Introduction to NCD Epidemiology

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**INTRODUCTION TO NCD EPIDEMIOLOGY**

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Introduction to NCD Epidemiology

**LEARNING OBJECTIVES**

- To describe how to use epidemiology to address a public health problem by the end of training.

**ESTIMATED COMPLETION TIME**

- 2 hours, 25 minutes (110 minutes interactive presentation; 35 minutes Skill Assessment).

**TRAINING TECHNIQUES**

- Present content and examples by using lecture and group discussion. Skill assessment will be in small groups.

**MATERIALS AND EQUIPMENT**

For the Facilitator:
- PowerPoint file for presentation
- Two flip charts with markers

For the Participant:
- Participant Guide

**REFERENCES AND RESOURCES**


**PREPARATION CHECKLIST**

The following are action items to be completed by the facilitator prior to training:

___ Review slides
___ Obtain background information about priority NCDs for participants
___ Prepare flip chart for Common Risk Factors (see slide 12)
INTRODUCTION TO NCD EPIDEMIOLOGY

FONT GLOSSARY
The following fonts are used in this guide:

<table>
<thead>
<tr>
<th>Font Type</th>
<th>Font Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain</td>
<td>Script</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td><strong>Instructions</strong></td>
</tr>
<tr>
<td><em>Italics</em></td>
<td><em>Answers</em></td>
</tr>
</tbody>
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ICON GLOSSARY
The following icons are used in this guide:

<table>
<thead>
<tr>
<th>Image Type</th>
<th>Image Meaning</th>
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<tbody>
<tr>
<td>Activity Icon</td>
<td><em>Small group exercise.</em></td>
</tr>
<tr>
<td>Flip Chart Icon</td>
<td>Write responses during facilitator-led discussions or debriefs.</td>
</tr>
<tr>
<td>Question Icon</td>
<td>Question for facilitator to ask participants.</td>
</tr>
<tr>
<td>Tip Icon</td>
<td>Supplemental information discussion.</td>
</tr>
<tr>
<td>Stop Icon</td>
<td>Do not start the assignment until your facilitator tells you to begin.</td>
</tr>
</tbody>
</table>
### Module Content

<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 minutes Slide 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Introduce trainer to participants.</td>
</tr>
<tr>
<td></td>
<td>• Tell participants that this lesson will take approximately two hours to complete.</td>
</tr>
<tr>
<td></td>
<td>• Explain that this lesson will provide participants with an overview of epidemiology with an emphasis on non-communicable diseases.</td>
</tr>
<tr>
<td></td>
<td>• Explain that after learning the lesson content they will complete a skill assessment with a small group.</td>
</tr>
<tr>
<td>1 minute Slide 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Direct participants to Slide one in their Participant Guides.</td>
</tr>
<tr>
<td></td>
<td>• Read the learning objective from the slide.</td>
</tr>
</tbody>
</table>
INTRODUCTION TO NCD EPIDEMIOLOGY

Duration/Slide Number | What To Do/What To Say
---|---
1 minute | Slide 3

- Tell participants what they will learn during this lesson.

2 minutes | Slide 4

- Tell participants that you will begin the lesson by defining a non-communicable disease.
- Explain that for the purpose of this course, chronic diseases will be referred to as NCDs.
- Ask: Can someone define a non-communicable disease?
- Read the definition on the slide.
- Ask participants if they like this definition.
- Ask: What about HIV? Malaria? Injury? Say: They fit the definition but are not NCDs and HIV is spread from person to person.
- Tell participants that they have brought up good points, but for the purposes of this lesson you will be adding another definition to complete it.
Non-Communicable Disease (NCD): Definition (cont.)

- Chronic conditions are characterized by the following:
  - Do not result from an (acute) infectious process
  - Are “not communicable”
  - Cause premature morbidity, dysfunction, and reduced quality of life
  - Usually develop and progress over long periods,
  - Often initially insidious
  - Once manifested there is usually a protracted period of impaired health

Tip:

- Read the slide.
- Highlight that some NCDs have an infectious origin, like ulcers and cervical cancer.
- Note that there are a variety of opinions about this definition in the field, and there is not 100% agreement, for example, some would argue that HIV is a chronic condition.

