



Government of the Republic Malawi

**Ministry of Health**

**CERTIFICATE IN COMMUNITY HEALTH  
STUDENTS HANDBOOK  
JUNE 2021**

**Part 1: Semester 1: Block 1 Modules**

<b>Academic Year/ Semester</b>	<b>Module Code</b>	<b>Title</b>	<b>Weeks</b>	<b>Total hours</b>
Year 1 Semester 1	CCH111	Introduction to Computers and Language skills	1	30
	CCH112	Introduction to Human Anatomy	1	40
	CCH113	Public Health	1	40
	CCH114	Health promotion and education	2	45
	CCH115	Environmental Health	2	48
	CCH116	Public Health Ethics	1	40

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# MODULE 1: INTRODUCTION TO COMPUTER STUDIES

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## **Module aim**

The aim of this module is to introduce learners to the basic computer skills so that they can familiarize themselves Microsoft packages, using the internet and general knowledge on computer hardware.

## **THE LAYOUT OF THE MODULE**

This module equips the learners with basic knowledge, skills and attitudes to understand information communication technologies tools. These include computers, mobile devices such as smartphones, the internet and operating systems used on these technological devices. This a key competence that essential in their administrative work since they provide a linkage between the community, health center and other key stakeholders. Below is an outline of the units which make up this module as follows:

**UNIT 1:** Introduction to Computers

**UNIT 2:** Microsoft office packages

**UNIT 3:** Technologies in E-health

## **UNIT 12.1: INTRODUCTION TO COMPUTERS**

### **LEARNING OBJECTIVES**

By the end of this unit learners should be able to do the following:

1. Outline the parts of a computer
2. Describe the History of Computers.
3. They should demonstrate the ability to use computers for basic administrative work.

### **12.1.1: INTRODUCTION**

In the 21<sup>st</sup> Century we can clarify it as the computer age, and in our national agenda on health computers and related technologies play a key role achieving the Universal Health Coverage and as such this is paramount for Health Surveillance Assistants to know about computers, their function and be able to utilize them during their operations. In this unit we will look into the history of computers, the parts of the computer, its functions and will include practical work to ensure that the HSAs are able to demonstrate their ability to use computers in their basic administrative functions.

### **12.1.2 DEFINITION**

The term computer is derived from the Latin word compute, which means to calculate. A computer is an electronic machine, devised for performing calculations and controlling operations that can be expressed either in logical or numerical terms. In simple terms, a computer is an electronic device that performs diverse operations with the help of instructions to process the information in order to achieve the desired results. Computer application extends to cover huge area including education, industries, government, medicine, scientific research.

A computer is one of the most influential forces available in modern times. Due to its memory, high speed and perfection, its application can be extended to almost infinite levels.

Millions of complex calculations can be done in mere fraction of time. Difficult decisions can be made with accuracy for comparatively little cost. Computers are widely seen as instruments for future progress and as tools to achieve substantiality by way of improved access to information by means of video conferencing and e-mail. Indeed, computers have left such an impression on modern civilization that we call this era as the information age.

In summary a computer can be defined as follows:

1. Computer is a programmable machine.
2. Computer is a machine that manipulates data according to a list of instructions.
3. Computer is any device which aids humans in performing various kinds of computations or calculations.

### **12.1.3 CHARACTERISTICS OF COMPUTER**

Below are the characteristics of computers that HSAs need to be familiar with:

#### **1. Speed**

Computers are capable of carrying out the task with enormous speed. Today's computers, according to their class, can perform from 4 MIPS (Millions of instructions per second) to 100

MIPS. What may take days for manual calculations may take only a few hours for computers to perform. Inside the computer the information signal travels at incredible electronic speed.

## **2. Storage**

Computers can store enormous quantity of information. Which is expressed in terms of Kilobytes (or) Mega Bytes (MB) or Giga Bytes (GB) or Terabyte (TB). It is achieved through its main memory or primary storage' and through auxiliary storage or secondary storage. The hard drivers flash disks, compact disc (CD) and magnetic tape storage are examples of secondary storages.

These large volumes of storage occupy much lesser space compared to paper documents and this aspect of computers makes them more powerful.

## **3. Accuracy**

The accuracy of a Computer is consistently high. In fact, this quality of the computers makes them indispensable in various fields such as Scientific Research, Space Research, Weather Predictions and many other areas where precision of a high order is required. The accuracy of the computer is best achieved by programming them in the most efficient manner. When it comes to very complex mathematical or scientific problem the computer's accuracy has no substitute.

## **4. Versatility**

Computers are versatile in that they can perform almost any task, provided they are given the appropriate logical steps. For example, they are capable of performing wide ranging tasks such as construction of a payroll, inventory management in a factory, hotel billing, hospital management, banking applications and any imaginable task in every walk of life.

## **5. Automation**

The biggest advantage of computers is that it is automatic in its operation. Once a programming logic is initiated the computer performs repeated operations without human interventions until program completion.

## **6. Diligence**

Computers are machines and that do not get tired or 'lose concentration' like human beings. If a large number of calculations say million calculations are to be performed the resultant output will remain exactly the same even if operations are repeated any number of times. But when a human being is asked to do the same job this consistency cannot be achieved.

## **7. Reliability**

The computers give very accurate results with predetermined values. They correct and modify the parameters automatically, giving suitable signals. They give formatted results with high degree of precisions.

## HISTORY OF COMPUTERS

In the early days of mankind, man used to count the head of cattle by putting lines on trees. Slowly these lines changed to numbers. To do calculation on numbers he started inventing machines. These human computers were typically engaged in the calculation of a mathematical expression. The calculations of this period were specialized and expensive, requiring years of training in mathematics.

The first use of the word "computer" was recorded in 1613, referring to a person who carried out calculations, or computations, and the word continued to be used in that sense until the middle of the 20th century.

Below are the various stages in history of computers as follows:

### 1. Tally Sticks

A tally stick was an ancient memory aid device to record and document numbers, quantities, or even messages.

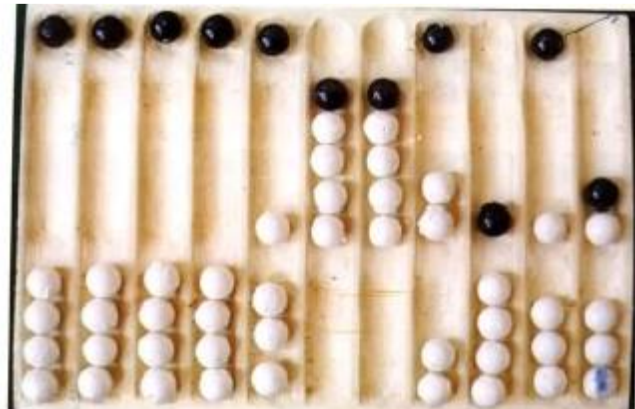
### Tally sticks

### 2. Abacus

An abacus is a mechanical device used to aid an individual in performing mathematical calculations. The abacus was invented in Babylonia in 2400 B.C. The abacus in the form we are most familiar with was first used in China in around 500 B.C. It used to perform basic arithmetic operations.



**Modern Abacus**



**Early Abacus**

### **3. Napier Bones**

Invented by John Napier in 1614. Allowed the operator to multiply, divide and calculate square and cube roots by moving the rods around and placing them in specially constructed boards.

### **4. Slide Rule**

Invented by William Oughtred in 1622. Is based on Napier's ideas about logarithms. Used primarily for the following: Multiplication, division, roots, logarithms, trigonometry. Not normally used for addition or subtraction.

### **5. First portable computer**

Osborne 1 – the first portable computer. Released in 1981 by the Osborne Computer Corporation.



There have been five generations of computers and they are as follows:

1. First generation – 1946 - 1958
2. Second generation – 1959 - 1964
3. Third generation – 1965 - 1970
4. Fourth generation – 1971 - today
5. Fifth generation – Today to future

## **THE COMPUTER SYSTEM**

A computer system is a combination of various components. It performs the system functions such as input, processing, output, storage and control. A computer system consists of the following components:

### **1. Hardware**

The physical components of the computer, such as electrical, electronic and mechanical unit are known as the hardware of the computer. That is, the input units, output units and CPU are called hardware. Thus, hardware is the equipment involved in the function of a computer. It consists of the components that can be physically handled. The function of these components is typically divided into three main categories: input, output, and storage. Components in these categories connect to microprocessors, output and storage. Components in these categories



connect to microprocessors, specifically, the computer's central processing unit (CPU), the electronic circuitry that provides the computational ability and control of the computer, via wires or circuitry called a bus.

## **2. Software**

The computer performs operations like addition, subtraction, multiplication and division only when the user instructs it to do so. The user issues instructions and the CPU acts in accordance with the instructions. The sets of instructions, which control the sequence of operations, are known as programs, and collectively programs are called software. The software can be broadly classified into two types. They are:

- System Software
- Application software

## **3. Human ware**

The man-machine interface is called a human ware. The people who work with the computer are collectively called the human ware or livewire.

## **4. Firmware**

The computer programs permanently stored in ROM or PROM are called firmware. These programs are provided by hardware manufacturer along with the computers. Generally these are booting programs which help in the starting of a computer. Such programs cannot be erased or overwritten.

## **5. Bridge ware**

The computer components and programs used to translate instructions and information written for one type of computer into a format that another type of computer can understand is called bridge ware. This is necessary because different computers are made by different manufacturers.

## **DATA PROCESSING**

Health Surveillance Assistants will mostly use computers for data collection so it is important for them to understand how this process is achieved using the computers.

## **DEFINITION OF DATA**

Data means any collection of raw hand figures facts. Data can be considered as the raw material of information. The data may be numerical such as payroll, employee Number, or non-numerical like Student names, Product names.

## DATA PROCESSING

As data is in its raw form it cannot solve any problem. The data needs some processing to make it useful. Data processing is the conversion of data into a more useful form. That is, transmission of data into meaningful information is called data processing.

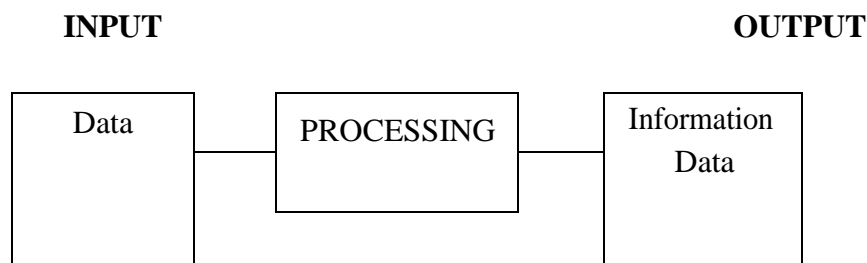
## INFORMATION

The result obtained by data processing is called information. That is, the processed data is known as information. However, information produced in one data processing step may be used as data in the next data processing step.

DATA VS INFORMATION	
DATA	INFORMATION
Raw records	Completed ones
Unordered	Ordered
Unrefined data	Refined data
What prevails	What is necessary

## DATA PROCESSING CYCLE

Data Processing is viewed as a system that accepts data as input, processes it into information as output. This can be explained with the help of the following diagram.



## **TYPES OF DATA PROCESSING**

Below are the following types of data processing:

1. **Manual Data Processing:** Data is processed without the help of mechanical devices. Here the data is processed using manual things such as abacus, slide rule, Napier bones.
2. **Mechanical Data Processing:** In Mechanical Data Processing, mechanical devices like calculators, tabulators, etc., are used for processing.
3. **Electronic Data Processing:** In Electronic Data Processing, the data is processed by either analog or digital computer.

## **OBJECTIVES OF DATA PROCESSING**

HSAs need to understand that after the industrial revolution, the needs of the mankind increased. Man had to deal with large volume of data. He had to cope up with more and more information. The information collected is to be sorted out, stored and retrieved at short intervals. This necessitated the concept of data processing. As the complexities of business increased, the number of functions to be performed also increased. The data processing system must be responsible to supply the information when it is needed, so as to make the performance of the organization optimum.

Here is a list of the objectives of data processing:

1. Handle huge volume of Data
2. Qualitative and quantitative information
3. Proper and timely Information
4. Storage and retrieval of data
5. Helps in decision making.
6. Improves productivity
7. Maintaining performance at optimum level
8. Efficient office management

## **COMPONENTS OF A COMPUTER**

There are three main components of a computer which are described as follows:

1. Input
2. Output
3. Storage

### **INPUT**

The input unit is used for entering the data and instruction into the computer for performing computation of the data. The input unit accepts or reads the list of instructions and data and converts these instructions and data in computer acceptable form. It supplies the

converted instructions and data to the computer for further processing. The devices used for this purpose are called as input devices. Key Board and Mouse are the important input devices used in our offices. Light pen, Joy stick, tracker ball, Touch pad, Scanner and Pointing stick are some of the input devices.

## **OUTPUT**

The results of the data processed by the computer are available in electronic signals. The output unit converts these signals into a form which could be easily understood by us. The output is usually given either on the screen by visual display unit/monitor or in a printed form by printers.

## **STORAGE**

The purpose of the storage unit of the computer is to store the data entered before processing and also to store the results after processing. The Central Processing Unit [CPU] is the brain of any computer system. In a computer system all major calculations and comparisons are made inside the CPU. The CPU is also responsible for activating and controlling the operations of other units of a computer system.

There are two types of storage namely:

- a. **Primary storage:** usually referred to as Random Access Memory [RAM] because it is possible to randomly select and use any location of this memory to directly store and retrieve data and instructions. It is also referred to as read/write memory because information can be 'read' from a RAM chip also be 'written' into it. The Random Access Memory requires some times for accessing data and is considered to be the fastest memory. Each bit in a RAM stores information by means of electric charge, where the presence of an electric charge indicates '1' and the absence of an '0'.

RAM is called Temporary storage, because data persists until the machine is on.

A Read Only Memory [ROM] is one in which information is permanently stored. The information from the memory can only be read and it is not possible to write fresh information into it. This is the reason why it is called ROM. When the power supply is switched off, the information stored inside ROM is not lost as it is in the case of a RAM chip. ROMs are mainly used by computer manufacturers for storing the micro programs so that they cannot be modified by the users.

- b. **Secondary storage:** This section of the memory is also referred to as backup storage because it is used to store large volume of data on a permanent basis which can be partially transferred to the primary storage as and when required for processing. The storage capacity of the primary storage of today's computers is not sufficient to store the large volume of time handled by most data processing centers. As a result, additional memory, called auxiliary memory or secondary storage, is used with most computer systems. Hard disk, flash disks, tape, mobile phones and compact disc are the main secondary storage devices.

## **UNIT12.2: MICROSOFT PACKAGES**

### **LEARNING OBJECTIVES**

By the end of this unit learners should be able do the following:

1. Identify the Microsoft office packages.
  2. Illustrate the basic operations of the Microsoft office packages.
  3. Demonstrate the ability to create, edit and save files.
  4. Demonstrate the ability to perform basic functions of file management
- 

#### **12.2.1 INTRODUCTION**

In today's world Computers are key to the daily operations at various sectors of society. In this unit we will share more on Microsoft packages. This is so because they are a key operating system in computers on organization level for administrative purposes. This unit will be a very practical one to Health Surveillance Assistants and will include a lot of demonstrations.

It is very important to understand that Microsoft office packages are very helpful tool widely used in home, office, Industries and schools, to organize, manage and present information, data and figures. used in most administrative positions regardless of industry can make you more productive and confident equipping our Health Surveillance Assistants.

#### **12.2.2 WHAT IS MICROSOFT OFFICE**

Microsoft Office is a set of products developed by Microsoft Corporation. Microsoft Office includes the following packages Microsoft Word, Excel, Power point, Access, Publisher and Outlook. Each program serves a different purpose and is compatible with other programs included in the package.

##### **12.2.1.1 MICROSOFT WORD**

Microsoft Word is a word processor application software. A word processor is a computer application used for the production of potentially printable material.

##### **OPERATIONS OF MICROSOFT WORD**

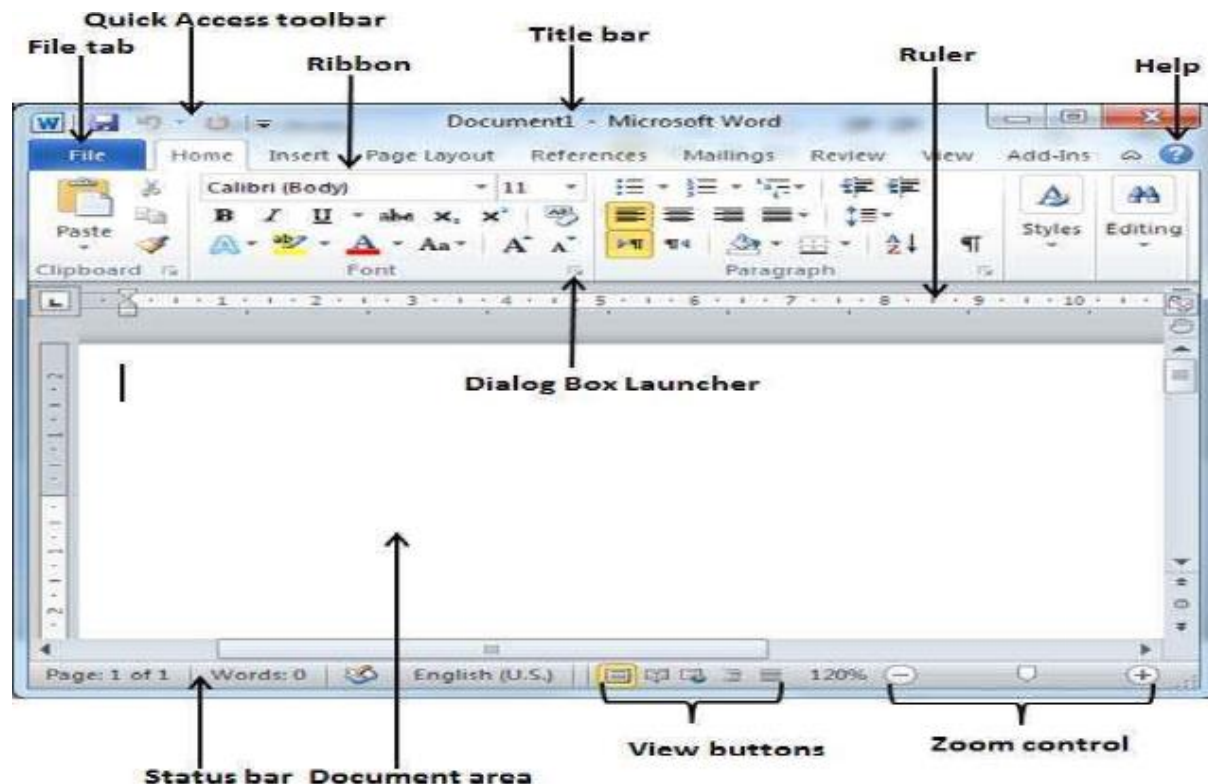
Here is a list of Microsoft Word operations and they are as follows:

1. This package can create business documents having various graphics including pictures, charts, and diagrams.



2. It can store and reuse readymade content and formatted elements such as cover pages and sidebars.
3. It can create letters and letterheads for personal and business purpose.
4. It can design different documents such as resumes or invitation cards etc.
5. It can create a range of correspondence from a simple office memo to legal copies and reference documents.

## FEATURES OF MICROSOFT WORD



**FILE TAB:** This gives you access and options on how you can manage your files.

**TITLE BAR:** This shows the title of which the document is saved in.

**RULER:** The ruler is both vertical and horizontal are used to adjust or align the various elements in your document.

**VIEW BUTTONS:** This assists in the navigation across and along the document.

**ZOOM CONTROL:** This option provides the zoom in and zoom out option.

**DOCUMENT AREA:** This is the area in which you will write your document.

**HELP:** Assists the user in responding in providing guidance where they are facing problems.

## 12.2.1.2 MICROSOFT EXCEL

Microsoft Excel is a Spread Sheet developed by Microsoft Application software. Spread Sheet is an electronic document in which data is arranged in the rows and columns of a grid used for calculations.



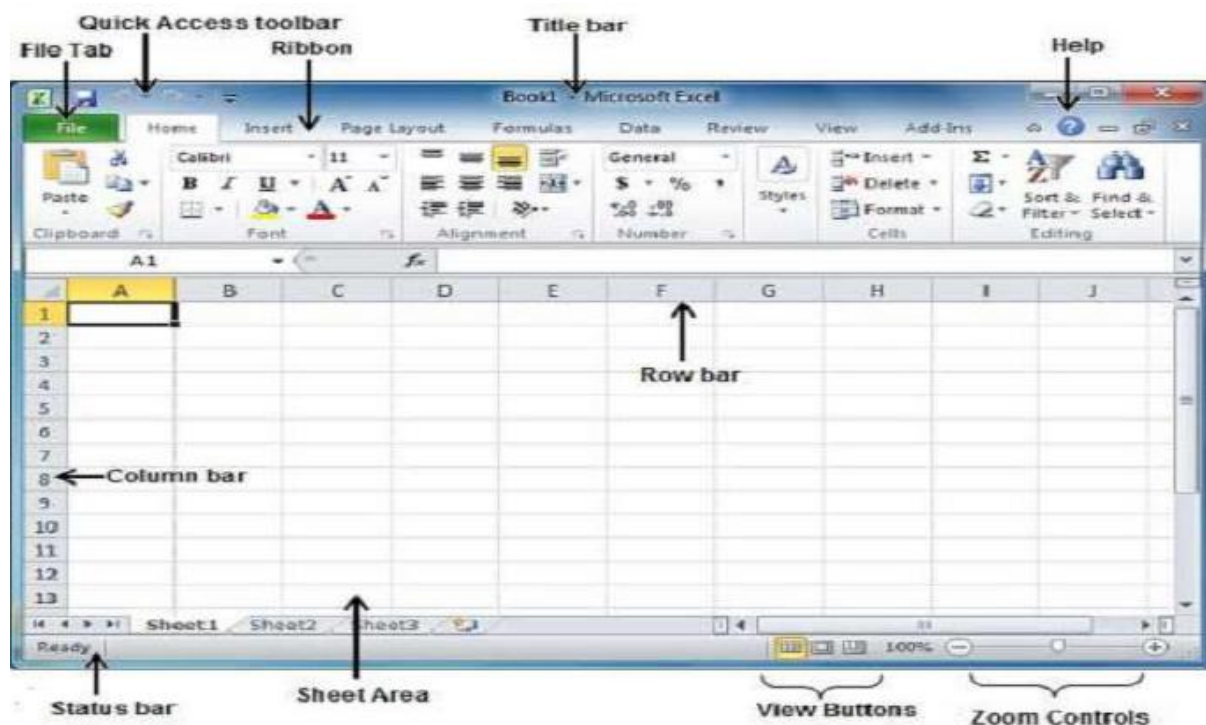
It is an interactive computer application for organization, analysis and storage of data in tabular form.

### OPERATIONS OF MICROSOFT EXCEL

Below are the various specific operations of Microsoft Excel and there are as follows:

1. They provide basic fundamental mathematical calculation.
2. It creates graphs and charts.
3. Assists with sales data and analysis.
4. Assists with financial data and analysis.

### FEATURES OF MICROSOFT EXCEL



**FILE TAB:** This gives you access and options on how you can manage your files.

**TITLE BAR:** This shows the title of which the document is saved in.

**RULER:** The ruler is both vertical and horizontal are used to adjust or align the various elements in your document.



**VIEW BUTTONS:** This assists in the navigation across and along the document.

**ZOOM CONTROL:** This option provides the zoom in and zoom out option.

**SHEET AREA:** This is the area in which you will write your document.

**HELP:** Assists the user in responding in providing guidance where they are facing problems.

### 12.2.1.3 MICROSOFT POWERPOINT

Microsoft PowerPoint is a presentation program developed by Microsoft. PowerPoint is an application software. Presentation is a process of presenting a topic to audience. This includes lectures, speeches, demonstration.

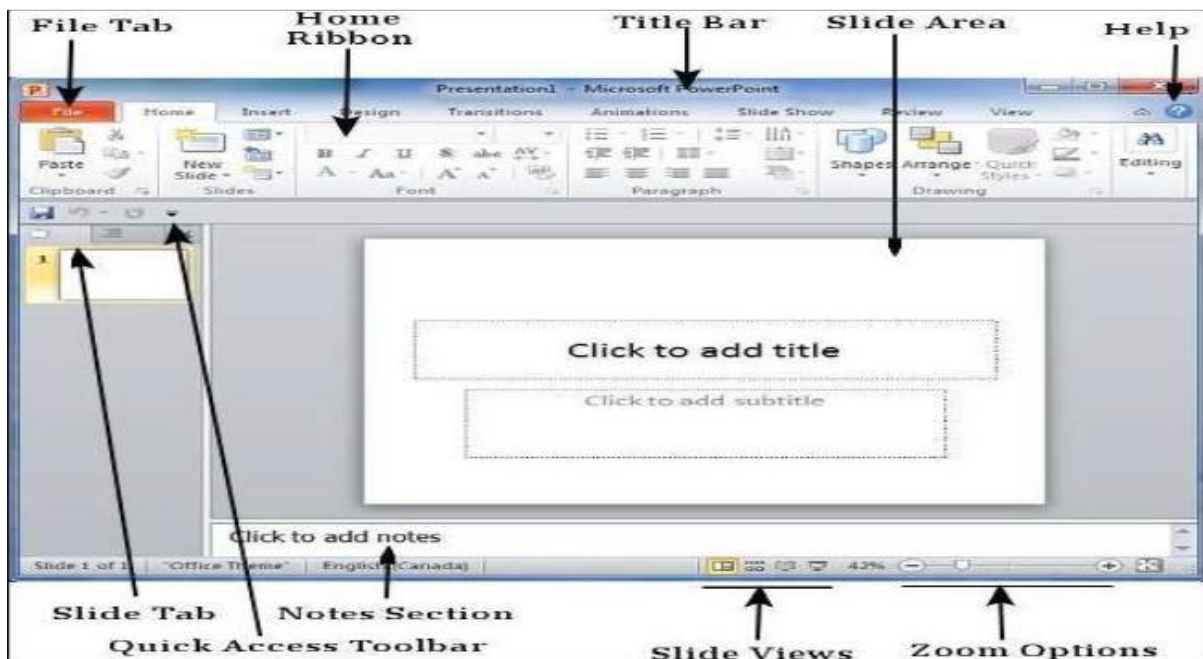


### OPERATIONS OF MICROSOFT POWERPOINT

Below are some of the specific operations of Microsoft powerpoint:

1. This can be used to create animations.
2. Can be used for photo slide show.
3. This is used to create and share personal promotional videos.
4. This can be used for project presentation for Health Surveillance Assistants.

### FEATURES OF MICROSOFT POWERPOINT



**SLIDE TAB:** This gives you access and options on how you can manage your files.

**QUICK ACCESS TOOLBAR:** Assists you in accessing the document.

**NOTES SECTION:** This is the place where the notes of the slides are displayed.

**TITLE BAR:** This shows the title of which the document is saved in.

**RULER:** The ruler is both vertical and horizontal are used to adjust or align the various elements in your document.

**VIEW BUTTONS:** This assists in the navigation across and along the document.

**ZOOM CONTROL:** This option provides the zoom in and zoom out option.

**SLIDE AREA:** This is the area in which you will write your document.

**HELP:** Assists the user in responding in providing guidance where they are facing problems.

## **UNIT 12.3: TECHNOLOGIES IN E-HEALTH**

### **LEARNING OBJECTIVES**

By the end of this unit the learners should be able to do the following:

1. List the different communications technologies being used in the health sector.
2. Describe the various communications technologies.
3. Understand the policies supporting these strategies.

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### **13.3.1 INTRODUCTION**

Health Surveillance Assistants are the key players in the at community health level. Malawi's health system is organized at four levels namely: community, primary, secondary and tertiary. These different levels are linked to each other through an established referral system. Community, Primary and Secondary level care falls under district councils. The District Health Officer (DHO) is the head of the district health care system and reports to the District Commissioner (DC) who is the Controlling Officer of public institutions at district level. At community level, health services are provided by health surveillance assistants (HSAs), health posts, dispensaries, village clinics, and maternity clinics.

The prioritization of digital health service delivery is not isolated to Malawi. The United National Sustainable Development Goal #9 provides a clear focus on technology to promote good health and well-being. This SDG goal is preceded by a number of World Health Assembly (WHA) resolutions which provided initial encouragement to countries to develop digital health strategies and increased focus on national standards, strategies and Internet for health. These WHA resolutions are an attempt by WHO to encourage member states to integrate innovation in the delivery of health services.

Key global trends and experiences have also influenced the development of this strategy. Advances in information technology and computer sciences have predisposed emerging trends including the principles for digital development in Health; paradigm shift of health services model; population health, big data and artificial Intelligence; telehealth/telemedicine; mobility and Internet of Things (IoT)-based devices; health systems interoperability; renewable and hybrid energy sources; E-Learning; privacy and confidentiality. This strategy has integrated these emerging areas in the action plan.

## TYPES OF E-HEALTH TECHNOLOGIES

Here are the types of technologies that are currently in use that HSAs need to be aware of for more refer to the Digital Health Strategy:

1. **Digital Health:** This is the use of ICT and computer enabled medical devices in health service delivery.
2. **mHealth:** This is the delivery of health services using ICTs available on mobile digital devices.
3. **Big Data:** This refers to the collection, processing, analysis and use of large data sets in sizes of more than one Terabyte.
4. **Telehealth:** This includes provision of remote clinical services (telemedicine) and other additional non-clinical services such as provider training, administrative meetings, continuing medical education, Surveillance, health promotion, public health functions etc.
5. **Telemedicine:** This is a component of telehealth and includes remote delivery of healthcare services, such as health assessments or consultations, over the telecommunications infrastructure. Telemedicine focuses only on clinical health services.
6. **Internet of Things (IoT):** This is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction

# MODULE 2: INTRODUCTION TO HUMAN ANATOMY

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## INTRODUCTION TO HUMAN ANATOMY

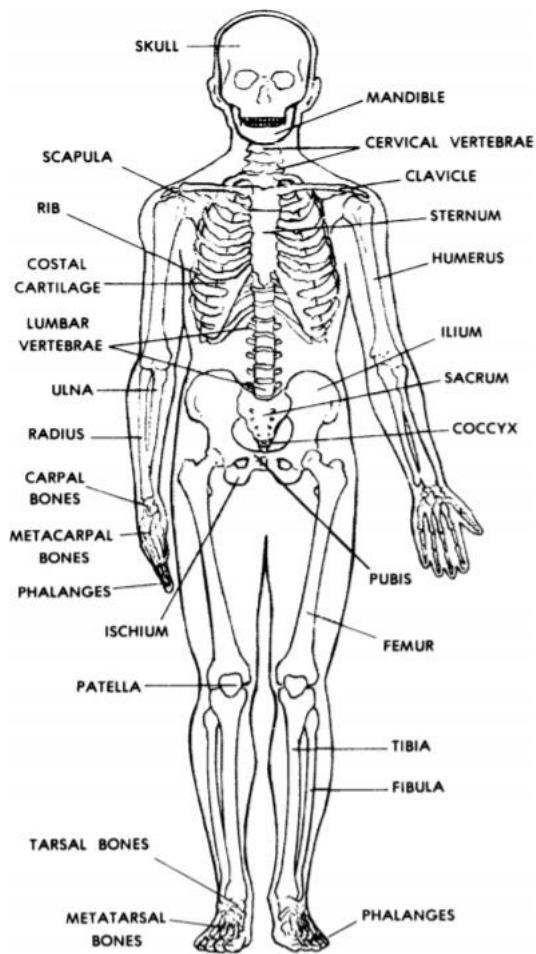
### Module aim

The module will equip learners with basic biological science knowledge that is foundational to the study of disease control and prevention. They will familiarize themselves with necessary anatomical landmarks and terminology and understand the basic functions of body systems such as respiratory, circulatory, renal and gastrointestinal system.

