

## Part 1: Introduction and Roles

### Overview

#### In this Part

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## Section 1: Introduction

### Overview

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**Introduction** This section is an introduction to the WHO STEPS Surveillance Manual.

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**Purpose** The purpose of the manual is to provide guidelines and supporting material for countries embarking on a noncommunicable disease (NCD) risk factor survey following the WHO STEPwise approach to surveillance (STEPS), so they are able to:

- plan and prepare the survey scope, sample and environment
- train staff
- conduct the field work
- capture and analyse the data collected
- report and disseminate the results.

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**Intended audience** The manual is intended for all parties responsible for implementing a STEPS NCD risk factor survey in their country. The various parties include a wide range of people from public health officials in the Ministry of Health and/or any health institutions, to field staff as well as laboratory technicians, nurses and statisticians. Interested parties will read the parts and sections relevant to their role in STEPS.

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**Guide to using the manual** The manual has been written in seven modular parts and is structured to follow the sequence of events required to implement a STEPS survey. Each part of the manual is further divided into sections. Each part and section is introduced with a table of contents to help readers find specific topics. The manual includes guidelines and instructional material that can be extracted and used for:

- training
- data collection
- data analysis
- reporting.

Page numbers have three components. The first number refers to the part, the second to the section and the third to the page number in that section. For example: 3-6-5 indicates Part 3, Section 6, Page 5.

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## Overview, Continued

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# Rationale for Surveillance of NCD Risk Factors

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## Introduction

Of the 56 million deaths occurring globally in 2012, NCDs were responsible for 38 million (68%) (1,2).

Especially in developing countries, the burden of NCDs is increasing rapidly and will have significant social, economic, and health consequences.

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## Main NCDs

The main NCDs contributing to the NCD death and morbidity burden are:

- cardiovascular diseases
- cancer
- chronic respiratory diseases
- diabetes (2).

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## Terminology

The term 'noncommunicable diseases' is used to make the distinction between these conditions and infectious or 'communicable diseases'.

Characteristics of NCDs include:

- the epidemics take decades to become fully established - they have their origin at young ages;
- they require a long term systematic approach to treatment;
- given their long duration, there are multiple opportunities for prevention.

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## The evidence

Evidence of the increasing burden of NCD globally, including in low and middle income countries is now very clear.

- In 2012, the major NCDs accounted for 38 million (68%) of all deaths.
- By 2030, these figures are expected to rise to 52 million deaths.
- Age-standardized NCD death rates are highest in low-income, and lowest in high-income countries.
- Approximately 42% of all NCD deaths are premature, occurring before the age of 70 years. The majority of premature deaths (82%) are in low- and middle income countries (2).

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## Rationale for Surveillance of NCD Risk Factors, Continued

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### Prevention

The key to controlling the global epidemics of NCDs is primary prevention based on comprehensive population-wide programmes.

The aim is to avert these epidemics wherever possible and to control them as quickly as possible where they are already present.

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### Basis of prevention

The basis of NCD prevention is the identification of the most common risk factors and their prevention and control. The risk factors of today are the diseases of tomorrow.

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### Objectives of surveillance

The objectives of surveillance of the most common NCD risk factors and NCDs are therefore to:

- collect consistent data across and within countries;
- develop standardized tools to enable comparisons over time and across countries;
- prevent NCD epidemics before they occur;
- help health services plan and determine public health priorities;
- predict future caseloads of NCDs;
- monitor and evaluate population-wide interventions.

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# Selected Risk Factors

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## Introduction

Common, preventable risk factors underlie most NCDs. The leading risk factor globally is raised blood pressure, followed by tobacco use. Other major risk factors, accounting for a large fraction of the global mortality and morbidity from NCDs include alcohol use, unhealthy diet (such as low fruit and vegetable intake, or high salt intake), insufficient physical activity, overweight/obesity, raised blood glucose, and raised cholesterol (3).

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## Risk factor definition

A 'risk factor' refers to any:

- attribute
- characteristic, or
- exposure of an individual

which increases the likelihood of developing an NCD.

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## Major behavioural risk factors

The major modifiable behavioural risk factors are (2,4):

- tobacco use
- harmful alcohol consumption
- unhealthy diet (low fruit and vegetable consumption, diet high in salt)
- insufficient physical activity.

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## Major biological risk factors

The major biological risk factors are (2,4):

- overweight and obesity
- raised blood pressure
- raised blood glucose
- abnormal blood lipids, including raised cholesterol.

These eight major behavioural and biological risk factors are therefore included in STEPS NCD risk factor surveillance.

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## Selected Risk Factors, Continued

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### Rationale for inclusion of core risk factors

The rationale for including these eight core risk factors in STEPS surveillance activities is that:

- they have the greatest impact on NCD mortality and morbidity
- modification is possible through effective prevention
- measurement of risk factors has been proven to be valid
- measurements can be obtained using appropriate ethical standards (5,6,7).

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## Item Rationales for Risk Factors

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### Introduction

The following paragraphs provide specific information and research findings for each of the risk factors that are included in STEPS NCD risk factor surveillance, and are presented in the order they are addressed in a standard STEPS survey.

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### Tobacco use

- In 2013, WHO Member States agreed to target a 30% relative reduction in prevalence of current tobacco use by 2025 (4).
- In 2010, the global prevalence of current tobacco smoking was estimated at around 22%. Smoking prevalence was about five times higher among men (37%) than among women (7%). Projections for 2025 are that the prevalence will slightly decrease, to around 19% (33% for men and 5% for women) (2,8).
- Smoking prevalence varied widely across the WHO regions in 2010, with the highest percentage of 30% of current smokers in the WHO European Region, and the lowest of 13% in the WHO African Region. However, projections for 2025 include that prevalence in the WHO African Region will increase to 18%, while prevalence in the WHO European Region will decrease to about 23% (2,8).
- Smoking prevalence among women increased with country income group in 2012, while prevalence among men varied less across income groups (2).
- Over 8 of 10 smokers smoke daily (2).
- Manufactured cigarettes, the most common form of smoked tobacco, are used by over 90% of current smokers (2).
- Tobacco use is estimated to cause about 6 million deaths each year (2).
- In 2015, tobacco use caused 6.9% of the global disease burden – as estimated in DALYs (3).
- Second-hand smoking was estimated to cause 1.0% of the global disease burden in 2015, and nearly a million deaths worldwide. Many of these deaths were among children (2,3).
- Smokers have markedly increased risk of multiple cancers, particularly lung cancer, and are at far greater risk of heart disease, stroke, Chronic Obstructive Pulmonary Disease (COPD), diabetes, and other fatal and non-fatal diseases. People who chew tobacco risk cancer of the lip, tongue and mouth (9).
- Intra Uterine Growth Retardation, spontaneous miscarriages and low birth weight babies are known outcomes of smoking during pregnancy (9).
- Non-smokers exposed to second hand smoke have a 20–30% risk of developing lung cancer and a 25–30% increased risk of suffering acute coronary diseases, as well as an increased frequency of chronic respiratory conditions. Small children whose parents smoke at home have an increased risk of suffering lower tract respiratory infections, middle ear infections and asthma (10,11).
- From 2003–2008, smoking-related healthcare accounted for up to 11% of a country’s total healthcare costs (9).
- Many studies have shown that in the poorest households in some low-income countries as much as 10% of total household expenditure is on tobacco. In addition to its direct health effects, tobacco leads to malnutrition, increased health care costs and premature death (9,12).