Non-Communicable Disease (NCD): Extended Definition

In some definitions, NCDs also include:
- Chronic mental illness
- Injuries, which have an acute onset, but may be followed by prolonged convalescence and impaired function

- Read the slide and briefly explain how mental illness and injuries fit into “NCDs”.
INTRODUCTION TO NCD EPIDEMIOLOGY

<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
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<tbody>
<tr>
<td>2 minutes Slide 7</td>
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</tbody>
</table>

**Types of NCDs**
- Cardiovascular disease (Coronary heart disease, Stroke)
- Cancer
- Chronic lung disease
- Diabetes
- Chronic neurologic disorders (Alzheimer’s, dementias)
- Arthritis/Musculoskeletal diseases

- Ask participants for types or examples of NCDs.
- Read the types of NCDs on the slide and explain that this list is not complete.
- Explain that the first four on the slide are the most prevalent NCDs and also the focus for WHO. (Point out the reference for this at the bottom of the slide.)
- Mention that 80% of NCD deaths occur in low-to-middle income countries.

2 minutes Slide 8

**Leading Causes of Attributable Global Mortality and Burden of Disease, 2004**

- **Attributable Mortality**
  1. High blood pressure 12.8
  2. Tobacco use 8.7
  3. High blood glucose 5.8
  4. Physical inactivity 5.5
  5. Overweight and obesity 4.8
  6. High cholesterol 4.5
  7. Unsafe sex 4.0
  8. Alcohol use 3.8
  9. Childhood underweight 3.8
  10. Indoor smoke from solid fuels 3.3

- **Attributable DALYs**
  1. Childhood underweight 7.8
  2. High blood pressure 7.5
  3. Unsafe sex 6.6
  4. Unsafe water, sanitation, hygiene 6.1
  5. High blood glucose 4.9
  6. Indoor smoke from solid fuels 4.8
  7. Tobacco use 3.9
  8. Physical inactivity 3.8
  9. Suboptimal breastfeeding 3.7
  10. High cholesterol 3.3

- Say: Most lists of causes of death show the diseases that led to death. This slide takes causes one step back and looks at the causes of the diseases, in particular the preventable risk factors for the diseases that result in death. On the left you see the contribution of each risk factor to overall mortality. On the right, you see the contribution of each risk factor to disability-adjusted life years lost.
**Characteristics of NCDs**

- Complex etiology (causes)
- Multiple risk factors
- Long latency period
- Non-contagious origin (non-communicable)
- Prolonged course of illness
- Functional impairment or disability
- Incurability
- Insidious onset

**Question**

- Ask participants for common characteristics of NCDs.
- Read the characteristics of NCDs on the slide.
- If needed, clarify what is meant by some of the terminology on the slide, for example:
  - Latency period: the period between when you get the disease and when you discover it.

Although NCDs may be incurable, public health research professionals can help in learning methods to enhance management of the disease and improve the quality of life in those diseased individuals.
<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
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</thead>
</table>
| **Question** | - Ask participants to define risk factor.  
- Click on slide and read definition.  
- Ask: What is environmental exposure?  
- **Possible answers:** exposure to sun, tobacco smoke  
- Explain that risk factors can be either modifiable or non-modifiable.  
- Show the next two slides for further explanation. |

2 minutes

**Slide 11**

**Modifiable Risk Factor**
- A risk factor that can be reduced or controlled by intervention, thereby reducing the probability of disease.
- The WHO has prioritized the following four:
  - Physical inactivity
  - Tobacco use
  - Alcohol use
  - Unhealthy diets

**Question**
- Ask: Can anyone define modifiable risk factor?  
- Click and read the definition on the slide.  
- Ask: Why is it important for us to think about modifiable risk factors?  
- **Possible answer:** Because we can do something about it; we can have an intervention for it.  
- Ask participants for examples of modifiable risk factors.  
- Click and read examples on the slide.  
- Ask participants for examples of modifiable risk factors for type 2 diabetes.
What To Do/What To Say

2 minutes

Slide 12

**Non-Modifiable Risk Factor**

- A risk factor that cannot be reduced or controlled by intervention, for example:
  - Age
  - Gender
  - Race
  - Family history (genetics)

**Question**

- **Ask:** What is the definition of non-modifiable risk factor?
- **Click and read definition on slide.**
- **Ask:** What are examples of non-modifiable risk factors?
- **Click and read examples on slide.**
- **Ask:** What are examples of non-modifiable risk factors for type 2 diabetes?