### 1. ORGANIZATION OF THE HUMAN BODY

The human body is organized into cells, tissues, organs and organ systems.

- **Cells** are the smallest living unit of body construction.
- **A tissue** is a grouping of like cells working together. Examples are muscle tissue and nervous tissue.
- **An organ** is a structure composed of several different tissues performing a particular function. Examples include the lungs and the heart.
- **Organ systems** are groups of organs which together perform an overall function. Examples are the respiratory system and the digestive system. The total organism is the individual human being. You are a total organism.



## Types of tissue

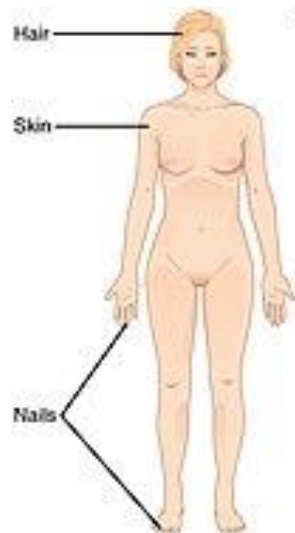
There are several major types of tissues. The most common types are epithelial, connective (e.g. bone, ligaments, tendons), muscle, and nervous tissues

**Ligaments.** Primarily, ligaments hold bones together. Ligaments also may help restrain motion in certain directions and stabilize the articulation.

**Muscles.** Skeletal muscles apply the forces to produce a given motion

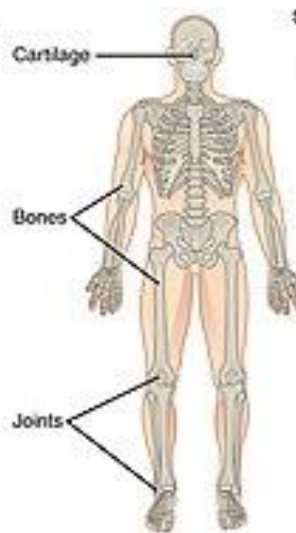
## Skeletal system

Besides bones, the skeletal system includes cartilage and ligaments. The skeleton is traditionally divided into two major parts: the **axial skeleton**, which includes the skull, spine, and rib cage; and the **appendicular skeleton**, which includes the appendages and the girdles that attach them to the axial skeleton.



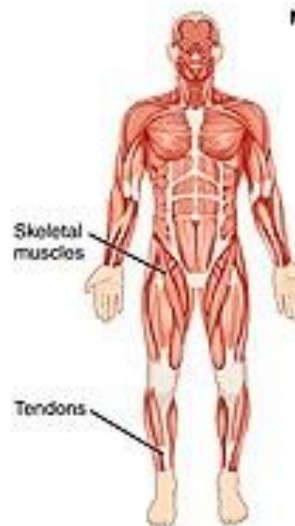
### Integumentary System

- Encloses internal body structures
- Site of many sensory receptors



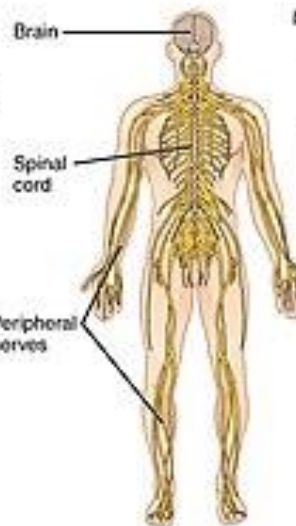
### Skeletal System

- Supports the body
- Enables movement (with muscular system)



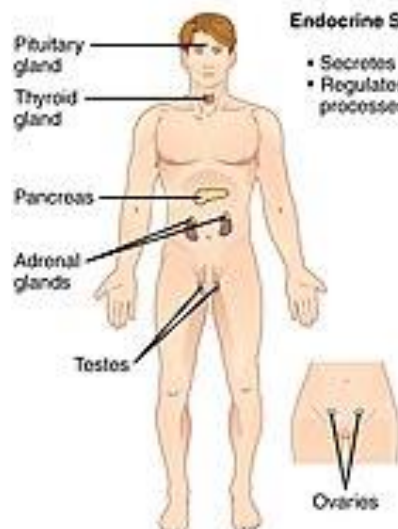
### Muscular System

- Enables movement (with skeletal system)
- Helps maintain body temperature



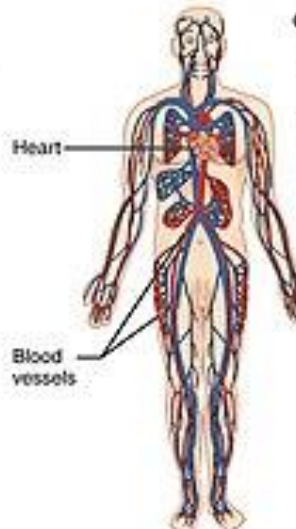
### Nervous System

- Detects and processes sensory information
- Activates bodily responses



### Endocrine System

- Secretes hormones
- Regulates bodily processes

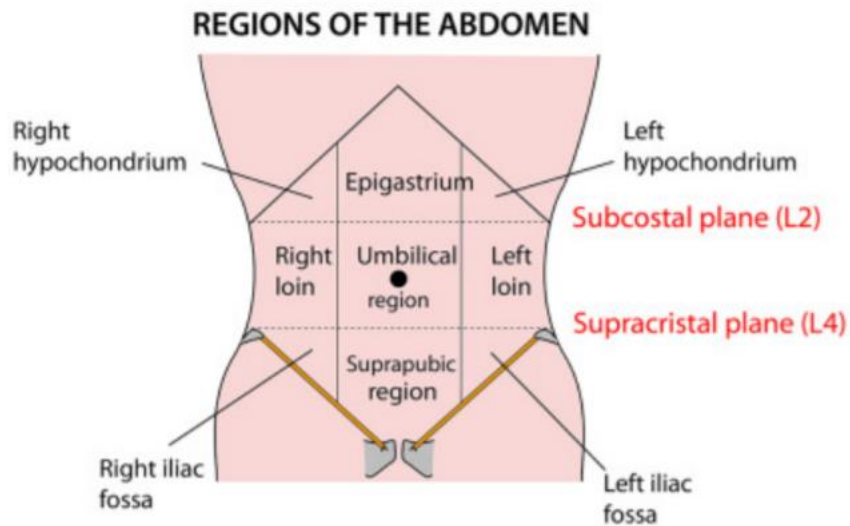


### Cardiovascular System

- Delivers oxygen and nutrients to tissues
- Equalizes temperature in the body

## 2. Gastrointestinal system structure and function review

### SURFACE ANATOMY OF ABDOMINAL WALL



#### 2.1 Function of GI system:

- Ingestion (via mouth)
- Mechanical breakdown
- Chemical Digestion
- Absorption
- Excretion/Defecation

#### 2.2 Digestion Phases:

##### 2.2.1 Mechanical Digestion:

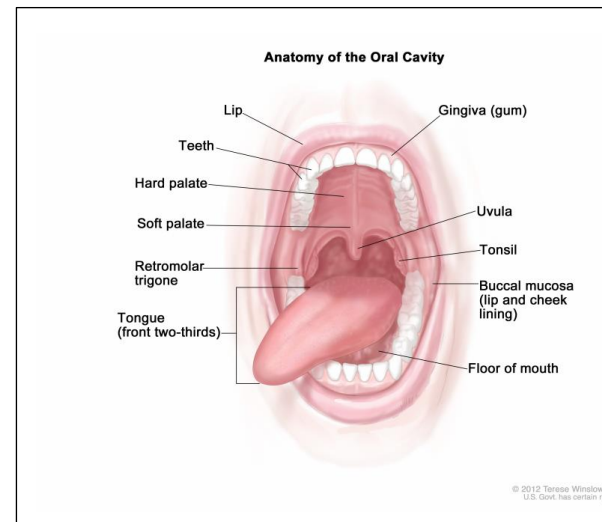
- Chewing
- Stomach

##### 2.2.2 Chemical Digestion:

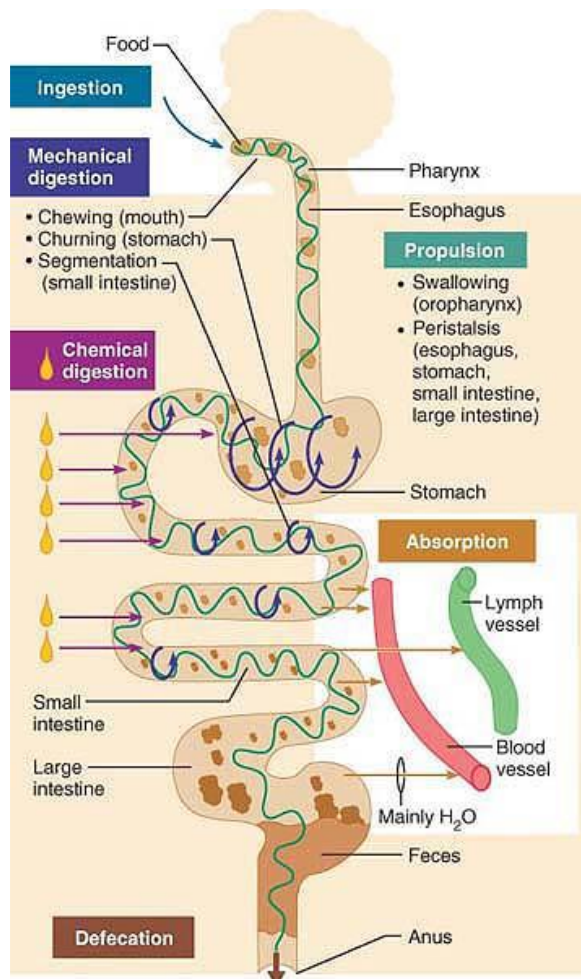
- This is done by enzymes

##### 2.2.3 Intestinal Absorption:

- Fluid + Nutrients are absorbed into blood Vessels
- Fluid + Fats are absorbed into Lymph Vessel







c). Exocrine pancreas, gallbladder: digestion

#### 2.2.4 Small Intestine:

- Duodenum;** C-shaped
- Jejunum;** High surface area (plicae, villi & microvilli) -Nutrient Absorption.
- Ileum;** Lower surface area (fewer plicae, villi & microvilli) -Fluid Absorption
- Ileo-cecal Junction/Valve:** empties into Cecum of large intestine.

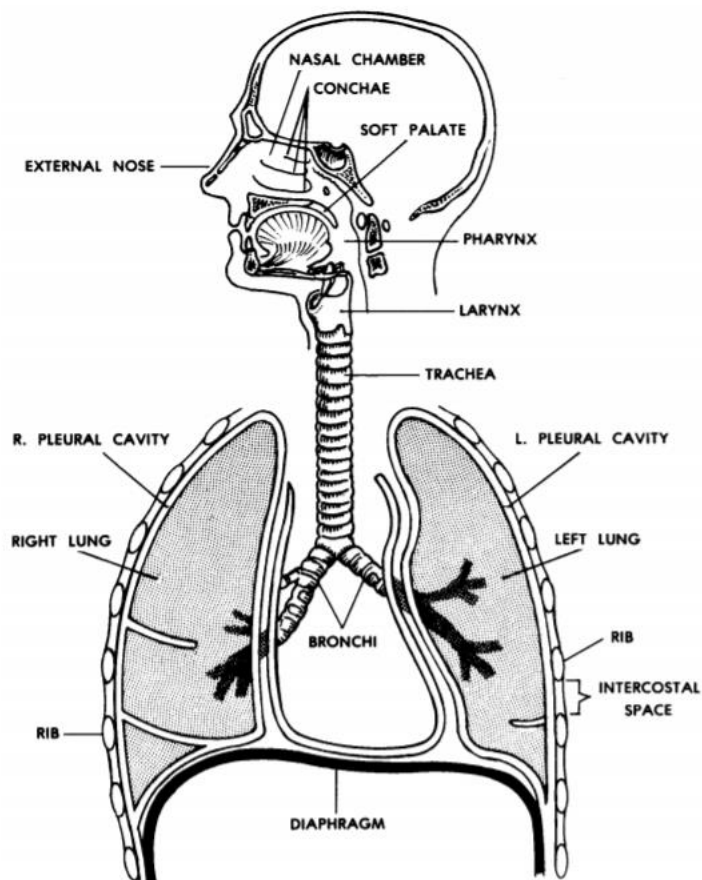
#### 2.2.5 Large intestine and anus:

- Absorbs H<sub>2</sub>O from indigestible food
- Temporarily stores waste
- Eliminates semi-solid faeces

### 3. Respiratory system

Respiration is the exchange of gases between the atmosphere and the cells of the body. It is a physiological process. There are two types of respiration--external and internal. External respiration is the exchange of gases between the air in the lungs and blood. Internal respiration is the exchange of gases between the blood and the individual cells of the body.

Breathing is the process that moves air into and out of the lungs. It is a mechanical process. There are two types of breathing in humans—costal (thoracic) and diaphragmatic (abdominal). In costal breathing, the major structure causing the movement of the air is the rib cage. In diaphragmatic breathing, interaction between the diaphragm and the abdominal wall causes the air to move into and out of the lungs

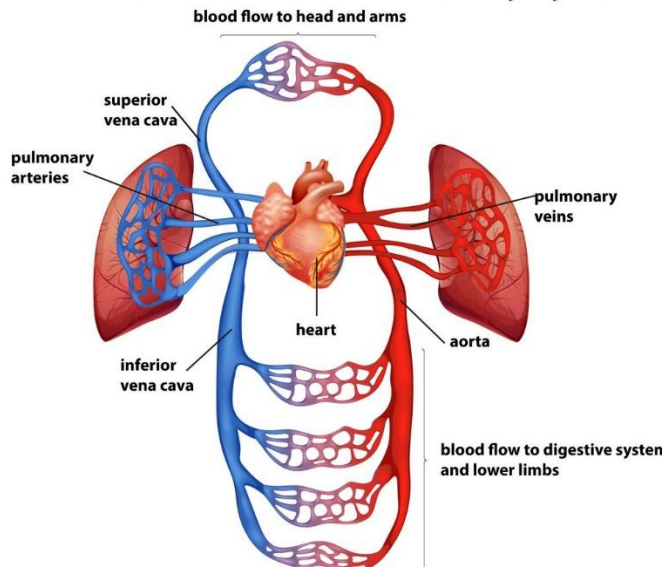


#### 4. CIRCULATORY SYSTEMS IN THE HUMAN BODY

- The cardiovascular system is the circulatory system involving the heart and blood vessels.
- The lymphatic system is a drainage-type circulatory system involved with the clear fluid known as lymph.
- There are other minor circulatory systems in the human body, such as the one involved with cerebrospinal fluid.

## 4.1 THE HUMAN CARDIOVASCULAR SYSTEM GENERAL

### Blood Flow in Human Circulatory System



The human cardiovascular system is a collection of interacting structures designed to supply oxygen and nutrients to living cells and to remove carbon dioxide and other wastes.

Its major components are the:

- Blood. Blood is the vehicle for oxygen, nutrients, and wastes.
- Blood Vessels. Blood vessels are the conduits, or channels, through which the blood is moved.
- Heart. The heart is the pump which provides the primary motive force.
- Capillaries. The capillaries, minute (very small) vessels, provide exchange areas. For example, in the capillaries of the lungs, oxygen is added and carbon dioxide is removed from the blood.

### 4.2 BLOOD

Blood is the vehicle for the human cardiovascular system. Its major subdivisions are the plasma, a fluid containing proteins, and the formed elements, including red blood cells, white blood cells, and platelets.

#### A. Plasma.

- a. Plasma makes up about 55 percent of the total blood volume. It is mainly composed of water. A variety of materials are dissolved in plasma. Among the most important of these are proteins.
- b. After the blood clots, the clear fluid remaining is called serum. Serum does not contain the proteins used for clotting. Otherwise, it is very similar to plasma.

#### B. Formed Elements.

- a. The formed elements make up about 45 percent of the total blood volume. The formed elements are cellular in nature. While the red blood cells (RBCs) and white blood cells (WBCs) are cells, the platelets are only fragments of cells.

- b. Red blood cells (erythrocytes). RBCs are biconcave discs. That is, they are shaped something like an inner tube from an automobile tire, but with a thin middle portion instead of a hole.
- c. White blood cells (leukocytes). There are various types of WBCs, but the most common are neutrophils and lymphocytes. Neutrophils phagocytize (swallow up) foreign particles and organisms and digest them. Lymphocytes produce antibodies and serve other functions in immunity.
- d. Platelets are about half the size of erythrocytes. They are fragments of cells. Since they are fragile, they last only about three to five days. Their main function is to aid in clotting by clumping together and by releasing chemical factors related to clotting. There are 150,000 - 350,000 platelets in a cubic millimeter of normal blood.

#### 4.2.1 General Functions of the Blood.

- Blood serves as a vehicle for oxygen, nutrients, carbon dioxide and other wastes, hormones, antibodies, heat, etc.
- Blood aids in temperature control. Beneath the skin, there is a network of vessels that functions much like a radiator. To avoid accumulation of excess heat in the body, the flow of blood to these vessels can be increased greatly.
- The blood aids in protecting our bodies by providing immunity. Some WBCs phagocytize (swallow up) foreign particles and microorganisms. Other WBCs produce antibodies. The blood transports antibodies throughout the body.
- Blood clotting is another function of blood. Not only does this prevent continued blood loss, it also helps prevent invasion of the body by microorganisms and viruses by sealing the wound opening.

### 4.3 BLOOD VESSELS

The blood is conducted or carried through the body by tubular structures known as blood vessels. Types of blood vessels include arteries, veins and capillaries.

Arteries and veins are largest where they are closest to the heart. Away from the heart, they branch into smaller and smaller and more numerous vessels. The branching continues until the smallest arteries (arterioles) empty into the capillaries. The capillaries in turn are drained by the venules of the venous system.

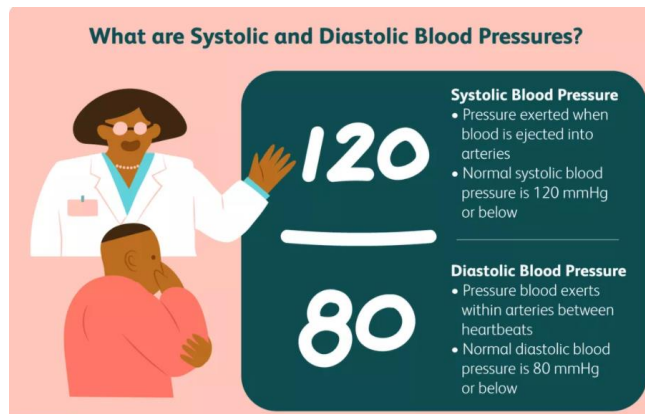
## 4.4 HEART

Through the action of its very muscular walls, the heart produces the primary motive force to drive the blood through the arterial system. In humans, the heart is located just above the diaphragm, in the middle of the thorax, and extending slightly to the left. It is said that the heart of an average individual is about the size of that individual's clenched fist.



### Clinical Correlation

High blood pressure (also referred to as HBP, or hypertension) is when your blood pressure, the force of blood flowing through your blood vessels, is consistently too high.



- Normal: Less than 120/80 mm Hg;
- Elevated: Systolic between 120-129 *and* diastolic less than 80;
- Stage 1: Systolic between 130-139 *or* diastolic between 80-89;
- Stage 2: Systolic at least 140 *or* diastolic at least 90 mm Hg;

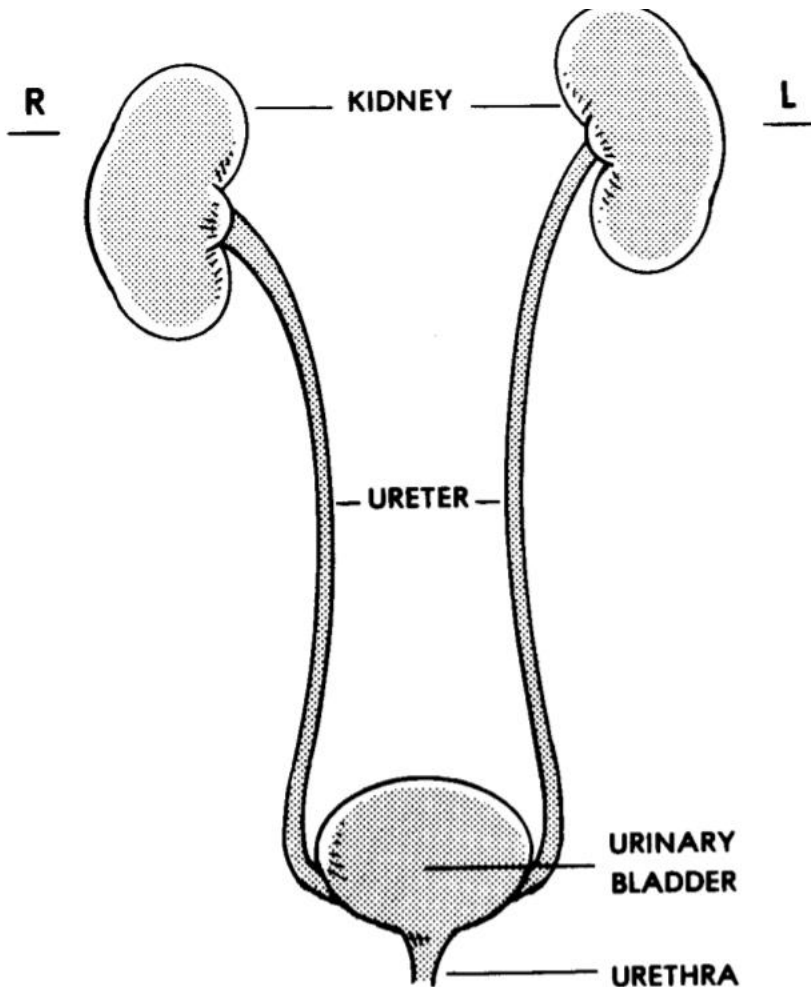
## 5. UROGENITAL SYSTEM

The human urogenital systems are made up of the urinary organs, which produce the fluid called urine, and the genital, or reproductive, organs of male and female humans, which together can produce a new human being.

### 5.1 INTRODUCTION TO THE HUMAN URINARY SYSTEM.

Proteins are one of the basic foodstuffs that humans consume. When proteins are used by the body, there are residue or waste products which can be poisonous (toxic) if allowed to accumulate in large amounts. The urinary system of the human body is specialized to remove these nitrogenous waste products from the circulating blood.

**Major Parts** - See figure below for the major parts of the human urinary system. This system includes two kidneys, two ureters (one connecting each kidney to the urinary bladder), the urinary bladder, and the urethra.



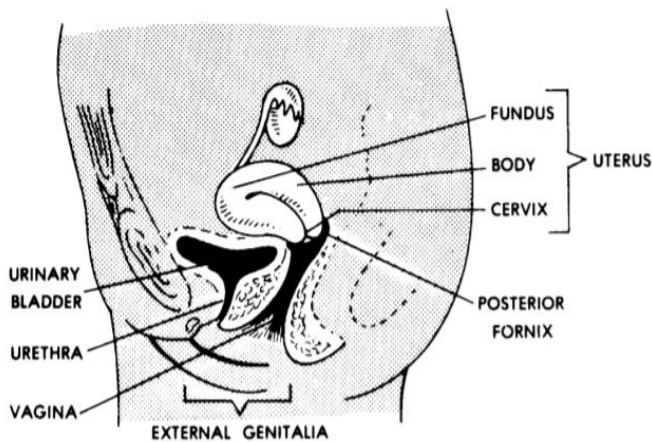
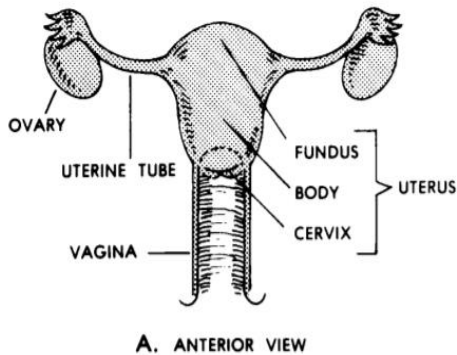
The **kidney** is the organ where urine formation occurs, in the smallest part called the nephron.

The **ureters** are tubes which connect the kidneys to the urinary bladder.

The **urinary bladder** is a muscular organ for storing the urine.

The **urethra** is a tube which conducts the urine from the urinary bladder to the outside of the body.

## 6. FEMALE REPRODUCTIVE ORGAN SYSTEM



The main structures of the female and male reproductive systems

### Female Reproductive System

The female reproductive organs or genitalia are divided into external and internal organs

#### • External Genitalia

The external genitalia are known collectively as the vulva and consist of;

#### • Labia majora

These are two large folds which form the boundary of the vulva. At puberty hair grows on the mons pubis and on the lateral surfaces of the labia majora

#### • Labia minora

These are two smaller folds of the skin between the labia majora, containing numerous sebaceous glands

#### • Clitoris

The clitoris corresponds to the penis in the male and contains sensory nerve endings and erectile tissue but has no reproductive significance

#### • Hymen

The hymen is the thin layer of mucous membrane which partially occludes the opening of the vagina. It is normally incomplete to allow for passage of menstrual flow

#### • Vestibular Glands

These are situated one on each side near the vaginal opening. They secrete mucus that keeps the vulva wet.

#### • Internal Genitalia

The internal organs of the female reproductive system lie in the pelvic cavity and consist of:

- **Vagina**

This is a fibromuscular tube connecting the external and internal organs. The vagina acts as receptacle for the penis during coitus and provides an elastic passageway through which the baby passes during childbirth

- **Uterus**

The uterus is a hollow muscular pear shaped organ. It lies in the pelvic cavity between the urinary bladder and the rectum. The parts of the uterus are; the fundus the dome-shaped part of the uterus above the openings of the uterine tubes, the body which is the main part of the organ, the cervix or neck of the uterus which protrudes the anterior wall of the vagina opening into it at the external os.

After puberty the endometrium of the uterus goes through a regular monthly cycle of changes, the menstrual cycle, which is under the control of hypothalamic and anterior pituitary hormones. The purpose of the cycle is to prepare the uterus to receive, nourish and protect a fertilized ovum. Once fertilization has taken place, the uterine secretions nourish the fetus for a few weeks thereafter the placenta takes over. The placenta, which is attached to the fetus by the umbilical cord, is firmly attached to the wall of the uterus and provides a means by which the growing baby receives oxygen and nutrients and gets rid of the wastes.

- **Uterine tubes**

The uterine tubes extend from the sides of the uterus between the body and the fundus. The end of each tube has finger-like projections called fimbriae. The longest of these is the ovarian fimbria which is in close association with the ovary. The uterine tubes convey the ovum from the ovary to the uterus by peristalsis and ciliary movement. The mucus secreted by the lining membrane provides ideal conditions for movement of ova and spermatozoa. Fertilization of the ovum usually takes place in the uterine tube, and the zygote is propelled into the uterus for implantation.

- **Ovaries**

These contain ovarian follicles in various stages of maturity each of which contains an ovum. Before puberty the ovaries are inactive but during childbearing years, about every 28 days, one ovarian follicle matures and ruptures and releases its ovum into the peritoneal cavity. This is called ovulation and it occurs during most menstrual cycles. The ovaries are the female gonads or glands. The maturation of the follicle is stimulated by follicle stimulating hormone from the anterior pituitary and oestrogen secreted by the follicle lining cells. If the ovum is fertilized it embeds itself in the wall of the uterus where it grows and develops and produces the hormone which stimulates the corpus luteum to continue secreting progesterone and oestrogen. If the ovum is not fertilized the corpus luteum degenerates and new cycle begins with menstruation.



## **The Physiology of Menstrual (Sexual) Cycle**

Menstrual cycle is defined as a series of events occurring regularly in females every 26 to 30 days throughout the childbearing period of about 36 years. The cycle consists of a series of changes that take place concurrently in the ovaries and uterine walls, stimulated by changes in the blood concentration of hormones. Hormones secreted in the cycle are regulated by negative feedback mechanisms.

### **Negative Feedback Mechanisms**

The hypothalamus responds to changes in the blood levels of oestrogen and progesterone. It is switched off by high levels and stimulated when they are low. The hypothalamus secretes luteinising hormone releasing hormone (LHRH) which stimulates the anterior pituitary to secrete

- Follicle stimulating hormone (FSH), which promotes the maturation of ovarian follicles and the secretion of oestrogen, leading to ovulation
- Lutenising hormone, which triggers ovulation, stimulates the development of the corpus luteum and secretion of progesterone.

### **Menstrual Phases**

The average length of the menstrual cycle is about 28 days. By convention the days of the cycle are numbered from the beginning of the menstrual phase as follows;

#### **• *Menstrual Phase***

This phase lasts for about 4 days. When the ovum is not fertilized, the corpus luteum starts to degenerate. Progesterone and oestrogen levels therefore fall, and the functional layer of the endometrium of the uterus which is dependent on the high levels of these hormones, is shed in menstruation. After degeneration of the corpus luteum, however, falling levels of oestrogen and progesterone lead to resumed anterior pituitary activity, rising FSH levels and initiation of the next cycle.

#### **• *Proliferate Phase***

This phase lasts for about 10 days. At this stage an ovarian follicle, stimulated by FSH, is growing towards maturity and is producing oestrogen. Oestrogen stimulates the proliferation of the functional layer of the uterine endometrium in preparation for the reception of a fertilized ovum. This phase ends when ovulation has occurred and oestrogen production declines.

#### **• *Secretory Phase***

This phase lasts 14 days. Immediately after ovulation, the lining cells of the ovarian follicle are stimulated by LH to develop the corpus luteum, which produces progesterone and some oestrogen. Under the influence of progesterone the endometrium becomes oedematous and the secretory glands produce increased amounts of watery mucus. This is believed to assist the passage of the spermatozoa through the uterine tubes where the ovum is fertilized. If the ovum is not fertilized menstruation occurs and a new cycle begins.