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## Item Rationales for Risk Factors, Continued

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### Harmful alcohol consumption

- In 2013, WHO Member States agreed to target an at least 10% relative reduction in the harmful use of alcohol by 2025, as appropriate, within the national context (4).
- The level of alcohol consumption worldwide in 2010 was estimated at 6.2 litres of pure alcohol per person aged 15 years and over (equivalent to 13.5 g of pure alcohol per day) (2,13).
- A quarter of this consumption (24.8%) was unrecorded, i.e., homemade alcohol, illegally produced or sold outside normal government controls. Of total recorded alcohol consumed worldwide, 50.1% was consumed in the form of spirits (13).
- The global prevalence of heavy episodic drinking during the past 30 days was estimated to be 7.5% in 2010 (2).
- Total alcohol consumption per capita among those aged 15 years and over varied greatly across WHO regions, with the lowest consumption of 0.7 litres of pure alcohol in the Eastern Mediterranean region, and the highest consumption of 10.9 litres in the European region (2).
- In general, the greater the economic wealth of a country, the more alcohol is consumed and the smaller the number of abstainers (2,13).
- Alcohol use causes about 3.3 million deaths each year (1).
- Alcohol use was estimated to cause 5.1% of the global disease burden – as estimated in DALYs – in 2015 (3).
- There are significant sex differences in the proportion of global deaths attributable to alcohol, for example, in 2012, 7.6% of deaths among males and 4.0% of deaths among females were attributable to alcohol (13).
- Harmful use of alcohol is associated with a risk of developing NCDs, mental and behavioural disorders, including alcohol dependence, as well as unintentional and intentional injuries, including those due to road traffic accidents and violence (2).
- There is also a causal relationship between harmful use of alcohol and incidence of infectious disease such as tuberculosis. Alcohol consumption by an expectant mother may cause fetal alcohol syndrome and pre-term birth complications (2,14).
- The highest numbers of deaths from alcohol are from cardiovascular diseases, followed by injuries (especially unintentional injuries), gastrointestinal diseases (mainly liver cirrhosis) and cancers (13).
- From 4% to about 25% of the disease burden due to specific cancers are attributable to alcohol worldwide (13).

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## Item Rationales for Risk Factors, Continued

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### Unhealthy diet – low fruit and vegetable intake

- In 2013, WHO Member States agreed to a diet indicator regarding monitoring of the prevalence of persons aged 18+ years consuming less than five total servings (400 grams) of fruit and vegetables per day (4).
- In many countries worldwide, the vast majority of the population consumes less than the recommended amount of five servings of fruit and vegetables per day (15).
- In 2015, low intake of fruits and vegetables was estimated to cause 4.7% of the global disease burden – as estimated in DALYs (3).
- Adequate consumption of fruit and vegetables reduces the risk of cardiovascular diseases, stomach cancer and colorectal cancer (15).
- A higher consumption of fruit and vegetables is associated with a lower risk of all-cause mortality, particularly cardiovascular mortality. There was a threshold around five servings of fruit and vegetables a day, after which the risk of all-cause mortality did not reduce further (16).

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### Unhealthy diet – diet high in salt

- In 2013, WHO Member States agreed to target a 30% relative reduction in mean population intake of salt/sodium by 2025 (4).
- WHO recommends a reduction in salt intake to less than 5 g/day (sodium 2 g/day). Current estimates suggest that the global mean intake of salt was around 10 g of salt daily (4 g/day of sodium) in 2010 (2,17,18).
- Intake in men was approximately 10% higher than in women (2,17,18).
- In 2010, a diet high in salt was estimated to cause 1.7 million deaths (2).
- In 2015, a diet high in salt was estimated to cause 3.4% of the global disease burden – as estimated in DALYs (3).
- High salt consumption is adversely associated with high blood pressure, coronary heart disease and stroke (19-21).
- A reduction of salt intake by 4g/day is associated with a fall in blood pressure of 5/3 mmHg—systolic/ diastolic respectively—among those with hypertension and 2/1 mmHg among those with normal blood pressure (22).

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## Item Rationales for Risk Factors, Continued

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### Insufficient physical activity

- In 2013, WHO Member States agreed to target a 10% relative reduction in prevalence of insufficient physical activity by 2025 (4).
- Globally, in 2010, 23% of adults aged 18 years and over were insufficiently physically active – i.e. they did less than 150 minutes of moderate-intensity physical activity per week, or equivalent, as recommended by WHO. Women were less active than men, with 27% of women and 20% of men not reaching the recommended level of activity (2,23).
- The WHO Eastern Mediterranean Region (31%) and the Region of the Americas (32%) had the highest prevalence of insufficient physical activity, while the prevalence was lowest in the South-East Asia (15%) and African (21%) Regions (2).
- Insufficient physical activity in adults increased according to the level of country income in 2010, with the prevalence in high-income countries (33%) about double that in low-income countries (17%) (2).
- In 2015, insufficient physical activity was estimated to cause 1.4% of the global disease burden – as estimated in DALYs (3).
- Physically inactive persons have a 20% to 30% increased risk of all-cause mortality as compared to those who adhere to 150 minutes of moderate-intensity activity per week, or equivalent (23).
- It has been shown that participation in regular physical activity reduces the risk of coronary heart disease and stroke, diabetes, hypertension, colon cancer, breast cancer and depression. Additionally, physical activity is a key determinant of energy expenditure, and this is fundamental to energy balance and weight control (23).
- Insufficient physical activity accounts for about 3.8% of cases of dementia worldwide (24).
- In 2013, insufficient physical inactivity cost health-care systems international \$ (INT\$) 53.8 billion worldwide (25).