5 minutes

Slide 13

**Common Risk Factors**

- Tobacco use
- Unhealthy diet
- Physical inactivity
- Harmful use of alcohol

<table>
<thead>
<tr>
<th>Noncommunicable Diseases</th>
<th>4 Diseases, 4 Modifiable Shared Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular disease</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>Diabetes</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>Cancer</td>
<td>![Checkmark]</td>
</tr>
<tr>
<td>Chronic respiratory</td>
<td>![Checkmark]</td>
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</tbody>
</table>
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<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
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</thead>
<tbody>
<tr>
<td>Flip Chart</td>
<td>• Note: Draw the above slide on a flip chart without the checkmarks. Do not show the slide yet. Use the flip chart for the beginning part of the discussion.</td>
</tr>
<tr>
<td>Tip</td>
<td>• Ask: Is tobacco use a risk factor for cardiovascular disease? Type 2 Diabetes? Cancer? Chronic Respiratory Conditions?</td>
</tr>
<tr>
<td>Question</td>
<td>• Continue asking the questions for each risk factor and mark off each column with a checkmark.</td>
</tr>
<tr>
<td></td>
<td>• Make the point that not all cancers share the risk factors of unhealthy diet, alcohol use, etc.</td>
</tr>
<tr>
<td></td>
<td>• After you fill in the checkmarks, show the slide.</td>
</tr>
<tr>
<td>Question</td>
<td>• Ask: What does this say about tobacco use? Physical inactivity? Unhealthy diet?</td>
</tr>
<tr>
<td></td>
<td>• Point out that if you have an intervention for physical inactivity and tobacco use you can make progress on four key NCDs. You do not need to plan separate interventions for each NCD or each risk factor.</td>
</tr>
<tr>
<td>Question</td>
<td>• Ask: If we adequately addressed these risk factors, how would this affect these diseases?</td>
</tr>
<tr>
<td></td>
<td>• Answer: These diseases would be affected in the following way:</td>
</tr>
<tr>
<td></td>
<td>o 80% reduction in coronary heart disease</td>
</tr>
<tr>
<td></td>
<td>o Up to 90% reduction of type 2 diabetes</td>
</tr>
<tr>
<td></td>
<td>o 1/3 reduction of cancers</td>
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</tbody>
</table>
• Tell participants that you will compare non-communicable diseases with communicable diseases.

• Ask: Can someone define a communicable disease and provide examples?
• Read the slide.
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<tr>
<td>4 minutes</td>
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<td>Slide 16</td>
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**Question**

- **Ask**: How do NCDs and communicable diseases differ in infectiousness?
- **Answers should include the following**:
  - *Communicable disease occurrence depends upon the presence/absence of disease already occurring in that population. Meaning, one person getting a disease depends upon whether or not other people in the population have the disease and come in contact with the infected individual (except with zoonoses or environmentally associated diseases). Infectious diseases are caused by single agents whereas communicable diseases have multifactorial causes. Also, communicable diseases typically have a longer duration than infectious diseases.*
  - *For NCDs, all disease events are generally independent of one another.*
- **Say**: There has been a recent trend to look at the importance of social factors that cluster together and are associated with NCDs. For example, if a group of friends tend to eat fattening foods and are therefore overweight, and a new friend joins the group, he/she may start eating fattening foods and consequently gain weight.
• **Ask:** How do NCDs and communicable diseases differ in **risk of disease**?

• **Answers should include the following:**
  
  o *For NCDs,* the risk of disease largely depends on population characteristics such as genetics, diet, and exercise, and other health behaviors.

  o *Communicable disease* can also be influenced by these characteristics, but they have properties that contribute to whether an exposed individual will become infected, e.g., agent’s pathogenicity, the minimum infective dose, the duration of infectiousness and type of exposure.

1 minute

**Slide 17**

DEFINITIONS AND APPROACHES OF EPIDEMIOLOGY

• Tell participants you will now define epidemiology and discuss approaches.

3 minutes

**Slide 18**

What is Epidemiology?
<table>
<thead>
<tr>
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<th>What To Do/What To Say</th>
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</thead>
<tbody>
<tr>
<td>• Ask: Can anyone describe epidemiology?</td>
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</tr>
<tr>
<td>• Encourage participants to write responses in their Participant Guide as you review the correct answers.</td>
<td></td>
</tr>
<tr>
<td>• Answers should include the following:</td>
<td></td>
</tr>
<tr>
<td>o Basic science of public health</td>
<td></td>
</tr>
<tr>
<td>o Study of health and disease on the population level</td>
<td></td>
</tr>
<tr>
<td>o Answers the who, what, when, where, why, and how regarding health and disease</td>
<td></td>
</tr>
<tr>
<td>o Applies data and research to improve public health.</td>
<td></td>
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</table>

2 minutes

Slide 19

**Epidemiology: CDC Definition**

“The study of the distribution and determinants of health-related states in specified populations, and the application of this study to control health problems.”

