

Government of the Republic Malawi

Ministry of Health

CERTIFICATE IN COMMUNITY HEALTH
STUDENTS HANDBOOK
JUNE 2021

Part 3: Semester 2 Block 1 Modules

Foreword

UNIT 1: HISTORICAL BACKGROUND OF DISEASE SURVEILLANCE

MODULE 12: PUBLIC HEALTH SURVEILLANCE

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

1. Define disease surveillance
2. Describe the brief historical background of disease surveillance
3. Describe the of concept of disease surveillance

INTRODUCTION

Surveillance, which for long was considered a branch of epidemiology, has in the last thirty years developed into a complete discipline within public health, with its own objectives, data sources, methodologies and evaluation procedures. The essence of public health surveillance is the use of data to monitor health problems to facilitate their prevention and control. Data and interpretations derived from the evaluation of surveillance data, can be useful in setting priorities, planning and conducting disease control programs, and in assessing the effectiveness of control efforts.
Community based health surveillance is an essential public health function as it provides the scientific database essential for decision making and appropriate public health action. Annually, over 100 infectious disease outbreaks and other public health emergencies occur in the WHO African region.

Effective communicable disease control relies on effective disease surveillance. A functional national communicable diseases surveillance system is essential for action on priority communicable diseases.

Many countries have developed surveillance activities for communicable diseases in order to monitor diseases with a high burden, detect outbreaks of epidemic-prone disease and monitor progress towards national or international control / eradication targets. In this sense, surveillance

of communicable diseases is a national function; and the sum of all surveillance activities represents the "national communicable disease surveillance system".

Definition

- *Surveillance*- from the French *sur* (over) and *veiller* (to watch)- is the close and continuous observation of one or more persons for the purposes of direction, supervision, or control.
- Disease Surveillance is defined as an ongoing systematic collection, collation, analysis and interpretation of data; and dissemination of information for action.
- It is a watchful and vigilant approach for gathering information on health problems and their determinants with the intention of taking action in order to improve or maintain the health of the people.
- It includes data collection, analysis, and dissemination to those responsible for prevention and control.
- Public health relies on information from medical care providers and takes prevention-oriented actions based on information received
- Surveillance is outcome oriented because it
    - can measure severity of the condition (e.g., hospitalization rate, disability, case fatality)
    - can measure impact of the condition (e.g., cost)
    - orients data by person, place, and time

BRIEF HISTORICAL BACKGROUND

- Prior to 1950, surveillance meant the close observation of persons exposed to a communicable disease to detect early symptoms and institute prompt isolation and control measures.
- The term surveillance was used initially in public health to describe the close monitoring of persons who, because of an exposure were at risk for developing highly contagious infectious diseases that had been controlled or eradicated in a particular geographic area or among a certain population.

- These persons were monitored so that if they exhibited evidence of disease, they could be isolated to prevent spreading the disease to others.
- In Europe the earliest systematic records regarding births and deaths were recorded in churches by parish clerks.
- This data was summarized, analyzed ad published. Seasonal variations I death rate were noted. Some diseases had considerably constant death rate, while others varied considerably.
- In 1837, England established the general registrar's office in order to record births, deaths, and marriages.
- Dr. William Farr was appointed chief statistician, and the data that was collected was used by John Snow.
- Ad Edwin Chadwick to explore the determinants of diseases by looking at how disease rates differed according to factors such as gender, location, occupation, and social class.
- Measuring disease frequency ad making comparisons among groups of people is essential to identifying the determinants of disease and health.
- John Snow is known for locating source of a cholera outbreak thus establishing the disease as water-borne.
- At the 21st World Health Assembly in 1968, the Organization adopted the definition of surveillance, meaning *"the epidemiological study of a disease as a dynamic process involving the ecology of the infectious agent, the host, the reservoirs, and the vectors, as well as the complex mechanisms concerned in the spread of infection and the extent to which this spread occurs"*
- In his classic 1963 paper, Alexander Langmuir applied surveillance for a disease to mean "the continued watchfulness over the distribution and trends of incidence of a disease through the systematic collection, consolidation, and evaluation of morbidity and mortality reports and other relevant data.
- According to the 1968 World Health Assembly Technical Discussions, the purpose of surveillance is "to use all appropriate epidemiologic and other methods as a guide to the control of disease".

- This function of surveillance is also described in the Dictionary of epidemiology: *"its main purpose is to detect change in trend or distribution in order to initiate investigation or control measures"*
- In the 1980s and 1990s, the term surveillance was now used to encompass not just disease, but any outcome, hazard or exposure.
- In fact, the term surveillance is often applied to almost any effort to monitor, observe, or determine health status, diseases, or risk factors within a population.
- Care should be taken, however, in applying the term "surveillance "to virtually any program for or gathering information about population's health, because this might lead to disagreements and confusion among public health policy makers and practitioners.
- Other terms (e.g., survey, health statistics and health information system) might be more appropriate for describing specific information gathering activities or programs.

The concept of disease surveillance

- This is an information-based activity involving the collection, analysis and interpretation of large volumes of data originating from a variety of sources.
- Disease surveillance provides and interprets data to facilitate the prevention and control of disease.
- To achieve this purpose, surveillance for a disease or other health problem should have clear objectives.
- These objectives should include a clear description of how data that are collected, consolidated and analyzed for surveillance will be used to prevent or control the disease.
- For example, the objective of surveillance for tuberculosis might be to identify persons with active disease to ensure that their disease is adequately treated.
- For such an objective, the data collection should be sufficiently frequent, timely and complete to allow effective treatment.
- To establish the objectives of surveillance for a particular disease, in a specific setting and to select an appropriate method of conducting surveillance for that disease, asking and answering the following questions will be helpful:

1. What is the health-related event under surveillance?
2. What is its case definition?

3. What is the purpose and what are the objectives of surveillance?
4. What are the planned uses of the surveillance data?
5. What is the legal authority for any data collection?
6. What is the population under surveillance?
7. What is the frequency of data collection (weekly, monthly, quarterly, or annually?
8. What are the data sources?
9. How are the data processed and managed?
10. How is confidentiality maintained?
11. How are the data analyzed?
12. How is the information disseminated?

- In summary, surveillance has a long history of value to the health population and continues to evolve as new health-related problems arise.
- Critical to maintaining useful, cost effective surveillance is periodic evaluation and implementation of recommended improvements.
- Stakeholders should be identified and included in all the evaluation processes and a clear description of surveillance activities should be developed.

UNIT 2: THE IMPORTANCE OF DISEASE SURVEILLANCE

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

1. List uses of surveillance data
2. Describe surveillance methods
3. Describe the five steps of surveillance

INTRODUCTION

The unit will assist the students to gain knowledge and skills to understand the usefulness of data in the prevention and control of disease and other health related issues. Surveillance data can be used to estimate the magnitude of specific problems, determine the distribution of illness, portray the natural history of the disease, generate hypotheses, stimulate research, evaluate control measures, monitor changes and facilitate planning. The goal of surveillance is not merely to collect data for analysis but to guide public health policy and action in fact surveillance is defined as ‘’information for action. Public health agencies use surveillance data to describe and monitor health events in their jurisdictions, set priorities and assist in the planning, implementation and evaluation of programs.

Importance of disease surveillance

Disease surveillance helps in the assessment of public health status, to define public health priorities, to evaluate programs, and to stimulate research. This tells us where the problems are, who is affected, and where the programmatic and prevention activities should be directed.

This importance focuses specifically on;

- Providing for quick identification of health problems
- Priority setting
- Early and adequate response to epidemics
- Resource mobilization and allocation
- Prediction and early detection
- Early and adequate response

- Allowing for early treatment and control
- Enabling the putting in place quick control measures.
- Enabling the timely notification to higher authorities for necessary support.
- Monitoring and evaluation of intervention programs

PURPOSE OF SURVEILLANCE

- The purpose for conducting public health surveillance is to learn the on-going pattern of diseases, occurrence and the potential for disease in a population so that we can effectively investigate, control, and prevent diseases in that population.
- Through surveillance we can learn more about the natural history, clinical spectrum and epidemiology of disease (who is at risk, when it occurs and exposures or risks factors that are critical to its occurrence).
- Surveillance will provide us with a baseline data which we use to assess prevention and control measures when they are developed and implemented.

USES OF SURVEILLANCE

1. Monitoring health events

- To detect sudden changes in disease occurrence and distribution (outbreaks).
- To follow secular trends and patterns of disease (long term).
- To identify changes in agents and host factors.
- To detect changes in health care practices.
- Cluster - an aggregation of cases of a disease or another health related condition such as a cancer or birth defect closely grouped in time and place.
- Local health agencies use surveillance data for detecting sudden increases in disease occurrence (out breaks).
- Health agencies need to be aware of the secular (long term) trends and patterns of disease among the population they serve and to explain any change in those patterns
- Health agencies must know the pattern of disease occurrence by risk group to target strategies and anticipate needs.

- Health agencies monitor changes in agents and host factors to assess the potential for future disease occurrence (resistance to antibiotics).
- Health agencies monitor changes in health care practices e.g when some hospitals identified a marked increase in caesarean deliveries, they establish decision making protocols.

2. Link to public health action

Investigation and control

- One action is to search for the source or sources which when found may prompt further actions e.g. closure of a restaurant.
- Counselling and treatment of an asymptomatic patient
- Withdrawal of a commercial product or warnings to the public
- Planning because agencies can anticipate when and where resources will be needed and thus will be able to plan how to allocate them affectively
- Evaluating prevention and control measures
- Surveillance data are used frequently to quantify the impact of program intervention. Agencies can use surveillance data in a similar way to monitor and modify educational and other risk reduction programs
- Generating hypothesis and stimulating public health research
- Because we collect and analyze surveillance data on an on-going basis our findings often generate questions and hypothesis that provide direction for further research.

FIVE STEPS OF SURVEILLANCE

1. Data collection

- Use standardized instruments, field tested

i. Passive surveillance

This type of disease surveillance involves the collection of data as part of routine provision of health services

- Providers are responsible for reporting
- Health department waits to receive reports
- Problem with under-reporting

ii. Active surveillance

This type of disease surveillance involves the collection of data from communities through surveys or mobilizing communities to some central point where data may be collected.

- Providers contacted on regular basis to collect information
- More resource intensive
- Used for outbreaks or pilot studies

2. Data analysis

- On-going review
- Descriptive statistics, multivariate analyses
- Automated analyses

3. Interpretation and dissemination

- **P**resentation of data in the form of tables, graphs, maps, etc.
- Disseminate data via reports, presentations, internet, etc.

4. Evaluation

- Did the system generate needed answers to problems?
- Was the information timely?
- Was it useful for planners, researchers, etc?
- How was the information used?
- Was it worth the effort?
- What can be done to make it better? (More on evaluation later).

5. Link to action

- Without action, the collected data serve no real purpose

UNIT 3: MEASLES

LEARNING OBJECTIVES

1. Define professional and lay case definition of measles
2. Describe specimen collection and transporting techniques
3. To outline strategies for accelerated measles control and elimination

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INTRODUCTION

In Malawi, measles used to be a major childhood public health problem until 1998 when the first measles vaccination catch –up campaign was done. Follow-up campaigns are conducted every three to four years in order to interrupt the circulation of the virus and protect susceptible children missed during routine EPI services and campaigns. In 2009 and 2010 Malawi had measles outbreak and in response a vaccination campaign was conducted targeting all children less than 15 years of age.