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## Item Rationales for Risk Factors, Continued

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### Cervical Cancer Screening

- In 2013, WHO Member States agreed to an indicator regarding monitoring of the proportion of women between the ages 30-49 years screened for cervical cancer at least once, or more often, and for lower or higher age groups according to national programmes and policies (4).
- Each year, more than half a million new cases of cervical cancer are diagnosed (26).
- Cervical cancer is a largely preventable disease, but worldwide it is one of the leading causes of cancer death in women. Most deaths occur in low- and middle-income countries (26,27).
- 70% of cervical cancer is caused by the Human papillomavirus (HPV) types 16 and 18, for which there is a multivalent vaccine available. Without vaccination, almost every sexually active person will be infected with HPV at some time in their life (26).
- Primary prevention of most cervical cancer can be taken by administering the HPV vaccine to women and is most efficacious among girls between the ages of 9–13 who are not yet sexually active (26).
- If cancer develops, the time from HPV infection to invasive cervical cancer can be several decades, making it a good target for screening and early detection (28).
- Cervical cancer screening is recommended for women over 30 and can be done by pap smear, visual inspection with acetic acid (VIA), or HPV testing for high risk HPV types (26).
- Well established cytology-based screening and treatment programmes have resulted in a 50–90% reduction in cervical cancer annual rates (29).

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### Overweight and obesity

- In 2013, WHO Member States agreed to target to halt the rise in obesity by 2025 (4).
- In 2014, 39% of adults aged 18 years and older (38% of men and 40% of women) were overweight (Body Mass Index (BMI)  $\geq 25$ ), and 13% were obese (BMI  $\geq 30$ ), including 11% of men and 15% of women (1,2).
- Worldwide, obesity has more than doubled since 1980 (1,2).
- The prevalence of overweight and obesity was highest in the Region of the Americas (61% overweight, 27% obese) and lowest in the South-East Asia Region (22% overweight, 5% obese) in 2014 (1,2).
- The prevalence of overweight and obesity increased with the income level of countries, with the prevalence of obesity in high- and upper-middle income countries having been more than double of that of low-income countries in 2014 (1,2).
- Overweight and obesity cause nearly 4 million deaths annually (3,30).
- Overweight and obesity cause about 4.9% of the global disease burden – as estimated in DALYs (3).
- Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, stroke, certain cancers, obstructive sleep apnoea and osteoarthritis. It also negatively affects reproductive performance (2).

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## Item Rationales for Risk Factors, Continued

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**Overweight and obesity, cont.**

- Obesity also leads to adverse metabolic effects on cholesterol and triglycerides (31).
- Waist circumference is an approximate index of intra-abdominal fat mass and total body fat. Changes in waist circumference reflect changes in risk factors for cardiovascular disease and other forms of NCDs (32).
- Waist circumference or waist-to-hip ratio are powerful determinants of subsequent risk of type 2 diabetes (33).

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**Raised blood pressure**

- In 2013, WHO Member States agreed to target a 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances by 2025 (4).
- The global prevalence of raised blood pressure (defined as systolic and/or diastolic blood pressure  $\geq 140/90$  mmHg) in adults aged 18 years and over was around 22% (23% for men, 21% for women) in 2014 (2).
- Across the WHO regions, raised blood pressure was highest in Africa (30%), and lowest in the Region of the Americas (18%). In all WHO regions, men had slightly higher prevalence of raised blood pressure than women (2).
- The prevalence of raised blood pressure in adults was higher in low-income countries compared to middle- and high-income countries in 2014 (2).
- During the past four decades, the highest worldwide blood pressure levels have shifted from high-income to low-income countries in south Asia and sub-Saharan Africa due to opposite trends, while blood pressure has been persistently high in central and eastern Europe (34).
- Raised blood pressure is one of the leading risk factors for global mortality and is estimated to cause about 10 million deaths each year (2,3).
- Raised blood pressure was estimated to cause 8.6% of the disease burden – as measured in DALYs – in 2015 (3).
- Raised blood pressure and hypertension, if left uncontrolled, can cause stroke, myocardial infarction, cardiac failure, dementia, renal failure and blindness, causing human suffering and imposing severe financial and service burdens on health systems (2,35).
- A reduction in systolic blood pressure of 10 mmHg is associated with a 22% reduction in coronary heart disease, and a 41% reduction in stroke in randomized trials, and a 41-46% reduction in cardiometabolic mortality in epidemiological studies (36,37).
- Identifying and treating hypertension early is associated with a reduction in the risk of heart attack, heart failure, stroke, and kidney failure (36,37).

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## Item Rationales for Risk Factors, Continued

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### Raised blood glucose

- In 2013, WHO Member States agreed to target to halt the rise in diabetes by 2025 (4).
- The global prevalence of diabetes (defined as a fasting plasma glucose value  $\geq$  7.0 mmol/L [126 mg/dl] or being on medication for raised blood glucose) was estimated to be 8.5% in 2014 (38).
- The global prevalence of diabetes has nearly doubled since 1980 (38).
- Over the past decade, diabetes has risen faster in low- and middle-income countries than in high-income countries (38).
- The prevalence of diabetes was highest in the WHO Eastern Mediterranean Region (14%) and lowest in the African and European Regions (7%) in 2014 (38).
- In 2012, diabetes was estimated to cause 1.5 million deaths worldwide, and higher-than-optimal blood glucose caused an additional 2.2 million deaths. Forty-three percent of these 3.7 million deaths occurred before the age of 70 years (38).
- In 2015, raised blood glucose was estimated to cause 5.8% of the global disease burden – as estimated in DALYs (3).
- Diabetes is a well-recognized cause of premature death and disability, including heart attack, stroke, kidney failure, blindness, nerve damage, and lower-limb amputation (2,38).
- Impaired glucose tolerance and impaired fasting glycaemia are risk categories for future development of diabetes and cardiovascular disease (39,40).
- Cardiovascular disease is a main cause of mortality and morbidity among those with diabetes. Those with type 2 diabetes often have comorbidities such as obesity, hypertension, and abnormal blood lipids that further increase the risk of cardiovascular disease (41).
- Approximately one-third of people with diabetes develop some degree of diabetes-related eye damage, or retinopathy (42).
- Clinical trials have shown that type 2 diabetes can be prevented or delayed for long periods of time if lifestyle and/or medical intervention is sought. Returning to normal glucose levels from prediabetes reduces the risk of developing diabetes (39).
- Lower extremity amputations are at least 8 times more common in people with diabetes than in non-diabetic individuals in developed countries, and around half of all non-traumatic lower limb amputations are due to diabetes (43-45).