- Distribution
- Determinants
- Health-related states
- Specified population
- Application

• Read the CDC definition of epidemiology. Then click until the words appear below the definition. Say that you will now discuss in detail the meaning of these words.
### Duration/Slide Number | What To Do/What To Say
--- | ---
2 minutes | Slide 20

- **Epidemiology: CDC Definition Distribution**

  *Distribution*: Occurrence of cases by time, place, and person

  *Example*: According to a study of deaths in Country X in 2008, 1,034 cervical cancer deaths occurred among women between the ages of 45-54.

- **Read the slide.**
- **Explain that the example provides a time period of 2008, the place of Country X, and the persons affected – women ages 45-54.**

2 minutes | Slide 21

- **Epidemiology: CDC Definition Determinants**

  *Determinants*: All the causes and risk factors for the occurrence of a disease, including physical, biological, social, cultural, and behavioral factors

  *Example*: Smoking was a risk factor or determinant for the greater number of cancer deaths among women ages 45-84 in Country X.

- **Read the definition on the slide.**
- **Explain that determinants are the “how” and the “why”, for example, poor nutrition or tobacco use.**
- **Read the example.**
• Read the slide.

Slide 23

Epidemiology: CDC Definition
Specified Population

Specified Population: A measurable group, defined by location, time, demographics, and other characteristics


• Read the slide.

Slide 24

Epidemiology: CDC Definition
Application

Application

• Analysis, conclusion, distribution, and timely use of epidemiologic information to protect the health of the population

Example: As a result of the Country X Study, free cervical cancer screening programs were implemented. They targeted women living in remote areas in hopes of finding women with cervical cancer at an earlier stage of cancer in order to prevent death.

• Read the slide.
Purpose of Epidemiology

- To measure frequency of disease
  - Quantify disease
- To assess distribution of disease
  - Who is getting disease?
  - Where is disease occurring?
  - When is disease occurring?
- To form hypotheses about causes and preventive factors
- To identify determinants of disease
  - Hypotheses are tested using epidemiologic studies

- **Say:** Epidemiology is applied to both chronic and communicable diseases and injury. The principles are the same, but the methods differ.

- **Ask:** What is the purpose of epidemiology? How can it help us?

**Question**

- **Ask:** Why do we sometimes say “risk factor” and other times “determinants”? What is the difference?

- **Possible answer:** A *risk factor is something that increases a person's chances of developing a disease; such as age, gender, tobacco use, unhealthy diet. A determinant is a personal, social, economic or environmental factor which determines the health status of a person.*

Epidemiologic Assumptions

- Diseases and other health-related events do not occur at random.
- Diseases and other health-related events usually have causal and preventive factors that can be found.

- **Briefly discuss the slide by asking for volunteers to explain each principle.**

- **Answers may include the following:**
  - *Diseases do not occur randomly throughout a population.*
A disease is more likely to occur in a person who has a genetic disposition, exposure, a behavior, or some other characteristic that increases that person’s risk of disease.

- Disease is more likely to occur in a person who has “risk factors” for the disease than in a person who does not have those risk factors.
- We do not know all of the causes or risk factors for NCDs, but we do know some. Fortunately, some of these factors, such as tobacco smoking (a risk factor for lung cancer) or elevated cholesterol (a risk factor for heart disease) can be avoided or modified or treated to lower the risk of disease.

5 minutes

Slides 27-33

- Explain that coordination between clinical practitioners and epidemiologists is critical.
- Note: When you first show this slide, the “Epidemiology” column will be blank. As you continue from slide 25 – 30, each box under “Epidemiology” will fill in, one row at a time.
- Ask: If the focus of clinical medicine is individuals, what is the focus of epidemiology?
- Continue asking questions about each row of the slide.
- When you discuss these slides, make sure to include these points:
  - Coordination between clinical practitioners and epidemiologists is critical, since for an epidemiologist to compile population data or epidemiological data, individual data or clinical data from the individuals needs to first be obtained from the clinical practitioners.
  - In some cases, clinical medicine and epidemiology can be
seen as a continuum.