Case Definitions

Professional case definition:

- History of generalized blotchy rash and fever, and history or any one of the following; Cough, runny nose and/or red eyes

Lay Case Definition: History of rash and fever

Lab confirmed:

- Suspected case of measles with positive serum IgM antibody, and not vaccinated in the preceding 4 weeks.

Confirmed by epidemiologic linkage:

- A suspected case of measles not investigated serologically (blood sample collected and analyzed) but has possibility of contact with a laboratory-confirmed case whose rash onset was within the preceding 30 days in the same geographical area.

Investigation

- All suspected measles cases should be investigated.

- Health facility personnel should conduct investigation within 24 hours of receiving information regarding suspected measles case(s).
- For investigation and confirmation, use the case investigation form.

Reporting

- A suspected measles case should be reported to the nearest health facility which will in turn report to the District Health Office for further communication to higher authorities.
- The existing line listing form should be used for reporting and a copy should be retained by health facilities for their records.
- To facilitate prompt case investigation and response, rapid notification by telephone, radio and other means, where available, should be organized and mobilized when the occasion arises.

SPECIMEN COLLECTION AND TRANSPORTATION TECHNIQUES

- Blood specimen should ideally be taken from 0-6 days after onset of rash.
- The blood specimen can be taken up to one month from onset of rash.
  However, the probability of the 1gM tests being positive declines after 30 days.
- For children under 1 year, collect 1ml of blood while for those over 1 year collect 3-5 mls in a plain tube with no anticoagulant
  Collect blood at first contact from
- In case of an outbreak, collect from the first 5 cases, discontinue specimen collection once an outbreak is confirmed i.e. 3 measles IgM positives. If not a measles outbreak (less than 3 measles IgM positives), resume collection of blood specimens from all suspected cases
- Take a blood specimen and separate the serum by;
- Letting blood sit at an angle for at least 1 hour without shaking
- If a refrigerator is available, refrigerate over-night. If there is no refrigerator, transport the serum within 6 hours of collection to the laboratory
- If a centrifuge is available, centrifuge at 2000 rpm for 10-20 minutes
- Decant the serum into a clean labeled test-tube
- Label the specimen by endorsing name, age, sex and the date of blood collection.

- Transport samples in a vaccine carrier with frozen ice packs (reverse cold chain system) together with a completed measles case investigation form in a plastic paper

Strategies for Accelerated Measles Control and Elimination

- Strengthening routine immunization to achieve and sustain high coverage.
- Providing a second opportunity for measles immunization through the implementation of high quality supplemental immunization activities (SIAs).
- Epidemiologic surveillance with lab confirmation of cases and outbreaks.
- Improved case management as per IMCI guidelines.

UNIT 4: POLIOMYLITIS/ ACUTE FLACCID PARALYSIS (AFP)

LEARNING OBJECTIVES

1. Define the standard and lay definition of acute flaccid paralysis
2. Describe specimen collection and transporting techniques
3. Describe polio eradication strategies

INTRODUCTION

- Acute Flaccid Paralysis (AFP):
  Any case with weakness or floppiness in the limbs of sudden onset, not due to clear history of trauma in a child less than 15 years of age or any case in whom a clinician suspects Poliomyelitis as a possible diagnosis regardless of age.
- Poliomyelitis is an infectious disease caused by polio virus.
- The virus mostly affects children below five years of age who are usually most vulnerable.
- However, a person of any age who does not have immunity to polio may be infected.
- The virus is spread from person to person by contaminated hands and food in areas where sanitation is poor.
- This mode of transmission is faeco-orally similar to that of cholera.
- Polio transmission is facilitated by crowded living conditions, especially in city slums where sanitation is poor and vaccination coverage is low and
- In hard-to-reach urban area with pockets of low vaccination coverage, polio transmission may persist.

Detecting and Notifying a case of AFP

- Recognizing and reporting an AFP case is one of the most important tasks that a health worker should carry out.
- All AFP cases should be reported.
- Reporting of these cases is based primarily on careful observation of the clinical features
- In view of different training background of different cadres of health workers and involvement of communities, professional and lay case definitions are used.

Standard Case definition

- Any case with weakness or floppiness in the limbs of sudden onset not due to clear history of trauma, in a child less than 15 years of age or
- Any case in whom a clinician suspects Poliomyelitis as a possible diagnosis regardless of age.

Lay case definition

- A person presenting with sudden weakness or paralysis in the leg(s) and / or arm(s), not caused by injury in a child less than 15 years of age.

Investigating a case of AFP

- Each detected case of AFP should be investigated within 24 hours of receiving notification.
- The epidemiological information (name of the patient, physical address, date of birth, date of onset of paralysis, initial signs and symptoms, vaccination status, date of stool specimen collection.) should be obtained on the spot.
- The health worker should ensure that case investigation form is completely filled and stool specimens are collected and transported appropriately.
- However, in cases when stool specimen is collected after 14 days of onset of paralysis or one stool specimen is collected, follow up at 60 days should be conducted.

Collecting and Transporting of stool specimen

Collection

- Collect two stool specimens 5-10 grams each (tea spoon, or size of an adult thumb), with an interval of 24 to 48 hours apart.
- Collect two specimens within 0-14 days after onset of paralysis when viral load is very high in the stools. Stool specimens can still be collected up to 60 days of onset of paralysis. However, chances of isolating wild polio virus are very minimal.
- Complete a late stool questionnaire if case is detected beyond 14 days from onset of paralysis
- Use any clean container with a tight lid.

- Tightly close the container to prevent leakage and label it (name, date of specimen collection).
- Store the specimen in refrigerator/freezer, vaccine carrier or cold box with frozen ice packs.
- Fill the AFP investigation form.

Transportation

- Once the second stool specimen has been collected, arrange to send them to the next level immediately.
- Ensure the stool specimen containers are labeled with name and date of collection
- Pack the specimens in the vaccine carrier with frozen icepacks
- Put the case investigation form in a plastic paper and put it inside the vaccine carrier.
- Close the vaccine carrier tightly.

Polio Eradication Strategies

- Attaining high routine coverage (at least 80%) with at least 3 doses of Oral Polio Vaccine.
- Conducting periodic supplemental Immunizations (NIDs, SNIDs) to boost population immunity.
- Strengthening the implementation of Acute Flaccid Paralysis.
- Conduct mop-up vaccination campaigns when poliovirus transmission is localized or when an importation has occurred.
- Supplemental Immunizations
- In Malawi National Immunization Days (NIDs) for polio were conducted in 1996 and 1997.
- This was aimed at interrupting transmission of wild polio virus (WPV) from circulation.
- In addition, Sub- National Immunization Days (SNIDs) were conducted in 7 districts which had low NID coverage in the 1997 campaign. In 2011 three (3) districts (Phalombe, Mulanje and Nsanje) in Southern region conducted SNIDs in response to VDPV outbreak in Mozambique.

UNIT 4: INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR)

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

1. Describe the concept of IDSR
2. Explain the steps of IDSR
3. Describe the case definition for priority diseases and conditions of public health interest in Malawi
4. Describe reporting procedures in disease surveillance

INTRODUCTION

IDSR involves coordinating and streamlining surveillance activities to maximize the scarce resources. Several activities are combined into one integrated activity and take advantage of similar surveillance functions, skills, resources and target populations.

The key components of IDSR at the community level include

- Interpretation of disease data
- Case Investigation
- Case detection
- Case registration
- Case reporting
- Response to suspected outbreaks

The Specific Objectives of IDSR

- Strengthen the capacity of countries to conduct effective surveillance activities: train personnel at all levels; develop and carry out plans of action; and advocate and mobilize resources.
- Integrate multiple surveillance systems so that forms, personnel and resources can be used more efficiently.

- Improve the use of information to detect changes in time in order to conduct a rapid response to suspect epidemics and outbreaks; monitor the impact of interventions: for example
    - declining incidence, spread, case fatality, and to facilitate evidence-based response to public health events; health policy design; planning; and management
    - Improve the flow of surveillance information between and within levels of the health system.
    - Strengthen laboratory capacity and involvement in confirmation of pathogens and monitoring of drug sensitivity.
    - Increase involvement of clinicians in the surveillance system.

The IDSR Steps

Step 1 - Identify Cases Use standard case definitions, identifying priority diseases and conditions

Step 2 - Report suspected cases or conditions or events to the next level

If this is a potential Public Health Emergency of International Concern (PHEIC), or a disease targeted for elimination or eradication, respond immediately by investigating the case or event and submit a detailed report.

Step 3 - Analyze and interpret findings

Compile the data, and analyze it for trends. Compare information with previous periods and summarize the results.

Step 4 - Investigate and confirm suspected cases, outbreaks or events

Take action to ensure that the case, outbreak or event is confirmed including laboratory confirmation wherever it is feasible. Gather evidence about what may have caused the outbreak or event and use it to select appropriate control and prevention strategies.

Step 5- Prepare

Take steps in advance of outbreaks or public health events so that teams may respond quickly and essential supplies and equipment are available for immediate action.

Step 6- Respond

Coordinate and mobilize resources and personnel to implement the appropriate public health response.

Step 7- Provide feedback

Encourage future cooperation by communicating with levels that provided data, reported outbreaks, cases and events about the investigation outcome and success of response efforts.

Step 8- Evaluate and improve the system

Assess the effectiveness of the surveillance and response systems, in terms of timeliness, quality of information, preparedness, thresholds, case management and overall performance. Take action to correct problems and make improvements.

Diseases of Public Health Importance

The integrated disease surveillance and response priority diseases are classified into three categories and these are:

- Cholera
- Dysentery (bloody diarrhea)
- Measles
- Bacterial meningitis
- Plague
- Viral haemorrhagic fever
- Poliomyelitis/Acute flaccid paralysis
- Neonatal tetanus
- Leprosy
- Malaria
- Tuberculosis
- New AIDS patients
- Pneumonia in under- five children
- Schistosomiasis
- Sexually transmitted infections

STANDARD CASE DEFINITION

Case definition is a standard set of criteria for deciding whether an individual should be classified as having the condition of interest or not. In a clinical setting, a set of criteria is used to make a diagnosis in order to prescribe appropriate treatment.

Why is case definition important?

