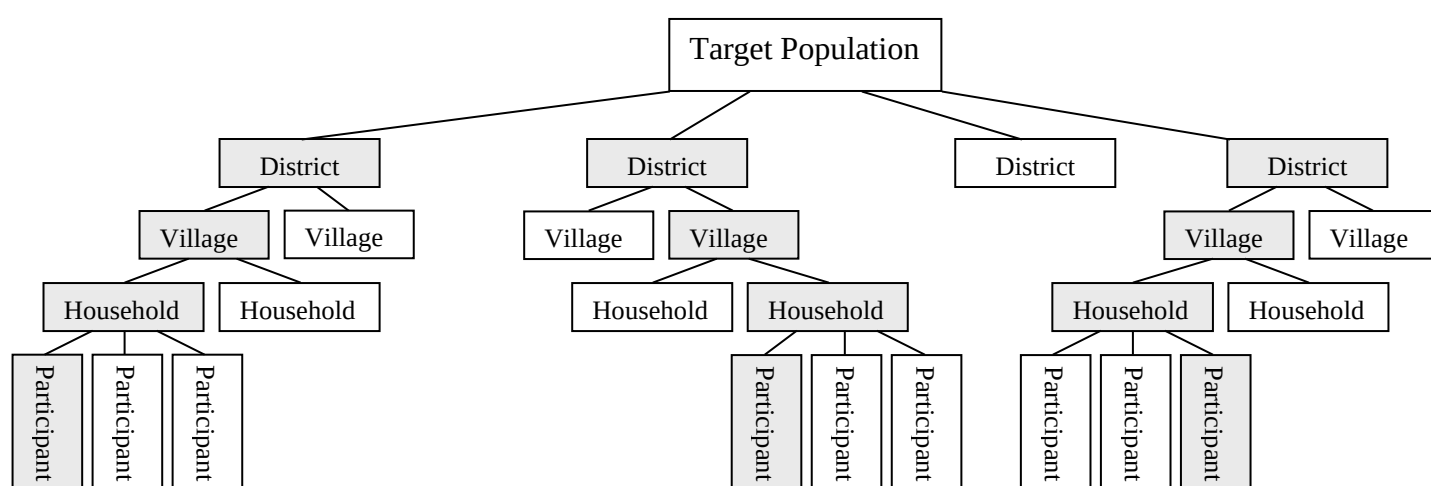
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Choosing the Sample Design, Continued

Example 2

In this example, there are four stages of sampling. Districts are serving as the PSUs. For each selected PSU, a sampling frame was created comprised of a list of all villages (the SSUs) with the target population of each village. For each selected village, a sampling frame was also created, comprised of a list of all households in the village. If a detailed list of all eligible individuals were available for any selected village, this list could be used in place of the household list and selection could proceed directly from the village level to the participant level.

Shaded boxes indicate that the cluster or participant was selected.



Qualities of a Good Multi-stage Cluster Design

One very important check to perform on the multi-stage cluster design is that every individual in the target population is included in only one sampling unit per stage. This means that the clusters at each level of sampling must cover the entire target population and be mutually exclusive (non-overlapping).

Additionally, it is important to check the characteristics of the PSUs. The first two items in the table below can be used to check the SSUs, TSUs, etc. as well, but given the nature of multi-stage cluster designs, these checks are most critical for the PSUs.

If ...	Then ...
PSUs exist that are very small.	Combine these PSUs with a neighboring PSU before selecting the sample.
PSUs exist that are very large.	Split these PSUs into two or more smaller PSUs that are more similar in size to other PSUs.
Total number of PSUs is small (i.e. <100).	Begin sampling at the SSU level (the SSUs would then become PSUs) or subdivide the existing PSUs to ensure that at least 50-100 PSUs can be selected.

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Choosing the Sample Design, Continued

Sample Allocation and Multi-stage Cluster Design

Once the sampling units to be used for PSUs, SSUs, etc. have been determined, the allocation of the sample must be decided. That is, the total number of PSUs to be selected, the total number of SSUs to be selected per PSU, etc. must be determined.

The table below describes the steps to take to determine how to allocate the sample.

Step	Description
1	Calculate the total sample size.
2	Assess the resources available and determine the total number of PSUs to be sampled, keeping in mind that at least 50 to 100 PSUs should be selected.
3	Divide the total sample size by the number of PSUs to be sampled to determine the number of individuals to be sampled per PSU.
4	Continue subdividing the sample size at each stage of sampling according to the number of sampling units to be selected at each stage.

Note: As stated previously, stratification can be combined with a multi-stage cluster design. The total number of PSUs would be allocated proportionately or disproportionately (depending on the requirements of the survey results) across all strata and sample allocation would continue within each strata following the steps above.