- In epidemiologic studies where data is self reported by the participant or ill individual, as in large population surveys, a clinical practitioner may not involved.

2 minutes
Slide 33

**Question**
- Tell participants that you will now discuss two approaches to epidemiology.
- Ask: Can anyone name the approach to epidemiology that deals with the distribution of disease? What about the approach that deals with the determinants of disease?
- Click one at a time and read each approach.
- Briefly mention that typically descriptive studies are done first and then analytic. However, some studies may stop at descriptive and do not go on to analytic.
- Tell participants that you will now briefly discuss each one.

2 minutes
Slide 34

**Descriptive Epidemiology**
- Studies the pattern of health events and their frequency in populations in terms of:
  - Person
  - Place
  - Time
- Purpose:
  - To identify problems for further study
  - To plan, provide, and evaluate health services
• Read the slide.

• Ask for an example of how descriptive epidemiology can be used in their country/region/district.

  o Possible answers: Study the number of new cases of diabetes in the country by race and sex in order to assess groups to target.

• Tell participants that they will learn about types of descriptive studies in another lesson.

2 minutes

Slide 35

Analytic Epidemiology

- Studies the association between risk factors and disease
- Purpose:
  - To determine why disease rates are high (or low) in a particular group

• Read the slide.

• Ask for an example of how analytic epidemiology can be used in participants’ country/region/district.

  o Possible answer: Study of whether smoking 20 or more cigarettes per day increases the relative risk of type 2 diabetes in adults.

• Tell participants that they will learn about types of analytic studies in another lesson.
<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
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</thead>
<tbody>
<tr>
<td>3 minutes Slide 36</td>
<td>Explain that you will now discuss how epidemiology fits into the public health management cycle.</td>
</tr>
<tr>
<td></td>
<td>Ask: What do you think are the components of the public health management cycle?</td>
</tr>
<tr>
<td></td>
<td>Draw answers on flip chart.</td>
</tr>
</tbody>
</table>

**Question**

**Flip Chart**

- Explain that the management of public health occurs in a cycle.
- Point out that even though this slide shows four main roles or responsibilities, there are many tasks leading up to each one, for example, testing interventions prior to implementing them.
- Ask participants to define each role. Add examples, as needed.

**Answers and examples may include:**

- Objectives are determined based on the goal for your
### What To Do/What To Say

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td></td>
<td>public health problem. For example, an objective may be to increase the percentage of individuals who engage in physical activity by 30% over the next two years.</td>
</tr>
<tr>
<td></td>
<td>• Interventions are designed and implemented with this objective in mind. For example, an intervention might be to offer nutritional and physical activity counseling to women. Note that interventions should not be implemented without testing them and knowing efficacy and effectiveness. (Efficacy is how well an intervention works under ideal circumstances, such as in a lab or strict clinical trial; effectiveness is how well an intervention works under normal field conditions.)</td>
</tr>
<tr>
<td></td>
<td>• The intervention is measured in terms of whether it was successful, and if so, by how much? If not, why didn’t it work? In this example, you may measure if the nutritional and physical activity counseling reduced the prevalence of obesity.</td>
</tr>
<tr>
<td></td>
<td>• Programs may need to be revised after they are implemented for a variety of reasons, for example, there may have been insufficient resources to complete a program activity.</td>
</tr>
<tr>
<td></td>
<td>• The cycle begins again with new objectives, interventions, etc.</td>
</tr>
</tbody>
</table>

### Say: Epidemiology influences each part of the public health management cycle.

### Ask: How is epidemiology used to formulate objectives?

### Possible answer: Epidemiologists assess the public’s health by collecting or using existing data and analyzing it. This epidemiologic information is then used to formulate objectives.
### Introduction to NCD Epidemiology