### **How to tell that a Woman is pregnant**

If a woman had sex and her last period was five weeks ago or more, pregnancy cannot be ruled out, even if she used effective contraception. The signs of pregnancy are;

#### Early Signs

- Later menstrual period
- Breast tenderness
- Nausea
- Vomiting
- Weight change
- Always tired
- Mood changes
- Changed eating habits
- Urinating more frequently

#### Late Signs

- Larger breasts
- Dark nipples
- More vaginal discharge
- Enlarged abdomen
- Movements of a baby

If a woman's answers cannot rule out pregnancy she should wait until her next period or she should have a laboratory test if available



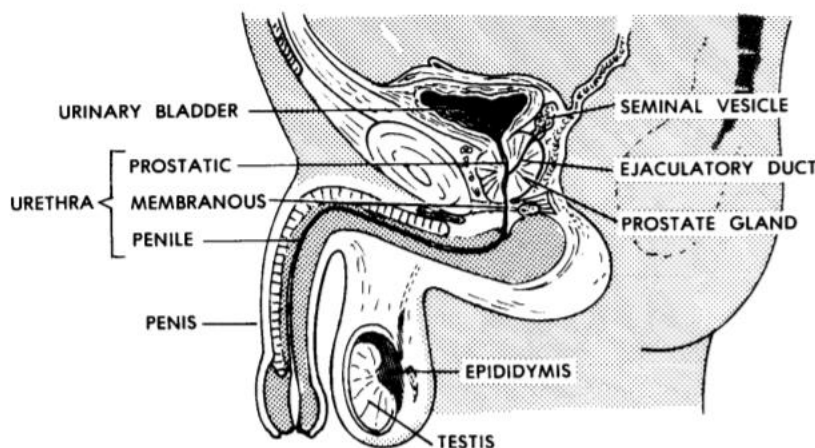
### **How to tell that a Woman is not pregnant**

A woman should not start certain family planning methods while she is pregnant. However, condoms and vaginal methods can and should be used when protection against sexually transmitted infections is needed

A woman is not pregnant if: -

- Her menstrual period started within the last seven days
- She gave birth within the last four weeks
- She had an abortion or miscarriage within the last seven days
- She gave birth within the last six months, breast feeding and has not yet had a menstrual period
- She has not had vaginal sex since her last menstrual period
- She has had sex since her last menstrual period using family planning methods correctly

## **7. MALE REPRODUCTIVE ORGAN SYSTEM**



The male reproductive system consists of the following organs;

- Scrotum

The scrotum is a pouch divided into two compartments each of which contains;

- One testis

- One epididymis
- Testicular end of the spermatic cord

As the urethra leaves the urinary bladder, its first inch is surrounded by a chestnut-size gland called the **prostate gland**.

The testis produces the male sex cells called spermatozoa.

The paired testes lie within the scrotum. The **scrotum** is a sac of loose skin attached in the pubic area of the lower abdomen. The scrotum provides a site cooler than body temperature to maintain the viability of the spermatozoa.

Testes

The testes are the reproductive glands of the male and are equivalent of the ovaries in the female. In each testis are lobules and within each lobule are convoluted loops called seminiferous tubules. The tubule leaves the scrotum as the vas deferens in the spermatic cord.

Spermatozoa (sperms) are produced in the seminiferous tubules of the testes, and mature as they pass through the long and convoluted epididymis, where they are stored. The hormones controlling sperm production is Follicle Stimulating Hormone from the anterior pituitary gland. Successful spermatogenesis takes place at a temperature about 3 degrees Celsius below normal body temperature. The testes are surrounded by three layers of tissue;

- The tunica vaginalis

This is a double membrane, forming the outer covering of the testes, and is down growth of the abdominal and pelvic peritoneum. Descent of the testes into the scrotum should be complete by the 8th month of fetal life.

- The Tunica Albuginea

This is a fibrous covering beneath the tunica vaginalis that surrounds the testes. Ingrowths form septa dividing the glandular structure of the testes into lobules.

- The Tunica Vasculosa

This consist of a network of capillaries supported by delicate connective tissue

- The Spermatic Cords

The spermatic cords suspend the testes in the scrotum. Each cord extends through the inguinal canal and is attached to the testes on the posterior wall.

- Seminal Vesicles

These are small fibromuscular pouches lined with columnar epithelium, lying in the posterior aspect of the bladder. At its lower end each seminal vesicle opens into a short duct which joins with the corresponding deferent duct to form an ejaculatory duct. The seminal vesicles contract and expel their stored contains, seminal fluid, during ejaculation. The fluid contains nutrients to support the sperm during their journey through the female reproductive tract.

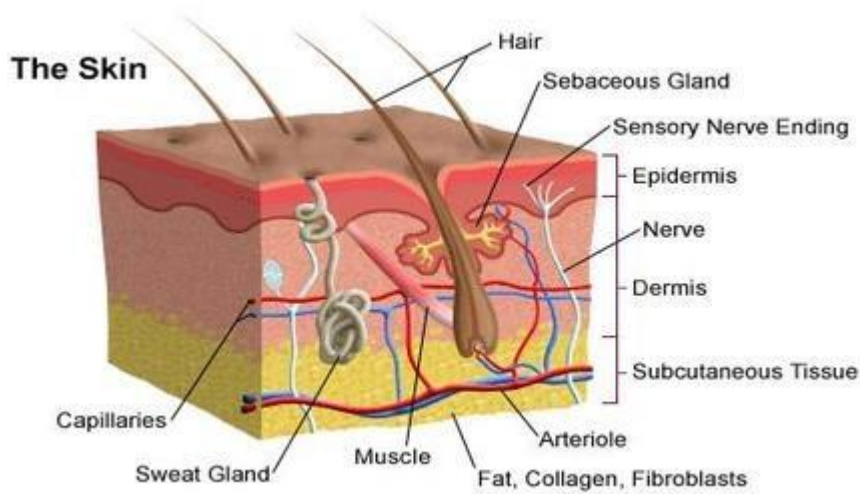
- Ejaculatory Ducts

These are two tubes each formed by the union of the duct from a seminal vesicle and deferent duct. These ducts carry seminal fluid and spermatozoa to the urethra.

- Urethra

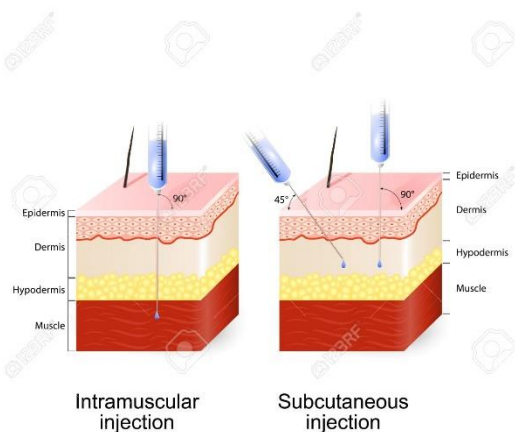
The male urethra provides a common pathway for the flow of urine and semen, the combined secretions of the male reproductive organs.

## 8. SKIN SYSTEM



The integumentary system has many functions, most of which are involved in protecting and regulating the body's internal functions in a variety of ways:

- Protects the body's internal living tissues and organs
- Protects against invasion by infectious organisms
- Protects the body from dehydration
- Protects the body against abrupt changes in temperature
- Helps dispose of waste materials
- Acts as a receptor for touch, pressure, pain, heat, and cold
- Stores water and fat



### Clinical correlation

It is important to know the layers of the skin for use in practical settings such as administering injectable vaccines.

# MODULE 3: INTRODUCTION TO PUBLIC HEALTH

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## Definition of Public Health

There are several definitions of Public Health. 'Public Health is the art and science of preventing disease, promoting health and prolonging life through organised efforts of society' (1978 UK Acherson Report). Collective action for sustained population-wide health improvement' (Beaglehole and Bonita book Public Health at the crossroads published in 2004).

## Prevention

Prevention refers to the goals of medicine that are to promote, to preserve, and to restore health when it is impaired, and to minimize suffering and distress. There are three levels of prevention:

**Primary Prevention** refers to those activities that are undertaken to prevent the disease and injury from occurring. It works with both the individual and the community. It may be directed at the host, to increase resistance to the agent (such as immunization or cessation of smoking), or may be directed at environmental activities to reduce conditions favorable to the vector for a biological agent, such as mosquito vectors of malaria.

**Secondary Prevention** is the early diagnosis and management to prevent complications from a disease. It includes steps to isolate cases and treat or immunize contacts to prevent further epidemic outbreaks.

**Tertiary Prevention** involves activities directed at the host but also at the environment in order to promote rehabilitation, restoration, and maintenance of maximum function after the disease and its complications have stabilized. Providing a wheelchair, special toilet facilities, doors, ramps, and transportation services for paraplegics are often the most vital factors for rehabilitation

## Historical Perspective, Core functions and essential services

- Different countries years ago observed and followed some influences on individual health.
- 400 BC (Chinese medicine, Ayurvedic medicine in India), 460-377 BC (Hippocrates in Greece and AD 129–199 Galen in Rome and their followers were aware of the influences of season, diet, the winds and lifestyle for individual people's health.

- Galen created the theory of ‘miasma’ or bad air causing disease. A miasma was seen as consisting of malodorous and poisonous particles created by decomposing organic matter.
- 1683 with the microscope discovery the contagion theory was changed to microorganisms.
- 1347 to 1351 the Black Death or plague which killed 23 million of the 80 million people in Europe and the Islamic doctors developed science of hygiene and yet all agreed that there were God given illnesses.
- 1600: Italian states developed the concepts of purification of enclosed space – quarantine as 40-day hold on ships.
- 1718 Lady Mary Watley Montague (1689–1762), wife of the British ambassador to Constantinople, reports on the common practice of inoculation in the Ottoman Empire.
- 1853 Smallpox vaccination made compulsory for children under 5 in Britain.
- 1966 Global eradication of smallpox formulated as goal by World Health Organisation (WHO).
- 1977 Last national case of smallpox.
- 1980 WHO declares global eradication: ‘the world and all its peoples have won freedom from smallpox, which was a most devastating disease sweeping many countries since earliest times leaving death, blindness and disfigurement in its wake’.
- John Snow, from Newcastle upon Tyne, became famous for his investigations of the cholera epidemics in London in 1848–49 and 1853–54. Based on data in Exercise 1.3 he decided to remove the pump handle from a water pump which he saw as responsible for local residents getting infected with cholera (the Broad Street pump).

#### Different public health disciplines

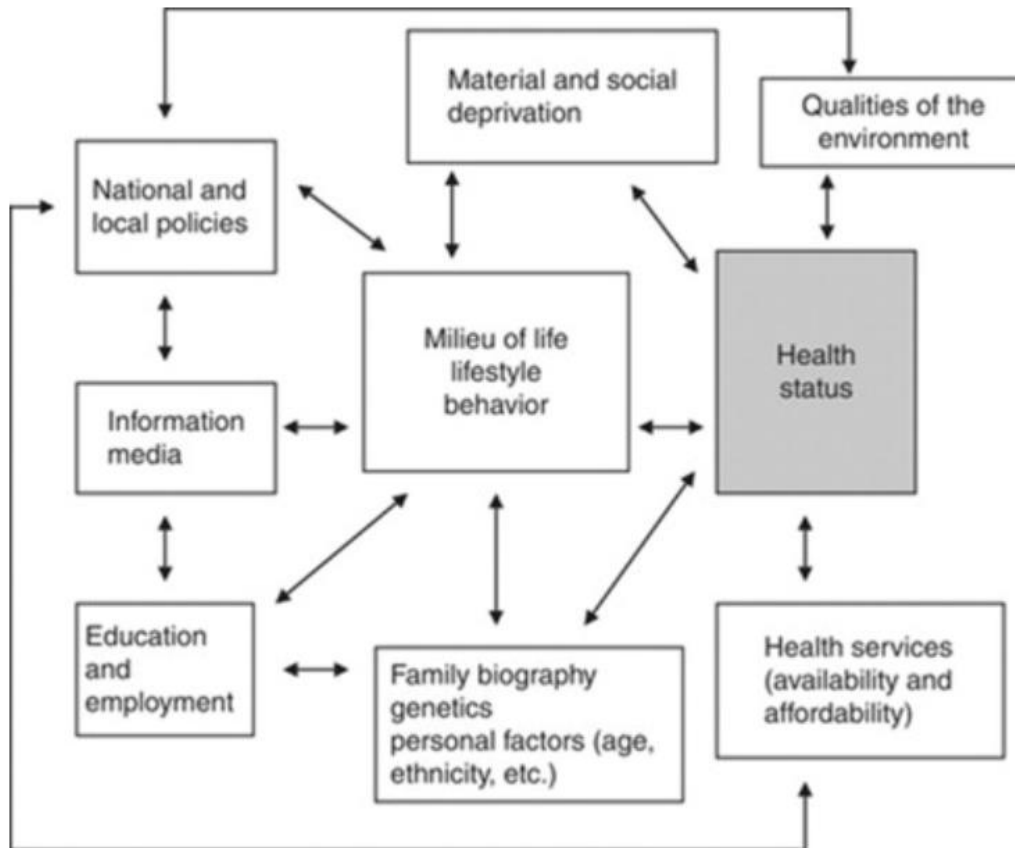
- Biostatistics: Application of statistical principles to questions and problems in health for data collection and analysis plus interpretation.
- Preventive (Environmental Health Sciences): This encompasses all areas that prevent illness in the environment where humans and other creatures stay.
- Epidemiology: The study of the distribution and determinants of disease and the application of this knowledge to improve health.
- Health Policy and Management
- Social Behavioural Sciences.

#### Public health principles and application

- Non maleficence
- Beneficence
- Health Maximisation
- Efficiency
- Respect for autonomy

- Justice
- Proportionality

## Determinants of health



## Core activities in public health

1. Preventing epidemics
2. Protecting the environment, workplace, food and water
3. Promoting healthy behavior;
4. Monitoring the health status of the population;
5. Mobilizing community action
6. Responding to disasters
7. Assuring the quality, accessibility, and accountability of medical care
8. Reaching to develop new insights and innovative solutions
9. Leading the development of sound health policy and Planning

## Key issues for Public Health Management at a strategic policy level are:

10. Vision.
2. Political leadership for health.



3. Central government policy-making approaches that support the vision and provide leadership.
4. Delivery mechanisms through regions, districts and communities that serve as instruments for implementation
5. Multisectoral collaboration.

#### **Priority diseases in public health**

1. HIV/AIDS
2. Malaria
3. Lower respiratory infections
4. Diarrheal diseases
5. Perinatal conditions
6. Measles
7. Tuberculosis
8. Road traffic accidents
9. Pertussis
10. Malnutrition

#### **Emerging conditions of public health importance**

1. Ebola
  1. Ebola virus disease (EVD) is a deadly disease with occasional outbreaks that occur primarily on the African continent. The virus spreads to people initially through direct contact with the blood, body fluids and tissues of animals. Ebola virus then spreads to other people through direct contact with body fluids of a person who is sick with or has died from EVD
2. Corona virus disease (COVID-19)

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus. Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment.

#### **Examples of interventions for priority diseases**

- Immunizations
- Health promotion



#### **ACTIVITY**

- What is the role of an HAS in public health enforcement?

## Basic principles of epidemiology

### Definition of epidemiology

- Epidemiology is the study of how disease is distributed in populations and the factors that influence or determine this distribution or on a broader definition the study of the distribution and determinants of health-related states or events in specified populations and the application of this study to control of health problems.”. Gordis L, 2015.

### Objectives of Epidemiology

- To identify the etiologic or causal factors for disease and reduce or eliminate exposure to those factors, we can develop a basis for prevention programs.
- To determine the extent of disease found in the community. This helps to know disease burden.
- To study the natural history and prognosis of disease.
- To evaluate both existing and newly developed preventive and therapeutic measures and modes of health care delivery.
- To provide the foundation for developing public policy relating to environmental problems, genetic issues, and other considerations regarding disease prevention and health promotion.

### Types of Prevention in Epidemiology

- **Primary prevention is defined as** preventing the *initial development* of a disease. An example is Immunization, reducing exposure to a risk factor
- **Secondary prevention is defined as an** Early detection of *existing disease* to reduce severity and complications an example is Screening for cancer
- **Tertiary prevention is defined as** Reducing the *impact of the disease*. An example is *Rehabilitation* for stroke

# MODULE 4: HEALTH PROMOTION AND HEALTH EDUCATION

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## LAYOUT OF THE MODULE

This manual has been developed following the objective, question and content format. It has been divided into five units geared towards providing the participant with knowledge and skills necessary for promoting health, preventing diseases and encouraging community participation in health-related community activities. The units are as follows:

**UNIT 1:** Health Education

**UNIT 2:** Health Promotion

**UNIT 3:** Health Communication

**UNIT 4:** Community Mobilization

**UNIT 5:** Planning, Implementing and Monitoring health education activities

**UNIT 13.1: HEALTH EDUCATION**

## LEARNING OBJECTIVES

By the end of this unit learners should be able to:

1. Define health education.
2. Describe the history of Health Education.
3. Describe the qualities of a good health educator.
4. Explain the purpose of health education.
5. Describe the health education methods.
6. Demonstrate the ability to provide counselling of patients.
7. Demonstrate the ability to provide counselling during home visits.
8. Demonstrate understanding of the health education methods.

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## 1. 1.1 INTRODUCTION

Health education is the outward and downward communication of “health knowledge” to individuals and communities supposedly with limited ideas on how to avoid illness, how to cope with disease in order to promote health. Appropriate education in health calls for proper understanding of instructional methods and use of proper health education materials. This module is therefore designed to provide knowledge, attitude and skills in health education methodologies.

It is of paramount importance for Health Surveillance Assistants (HSAs) to understand that all health programs tend to improve and promote health and well-being of individuals and communities, health education has an important role to play in such programs so as to create awareness and sensitize people in the programs.

Before we proceed in defining Health Education it is important for you to understand what health is. Health is a highly subjective matter. As such it is important to understand that good health means different things to different people, and its meaning varies according to individual and community expectations and context. For instance, many people consider themselves healthy if they are free of disease or disability. However, people who have a disease or disability may also see themselves as being in good health if they are able to manage their condition so that it does not impact greatly on their quality of life.

The World Health Organization (WHO) defines, “a state of complete physical, mental, and social well-being and not the mere absence of disease or infirmity.”

### **13.1.2 DEFINITION OF HEALTH EDUCATION**

Health Education has been defined in many ways by different authors but in this unit, we are going to define Health Education as follows: Health education is the outward and downward communication of “health knowledge” to individuals and communities supposedly with limited ideas on how to avoid illness, how to cope with disease in order to promote health.

Health Education has various types of activities which as HSAs you need to familiar with, these activities can be described as follows:

1. **Advocacy:** refers to communication strategies focusing on policy makers, community leaders and opinion leaders to gain commitment and support. It is an appeal for a higher-level commitment, involvement and participation in fulfilling a set program agenda. Advocacy can be used to change or modify harmful cultural norms or society norms that affect healthy of communities
2. **Social and behavior Change Communication (SBCC):** Is an interactive process aimed at changing individual, community and social behavior, using targeted, specific messages and different communication approaches, which are linked to services for effective outcomes. SBCC has evolved from IEC and health education. Earlier models used a linear “expert–learner” or “sender–receiver” paradigm to transfer information. The focus then shifted to Behaviour Change Communication (BCC) which emphasizes on analysis of behavior and determinants to affect changes in knowledge, attitudes, practices. Now, our focus is SBCC, which employs a more comprehensive approach.

3. **Patient Education:** This is a term for education in hospital and clinic settings linked to following of treatment procedures, medication, and home care and rehabilitation procedures.
4. **Social mobilization:** is the process of bringing together all societal and personal influences to raise awareness of and demand for health care, assist in the resources mobilization and delivery of services, and cultivate sustainable individual and community involvement. This involves engagement civil society organizations, community structures, governmental sectors and community influencers to mobilize resources and implement health interventions.
5. **Health extension:** is an approach of promoting change through demonstration, working with opinion leaders and community based educational activities.
6. **Nutrition Education:** is imparting knowledge and skills directed at the promotion of nutrition and covers choice of food, food-preparation and storage of food.

### **13.1.3 HISTORY OF HEALTH EDUCATION**

Health Surveillance Assistants need to understand that Health Education is an emerging profession that has been around for only close to hundred years. Although the concept of educating people has been a practice for so many years.

At the time of Alma Ata declaration of Primary Health Care in 1978, health education was put as one of the components of PHC and it was recognized as a fundamental tool to the attainment of health for all. Adopting this declaration, health education as a primary means of prevention of diseases and promotion of health. Since this time health education has been incorporated into our key health policies in Malawi.

### **13.1.4 PURPOSE OF HEALTH EDUCATION**

It is important for Health Surveillance Assistants that Health Education aims to achieve the follow:

1. To help individuals and communities to become competent to be able to participate in community health activities.
2. To promote the development and proper use of health services.
3. To motivate people to adopt health promotion messages by providing appropriate knowledge and helping with changing of attitudes.

## **DEGREE OF ACHIEVEMENT OF THE GOALS**

The degree to which these goals can be achieved is determined by a series of inter-related factors. These factors are:

1. The availability of health advice and health services in which the individuals have trust.
2. The economic feasibility of putting into practice the health measures being advocated.
3. The accessibility of the proposed health practice in terms of the customs and traditions that individuals, families and groups observe, the beliefs that they hold and the attitudes of their peers.
4. The extent to which people already have the kinds of learning experience needed to enable them to understand or to desire the benefits to be derived from a new or modified health behavior which may require personal sacrifice of financial, social or psychological in nature.

## **PRINCIPLES OF HEALTH EDUCATION**

It is important for Health Surveillance Assistants to know the principles that Health Education holds to enable them develop a clear understanding of this component of public health. The follow are the principles of health education:

1. All health education should be need based. Therefore, before involving any individual, group or the community in health education with a particular purpose or for a program the need should be ascertained. It has to be also specific and relevant to the problems and available solutions.
2. Health education aims at change of behavior. Therefore, multidisciplinary approach is necessary for understanding of human behavior as well as for effective teaching process.
3. It is necessary to have a free flow of communication. The two- way communication is particularly of importance in health.
4. Health Education should provide an opportunity for the clients to go through the following stages: identification of problems, planning, implementation and evaluation.
5. Health Education is based on scientific findings and current knowledge. Therefore, a health educator should have recent scientific knowledge to provide health education.

### **13.1.6 ROLES OF A HEALTH EDUCATOR**

Health education is the duty of everyone engaged in health and community development activities. HSAs are primarily responsible in working with the families and community at a grass root level to promote health and prevent disease through provision of health education.

If health and other workers are not practicing health education in their daily work, they are not doing their job correctly.

For instance, when treating someone with skin infection or malaria, a health also educates the patient about the cause of the illness and teach preventive skills.

1. Talking to the people and listening of their problems.
2. Thinking of the behavior or action that could cause, cure and prevent these problems.
3. Helping people to see the reasons for their actions and health problems.
4. The HSAs asking people to give their own ideas for solving the problems.
5. Helping people to look as their ideas so that they could see which were the most useful and the simplest to put into practice.
6. Encouraging people to choose the idea best suited to their circumstances.

### **13.1.7 QUALITIES OF A GOOD HEALTH EDUCATOR**

For a Health Surveillance Assistant to be a good educator they need to possess the following qualities:

1. They need to be a role model to the community.
2. Should be knowledgeable of health messages to communicate.
3. Have the ability to plan.
4. Possess good communication skills both verbal and non-verbal.

### **13.1.8 METHODS OF HEALTH EDUCATION**

There are two main types of education methods namely:

1. Individual educational method
2. Group educational method

Health education helps people to make wise choices about their health and the quality of life of their community. To do this, accurate information must be presented in an understandable way using different methods. The selection of health education methods should be based on the type of audience to be taught, for example some education methods would target individuals, groups or communities.

### **13.1.9 INDIVIDUAL EDUCATIONAL METHOD**

#### **13.1.9.1 COUNSELLING**

Counseling is one of the approaches most frequently used in health education to help individuals and families. It is a person-to-person communication in which one person is helped by another to increase in understanding, ability and confidence to find solutions to own problems.

This method provides information for the patient or client to make an informed choice. It is a method that is used to help clients or patients to make a decision and come up with a care plan.

### **13.1.9.2 HOME VISITS**

#### **Here are some of the advantages of home visits:**

1. When people are in their home, they usually feel happier and more secure. You may find that people are more willing to talk in their own homes than when they are at the clinic.
2. It also gives an opportunity to see how the environment and the family situation might affect a person's behavior; thus, making observations and any necessary suggestions for change right there.
3. Encourages the prevention of common diseases.
4. Enables detecting and improving troublesome situations early, before they become big problems.
5. Keeps a good relationship with people and families. Therefore, HSAs should visit all homes in their communities regularly. Home visits become convenient if we design our own family health education folder for use.

#### **Here are some do the disadvantages of home visits:**

1. The HSAs cannot visit every family in the community.
2. Only families in accessible localities can be visited.

#### **Information which HSAs should keep updated during home visits**

1. The family name
2. The address and location of the house
3. The date of the visit.
4. The name and ages of all members of the house hold. (Be sensitive to local customs about collecting such information)
5. Health problems
6. Information discussed
7. Ideas offered
8. Agreements reached
9. What you agreed to do
10. Date of next visit

### **13.1.9.3 PURPOSES OF COUNSELLING**

1. To help individuals increase knowledge of self
2. To encourage individuals or families to think about their problems and understand the causes.
3. Help people commit themselves to take action on their own will to solve the problems.
4. Help individuals to choose, but not forcing them to do so.



### **13.1.9.4 PRINCIPLES OF COUNSELLING**

Below are the principles of counselling that HSAs need to be aware of:

1. Counseling requires establishing good relationship between the counselor and the client.
2. Counselors should assist people identify their own problems.
3. Counselors develop empathy (understanding and acceptance) for person's feelings. It is thinking by putting self on the shoe of the others.
4. Counselors should never try to persuade people to accept their advice. Rather help people to think about all the factors involved in their problems and encourage them to choose the solutions that are best in their particular situation.
5. Counselors should always respect the privacy of the people they are helping. They never reveal information without specific permission.
6. Counselors should be able to share information and ideas on resources, which the client needs in order to have a sound mind.

### **13.1.10 GROUP EDUCATIONAL METHODS**

Health Surveillance Assistant's need to understand that it is needless to mention that much of the problem solving in the community has to be done by group work and cannot be attempted at individual level alone. Specifically, working with groups is a major activity in health education. When people get together to identify, define, and solve a problem, they have many more resources than when they work individually.

This a method that helps members to build group consciousness and create a common understanding.

#### **13.1.10.1 DEFINITION OF A GROUP**

A group could be defined as a gathering of two or more people who have a common interest.

Example of groups often found in a community:

1. A family
2. A health committee
3. People working at the same factory, business, or agency
4. A class of school children
5. A farmer's cooperative
6. A youth club
7. People attending a religious ceremony together
8. Some friends getting together to relax
9. A gathering of patients at a clinic
10. People riding together on a bus

#### **13.1.10.2 TYPES OF GROUPS**

Groups can be classified as follows:

1. **Formal group:** Groups that are well organized with some rules and regulations.
2. **Informal group:** Groups that are not well organized.

### **Characteristics of a formal group**

1. Has a purpose or goal that everyone strives to achieve together.
2. There is a set membership, so people know who is a member and who is not.
3. There are recognized leaders who have the responsibility of guiding the group towards achievement of its goals.
4. There are organized activities such as regular meetings and project.
5. The group has rules that members agree and work towards the welfare of members.

### **Characteristics of informal group**

1. May have some features in common, but no special goal that they are trying to achieve together E.g. People riding together on a bus
2. No special membership or feeling of belonging
3. People come and go at will
4. No special leader selected, no special rules apply
5. Usually no special activity is planned by the people themselves. E.g. People coming to watch a football match
6. There is usually more concern for self, and less for the welfare of the other people.

## **COMMON METHODS USED IN GROUP EDUCATION**

### **1. Group discussions**

Health education has been quick to recognize that groups provide an ideal set-up for learning in a way that leads to change and action. Discussion in a group allows people to say what is in their minds. They can talk about their problems, share ideas, support and encourage each other to solve problems and change their behavior.

### **2. Meetings**

Meetings are good for teaching something of importance to a large group of people. They are held to gather information, share ideas, take decisions, and make plans to solve problems. Meetings are different from group discussions. A group discussion is free and informal, while meetings are more organized. Meetings are an important part of successful self-help projects.

### **Advantages of meeting**

- a. Easy to arrange
- b. Can reach many people
- c. Can have more than one speaker
- d. Creates public interest and awareness
- e. Stimulates follow-up discussions

### **Disadvantages of meeting**

- a. Audience is usually passive
- b. Speakers may not understand audience's needs
- c. Difficult to assess success
- d. Audience might not learn the main points

### **3. Clubs**

There are many kinds of organizations to which women, men and young people belong. Clubs are becoming popular in many areas. They provide an opportunity for a systematic way of teaching over an extended period of time. E.g. a group of citizens could form an association to deal with problems related to a major local disease or to protect the environment.

#### **Advantages of Clubs**

- a. Participants can be active and learn by doing
- b. Convinces audience that things can easily be done
- c. Establishes confidence in community health workers' ability

#### **Disadvantages of clubs**

- a. Requires preparation and careful selection of demonstration topic and place
- b. Outside factors can affect demonstration results and consequently might affect confidence in the health worker

### **4. Songs**

People sing to express ideas and feelings, such as love and sadness, to tell story of a famous person, commemorate religious days etc.

#### **Advantages of songs**

- a. Groups can be active "learning by doing".
- b. Can attract attention and stimulate thinking if situations are effectively memorized.

#### **Disadvantages of songs**

- a. Musicians require attention in training and so that they can compose songs that communicate well the key messages.
- b. Preparation may be too difficult for a HSA, since music production is quite an involving task.
- c. Difficult to organize because it requires considerable skills and careful guidance by the HSA.

## **5. Drama**

Drama is less common in villages, but it is a good means to entertain people in a message. Their preparation, practice and others may incur time and money.

### **Advantages of drama**

- a. Groups can be active “learning by doing”.
- b. Can attract attention and stimulate thinking if situations are effectively dramatized.

### **Disadvantages of drama**

- a. Actors require attention in training and preparing script
- b. Preparation may be too difficult for a community worker
- c. Difficult to organize because it requires considerable skills and careful guidance by the HSA.
- d. There is need to understand the various social dynamics in the community which need to be incorporated into the drama.

## **6. Role playing**

Role-playing consists of the acting out of real-life situations and problems. The player tries to behave in a way that the character might behave when faced with a given situation or problem. It is used to show different people feel about a problem and what they should do about it.

### **Advantages of Role playing**

- a. Facts and opinions can be presented from different viewpoints especially on controversial issues.
- b. Encourages people to re-evaluate their stand and understanding on issues.
- c. Allows audience to participation.
- d. Deepens group insight into personal relations.

### **Disadvantages of Role playing**

- a. Cannot be used in community meetings where there is limited time, because participants need to plan and prepare before they conduct the role plays.
- b. Some role players may feel upset by playing a role they do not agree with and there by having a negative impact to the lesson.
- c. Requires careful preparation for the selection of the issue and actors
- d. Careful preparation is essential to understand the various social matters in the community and identifying resources to use during the role play.

## **UNIT 13.2: HEALTH PROMOTION**

### **LEARNING OBJECTIVES**

By the end of this unit learners should be able to do the following:

1. Definition health promotion
  2. The relationship between health promotion and health education
  3. The contrast between health promotions and health education
- 

#### **13.2.1 INTRODUCTION**

. Health Promotion as a term was used for the first time by Marc Lalonde in 1974 and quickly became an umbrella term for a wide range of strategies designed to tackle the wider determinants of health.

After reviewing the evidence, the Lalonde Report suggested that health care services were not the most important determinant of health and there were four health fields: lifestyle, environment, health care organization, human biology.

Health promotion provides the notion that major improvements in health would result primarily from improvements in lifestyle, environment and our knowledge of human biology.

#### **13.2.2 DEFINITION OF HEALTH PROMOTION**

Health promotion is the process of enabling people to increase control over, and to improve, their health.

It moves beyond a focus on individual behavior towards a wide range of social and environmental interventions.