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### Abnormal blood lipids

- In 2013, WHO Member States agreed to an indicator regarding monitoring of the prevalence of raised total cholesterol among persons aged 18+ years (defined as total cholesterol  $\geq$  5.0 mmol/l or 190 mg/dl); and mean total cholesterol concentration (4).
- Globally, the prevalence of raised total cholesterol (defined as  $\geq$  5.0 mmol/l) was at nearly 40% in 2008 (15).

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## Item Rationales for Risk Factors, Continued

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### Abnormal blood lipids, cont.

- The prevalence of raised total cholesterol was highest in the WHO European Region (54%), followed by the Region of the Americas (48%). The WHO African Region and the WHO South-East Asia Region showed the lowest percentages (23% and 30%, respectively) (15).
- The prevalence of raised total cholesterol increased according to the income level of the country. In low-income countries, around a quarter of adults had raised total cholesterol in 2008, while in high-income countries, the prevalence was over 50% (15).
- In 2015, raised total cholesterol was estimated to cause 3.6% of the global disease burden – as estimated in DALYs (3).
- Raised total cholesterol is a major cause of disease burden in both the developed and developing world as a risk factor for ischaemic heart disease, stroke and other vascular diseases (15).
- Lowering cholesterol through dietary changes and/treatment is associated with a reduction of risk of cardiovascular disease. 1 mmol/L lower total cholesterol is associated with about a half lower heart disease-related mortality in those aged 40–49, a third lower in those aged 50–69, and a sixth lower in those aged 70–89 through the main range of total cholesterol levels (46,47).
- Levels of plasma high-density lipoprotein (HDL) cholesterol are inversely related to coronary artery disease incidence, and the relationship is independent of total, low-density lipoprotein (LDL) cholesterol and triglyceride levels (48).
- An elevated triglyceride level is commonly accompanied by high LDL and low HDL cholesterol, and this combination (i.e. the atherogenic dyslipidemic triad) is associated with the highest risk of cardiovascular disease. Therefore, triglyceride levels appear to provide unique information as a biomarker of risk, especially when combined with low HDL and elevated LDL cholesterol (49).
- A large proportion of people with raised blood lipids remain unaware of or untreated for their condition (50).

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# WHO STEPS Overview

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## Introduction

STEPS is the WHO's recommended tool for surveillance of NCDs and their risk factors.

It provides an entry point for low and middle income countries to get started on NCD surveillance activities. It is also designed to help countries build and strengthen their capacity to conduct surveillance (5,6).

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## Basis of STEPS

STEPS is a sequential process. It starts with gathering key information on risk factors with a questionnaire, then moves to simple physical measurements and then to more complex collection of urine and blood samples for biochemical analysis.

STEPS emphasizes that small amounts of good quality data are more valuable than large amounts of poor data. It is based on the following two key premises:

- collection of standardized data
- flexibility for use in a variety of country situations and settings.

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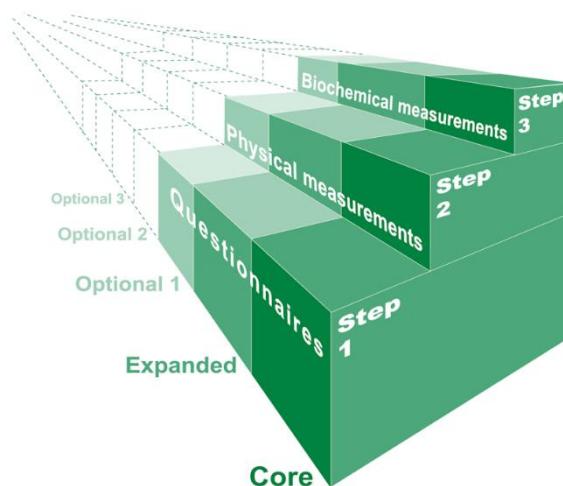
## Population focus

The STEPS approach uses a representative sample of the study population. This allows for results to be generalized to the population.

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## STEPS diagram

The following diagram illustrates the general concept of the STEPwise approach:



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## WHO STEPS Overview, Continued

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### STEPS Instrument

The STEPS tool used to collect data and measure NCD risk factors is called the **STEPS Instrument**.

The STEPS Instrument covers three different levels, or 'Steps', of risk factor assessment: Step 1, Step 2 and Step 3, as follows:

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Step	Description	Purpose	Recommendation
1	Gathering demographic and behavioural information by questionnaire in a household setting.	To obtain core data on: <ul style="list-style-type: none"><li>• socio-demographic information</li><li>• tobacco and alcohol use</li><li>• dietary behaviour</li><li>• physical activity</li><li>• history of NCD conditions and lifestyle advice</li><li>• cervical cancer screening.</li></ul>	All countries should undertake the core items of Step 1.
2	Physical measurements in a household setting.	To build on the core data in Step 1 and determine the proportion of adults that: <ul style="list-style-type: none"><li>• are overweight and obese</li><li>• have raised blood pressure.</li></ul>	All countries should undertake the core items of Step 2.
3	Receiving participant's urine samples and taking blood samples in a convenient setting such as a community health facility, a school, the house of the local health worker, or a place of worship.	To measure prevalence of high urinary sodium concentration, raised blood glucose, and abnormal blood lipids.	All countries should undertake the core items of Step 3.

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## WHO STEPS Overview, Continued

### Core, expanded and optional items

Within each Step, there are three levels of data collection. These depend on what can realistically be accomplished (financially, logically and in terms of human resources) in each country setting.