<table>
<thead>
<tr>
<th>Question</th>
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<tbody>
<tr>
<td><strong>Ask:</strong> How is epidemiology used to implement interventions?</td>
<td><strong>Possible answer:</strong> Epidemiology helps distinguish the target population for an intervention. It helps identify who is more likely to benefit from an intervention.</td>
</tr>
<tr>
<td><strong>Ask:</strong> How is epidemiology used to measure impact?</td>
<td><strong>Possible answer:</strong> This can be done through established surveillance systems or through specific studies designed to evaluate the intervention.</td>
</tr>
<tr>
<td><strong>Ask:</strong> How is epidemiology used to revise programs?</td>
<td><strong>Possible answer:</strong> Epidemiologists will interpret the evaluation data and improve the intervention by revising objectives or formulating new objectives, and starting the cycle once again.</td>
</tr>
<tr>
<td></td>
<td><strong>Explain that during this training they will learn how to use epidemiology for each of these roles just described.</strong></td>
</tr>
</tbody>
</table>

1 minute

Slide 39

- **Functions of Epidemiology**

- Explain that you will now discuss some functions of epidemiology and how they influence public health.
Functions of Epidemiology

Public Health Surveillance
Investigation
Data Analysis
Intervention
Evaluation
Communication
Management and Teamwork

- **Ask:** What are some functions of epidemiology? If participants have difficulty answering the question, you may rephrase, for example by asking what is the role of an epidemiologist?

- **Click and read the answers one at a time.**

- **Explain that although these functions are listed in some type of order, some of them occur simultaneously and/or continuously, such as management and teamwork. It also depends upon the stage of the program.**

- **Tell participants that you will next briefly discuss each function and during the rest of the training course you will explain some of these functions in greater detail.**

Public Health Surveillance

- **Ask:** Looking at this slide, who can define surveillance?

- **Solicit responses. The MMWR definition of surveillance is on the following slide.**
### Duration/Slide Number

<table>
<thead>
<tr>
<th>Slide 42</th>
<th>2 minutes</th>
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</table>

### What To Do/What To Say

- **Read the slide.**

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<table>
<thead>
<tr>
<th>Slide 43</th>
<th>2 minutes</th>
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- **Explain that the next core function of epidemiology is conducting investigations, which are often called “field investigations”**.

- **Ask**: How can we use investigations in epidemiology?

- **Ask**: What is an example of an NCD investigation?

- **Possible answers**: *Survey of adults to ask about physical activity during the week and barriers to physical activity; prospective cohort study (e.g., Framingham Study) to document development of or effects of interventions on NCDs and their sequelae; case-control study of risk factors for brain cancer.*
Data Analysis

- Describe the distribution of a health condition or event in a community
- Create a hypothesis about what causes or protects against disease or injury
- Learn about factors thought to be associated with disease
- Assess associations between risk factors and disease, using statistical methods
- Interpret results and disseminate information

? Question

- Explain that data analysis is also important in epidemiology.
- Ask: When would you use data analysis?
- Discuss bullets on the slide.

Intervention

- Explain that epidemiology is important for planning and evaluating interventions.
- Remind participants that epidemiology is used in the design and implementation of interventions by describing patterns of disease. This provides information on who, where, and when to focus interventions.
- Ask participants for examples of interventions for NCDS in their country/region/district.
<table>
<thead>
<tr>
<th>Duration/Slide Number</th>
<th>What To Do/What To Say</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 minutes Slide 46</td>
<td><strong>Evaluation</strong></td>
</tr>
<tr>
<td></td>
<td>- Note: When you first click on the slide there is no graphic.</td>
</tr>
<tr>
<td></td>
<td>- Tell participants that evaluation is another important function of epidemiology.</td>
</tr>
<tr>
<td></td>
<td>- Ask: What are some questions that an evaluation might answer?</td>
</tr>
<tr>
<td></td>
<td>- Read the two types of evaluations and ask participants to define each one. Include these points:</td>
</tr>
<tr>
<td></td>
<td>- A process evaluation assesses the operation of the project. It answers questions such as: Are the supplies delivered on time? Do people have access to the intervention? Were you able to hire and train workers?</td>
</tr>
<tr>
<td></td>
<td>- An outcome evaluation assesses changes in health. It answers questions such as: Are fewer people getting the disease? Are there changes in behavior?</td>
</tr>
<tr>
<td>2 minutes Slide 47</td>
<td><strong>Communication</strong></td>
</tr>
<tr>
<td></td>
<td>- Ask: How would you use communication in epidemiology? To whom would you communicate?</td>
</tr>
</tbody>
</table>
• **Answer:** to communicate findings and policy recommendations to key stakeholders.