- important to clearly define condition
- Ensures same criteria are used by all
- Makes the data more comparable
- Include person, place, time
- May define suspected and confirmed cases
- May include symptoms, laboratory values, time period, population as appropriate

Case classification

- **Confirmed:** a case that meets the clinical description and the criteria for laboratory confirmation.
- **Probable:** a case that meets the clinical description and that is epidemiologically linked to a confirmed case.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Acute haemorrhagic fever syndrome	**Suspected case**: Acute onset of fever of less than 3 weeks' duration in a severely ill patient AND any 2 of the following; haemorrhagic or purpuric rash; epistaxis (nose bleed); haematemesis (blood in vomit); haemoptysis (blood in sputum); blood in stool; other haemorrhagic symptoms and no known predisposing factors for haemorrhagic manifestations. **Confirmed case**: A suspected case with laboratory confirmation or epidemiologic link to confirmed cases or outbreak. ***Note**: During an outbreak, case definitions may be changed to correspond to the local event.*

Adverse events following immunization (AEFI)	A medical incident that takes place after immunization, causes concern and is believed to be caused by the immunization
Cholera	**Suspected case**: In a patient age 5 years or more, severe dehydration or death from acute watery diarrhoea. • If there is a cholera epidemic, a suspected case is any person age 5 years or more with acute watery diarrhoea, with or without vomiting. **Confirmed case**: A suspected case in which *Vibrio cholerae* O1 or O139 has been isolated in the stool.
Diabetes	**Suspected new case**: Any person presenting with the following symptoms: • Increased thirst • Increased hunger • Frequent urination **Confirmed new case**: Any person with a fasting venous plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillary glucose ≥ 6.1 mmol/L (110 mg/dl) Or Any person with a non-fasting venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl) or capillary glucose ≥ 11,1 nnik>k (200 mg/dl) **Report only the first lab-confirmed diagnosis of the patient*
Diarrhoea with blood (dysentery)	**Suspected case**: A person with diarrhoea with visible blood in stool.

	Confirmed case: Suspected case with stool culture positive for *Shigella dysenteriae* type 1.
Ebola or Marburg viral hemorrhagic Fevers	**Suspected case**: Illness with onset of fever and no response to usual causes of fever in the area, and at least one of the following signs: bloody diarrhoea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine. **Confirmed case**: A suspected case with laboratory confirmation (positive IgM antibody, positive PCR or viral isolation), or epidemiologic link to confirmed cases or outbreak. ***Note****: During an outbreak, these case definitions may be changed to correspond to the local event.*
Hypertension	**Suspected new case at first visit:** Any individual presenting with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure. **Confirmed case:** Any individual presenting on at least two occasions with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure.
Leprosy	**Suspected case**: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve. **Confirmed case:** A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with Multi Drug Therapy (MDT).
Malaria	**Uncomplicated malaria**: Any person with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as malaria.

	Confirmed uncomplicated malaria: Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. **Unconfirmed severe malaria** Any patient hospitalised with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically. **Confirmed severe malaria** Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.
Malnutrition	**Low birth weight newborns:** Any new born with a birth weight less than 2500 grams (or 5.5 lbs) **Malnutrition in children:** • Children under five who are underweight (indicator: weight for age<-2 ZScore) • Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality) • Bilateral pitting oedema **Malnutrition in pregnant women:** Pregnant women given birth to low birth weight babies (birth weight < 2.5 Kg) (poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants).
Maternal Deaths	The death of a woman while pregnant or within 42 days of the delivery or termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Measles	**Suspected case**: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles. **Confirmed case**: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak.
Meningococcal Meningitis	**Suspected case**: Any person with sudden onset of fever (>38.5ºC rectal or 38.0ºC axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal signs. **Confirmed case**: A suspected case confirmed by isolation of *N. meningitidis* from CSF or blood.
Neonatal tetanus	**Suspected case**: Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both. **Confirmed case**: No laboratory confirmation recommended.
Plague	**Suspected case**: Any person with sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood stained sputum, chest pain, and difficulty in breathing. **Confirmed case**: Suspected case confirmed by isolation of *Yersinia pestis* from blood or aspiration of buboes, or epidemiologic link to confirmed cases or outbreak.
Poliomyelitis (Acute flaccid paralysis)	**Suspected case:** Any child under 15 years of age with acute flaccid paralysis or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis. **Confirmed case**: A suspected case with virus isolation in stool.
Severe Pneumonia in Children under 5	**Clinical case definition (IMCI) for pneumonia:** A child presenting with cough or difficult breathing and: • 50 or more breaths per minute for infant age 2 months up to 1 year • 40 or more breaths per minute for young child 1 year up to 5 years

	Note: *A young infant age 0 up to 2 months with cough and fast breathing is classified in IMCI as "serious bacterial infection" and is referred for further evaluation.* **Clinical case definition (IMCI) for severe pneumonia:** A child presenting with cough or difficult breathing and any general danger sign, or chest indrawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness. **Confirmed case:** Radiographic or laboratory confirmation of pneumonia may not be feasible in most districts.
Sexually transmitted infections	**Genital ulcer syndrome (non-vesicular):** **Suspected case**: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy. **Confirmed case:** Any suspected case confirmed by a laboratory method. **Urethral discharge syndrome:** **Suspected case**: Any male with urethral discharge with or without dysuria. **Confirmed case**: *Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (for example Gram stain showing intracellular Gram-negative diplococci).
Tuberculosis	**Suspected case**: Any person with a cough of 3 weeks or more. **Confirmed case**: ***Smear-positive pulmonary*** TB: a) a suspected patient with at least 2 sputum specimens positive for acid-fast bacilli (AFB), or b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined by the treating

medical officer, or c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB.

***Smear negative PTB*:** a patient who fulfils all the following criteria: a) two sets taken at least 2 weeks apart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalities consistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, a decision by a physician to treat with a full course of anti-TB chemotherapy, or b) a patient who fulfils all the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and miliary), a decision by a physician to treat with a full course of anti-TB chemotherapy, or c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result is positive.

REPORTING IN DISEASE SURVEILLANCE

- Each month, the health facility calculates the total number of cases and deaths due to priority diseases and events seen in the health facility.
- Separate totals are calculated for outpatient cases and inpatient cases.
- The summary totals are recorded on a form and sent to the district level.
- The district aggregates the totals from all the health facilities that reported and submitted district summary totals to the provincial, regional or central level.
- In cases where a computer is available for surveillance or case management, patient records can be analyzed to generate the weekly, monthly or quarterly reports.
- This information is important for producing national and sub-national situation reports.
- All data sets should be shared with the health authorities with a copy to the respective disease prevention and control program: this is important for coordination at central level, and for the building or strengthening of a national IDSR database system.

Improve Routine Reporting Practices

- In some health facilities, more than one person may be responsible for recording information about patients seen in the facility.

- For example, the clinician records the patient's name and diagnosis in a clinic register.
- Later in the day, a nurse tallies the number of cases and deaths seen in an outpatient service.
- The ward nurse tallies the number of hospitalized cases.
- Each week, month, or quarter, a records clerk or statistician calculates summaries for all the diseases and records them in a standard form.
- In case the health facility is equipped with computers, individual patient records shall be entered, from which the surveillance subset will be extracted and analyzed to get the required weekly, monthly or quarterly compilations.

Zero reporting

Whatever the structure of the surveillance system, data on priority diseases or syndromes should move smoothly through the system triggering the appropriate responses throughout. The system should include zero reporting: each site should report for each reporting period even if that means reporting zero cases. This avoids the confusion of equating .no report with no cases. In addition, the surveillance system must include performance indicators for reporting (e.g. completeness and timeliness of reports).

Monitor access to forms and procedures

- Keep a record of IDSR forms and reports received at your level.
- The record you keep will be an essential data source for calculating indicators for your country's IHR report and for monitoring performance of the IDSR indicators.
- Periodically check with reporting sites that you supervise (community, health facility, and district) to ensure that the correct forms and procedures are available to staff so they can record and report the required cases of priority diseases and conditions:
- Take steps to ensure that all health workers know the standard case definitions recommended by national policy.
- Establish or modify existing procedures so that all health workers will be able to apply the standard case definitions in detecting and reporting priority cases, outbreaks or events.
- Highlight with staff those diseases or conditions that require immediate reporting for case-based surveillance including PHEIC and other priority diseases or events of national

and regional concern. For example, all the health staff should be aware of epidemic-prone diseases for which a single case is a suspected outbreak requiring immediate action, and of any unusual or unexplained event with potential for affecting human health.

- Review with health staff the role that case-based data plays in determining risk factors and the means of disease transmission or exposure to health risks in a public health event.
- Make sure the staff has access to a recommended form for reporting case-based information.
- Ensure that the surveillance unit has access to fast communication means (facsimile, telephone, text message, electronic mail, telegrams, personal messages, or other rapid communication means).

UNIT 5: MORBIDITY, MORTALITY FREQUENCY MEASURES

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

- Calculate simple mortality frequency measures commonly used in disease surveillance

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INTRODUCTION

Mortality rates are also used in disease surveillance.

Mortality rate, also known as death rate, is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time. Mortality rate is typically expressed in units of deaths per 1,000 individuals per year, thus, a mortality rate of 9.5 (out of 1,000) in a population of 1,000 would mean 9.5 deaths per year in that entire population, or 0.95% out of the total. It is distinct from "morbidity" which is either the prevalence or incidence of a disease, and also from the incidence rate (the number of newly appearing cases of the disease per unit of time)

Mortality Rate

- Mortality rate is a measure of the frequency of occurrence of death in a defined population during a specified interval.
- Formula:

$$\text{Mortality rate} = \frac{\textit{death occurring during a given time period}}{\textit{Size of the population among which the death occurred}} \times 10^n$$

Frequently Used Measures of Mortality

1. **Infant mortality rate**
    - The infant mortality rate is one of the most commonly used measures for comparing health services among nations.
    - The numerator is the number of deaths among children under 1 year of age reported during a given time period, usually a calendar year.
    - The denominator is the number of the live births reported during the same time period.

- The infant mortality rate is usually expressed per 1,000 live births.

2. **Neonatal mortality rate**
    - The neonatal period is defined as the period from birth up to but not including 28 days.
    - The numerator of the neonatal mortality rate therefore is the number of deaths among children under 28 days of age during a given period time
    - The denominator of the neonatal mortality rate is the number of live birth reported during the same time period,
    - Usually expressed per 1,000 live births.
3. **Postnatal mortality rate**
    - The postnatal period is defined as the period from 28 days of age up to but not including 1 year of age.
    - The numerator of the postnatal mortality rate therefore is the number of death among children from 28 days up to but not including 1 year of age during a given time period.
    - The denominator is the number of live births reported during the same time period.
    - The postnatal mortality rate is usually expressed per 1,000 live births.
4. **Maternal mortality rate**
    - The maternal mortality rate is really a ratio used to measure mortality associated with pregnancy.
    - The numerator is the number of deaths assigned to cause related to pregnancy during a given time period.
    - The denominator is the number of women delivered during the same time period.
    - Because maternal mortality is much less common than infant mortality, the maternal mortality rate is usually expressed per 100,000 women delivered.
5. **Prevalence**

- This is defined as a proportion of cases for a particular condition in the surveyed population of interest and this includes both new and old cases.

- Prevalence, sometimes referred to as prevalence rate, is the proportion of persons in a population who have a particular disease attribute at a specific point in a time or over a specified point in time or over a specified period of time.
- The formula for prevalence of disease is:
- **Prevalence =** *All new and pre-existing cases during a given time period X* 10^n

Population during the same time period

Incidence

This is defined as a proportion of cases for a particular condition in the population of interest and this excludes old cases.