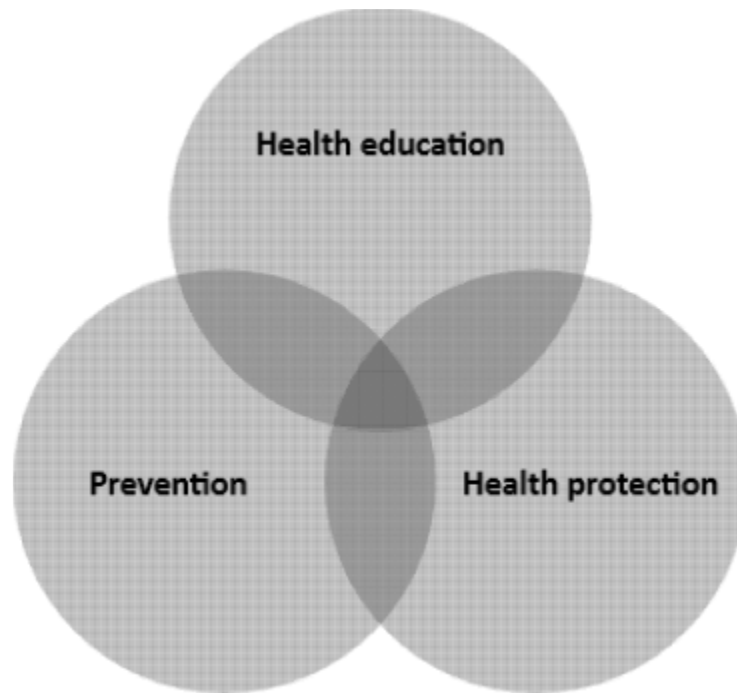
It is a positive concept emphasizing personal, social, political and institutional resources, as well as physical capacities.

Health Promotion is any combination of health, education, economic, political, spiritual or organizational initiative to bring about positive attitudinal, behavioral, social, or environmental changes conducive to improving the health of population.

Health Promotion is directed towards action on the determinants or causes of health

Health Promotion, therefore, requires a close co-operation of sectors beyond health services, reflecting the diversity of conditions which influence health.

### 13.2.3 THE MODEL OF HEALTH PROMOTION



**The Health promotion model**

### 13.2.4 DIFFERENCE BETWEEN HEALTH PROMOTION AND HEALTH EDUCATION

In the above unit we had a detailed look on what health education. HSAs need to be able to differentiate between health promotion and health education. Below is the key difference between these two terms:

Health Surveillance Assistants need to understand that health education deals with giving information and teaching individuals and communities how to achieve better health. Health education seeks to motivate individuals to accept a process of behavioral change through directly influencing their values, beliefs, and attitude systems. Health promotion on the other hand involves social, economic, and political change to ensure the environment is conducive to health.

HSAs need to know that health promotion and health education are symbiotic strategic. This simply means that they are closely associated or related and that they benefit from each other.

In the case of Health Education, most activity centers on providing learning opportunities for individuals and communities so that they are able to voluntarily change their behavior. In other words, they acquire information and skills to help them initiate a change that enhances their well-being and their health.

On the other hand, Health promotion activities are broader and it encompasses the following: provision of preventive health services, mobilization of community resources, implementation of organization policies that promote health and economic plus regulatory activities. Health Promotion is an umbrella of many activities.



### 13.2.5 THE IMPORTANCE OF HEALTH PROMOTION

HSAs need to understand the value of health promotion to the wellbeing of people in their community. Health promotion is important because of the following aspects:

- Health promotion is important because it reduces inequalities in health.
- It promotes the quality of life.
- Health promotion is cost effective and efficient.
- Health promotions is key in reducing pressure on health resources.

### 13.2.6 PRINCIPLES OF HEALTH PROMOTION

The 5 key principles of health promotion as determined by WHO are as follows:

- Health promotion involves the population as a whole in the context of their everyday life, rather than focusing on people at risk from specific diseases.

- Health promotion is directed towards action on the determinants or cause of health. This requires a close co-operation between sectors beyond health care reflecting the diversity of conditions which influence health.
- Health promotion aims particularly at effective and concrete public participation. This requires the further development of problem-defining and decision-making life skills, both individually and collectively, and the promotion of effective participation mechanisms.
- Health promotion combines diverse, but complementary methods or approaches including communication, education, legislation, fiscal measures, organizational change, community change, community development and spontaneous local activities against health hazards.
- Health promotion is primarily a societal and political venture and not medical service, although health professionals have an important role in advocating and enabling health promotion.

### **13.2.7 THE APPROACHES IN HEALTH PROMOTION**

#### **a. Behavior change Approach**

- Behavior Change Approach aims to encourage individuals to adopt “healthy” behaviors that are regarded as key to improving health.
- Such approaches seek to educate the individual so that they change their lifestyle or a particular behavior to help improve their health. This may be to stop partaking in a risk behavior or to start enjoying some protective behaviors. Either way, the aim is to change the person’s lifestyle or behavior.

#### **b. Educational Approach**

- This approach is strongly linked to Health Education.
- This seeks to provide knowledge and information, and to develop the necessary skills so that people can make informed decisions about their behavior.
- This approach holds the assumption that increasing knowledge may change in attitudes, that may result in changed behavior.
- Weakness with this approach is that assumes that by increasing knowledge, there will be an attitudinal change, which leads to behavioral change.
- This approach also ignores the constraints that social, economic and environmental factors place on voluntary change.

#### **c. Client centered approach**

- Helps people to identify their own needs and concerns, and gain the necessary skills and confidence to act upon them.



- So-called bottom up approach - idea is premised on helping people or communities to identify their own health concerns, gain the skills and make changes to their lives accordingly.
- Professional acts as a facilitator rather than expert.
- Client-centered, including counseling, community development and advocacy.
- Health advocacy refers to the action of health professionals to influence and shape the decisions and actions of decision- and policy-makers who have some control over the resources which affect or influence health.
- Promoting public involvement and participation in decision-making on health-related issues.

**d. Social change approach**

- Targets groups and populations, top down method of working.
- Sometimes known as radical health promotion and is underlined by a belief that socio-economic circumstances determine health status.
- Its focus is at the policy or environmental level.
- Aims is to bring about physical, social, economic, legislative and environmental changes.

## **UNIT 13.3: HEALTH COMMUNICATIONS**

### **LEARNING OBJECTIVES**

By the end of this unit learners should be able to do the following:

1. Definition health education
  2. Qualities of a good health educator
  3. Health education methods
  4. Health education methods in practice
- 

#### **13.3.1 INTRODUCTION**

Communication is the core of health education and promotion programs. In human society communication can play an important part in daily life. We have the advantage of language, spoken words, songs, and written scripts and so on. It is by communication that an individual makes himself/herself to understood by others. This act requires an appropriate design so as transmit an effective message.

#### **13.3.2 DEFINITION OF COMMUNICATION**

Communication is the process of sharing of ideas, information, knowledge, and experience among people to take action.

Communication may take place between one person and another, between an individual and a group or between two groups. Communication facilitates creation of awareness, acceptance and action at individual, group and inter-group level. The process always involves a sender and a receiver regardless of the number of people concerned.

#### **REASONS WHY COMMUNICATION TAKES PLACE**

Communication usually takes place for the following reasons:

1. To have dialogue with communities.
2. Influence decision makers to adopt health promoting policies and laws.
3. Raise awareness among decision makers on issues regarding poverty.
4. Communicate new laws and policies to the public.
5. Raise public awareness in order to mobilize community participation.
6. Develop community action on health issues.

#### **13.3.3. TYPES OF COMMUNICATION**

There are two main types of communication, and they are as follows:

1. **One-way communication:** This is a linear type of communication in which information flows from the source to the receiver. There is no input (feedback) from the receiver. It is commonly used in advertising; the message is designed to persuade the receiver to take action prescribed by the sender.
2. **Two-way communication:** As the message is more complex, two-way communication becomes essential. In this type of communication, information flows from the source to the receiver and back from the receiver to the source.

### 13.3.4 COMPONENTS OF COMMUNICATION

Below are the components of communication, and they are listed as follows:

#### 1. Sender

- Originator of message
- Can be from an individual or groups, an institution or organization.
- People are exposed to communication from different source but most likely to accept a communication from a person or organization that they trust i.e. has high source credibility.

Depending on the community, trust and source credibility may come from the following:

- Personal qualities or actions e.g. a health worker who always comes out to help people at night.
- Qualification and training.
- A person's natural position in the family or community, e.g. village chief or elder.
- The extent to which the source shares characteristics such as culture, education, experiences.

#### 2. Message

It consists of what is actually communicated including the actual appeals, words, and pictures and sounds that you use to get the ideas across.

A message will only be effective if the advice presented is relevant, appropriate, and acceptable and put across in an understandable way.

#### 3. Channel

A Channel is a physical means by which message travels from a source to a receiver. The commonest types of channels are verbal, visual, printed materials or combined audio visual and printed materials. Your choice of channel will depend on what you are trying to achieve, the nature of your audience and what resources are at your disposal.

#### **4. Receiver**

- The person or a group for whom the communication is intended.
- The first step in planning any communication is to consider the intended audience.

#### **5. Effect and Feedback**

- Effect is the change in receiver's knowledge, attitude and practice or behavior.
- Feedback is the mechanism of assessing what has happened on the receiver after communication has occurred.

### **13.3.4 STAGES OF COMMUNICATION**

In health education and health promotion we communicate for a special purpose – to promote improvements in health through the modification of the human, social and political factors that influence behaviors. To achieve these objectives, a successful communication must pass through several stages:

#### **a. Reaching your audience**

Communication cannot be effective unless it is seen or heard by its intended audience. A common cause of failure is preaching to the converted.

#### **b. Attracting your audience's attention**

Any communication must attract attention so that people will make the effort to listen/read it. At any one time we receive a wide range of information from each of our five senses – touch, smell, vision, hearing and taste.

#### **c. Understanding the message (perception)**

Once a person pays attention, he/she then tries to understand it. It is a highly subjective process i.e. two people may hear the same radio program and interpret the message quite differently from each other and from the meaning intended by the sender.

#### **d. Promoting change (acceptance)**

A communication should not only be received and understood; it should be believed and accepted. It is easier to change beliefs when they have been acquired only recently and when its effects can be easily demonstrated.

#### **e. Producing a change in behavior**

A communication may result in a change in beliefs and attitudes but still may not influence behavior. This can happen when the communication has not been targeted at the belief that has the most influence on the person's attitude to the behavior, pressure from other people in the family or community and lack of enabling factors.

#### **f. Improvement in health**

Improvements in health will only take place if the behaviors have been carefully selected so that they really do influence health. If your messages are based on outdated and incorrect ideas, people could follow your advice but their health would not improve – need accurate advice.

### **13.3.5 METHODS OF COMMUNICATION**

There are three main methods of communications which are stated in this unit as follows:

#### **a. Intra-personal communications**

It takes place inside a person. It includes the beliefs, feelings, thoughts and justification we make for our actions. E.g. a person may look at an object and develop a certain understanding. However, this could be affected by a number of factors including previous experience, language, culture, personal needs, etc.

#### **b. Inter-personal communications**

It means interaction between two or more people who are together at the same time and place. E.g. between health extension worker and community member, a teacher and students in a class. The decisive criterion for personal communication is that communication happens at the same time and place.

**Advantages of inter-personal communications are as follows:**

- Two-way communication.
- The communication could utilize multi-channels (both verbal and non-verbal).
- Useful when dealing with a sensitive topic or a taboo.

**Disadvantages of inter-personal communications are as follows:**

- Requires language ability of the source.
- Requires personal status.
- Needs professional knowledge and preparation.

#### **c. Mass Communication**

It is a means of transmitting messages to a large audience that usually reaches a large segment of the population. It uses mass media. Mass media includes broadcast media (radio and television) as well as print media (newspapers, books, leaflets and posters).

**Advantages of Mass Communication are as follows:**

- Reach many people quickly.
- They are believable especially when the source is a credible one.

**Disadvantages of Mass Communication are as follows:**

- One sided (linear) form of communication.
- Does not differentiate the target audience.

Main forms of Mass Communication are radio and television and in recent times social media platforms such as Facebook and twitter. Below we look at the advantages and disadvantages of radio and television.

## **Radio**

### **Here are the advantages of radio:**

- Can reach mass audience cheaply.
- Receivers are available in the remotest communities.
- Messages can be repeated at low cost.
- Easy to reach illiterate audience.
- Can be used to support other channels of communication.
- Efficient in announcing events and development activities.
- If properly used can mobilize audience to participate in public events and projects of value to the community.
- It is flexible for it can include; drama, lectures, folklore songs and interviews.
- It is effective in creating awareness and setting agenda of priorities for peoples' attention.

### **Here are the disadvantages of radio:**

- One-way channel
- Difficult to illustrate
- Difficult to assess audience reaction, participation or interest in messages delivered.
- It requires special skill and continuous training of radio personnel.
- Content may not be tailored to small communities and it tends to be general in nature.
- Usually prepared for national audience or special ethnic or language group reducing relevance to local problems.
- Difficult to use material broadcast as a reference without investment in radio documentation.
- Effective follow-up is not always possible.

## **Television**

### **Here are the advantages of television:**

- It attracts audience and be the main captivator in rural communities.
- It can be used to explain complicated messages because of its combination of sound and pictures.
- It is suitable for mixed presentation of issues through utilization of folklore art and music, community events and animated public speeches and debates.
- Successful in creation awareness.
- Suitable for illiterate audiences if they have access to receivers or Television clubs.

### **Here are the disadvantages of television:**

- Television is expensive to operate.
- Receivers not available in many rural areas and among poorest groups.

- Has traditionally been used for entertainment and politics more than health educational and development purposes.
- Health educational programs may face severe competition from entertainment programs.
- No audience participation. Unless during call-in programs or programs that have studio audience.
- Present state of technology in many developing countries does not allow immediate coverage or timely relay of local community actions and events.
- Requires more planning and preparation and technical, creative and communication skills.
- Difficult to use material televised as a reference without investment in television documentation.
- Effective follow-up is not always possible.

## **UNIT 13.4: COMMUNITY MOBILIZATION**

### **Learning Outcomes for Session**

1. Define community mobilization
  2. Describe some of the criteria that bind a community together, and describe how to work with the community.
  3. Describe the techniques that are required to involve a community in health activities.
- 

### **13.4.1 Community and its advantages**

A community is a group of people, based on common values and norms, who live within a geographically defined area and who share a common language, culture or values. In short, a community refers to an area or a village with families who are dependent on one another in their day-to-day transactions, thereby creating mutual advantages.

### **13.4.2 CONCEPTS OF COMMUNITY MOBILIZATION**

To mobilise is to get something or someone on the move. community mobilization is defined as a capacity building process, through which individuals, groups and families (such as model families), as well as organizations, plan, carry out and evaluate activities on a participatory and sustained basis to achieve an agreed goal

Community-based participatory approaches to community mobilization will help to achieve reliable and sustainable healthy lifestyles and behavioral changes. Through community involvement, lay and professional people study health problems, pool their knowledge and experience, and develop ways and means of solving their health problems.

Your role is to help the community organize itself so that learning will take place and action follows. The health activity cannot achieve the intended goals without involving the community. This can only be achieved by building on the community's knowledge and beliefs through a continuous dialogue, and not by dictating to them what they should do.

A community should be mobilized and technically supported to take action to identify their own health issues or problems if essential health care is to be made available to every household in Ethiopia.

#### **13.4.2.1 Mobilizing your community**

There are important things that you need to bear in mind while mobilizing your community. You need to encourage participation by as many community members as possible. This means working actively with the community to solve their own health-related problems. You really need to know your community.



However, knowing your community is only the beginning. Community mobilization is an active process. Community participation is necessary at every step of the process, from identifying problems to solving the problems.

Communities have different amounts of resources, and they also have different values and beliefs. Things that work best for one person or one community may not work for another. So do not assume you know what the best solution is.

#### **13.4.2.2 Equipping your community**

You should equip your community with appropriate skills and knowledge, and empower them through community participation. The greatest resources you have in your community are good relationships with individuals therefore, you should mobilise them to pool the resources available in the community, including labour power.

#### **13.4.2.3 The advantages of community mobilization**

community mobilization that will help local ownership and the sustainability of the health programs. Community mobilization helps to motivate the people in your community and encourages participation and involvement of everyone, as well as building community capacity to identify and address community needs Community mobilization also promotes sustainability and long-term commitment to a community change movement. In addition, it motivates communities to advocate for policy changes to respond better to their health needs.

#### **13.4.2.4 Key steps in community mobilization**

- Create awareness of the health issue
- Motivate the community through community preparation, organizational development, capacity developments and bringing allies together
- Share information and communication
- Support them, provide incentives and generate resources.

#### **13.4.2.5 Techniques to involve a community**

For you to work best with the community, you need to identify the right people in the community who can explain to you their habits, customs, values, taboos and the rules of that community. It is also good to know and develop relationships with other influential people within your localities, such as the religious leaders, in order to be accepted by the community. These influential people are often called opinion leaders and are important people to keep informed about the sorts of health issues you feel should be addressed. Indeed, as you move forward, everyone in the community needs to be informed about these matters.

To be involved in the community, you need to develop the required or acceptable behavior. So you need to be polite, persuasive and be good at being a role model. This will involve you being patient, a good listener, tolerant and self-restrained, honest, open, non-judgmental and respectful.

### **13.4.2.6 Working with the community**

- Go to the community
- Love with them
- Live with them
- Learn from them
- Link your knowledge with them
- Start with what they have
- When you finish your job, the people will say we did it all by ourselves.

### **13.4.3 EFFECTIVE NETWORKING**

To work effectively with the community, you need to understand who holds the power in the community and how they influence community decisions. The community has an important role to help identify health problems and use the available resources in the village to plan activities and then act to improve the community's health. For the successful implementation of development activities, you need to involve everyone in a community network, especially those with power (the decision makers in the community), as early and as often as possible.

You can engage the community using one or more of the participatory methods, such as small groups, large meetings, community conversation, local celebrations or exhibitions. You should also identify health objectives for your community, and use the right approaches to engage the whole community. Invite the whole community and representatives to meetings, and secure their approval for your advocacy objectives. Then ensure clarification of the roles of all the people involved.

Community mobilization at its best does not merely raise community awareness about an issue, or persuade people to participate in activities that have been prioritized and planned by others. Rather, it is a comprehensive strategy that includes exploring the health issues in the community, developing a plan of work, working with the community to establish credibility and trust, working together with the community to implement your plan, and raising community awareness about important health issues. It also involves working with community leaders, model families and others to make sure that those most affected by the health issues are involved in the necessary action.

### **13.4.6 THE ACTION CYCLE OF COMMUNITY MOBILIZATION**

You should start the mobilization process by organizing your plan of work with the community. After that you can explore all the most important health issues in order to understand what is currently happening in the community. In addition, you can identify why any specific problems are occurring. You should look for helpful or harmful health practices, beliefs, attitudes and knowledge within that community that are related to the health problem under consideration. Once the health issues are fully explored, you can set priorities, develop a more detailed plan of work, and carry out the plan. During implementation of the programme, you should monitor and finally evaluate your activities. If the programme seems successful, you should think about

how you could scale up that method to a larger number of households. In this way, the action continues. These activities are known as the community action cycle

### Steps of community action cycle

Step 1 Identify a significant health problem, for example immunization

Step 2 Plan and select a strategy to solve the problem (for example, conduct a workshop for influential people in the community for sensitization on the issue).

Step 3 Identify key actors and stakeholders (village chief, Imam, heads of families, etc.)

Step 4 Mobilise these key actors and stakeholders for action (discussions and agreement on what to do).

Step 5 Implement activities to work towards a solution (capitalize on the sensitization of the people created by the workshop and intensify this through various follow-up activities).

Step 6 Assess the results of the activities carried out to solve the problem.

Step 7 Improve activities, based on the findings of the assessment.

### Steps in community action cycle



**In this session you have learned that:**

1. Community mobilization is a capacity building process through which you will be able to work with the community to identify and plan health activities.
2. Always think of undertaking community mobilization when the problem affects the whole community and when local resources, as well as larger-scale changes, are required to address the problem.
3. The greatest benefits of community mobilization are to build community capacity and to help the community identify and address its own needs.
4. In community mobilization, the first step is to investigate the health problems, then develop an action plan.
5. Community participation as part of community mobilization is critical for success.
6. Participation enables local people to develop commitment, skills and knowledge, and it enhances the partnership with health workers.
7. You will need to identify the right people in the community who can explain to you the norms, taboos and rules of the community before you start work in the community.
8. Community mapping is a good community participatory tool.

## **UNIT 13.5: PLANNING, IMPLEMENTING AND MONITORING FOR HEALTH EDUCATION ACTIVITIES**

Here are some of the steps that will aid you in planning for health education activities:

### **13.5.1 IDENTIFICATION OF COMMUNITY NEEDS**

It is important for HSAs to conduct a needs assessment in your communities. This will assist you in finding areas in which you need to prioritize during your health education activities. The process of identifying needs in your community are as follows:

- Community needs assessment
- Setting priorities
- Deciding on goals for Information, Education and Communication activities
- Formulating specific objectives
- Deciding on the content to be communicated

### **13.5.2 PLANNING FOR DELIVERY OF HEALTH EDUCATION MESSAGES**

The planning for a health education session will involve the preparing a lesson plan and this should include the following:

- Consideration of the audience
  - Consideration of the topic to be delivered
  - Deciding on the duration of the session
  - Outlining the specific objectives identified during the need's assessment exercise
  - Outlining the content that should correspond to the objectives
  - Deciding on the methods to be used, will it be a lecture, health talk, group discussion, demonstration or role plays
  - Organizing the teaching materials like audio visual or audio materials or visual materials like posters or pictures
- c. Conducting a health education session
- Use suitable language and speak loudly to be heard.
  - Greet the audience.
  - Organize the audience in a manner that will enable you to maintain eye contact to most audience.
  - Introduce yourself.
  - Let the audience introduce themselves if possible.
  - Introduce the topic.

- Introduce the objectives to be covered in a simple way.
- Ask the audience what they know about the topic to be discussed and praise for the participation, this will motivate them to continue participating.
- Present the information step by step.
- Minimize mannerisms because these can be distracting to the audience.
- Give time for questions from the audience, respond to the questions and praise as appropriate.
- Evaluate the session by asking questions related to the objectives.
- Then summarize the session.
- Finish by thanking the audience for their participation and attention.

### **13.5.3 TARGETS FOR HEALTH EDUCATION**

When considering the range of health education interventions, they are usually described in relation to different settings. Settings are used because interventions need to be planned in the light of the resources and organizational structures peculiar to each. Thus, health education and promotion take place, amongst the following:

1. Communities
2. Health care facilities
3. Work sites
4. Schools
5. Prisons
6. Refugee camps

### **13.5.4 ETHICAL ISSUES IN HEALTH EDUCATION**

From a profession point of view, ethical behavior is expected from professionals. Ethical conduct is particularly important for health educators, since they are working with a mission to serve the individual.

#### **13.5.4.1 DEFINITION**

**Ethics** is the philosophical study of the moral value of human conduct and the rules that govern it. It is the right thing to do for society and self.

**Morals** refer to those beliefs about how people ought to behave.

### **13.5.4.2 PRINCIPLES OF ETHICS**

#### **1. Principle of autonomy**

This principle means that people, being individuals with individual differences must have a freedom to choose their own ways and means of being moral with the framework of the other four principles.

Respect for autonomy involves respecting another person's rights and dignity such that a person reaches a maximum level of fulfillment as a human being. In the context of health promotion and health care this means that the relationship between health extension worker and community member is based on a respect for him or her as a person and with individual rights.

Rights in relation to health care usually include the following:

- a. Right to information.
- b. Right to privacy and confidentiality.
- c. Right to appropriate care and treatment.

#### **2. Beneficence (doing good)**

Beneficence means doing or promoting good as well as preventing, removing and avoiding evil or harm.

#### **3. Non- maleficence**

Non-maleficence holds a central position in the tradition of medical ethics and guards against avoidable harm to subjects. In short, it refers to non-infliction of harm to others. E.g. use of sterile needles.

#### **4. Justice (fairness)**

This principle states that human being should treat other human being fairly and justly in distributing goodness and badness among them. In other words, justice should include:

- a. Fair distribution of scarce resources
- b. Respect for individual and group rights
- c. Following morally acceptable laws

#### **5. Principle of truth telling (honesty)**

At the heart of any moral relationship, there is communication. A necessary component of any meaningful communication is telling the truth, being honest.

### **13.5.5 DEVELOPING A WORK PLAN FOR HEALTH EDUCATION ACTIVITIES**

Planning is the process of making thoughtful and systematic decisions about what needs to be done, how it has to be done, by whom, and with what resources. Planning is central to health

education and health promotion activities. If you do not have a plan, it will not be clear to you how and when you are going to carry out necessary tasks. Everyone makes plans for looking after their family, for cooking, and so on. You can build on experience you already have in planning, and apply it to health education.

Key questions to ask when planning

- What will be done?
- When will it be done?
- Where will it be done?
- Who will do it?
- What resources are required?

#### **13.5.5.1 WHAT IS IN A WORK PLAN**

Your plan of work should include the following components:

1. Clear objectives
2. Your strategies
3. A list of activities that you will do
4. Who will help you
5. Resources to be used
6. Timing
7. Indicators.



### 13.5.5.2 SAMPLE WORK PLAN

Objective	Strategies/methods	Activities	Responsible people	Resources	Timing	Indicators
<p>To increase the number of households who use bed nets properly from 20% to 60% over the next year.</p>	<p>Home visits. Training each household on the proper use of bed nets</p>	<p>Conducting home visits. Identifying barriers to using bed nets, giving advice to families, and helping them to hang bed nets properly. Preparing training materials, selecting participants, giving training.</p>	<p>Village volunteers HSA</p>	<p>IEC materials. Posters, leaflets, papers, pen, pencils, bed nets. Materials to demonstrate use of bed nets such as rope.</p>	<p>10-12 August 2020</p>	<p>Percentage of households who received training. Number of households who use bed nets properly after training.</p>

### **13.5.6 IMPLEMENTATION**

Implementation is the act of converting your planning, goals, objectives and strategies into action. Conducting health education activities at a community gathering, or during home visits, are examples of implementation, or carrying out health education activities.

Community members should be involved in all your health education activities whenever possible. This should improve the uptake of your health education interventions, and enable you to pool community resources, including labour power.

If the community seems reluctant to participate in health education activities, your plans stand much less chance of being successfully implemented. In order to avoid this difficulty, you should try to make sure that as many members of the community as possible are ready to participate in health education activities.

To ensure participation, you should organize the community, and discuss with them the issues that you feel are important for the implementation of health education activities in their locality.

#### **13.5.6.1 Recording health education activities**

Recording and reporting all your health education activities is very important, and you must record all your routine health education activities according to the standard documentation guidelines provided for you. It is usually considered that an activity which is not recorded has not been done. So, if you fail to document or record the activities you have accomplished, others will not know whether or not the activity has been performed.

Likewise, if you fail to record activities, you cannot evaluate and monitor your achievements. As well as recording the activities, you should also report your health education activities to the concerned bodies, like the health centers, and the district health office. You should keep others informed about the progress of your activities so that they can give you any necessary support and help.

Health education activities are usually reported in standard reporting format. If standard reporting format is not available to you, you can record the activities in your own book, and later you should be able to replace it with the standard reporting format, when it is made available for you to.

During the implementation of a health education activity, the following information should be recorded:

- Number of people who received health education (total, male, females)
- The topic addressed, and the content of the message
- The place where the health education activity was delivered
- The person who delivered the health education session
- The materials used (posters, leaflets, etc.)

- The method used (discussion, drama, etc.)
- Number of households reached or covered
- Number of health education sessions delivered
- Were any problems encountered?

#### **13.5.6.2 Monitoring the implementation of health education activities**

While you are undertaking health education activities, make sure that the planned activities are actually delivered in the way that they have been planned. It is easy to begin with plans and then to go off the beaten track. The method which enables you to know whether the activities are being implemented as planned is called monitoring. Monitoring is the ongoing routine collection and analysis of information that you record as your activities are progressing. Using monitoring, you should be able to check whether activities are being carried out as planned, and whether they are effective or not. Monitoring will help you keep your work on track, and can let you know when things are going wrong. If things are going wrong, you will be able to take action to correct any problems. Monitoring should enable you to determine whether the resources you have are sufficient and are being well used—and whether the capacity you have is sufficient and appropriate.

Monitoring can take place at any time during the implementation process, on a regular or periodic basis. For instance, you will be able to monitor your activities daily, fortnightly or monthly, or as the need arises. So as you can see, monitoring is absolutely crucial.

#### **13.5.6.3. Monitoring health education activities**

The data which shows the progress of health education activities can be collected by several methods, from various sources. During all your health education work, you will be able to observe how your own activities are being received, and the reaction of the community or participants.

Of course, you will make periodic visits to households, during which time you can check whether their health-related practice has actually changed. It is important to make a periodic review of your recorded activities. For example, fortnightly you can review your achievements and check whether you have completed what you have planned to do. Feedback from clients and community, particularly those who participated in the activities, will always be the most important sort of monitoring.

# MODULE 5: ENVIRONMENTAL HEALTH

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## ENVIRONMENTAL HEALTH

### 8.1 Module aim

The aim of this module is to provide knowledge, attitude and skills to enable the learner apply the basic principles of environmental health, particularly in the promotion of food safety and hygiene, pollution control, personal hygiene, safe water supply, village and school sanitation, occupational safety and health and vector and vermin control.

This module is divided into eight units. Each unit has intended learning outcomes and content covering each intended outcome.

Unit 1: Food Safety and Hygiene

Unit 2: Personal Hygiene

Unit 3: Pollution Control

Unit 4: Water Supply

Unit 5: Village Inspection

Unit 6: Community and School Sanitation

Unit 7: Vector and Vermin Control

Unit 8: Occupational Health and Safety

Unit 9: Climate Change and Health

## **Unit 1: Food Safety and Hygiene**

### **8.1.1 Introduction**

Every day thousands of people suffer from diseases that are caused by consuming unsafe and unhygienic food. The most at risk include the very young, the elderly, persons who are already ill and pregnant women, Therefore, we have to give due emphasis to good hygienic practices to prevent and control **foodborne diseases**. These diseases result from eating foods that contain infectious or toxic substances. The food we eat should be free from contaminants such as microorganisms and chemicals.

This Unit introduces the principles of food safety and hygiene. You will also learn about food inspection, food premises inspection and how to write a food inspection report. This Unit does not cover meat inspection as HSAs are not legally mandated to conduct meat inspection in the country.

### **8.1.2 Intended Learning Outcomes**

Upon successful completion of this unit, learners should be able to:

- Define food safety and hygiene
- Explain the importance of food safety and hygiene practices
- Describe good food safety and hygiene practices in food premises
- Identify diseases associated with poor food safety and hygiene practices
- Describe common methods used during food inspection
- Identify specific defects on foods during food inspection
- Conduct food premises audits
- Write a food inspection report

### **8.1.3 Definition of Food Safety and Hygiene**

Food safety is closely related to food hygiene but it is a broader concept that means food is free from all possible contaminants and hazards. **Food safety** involves all those measures necessary to protect consumer health by protecting food from hazards i.e. anything that could cause harm. Food handlers must be aware of the hazards associated with their job and how these hazards can be controlled. Hazards may be microbiological (e.g. food contaminated by bacteria, viruses, moulds and parasites), physical (e.g. contamination of food with glass, stones, drawing pins or nails), chemical (e.g. contamination of food with pesticides and cleaning chemicals) or allergenic (contamination of food with peanuts or sesame seeds). **Food hygiene** refers to the many practices needed to safeguard the quality of food from production to consumption. The practices include storage, preparation, and cooking. Good food hygiene practices in these areas ensure that customers receive **food** that's **safe** and as described. Food hygiene is more than cleanliness; it includes all practices involved in:

- Protecting food from **risk of contamination**, including harmful bacteria, poisons and foreign bodies.
- Destroying any harmful bacteria in the food through cooking or processing;
- Disposing of unfit, unwholesome, unsound or contaminated food.