The core, expanded and optional levels of detail gathered for each Step are briefly described below:

### STEPS Core, Expanded, and Optional Items

	Core Items	Expanded Items	Optional Items
<b>Step 1 Behavioural</b>	Basic demographic information, including age, sex, and years at school  Tobacco use, duration and quantity of smoking, quit attempts, past smoking, smokeless tobacco use  Alcohol consumption, cessation, binge drinking, past 7 days drinking, consumption of untaxed alcohol  Fruit and vegetable consumption, consumption of salt and processed food high in salt  Physical activity at work/in the household, for transport and during leisure time  History of raised blood pressure, diabetes, raised total cholesterol and cardiovascular diseases  Lifestyle advice  Cervical cancer screening	Expanded demographic information including highest level of education, ethnicity, marital status, employment status, household income  Cessation, exposure to environmental tobacco smoke  Alcohol use disorders  Awareness of too much salt as a health problem, control of salt intake  Sedentary behaviour	Cervical cancer Mental health/suicide Oral health Tobacco policy Violence and injury Household energy use Sensory function Disability Mental Health-depression Chronic respiratory diseases
<b>Step 2 Physical measurements</b>	Blood pressure Height and weight Waist circumference	Hip circumference Heart rate	Objective measurement of physical activity Sensory function assessment Peak expiratory flow
<b>Step 3 Biochemical measurements</b>	Fasting blood sugar Total cholesterol Urinary sodium and creatinine	HDL-cholesterol Fasting triglycerides	

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## WHO STEPS Overview, Continued

### eSTEPS

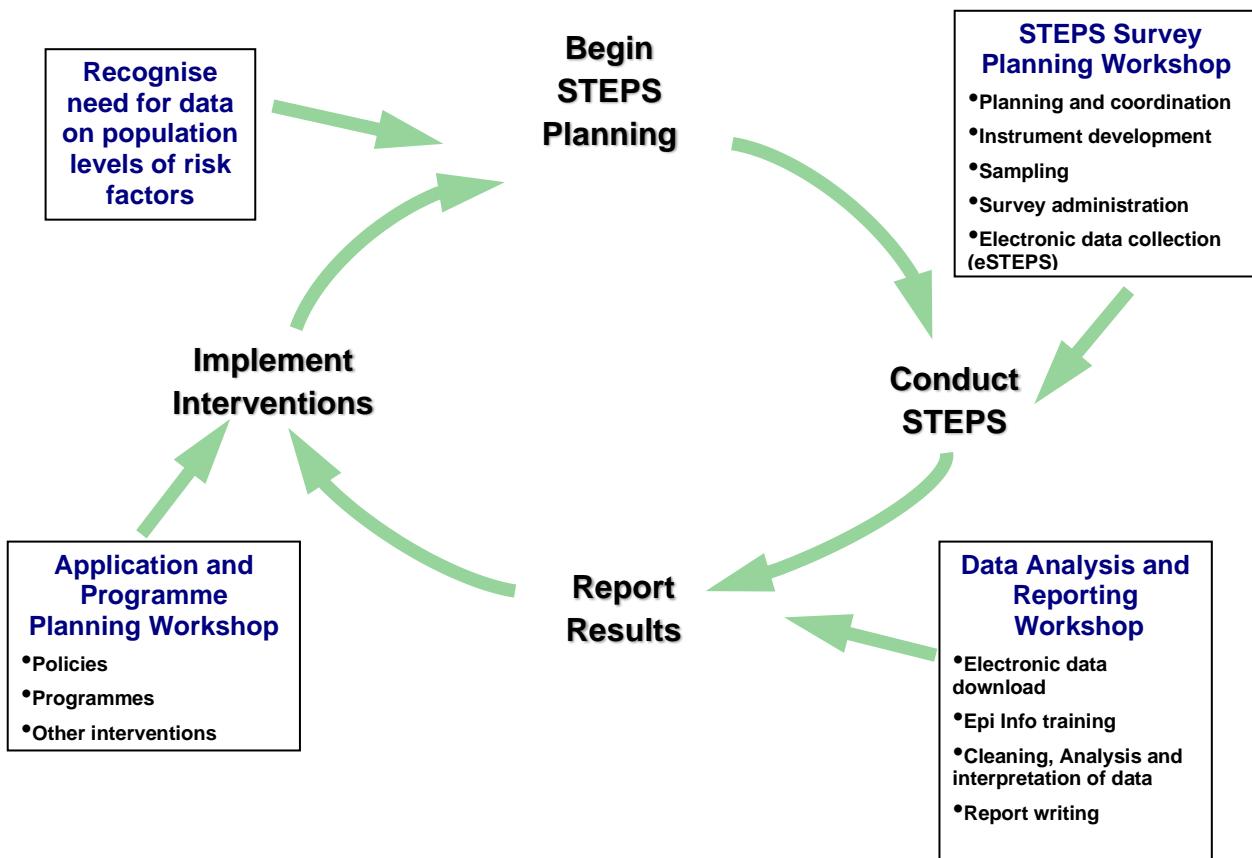
WHO STEPS includes specific software and supporting materials to undertake data collection electronically (eSTEPS), such as with Android devices. The benefits of electronic data collection include:

- immediate error checking during data collection (e.g. inadvertently skipped questions or out of range responses);
- marked reduction of materials to be carried by data collectors;
- remote data submission;
- no additional data entry from paper based questionnaires is needed, and therefore
  - no additional cost for data entry;
  - fewer errors arising from data entry;
  - final dataset can be created quickly following completion of data collection.

### From surveys to surveillance

While surveys can be a one off exercise, surveillance involves commitment to data collection on an ongoing, repeated basis. Repeat surveys are essential to identify trends in the prevalence of risk factors.

The following diagram illustrates the surveillance process. Ideally, countries should repeat these surveys every approximately 5 years, depending on the resources available.