- It is a measure of the frequency with which an event, such as a new case of illness, occurs in a population over a period of time
- We use incidence rates instead of raw numbers for comparing disease occurrence in different population because **rates adjust for differences in population sizes.**
- The formula for calculating an incidence rate follows:

  Incidence rate = *New cases occurring during a given time period X* 10^n

  Population at risk during the same time period

- The incidence rate expresses the probability or risk of illness in a population over a period of time.
- The numerator of an incidence rate should reflect new cases of disease which occurred or were diagnosed during the specified time period
- The denominator should represent the population from which the cases in the numerator arose.
- Depending on the circumstances, the most appropriate denominator will be one of the following:
    - Average size of the population over the time period
    - Size of the population (either total or at risk) at the middle of the time period.
    - Size of the population at the start of the time period.
- Sometimes the incidence rate is like the velocity or speed measured in miles per hour. It indicates how quickly people become ill measured in people per year.

Comparison of *Prevalence* and *Incidence*

- The prevalence and incidence of disease are frequently confused.
- They differ in what cases are included in the numerator.
- Numerator of incidence = new cases occurring during a given time period
- Numerator of prevalence = all cases present during a given time period.

UNIT 6: DEFAULTER TRACING

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

- To understand the goals of defaulter tracing in order to improve clients' and patients' adherence to health services/ treatment
- To describe factors that contribute to occurrence of defaulters
- To list the impact of occurrence of defaulters in the health service
- To describe the roles of stakeholders in defaulter tracing system

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INTRODUCTION

The defaulter tracing system covers operational definition of defaulter in community health context, community health programs affected by occurrence of defaulters, factors contributing occurrence of defaulters, impact of occurrence of defaulters on community health programs.

There are several community health programs that have services to be offered to patients/clients for a number of times to complete comprehensive treatment or service coverage. These programs have different prescribed schedules or intervals for patients/clients depending on the nature of condition or need of patient/client. These programs include: EPI, ART, nutrition, TB, ANC and PNC, NCDs and NTDs.

Definition of defaulter

- Patient or client who was initiated on a service but fails to turn up for subsequent services for a specified period of time.
- Defaulter tracing is the process of identifying and following up of clients and patients who have dropped out of (failed to turn up for) continuum of care.

Factors contributing occurrence of defaulters

There are various factors that contribute to the occurrence of defaulters in community health programs are from both supply side (health system) and demand side (service users).

These include:

- Poor attitude of some health workers towards patients/clients which discourage the users to continuing coming for subsequent services according to recommended schedules or prescribed schedules.
- Long distance to service delivery points also contribute to occurrence of defaulters as some patients/clients in hard to-reach areas cannot reach the delivery points due to different challenges such as transport issue.
- Physical barriers-in some communities, there are physical barriers such as rivers, terrain that prevent users to continuing coming for subsequent services according to recommended schedules or prescribed schedules.
- Psychosocial barriers such as stigma and discrimination, -in some communities, these prevent users to continue seeking subsequent services according to recommended schedules or prescribed schedules.
- Myths, religious and traditional beliefs contribute to occurrence of defaulters in community health programs
- Frequent cancellation of services due to various reasons such as stock outs of drugs and supplies, Poor communication of the health workers to the patients/clients
- Migration of patients/clients contribute to occurrence of defaulters in community health programs as these users may be away on the time for follow-up or subsequent services thereby missing these subsequent services.
- Lack of Knowledge to patients/clients who are new in the area about availability of services or dates or schedules for particular services in the area.

Impact of occurrence of defaulters

Occurrence of defaulters have impacted on the community health programs in a number of ways.

- **In EPI:** occurrence of defaulters has contributed to risk of outbreaks, low immunization coverage and increase in Program running cost.
- **In ART program**, the occurrence of defaulters has contributed to drug resistance, increased risk of HIV transmission, increased mortality.
- **In TB:** drug resistance, increased risk of TB transmission, TB relapse occurrence and increased mortality.

- **In nutrition:** occurrence of defaulters has contributed to high mortality, increased susceptibility to other infections, disability.

- **In MNH**: occurrence of defaulters has contributed to poor maternal and newborn outcomes: (NNDs, MDs, LBW Babies).
- **In NCDs:** occurrence of defaulters has contributed to increased cases of Mental illness Increased incidents of violence, suicide, increase in complications from epilepsy.

Roles of HSAs in defaulter tracing

No	*Implementer*	*Specific roles*
1	HSA	1. Review the data collection tools such as registers (i.e., CHR
		2. Identify defaulters immediately after service provision from tools such as registers
		3. Link with other implementers to find the defaulters and provide services
		4. Provide services to defaulters within next five working days to ensure they receive services within recommended schedule
		5. Provide support supervision to community health volunteers and community structures on defaulter tracing implementation
2	SHSA	1. Review the data collection tools such as registers (i.e., CHR
		2. Identify defaulters immediately after service provision from tools such as registers
		3. Link with other implementers to find the defaulters and provide services
		4. Provide services to defaulters within next five working days to ensure they receive services within recommended schedule
		5. Provide support supervision to HSAs, community health volunteers and community structures on defaulter tracing implementation
3	CMA	1. Review the data collection tools such as registers (i.e., ANC register)
		2. Identify defaulters immediately after service provision from tools such as registers
		3. Link with other implementers to find the defaulters and provide services

Roles of Stakeholders in Defaulter Tracing System

The occurrence of defaulters is due to multiple factors. Hence, it requires a multi-stakeholder approach in order to address this issue across programs.

District level

- Capacity building to health workers - TOTs, supervision of the trainings, identifying participants and venues, communication with participants, conduct follow up supervision after the trainings
- Conduct quarterly supportive supervision - Planning (transport, fuel, human resources and other logistics), development of checklist, development of supervision schedule, areas to supervise
- Conduct quarterly review and planning meetings – Planning for the meeting (resources, venue, refreshments, allowances), preparation of reports to be presented, way forward and action plans developed at the end of the meeting.
- Mobilize resources - Mobilizing resources through writing proposals, conducting meetings with partners, other fundraising activities.
- Briefing meetings with DEC, TWGs, health and environment service committee
- Produce reports and provide feedback to health facility and other stakeholders

Health facility level

- Identification of defaulters soon after service provision - review the registers at the end of each service delivery session and identify defaulters.
- Communicate with relevant structures to follow up the defaulters
- Collection of data – data generated through registers (electronic and paper based) by HSAs, Data clerks, Clinicians and nurses
- Produce and submit reports to the district- consolidate facility reports, analyze and provide feedback to the facilities, stakeholders and community
- Conduct review meetings- Planning for the meeting (resources, venue, refreshments, allowances), preparation of reports to be presented, way forward and action plans developed at the end of the meeting • Supportive supervision to the community structures (monthly, Quarterly)

- Health service provision to the community- actual defaulter tracing

Community level

- Conduct home visits
- Identification of a defaulter
- Link with community health worker or structure
- Analysis of the reason for defaulting
- Conduct actual defaulter tracing- Decide which method to use for defaulter tracing and mobilize necessary tools and logistics such as transport, checklist, registers
- Refer clients to facility - H S A or volunteer uses necessary tools such as referral slips to refer clients to the facility.
- Produce reports to the health facility- Collect data and write/submit reports to the facility.
- Conduct awareness meetings
- Conduct disease surveillance
- Supervision to community structures

Annex 3: CASE INVESTIGATION FORM – NEONATAL TETANUS

Official Use Only **Epid Number**: (**completed by district team**) Mal - _____-_____-_____-_____ **Ctry** **Region** **District** **Year Onset** **Case Number** Received at National _____/_____/_____

IDENTIFICATION

District: _____ Region: _____

Nearest Health Facility to Village: _____ Village/ Neighbourhood: _____ Town/ City: _____

Address: _____

Name(s) of patient: _____ Mother: _____

Sex: ☐ 1 = Male, 2 = Female Father: _____

NOTIFICATION/INVESTIGATION

Notified by: _____ Date District Notified: _____/_____/_____ Date Case Investigated: _____/_____/____

MOTHER'S VACCINATION HISTORY Please use the following key, **1=Y, 2=N, 9=U**, where applicable.

Question	Answer
Mother vaccinated with TT?	
Have card?	
Number of doses:	
Vaccination status of mother prior to delivery? **	

1st _____/_____/_____ 4th _____/_____/_____
2nd _____/_____/_____ 5th _____/_____/_____
3rd _____/_____/_____ **If >5, last dose** _____/_____/_____

****1= up-to-date, 2= not up-to-date, 9= unknown**

BIRTH OF INFANT

Date of birth: _____/_____/_____ Please use the following key**, 1=Y, 2=N, 9=U**, where applicable.

Questions		Questions	
Mother received antenatal care?		Location of birth: ***	
How many prenatal visits?		If birth in institution, name of institution:	
Attended by a trained TBA/midwife?		Cut cord with a sterile blade?	
If attended by a trained TBA/midwife, give name		Cord treated with anything?	
Attended by doctor/nurse?		Describe treatment of cord: Where?	

*** 1=Hospital, 2=Health centre, 3=Home, trained attendant, 4=Home, untrained attendant, 5=Home, no attendant, 9=Unknown

INITIAL CLINICAL HISTORY Please use the following key, 1=Y, 2=N, 9=U, where applicable.

Was baby normal at birth?		Spasms or Convulsions?	
Normal cry and suck during first 2 days?		Complications?	
Stopped sucking after 2 days?		Did the baby die?	
Arched back?		Age at death:	Days
Stiffness?		Age of onset in days:	Days (99=Unknown)

Onset of symptoms _____/_____/_____

TREATMENT

Date of admission _____/_____/_____

Medical record number: _____

Facility Address:

Questions	Answer 1=Y, 2=N, 9=U
Seen in OPD?	
Admitted?	

COMMENTS:

RESPONSE Please use the following key, **1=Y, 2=N, 9=U**, where applicable.

Questions	Answer
Mother given protective dose of TT within 3 months of report?	
Supplemental vaccination within same locality as the case?	

Date of response: _____/_____/_____

Details of response:

_____

FINAL CLASSIFICATION OF THE CASE: Neonatal Tetanus**:** ☐ **1=Yes, 2=No, 9=Unknown**

INVESTIGATOR

Name: _____ Title: _____

Unit: _____ Address: _____ Phone: _____

Annex 2: *CASE –BASED SURVEILLANCE REPORTING FORM*

_____ Reporting Health Facility

_____ Reporting District

☐ Cholera ☐ Dysentery (Diarrhoea with Blood) ☐ Measles ☐ Bacterial Meningitis ☐ Plague ☐ Viral Hemorrhagic Fever _____ Other

Serial Number: _____

_____/_____/_____ Date Received at national level

Name(s) of Patient: _____ **Date of Birth:** ____/_____/_____ **Age: (If DOB unknown)** ____ **years** _____ **months** (If <12 months)

Patient's Residence: Village_____ **Traditional Authority** _____ **District of residence:** _____

Sex: M=Male F=Female ☐

Town/City: _____ U=Urban R=Rural **Urban/Rural** ☐

Physical address:_____

If applicable, Name of mother and father if neonate or child

Date Seen at Health Facility: _____/_____/_____
Date Health Facility Notified District: _____/_____/_____

Dates of Onset: _____/_____/_____

For cases of Measles, and Meningitis:
Number of vaccine doses received ☐ 9=unknown
For Measles (documented by card)

Date of last vaccination: _____/_____/_____
(Measles, and Meningitis only)

Risk factor #1_____ _____

Risk factor #2_____ _____

In/Out patient : ☐ 1=In-patient 2=Out-patient

Outcome ☐ 1=Alive 2=Dead 9=unknown

Final Classification: ☐ 1=Confirmed 2=Probable/Compatible 3=Discarded 4=Suspected

Person Completing Form Name: _____
Signature: _____
Phone No. _____

Date Sent to District:____/_____/____

Collect Lab Specimens

For Health Facility:Complete the following information and send a copy of this form to the lab with the specimen.