**Food safety and hygiene** usually refers to conditions and measures necessary to certify the safety of food from harvesting, processing, storage, distribution, transportation and consumption.

### 8.1.4 Importance of food safety and hygiene practices

#### 8.1.4.1 What is food?

Food consists of edible materials such as meat, bread and vegetables; it may be raw (like fresh fruit, or cooked, processed or semi-processed). Food is a nutritious substance eaten by us to maintain our vital life processes. It is a fundamental need, a basic right and a prerequisite to good health.

Food can be described in a number of different ways. Here are some terms you will find useful:

**Perishable food:** food items that have a short storage life and will become spoiled or contaminated if not preserved and handled properly, e.g. meat, eggs, milk, fruits, vegetables and the like.

**Non-perishable food:** foods which are not easily spoiled, e.g. sugar

**Wholesome food:** food which is sound, clean and free from harmful ingredients – it is suitable for human consumption.

**Food hazard:** food that is contaminated with biological, chemical or physical agents and, if eaten, will cause ill health.

Food is essential for the existence of all living things. Our bodies need food for energy production, to survive and to remain strong. For good health you need a balanced diet; this means that you don't just eat one foodstuff, but you eat a range of foods so that you can get everything your body needs. The health of children will be improved and they will grow taller if they are given a healthy, balanced diet rich in protein, energy and vitamins.

Food contaminated with food poisoning organisms looks, tastes and smells completely normal. **Food poisoning** is an acute illness, which usually occurs within one to 36 hours of eating contaminated food or poisonous food. Food poisoning maybe caused by: bacteria or their toxins; viruses, moulds, chemicals such as insecticides, cleaning agents and weed killers; metals such as lead, copper and mercury; poisonous plants, fish or shellfish. **Symptoms** normally last from one to seven days and include one or more of the following: abdominal pain (stomach cramps), diarrhoea, vomiting, nausea, fever, dehydration and collapse. The main reasons for **food poisoning** are negligence, ignorance, poor management and failure to implement good hygiene practices.

### 8.1.5 Diseases associated with poor food safety and hygiene practices

The following are some of the diseases/conditions associated with poor food hygiene practices:

- Cholera
- Dysentery (Bacillary, amoebic)
- Tuberculosis
- Typhoid
- Food poisoning
- Round worms (Ascariasis)

### 8.1.6 Food that is not safe to eat

Although food is essential for life and good health, there are some foods that are not safe to eat. Foods may either be adulterated or contaminated.

**Adulteration** is when the normal content of the food has been intentionally changed by adding something to it that is not essential; for example, diluting milk with water and selling it as whole milk. Adulterated food could be unsafe for a number of reasons. These include poor nutrition; watered-down milk is not as nutritious as whole milk. Unsafe ingredients may have been used, for example unclean water or other harmful ingredients might have been added deliberately.

**Contamination** is the undesired presence of harmful microorganisms or substances in food. Food can be contaminated by unhygienic practices in storage, handling and preparation, and may compromise food safety and palatability.

## **8.1.7 Principles of safe food preparation**

### **8.1.7.1 Why is it important to eat safe food?**

You need to be able to advise people in your community about the correct methods of food handling and preparation to ensure that food is safe to eat. The key principles for safe food preparation are outlined below.

- Choose foods that are not easily damaged by transportation, accidents or by storage.
- Cook foods thoroughly, especially meat because this can help to kill any microorganisms that might be present in the food.
- Eat cooked foods immediately after they are cooked, rather than leave them out and eat later. Delays in eating cooked food can lead to the growth and reproduction of microorganisms in the cooked foodstuff.
- Store cooked food carefully at an appropriate temperature. It should either be kept cold, ideally in a refrigerator, or it should be kept hot.
- If food must be reheated, be sure to reheat it thoroughly.
- Avoid contact between raw and cooked food.
- Wash hands properly before handling food and before eating.
- Keep all kitchen surfaces and utensils meticulously clean.
- Protect food from animals including insects, rodents and other animals.
- Use safe water in food preparation and for washing fruits and vegetables to be eaten raw

## **8.1.8 Good food safety and hygiene practices in food premises**

**Five** keys to safer food are:

1. Keep clean;
2. Separate raw and cooked;
3. Cook thoroughly;
4. Keep **food** at **safe** temperatures; and
5. Use **safe** water and raw materials.

## **8.1.9 Food inspection**

Food inspection is the process of finding out the wholesomeness of food other than meals to make sure that the food is safe for human consumption. It is also about detecting defects in storage, handling and processing of food.

### **8.1.9.1 Common foods in Malawian markets**

The following are common foods among others on Malawian markets;

- Fish
- Meat
- Fruits (mangoes, bananas, etc.)



- Maize
- Legumes (beans, groundnuts)
- Baked items (scones, bread, etc.)
- Milk (fresh, dry)
- Vegetables
- Canned foods

#### **8.1.9.2 Common defects on specific foods**

The following are the common defects on specific foods found in Malawi;

- Weevils
- Decomposition
- Discoloration
- Moulds
- Withered fresh leaves, vegetables)
- Other common infestations

#### **8.1.9.3 Methods used for inspecting food**

Common methods used for inspecting food are;

- **Percussion**

This is method that uses striking with a finger on the tin or two tins together. Listen to the sound. If sound is high pitched, then it is normal and the food may be safe for human consumption but if the sound is drum like then it is abnormal and the food may not be safe for human consumption.

- **Palpation**

This method uses the senses of touching and feeling. You feel for crepitation. If this is present, then the food may not be safe for human consumption.

- **Observation**

This is a method that uses eyes to check for swollen or concaved shape, in case of a can/tin, which indicates abnormality, withering of vegetables, rotten meat, fish or fruits; this may be an indication that the food is not safe for human consumption.

- **Smelling**

This method uses the sense of smell to check for rotten meat, fish or fruits. If a bad smell has been smelt, it may be indication that the food may not be safe for human consumption.

Apply the above-mentioned methods to conduct food inspection in your work area.

#### **8.1.9.4 Practical session of food inspection methods**

Emphasis should be on the three branches of Food Safety and Hygiene:

- The Food;
- The Food Handler; and
- The Premises

#### **8.1.9.5 Action to be taken after inspecting the food**

The action to be taken after inspecting the food will be in the form of:

- Advise the on how to make the food safe for human consumption
- Condemning the food
- Refer for further re-assessment by or advice to AEHO or EHO

#### **8.1.9.6 Food inspection report**

The findings and action taken after food inspection must be reported to appropriate authorities.

The report should include the following:

- Date and time of inspection
- Name of Inspectors and titles.
- Location
- Food inspected
- Quantity of food with defect/conditions
- Defect / conditions identified
- Action taken

#### **8.1.10 Auditing of food premises**

Food premises is a place where food is stored, prepared and served for consumption.

##### **8.1.10.1 The characteristics of good food premises**

Good food premises are characterized by a building which;

- Is in good state of repair (e.g. free from cracks, chips, leakage)
- Has adequate safe water
- Has good drainage system
- Has adequate ventilation
- Has adequate lighting

### **8.1.10.2 The objectives of food premises auditing**

The objectives of food premises inspection are basically two-fold:

- To improve hygiene standards
- To prevent the spread of food-borne diseases

### **8.1.10.3 Features to be checked during food premises auditing**

In all food premises there are specific features that need to be checked to make the process complete. Therefore, during food premises inspection, check the following:

- Condition and cleanliness of the walls, floor, roof and furniture, doors and windows
- Presence of infestations
- Business license
- Medical certificates for food handlers
- Proper disposal or refuse and excreta
- Presence of adequate water supply (Include source of water, storage practices and quantity).

**NB:**

- Report inspection findings to your supervisor

### **8.1.10.4 Defects in food premises**

The following defects in food premises need to be recognized during the inspection:

- Poor drainage system
- Lack of excreta and refuse disposal facilities
- Lack of vector or vermin proofing
- Inadequate ventilation and lighting
- Dirty, peeled off walls
- Chipped floors
- Broken windows
- Signs of leaking roofs
- Presence of cobwebs

### **8.1.14.4 Procedure of food premises auditing**

The proper procedure for inspecting food premises should start by introducing yourself (produce work identity card, if available), then ask the owner to take you round checking the following;

- Business license

- Food storage facilities
- Condition of building
- Condition of furniture
- Condition of the surrounding or sanitary facilities
- Food handlers, medical certificates

While undertaking an auditing, give advice on the spot accordingly.

#### ***8.1.14.5 Inspection of food handling practices***

##### **Food handler**

- Name of food handler
- Taking daily bathe
- Oral cleanliness
- Washing of beddings and clothes
- Cutting nails and hair short
- Proper hair dressing
- Washing hands

##### **Food handling practices**

- Washing hands before handling the food
- Use of clean utensils

#### **8.1.14.6 Writing a food inspection report**

After conducting the inspection, a report must be made available to appropriate authorities and the report should include the following:

- Name of the food premises
- Name of the owner
- Date of inspection
- Location of the premises (Physical address)
- Defects and other conditions of the building identified
- Advice given
- Date of follow up or notice
- Name of HSA

## 8.1.11 Food fortification

### 8.1.11.1 Definition

**Food fortification** is the practice of adding vitamins and/or minerals (micronutrients) to **foods** and condiments, to improve their nutrient content. **Fortification** is the practice of deliberately increasing the content of an essential micronutrient, i.e. vitamins and minerals (including trace elements) in a food, so as to improve the nutritional quality of the food supply and provide a public health benefit with minimal risk to health

### 8.1.11.2 Why is fortification important?

The importance of fortification is to maintain the nutritional quality of **foods**, keeping nutrient levels adequate to correct or prevent specific nutritional deficiencies in the population at large or in groups at risk of certain deficiencies (i.e., the elderly, vegetarians)

### 8.1.11.3 Methods of food fortification

- Commercial and industrial fortification (**wheat flour**, corn meal, cooking oils)
- Bio fortification (breeding crops to increase their nutritional value, which can include both conventional selective breeding, and genetic engineering)
- Home fortification (example: vitamin D drops)

### 8.1.11.4 Micronutrients that are monitored

- Iodine in salt
- Vitamin A in cooking oil, sugar
- Zinc in wheat
- Iron in maize flour and wheat flour

### 8.1.11.5 Procedures for monitoring micronutrients

Every three months:

- Carry out food premises auditing
- During premises auditing collect samples for monitoring levels of micronutrients in food
- Do rapid tests for iodine at the point of sample collection
- Collect salt samples for each brand for further analysis
- Collect samples from other food vehicles such as maize flour, sugar, cooking oil, wheat flour ensure collect packaging of samples
- Proper labelling must be done

- Safely transport samples to the district for quantitative analysis
- Ensure adequate quantities of samples are collected per each brand.
- Advise shop owners or sellers about proper storage and right packing

### 8.1.15 Summary of Unit 1

In Unit 1, you have learned that:

1. Globally, people are seriously affected every day by diseases that are caused by consuming unsafe and unhygienic food.
2. Food is any nutritious substance eaten to maintain vital life processes. Food is important for human beings and affects human physiological activity, growth, repair and energy, and psychological and social relations.
3. Food hygiene and safety issues are not separate from human health concerns or from community health issues. Good food hygiene practices can protect the community from foodborne illness.
4. Different food safety terminologies like food safety and hygiene, wholesomeness of food, food contamination, perishable and non-perishable foods are important for our understanding
5. Categories of unsafe food include adulterated food, unwholesome food and contaminated food.
6. Important principles for safe food preparation include having clean hands, clean surfaces, adequate cooking time and the correct conditions for food storage, among others.
7. Percussion, palpation, observation and smelling are common methods used in food inspection.
8. The three branches of food safety and hygiene are the food itself, the food handler and the premises.  
Findings of food and premises auditing must be reported to appropriate authorities and stakeholders for action.
9. The objective of food fortification is to maintain the nutritional quality of foods, keeping nutrient levels adequate to correct or prevent specific nutritional deficiencies in the population at large or in groups at risk of certain deficiencies

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## Unit 2          Personal Hygiene

### 8.2.1 Introduction

Personal hygiene is an important aspect in the promotion of health, prevention of diseases and enhancement of social status in the community because it complements other aspects of sanitation. The prevention of communicable diseases, like diarrhoea, trachoma and many others is highly possible through the application of proper personal hygiene. This Unit will also help you to understand the links between personal hygiene and one's dignity, confidence and comfort.

### 8.2.2 Intended Learning Outcomes

Upon successful completion of this unit, students should be able to:

- Define personal hygiene.
- Describe the importance of personal hygiene.
- List diseases and conditions associated with poor personal hygiene
- Explain the components of personal hygiene.
- Describe hygienic handwashing using standard procedures.
- Advise the community on good personal hygiene practices.

### 8.2.3 What is personal hygiene?

**Personal hygiene** is a concept that is commonly used in medical and public health practices. It is also widely practiced at the individual level and at home. It involves maintaining the cleanliness of our body and clothes. Personal hygiene is personal, as its name implies. In this regard, personal hygiene is defined as a condition promoting sanitary practices to the self. Everybody has their own habits and standards that they have been taught or that they have learned from others. Generally, the practice of personal hygiene is employed to prevent or minimise the incidence and spread of communicable diseases.

#### 8.2.3.1 Difference between cleanliness and hygiene

The term **cleanliness** should not be used in place of hygiene. Cleaning in many cases is removing dirt, wastes or unwanted things from the surface of objects using detergents and necessary equipment. Hygiene practice focuses on the prevention of diseases through the use of cleaning as one of several inputs. For example, a janitor cleans the floor of a health Centre using detergent, mop and broom. They might also use chlorine solution to disinfect the floor. The cleaning process in this example is the removal of visible dirt, while the use of chlorine solution removes the invisible microorganisms. Hygienic practice encompasses both cleaning for the removal of physically observable matters *and* the use of chlorine for the removal of microorganisms. The hygiene practice in this example aims at preventing the spread of disease-causing organisms. Cleaning is a means to achieve this task.



## **8.2.4 importance of personal hygiene**

The knowledge and practice of personal hygiene are vital in all our everyday activities. The purposes are:

### **8.2.4.1 Preventing faeco-orally transmitted diseases**

The fingers may get contaminated with one's own faeces, either directly or indirectly. Activities during defecation and child bottom-washing are additional opportunities for the contamination of the fingers that facilitate the transmission of infections.

### **8.2.4.2 Aesthetic values of personal hygiene**

A person with clean hands is proud while eating because they feel confident of preventing diseases. A teacher in a school is always happy to see their students with clean faces and eyes, and dressed in clean clothes. A mother is mentally satisfied to feed her infant with clean hands because she ensures the preservation of her child's health. Generally, cleaning oneself produces pride, comfort and dignity at home and in public places. Caring about the way you look is important to your self-esteem.

### **8.2.4.3 Social impact**

A person with poor personal hygiene might be isolated from friendship because telling the person about the situation might be sensitive and culturally difficult. The success of a job application or the chance of promotion could be affected by poor personal hygiene; no company wants to be represented by someone who does not appear to be able to look after themselves.

## **8.2.5 Components of personal hygiene**

### **8.2.5.1 Body hygiene (skin care)**

The body has nearly two million sweat glands. Moistened and dried sweat and dead skin cells all together make dirt that sticks on to the skin and the surface of underclothes. The action of bacteria decomposes the sweat, thereby generating bad odour and irritating the skin. This is especially observed in the groin, underarms and feet, and in clothing that has absorbed sweat. Skin infections such as scabies, pimples and ringworm are results of poor body hygiene. Figure 8.2.1 shows ringworm of the scalp (*Tinea capitis*).



### Figure 8.2.1 Scalp *Tinea capitis* (scalp ringworm)

The first task in body hygiene is to find water, soap and other cleansing materials. Taking a bath or a shower using body soap at least weekly is very important to ensuring our body stays clean (Figure 2.2). Bathing can be every day or after periods of sweating or getting dirty. The genitals and the anal region need to be cleaned well because of the natural secretions of these areas. Dry the body with a clean towel after thorough rinsing. Change into clean underwear after a bath. Changing sweat-soaked clothes after each bath is advised. Cleaning the ears after every bath is also necessary. Avoid sharing soaps and towels because of the danger of cross-infection.



Figure 8.2.2 Body washing

### 8.2.5.2 Oral hygiene (oral care)

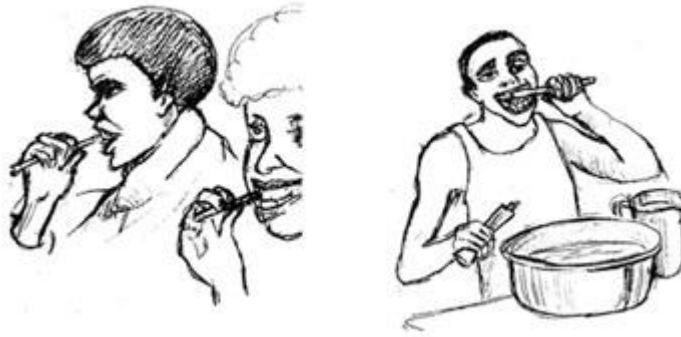
The mouth is the area of the body most prone to collecting harmful bacteria and generating infections. Our mouth mechanically breaks food into pieces. This process leaves food particles (food debris) that stick to the surface of our gums and teeth. Our mouth cavity is full of bacteria and is a good environment for bacterial growth.



#### ACTIVITY

- Why is the mouth a good environment for bacterial growth?

Advice for keeping the mouth clean (Figure 8.2.3) is:



**Figure 8.2.3 Mouth cleaning**

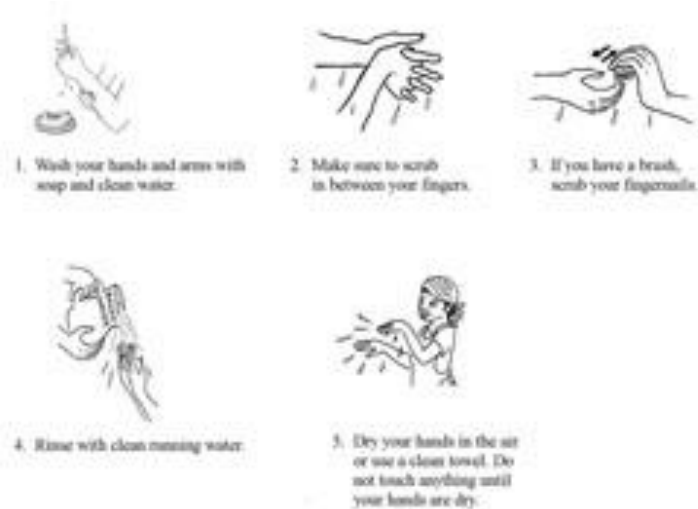
- Rinse the mouth after each meal.
- Brush your teeth with a fluoride-containing toothpaste twice a day – before breakfast and before you go to bed. Cleaning the mouth with twigs is possible if done carefully.
- During the day, fill your mouth with water and swish it around to get rid of anything sticking to your teeth.
- In addition to regular brushing, it is advisable to floss your teeth at least once a day, usually before you go to bed.

### **8.2.5.3 Handwashing (hand care) with soap**

The cleanliness of our hands is very important in all our daily activities. In our normal activities our hands frequently get dirty. There are many situations in which microorganisms are likely to attach to our hands along with the dirt. There are many communicable diseases that follow the route of faeco-oral transmission. Hand hygiene plays a critically important role in preventing this transmission.

**Handwashing** with soap involves the mechanical removal of microorganisms from contaminated hand surfaces using soap or detergent. Handwashing should involve more than a quick rinse under a tap (faucet) or in running water.

Figure 8.2.4 shows the standard handwashing technique to ensure that the hands are properly washed and it doesn't take long to complete.



**Figure 8.2.4 Handwashing technique**

- First wet your hands with clean water and lather with a bar of soap.
- Next rub your hands together vigorously and scrub all surfaces up to your wrists.
- Clean under your fingernails.
- Continue for 15–30 seconds or about the length of a little tune (for example, the ‘Happy Birthday’ song). It is the soap combined with the scrubbing action that helps dislodge and remove germs.
- Rinse your hands well with clean running water (pour from a jug or tap).
- Dry your hands in the air to avoid recontamination on a dirty towel – do not touch anything until your hands are dry.
- Wood ash will also rub off any dirt and smells. The slight irritation you feel when you wash your hands with ash shows the cleansing power of ash.
- Clean sand with water can be used for handwashing to help to rub off dirt.

If you don’t have soap, you can use alternatives. These serve the same purpose as the soap, to help ‘scrub’ what is stuck on your hands, so the running water can brush it off. To get clean hands, you must POUR the water over your hands (no dipping in a bowl!). The soap or ash ‘lifts’ the dirt, and the water then washes off the visible dirt and the invisible germs. Various options for handwashing are indicated in Figure 8.2.5.



**Figure 8.2.5 Handwashing (cleaning)**

As well as routine personal hygiene that applies to everyone, your daily work will include many situations when you may ask yourself when you need to wash your hands. To know when to wash your hands at home and at work, you must first identify **critical situations**; that is, situations, activities or incidents that indicate the possibility that pathogenic microorganisms are present on hands, fingers and nail surfaces.

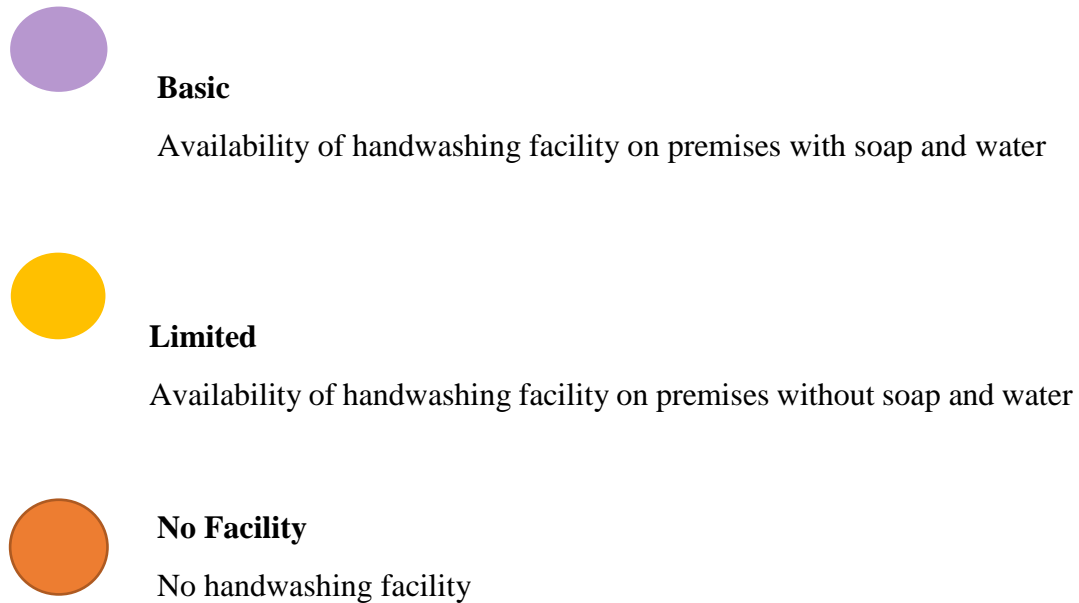
Critical situations in everyday activity include:

- After using the toilet (or disposing of human or animal faeces)
- After changing a baby's diaper (nappy) and disposing of the faeces.
- Immediately after touching raw food when preparing meals (e.g. chicken or other meat).
- Before preparing and handling cooked/ready-to-eat food.
- Before eating food or feeding children.
- After contact with contaminated surfaces (e.g. rubbish bins, cleaning cloths, food-contaminated surfaces).
- After handling pets and domestic animals.
- After wiping or blowing the nose or sneezing into the hands (respiratory hygiene).
- After handling soiled tissues (your own or others', e.g. children).
- After combing your hair

Critical situations for handwashing in healthcare activity include:

- Before and after contact with an infected wound.
- After contact with blood or body fluids (e.g. vomit).
- Before and after dressing wounds.
- Before giving care to an ‘at risk’ person (e.g. attending delivery, attending a baby).
- After giving care to an infected person.

Figure 8.2.1 shows the handwashing ladder. Handwashing with soap is the most desirable.



**Figure 8.2.1 Handwashing ladder**

**Note:**

- Handwashing facilities may be fixed or mobile and include a sink with tap water, buckets with taps, tippy-taps, and jugs or basins designated for handwashing.
- Soap includes bar soap, liquid soap, powder detergent, and soapy water but does not include ash, soil, sand or other handwashing agents.

#### **8.2.5.4 Face hygiene**

Our face reveals our daily practice of personal hygiene. Face hygiene includes all parts of the face. The most important area to keep clean is the eyes. The eye discharges protective fluids that could

dry and accumulate around the eye. They are visible when a person gets up in the morning. The organic substance of the eye discharge can attract flies and this is dangerous because the fly is a carrier (vector) of trachoma and conjunctivitis.

A person should wash their face every morning in order to remove all dirt that they have come in contact with during the course of the day. This will keep your face clean all day. Children are advised to wash their face frequently. Never share your face towel with others.

#### **8.2.5.5 Fingernail and toenail hygiene (nail care)**



##### **ACTIVITY**

- **Why is it inadvisable to share a face towel?**

A nail is hard tissue that constantly grows. Long fingernails tend to accumulate or trap dirt on the underside. The dirt could be as a result of defecation or touching infected and contaminated surfaces. Keeping nails trimmed and in good shape weekly is important in maintaining good health. Clip nails short along their shape but do not cut them so close that it damages the skin. Razor blades and fingernail cutters or scissors are used to cut nails. Nail cutters should not be shared with others.



##### **ACTIVITY**

- **Why is it inadvisable to share nail cutters?**

#### **8.2.5.6 Ear hygiene**

Ear wax accumulates in the ear canal that leads from the outer ear to the ear drum. As the secretion comes out of the ear it collects dust particles from the air. Daily washing with soap and water is enough to keep the outer ear clean. Do not reach farther than you can with your little finger into your ear. Putting in hairpins, safety pins or blunt-edged things for cleaning purposes might harm

the ear. If you feel wax has accumulated and is plugging your ears and interfering with hearing, consult your doctor.

### 8.2.5.7 Hair hygiene (hair care)

The hair follicles from which the hair grows produce oil from the sebaceous glands that keeps the hair smooth. The scalp (the skin covering the head) also has numerous sweat glands and is a surface for the accumulation of dead skin cells. The oil, sweat and dead cells all add together and can make the hair greasy and look dirty unless you wash it regularly.

Poor hair hygiene could cause dandruff and skin infections such as *Tinea capitis* (see Figure 3.1). Dandruff is dead skin on the scalp that comes off in tiny flakes when sebaceous glands produce too much oil and accumulates on the scalp.



**Figure 8.2.6 Hair cleaning**

Head hair is a good harbour for head lice (*Pediculus humanus capitis*) and nits (eggs of head lice). The head louse is a tiny insect that lives by sucking blood. Children are especially prone to lice infestation. Lice spread from one head to another when there is close contact as in school environments. They make the scalp itchy and are a cause of annoyance, irritation and embarrassment. Shaving of the head hair is possible in cases of heavy lice infestation. Sharing of blades with others, however, should be discouraged.

Hair cleaning (Figure 2.6) is important to ensure it stays clean, healthy and strong.

The recommended procedures for cleaning the hair are:

- Use clean water to wash your hair regularly (at least twice weekly, preferably once every other day) with body soap or shampoo, whichever is available.
- Massage your scalp well. This will remove dead skin cells, excess oil and dirt.
- Rinse well with clear water.
- Conditioner is helpful if you have longer hair as it makes the hair smoother and easier to comb, but hair doesn't need to have conditioner.
- Use a wide toothed comb for wet hair as it is easier to pull through.



- Dry the hair and the head with a clean towel. Never share a towel with someone else.
- Comb the hair to look beautiful for the day.

### **8.2.5.8 Foot hygiene (foot care)**

We spend a lot of time on our feet. Our feet sweat as we walk day and night and the sweat accumulates on all foot surfaces and between the toes. The sweat may stain the shoes and can produce an awful odour.



#### **ACTIVITY**

- **What causes sweat on the skin to produce an unpleasant odour??**

### **8.2.5.9 Armpit and bottom hygiene**

These are body parts that easily get sweaty and where ventilation is very poor. After puberty, our sweat gains a specific and unpleasant odour which may be offensive to others. The armpits and the bottom should be washed daily.

Anal cleansing is the hygienic practice of cleaning the anus after defecation. The anus and buttocks may be cleansed with clean toilet paper or similar paper products. Water may be used. Hands must be washed with soap afterwards. The use of rags, leaves, stones, corn cobs, or sticks must be discouraged as these materials can damage the skin.

### **8.2.5.10 Clothes hygiene**

We usually have two layers of clothing. The internal layer is underwear (or underclothes) such as pants, vest and T-shirt. These are right next to our skin and collect sweat and dead skin cells, which can stain the cloth. Bacteria love to grow on this dirt and produce a bad smell in addition to the specific odour of the sweat. Underwear must be washed more frequently than the outer layer of clothing.

Clothes hygiene is an important aspect of one's dignity. Changing used clothes for clean ones every day is recommended. Washing dirty clothes requires adequate clean water, detergents (solid or powdered soap) and washing facilities (Figure 8.2.7). If possible, the washed clothes should be ironed to help the destruction of body lice and nits. Boiling water or insecticides can be used to destroy clothes infestation.



**Figure 8.2.7 Washing clothes in rural areas (a) by a river and (b) at a communal washbasin**

Frequent changing into clean clothes might not always be possible in poor households. However, the frequency of changing is advised to be twice a week for internal wear and 12 times per week for outerwear. The frequency mainly depends on the intensity of dirt on the clothes, and that depends on the climate and type of activity.

### **Menstrual hygiene (personal hygiene for girls and women)**

#### *Physiological difficulties a girl may encounter during menstruation*

The difficulties that girls may experience during menstrual on are:

1. Irregular periods
2. Heavy periods
3. Painful periods

**Irregular Periods:** For the first few years of menstruation, cycles are often irregular. They may be shorter (3 weeks) or longer (6 weeks). A young girl may even have only three or four periods a year. A girl's cycles will usually become regular within two to three years after menarche.

**Heavy periods:** A heavy period is one which lasts longer than eight days, saturates the napkin within an hour or includes large clots of blood in the menstrual flow. This is common in adolescents because of slight imbalance in chemical hormones secreted by the body. However, if this happens regularly, it leaves the girl feeling exhausted; which means that the body is losing more blood than it is producing. The girl should then consult a doctor immediately.