# Planning and Implementation Overview

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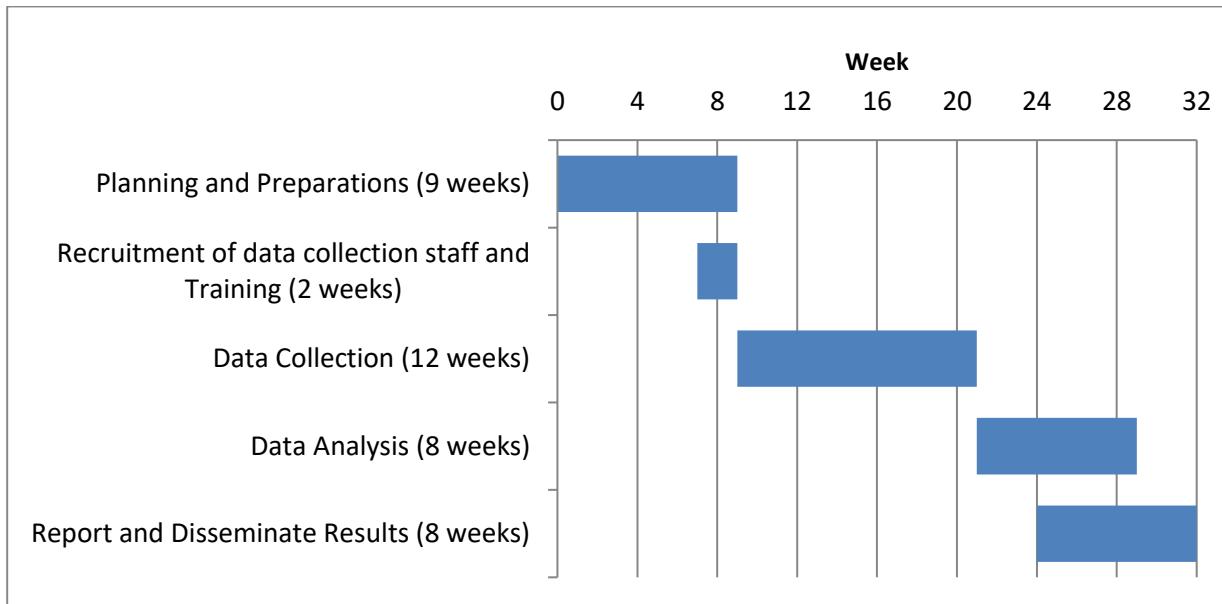
## Introduction

For STEPS Surveillance to be effective, the whole process needs to be properly planned and organized before being implemented. Guidelines are provided below to help a country plan a STEPS survey.

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## Key stages, tasks and timeframes

The optimal, recommended total timeframe to conduct a STEPS survey of NCD risk factors is approximately six to eight months. This timeframe is based on seasonal considerations and a country's ability to 'dedicate' staff to the STEPS project for longer periods. It is by no means a hard and fast rule, but an indicative guideline.



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## Section 2: Roles and Responsibilities

### Overview

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**Introduction** There are a number of entities involved in a STEPS survey at different levels including:

- country
- regional
- global.

They all have key roles, which are described below.

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**Purpose** The purpose of this section is to:

- provide an overview of the relationships between all those involved in a STEPS survey;
- provide a description of each of the core roles involved.

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**In this section** This section contains information outlining the responsibilities for the following:

Topic	See Page
<b>Error! Not a valid result for table.</b>	1-2-27
STEPS Survey Coordinator	1-2-28
<b>Error! Not a valid result for table.</b>	1-2-30
Data Collection Team	1-2-31
Laboratory Technician	1-2-9
Statistical Adviser	1-2-35
<b>Error! Not a valid result for table.</b> is Team	1-2-36
<b>Error! Not a valid result for table.</b>	1-2-38

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# Relationships Between Survey Team and WHO

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## Introduction

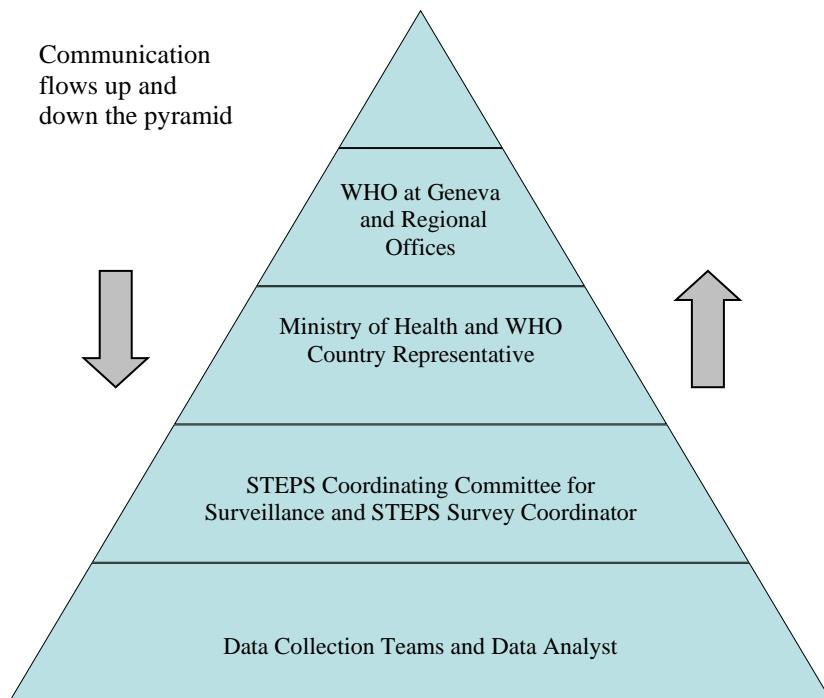
The survey team is all those involved in the survey preparation, data collection, analysis and reporting processes.

The WHO Geneva STEPS team and the WHO Regional Office provide guidance and support for STEPS surveys.

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## Roles and Relationships

The diagram below shows the lines of communication between all the players in a STEPS survey.



## STEPS data policy and procedures

As part of the collaboration between the implementing country, the survey team, WHO and other stakeholders, it is recommended to have all involved parties sign the STEPS Data Policy document.

The document is available from the WHO Geneva STEPS team upon request, and provides guidance on data policy and sharing, information exchange and publication procedures.

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# STEPS Survey Coordinator

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## Introduction

The STEPS Survey Coordinator is the key person responsible for planning and implementing STEPS.

The STEPS Survey Coordinator should be familiar with the entire manual to understand the whole STEPS process.

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## Skills and attributes

The STEPS Survey Coordinator will need to have the following general skills and attributes:

- good written and oral communication skills;
- ability to recruit efficient and motivated staff;
- current knowledge of the Ministry of Health, public health institutions and the personnel involved in STEPS;
- well-organized and efficient planner;
- ability to mobilize multiple teams over a short period to complete data collection;
- ability to chair/organize meetings of the STEPS Coordinating Committee;
- good understanding of the philosophy and objectives of the STEPS risk factor surveillance process.

---

## Level of authority

The STEPS Survey Coordinator should have sufficient authority to:

- lead the whole process of STEPS implementation;
- negotiate and obtain resources for survey implementation;
- oversee progress of the national/subnational STEPS implementation plan
- develop partnerships;
- contribute to the disease prevention and health promotion activities that will arise from the data gathered by STEPS.