Date of specimen collection: _____/_____/_____
Date Specimen sent to lab: _____/_____/_____

Specimen: Stool Blood CSF _____ Other

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MODULE 13: COMMUNITY HEALTH INFORMATION MANAGEMENT

Community Health Information Management

The quality of research results depends on data collection techniques, data collection and management tools used. In this module, learners will be introduced to data collection, analysis and reporting. The module reviews the common methods used in data collection and simple analysis and presentation of the data for a report. The module also features eHealth - the use of mobile communication devices, such as mobile phones, tablet computers and personal digital assistants (PDAs), and wearable devices such as smart watches, for health services, information, and data collection.

12.2Intended learning outcomes

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

- Define data collection and data management
- Explain various data collection techniques and data collection tools used in research
- Describe various methods of data analysis and presentation
- Write a research report

12.3What is data collection and data management?

- Data collection is a means of gathering facts, statistics and details from different sources.
- Data management is the process of collecting, keeping, processing and using required data to ensure the accessibility, reliability and timeliness of the data to the users.

12.4Overview of data collection techniques

Data collection techniques allow us to systematically collect information about our objects of study (people, objects, etc.) and about the settings in which they occur. If data are collected haphazardly, it will be difficult to answer our research questions in a conclusive way.



Example:

During a nutrition survey three different weighing scales were used in three villages. The researchers did not record which scales were used in which village. After completion of the survey it was discovered that the scales were not standardized and indicated different weights when weighing the same child. It was therefore impossible to conclude in which village malnutrition was most prevalent.

Various data collection techniques can be used such as:

- Using available information
- Observing
- Interviewing (face-to-face)
- Administering written questionnaires
- Focus group discussions
- Projective techniques, mapping, scaling

12.4.1 Using available information

Usually there is a large amount of data that has already been collected by others, although it may not necessarily have been analysed or published. Locating these sources and retrieving the information is a good starting point in any data collection effort.

For example, analysis of the information routinely collected by health facilities can be very useful for identifying problems in certain interventions or for identifying increases in the incidence of certain diseases.

12.4.1.1 Village Registers

Analysis of health information from village registers, for example, may be a study in itself. Usually, however, it may form part of a study in which other data collection techniques are also used.

12.4.1.2 Key informants

The use of key informants is another important technique to gain access to available information. Key informants could be knowledgeable community leaders or health staff at various levels and one or two informative members of the target group (e.g., adolescents on their sexual behaviour).

Other sources of available data are newspapers and published case histories, e.g., patients suffering from serious diseases, or their relatives, telling their experiences and how they cope.

The advantage of using existing data is that collection is inexpensive. However, it is sometimes difficult to gain access to the records or reports required, and the data may not always be complete and precise enough, or too disorganised.

12.4.1.3 Observing

Observation is a technique that involves systematically selecting, watching and recording behaviour and characteristics of living beings, objects or phenomena

Observation of human behaviour is a much-used data collection technique. It can be undertaken in different ways:

- **Participant observation:** The observer takes part in the situation he or she observes.

  (For example, a doctor hospitalized with a broken hip, who now observes hospital procedures 'from within'.)
- **Non-participant observation:** The observer watches the situation, openly or concealed, but does not participate.

Observations can be open (e.g., 'shadowing' a health worker with his/her permission during routine activities) or concealed (e.g., 'mystery clients' trying to obtain antibiotics without medical prescription). They may serve different purposes. Observations can give additional, more accurate information on behaviour of people than interviews or questionnaires. They can also check on the information collected through interviews especially on sensitive topics such as alcohol or drug use, or stigmatizing diseases. For example, whether community members share drinks or food with patients suffering from feared diseases (leprosy, TB, AIDS) are essential observations in a study on stigma.

Observations of human behaviour can form part of any type of study, but as they are time consuming, they are most often used in small-scale studies.

Observations can also be made on objects. For example, the presence or absence of a latrine and its state of cleanliness may be observed. Here observation would be the major research technique.

If observations are made using a defined scale, they may be called measurements. Measurements usually require additional tools. For example, in nutritional surveillance we measure weight and height by using weighing scales and a measuring board. We use thermometers for measuring body temperature.

12.4.1.4 Interviewing

An ***interview*** is a data-collection technique that involves oral questioning of respondents, either individually or as a group.

Answers to the questions posed during an interview can be recorded by writing them down (either during the interview itself or immediately after the interview) or by tape-recording the responses, or by a combination of both.

12.4.1.5 Administering written questionnaires

A WRITTEN QUESTIONNAIRE (also referred to as self-administered questionnaire) is a data collection tool in which written questions are presented that are to be answered by the respondents in written form.

A written questionnaire can be administered in different ways, such as by:

- Sending questionnaires by mail with clear instructions on how to answer the questions and asking for mailed responses;
- Gathering all or part of the respondents in one place at one time, giving oral or written instructions, and letting the respondents fill out the questionnaires; or
- Hand-delivering questionnaires to respondents and collecting them later.

The questions can be either open-ended or closed (with pre-categorised answers).

12.4.1.6 Focus group discussion (FGD)

A focus group discussion allows a group of 8 - 12 informants to freely discuss a certain subject with the guidance of a facilitator or reporter.

12.4.1.7 Mapping and scaling

Mapping is a valuable technique for visually displaying relationships and resources. In a water supply project, for example, mapping is invaluable. It can be used to present the placement of wells, distance of the homes from the wells, other water systems, etc. It gives researchers a good overview of the physical situation and may help to highlight relationships hitherto unrecognized. Mapping a community is also very useful and often indispensable as a pre-stage to sampling.

Scaling is a technique that allows researchers through their respondents to categorise certain variables that they would not be able to rank themselves. For example, they may ask their informant(s) to bring certain types of herbal medicine and ask them to arrange these into piles according to their usefulness. The informants would then be asked to explain the logic of their ranking.

Mapping and scaling may be used as participatory techniques in rapid appraisals or situation analyses. In a separate volume on participatory action research, more such techniques will be presented.

12.4.1.8 Differentiation between data collection techniques and data collection tools

To avoid confusion in the use of terms, Table 12.1 points out the distinction between techniques and tools applied in data collection.

Table 12.1 Data collection techniques and tools

Data collection techniques	Data collection tools
Using available information	Checklist; data compilation forms
Observing	Eyes and other senses, pen/paper, watch, scales, microscope, etc.
Interviewing	Interview guide, checklist, questionnaire, tape recorder
Administering written questionnaires	Questionnaire

12.4.1.9 Advantages and disadvantages of various data collection techniques

Table 12.2 summarises the advantages and disadvantages of various data collection techniques.

Technique	Advantages	Possible constraints
Using available information	Is inexpensive, because data is already there. Permits examination of trends over the past.	Data is not always easily accessible. Ethical issues concerning confidentiality may arise. Information may be imprecise or incomplete.
Observing	Gives more detailed and context-related information. Permits collection of information on facts not mentioned in an interview. Permits tests of reliability of responses to questionnaires.	Ethical issues concerning confidentiality or privacy may arise. Observer bias may occur. (Observer may only notice what interests him or her.) The presence of the data collector can influence the situation observed. Thorough training of research assistants is required.
Interviewing	Is suitable for use with both literates and illiterates. Permits clarification of questions. Has higher response rate than written questionnaires.	The presence of the interviewer can influence responses. Reports of events may be less complete than information gained through observations.
questionnaires	more honest responses. Does not require research assistants. Eliminates bias due to phrasing questions differently with different respondents.	There is often a low rate of response. Questions may be misunderstood.

Activity



Exercise

A district health team (DHT) evaluated its malaria spraying programme by looking at available records and reports. It did not find significant flaws in the functioning of the services in different villages. Nevertheless, the incidence of malaria and mosquito counts show peaks in certain villages that the DHT cannot explain. It wants to find out if there is something wrong with the services.

Which data collection techniques would you use?

12.4 2 mHealth

mHealth (also written as **m-health** or **mhealth**) is an abbreviation for **mobile health**. It has emerged as a sub-segment of eHealth, the use of information and communication technology (ICT), such as computers, mobile phones, communications satellite, patient monitors, etc., for health services and information. mHealth applications include the use of mobile devices in collecting community and clinical health data, delivery of healthcare information to practitioners, researchers and patients, real-time monitoring of patient vital signs, the direct provision of care (via mobile telemedicine) as well as training and collaboration of health workers.

One of most common mHealth application in use in Malawi is KoBoCollect.

12.5Data analysis and presentation

Data could either be quantitative (numbers) or qualitative (descriptive). After data has been collected, it has to be processed before analysis.

Only after **data** have been compiled, processed and analyzed do they produce **information** which can be integrated with other information and interpreted in terms of the issues confronting the health system. Information then becomes **evidence** that can be used by decision-makers.
Evidence must be effectively communicated to decision-makers in order to shape their understanding of health issues and needs. It must be properly formatted into reports and presentations with user friendly graphs, tables and maps. This is the process of transforming evidence into **knowledge**, and once applied can result in **decisions** which will directly **impact** upon health and health equity. The impact on health can then be monitored by the health information system by measuring changes in health indicators. There are numerous ways in which data can be presented and communicated. The choice can have a significant impact on how the data are interpreted and received; therefore, the choice is not trivial.