Example

For this example, assume that the total sample size has been calculated to be 2,880 individuals. It has also been decided that regions will serve as PSUs, villages will serve as SSUs, and then households will be selected in each village. Resources will allow for 72 PSUs to be selected, meaning that 40 ($= 2880/72$) individuals will be selected per PSU.

There is some flexibility in how the 40 individuals per PSU are allocated. At this point it would be worthwhile to consider a few scenarios and select the one that is feasible yet provides a good distribution of individuals across the PSU (i.e. not too many or too few of the 40 individuals drawn from a given village). Two scenarios are presented below:

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Choosing the Sample Design, Continued

Example (cont.)	Scenario	Description
	1	10 individuals will be selected per village, meaning that 4 villages (= 40/10) must be selected per PSU. <u>Sample allocation:</u> 72 regions x 4 villages/region x 10 individuals/village = 2880
	2	5 individuals will be selected per village, meaning that 8 villages (= 40/5) must be selected per PSU. <u>Sample allocation:</u> 72 regions x 8 villages/region x 5 individuals/village = 2880

In terms of resources, the key difference between the above scenarios is the number of villages that would need to be visited within each PSU. This number will likely be a deciding factor in the allocation of the sample, keeping in mind that having a high number of individuals selected from only a few villages would result in greater clustering of survey data and a potential loss of precision in survey estimates.

Example with stratification

For this example, assume again that the total sample size has been calculated to be 2,880 individuals and that regions will serve as PSUs, villages will serve as SSUs, and then households will be selected in each village. Resources will allow for 80 PSUs to be selected. However, the survey designers wish to ensure that the sample is drawn proportionately across the 4 islands that comprise the country.

The table below shows the proportion of the total underlying population that each island represents. The right-most column shows how the number of PSUs would be proportionately allocated across these 4 islands or strata.

Island	Proportion of Total Pop.	PSUs
A	0.50	40
B	0.175	14
C	0.125	10
D	0.20	16
Total	1.00	80

Thus, 40 regions (PSUs) will be picked out of all regions on island A, 14 regions will be picked out of all regions on island B, and so on. Once the PSUs are selected per island, sample allocation continues just as in the preceding example, with the same number of villages being selected in each PSU, regardless of the island on which the PSU is located.

Selecting the Sample

Introduction Once the sample design is selected and the sampling frame has been prepared, sample selection can start. This section provides instructions for the various stages of sampling.

Available tools There is an Excel workbook entitled **STEPSsampling.xls** that includes spreadsheets for every stage of the sample selection. STEPSsampling.xls will:

- provide probability proportional to size (PPS) sampling (see description below) for primary and secondary sampling units as needed;
- randomly select households or individuals;
- provide information for weighting the data.

The spreadsheet is available on the STEPS website (www.who.int/ncds/steps).

Probability proportional to size (PPS) sampling Probability proportional to size (PPS) sampling is a method for selecting a sampling unit in which the probability of selection for a given sampling unit is proportional to its size (most often the number of individuals or households within the sampling unit).

PPS sampling is appropriate for use when sampling units are of markedly different size. In these situations, were random sampling to be used to select sampling units, those individuals in the larger sampling units would have a much smaller chance of selection than those individuals in the smaller sampling units. PPS sampling corrects this problem, therefore reducing bias in survey estimates.

Instructions for PPS sampling The table below outlines the steps required to perform PPS sampling on a list of sampling units. Before beginning, a list of sampling units and their corresponding sizes (in number of households or in population) must be compiled. It is recommended that this list be organized geographically, meaning that sampling units located near each other are also near each other on the list. Additionally, the number of sampling units (clusters) to be selected must be decided.

The **STEPSsampling.xls** tool will automatically perform Steps 3 through 8 in the table below. The instructions worksheet inside the file explains how to perform PPS sampling using either the PSU or SSU worksheet in the file.

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Selecting the Sample, Continued

Instructions for PPS sampling (cont.)

Step	Action
1	Create a list of all sampling units with their size (either number of households or population). If possible, order this list geographically, placing sampling units that are physically adjacent near each other on the list.
2	Determine the number of sampling units to be selected from the list.
3	Create a new column containing the cumulative size of the sampling units. The final total should match the total population across all sampling units.
4	Divide the total cumulative population size (N) by the number of sampling units to be selected (n) to obtain the sampling interval (k). $k = N/n$
5	Choose a random number (r) that is between 1 and the sampling interval (k). $1 < r < k$
6	Start at the top of the list and select the first sampling unit whose cumulative population size includes the random number (r).
7	To select the second cluster, first add the sampling interval to the random number (r). Then begin counting from the previous cluster selected until the cumulative population size includes this sum (r+k).
8	Select the remaining clusters by adding the sampling interval, multiplied by 2, then 3 and so on, to the random number. Always start counting from the previous cluster selected not the start of the list. $r+(k*2)$ $r+(k*3)$ etc
9	Continue until the end of the list is reached. Do not stop as soon as n units have been selected. To avoid bias, all units selected must be used in the survey even if the number is slightly greater than n.