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*Continued on next page*

## References, Continued

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### Core roles

The core roles of the STEPS Survey Coordinator may include all or some of the following:

Role	Description
1	Liaising with local authorities, the STEPS Coordinating Committee, WHO Country Representatives and other stakeholders
2	Developing a STEPS implementation plan
3	Planning a STEPS survey
4	Coordinating the setup of a STEPS survey in the country
5	Recruiting and training field staff
6	Supervising the data collection processes
7	Reporting back results and ensure results are appropriately used
8	Overseeing archiving of files at completion of the project
9	Planning and preparing for future surveys

**Note:** Information on archiving is available in Part 4, Section 4.

---

# STEPS Coordinating Committee

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## Introduction

The STEPS Coordinating Committee will most likely be organized within the Ministry or Department of Health (MOH).

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## Objectives

The main objective of the STEPS Coordinating Committee is to oversee the practical and logistic issues relating to the overall implementation of the STEPS survey.

---

## Core roles of the committee

The core roles of the STEPS Coordinating Committee are to:

- support the STEPS Survey Coordinator;
- act as an advocacy body for NCD surveillance within the country;
- develop national level partnerships with MOH and other stakeholders to enhance the capacity for ongoing NCD risk factor surveillance;
- identify and secure local funding and/or "in kind" support;
- oversee the overall implementation of the STEPS survey;
- assist in translating the data into policy and programmes;
- ensure the long term sustainability of STEPS surveillance.

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## Core roles of the chairperson

The STEPS Coordinating Committee chairperson is responsible for chairing meetings of the STEPS Coordinating Committee and for overseeing the practical and logistic issues relating to the overall implementation of the STEPS survey.

This role is usually filled by the STEPS Survey Coordinator.

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## Expertise of members

Members of the STEPS Coordinating Committee should be selected for their expertise in the following areas:

- public health
- epidemiology and statistics
- survey planning and implementation
- subject matter expertise in NCDs
- experience as an advocate for preventing NCDs.

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# Data Collection Team

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## Introduction

The data collection team undertakes a core function in a STEPS survey and includes all those who have been recruited for survey data collection.

The data collection team usually consists of

- field team supervisors
- interviewers
- Step 3 data collectors
- drivers
- administrative staff.

It is recommended these staff be organized in field teams. A field team usually includes one supervisor, two to three interviewers, one Step 3 data collector, and one driver.

Hiring good interviewers and other field personnel is crucial to successful data collection. The quality of data collection and the survey results depend on the consistency and quality of these workers. Training the staff is therefore a major undertaking.

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## Field team supervisor's roles

The core roles of a field team supervisor are listed in the table below. They are further specified in Part 3, Section 3.

Role	Description
1	Obtaining and preparing household lists and maps for each area, or other lists to be used as the sampling frame, data collection forms, devices for data collection, supplies and equipment, and distributing them to data collectors
2	Coordinating logistics and assigning interviewers to households in each cluster or primary sampling unit
3	Making travel arrangements for data collectors
4	Informing local authorities about the survey
5	Supervising the interview process and recording daily activities
6	Ensuring data quality
7	Ensuring regular submission of the data to the server
8	Managing human resource performance and issues
9	Sending regular progress reports to STEPS Survey Coordinator

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## References, Continued

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<b>Skills and attributes</b>	The field team supervisor should have the following skills and attributes: <ul style="list-style-type: none"><li>• ability to work with teams and motivate people;</li><li>• well-organized and efficient in planning STEPS activities;</li><li>• ability to mobilize multiple teams over a short period to complete data collection;</li><li>• experienced in health population-based surveys;</li><li>• good understanding of the philosophy and objectives of the global STEPS risk factor surveillance process.</li></ul>																																	
<b>Interviewer's roles</b>	The interviewers are all those who have been trained to conduct the survey in the household setting using Step 1, and take physical measurements for Step 2 of the STEPS Instrument. They may also undertake Step 3 measurements, if required. <p>The core roles of an interviewer include:</p> <table border="1"><thead><tr><th>Task</th><th>Description</th><th>✓</th></tr></thead><tbody><tr><td>1</td><td>Approach selected households.</td><td></td></tr><tr><td>2</td><td>Brief household members on purpose of the survey.</td><td></td></tr><tr><td>3</td><td>Select a participant from all eligible members within a selected household using the Android Device.</td><td></td></tr><tr><td>4</td><td>Record information on the Interview Tracking Form.</td><td></td></tr><tr><td>5</td><td>Inform the selected participant using the Participant Information Form and obtain written consent.</td><td></td></tr><tr><td>6</td><td>Conduct the interview and record results for Step 1.</td><td></td></tr><tr><td>7</td><td>Take measurements and record results for Step 2.</td><td></td></tr><tr><td>8</td><td>Fill in Participant Feedback Form on results of Step 2 measurements for the participant.</td><td></td></tr><tr><td>9</td><td>Make appointment for Step 3 (if consent given), provide instructions for correct collection of urine sample and inform participant on correct method of fasting.</td><td></td></tr><tr><td>10</td><td>Report any difficulties to supervisor.</td><td></td></tr></tbody></table>	Task	Description	✓	1	Approach selected households.		2	Brief household members on purpose of the survey.		3	Select a participant from all eligible members within a selected household using the Android Device.		4	Record information on the Interview Tracking Form.		5	Inform the selected participant using the Participant Information Form and obtain written consent.		6	Conduct the interview and record results for Step 1.		7	Take measurements and record results for Step 2.		8	Fill in Participant Feedback Form on results of Step 2 measurements for the participant.		9	Make appointment for Step 3 (if consent given), provide instructions for correct collection of urine sample and inform participant on correct method of fasting.		10	Report any difficulties to supervisor.	
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**Skills and attributes** Interviewers should have the following general skills and attributes:

- good oral and written communication skills
- friendly manner and patience
- good attention to detail.

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## References, Continued

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### Step 3 data collectors

Those people recruited to take biochemical measurements for Step 3 of the STEPS Instrument.

This role does not need health professionals with full medical training. These professionals could be nurse practitioners or medical assistants.

The core roles of the Step 3 data collectors include:

Role	Description
1	Checking for appropriate participant consent
2	Receiving urine samples from participants and ensuring proper labeling for further processing and shipment
3	Taking blood samples from participants and recording results for Step 3 on the tablets and the participant feedback forms
4	Ensuring consistency of Participant Identification Numbers (PIDs) for all data and labels

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### Drivers

Drivers are required to:

- move the field teams around to their respective enumeration areas, and within the enumeration areas where data collection is conducted.

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### Administrative staff

Administrative staff are required to:

- assist with organizing logistics
- organize supplies and venues
- print and distribute materials
- organize any publicity for the survey
- send out letters of invitation
- file survey materials in the STEPS coordination office.