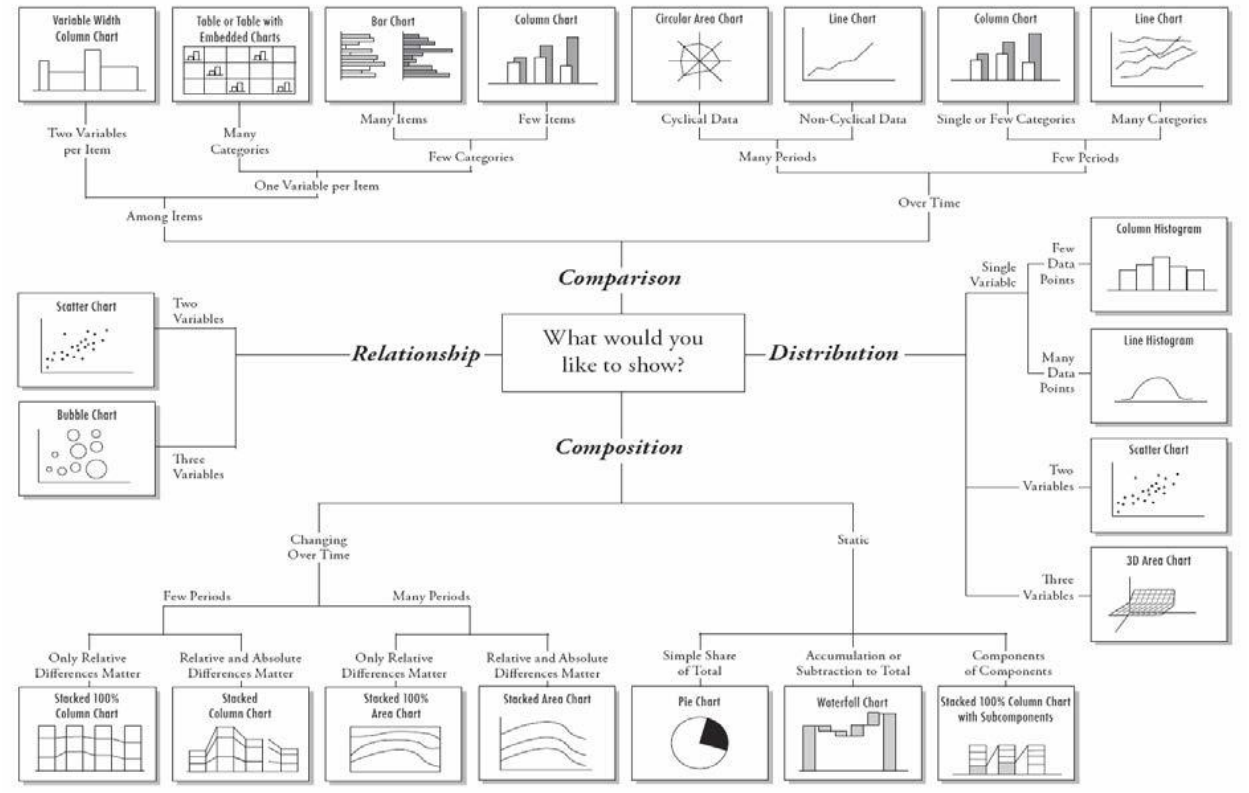


Figure 12.1 Examples pf types of charts to select and explain specific messages

12.5.1 Data processing – quantitative data

Decide whether to process and analyse the data from questionnaires:

- manually, using data master sheets or manual compilation of the questionnaires, or
- by computer, for example, using a micro-computer and existing software or self-written programmes for data analysis. A number of computer programs are available on the market that can be used to process and analyse research data. The most widely used programs are:

    - Epi Info (version 6), a very consumer friendly program for data entry and analysis, which also has a word processing function for creating questionnaires (developed by the Centre for Disease Control, Atlanta, USA and World Health Organization, Geneva),

    - LOTUS 1-2-3, a spreadsheet program (from the Lotus Development Corporation),

    - dBase (version III plus or IV), a data-management program (from Ashton-Tate), and

    - SPSS, which is a quite advanced Statistical Package for Social Sciences.

Data processing in both cases involves:

- categorising the data,
- coding, and
- summarising the data in data master sheets, manual compilation without master sheets, or data entry and verification by computer.

12.5.2 Data analysis – quantitative data

Analysis of quantitative data involves the production and interpretation of frequencies, tables, graphs, etc., that describe the data.

Frequency counts

Simple tables can be made with frequency counts for each variable. A frequency count is an enumeration of how often a certain measurement or a certain answer to a specific question occurs.

For example,

Smokers	51
Non-smokers	93
Total	144

If numbers are large enough it is better to calculate the frequency distribution in percentages (relative frequencies): 51/144 x 100 = 35% are smokers and 93/144 x 100 = 65% non-smokers. This makes it easier to compare groups than when only absolute numbers are given. In other words, percentages standardize the data.

Cross-tabulations

Further analysis of the data usually requires the combination of information on two or more variables in order to describe the problem or to arrive at possible explanations for it. For this purpose, it is necessary to design CROSS-TABULATIONS.

Depending on the objectives and the type of study, two major kinds of cross-tabulations may be required:

- Descriptive cross-tabulations that aim at describing the problem under study.
- Analytic cross-tabulations in which groups are compared in order to determine differences, or which focus on exploring relationships between variables.

A descriptive cross-tabulation would, for example, relate smoking behaviour to sex or occupational background.

Percentages, proportions, ratios, and rates

1. Percentages

Instead of presenting data in frequency tables using absolute numbers it is often better to calculate percentages.

A PERCENTAGE is the number of units in the sample with a certain characteristic, divided by the total number of units in the sample and multiplied by 100

2. Proportions

A PROPORTION is a numerical expression that compares one part of the study units to the whole; A proportion can be expressed as a FRACTION or in DECIMALS

Example

Out of a total of 55 patients attending a clinic on a specific day 22 are males and 33 are females. We may say that the proportion of males is 22/55 or 2/5, which is equivalent to 0.40.

> **Note** that when a proportion expressed in decimals is multiplied by 100, the value obtained is a percentage. In the example, 0.40 is equivalent to 40%.

3. Ratios

A **RATIO** is a numerical expression that indicates the relationship in quantity, amount or size between two or more parts.

Example

Out of a total of 55 patients attending a clinic on a specific day 22 are males and 33 are females. We may say that the ratio of males to females is 22:33, or 2:3.

4. Rates

A **RATE** is the quantity, amount or degree of a disease or event measured over a specified period of time

Commonly used rates in the health sector are:

- Birth Rate = The number of live births per 1000 population over a period of one year
- Death Rate = The number of deaths per 1000 population over a period of one year
- Infant Mortality Rate (IMR) = The number of deaths of infants under one year deaths of age per 1000 live births over a period of one year

- Maternal Mortality Rate (MMR) = The number of maternal pregnancy-related in one year per 100,000 total births in the same year

- Incidence Rate = The number of new cases per population over a specific period of time (usually a year)

  Prevalence Rate = The number of existing cases per population over a specific period of time (usually a year)

5. Figures

The most frequently used figures for presenting data include:

- Bar charts
- Pie charts
- Histograms
- Line graphs
- Scatter diagrams
- Maps

Bar chart

- **Bar chart** can be used for quick comparison across different regions, or periods or units of data

Pie charts

- **Pie charts** can be useful in depicting how individual parts make up the whole of something (such as overall mortality broken down by causes of death)

Line graphs

- **Line graphs** can be useful for showing trend over time.

Scatter diagram

- **Scatter diagram** graphs pairs of numerical data, with one variable on each axis, to look for a relationship between them. If the variables are correlated, the points will fall along a line or curve**.** They can be used when you have paired numerical data, when your dependent

variable may have multiple values for each value of your independent variable, when trying to determine whether the two variables are related

Maps

- **Maps** give a different color to each geographic region for quick appreciation of regional disparities in a key indicator. Alternatively, or in addition, the size or color of points placed on a map can represent the value of a key indicator

Measures of central tendency

Frequency distributions and histograms provide useful ways of looking at a set of observations of a variable. In many circumstances, it is essential to produce them to understand the patterns in the data. However, if one wants to further summarise a set of observations, it is often helpful to use a measure which can be expressed in a single number.

First of all, one would like to have a measure for the centre of the distribution. The three measures used for this purpose are the MEAN, the MEDIAN and the MODE

1. MEAN

The MEAN (or arithmetic mean) is also known as the AVERAGE. It is calculated by totaling the results of all the observations and dividing by the total number of observations. Note that the mean can only be calculated for numerical data

Example:

Measurement of the heights of 7 girls gave the following results:

141, 141, 143, 144, 145, 146, 155 cm (a total of 1015 cm for 7 measurements). The mean is thus 1015/7, which is 145 cm.

2. MEDIAN

The MEDIAN is the value that divides a distribution into two equal halves. The median is useful when some measurements are much bigger or much smaller than the rest. The mean of such data will be biased toward these extreme values. Thus the mean is not a good measure of the centre of the distribution in this case. The median is not influenced by extreme values. The median value, also called the central or halfway value, is obtained in the following way:

- List the observations in order of magnitude (from the lowest to the highest value or vice versa).
- Count the number of observations (n).
- The median value is the value belonging to observations number (n + 1) / 2 if n is odd or the average of the middle two numbers.

Example:

The weights of 7 pregnant women are 40, 41, 42, 43, 44, 47, 72 kg.

The median value is the value belonging to observation number (7 + 1)/2, which is the fourth one:

43 kg.

Note that the mean weight of this set of observations is 47 kg. This is an illustration of how the mean is affected by extreme values (in this case 72 kg) while the median is not. If the largest weight in this set of observations had been 51 kg instead of 72 kg, the median would still have been 43 kg, but the mean weight would have been 44 kg.

Note also that if there would be 8 observations: 40, 41, 42, 43, 44, 47, 49 and 72, the median would be 43.5 kg (the average of 43 and 44); the mean in this case would be 47.25 kg.

3. MODE

The MODE is the most frequently occurring value in a set of observations.

The mode is not very useful for numerical data that are continuous. It is most useful for numerical data that have been grouped.

In summary, the mean, the median and the mode are all measures of central tendency. The mean is most widely used. It contains more information because the value of each observation is taken into account in its calculation.

However, the mean is strongly affected by values far from the centre of the distribution, while the median and the mode are not. The calculation of the mean forms the beginning of more complex statistical procedures to describe and analyse data.

12.5.3 Data analysis – qualitative data

Qualitative data may be collected through open-ended questions in self-administered questionnaires, in individual interviews or focus group discussions or through observations during fieldwork.

Commonly solicited data in open-ended questions include:

- opinions of respondents on a certain issue;
- reasons for a certain behaviour; and
- descriptions of certain procedures, practices or perceptions with which the researcher is not familiar.

The data can be analysed in seven steps:

Step 1: Take a sample of (say 20) questionnaires and list all answers for a particular question.

Take care to include the source of each answer you list (in the case of questionnaires you can use the questionnaire number), so that you can place each answer in its original context, if required.

Step 2: To establish your categories, you first read carefully through the whole list of answers.

Then you start giving codes (A, B, C, for example or key words) for the answers that you think belong together in one category, and write these codes in the left margin. Use a pencil so that it is easy to change the categories if you change your mind.

Step 3: List the answers again, grouping those with the same code together.

Step 4: Then interpret each category of answers and try to give it a label that covers the content of all answers. In the case of data on opinions, for example, there may be only a limited number of possibilities, which may range from (very) positive, neutral, to (very) negative.

Data on reasons may require different categories depending on the topic and the purpose of your question. In the exercise below you will be asked to categorise the reasons why people smoke by grouping them in such a way that it is easy to find entry points for health education aimed at reducing smoking.

After some shuffling you usually end up with 5 to 7 categories.

Step 5: Now try a next batch of 20 questionnaires and check if the labels work. Adjust the categories and labels, if necessary.

Step 6: Make a final list of labels for each category and give each label a code (keyword, letter or number).

Step 7: Code all your data, including what you have already coded, and enter these codes in your master sheet or in the computer.