Using PPS sampling with a multi-stage cluster design

PPS sampling can be applied at all stages of a multi-stage cluster design except for the final stage in which households or individuals are selected.

The **STEPSsampling.xls** tool provides worksheets for selecting PSUs and SSUs using PPS sampling. The worksheet entitled PSU allows for the selection of up to 100 PSUs from an entered list of all PSUs. The worksheet entitled SSU allows for the selection of the SSUs within each selected PSU. Therefore, the SSU worksheet must be duplicated, one for each PSU that was selected, so that an independent selection of SSUs can be performed for each PSU.

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Selecting the Sample, Continued

Selection of households and/or individuals

The final stage of sampling, the selection of households and/or individuals, will depend on the type of information available. The table below describes the possible scenarios for the final stage of sampling and the sample selection process for each.

If ...	Then ...
A list of eligible individuals is available for the selected sampling unit (e.g. village).	First check that the list of eligible individuals meets the following requirements: • the list is up to date, for example, people who have moved away or who have died are not included in the list; • the list contains specific information allowing for each selected individual to be located by the interviewers. If both conditions are met, the selection of individuals can be done randomly from the list.
No or limited information is available about the individuals in the selected sampling unit but a list of households exists for the sampling unit.	First check that the list of households meets the following requirements: • the list is up to date and each household listed represents a single dwelling; • the list contains specific information allowing for each selected household to be located by the interviewers. If both conditions are met, the selection of households can be done randomly from the list. From the selected households, participants can be selected randomly using the STEPS Android app. If there is a concern that the list may be out of date, it is recommended that the field team first performs a quick mapping and household listing of the selected sampling units/clusters to update the list, noting abandoned/destroyed dwellings, new dwellings, or expanded dwellings (single family into multi-family).

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Selecting the Sample, Continued

Selection of households and/or individuals (cont.)

If ...	Then ...
The number of households is known for the sampling unit but there is no information about their location.	In this situation the sampling unit should be mapped to determine the location of the households. Please contact the STEPS team for more guidance on this method or other alternatives.

In the **STEPSsampling.xls** tool, the "RandHhold" worksheet can be used to randomly select the desired number of participants from a list of eligible individuals or the desired number of households from a list of households.

It is possible that some sampling units have more detailed information available than others. In this case, the above scenarios can be used on a case-by-case basis, meaning in some sampling units with more detailed information individuals may be selected directly while in other sampling units with less detailed information households may need to be selected first.

Note: In all STEPS survey designs, sampling is non-replacement, meaning that once a unit or person is selected they are not replaced with another person/unit. If non-respondents or persons who are not at home for the interview are replaced, a convenience sample will be performed and the results will only represent the people sampled and not the target population.

Selection of an individual within a household

In most STEPS surveys, the selection of an individual within a household is only done once the STEPS data collector is in the household. The Android STEPS app has an integrated random selection procedure, whereby eligible household members are entered and one participant from this list is randomly selected by the device.

Eligibility criteria for households and members of the households to be included will need to be defined by the STEPS Coordinating Committee in advance of the fieldwork.

Oversampling for 60-69 year olds

Depending on a country's population structure it may be difficult to obtain enough respondents from the 60-69 year old age group to get precise estimates for this age group. One possible solution to this problem is to oversample this age group at the household level. Therefore, at each household with adults aged 60-69, two adults will be selected.

Documenting the Sample Design

Introduction Once the sample design and methodology have been chosen, all aspects of the sample need to be clearly documented.

Purpose The purpose of documenting the sample design is primarily for the data analyst to understand how the sample was drawn in order to appropriately adjust the results to the target population. Additionally, an abbreviated version of the documentation should always accompany any presentation of the survey data to explain how the data were collected.

Recordkeeping during data collection Sufficient records must be kept **during data collection** to ensure that the data analyst can do all possible adjustments to make the results representative of the target population. Most importantly, the data analyst must know:

- the probability of selection of each sampling unit at every stage of sampling (i.e. probability of selection for each PSU, SSU, household, individual);
- the age and sex of any non-responders.

Thus, it is critical to keep a record of the following:

- all sampling frames used at each stage of sampling
 - sample selection method used at each stage of sampling
 - stratification design, if stratification is used
 - for each respondent, the PSU, SSU, etc. from which he/she was selected.
-

Future surveys Documenting the sample design and methodology is also important for future surveys when changes in risk factors over time are being examined, since methods chosen in future surveys may differ from this one and thus affect comparability.

Archiving documents It is important that all relevant sampling materials be archived. This includes the forms discussed in the next topic of this Section, "Preparing Data Collection Forms", as well as all information used to design and draw the sample.