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## Laboratory technician

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### Laboratory technician's roles

Laboratory technicians are the people responsible for analysing the urine samples taken for Step 3.

The core roles of a laboratory technician include:

Role	Description
1	Check whether or not urine samples can be analysed (e.g. check for contamination with blood)
2	Analyse urine samples
3	Record results for urinary sodium and creatinine along with PIDs

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# Statistical Adviser

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## Introduction

The statistical adviser plays a key role in the sampling and data analysis process. The statistical adviser should be part of the STEPS Coordinating Committee and/or may serve as the data analyst. If this expertise is not available within the MOH, experts from a country's national statistics agency or organization may be recruited. If a statistical adviser cannot be identified within a country, then the WHO Geneva STEPS team or the WHO Regional Office focal point will be able to advise and assist with this role.

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## Objectives

The statistical adviser provides an integral role in the sampling and weighting of the survey data. The objective of the adviser is to ensure that a proper sample is selected and that the sample can be weighted to make the results nationally representative.

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## Expertise of statistical adviser

The statistical adviser should have:

- an advanced degree in statistics
- a special interest in survey statistics
- experience with sampling and weighting data
- an interest in population health statistics
- an ability to discuss concerns and convey advice clearly to the data analyst.

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## Statistical adviser's roles

The statistical adviser, under the guidance of the STEPS Coordinating Committee, will be responsible for:

Role	Description
1	Collecting the sample frame
2	Drawing the survey sample and documenting the sampling strategy
3	Reviewing available tracking material and adapting it to the country-specific sample
4	Applying weights to survey data
5	Providing statistical advice during the analysis and reporting process

**Note:** The tracking material is the Interview Tracking Form, available in Part 6, Section 2. The statistical adviser or the supervisor should advise the data collection team on the importance of properly tracking the sample and the impact it has on making the data representative of the target population.

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# IT Specialist/Data Manager and Analysis Team

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## Introduction

The IT specialist/data manager and analysis team should work closely with the STEPS Survey Coordinator and the statistical adviser to produce results for inclusion in various STEPS country reports. They should also assist with any issues related to the Android devices used for electronic data collection.

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## Roles of the IT Specialist/data manager

The IT specialist/data manager is someone who has been assigned to provide support related to set up and use of the Android devices, and to oversee the data download from the Android devices, the compilation of the final dataset and the analysis process.

The core roles of the data manager are listed in the table below.

Role	Description
1	Assisting with set-up of Android devices for training and data collection
2	Providing support during the data collectors training on issues related to the Android devices
3	Providing support to the field teams during the field work on issues related to the Android devices
4	Downloading completed records from the Android devices
5	Compiling all completed records into one dataset
6	Pre-cleaning of the survey data
7	Weighting of the survey data in collaboration with the statistical adviser
8	Ensuring security of all survey data*
9	Overseeing the data analysis process

\* It is common that the data manager becomes the de-facto guardian of the survey data and files.

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## Roles of the data analysis team

The analysis team is assigned to undertake the descriptive and statistical analysis of data gathered using the STEPS Instrument.

The core roles of the data analysis team are listed in the table below.

Role	Description
1	Performing any needed cleaning of the dataset
2	Generating derived variables
3	Undertaking exploratory data analysis
4	Undertaking descriptive analyses (e.g. means and proportions)
5	Undertaking additional analyses if needed, under the guidance of the data manager
6	Producing tables and graphs for reports
7	Assisting in report preparation

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## IT Specialist/Data Manager and Analysis Team, Continued

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### Attributes and qualifications

It is desirable that the data manager and analysis team has some qualifications and experience in data analysis and statistics.

People asked to perform these roles should:

- have a science or computing background;
- have experience in analysis of previous survey data using statistical software;
- be able to understand outputs of means, proportions and confidence intervals.

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# WHO Offices

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## Introduction

There are various roles and responsibilities assigned to the WHO office in Geneva as well as to the WHO offices in the regions and countries. Each entity has a core function, which is described below.

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## WHO Geneva STEPS team

The WHO Geneva STEPS team works closely with the WHO Regional Offices and provides global coordination for STEPS implementation across the regions.

The WHO Geneva STEPS team is also responsible for supporting training and providing technical support to the countries implementing STEPS surveys.

The core roles of the WHO Geneva STEPS team include:

Role	Description
1	Providing training, tools, software, guidance and advice for all aspects of STEPS planning, implementation, analysis and dissemination of data
2	Lending survey equipment (Android devices, blood pressure monitoring devices, tape measures, weighting scales, devices for Step 3 measurements) to low resource settings, as needed
3	Communicating with the STEPS Regional focal point and with the STEPS Survey Coordinator
4	Developing a global strategy in NCD risk factor surveillance

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## WHO Regional Office

WHO Regional Offices are responsible for coordinating the implementation of STEPS in their respective region. The Regional Offices provide ongoing technical support to countries implementing STEPS surveys.

The core roles of the WHO Regional Office include:

Role	Description
1	Identifying countries that are ready to implement STEPS
2	Providing overall guidance on planning and coordination of STEPS in their region
3	Funding and delivering STEPS training workshops
4	Coordinating technical support to countries
5	Coordinating government and agency activities at the regional and international levels
6	Developing a regional strategy in NCD prevention and control activities by promoting use of STEPS data

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## References, Continued

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<b>STEPS regional focal point</b>	<p>The STEPS regional focal point is responsible for:</p> <ul style="list-style-type: none"><li>• developing a strategic plan of action that addresses the immediate needs for NCD risk factor surveillance;</li><li>• liaising between the WHO Geneva STEPS team and STEPS countries;</li><li>• suggesting improvements or developments to STEPS materials;</li><li>• providing technical support to countries.</li></ul>
<b>WHO Country Representative/WHO Country Office Staff</b>	<p>The WHO Country Office Staff, including the WHO Country Representative, is the local facilitator, and is responsible for:</p> <ul style="list-style-type: none"><li>• facilitating resource mobilization for NCD surveillance;</li><li>• serving on the STEPS Coordination Committee;</li><li>• facilitating communications between the STEPS country and the WHO Regional Office.</li></ul>
<b>Additional regional support</b>	<p><b>Note:</b> The WHO Country Representative does not usually have a technical role.</p> <p>This consists of providing additional technical and statistical support to build capacity at the regional and country level. The primary link is through the WHO Geneva STEPS team or Regional Office focal point.</p>