12.6Community health data management

12.6.1 Elements of data processing

- Organizing or collating data
- Checking data consistency
- Cleaning data
- Aggregating data

Organizing or Collating Data

- Data when originally collected is **raw data**
- First we select the data we want to analyse
- Then we must **collate** or organise it so that we have only the elements we need to respond to our objectives, by 1) collating data from same data elements but from different sources and 2) collating data from the same source over a period of time

Data verification

- Process of inspecting data to ensure that the data entered exactly matches the original source
- **Double entry**: Entering data twice and comparing the two copies. Doubles the workload
- **Proofreading**: Data is checked against the original document.
  Also, time-consuming. Can take place in two stages: At service delivery site or when data is aggregated or in program/project unit

12.7Steps of data management

- Step 1 Collection and storage
- Step 2 Processing
- Step 3 Reporting

- Step 4 Analysis, interpretation, and use

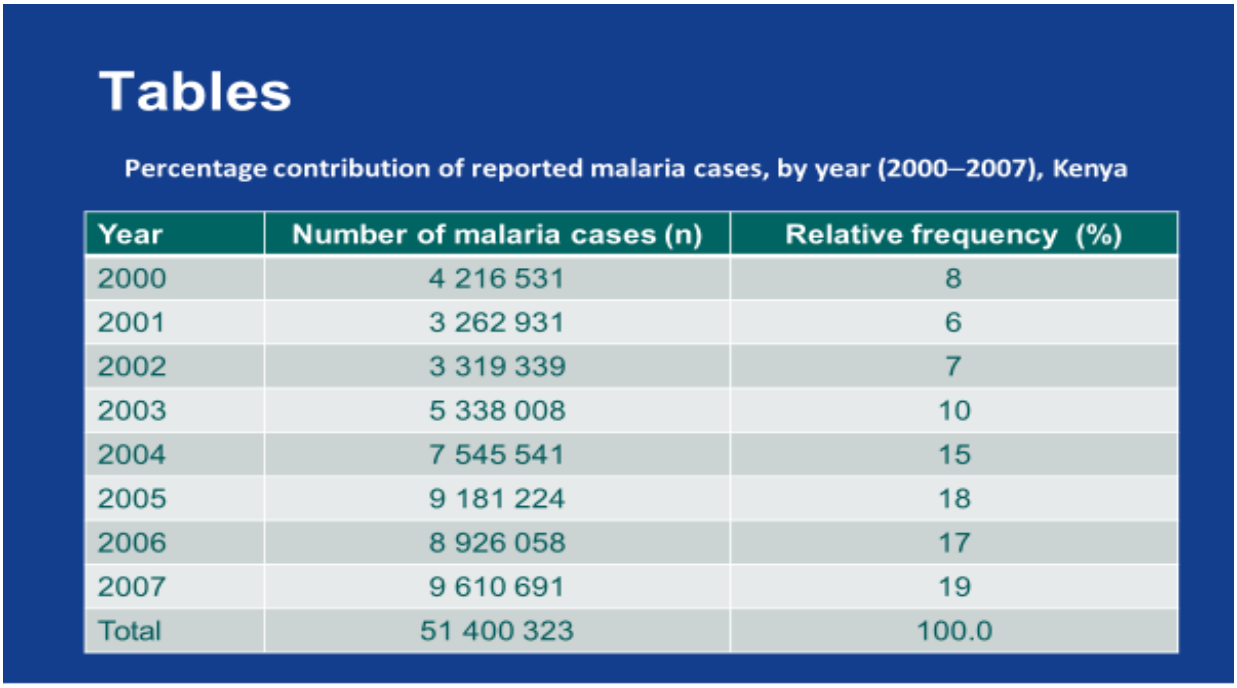
12.8Data dissemination and presentation

Tables

Tables present precise numerical statistics in an orderly fashion. The interested reader can conduct some further analysis of these statistics if they so choose. However, it is often difficult for the reader to appreciate the most important conclusions to be derived from a large table of numbers

Examples:

Table 12.6.1 Percentage contribution of reported malaria cases, by year (2000-2007), Kenya



In Table 12.6.1 we already have the total number of observations (or n) in the second column but we should add a title and the source of the data.

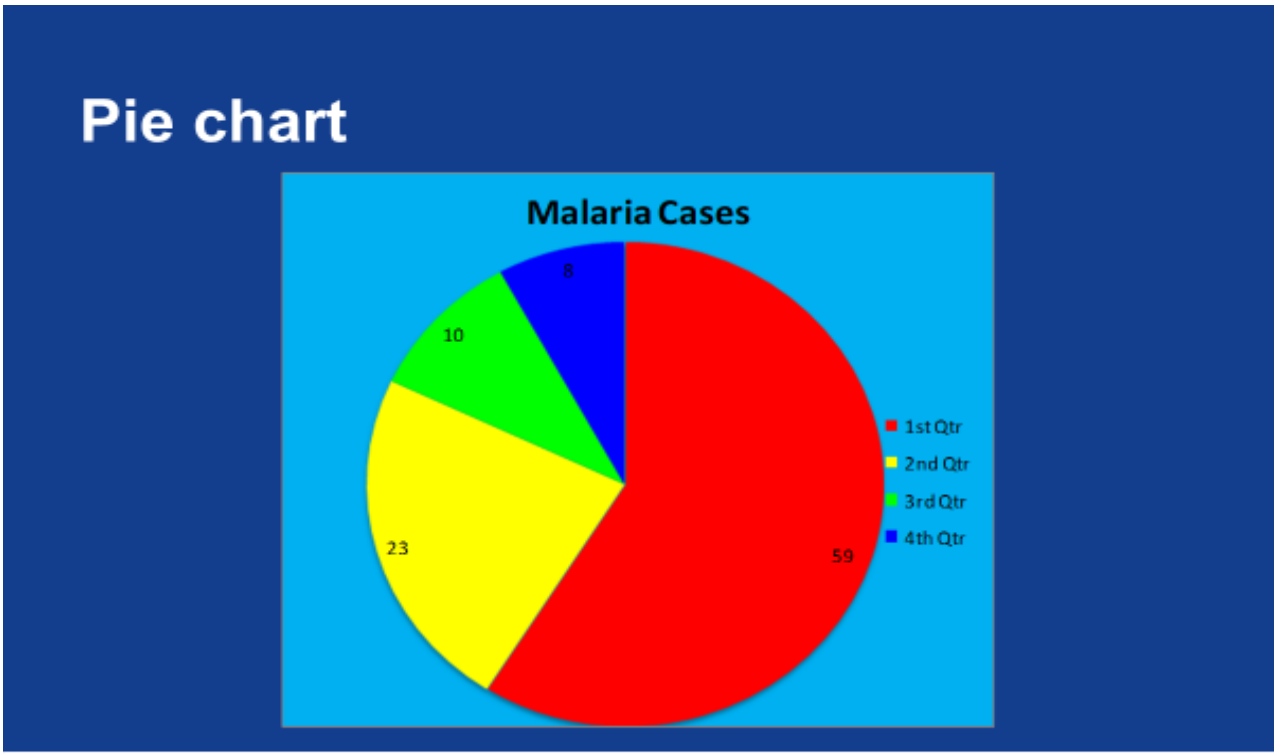
To analyze this table, we should look at the relative frequencies. What do they tell us? There is an increasing trend in the number of reported malaria cases and in the relative frequency of cases.

Does this mean that there is an increase in malaria cases? What would this say about our programs?

It is important to take into account what we already know when interpreting these data. We know that since 2000 there has been an increased effort toward malaria control. During this time period, the quality of treatment has improved, as has the quality of routine information systems.

When taking this knowledge into account, how would we interpret these data?

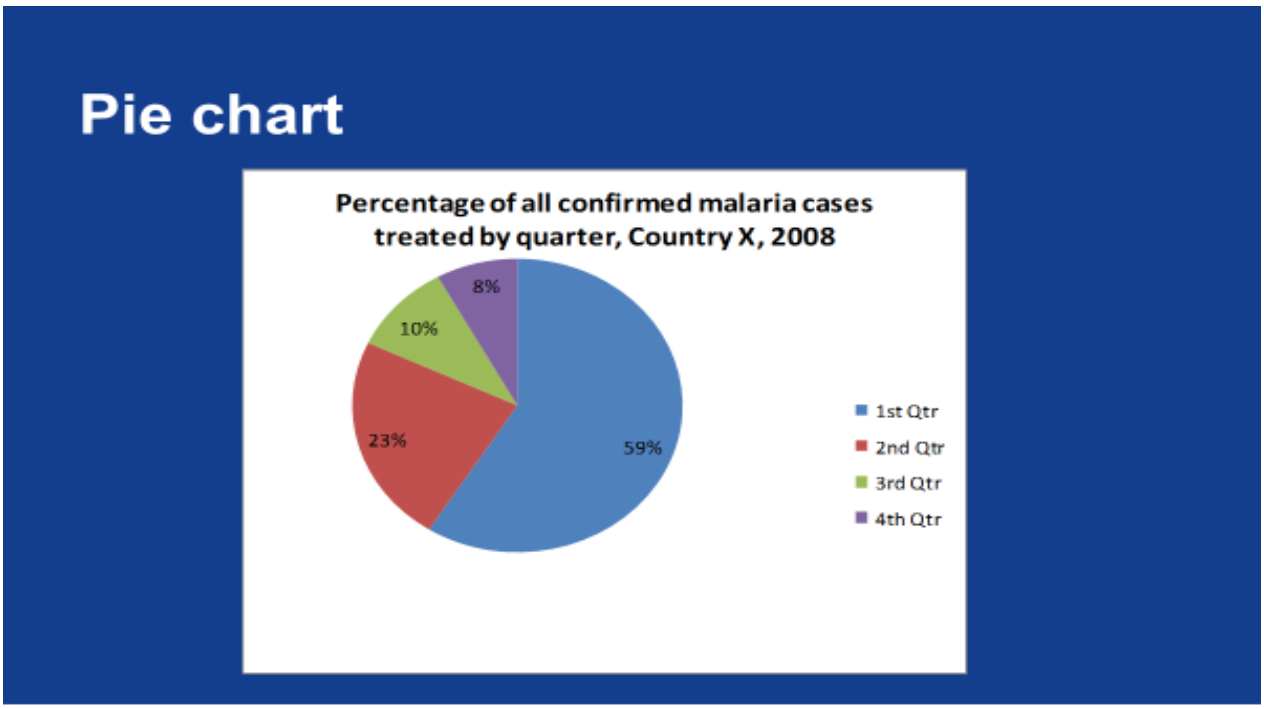
From 2000 to 2007, the number of reported malaria cases increased. This may not reflect an actual increase in cases, but rather an increase in care seeking and reporting. Due to improved case outcomes seen after the introduction of ACTs in Kenya in 2004, individuals with fever began to seek care at formal medical facilities at higher rates. Furthermore, the routine information system improved during this period of time and thus reported more complete information.



A pie chart displays the contribution of each value to a total. In this type of chart, the values always add up to 100.

What should be added to this chart to provide the reader with more information?

What should be changed about this chart to make it more readable?



A pie chart displays the contribution of each value to a total. In this case, we used the chart to show the contribution of each quarter to the entire year. For example, the first quarter contributed the largest percentage of enrolled patients.

To improve the understanding of the pie chart, we've added a more descriptive title and value labels. On the previous chart, we couldn't tell if the values are numbers or percentages. Adding the sample size lets us know the total number of observations.

It is also important to have charts that are attractive, easy to look at, and easy to read. The chart on the previous page was so colorful that it was distracting, the colors were so bright that it was hard to look at the chart, let alone read it. While these colors are not the most interesting, they let the reader focus on the chart and not how ugly it is. The last chart was an exaggeration, but make sure you do not make the same mistake on a smaller level.

Caution about using pie charts with a scientific audience.