**Painful period:** Slight pain during periods is quite normal. This is due to the secretions of a chemical called prostaglandins in larger quantity than normal. This leads to nausea, headaches, diarrhoea and severe cramps. Usually, this lasts only for a day or two. To get relief from these symptoms, a girl should try the following methods:

- Fill a plastic bottle with hot water, wrap it in a towel and place it on the abdomen,
- Massage the abdomen
- Local remedies such as ginger tea can be taken

### **Menstrual Hygiene Practices**

- The vagina is able to clean itself; no special care is needed other than washing the external genitals with clean water must be a daily practice
- Bathe at least once daily.
- Ensure that undergarments and sweat drenched clothes are changed regularly.
- Cotton panties are preferable to synthetic ones as the latter hold in moisture and heat making it a breeding ground for bacteria.
- Change napkins and cloth periodically at least 3 to 4 times per day (preferable, after every 6 hours). Most importantly, once wet, the napkin/cloth should be changed immediately.
- Clean and soft cloths can be used in place of sanitary pads. The use of dirty cloths must be discouraged.
- Wash the genital area after each use of the toilet, also after urinating. Cleaning of genitals and wiping from front to back after using toilet and after urinating
- Keep the area between the legs dry otherwise soreness and chaffing may develop.
- Some amount of body odour is natural but regular bathing, washing and changing of cloths/napkins will ensure that it is not noticeable.
- During menstruation, the outer genitals should be washed from time-to-time to remove any blood that is left.
- Girls should wash their hands every time they change the napkin.
- If the underwear is soiled, it must be changed. Otherwise this makes bacteria to grow and cause infection.

- If a girl's panties or clothes get stained with blood, she can soak them in cool, mildly salty water before washing. Hot water will cause the blood to set and remain as a permanent stain.

### **8.2.6 Good personal hygiene practices**

The community needs to be advised on good personal hygiene practices. Good personal hygiene practices include:

- Taking daily baths
- Oral cleanliness every morning and after a meal on a regular basis
- Washing hands frequently
- Cutting nails and hair short
- Proper hair dressing
- Putting on clean clothes. Dirty clothes should be washed with laundry soap before wearing them again
- Hanging clothes in the sun to dry. The sun's rays will kill some disease-causing germs and parasites
- Turning away from other people and covering the nose and mouth with a tissue or the hand when coughing or sneezing. If this is not done, droplets of liquid containing germs from the nose and mouth will be spread in the air and to other people

### **8.2.7 Diseases and conditions associated with poor personal hygiene**

The following are diseases and conditions associated with poor personal hygiene;

- Scabies
- Eye infection
- Lice infestation
- Diarrhoea
- Typhus fever
- Tuberculosis
- Scurvy
- Bad smell

### 8.2.8 Summary of Unit 2

In Unit 2, you have learned that:

1. Personal hygiene is a necessity for our daily activities. It is very important for the protection of our health and helps to prevent the spread of communicable diseases.
2. The term cleanliness is not the same as hygiene and therefore these terms should not be used interchangeably.
3. Personal hygiene has social and aesthetic values. An individual who follows the practice of proper personal hygiene gains confidence, pride and dignity.
4. Personal hygiene applies to all parts of the body, but hand hygiene (handwashing) is probably the most important for public health.
5. The procedures that apply in personal hygiene (such as handwashing and oral hygiene) need to be followed strictly to gain the best results.
6. The community needs to be advised on good personal hygiene practices and some of the areas that need to be emphasised.

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## **Unit 3      Pollution Control**

### **8.3.1    Introduction**

There is always an interaction between man and his environment. Some of man's activities pollute the environment. The activities are carried out for man's survival. In the process, the decay of the environment grows daily.

### **8.3.2    Intended Learning Outcomes**

Upon successful completion of this unit, students should be able to:

- Define pollution
- List sources of pollution and their categories
- Explain the effects of pollution on human health
- Describe the prevention and control measures of pollution

### **8.3.3    What is pollution?**

Pollution is the introduction of contaminants into an environment causing harm, instability or disorder to the ecosystem. (An ecosystem includes all the living organisms (plants, animals, microorganisms) and their physical environment and the interactions between them.) Pollution can be also defined as the presence of a substance in a medium or environment that results in a change to its 'natural' state, potentially causing an adverse effect. Pollution, however, is not simply the introduction of contaminants. There is always a response in the form of modification or change in the environment. From this standpoint, pollution is the harm that results because substances are present where they would not normally be found, or because they are present in larger than normal quantities. Contaminants are not necessarily pollutants. A contaminant is a minor substance, material or agent that is unwanted in the environment and may or may not be harmful. A pollutant is a contaminant which, due to its properties or amount or concentration, causes harm. Gases (carbon monoxide, ozone, and nitrogen dioxides), chemical vapours, dust particles, fumes and liquid chemicals (pesticides, solvents, drugs, acids, etc.) are examples of potential pollutants of air and water ecosystems.

### **8.3.4    Pollution sources and categories**

Pollutants can come from natural or man-made sources. Examples of natural sources of pollution are volcanoes which give out ash and dust into the atmosphere and metals such as arsenic which are naturally present in some rocks and soils. Man-made pollutants can come from industrial, domestic (home), transport and agricultural sources.

#### 8.3.4.1 Pollution sources

**Industrial sources:** sewage discharged into water bodies; air emission of smoke released to the atmosphere (see Figure 8.3.1).

**Domestic sources:** cooking and heating that releases smoke to the atmosphere. Solid waste and liquid waste are other forms of pollutants that can be released to water bodies and soil.

**Transport:** discharge of air pollutants from various types of vehicles. Heavy trucks and diesel engine vehicles are much more polluting than a petrol engine.

**Agricultural sources:** organic wastes such as agriculture residues, animal dung and wastes from agriculture-based plants.



**Figure 8.3.1 Air pollution from an industrial source**

#### 8.3.4.2 Pollution categories

Pollution can take many forms. The air we breathe, the water we drink, the soil where we grow our food, and even the increasing noise we hear every day all contribute to health problems and a lower quality of life. Pollution can be classified as:

- **Air pollution:** the release of chemicals and particulates into the atmosphere.
- **Water pollution:** the release of wastes, chemicals and other contaminants into surface and groundwater.
- **Soil pollution:** the release of wastes, chemicals and other contaminants into soil.

- **Radioactive pollution:** presence of radioactive substances in the environment.
- **Noise pollution:** unacceptable levels of noise in work, residential and recreational places.
- **Thermal pollution:** the release of heat into the environment; for example, heated water into a river.

#### **8.3.4.2.1 Air pollution**

This occurs with the release of chemicals in gaseous or dust form into the atmosphere. Household cooking, industries, vehicles and incinerators are common sources of air pollution.

#### **8.3.4.2.2 Water pollution**

Water can be polluted by the release of liquid waste (human, animal or industrial) into rivers, streams and lakes. A common type of water pollution is organic material such as human and animal wastes and waste water from food processing. These wastes can be removed from rivers and lakes by the self-cleaning processes described above but, if present in large quantities, the biodegradation process can reduce the level of dissolved oxygen in the water so much that fish and other aquatic life cannot survive. As well as these environmental impacts, water contaminated with human waste is a significant cause of many diseases that will be described in more detail elsewhere in this Manual. Some pollutants can be extremely harmful even if they are taken in small quantities and may cause cancer, reproductive health effects (abortion, embryo malformation, birth defects) or nerve damage when the contaminated water is consumed.

#### **8.3.4.2.3 Land/soil pollution**

This occurs when land is used as a site for accumulating wastes that are generated from various sources (industry, agriculture, health facilities, and villages, private and public organisations). These wastes may be biologically, chemically or physically hazardous to plants and animals. The pollution by chemicals such as pesticides may have long-term consequences, such as groundwater pollution.

### **8.3.5 Principles of pollution management**

There are two main approaches to pollution management:

**Pollution prevention:** focuses on stopping pollution being produced in the first place, or reducing any waste generation at the source.

**Pollution control:** those measures taken to control pollution and wastes after they have been generated or produced.

#### **8.3.5.1 Principles of pollution prevention**

There are a number of principles of pollution prevention; we will briefly discuss some of them.



**Principle of waste minimization:** The motto in this principle is ‘Do not produce any waste; if this is not possible, reduce or minimise waste generation as much as possible’. There are three ‘Rs’ that are applied in waste minimization: Reduce, Reuse and Recover. Figure 8.3.2 shows the hierarchy or the order in which the waste minimization options should be used. Reduction refers to changing the process so that waste is not produced in the first place. Reuse involves using an item more than once (for example you can reuse plastic bottles for collecting water). Recovery involves recovery of materials or energy through recycling, composting and incineration. An example of recycling is taking used aluminium cans (tin cans) and recycle the metal to make it into something else. In composting we can take waste organic matter and make it into useful compost for fertiliser. Through incineration (burning), we can recover the energy contained in waste materials.

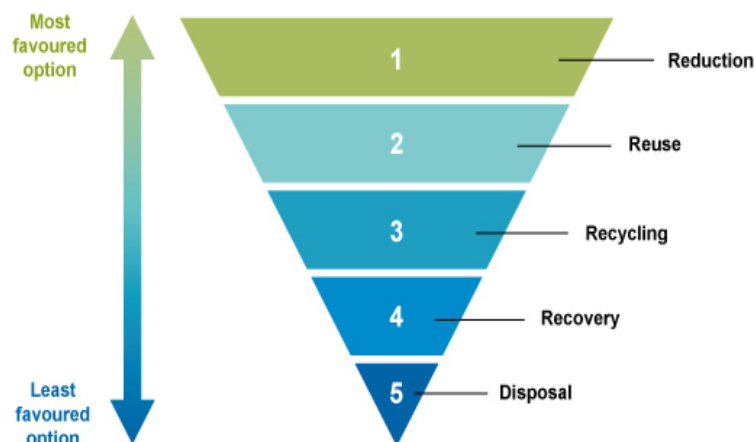


Figure 8.3.2 The waste management hierarchy

In Figure 8.3.2, waste management options are listed in order of desirability from most desirable at the top to least desirable at the bottom.

**Polluter pays principle:** This principle identifies the people or organisations who generate or produce waste or pollution as those who are accountable for any human or ecological damage. They are responsible for paying the costs of any damage. The principle is an economic tool to enforce accountability and responsibility. Strict standards for pollutant discharge permissions and enforcing heavy taxation on products or waste handling are ways of making the polluter pay.

**Principle of ‘Cradle to Grave’:** This principle applies to the production of any object or to any activity by an individual or institution and all the pollution that object or activity might cause throughout its lifecycle; that is, from its ‘cradle’ to its ‘grave’. For example, if you make a plastic bottle, pollution might be caused in the manufacturing process; pollution is also caused by the lorries that transport the bottles around the country; and pollution is caused when the bottle is thrown away. All these aspects should be taken into account.

**Precautionary principle:** For any activity, there is an obligation not to cause harm even when someone is uncertain about the effect of the activity on humans and the environment. Under this principle, you take precautions to avoid environmental damage, even if you are not certain that damage will result. The application of waste minimisation is an example.

**Principle of duty of care:** Any person or organisation that produces waste, i.e. a waste generator, has a citizenship and ethical obligation to handle their waste properly. They have a duty to ensure that it does not harm other people or the environment.

**Principle of discharge/emission permit:** A waste generator has an obligation to obtain permission from the regulatory authority in order to discharge waste to surface water and to the atmosphere.

**Principle of sustainable development:** Sustainable development is *‘development which meets the needs of the present without compromising the ability of future generations to meet their own needs’*. You could think of this as friendly coexistence where people and the environment sustain each other. Sustainable development requires people to carry out environmental mitigation (lessening the damaging effects) for newly developed factories, dams, irrigation schemes and other undertakings as prescribed by law.

**Principle of the right to know:** The public has the right to information about pollution from a particular process. Public participation at various stages of project development avoids mistrust and the consequences of conflicts of interest.

### **8.3.5.2 Pollution control**

Pollution prevention through various applicable principles and methods is not always possible and the consequence is that some pollution is produced. If pollution is produced, there should be some

measures to control it and minimise the effects on people and the environment. The application of waste treatment before disposal, restricting contact between the waste and the public, and monitoring and evaluating the effect of the waste on the immediate environment are some of the intervention options in waste control.

### **8.3.6 Summary of Unit 3**

In Unit 3, you have learned that:

1. Contamination and pollution are different; uncertainty of damage is a characteristic of contamination, while there is certainty of harm in the case of pollution.
2. Industries, domestic, transport and agriculture sectors are the major sources of pollution.
3. The environment has a natural self-cleaning process. Pollution occurs when the self-cleaning process is defeated. The consequence of water, air and soil pollution is damage to the environment and to humans.
4. Pollution management is an extension of hazard management with the focus on pollution prevention and control. Pollution prevention and control principles address various concepts including accountability, responsibility, and economic and environmental liability.
5. There are a number of principles of pollution prevention which include: 1) principle of waste minimization, polluter pays principle, principle of “cradle to grave”, precautionary principle, principle of duty of care, principle of discharge/emission permit, principle of sustainable development and principle of the right to know.
6. Pollution prevention through various applicable principles and methods is not always possible and the consequence is that some pollution is produced which must be controlled.

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## **Unit 4     Water Supply**

### **8.4.1 Introduction**

Water is Life. The provision and use of safe water promotes the health of people and contributes to the prevention and reduction of waterborne diseases in the community.

This Unit therefore aims at providing the learner with basic knowledge and skills in the improvement of the quality of water in order to enable the learner educate the community on the selection of safe water sources, protection of water sources and water quality improvement.

### **8.4.2 Intended Learning Outcomes**

Upon successful completion of this unit, students should be able to:

- Define water supply
- Outline diseases and conditions associated with poor water supply
- Advise on selection of safe water sources
- Organize the protection of water sources
- Conduct water chlorination
- Educate on water quality surveillance
- Train the community on water source protection

### **8.4.3 Definition of Water Supply**

Water supply is the provision of [water](#) by [public utilities](#), commercial organisations, community endeavors or by individuals, usually via a system of pumps and [pipes](#). Whatever the source of water, a water supply system is required to provide safe water (water free from biological, physical and chemical contaminants) and in adequate quantities to satisfy demand.

### **8.4.4 Diseases and conditions associated with poor water supply**

Water is a source of diseases because most of the occurring community diseases are water borne, water washed, water based or water related vector borne diseases. The following are the common diseases and conditions associated with water pollution:

#### **8.4.4.1 Water Borne Diseases**

These are diseases that are transmitted when water which is contaminated with infectious disease-causing organisms is consumed. Improved water quality such as boiling, treatment with chemicals and filtration can help reduce the transmission of water borne diseases. Examples are:

- Cholera
- Typhoid
- Diarrhoea

#### **8.4.4.2 Water Based Diseases**

These are diseases in which the causative organism must spend a portion of its life cycle in an aquatic animal before developing into infective larvae. They are transmitted when infective larvae are consumed with drinking water or when they penetrate the human skin. Improved sanitation helps to restrict these organisms from getting into the water. Examples of such diseases are:

- Schistosomiasis
- Guinea worm

#### **8.4.4.3 Water Washed Diseases**

These are diseases that are spread when personal and domestic hygiene is inadequate. This can be due to inadequate supply of water. Infective organisms are transmitted through dirty hands, utensils, food, towels etc. These are aggravated when excreta disposal is indiscriminate and domestic water supply is inadequate. Improved supply of water quantity can reduce the transmission of these diseases. Examples of such diseases are:

- Trachoma
- Scabies

#### **8.4.4.4 Water Related Vector Borne Diseases**

These are diseases in which the organism is spread by the bite of insects, especially mosquitoes, part of whose life cycle is spent in water and which in some cases live in polluted water that provide breeding places for these insects. It is necessary to eliminate sources of water where mosquitoes breed to reduce the occurrence and spread these diseases. Examples of these diseases are;

- Malaria
- Yellow fever

## **8.4.5 Selection of safe water sources**

### **8.4.5.1 Sources of water supply**

The common sources of water supply are:

- Rainfall – rainwater harvesting
- Surface water – lakes, rivers
- Underground water – wells, bore holes and springs

### **8.4.5.2 Water quality surveillance on existing water source**

Water quality surveillance on existing water sources should emphasize on the following aspects:

- Quantity of water
- Source of pollution
- Distance from user
- Water quality testing
- Ease of protection

## **8.4.6 Water quality testing**

Water quality testing can be done by using various methods. One of the methods is known as hydrogen sulfide (H<sub>2</sub>S) strip testing. H<sub>2</sub>S strip testing is a simple method developed to detect evidence of fecal contamination in drinking water. The H<sub>2</sub>S test was developed with purpose to meet criteria of: a simple and reliable field test for use by village public health workers to detect fecal contamination in drinking water. It was observed that the presence of coliform bacteria in drinking water was consistently associated with organisms that produce hydrogen sulfide (H<sub>2</sub>S). The test is based on the readily observable formation of an iron sulfide precipitate on a paper strip (or in the water sample liquid) in a bottle or test tube, as a result of the reaction of H<sub>2</sub>S with iron. The test is intended to detect bacteria associated with fecal contamination due to the activity of these microorganisms in reducing organic sulfur to the sulfide oxidation state (as H<sub>2</sub>S gas) which then reacts rapidly with iron to form a black, iron sulfide precipitate.

Consider also introducing the quantitative tests and do not restrict the testing to qualitative test. The reason is that they will be at times required to collect water samples for quantitative analysis hence their knowledge on that too.

#### 8.4.6.1 Advantages of this method

The advantages of the method include:

- It is simple,
- It is affordable because has low cost
- It has ability to be performed in the absence of a typical microbiology laboratory or field laboratory test kit.

#### 8.4.6.2 What H<sub>2</sub>S Tests Measure and How They Measure It

The H<sub>2</sub>S method also, commonly called **the paper strip method**. The tests do not consistently measure the presence of either total coliform bacteria, specific groups of fecal bacteria (e.g., fecal coliforms) or a specific fecal bacterium (*E. coli*). The test is based on measuring bacteria that produce hydrogen sulfide under the test conditions employed. However, some coliform bacteria (e.g., *Citrobacter* spp.), some the enteric bacteria (e.g., *Clostridium perfringens*) as well as many other types of bacteria produce H<sub>2</sub>S.

The test measures the production (actually, the presence) of H<sub>2</sub>S by its reaction with iron to form an insoluble, **black precipitate of iron sulfide**. Given the low solubility product of iron sulfide, the test can detect even small amounts of sulfide formation or presence. Any source of H<sub>2</sub>S in the sample can lead to a positive result.

Many different bacteria, from a variety of habitats, including many of enteric origin, can release sulfide from proteins, amino acids and other reduced sulfur compounds by reduction reactions. Therefore, there are many possible sources of a positive result in the H<sub>2</sub>S test.

The water quality testing uses H<sub>2</sub>S water testing kit, and the procedure is as follows:

- Take a water sample e.g. from a household water storage, tap, borehole, protected or unprotected shallow well, river, lake or other water sources using H<sub>2</sub>S bottle
- Keep the water sample for at least 24hrs
- Check for colour change of the sample
- Dark colour signifies contamination with *E. coli*



**Figure 8.4.1 Examples of H<sub>2</sub>S Test Bottles**

### **8.4.5.3 Characteristics of good water quality**

Good water quality should be:

- Free from turbidity (suspended matter)
- Free from pathogens
- Free from toxic substances
- Free from taste, colour and odors

### **8.4.5.4 The criteria for selecting safe water source**

The selection of a water source should be based on the following criteria:

- Adequate supply
- Easily accessible
- Free from sources of pollution
- Ease of quality improvement

### **8.4.6 The protection of water sources**

Protection of water source is very important in maintaining safe water supply within the community. Water source protection activities that should be planned and done together with the members of the community so that they are trained for the purposes of sustainability.



#### **8.4.6.1 Inspecting wells and springs for defects**

The activities involved in inspecting of wells and springs for defects are as follows:

- Check for cracks
- Check for broken apron and drainage
- Check for overflowing soak away pit
- Assess cleanliness of well
- Check stagnant water around the well
- Check for measurements provided to prevent damage of the well or spring.

#### **8.4.6.2 Protecting springs**

The following are the steps for protecting springs:

- Dig around the spring to find the eye
- Place loose stones against the eye
- Construct concrete box around the spring
- Make removable cover
- Provide screened outlet pipe
- Construct a concrete stance
- Provide drainage and soak away pit
- Provide a fence

#### **8.4.6.3 Protecting wells**

The following are the steps for protecting wells:

##### **1. Hand dug well**

- Prepare site
- Mark diameter (about 1 meter)
- Dig to required depth
- Scribe if necessary
- Lay stones at the base of well
- Avoid closing eye of the well
- Line up the walls of the well up to one meter above ground level
- Build lining up to one meter from the ground
- Fill sides with stones
- Make an apron around the well

- Provide drainage and soak away pit
- Chlorinate the water before use
- Install a pump if available or cover with a lid

## **2. Mechanical drilled well**

- Prepare site
- Drill to required depth
- Casing
- Make an apron around the well
- Provide drainage and soak away pit
- Chlorinate the water before use
- Install a pump
- Provide a fence

### **8.4.6.4 Maintaining a protected well or spring**

- Check for defects and rectify promptly
- Teach community how to operate and maintain the new source

## **8.4.7 Water quality improvement**

### **8.4.7.1 Water chlorination**

Water chlorination is one of the methods of making water safe for use in the homes. The method uses chlorine for the treatment of water.

#### **Materials and supplies for chlorination**

- Calcium Chloride (Chloride of lime 35 %) or High Test Hyper chlorite (HTH 70%) or Liquid water guard and powdered water guard
- Tea spoon and table spoon
- 1 litre jar or 5 l
- 1 litre container
- Weighing balance if possible
- Stirring stick

#### **Preparation of a 1% chlorine stock solution**

- Measure 11 tablespoons full of  $\text{CaCl}_2$  5.5 table spoons of HTH
- Add it to 5 litres of clean water

- Stir up the mixture to obtain a 1% stock solution
- Wait for sediments to settle
- Decant the solution
- Dispose the sediments by burying
- Store the solution in a cool dark place

### **Alternatively**

- Measure 1 litre of clean water
- Measure 40g CaCl<sub>2</sub> (35%) or 15gm HTH (70%) Add the powder to 1 litre of H<sub>2</sub>O
- Stir the mixture to obtain a solution
- Allow for sediments to settle
- Decant the solution
- Dispose the sediments by burying
- Store the solution in a cool dark place

### **Adding a 1% chlorine stock solution to a well or pot**

- Measure the volume of raw water to be chlorinated
- Add 1 litre of raw water into 3 drops of 1% stock solution or 20 litres of raw water into 2 teaspoons (1 table spoon) of 1% stock solution
- Wait for 1-hour contact time or 30 minutes in case of emergency before consumption

### **8.4.7.2 Other methods for improving water quality**

Apart from chlorination there are methods of water quality improvement

#### **1. Storage**

**The three-pot system.** Water is kept in a pot for 24 hours to allow for sediments to settle and then you decant and let the water to stand for another 24-hour period, repeating the same procedure for three times

#### **2. Boiling**

Water should be boiled for at least one minute to kill E-coli and microorganisms that normally live in water at room temperature

#### **3. Filtration**

Pour the water through a clean cloth or sand media to filter the sediments.

### 8.4.7.3 How each method improves the quality of water

It is important to advise people on the proper collection, distribution and storage of safe water. The following are means of how each method improves the quality of water.

<b>Method</b>	<b>How it improves quality of water</b>
Chlorination	kills pathogens
Storage	allows sediments to settle
Filtration	remove debris and turbidity
Boiling	kills pathogens

### 8.4.8 Proper water handling

The community needs to be advised on the proper handling of water to maintain safe water in the homes and this through the:

- Use of appropriate methods of water collection
- Proper care of water during transportation
- Use of clean storage containers,
- Appropriate behavior in distribution and usage of water that is two cup system

### 8.4.9 Training the community on water source protection

The community should be trained on water source protection especially the unprotected springs and wells.

### 8.4.10 Water Sampling

#### a) Taking a water sample from a tap

- i) Clean the tap/outlet using a clean cloth to remove any dirt.
- ii) Turn on the tap and let the water run at maximum flow for 1 to 2 minutes; then turn it off.
- iii) Sterilise the tap outlet for a minute with the flame from a cigarette lighter or an ignited alcohol-soaked cotton-wool swab.
- iv) Turn on the tap again and allow the water to flow for 1 to 2 minutes at a medium flow rate.
- v) Open a sterilised bottle by carefully unscrewing the cap.

- vi) Immediately hold the bottle under the water jet and fill.
- vii) While filling the bottle, hold the cap face downwards to prevent entry of dust, which may contaminate the sample.
- viii) Screw on the cap. A small air space should be left so that the contents can be shaken more easily before analysis.

**b) Sampling Procedure for Lake or Stream**

Surface waters collected in the field for chemical analyses are easily contaminated. The basic sampling procedure is as follows:

- i) **Choose a sampling spot** with fast-moving water, at least 15-20 cm (6-8 inches) deep if possible, and where you can reach it from a solid place on the stream bank (rocky, not soft/spongy spot) or from a large rock. Streams are always sampled upstream from any bridge, culvert, flume, or other artificial structure.
- ii) **Take Water Temperature.** Place thermometer in the water near the sampling point, preferably downstream. Avoid disturbing the bottom at the sample site.
- iii) Approach the sampling location from downstream if possible. the sampling. If collections are repeated over time, check the previous collection field notes for exact sampling location and collect from the same sampling site. A GPS identification of the location is helpful.
- iv) **Label Bottle Correctly.** Sample bottles should be brown 250 ml (about 1 cup volume) high-density polyethylene (HDPE) or low-density polyethylene (LDPE) plastic unless otherwise instructed. Before immersion of the sample bottle, use a black permanent marker to write on the dry bottle the sample location (geographic area name and stream or lake name), date and year, time of day.
- v) **Avoid Contaminating Bottle.** After the bottle is labelled, put on the gloves (latex or nitrile, and powder-free) and rinse the capped bottle and the gloves downstream to remove any possible contaminants. Be careful not to touch your face, the ground, or anything except the bottle after the gloves and bottle are rinsed. Fingers contain contaminants such as nitrates. Insect repellents, sunscreen, and cigarette smoke are particularly troublesome as contaminants. Do not touch anything except the sample bottle once the gloves are on. Avoid glove and sample contact with the ground or with human skin or clothing, and avoid breathing directly in/on the bottle or cap during sample collection.
- vi) **Prepare Bottle for Sampling.** First rinse the inside of the bottle, the inside of the cap, and the rim with the deionized water (DIW) that comes in the bottle. To rinse, remove the cap with index finger and thumb, palm facing up. If the cap is not held

correctly when removed, there is an increased possibility of pouring water over your hand and into the bottle when rinsing. Once the cap is removed, turn your palm down to face the cap up (Figure 6), fill the inside of the cap with water, and empty it over the rim and threads of the bottle, being careful not to pour water over your finger and/or thumb or back into bottle (point mouth of bottle down, not up). Do about six cap and rim rinses then completely empty the bottle of any remaining DIW. Pour discard downstream or off-stream on land away from the sampling site. After the final rinse, place cap back on ¼ turn, hold cap on with index finger of the hand holding the bottle. Now the sample rinses can be collected.

vii) **Rinse Bottle with Sample Water**

viii) **Rinse Bottle Three Times, Then Collect the Sample**

ix) **Seal and Store Bottle for Transport.** Once the final sample is collected, seal the sample bottle immediately in a zipper lock bag, place it in a cooler, and keep cold with frozen ice-packs or snow (place snow in double zipper lock bags). Do not place snow or ice in the same bag as the sample. Do not expose sample bottles to the sun.

#### **8.4.11 Summary of Unit 4**

In Unit 4, you have learned that:

1. Water is life and as such the provision and use of safe water promotes health of the people and contributes to the prevention and reduction of water-related diseases in the community. Water-related diseases include: water-borne diseases, water-based diseases, water-washed diseases and water-related insect vector borne diseases.
2. Rainwater, surface water (from lakes, rivers, ponds) and groundwater (from springs, wells and boreholes) are the sources of water for the community.
3. Protection of well water and spring water from contaminants and pollutants is very important.
4. Selection of a community water supply should be based on quantity of supply, quality of supply (free from pollution) and accessibility.
5. Drinking water is treated to improve smell, taste, and clarity and to remove disease-causing pathogens.
6. Safe storage, boiling, filtration and chlorination (using 1% chlorine stock solution or water guard) are common methods of improving quality of water at household level.
7. Sampling from a tap and surface water source are different but sterile sample bottles are used in both cases.

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## **Unit 5          Village Inspection**

### **8.5.1 Introduction**

Village inspection complements the process of community assessment. The process of collecting information about social demographic, environmental sanitation, access to safe, coverage of basic health services and disease prevalence.

### **8.5.2 Intended learning outcomes**

Upon successful completion of this unit, the student should be able to:

- Define village inspection
- Plan for village inspection
- Conduct village inspection
- Analyze data from village inspection
- Use the village register
- Write a report and Give feedback to stakeholders/community and supervisors

### **8.5.3 What is village inspection**

Village inspection is a process of collecting information about social demographic, environmental sanitation, access to safe, coverage of basic health services and disease prevalence at the village level.

### **8.5.4 Planning to conduct village inspection**

#### **8.5.4.1 Purpose of village inspection**

The purpose of village inspection is collect information about the sanitation of the village in terms of housing, water, food supply, excreta and refuse disposal, infestations, physical surroundings, personal hygiene, incidence and prevalence of disease and social demographic and coverage of basic health services. This enables to identify and prioritize village problems to implement essential health interventions. The information that will assist in achieving this purpose is about village sanitation in terms of:

- Housing
- Water supply
- Food supply
- Excreta and refuse disposal
- Infestations
- Physical surroundings
- Personal hygiene

- Incidence and prevalence of disease

#### **8.5.4.2 Types of village inspection**

- Routine inspection
- Incidental inspection

#### **8.5.4.3 Steps for preparing for village inspection**

- Send messages to leaders
- Collect required materials e.g. checklists, etc.
- Look at last inspection report in line with the name of village, location of village on map, demographic data on village and other findings

### **8.5.5 Conducting village inspection**

#### **8.5.5.1 The procedure for conducting village inspection**

To make the village inspection cost-effective and worthwhile the following procedure has to be followed:

- Meet the local leaders in the village or Village Health Committee (VHC)
- Outline the purpose of the village inspection
- Do the inspection together with local leaders
- Advise on the spot where possible
- Analyze the findings with the local leaders and give them a feedback

#### **8.5.5.2 Features and conditions to be checked during village inspection**

The features and conditions to be checked are presence, number and state of repair of:

- Dwelling houses
- Kitchens
- Water supply
- Latrines
- Bath shelters
- Dish racks
- Animal kraals
- Refuse pits



- Infestations
- Prevalence of diseases

### **8.5.5.3 The common defects or conditions identified during village inspection**

Some common defects and conditions identified during village inspection are;

- Cracked walls
- Broken bore holes
- Collapsed latrines, dish racks, etc.
- Presence of rodents and flies

### **8.5.6 Data analysis and interpretation after village inspection**

Data analysis and interpretation should be systematic and follow the following steps: -

- Sorting out the data
- Comparing the data collected with the current situation
- Identification of problems
- Prioritizing the problems
- Reporting the problems

### **8.5.7 Village Health Register**

The village health register is a monitoring tool that summarizes data from other registers and it is collated at health Centre level by the HSA supervisor. The register is owned by the Village Development Committee (VDC), at group village head level, but is kept by the HSA.