2 minutes

Slide 48

![Management and Teamwork Diagram](image)

- Explain that epidemiologists do not work in a vacuum; they are part of a public health team that includes the community.
- Read the slide and discuss how epidemiologists need to work with many different people or stakeholders to ensure that data are accurately collected and analyzed and that recommendations are implemented.
- **Ask:** Are there other groups who work with epidemiologists that are missing on this slide?
- **Possible answers:** lay health workers, community health workers
- **Ask:** What is an example of a collaboration/partnership that helped you succeed in your work?

5 minutes

Slide 49

![Review: Functions of Epidemiology](image)

- Tell participants that you will next review the functions of
### Duration/Slide Number | What To Do/What To Say
--- | ---
?? | epidemiology using an example of a health problem.
**Question** | • Ask participants for a local example of a health problem.
 | • Through questioning, briefly discuss how they would use the core functions of epidemiology to address the problem, for example, obesity:
 | o Conduct surveillance to collect data about the prevalence of obesity.
 | o Perform data analysis to analyze data collected during surveillance.
 | o Develop an intervention to address the problem of obesity, for example, one that addresses physical activity.
 | o Evaluate the intervention to determine if the target population is more physically active or if fewer people are obese.
 | o Communicate the results of the evaluation to stakeholders.
 | o Management and Teamwork: collaborate with public officials, stakeholders, etc. throughout the process to ensure that data are accurately collected and analyzed and that evaluation recommendations are implemented.

10 minutes
Slide 50

**Tip**
• Tell participants that they will now have a fun, review game of what they learned in the lesson.
• Note: Adjust number of questions depending on number of tables and teams. If participants are already at small tables, you may keep them together as a team. Otherwise, divide the class into teams of four or five participants.
• After participants are in their teams, ask each team to
### Duration/Slide Number | What To Do/What To Say
--- | ---
(quickly) give you a team name. Record team names on a flip chart.  
- Tell participants to discuss answers in their teams before providing them out loud. Correct answers will receive two points. You may give one point for partially correct answers.
- Begin by clicking on the following slides, one question at a time.
- To reveal the answers, click on the slide after the question appears (and participants answer the question).
- Record points on flip chart.
- (Optional) Provide a prize to winning team.

---

#### Question

**Review: Questions 1-2**

1. Name at least four types of NCDs
2. Name at least four characteristics of NCDs

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#### Question

**Review: Questions 3-4**

3. What are at least three examples of modifiable risk factors?
4. What are at least three examples of non-modifiable risk factors?
Review: Question 5
5. How do NCDs and communicable diseases differ?

Review: Questions 6-8
6. What questions does the field of epidemiology answer?
7. What are two approaches of epidemiology?
8. What are the four main roles of epidemiology in the Public Health Management Cycle?

Review: Question 9
9. What are the functions of epidemiology?
• Say: Most chronic diseases do not result in sudden death. Rather, they are likely to cause people to become progressively ill and debilitated, especially if their illness is not managed correctly.

• Say: Jonas Justo Kassa suffered from the symptoms of diabetes for many years before seeking help. After he was finally diagnosed with diabetes, the next few years were an immense relief as Jonas underwent medical treatment and changed his dietary and drinking habits. But Jonas didn't stick to his healthier ways for long, eventually resulting in the amputation of both his legs – complications that could have been avoided. Feeling doomed and lonely, Jonas died in his home at the age of 65.

• Say: Death is inevitable, but it does not need to be slow, painful or premature. Chronic disease prevention and control helps people to live longer and healthier lives.
• Tell participants that they will complete an assessment of what they learned during the lesson.

• Tell participants to turn to Slide 15 in their Participant Guide.

• Read the slide.

• Divide participants into small groups or let them remain in the same groups from the Review.

• Provide them with a relevant, local health problem. Tell them to recall how they described the functions of epidemiology in the previous (obesity) example and to do the same with this local health problem.

• Tell participants to think in general terms and not to be too detailed. For example, they do not have to describe a specific intervention they would use to address the health problem.

• Walk around the room and assist groups, if needed.

• After 20 minutes, reconvene the class and ask each group to provide you with their responses.

• Provide constructive feedback to the groups.
1. You will work in small groups to complete the assessment.

2. Identify a local health problem and describe in general terms the functions of epidemiology you would use to address the problem. Record your responses in the space below.

3. Assign a member of your group to record your responses.

4. Spend no more than 20 minutes completing the assessment.

5. Be prepared to share your work with the class.

Stop

Do not start the assignment until your facilitator tells you to begin.