12.9Writing research report

A research report will have the following components:

1. An **Introduction**, covering the statement of the problem, some relevant contextual data and literature review.
2. **Objectives,** main and specific
3. A **Methodology** section with information on when, where and how you have collected your data, how you have analysed the data; and possible weaknesses in the collection and analysis.
4. **Findings**
5. **Discussion**
6. **Conclusions and Recommendations**

12.10 Monitoring and evaluation

Data are key to monitoring and evaluation. For example, one may wish to know the impact of an intervention. In this case a comparison is made between the baseline with end line data. The difference may give a positive or negative impact. Also, one may wish to determine the progress of the intervention (performance evaluation). Is the programme progress according to plan?

12.10.1Definition of the terms "monitoring" and "evaluation"

Monitoring means regularly collecting information on your project and analysing it to see how things are going. To do this, you can look at quantitative information, hard facts such as how much money and time you've spent on the project and how many homes you've reached, for example. You can also consider qualitative information - the less measurable things, like whether the project is running smoothly and if people involved are satisfied. Proper monitoring will make it easy to evaluate your project when it ends. It will also give you a basis to make decisions on how the project should go forward and to make changes along the way if you find something isn't going well.

Evaluation is a review of the whole project, looking at its overall value and effect. It usually takes place when the project is complete. You can use the information you've collected during monitoring. Doing an evaluation will help you see how and where your project has been successful. It will let you see how well funds have been used, and what the benefits of your project have been to those involved. You can use this information to improve your future projects.

12.10.2Types and purposes of monitoring and evaluation

Typically, there are two kinds or stages of evaluation—formative evaluation and summative evaluation. The purpose of a formative evaluation is to assess initial and ongoing project activities. The purpose of a summative evaluation is to assess the quality and impact of a fully implemented project

- **Formative Evaluation.** Formative evaluation begins during project development and continues throughout the life of the project. Its intent is to assess ongoing project activities and provide information to monitor and improve the project. It is done at several points in the developmental life of a project and its activities. According to evaluation theorist Bob Stake, "When the cook tastes the soup, that's formative; When the guests taste the soup, that's summative." A formative evaluation assesses ongoing project activities. Formative evaluation has two components: implementation evaluation and progress evaluation.

- **Implementation Evaluation.** The purpose of implementation evaluation is to assess whether the project is being conducted as planned. This type of evaluation, sometimes called "**process evaluation,"** may occur once or several times during the life of the program. The underlying principle is that before you can evaluate the outcomes or impact of a program, you must make sure the program and its components are really operating and, if they, are operating according to the proposed plan or description.

- **Progress Evaluation.** The purpose of a progress evaluation is to assess progress in meeting the goals of the program and the project. It involves collecting information to learn whether or not the benchmarks of participant progress were met and to point out unexpected developments. Progress evaluation collects information to determine what the impact of the activities and strategies is on participants, curriculum, or institutions at various stages of the intervention. By measuring progress, program staff can eliminate the risk of waiting until participants have experienced the entire program to assess likely outcomes. If the data collected as part of the progress evaluation fail to show expected changes, the information can be used to fine tune the project. Data collected as part of a progress evaluation can also contribute to, or form the basis for, a summative evaluation conducted at some future date.

1. **Summative Evaluation.** The purpose of summative evaluation is to assess a mature project's success in reaching its stated goals. Summative evaluation (sometimes referred to as impact or outcome evaluation) frequently addresses many of the same questions as a progress evaluation, but it takes place after the project has been established and the timeframe posited for change has occurred.

Figure 12.7.1 gives a summary of the types of evaluation

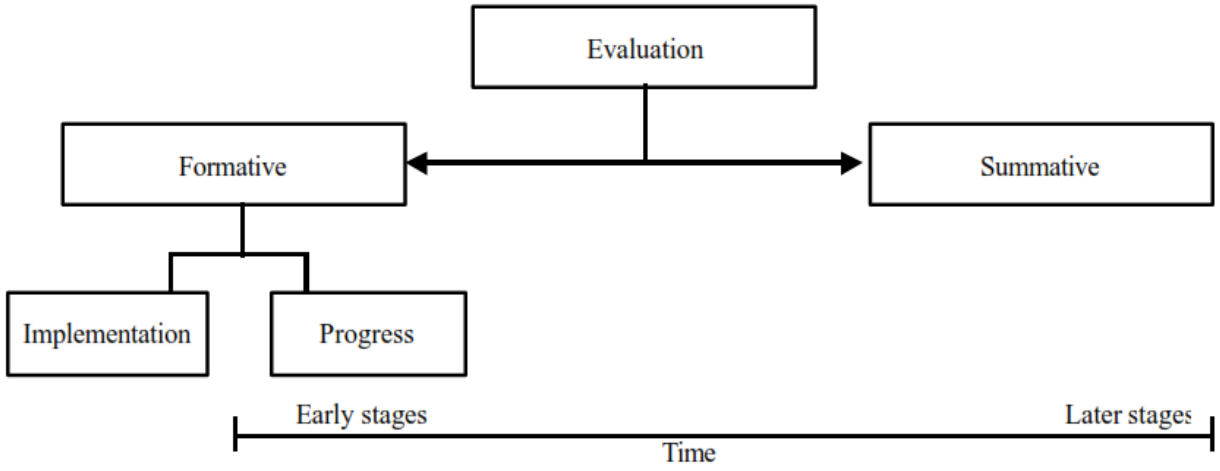


Figure 12.7.1 Types of Evaluation

12.10.3Indicators for monitoring and evaluation of community health programmes

Indicators are crucial in monitoring and evaluation of community health programmes/services. The three widely acknowledged types of indicators are process indicators, outcome indicators and impact indicators.

1. *Process indicators:* are those indicators that are used to measure processes or activities. For example, in relation to Safe Water, this could be "the number of households that have received training on chlorination of water."

2. *Outcome Indicators:* Are indicators that measure outcomes. Outcomes are medium impacts. For example, in the relation to Safe Water, outcome indicators could be "the proportion of households using chlorinated drinking water" or "the percentage of children suffering from diarrhea."

3. *Impact Indicators:* Are indicators that measure the long-term impacts of an intervention. In the case of the Safe Water, it could be, "the prevalence of under 5 mortality."

For example, in environmental health, you can monitor and evaluate community health activities using the following indicators:

- Percentage households with water treated with1% stick solution
- Percentage households with basic latrines
- Percentage households with improved pit latrines
- Percentage households with handwashing facilities with soap
- Percentage households infested with bed bugs

- Percentage infested households sprayed with insecticides
- Percentage of villages declared open-defecation free (ODF)
- Percentage of primary schools with adequate sanitation facilities
- Percentage of food serving premises with adequate sanitation facilities
- Percentage of Villages with Village Health Committees (VHCs) that have undergone preservice training within last two years.
- Percentage of Village Health Committees (VHCs) that meet monthly
- Percentage of HSAs supervised by a Senior HSA at least once in a month

12.11 Summary of Module 12

In Module 12, you have learned that:

1. Data collection techniques are different from data collection tools
2. mHealth, which is a sub-segment of eHealth, is an emerging data collection method in the developing world
3. Quantitative data deals with numbers while qualitative data is descriptive (words rather than numbers)
4. Quantitative data can be presented as frequency tables, percentages, proportions, ratios, rates and figures.
5. The median is more meaningful that the media particularly when some measurements are much bigger or much smaller than the rest. These skew data.
6. A report typically contains an introduction, objectives, methodology, findings, discussion, conclusions and recommendation
7. Data collection is a means of gathering facts, statistics and details from different sources. Data management is the process of collecting, keeping, processing and using required data to ensure the accessibility, reliability and timeliness of the data to the users.
8. There are two kinds or stages of evaluation—formative evaluation and summative evaluation. The purpose of a formative evaluation is to assess initial and ongoing project activities. The purpose of a summative evaluation is to assess the quality and impact of a fully implemented project.

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Varkevisser, C.M., Pathmanathan, I., Brownlee, A. (2003). **Designing and conducting health systems research projects.** ***Volume II: Data analysis and report writing***. KIT Publishers, Amsterdam, Netherlands, International Development Research Centre(IDRC), in association with WHO Regional Office for Africa (AFRO)

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MODULE 14: MANAGEMENT AND LEADERSHIP

UNIT 1: HISTORICAL ORIGINS OF DISEASE SURVEILLANCE

LEARNING OBJECTIVES

By the end of the unit the learner should be able to: -

Describe Leadership and management
Describe supportive Supervision
Describe Mentorship and coaching
Explain supply and cold chain management
Describe the Ministry of Health policies and other relevant policies
Demonstrate report writing skills ability
Demonstrate ability to facilitate meetings
Apply principles of leadership, mentorship and supportive supervision.
Describe roles on how equipment has to be maintained

INTRODUCTION

Leadership and msns

13. Module aim

The aim of this module is to equip learners with the basic knowledge and skills in Leadership and Management in community.

13 **Intended learning outcomes**

At the end of the module, learners should be able to:

14 **Indicative content**

14.1Leadership and Management

14.1.1 The concept of Leadership and management
14.1.2 Different types of leadership
14.1.3 Qualities of a good leader

14.1.4 Measures taken by a leader to encourage people to participate in projects
14.1.5 Concepts of WHO Health Systems Framework

14.2Supportive Supervision

14.2.1 Practices for supportive supervision
14.2.2 Foundations of good supervision
14.2.3 Giving feedback
14.2.4 Team building

14.3Mentorship and coaching

14.3.1 Definitions of mentorship and coaching
14.3.2 Significance and process of mentorship and coaching
14.3.3 Characteristics of a good mentor

14.4Supply and cold chain management

14.4.1 Process of vaccination from ordering to administration
14.4.2 Cold chain monitoring

14.5Ministry of Health Policies and other relevant policies

14.5.1 Policies used by the Ministry of Health
14.5.2 Roles of the available policies like adherence

14.6Report writing

14.6.1 Types of reports
14.6.2 The importance of reports
14.6.3 The structure of reports
14.6.4 Report submission
14.6.5 Timeliness on sending reports

14.7Conducting meetings

14.7.1 Importance of conducting meetings
14.7.2 Factors that can contribute to the success of meetings
14.7.3 The procedure of conducting meetings

14.8Equipment maintenance

14.8.1 Maintenance of equipment and cold chain equipment
14.8.2 Maintenance report
14.8.3 Timely reporting on major maintenance
14.8.4 Fixing minor maintenance problems

15 Teaching and learning methods

15.1 Lecturers
15.2 Group discussions
15.3 Individual Assignments
15.4 Role play
15.5 Practicum

16 Teaching and learning materials

16.1LCD Projector
16.2 Flip charts

17 Time allocation

17.180 hours

18 Methods of assessment

18.150% continuous assessment,50% end of module exam

19 **Prescribed text**

19.1 Beauvais Marie Audrey (2019), Leadership and Management Competence (1st Edition), Springer Publishing Company, New York, USA.

20 **Recommended text**

20.1 Sunil Unny Guptan (2018), Mentoring 2.0 : A practitioner's guide to changing lives (1st Edition), Vived Mehra ,New Delhi, SAGE Publications India, India.

20.2 English Susan et.al (2019), Professional Coaching; Principles and Practice (1st Edition) Springer Publishing Co. New York, USA.

20.3 Kriek Drikus (2019), Team Leadership (1st Edition), KR Publishing, Randburg, South Africa

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