#### **8.5.7.1 Purpose of village health register**

- Monitoring the equity of EHP service provision at household and community level
- Helping in the design of a monthly plan of activities at community level; home visit, village clinic, public facility inspection, outreach clinic and village feedback meetings
- Providing coverage indicators for the catchment area, if registers are well updated

#### **8.5.7.2 Type of data to be recorded**

The HSA assists the VDC by collecting, updating and compiling the data. The register provides summarized information to the VDC for feedback meetings. The type of data to be recorded is as follows:

- Household demographic information
- Immunizations
- Antenatal care and delivery
- Growth monitoring, Vitamin A supplementation and de-worming for children under 5 years
- Water and sanitation
- Death audit (who? where? why?)

### **8.5.7.3 Elements of data recorded**

- Code number
- Name of household member
- Sex
- Date of birth
- Relationship with head of household
- Education status
- Occupation
- Net income use

## **8.5.8 Report writing and giving feedback to stakeholders, community and HSA supervisors**

### **8.5.8.1 Report writing**

It is very important that after conducting village inspection, data analysis and interpretation a report must be written. The report will form the basis for giving feedback, future references and justification of interventions to be carried. The Village inspection report format is as follows:

- Name of the village
- Date of inspection
- Purpose of inspection
- Problems identified
- Advice given or solutions identified
- Date of follow up

### **8.5.8.2 Giving Feedback**

The giving of feedback to the community should start with the positives, the areas that the community has been able to achieve and tailor down the feedback to areas that need improvement and interventions. The process therefore should be as follows:

- Identification of the target group for the feedback

- Presenting the findings of the inspection
- Discussions of the solutions

### **8.5.9 Summary of Unit 5**

In Unit 5, you have learned that:

1. The purpose of village inspection is to collect information about the sanitation of the village in terms of housing, water, food supply, excreta and refuse disposal, infestations, physical surroundings, personal hygiene, incidence and prevalence of disease and social demographic and coverage of basic health services.
2. There are two types of village inspections: routine inspection and incidental inspection
3. The village health register is an important monitoring tool that summarizes data from other registers
4. It is very important that after conducting village inspection, data analysis and interpretation a report must be written
5. Giving of feedback to the community after village inspection should start with the positives, the areas that the community has been able to achieve and tailor down the feedback to areas that need improvement and interventions

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## **Unit 6 Community and School Sanitation**

### **8.6.1 Introduction**

Sanitation is a term applied to methods and technologies used for appropriate collection, transportation and disposal of human waste, community wastewaters and solid waste as well as provision of safe water in order to prevent disease transmission and create a safe environment. Sanitation, therefore, involves provision of safe water, maintenance of structures that remove, transport and dispose wastes. Such structures are latrines, drains, bath shelters, refuse pits, sewers, safe water points and related structures.

School sanitation is especially important because children spend a great part of their time at school and they need a healthy environment to learn and grow, physically, mentally and socially.

### **8.6.2 Intended learning outcomes**

Upon successful completion of this unit, the student should be able to:

- Define sanitation
- Describe the basic requirements for good village and school sanitation
- Explain proper waste and excreta disposal
- List common diseases and conditions associated with poor sanitation
- Explain low cost sanitation technology options suitable for rural villages and schools
- Cast a San plat
- Explain the sanitation ladder
- Describe village and school sanitation promotion approaches such as community led total sanitation, school-led total sanitation and sanitation marketing

### **8.6.3 The basic requirements for good village and school sanitation**

The basic requirements for good village and school sanitation are:

- Sound and satisfactory environmental conditions
- Protected water sources
- Hand washing facilities and urinals
- Good drainage facilities

### **8.6.4 Proper waste and excreta disposal**

Proper waste and excreta disposal is a very important preventive measure for diseases associated with poor sanitation:

#### **8.6.4.1 Importance of proper waste and excreta disposal**

Proper waste and excreta disposal is important as it helps to prevent:

- Water and sanitation related diseases
- Breeding of vectors such as flies and rodents
- Environmental pollution (water, land/soil pollution)
- Littering
- Smell

#### **8.6.4.2 Methods of proper excreta disposal**

Excreta can properly be disposed by:

- Burying the waste in emergency situations
- Use of ordinary latrines
- Use of improved sanitation e.g. san plats and dome slabs
- Use of water closets for those who can afford
- Use of urinals in schools

#### **8.6.4.3 Methods of proper waste disposal**

The following are proper waste disposal:

- Use of refuse pits
- Composting or Burying
- Burning of waste
- Appropriate burying of dead bodies e.g. Cholera and COVID-19 deaths
- Use of incinerators and menstrual hygiene facilities in schools

#### **8.6.5 Common diseases and conditions associated with poor sanitation**

The common diseases and conditions associated with poor sanitation are;

- Diarrhea
- Gastro-enteritis
- Cholera
- Hookworm
- Bilharzia
- Typhoid
- Bacillary and amoebic dysentery
- Ascariasis
- Infectious hepatitis
- Poliomyelitis

### **1.6.6. Excreta and waste disposal facilities in the village**

Waste disposal facilities should be sited on the windward side and never uphill to the water source. The following are the recommended siting and measurements of excreta and waste disposal facilities in the village:

#### **8.6.6.1 Pit latrine**

##### **Siting**

Pit latrines should be 10 m away from the house and kitchen.

##### **Measurements**

Pit latrine hole should be 90cm x 150cm x 500cm

#### **8.6.6.2 Refuse pit**

##### **Siting**

Refuse pits should be 10 m away from the house and kitchen

It should be sited towards direction of winds

##### **Measurements**

Household refuse pit should be 4' x 4' x 4' (120 x 120 x 120 cm)

### **8.6.7 Low-cost sanitation options for rural areas and peri-urban centres**

Low-cost sanitation options include:

- Pit latrine with sanitation platform (SanPlat) integrated slabs or Dome Slab are common low-cost forms of on-site dry sanitation applicable in rural and peri-urban areas of Malawi.
- A Ventilated Improved Pit latrine (VIP) is another option
- Ecological Sanitation latrines (ECOSANS) – Arborloo, Fossa Attena and Skyloos

#### **8.6.7.1 San Plat**

The SanPlat is made of concrete but is not designed to cover the whole pit. It is placed over an existing platform covering the area where people defecate. This provides a firmer place to squat. The SanPlat features raised footrests to help users locate the correct position over the hole and to

keep feet away from any mess left on the floor by previous users. The slab is easier to clean than a mud floor and helps prevent the transmission of hookworm

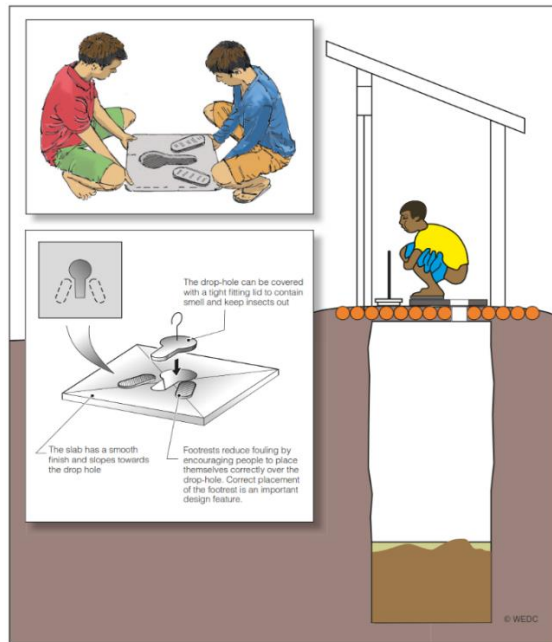


Figure 8.6.1 San Plat

Slab



Figure 8.6.2 Dome

### 8.6.7.2 Types of San Plats

There are three main types of sanitation slabs:

- Dome shaped sanitation slab, that is, it has a round roof with a circular base.
- Concave shaped sanitation slab, that is it has a surface that is curved inwards like the outside of the ball.
- Flat sanitation slab measuring 1.2 metres square, that is made similar to a sanplat measuring 60cm square

### Measurements

- 110 cm wide, round san slab is placed on the pit without the support of logs. It covers the entire hole/pit.

### **8.6.7.3 Advantages of san slab**

- It is smooth and easy to clean
- It has foot rests which makes it easy to use at night
- It has a drop hole which allows children to use it
- It is hygienic and keeps both smell, flies and cockroaches away since it has a tight fitting lid
- It is long lasting and can be re-used

### **8.6.7.4 Materials for casting san slab**

- Cement
- Quarry stones
- River sand
- Water
- Steel reinforcement bars
- San slab
- Drop hole
- Foot rest moulds
- Building trowel
- Pointing trowel
- Shovel
- Straight edges

### **8.6.7.5 Procedure for casting a San Plat and Dome Slab**

- Prepare a mixing bay
- Dry mix cement, sand and quarry stones in the mixing bay in the 1: 2: 3 ratio
- Add water slowly and continue mixing to a paste of required consistency
- Select a leveled ground slightly bigger than the circumference of the slab preferably under a shade
- Put a thin layer of sand or a sheet of plastic paper
- Put the san plat or dome slab mould on the layer of sand/plastic paper
- Determine the centre point using strings from mid points of opposite lengths
- Underneath the crossing point, place the drop hole mould fitting the mark on the mould
- Wet the drop hole mould and the san/dome slab mould
- Bring in the paste of concrete covering almost half of the required thickness
- Place reinforcement wires on the concrete
- Fill the san plat mould with concrete slightly above the required thickness



- Ram the concrete to achieve a compact fill
- Smoothen the top to remove excess stuff
- Continue working until you achieve an evenly smooth surface
- Apply smooth finish
- After allowing a 20 minutes of settlement , tap the sides until the mould is detached from the concrete then remove the mould
- Repeat the above step to remove the drop hole mould
- Bring a foot rest mould in line with the drop hole
- Scratch a few line on the marked for foot rests
- Remove the foot rest mould
- Mark the slab with a number for identification
- Apply shade on top of the san slab
- Advise people to start watering the slab from the next morning until it matures in 7 days time
- After about 24hrs, prepare another mixture with cement and sand (1:4) to provide foot rest and drop hole cover
- Bring back the foot rest mould in line with the drop hole
- Use the paste to fill the sites of the foot rests on the mould
- Ram and prepare these foot rests to a smooth finish
- Remove the foot rest mould
- Move away the unwanted stuff and ensure the foot rest remains smooth
- For the drop hole cover- a thin layer of plastic paper is put around the drop hole then concrete paste is put to fill the drop hole (observe that the sides of the drop hole should not have stones)
- Bring in a wire rod to act as reinforcement and also acts as a drop hole cover handle
- Add more paste and ram accordingly to achieve appropriate thickness of the cover
- Work on it to required smoothness and mark the drop hole cover as appropriate for identification
- If need be, support the wire with an external stick

### **8.6.8 Installation procedure of a san slab**

For the 60 cm wide, square san slab, no extension is required as the san slab is placed on logs on an existing pit latrine. But the standard procedure is as follows;

- Extend the edges of the pit to about 15 cm to a depth of about 30 cm.
- Fill the extension with brick work to the original level

- Allow the brick work to settle for 2 days
- Slowly place the slab on top of the brick work
- Advise on how to construct the super structure on the slab

Include section of integrated slabs that are 1.2 metre square. These are bigger than san plat of 60 cm square. Source information and add here as co

### 8.6.9 Community and School Hygiene and Sanitation Standards

- 1 latrine per household and no sharing is allowed. In addition, each household should have a refuse pit, kitchen and bath shelter. A handwashing facility and soap should be provided at each household latrine.
- 1 latrine of either sex per classroom of 40 within a 50 m distance from the class rooms. Handwashing should be provided outside the latrines. In addition, menstrual hygiene management (MHM) facilities (changing rooms) should be provided for adolescent girls.
- Teachers must have separate latrines from learners for either sex.
- Schools must have inclusive latrines as well

### 8.6.10 The sanitation ladder

The **sanitation ladder** is a well-established concept within the water and sanitation sector and is extensively used to illustrate how people can move from simpler sanitation solutions to more advanced ones, by moving up rung by rung on the ladder (Figure 8.6.3).



**Figure 8.6.3 The Sanitation Ladder**

### 8.6.11 Community and School Sanitation Promotion Approaches

#### 8.6.11.1 Community-led Total Sanitation

**Community-led total sanitation (CLTS)** is a method for mobilising communities to completely eliminate open defecation by triggering collective behaviour change. CLTS depends on raising awareness that everyone in the community is at risk of exposure to disease even if only a few people continue to defecate in the open. It has been successful in ensuring that all households gain

access to safe sanitation facilities in many parts of Malawi. It helps communities to understand the negative effects of poor sanitation and empowers them to collectively find solutions to their sanitation situation. CLTS is about bringing sustainable behavioural change. In general, it works best in villages that have enthusiastic leadership but it is also dependent on convincing everyone to change their behaviour. Besides leadership, many other local social, physical and institutional conditions affect the prospects for CLTS.

CLTS involves trained facilitators working with communities as they go through three phases of the process: pre-triggering, triggering and post-triggering phases.

### *CLTS pre-triggering phase*

The facilitators must visit the selected kebele or kebeles prior to the community triggering. This visit is mainly to estimate the size of the community and its population but also to identify the dirtiest areas in the vicinity that are most frequently used for open defecation. This must be done with the community, possibly using a participatory mapping process, as shown in Figure 8.6.1 They also decide on the most appropriate season and place to conduct the community triggering.

### *CLTS triggering phase*

Community triggering happens at a gathering of the local inhabitants who come together to have a dialogue about concerns related to open defecation. The purpose of this dialogue is to bring collective action against the open defecation behaviour. Triggering refers to the moment when the whole community shares a sense of disgust and shame about open defecation. The facilitator helps them to come to the realisation that they quite literally will be eating one another's shit if open defecation continues.

In particular, the aim of the triggering phase is to reach agreement about actions to be taken. The actions will be governed by bylaws developed by the community. The final output of triggering is a **community-based action plan**, which includes an agreed schedule and set of activities that everyone in the community commits to participating in. This involves construction of latrines with handwashing facilities and commitment from everyone that they will use the new facilities at all times.

### *CLTS post-triggering phase*

After the community-based action plan is prepared, the community members must put the plan into action. They develop bylaws to ensure the elimination of the practice of open defecation in their community. The plan also states who will implement and enforce the bylaw.

In this phase, participatory review meetings should be organised by community members and facilitated by Health Extension Workers or other CLTSH-trained facilitators. The main purpose of these sessions is to review the progress made towards achieving the objectives of the plan. A sanitation map prepared during triggering can be used again to follow the progress made. Households that have constructed and started using a latrine are marked on the sanitation map.

Comparing this with the original map can show the progress made in the reduction of open defecation sites.



**Figure 8.6.1 Producing a sanitation map using a community participatory approach**

#### **8.6.11.2 School-led Total Sanitation**

**School-Led Total Sanitation (SLTS)** is a process of facilitating **school** communities (learners, teachers, parents, **School** Management Committee members, village heads, etc.) to analyse the current **sanitation** and hygiene situation, their practices and consequences, and to improve their **sanitation** and hygiene status. Expand this section to give insights of school led total sanitation

- **Pre triggering**  
The DCT (with DEM leadership) selects 6 schools to be triggered. Plan together with the DCT to decide whether you want to target schools in CLTS triggered communities.
- **School facilitators training**  
Five (5) representatives from each school are trained in SLTS facilitation. After their training, these representatives can train other facilitators in their respective schools, if more facilitators are required.
- **Triggering**  
Participatory sanitation and hygiene profile analysis by school community (~2-3 hours one morning)
- **Post triggering**

The PEA, head teacher, learners, facilitators follow up to ensure the action plan is progressing. The PEA reports monthly to the DEM

- **Verification and certification**

Inspection to assess if school has reached Star Status with their completed action plan; school open day to celebrate achievement

### **Sustaining and improving**

A day is dedicated to each school term for activities which reinforce the behavior changes brought about by SLTS.

#### *Use these steps*

The training steps are as follows:

Part 1: Introduction

Part 2: SLTS Overview

Part 3: SLTS “Tools”

Part 4: Post-triggering

Part 5: Sustaining and Improving

Part 6: Practical Exercise

Part 7: Next Steps

### **Tools used**

The key tools for SLTS are as follows:

#### ***School mapping***

In order to learn about their school, facilitate the group to draw a map on the ground using local materials, showing the boundaries of the school and major landmarks (school blocks, water point, football field, bushes, toilets, etc.) Ask questions about the map and get as many people involved as possible in creating the map.

- Then ask them what they do at each major landmark. When you get to the toilets, ask them what they do there and what can be found there.
- Mark the areas where faeces are found with maize husks (or other suitably coloured material). Also ask if faeces can be found anywhere else (in case the bush is used, indicate this on the map).
- This map can be used to highlight things in the school. Draw attention to where people defecate and where this faeces goes. Is it going to places where it should go? Where else does the faeces go? Mark on the map the pathways which faeces travel around the school

### **Transect walk or walk of shame**

- Transect walks are a great facilitation tool. The feelings of embarrassment and disgust evoked during this tool can result in an immediate desire to change. Even though they see these things everyday, they awaken to the problem when forced to look at and analyze the situation in detail.
- Tell the participants that you want to see their school to learn more about it. Have them lead you for a walk around. Ask questions along the way about their behaviours. For example, when you reach the water point, you can ask questions or get them to demonstrate how they use it. If there are unhygienic behaviours exhibited, you can question them about it.
- When you reach the area where shit or urine is found, stay there and ask questions. Who left the shit here? Who urinated here? What are the reasons that shit is everywhere? What do we smell? What do we feel? Where else can we find shit in this school? If they mention the bush, ask them to take you there.
- Ask: What happens to shit when it rains? Where do the shit go?
- If there are flies around, you can also question where these flies come from. What do they carry with them? Where else do they go?

### **Faecal contamination pathways**

- Ask participants where all the shit goes. People can offer various explanations, such as: it is washed away in rain, it goes in the soil, and other ways.
- Then ask them to write down the different ways that shit gets into their schools, such as: flies, rain water, wind, shoes, dogs, toys, footballs, contaminated water and others...
- Then, ask how the shit goes into their mouths, such as: hands, fingernails, flies on food, fruits that have fallen on the ground with shit and not washed and dogs licking people

### **Cup of porridge or cup of water**

Go to an area where shit is found, either in the bushes or by the toilets where students have missed the hole. Bring a glass of water or a cup of porridge. Ask a participant to drink the water or eat the porridge. Then, take a piece of hair and dip it into the shit, then into the water or porridge. Ask them what they see (there will be little to no difference with how the water or porridge looks). Offer the water or porridge again to the students to drink or eat. If they refuse, ask them why they are refusing, to which they will say that it contains shit.

- Now ask them if they can see flies in their school. How many legs do these flies have? What do the legs look like? Can their legs pick up more shit than hair? Next, ask what happens when flies land on their (or their children's) food: what are they bringing with them? Finally, ask them what they are eating with their food.
- If a participant realizes that they are eating shit, bring them to the front to share their realization to the group. The bottom line: everyone in the school and surrounding community is eating shit. Do not say this before they do; it has to be a result of their own self-analysis.

## **Shit calculation**

Ask the audience to calculate the amount of Shit eaten in their school community every day. How many students in the school? Teachers? How many surrounding villages? How many community members?

- Now, how much does each person defecate each day? Compare it to something tangible, such as the number of bags of sugar. Multiply this by the number of people in the school and community to see how much shit is produced each day. Continue to calculate how much is produced each week, then each month. Ask how they feel about eating each other's shit because of the dirty environment.

## **Medical cost calculation or expenses**

This is a good tool for adults (parents, village headmen, etc.)

- Ask what types of illnesses are commonly found with their children. Ask how often their children get sick with diarrhoea or other sanitation and hygiene illnesses.
- Ask how much it costs for them to treat their child.
  - Cost of medication
  - Cost to go to the hospital
  - Cost of transport and chaperone at the hospital
  - Cost of lost time and money that could have been spent working
  - Other related costs
  - What else can't they do when their child is sick?
- Add these costs on a flip chart. Compare it to the costs associated with making some changes to their behaviours (or even building a simple pit latrine for the school until a permanent one is provided by the government).

## **Cassava or egg demonstration**

- Tell participants you have a present for someone with the cleanest hands. Give them a boiled egg or fresh cassava to peel in front of the group. Observe how they do it.
- Once the cassava or egg is peeled, hold it high for the rest of the group to see. Ask the people what they see on the cassava/egg—there will likely be dirt marks. Ask them what these marks are. Do they want to eat it? If they refuse, why?
- Ask them what in the future do you think they should do so that they would be willing to eat the food?

## **Shit and shake**

- Ask someone to demonstrate how a toilet is used. Get them to put charcoal on their hands to symbolize shit for the demonstration. After they use the toilet, ask them to show you what they normally do. Often, they will go play with or greet their friends.

- Ask them to show you the games they play or how they greet their friends. Continue having them do this with multiple people and see how many people's hands the shit is passed on to.
- Ask the people what is on their hands.
- Ask them how comfortable they are with faeces being passed around their school.

### **Anal cleansing materials**

- Ask a participant to show you what they do in the toilet (make it fun so that someone volunteers). How do they wipe themselves? What materials do they use? Get them to demonstrate using these materials (e.g. leaves, paper, their hands, etc.)
- Get a piece of brick, some mud, and some water; mix the mud with water to symbolize faeces then put it on the brick. Ask the same learner to use the material to wipe off the faeces. When they wipe it off, observe and ask questions? Did the leaf/paper/other material break? Did any of the "shit" get on their hands? What happens after they leave the toilet? What do they do after? Maybe they will play with friends, in which case the shit can be passed around. Have them demonstrate this.
- How do they feel being in a school where shit is passed around regularly?

### **Eye to eye transmission tool**

- Apply powder on any community participant's cheek
- Using a clean piece of cloth wipe off the powder from smeared cheek. Use the same dirt cloth to clean another person's cheek
- Let the community observe and discuss what has happened. This demonstrates how eye infections e.g. trachoma can be transmitted through use of fomites e.g. towels
- Let the community check each others faces and identify any signs and traces of uncleanliness

### **8.6.11.3 Market based sanitation**

The aim of sanitation marketing is to enhance behaviour change communication with a view to move up the sanitation ladder:

- Basic latrines
- Improved latrines with hygienic slabs, VIPs, Pour flush
- Improved latrines with sustainable super structures
- Bathroom facilities
- Sewerage systems
- Consider costs of moving up sanitation ladder



- Meeting JMP criteria (SDGs for improved latrinisation)

. The specific objectives of market-based sanitation are:

- To understand the basic characteristics of sanitation marketing (This approach complements the CLTS approach and focuses on the supply side)
- To review the products and services that can be sold
- To demonstrate that sanitation is a business
- To introduce selling techniques
- To develop an individual sanitation marketing business plan



**Figure 8.6.2 The MDG and SDG Sanitation Ladder**

### Market based sanitation/sanitation marketing steps

- The concept
- Understanding the market
- Estimating costs, and defining a price

- Business strategy
- Group exercise

#### **8.6.11.4 Participatory Hygiene and Sanitation Transformation (PHAST)**

**PHAST** stands for “Participatory Hygiene and Sanitation Transformation”. The **approach** is a participatory learning methodology that seeks to empower communities to improve hygiene behaviours, reduce diarrhoeal disease and encourage effective community management of water and sanitation.

There are seven steps to community planning of PHAST (**Figure 8.6.3**)

#### **8.6.12 Institutional triggering for sanitation and hygiene**

##### **8.6.12.1 Social Norms Analysis**

- Mapping of practices and actors of influence in areas such as districts or central government
- Interviews and analysis using the social norms theory concepts.
- Enhancing CLTS with Tools Borrowed from Social Norms Theory

A number of techniques from social norms theory can be used to sustain behaviors and social norms:

- a) Multi-tiered institutional triggering;
- b) Value deliberation with traditional leaders;
- c) Magnifying the effects of change through group activities, external signs and ‘Foire du Caca’; and
- d) Normalization.
  - Multi-tiered institutional triggering: the various levels of influence on the community are engaged to ensure buy-in, engagement and entry into the communities. This process also improves the ‘functional linkages’ between the Ministry of Health, Education and WASH to support the CLTS work in country.
  - Value deliberation held with groups of key stakeholders and traditional leaders (the ‘Core Group’). Value deliberations are held with the Core Group before the deliberations are held with individual villages.
  - The Core Group is triggered at the commune level - not in their communities. The members of the Core Group come from different communities but all belong to the same ethnic group, which means a common decision from traditional leaders and chiefs of village clusters.
  - During the value deliberations the Core Group discuss the strategy to be used to achieve a collective change as well as the possible sanctions (positive or

negative) such as declaring the defecation areas traditional authorities or districts which may be used to avoid individual deviance to the new norm. The fact that the Core Group designed the strategy generates ownership but also empowers them to become the agents of change in their respective communities and adds value to their role of leaders. This tool is applied one village at a time, discussing customary laws that can support the changing of the social norm, advantages of changing their behavior – health benefits, savings in health cost, etc. This is a key step in persuading people to abandon their negative OD social norm.

- Public declarations or Shit Festival. Multiple villages come together to make public declarations of their intent to abandon the behaviour of open defecation and to make a public plan of action with an agreed timeline that they can be held accountable to by other villages, traditional authorities, and observers to the process. This tool achieved highest impact at village group and traditional authority level.

Normalization, or making the new practice common, generally refers to positive influences from influential community members or government staff but can also refer to the installation of enforcement mechanisms or punish

#### **8.6.12.2 Institutional triggering process**

- Select key decision makers to a meeting (community, district, regional or central level)
- Organize interface meeting with these officials
- Present a good sanitation status picture in institutions
- Present another picture showing bad sanitation status in institutions
- Ask the officials if they experience the same in offices
- What can be done to improve the situation?
- At the end, each official sign a declaration form indicating when he/she wants to end open defaecation

## Seven steps to community planning for the prevention of diarrhoeal disease

STEP	ACTIVITY	TOOL
<b>1</b> Problem identification	<ol style="list-style-type: none"> <li>1. Community stories</li> <li>2. Health problems in our community</li> </ol>	<ol style="list-style-type: none"> <li>1. Unserialized posters</li> <li>2. Nurse Tanaka</li> </ol>
<b>2</b> Problem analysis	<ol style="list-style-type: none"> <li>1. Mapping water and sanitation in our community</li> <li>2. Good and bad hygiene behaviours</li> <li>3. Investigating community practices</li> <li>4. How diseases spread</li> </ol>	<ol style="list-style-type: none"> <li>1. Community mapping</li> <li>2. Three-pile sorting</li> <li>3. Pocket chart</li> <li>4. Transmission routes</li> </ol>
<b>3</b> Planning for solutions	<ol style="list-style-type: none"> <li>1. Blocking the spread of disease</li> <li>2. Selecting the barriers</li> <li>3. Tasks of men and women in the community</li> </ol>	<ol style="list-style-type: none"> <li>1. Blocking the routes</li> <li>2. Barriers chart</li> <li>3. Gender role analysis</li> </ol>
<b>4</b> Selecting options	<ol style="list-style-type: none"> <li>1. Choosing sanitation improvements</li> <li>2. Choosing improved hygiene behaviours</li> <li>3. Taking time for questions</li> </ol>	<ol style="list-style-type: none"> <li>1. Sanitation options</li> <li>2. Three-pile sorting</li> <li>3. Question box</li> </ol>
<b>5</b> Planning for new facilities and behaviour change	<ol style="list-style-type: none"> <li>1. Planning for change</li> <li>2. Planning who does what</li> <li>3. Identifying what might go wrong</li> </ol>	<ol style="list-style-type: none"> <li>1. Planning posters</li> <li>2. Planning posters</li> <li>3. Problem box</li> </ol>
<b>6</b> Planning for monitoring and evaluation	<ol style="list-style-type: none"> <li>1. Preparing to check our progress</li> </ol>	<ol style="list-style-type: none"> <li>1. Monitoring (checking) chart</li> </ol>
<b>7</b> Participatory evaluation	<ol style="list-style-type: none"> <li>1. Checking our progress</li> </ol>	<ol style="list-style-type: none"> <li>1. Various tool options</li> </ol>

Figure 8.6.3 The seven steps to community planning of PHAST (Source: WHO, 1998)

### 8.6.11 Summary of Unit 6

In Unit 6, you have learned that:

1. It is important for public and environmental health that schools meet basic sanitation requirements, including: water supply, personal hygiene, provision of latrines and menstrual hygiene facilities.
2. School hygiene and sanitation are especially important because children spend a great deal of time at school and they need a healthy environment to learn and grow, physically, mentally and socially.
3. Sanitary inspection of schools is one method for identifying hygiene and sanitation problems. It can also be used to inform the design of strategies for improvement.
4. Pit latrines and refuse pits should be sited at least 10 m away from the house and kitchen. Pit latrines should be located downhill and at least 30m away from a water source.
5. The standard practice should be **one sanitary latrine per household** and 1 latrine for 51 school boys or 30 school girls within a 50m distance from the class rooms.
6. Community-led total sanitation (CLTS) and School-led Total Sanitation are widely used approaches in promoting village and school sanitation; respectively. Adopting a sustainable behaviour is the ultimate goal of hygiene and sanitation promotion interventions.
7. Participatory hygiene and sanitation transformation (PHAST) and institutional triggering compliment CLTS and SLTS.

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National Sanitation and Hygiene Strategy (MoH-2018-2023)

MoH-Environmental Health Policy 2018-2023

MoH (2013) CLTS, SLTS AND SM HAND BOOK

Leave no one behind handbook (2017)

## **Unit 7 Vector and Vermin Control**

### **8.7.1 Introduction**

Vectors are arthropods and insects that play host to a disease-causing organism like mosquitoes, tsetse flies and house flies among others, while vermin are nuisance insects and rodents like rats, cockroaches that cause harm to animals and plants and may also play an intermediate role in disease transmission. The control of these vectors and vermin plays a major role in disease prevention and control.