If the sample is drawn by another government entity (e.g. the Statistics Bureau), be sure to obtain from them all materials and information that were used to draw the sample.

Preparing Data Collection Forms

Introduction

Once the sample has been drawn, the Interview Tracking Forms and the Step 3 Appointment Cards should be prepared for the data collection team. It is recommended that the field team supervisors and the statistical adviser collaborate on this task to ensure the forms are correctly filled out and properly organized for data collection.

Assigning Unique Identifiers and preparing stickers QR codes

Before preparing the data collection forms, ID Numbers must be assigned to all interviewers and to all selected clusters from which households and/or individuals will be selected. Additionally, all households and all participants to be selected should each be assigned a unique ID.

Due to the fasting requirement for Step 3 measurements, data collection for Step 1 and 2 generally takes place a day before data collection for Step 3. The unique ID of the participant will help match the Step 1 and 2 data with Step 3 data. In order to exclude errors during this matching process, it is recommended to also use Quick Response (QR) codes.

In preparation of the field work, the QR codes are printed on stickers. It is recommended to put one sticker on each container for urine collection or on each Step 3 Appointment Card as they are prepared, before handing them out to the interviewers. The Geneva STEPS team can help print the stickers.

During data collection, the QR codes are scanned for each participant with the Android device: once during data collection for Step 1 and 2, and once during data collection for Step 3.

The table below provides further instructions for assigning ID Numbers.

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Preparing Data Collection Forms, Continued

Variable	Description
Interviewer ID	Every interviewer should be assigned a unique ID number.
Device ID	Every Android should be assigned a unique ID number. If a device stops working during data collection, do not re-assign its Device ID to another device. It is recommended to assign the device the same ID as the interviewer using it.
Cluster ID	A unique number should be assigned to all selected sampling units from which households and/or individuals will be selected. Often these sampling units are villages, but could instead be city blocks, city districts, etc., depending on the sample design. Note: If household or individual selection is the <u>first or only</u> stage of sampling, it is not necessary to use Cluster IDs.
Household ID	All households to be visited should be assigned a unique ID. The Android STEPS app will automatically generate a unique household ID for each household visited based on a combination of the device ID and a unique number. If the app is not used and household IDs are generated manually, these numbers should be consecutive from 1 through the total number of households to be visited. If no interview is conducted at a selected household, the Household ID assigned to it is simply not used.
Participant ID	All participants should be assigned a unique ID. The Android STEPS app will automatically generate a unique participant ID for each participant based on the Household ID plus a unique number. If the app is not used and participant IDs are generated manually, these need not be consecutive and can be grouped by Cluster ID, where a sequence of participant IDs is associated with each Cluster ID (e.g. Participant IDs 101-120 are assigned to Cluster ID 1, Participant IDs 201-220 are assigned to Cluster ID 2, etc.). Note: In countries where no oversampling is done and IDs are generated manually, Participant and Household IDs can be the same.
QR code	In addition to the Participant ID, QR codes can be used to avoid errors, and to ensure easy matching of data collected for Step 1 and 2 with data collected for Step 3. The QR codes must be unique for each survey participant and are scanned using the Android device.

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Preparing Data Collection Forms, Continued

Assigning Unique Identifiers (cont.)

The following identifiers will also need to be assigned and made available to the data collection team as needed:

Variable	Description
Technician ID	If Step 2 and/or Step 3 will be implemented by someone other than the interviewer (e.g. specific Step 2 and/or 3 data collectors), these individuals should be assigned a Technician ID.
Device ID	Any equipment used for Step 2 and 3 should be assigned a unique Device ID.

Interview Tracking Form

All countries should use the Interview Tracking Form (see template in Part 6, Section 2) regardless of their sample design. This information is used for calculating the weights and response proportions for Step 1, Step 2, and Step 3.

Before data collection begins, Interview Tracking Forms should be completed for each Cluster and each interviewer who will conduct interviews in that Cluster.

Before data collection begins, the following should be completed on each Interview Tracking Form:

- Cluster ID
- Interviewer ID
- Household IDs (if not using auto-generated IDs from STEPS app)
- Participant IDs (if not using auto-generated IDs from STEPS app).

Note: If household or individual selection is the first stage of sampling (i.e. Cluster IDs are not used), then prepare the Interview Tracking Forms for each interviewer without assigning Cluster IDs.

Step 3 Appointment Card

The Step 3 Appointment Card (see template in Part 6, Section 2) that serves for arranging appointments at the Step 3 location should be partly filled in before the interviewers start data collection:

- Participant ID (if not using auto-generated IDs from STEPS app)
- Centre name

If the stickers with the QR codes for each participant are not put on the containers for urine samples, these can alternatively be put on the Step 3 Appointment Card.