### **8.7.2 Intended learning outcomes**

Upon successful completion of this unit, the student should be able to:

- List common vectors and vermin of public health importance
- Detect signs of vector and vermin infestations in the houses
- List examples of diseases transmitted by common vectors and vermin
- Use local methods in controlling vectors and vermin
- Apply Insecticides/Pesticides

### **8.7.3 Common vectors and vermin**

The most common vectors in the households are:

#### **8.7.3.1 Vectors**

- House flies
- Cockroaches
- Mosquitoes
- Bedbugs
- Itch mites
- Fleas
- Ticks
- Lice

#### **8.7.3.2 Vermin**

- Snails
- Rodents
- Bats

### **8.7.4 Signs of vector and vermin infestations in the houses**

The following are the common signs of infestation of vectors and vermin:

- Droppings
- Rat runaways
- Gnawed wood
- Sound
- Presence of larva

### **8.7.5 Diseases transmitted by common vectors and vermin**

The following are examples of diseases transmitted by common vectors and vermin:

- Malaria – mosquito
- Schistosomiasis – Water-based snail
- Sleeping sickness – Tsetse fly
- Onchocerciasis (River blindness) – Black fly
- Relapsing fever – Lice
- Plague – Rats

### **8.7.6 Local methods of controlling vectors and vermin**

The common local methods of controlling vectors and vermin within the community are:

- Maintenance environmental sanitation
- Use of hot water
- Use of traps
- Use of clubs for rodents
- Use of maize husks
- Personal Hygiene practices
- Use of cat

### **8.7.7 Modern methods of controlling vectors and vermin**

- Fumigation
- Spraying, e.g. Indoor residual spray (IRS)
- Dusting
- Baiting
- Dipping

### **8.7.8 Application of insecticides and pesticides**

#### **8.7.8.1 Chemicals, insecticides and pesticides used**

There are various chemicals, insecticides and pesticides used in the control vectors and



vermin, the following are commonly in the community:

- Doom
- Cislin
- Fenitriothion
- Actellic
- Fendona
- Storm
- KO-TAB

### **8.7.8.2 Classification of chemicals, insecticides and pesticides**

The chemicals, insecticides and pesticides are classified as;

#### **Knockdown:**

- Doom
- Storm

#### **Residual**

- Cislin
- Fenitriothion
- Actellic
- Fendona
- KO-TAB

### **8.7.9 Safety measures on the use of the chemicals**

The following are the safety measures on the use of insecticides:

- Read the label
- When applying remove or cover food and utensils
- Wear protective clothing
- Do not eat or drink while spraying
- Bath thoroughly the whole body afterwards
- Wash clothing thoroughly
- Wash the equipment after use
- Bury empty containers and dead vectors safely
- Keep all insecticides out of children's reach
- Store away from food stuff

### **8.7.10 Preparation of chemical solutions**

The procedure for preparing chemical solution for spraying is as follows:

- Read instructions
- Check expiry dates
- Measure the chemical
- Measure the water
- Add to make a mixture

### **8.7.11 Forms of applying insecticides and pesticides**

The forms of applying insecticides and pesticides are:

- Dusting
- Spraying
- Baiting
- Dipping

### **8.7.12 Spraying of houses and any other vector and vermin breeding places**

When spraying houses with chemicals, follow the following procedural steps:

- Check the parts of the sprayers
- Put on gloves, masks and head gear
- Spray finely on walls from top downwards in uniform sweep
- Spray on skirting (along base of wall) in food room
- Clean pump using clear water until pump nozzle is clean
- Store pump and drugs properly,

### **8.7.13 Equipment for insecticide spraying**

Good quality reliable sprayers are essential for an effective spraying programme. The Hudson X-Pert compression sprayers are used globally in disease vector control programmes and are also the sprayer of choice in Southern Africa, including Malawi. Reasons for this choice are that the Hudson sprayer:

- Is manufactured from stainless steel, is strong, durable and has been field proven for more than 40 years.
- Has a large filling operator and so facilitates easy cleaning and filling.
- Has a reliable and accurate pressure gauge which is important as correct pressures should be maintained throughout spraying.
- Has an effective filtration system preventing blocked nozzles

- Has interchangeable hardened stainless-steel nozzles, if required.
- An added advantage is that spares for Hudson X-Pert sprayers are generally available.

The Hudson X-Pert Model 67422AD is a 15.1 litre sprayer (tank size) with a 10-litre working capacity. The additional 5.1 litres of headspace allows for adequate pressurization. Figure 8.7.1 shows the Hudson X-Pert Sprayer.



**Figure 8.7.1 Hudson X-Pert Sprayer**

#### **8.7.14 Summary of Unit 7**

In Unit 7, you have learned that:

1. Vectors are anthropoids and insects that play host to a disease-causing organism like mosquitoes, tsetse flies and house flies among others, while vermin are nuisance insects and rodents like rats, cockroaches that cause harm to animals and plants and may also play an intermediate role in disease transmission vector is a non-human carrier of communicable diseases.
2. Chemicals, insecticides and pesticides used in the control vectors and vermin maybe of knockdown or residual effect.
3. There are both local and modern methods available for vector and vermin control.
4. Proper procedures must be followed when preparing and spraying chemical solutions against vectors and vermin.

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MOH (2016). *Health Surveillance Assistant Training Manual*. Lilongwe Malawi.

## **Unit 8 Occupational Health and Safety**

### **8.8.1 Introduction**

Workplace-related health impairments, injuries and illnesses cause great human suffering and incur high costs, both for those affected and for society as a whole. Occupational health and safety measures and health promotion in workplaces are aimed at preventing this. But, in addition to protecting workers from harm. The healthcare sector is not spared from occupational risks and hazards. Waste materials are generated in the healthcare setting. They require special procedures for collection, storage, transport, and disposal in efforts to prevent complications related to direct exposure of these waste products. The key step in waste management is to distinguish between infectious and non-infectious waste. Infectious waste has the potential to transmit disease and should be collected, transferred, and disposed of in a manner that decreases the risk of injury to healthcare workers, waste management workers, patients, and the community.

This Unit focusses on the prevention and good practice in hospitals and the healthcare sector.

### **8.8.2 Intended learning outcomes**

Upon successful completion of this unit, the student should be able to:

- Define occupational safety and health
- Explain the importance of occupational safety and health in hazardous work places such as hospitals
- Define the terminology commonly used in occupational safety and health
- Identify risks and hazards in hospital environment
- Describe risks and hazards of health care wastes, infectious human and animal dead bodies such as Cholera, Ebola and COVID-19.
- Apply infection Prevention and control measures when handling health care wastes, agricultural pesticides and any other activities posing risks to workers in the community and workplaces.

### **8.8.3 What is Occupational Health and Safety?**

**Occupational Health and Safety (OHS)** is concerned with the safety and health of people at work. Thus, the objective of OSH is to prevent needless deaths and injuries to workers from occupational hazards. It involves more than first aid activities and is far-reaching in both scope and practice.

#### 8.8.4 Common terms used in Occupational Health and Safety

**Hazard** is a workplace condition or worker action that can result in injury, illness, or other organizational loss.

**Risk** is the likelihood or probability of the hazard occurring and the magnitude of the resulting effects. For example, if you climb a ladder you know there is a chance you could fall off and be injured, although it is unlikely. The ladder is the hazard and the chance of injury is the risk you take by climbing the ladder.

Hazards are generally categorised as follows:

- **Physical hazards**

Physical hazards are those substances or conditions that threaten our physical safety. Fires, explosive materials, temperature (hot or cold), noise, radiation, spills on floors and unguarded machines are some examples of physical hazards. Physical hazards also include ergonomic hazards which occur when the type of work, body position and working conditions put strain on your body. This happens when your capacity for work is restricted by the type of work. These instances are hard to spot since you don't always immediately notice the strain on your body or the harm these hazards cause. Short-term exposure in badly designed work may result in muscle fatigue or tiredness, but long-term exposure can result in serious long-term injuries of the musculo-skeletal system.

- **Biological hazards**

While on the course of duty, one maybe exposed to biological hazards. These are organisms, or by-products from an organism, that are harmful or potentially harmful to human beings. They include pathogenic bacteria, viruses and parasites, and also toxins (poisons) that are produced by organisms. Biological hazards are the cause of the majority of human diseases. For example, bacteria cause cholera, tuberculosis, leprosy, relapsing fever and many diarrhoeal diseases; viruses are responsible for hepatitis B and C, HIV, measles and polio; and there are many diseases caused by parasites. A parasite is any organism that lives on or in another organism, called the host, and causes damage, ill health or even death to the host

Biological hazards arise from working with infected people animals, or handling infectious waste and body fluids, as well as contact with unsafe water, food and waste. The hazards may occur in the home, at school or at work. In particular, work in hospitals, hotel and hospital laundries, laboratories, veterinary offices and nursing homes may expose someone to biological hazards.

- **Chemical hazards**

Chemical hazards are present when a person is exposed to a harmful chemical at home or at work. The chemicals can be in the form of gases, solids or liquids. Exposure to chemicals could cause acute health effects (an immediate or rapid onset) if taken in large quantities in a single dose; and chronic health effects (long-term effects on health) if taken in small doses over an extended time. Detergents (powdered soap, bleaching powder), drugs (veterinary and human) and pesticides

(DDT, Malathion, diazinon, zinc phosphide, warfarin) are chemical hazards that are commonly found in rural households (Figure 2.3). Farmers, young children (under 5 years) and household animals are vulnerable to chemical exposure, but it is always possible that anyone might come into contact with the chemical during preparation, spraying, use or storage. A person is exposed to chemicals through various ways: through inhaling the vapour, gases or dusts; through skin contact with solvents, acids and alkalis; and through ingestion of unknown chemicals with food and water.

**Safety.** One of the most important terms used in the safety and health profession is “**safety**”. It is probably the most misinterpreted term by individuals outside of the safety profession. For the layperson, safety means not getting injured. “*Safety*,” to the professional, implies reference to the likelihood or risk that a loss event will occur. It can be defined as “operating within an acceptable or low probability of risk associated with conditions or activities having the potential to cause harm to people, equipment, facilities or the enterprise.”

### 8.8.5 Importance of Occupational Health and Safety

Health sector personnel face an increased risk from the following hazards:

- biological agents
- musculoskeletal disorders
- psychosocial disorders, and
- chemical agents.

#### 8.8.5.1 Common hazards and risks in healthcare and hospitals

- **Biological agents.** In the context of the health sector three modes of transmission are of relevance:
  - **blood-borne infections**
  - **airborne infections**
  - **contact infections**

Health care workers are exposed to bloodborne pathogens and other infectious body parts. Contact with blood, whether through needlesticks or other accidental exposure, can put one at risk for HIV and other infectious diseases.

- **Musculoskeletal disorders.** In healthcare and hospitals, injuries can often come from lifting and moving people or heavy objects, or a lot of bending, twisting or reaching. Examples of this kind of work are transferring a patient from bed to chair, helping a patient who has fallen, and handling trolleys and wheelchairs. Tasks like these may involve hazardous manual handling, which can lead to musculoskeletal disorders like sprains and strains to the back and shoulders.
- **Psychosocial or Work-related stress.** In a hospital setting, healthcare workers maybe be exposed to emotional, demanding situations involving both patients and their

families. It's important to not only be willing to deal with stress as a reality, but also to take its potential consequences seriously. Another related potential problem is balancing work and home life, which can in itself cause stress. To reduce employee stress, stress management programs or counselling are useful.

- **Slips, trips and falls.** Slip and fall hazards are a concern in almost any workplace, but a hospital environment, in which the atmosphere is unpredictable and often fast-paced, can be especially worrying. The CDC (Center for Disease Control and Prevention) provides a [comprehensive guide](#) detailing the importance of slip and fall prevention for healthcare workers, as well as common preventable causes for slips and falls. Some of these causes include:
  - Wet floors, including floors contaminated with water, grease or food.
  - Various tripping hazards common in medical settings, such as cords, tubing, and hoses.
  - Bad lighting.
  - Floor mats and runners that are improperly used or maintained.

- **Contact infections**

Healthcare workers are at risk from contact infections while handling health care waste, infectious dead bodies such as Ebola, Cholera and COVID-19 dead bodies. All dead bodies are potentially infectious and “STANDARD PRECAUTIONS” should be implemented for every case. Although most organisms in the dead body are unlikely to infect healthy persons, some infectious agents may be transmitted when persons are in contact with blood, body fluids or tissues of dead body of person with infectious diseases. To minimize the risks of transmission of known and also unsuspected infectious diseases, dead bodies should be handled in such a way that workers' exposure to blood, body fluids and tissues is reduced.

Waste materials are generated in the healthcare setting. They require special procedures for collection, storage, transport, and disposal in efforts to prevent risks related to direct exposure of these waste products. The key step in waste management is to distinguish between infectious and non-infectious waste. Infectious waste has the potential to transmit disease and should be collected, transferred, and disposed of in a manner that decreases the risk of injury to healthcare workers, waste management workers, patients, and the community.

#### **8.8.5.2 Safety tips for health care workers**

- Take precautions in order to avoid bloodborne, airborne and contact pathogens.
- Take precautions with sharps Injuries.



- Use proper devices to decrease the risk of musculoskeletal Injuries
- Use PPE to be **safe** against biological and chemical substances

### 8.8.6 Summary of Unit 8

In Unit 8, you have learned that:

1. **Occupational Health and Safety** is concerned with preserving and protecting human and facility resources in the workplace. Thus, the objective of OSH is to prevent needless deaths and injuries to workers.
2. The workplace is never risk free as there are so many hazards: physical, biological and chemical hazards.
3. Use of PPE is a must in the healthcare sector.

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## **Unit 9      Climate Change and Health**

### **9.1. Introduction**

Climate change threatens human health and well-being in many ways, including through more extreme weather events and wildfires, decreased air quality, and diseases transmitted by insects, food, and water. Vulnerable populations, including the poor, the elderly, children, those already in poor health, the disabled, and indigenous populations, are most at risk.

In this Unit, we will define climate change, its causes and effects on human health. We will conclude this Unit by looking at mitigation, adaptation and resilience to climate change,

### **9.2 Intended Learning Outcomes**

Upon successful completion of this module, learners should be able to:

- Define climate change
- Explain the causes of climate change
- Discuss how climate change affects health
- Explain climate change adaptation and mitigation.
- Advise communities on climate change adaptation and resilience

### **9.3 What is climate change?**

Climate change is the name given to the long-term change in global weather patterns caused by human activities. It is a global problem and its effects may not be easy to see at a local level. However, it may have an increasingly important impact on the future provision of safe water and therefore on human health and safety.

### **9.4 Causes climate change**

- Natural temperature variations
- Deforestation

### **9.5 Relationship between climate change and health**

Climate change causes the following:

#### **i. Hot temperatures**

- This aids in multiplication of organisms like mosquitoes which spread malaria
- Water scarcity which leads to people using unsafe water which bring about diseases

- Increase in skin diseases/cancer

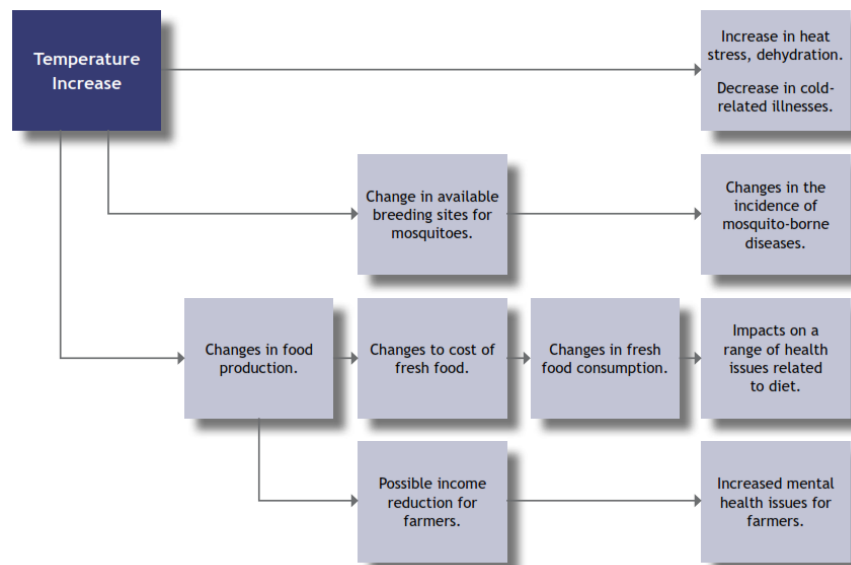
**ii. Increase in rainfall brings about the following problems:**

- Floods which wash away houses and may lead to injury to people
- Floods which wash away agricultural fields and hence bring about hunger
- Floods which may wash away toilets and hence lead to the spread of diarrhoeal diseases for example cholera
- Increase in stagnant water which may act as breeding grounds for mosquitoes which transmit malaria
- Destruction of houses which may leave people homeless, floods which wash away hospitals which may lead to people not having a place to seek medical help
- Washing away of road and rail networks which may lead to people having transportation problems when going to the hospital or schools
- People becoming mobile/unsettled which may contribute the spread of diseases.

**iii. Poor rainfall/draught may bring about the following**

- Hunger which promotes malnutrition
- Water scarcity that causes people to drink unsafe water that brings about diarrhoeal diseases, scabies, etc.
- Men moving out of the houses in search for food which brings about food

Figure 9.5.1 summarises the effects of temperature increase by 2030.



**Figure 9.5.1 Examples of potential direct and indirect health impacts of temperature increase in 2030**

## **9.6 Climate Change Adaptation and Mitigation**

### **9.6.1 What are mitigation and adaptation?**

Adaptation and mitigation present some notable differences, particularly in their objectives. Mitigation addresses the causes of climate change (accumulation of greenhouse gases in the atmosphere), whereas adaptation addresses the impacts of climate change. Both approaches are needed. On the one hand, even with strong mitigation efforts, the climate would continue changing in the next decades and adaptation to these changes is necessary. On the other hand, adaptation will not be able to eliminate all negative impacts and mitigation is crucial to limit changes

Appended below are some of the adaptation measures to climate change:

- Following updates on the weather /weather forecast
- Staying in places where there are no dangers that may arise due to climate change
- Building strong houses that can survive dangerous consequences of climate change
- Reforestation in areas prone to receiving climate change consequences
- Planting extreme weather/climate change resistant crops
- Constructing strong toilets which can survive the weather elements
- Finding ways of bringing safe water to places where there is danger of suffering from consequences of climate change

### **9.6.2 What is the other difference between mitigation and adaptation?**

Another difference between mitigation and adaptation is that the former is an international issue and provides global benefits. On the other hand, adaptation is primarily a local. It provides benefits at local level.

### **9.6.3 Climate resilience and adaptation**

**Climate resilience** is the ability to anticipate, prepare for, and respond to hazardous events, trends, or disturbances related to climate. Improving climate resilience involves assessing how climate change will create new, or alter current, climate-related risks, and taking steps to better cope with these risks

**Adaptation** refers to those crucial actions or plans that a community or household or individual will employ against a current or anticipated impact of climate change whilst **resilience** refers to the ability to recover (bounce back to the original state before the exposure to shock) from the effect of climate change.

An **example of resilient** is elastic being stretched and returning to its normal size after being let go. An **example of resilient** is a sick person rapidly getting healthy

## 9.7 Summary of Unit 9

In Unit 9, you have learned that:

1. Climate change is a long-term change in global weather patterns caused by human activities.
2. There is a strong relationship between climate change and health.
3. Climate change mitigation addresses the cause of climate change while climate change adaptation addresses the impacts of climate change.

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# MODULE 6: PUBLIC HEALTH ETHICS

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## Module Objectives

- a) Describe the historical origins of bioethics
- b) Describe various principles of ethics in the practice of public health
- c) Explain the process of informed consent
- d) Explain the concept of conflict of interest

## 13.1 Introduction

- It is basically a field of ethical enquiry that examines ethical issues and dilemmas arising from health, health care and research involving humans.
- It is also moral discernment as it relates to medical policy and practice.
- Bioethics are concerned with the ethical questions that arise in the relationships among life sciences, biotechnology, medicine and medical ethics, politics, law, theology and philosophy.
- It includes the study of values relating to primary care and other branches of medicine.
- In Malawi the field of public health is evolving and over the past years, new structures have been created. In the midst of such change, there is a growing need to consider the ethical foundations for and implications of our work.
- Many of the ethical issues that arise from surveillance activities are fairly well known and well documented.
- For example, the problems involved in managing the data used as inputs to surveillance plans have received ongoing attention in the literature; examples of these problems include protection of confidentiality and privacy and the risk of stigmatization, especially in relation to dissemination of information on vulnerable groups.
- It is these problems, among others, that this module is designed to alleviate.

## 13.2 Ethics Description

- From a Greek word *ethikos* or Latin word *moralis* – meaning conduct or behaviour
- Hence **Ethics** and **Morality** have the same root meaning.
- **Ethics** are standards of conduct (or social norms) that prescribe behaviour

## 13.3 Ethics and Morality

### 13.3.1 Ethics

- Ethics is the study of values in human conduct or the study of right conduct.



- Ethics offers a critical, rational, defensible, systematic and intellectual approach to determining what is right or best in a difficult situation.
- Are not general standards of conduct
- Are standards of a particular profession, occupation, institution, or group within society
- The word ethics, when used in this way, usually serves as a modifier for another word, e.g. business ethics, medical ethics, sports ethics, military ethics, etc. which are all professional ethics
- Ethics deals with the “rightness” or “wrongness” of human behavior
- Concerned with the motivation behind the behavior
- Bioethics is the application of these principles to life-and-death issues

### 13.3.2 Morality

- Consists of a society’s most general standards
- These standards apply to all people in society regardless of their professional or institutional roles

### 13.3.3 Moral standards

- Include those rules that most people learn in childhood, e.g., do not lie, cheat, steal, harm other people, etc.
- Distinguish between right and wrong, good and bad, virtue and vice, justice and injustice.
- An individual’s own code for acceptable behavior
- They arise from an individual’s conscience
- They act as a guide for individual behavior
- They are Learned

## 14.0 Bioethics Description

- A branch of applied ethics that deals with ethical issues emerging from advances in medicine and health care practice. It is also moral discernment as it relates to medical policy and practice.
- It also deals with ethical issues surrounding human life and environment and social, religious, cultural, political, technological determinants.

Big moral considerations in bioethics often revolve around questions about:

- Whether one ought to act to maximize the best outcomes or ought to act to uphold important moral rules and duties? Or how to do both?
- What should be done when we think policies or laws are unethical because they don’t treat people fairly or equally?
- How and when should we share information about medical treatment to best permit others make informed and voluntary decisions about what is done or not done to their bodies?
- When can minors make their own health care decisions? Who should decide if a minor or child’s opinions about medical treatment for them differs from that of his or her parents?

## **14.1 Evolution of bioethics**

- Started as concerns regarding research ethics
- Nuremberg Doctors' Trial -- 23 German physicians who either participated in the Nazi program to euthanize persons deemed "unworthy of life" or who conducted experiments on concentration camp prisoners without their consent were tried.
- The trial lasted 140 days.
- 85 witnesses testified and almost 1,500 documents were introduced.
- 16 of the doctors charged were found guilty. 7 were executed.
- The distinct academic field began in the 1960s in the United States
- Philosophers and theologians were later joined by physician-ethicists and lawyers.
- *(An ethicist is a person whose judgment on ethics and ethical codes has come to be trusted by a specific community).*
- New emphasis on individual autonomy and rights was instituted

### **14.1.1 What ethical principles are meant for the protection of human subjects in prescribed guidelines?**

- Respect for persons
- Autonomy
- Non maleficence
- Beneficence
- Justice
- Fidelity
- Confidentiality
- Veracity
- Accountability

### **Respect for persons**

- Self-determination (participation and withdrawing)
- No coercion
- Full disclosure, no deception
- Provide all information about the study
- Voluntary consent
- Persons with diminished autonomy have special protections

### **Beneficence**

- Freedom from harm
- Freedom from exploitation
- Risk/benefit ratios (high anticipated benefit may balance high risk)
- This principle means “doing good” for others
- Health care workers need to assist clients in meeting all their needs
- Biological
- Psychological
- Social

### **Justice**

- Every individual must be treated equally
- This requires HSAs to be nonjudgmental
- Fair treatment even if the person refuses to participate
- Right to privacy (anonymity, confidentiality)

### **Fidelity**

- Loyalty
- The promise to fulfill all commitments
- The basis of accountability
- Includes the professional’s faithfulness or loyalty to agreements & responsibilities accepted as part of the practice of the profession
- This ethical principle is the foundation of the HCW-patient relationship.
- Fidelity comes into play when we uphold our commitment to provide adequate pain control, when we provide quality of care, comfort and support when needed, when we represent the interests of our clients and we tell the truth.

### **Confidentiality**

- Privacy is the fundamental concern of surveillance authorities not to disclose information that could be used to identify individuals, households, or communities, depending on the kinds of characteristics on which data are being disseminated.
- Anything stated to health-care providers by patients must remain confidential
- The only times this principle may be violated are:

- If patients may indicate harm to themselves or others
- If the patient gives permission for the information to be shared

### **Autonomy**

The overarching principle involves:

- The freedom to make decisions about oneself
- The right to self-determination
- Healthcare providers need to respect patient's rights to make choices about healthcare, even if the healthcare providers do not agree with the patient's decision.

### **Non-maleficence**

- Requires that no harm be caused to an individual, either unintentionally or deliberately
- This principle requires HCW to protect individuals who are unable to protect themselves
- Harm and its effects are considerations and part of ethical decision-making process in public health research and surveillance.
- Non-maleficence is particularly useful in dealing with difficult issues surrounding the terminally or the seriously ill and injured persons.
- Some philosophers combine *Non-maleficence* and *Beneficence*, considering them a single principle

### **Veracity**

- Veracity is an important component of building trusting relationships
- This principle implies "truthfulness"
- HCW need more awareness and training to increase their skills in the ethics of veracity and also the communication skills especially in the context of breaking bad news in telling the patient the truth about diagnosis, treatment outcomes, and prognosis of any serious illness.
- Such skills have been found to improve health care worker-patient relationship, satisfaction with care and patient health outcomes.

### **Accountability**

- Individuals need to be responsible for their own actions
- HCW are accountable to themselves and to their colleagues

### **Bioethics examples**

#### Clinical Ethics

- Withdrawal and withholding Life Support, HCW-patient Relationship

#### Research Ethics

- Stem cells, cloning

#### Animal Rights

- Euthanasia, the use of animals in testing products

## Environmental Ethics

- Genetically Modified Food, air pollution, climate change

## Public Health

- Mandatory Vaccinations, quarantines

## Advantages of adherence to bioethics

Adherence to bioethics helps to:

- Prevent professional misconduct
- Promote professionalism
- Prevent negligence
- Manage conflict of interests and ethical dilemma
- Facilitates efficient proper decision making process

## Ethics

and

## Laws

### Difference

- Laws are the set of rules that are put forward and enforced by the ruling governments to discipline the society
- Ethics are the moral codes set by the organization on the basis of the culture of the society.
  - *Some actions that are unethical may not be illegal (secret)*
- Laws can be unethical or immoral (*Nazi 's*)
- We use different kinds of mechanisms to express, teach, inculcate, and enforce laws and ethics.
- We use the coercive power of government to enforce laws.
- People who break certain laws can be fined, imprisoned or executed.
- People who violate ethical or moral standards do not face these kind of punishments unless their action also violate laws.
- We often punish people who disobey moral or ethical obligations by simply expressing our disapproval or by condemning the behavior.

## Recent reports on unethical practices in Malawi

Over the years the Center for Bioethics has been noting newspaper reports covering unethical practices or behaviors in Malawi

- Private clinic issuing false HIV test results
- Dermatologist abuses female patient
- Clinician suspended in connection with albino killing
- A clinician conducting a clinical trial not approved by an ethics committee
- HCW impregnating a patient

- HCWs providing blood transfusion when patients refuse i.e because of religious beliefs

### Effects of unethical practices

- This erodes confidence and public trust
- It promotes corruption
- It undermines professionalism
- It undermines rule of law
- It undermines sustainable development
- It undermines performance

### Examining ethics in Public health research

- *How does ethical research differ from unethical research?*
- Ethical studies protect subjects and are carried out using scientific principles
- Unethical research includes:
  - Scientific misconduct
  - Fraud and research protocol violations
  - Fabrication, falsification and fabrication of data
  - Plagiarism
  - Putting subjects at risk without consent

### What are the elements of ethical research?

- Protecting human rights
- Understanding informed consent
- Understanding institutional review of research
- Balancing benefits and risks in a study

<b>The</b>	<b>Informed</b>	<b>Consent</b>
<b>Definition</b>		

Informed consent is ... “consent given by a competent individual who

- has received the *necessary information*
- has *adequately understood* the information
- after considering the information, has arrived
- at a decision without having been subjected
- to *coercion, undue influence, inducement, or intimidation.*

It is done before conducting any health care intervention on a person or for disclosing personal information.

- A health care provider may ask a patient to consent in order to receive therapy/ immunization before providing it or a researcher may ask a research participant before enrolling that person into a clinical trial.
- An informed consent can be said to have been given upon a clear appreciation and understanding of the facts implications and consequences of an action.
- Obtaining informed consent is not always required under special circumstances.
- If an individual is considered unable to give informed consent, another person is generally authorized to give consent on their behalf, e.g. parents or legal guardians of a child.

### **Informed Consent as a Process**

Informed consent is a communication process:

- between the researcher or HCW and the participant
- starts before the research or medical/ surgical procedure is initiated
- continues throughout the duration of the study (in research)
- Can withdraw at any point
- No penalty, no loss of benefits

This information must be provided in writing by use of a consent form in a language which the subject understands.

### **Language**

- Clear, simple, non-technical
- Sufficient time to make decision
- Give written information
- Translations written / verbal
- Thumb impressions allowed
- All signatures should be dated

### **Who are vulnerable persons?**

- Minors, pregnant women, prisoners
- Persons with mental disabilities
- Persons who are illiterate or have limited formal education
- Persons with limited access to health services
- Women in some settings

### **Features of vulnerable persons include**

- High percentage of illiteracy
- Political instability
- Limited economic development
- High rate of mortality
- Low level of investment in health care systems

- Endemic diseases e.g. TB, Malaria, > HIV

### **Facilitating or Hindering Factors**

- Technical language or other language
- Too much or too little information or time
- Anxiety
- Power imbalance
- Class, gender imbalance

### **Competence**

- Required for valid consent
- If not competent to consent, surrogate permission or legally acceptable representative (LAR) are required
- Surrogate means someone replacing another person, proxy, or someone deputizing

### **CONFLICT OF INTEREST**

- A conflict of interest is a situation in which an individual has competing interest or loyalties.
- Conflicts of interest involve a person who has two relationships that might compete with each other for the person's loyalties.
- For example, the person might have a loyalty to an employer and also loyalty to a family business.
- Each of these businesses expects the person to have its best interest first (Thus, the conflict).
- It is a set of conditions in which professional judgement concerning a primary interest tends to be unduly influenced
- A conflict between the private interests and the official responsibilities of a person in a position of trust
- Primary interest of research: scientific knowledge; official responsibilities
- Secondary interest: financial gains, personal prestige, academic recognition.
- When conducting research with patients, research is secondary to care

### **Kinds of conflicts of interest**

- There are many kinds of conflicts of interest, occurring at all levels of research
- Some conflicts of interest are obvious, but many are more subtle
- In most situations there is a means to avoid or at least minimize conflicts of interest
- To do so often requires considerable thought beforehand

### **Are all Conflicts automatically “bad”?**

- Having a conflict of interest is not necessarily a problem or a “bad thing”.
- Having a conflict of interest and doing nothing about it is a problem!

### **Consequences of conflicts of interest**



- Health worker-researcher conflict (Compromised client's care, Compromised client's trust)
- Invalid data reported (Misdirects science or medical care)
- Exploitation (e.g. finder's fees where research is not relevant to population)
- Public mistrust of research

### **Ways to mitigate conflict of interest**

- **Prevention:** The best way to mitigate conflicts of interest is to avoid them in the first place. Do not accept roles and responsibilities that are incompatible with your existing interests.
- **Public Disclosure:** Avoid hiding your roles and responsibilities. Disclosing your interests in a public forum enables potential partners to determine the course of action for them. By making your position public, you also develop an audience to which you are accountable.
- **Follow Procedure:** Organizations and governing bodies create extensive procedures and guidelines for the management of conflict of interest. This document may include rules and list of prohibited activities.

### **Consequences of violation of code of ethics**

- The Medical Council of Malawi is mandated to enforce the ethical code and may impose civil and criminal penalties for violations.
- Results of ethical violation range from reprimand, suspension to dismissal.
- Additionally, the attorney general may seek damages from violators to compensate clients.
- He may also prosecute violators who intentionally engage in the unethical behavior.
- The Medical council of Malawi can revoke the license of practitioner depending on the severity of violation.

