



DELTA STATE UNIVERSITY, ABRAKA

OPEN AND DISTANCE LEARNING



FACULTY OF BASIC MEDICAL SCIENCES
DEPARTMENT OF NURSING SCIENCE

COURSE UNIT: 2C

COURSE CODE: COM 311

COURSE TITLE: PRINCIPLES AND METHODS OF EPIDEMIOLOGY

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1.0 Introduction

COM 311- Epidemiology is a two (2) credit unit course and is a part of Community/Public Health Course. It is a 300 level course for Bachelor of Nursing Science (B.NSc) students. Epidemiology exposes the student nurses to the origin, causes, determinants, deterrent and distribution of diseases. It is important for students to have knowledge of disease pattern to enable them get acquainted with the prevention and control of diseases.

AIM OF THE COURSE

COM 311 four has (4) modules and twelve (12) study sections. Each of the sections encompasses introduction, learning outcomes, main content, tutor-marked assignment including reference/further reading. Module one covers the concept, principles of epidemiology and types of epidemiological studies. Module two (2) will discuss epidemiological triad and epidemiological models including epidemiological applications. Module three (3) will dwell on communicable diseases, strategies of epidemiology, epidemiology of communicable diseases and epidemics.

Finally, module four (4) will explain epidemiology of non-communicable diseases and the role nurses play in disease surveillance and response. Epidemiology will be discussed in detail for the students to be knowledgeable about disease outbreak and measures to embark on the prevention and control. At the completion of the course, students will be assessed using the instruction-based assessment, courses assessment and non-examinable courses assessment.

OBJECTIVES OF THE COURSE

At the completion of the course, students should be to :

1. Define epidemiology, trace the origin of epidemiology
2. Explain the concept of epidemiology
3. Enumerate the uses of epidemiology
4. Describe the application of epidemiology
5. Understand epidemiological models
6. Define epidemics
7. Discuss epidemiological triad and colours
8. Enumerate the types of epidemiology studies
9. Define disease surveillance
10. Explain integrated disease surveillance and responses
11. Define communicable and non-communicable diseases
12. List communicable and non- communicable diseases

LEARNING OUTCOMES FOR THE COURSE

After reading this course, students should be able to:

- i. Define epidemiology
- ii. Explain the concept

- iii. Discuss the uses of epidemiology
- iv. Describe epidemiological applications
- v. Explain epidemiological models
- vi. Define epidemics
- vii. Explain epidemiological triad and the usage of the colour tags
- viii. Enumerates types of epidemiological studies
- ix. Define disease surveillance
- x. Explain integrated disease surveillance and response
- xi. Define communicable and non-communicable diseases
- xii. List communicable and non-communicable diseases

COURSE EXPECTATIONS

The blended learning mode will be used in delivery of the course COM 311 such that 70% will be online and distance learning protocol while 30% will involve physical contact which embraces interactive sessions and facilitators. You will be equipped with soft copies accessible from the university e-courseware resources while the hard copies of the course materials will be obtained from the ODL Directorate of Delta State University, Abraka. To access the online course sessions and this course material, you are required to register for this course online. You can join the interactive online activities through the course link on the ODL website of the University. Try to participate in the scheduled activities and submit assignments were applicable for each study session as stipulated in the course schedule template before deadlines as grades will form part of the overall assessment for the course. You shall be expected to study carefully the module while attempting the assigned readings and the tutor-marked assessment provided at the end of every study sessions, to help you understand the course content in detail and prepare adequately for thee course assessment/examination. Participating actively in group discussion with your colleagues will enhance your knowledge.

INSTRCTIONAL MATERIALS FOR THE COURSE

The instructional materials for the course include the following:

- Course Guide
- Study Sessions
- Text Books
- Presentation (Audio, visual or slide)
- Assignment Files
- Tutorials

COMPUTER-MARKED ASSIGNMENT (CMA) PROCEDURE

The Computer Marked Assignment of the course COM 311 will consist of continuous assessment structured into CMA-1, CMA-2 and CMA-3. Every module has an activity that must be done by the student as spelt out in the course materials. These exercises are to aid students in understanding the concepts of the course and it is advisable that you attempt each of them.

COURSE ASSIGNMENTS

To complete the course COM 311, you are required to read the study sessions for each module and related materials, thereafter, attempt the specific in-text questions as requested by each

course facilitator. The CMA and assignments will account for 30% of the total course mark. Ensure that your assignments are submitted to your facilitator before the stipulated deadline. Request for extension of extension of submission deadline by contacting the facilitator on time. Note that there will be no granting of extension time after the due date except of exceptional conditions.

COURSE EXAMINATION AND GRADING

At the completion of this course, you shall sit for the final written examination of COM 311 for 2 hours duration at a stipulated examination venue within the university. This examination will account for 70% of the total course mark. The examination will cover every area of the course including questions related to the self-testing, practice exercise and in-text questions that you previously practiced in the study sessions of the course.

COURSE MARKING SCHEME

Table 1: Marking Scheme for COM 311

Category	Marks
Assignments and CMAs	CMA 1-10Marks CMA 2- 10Marks CMA 3- 10Marks Total: 30 Marks
End of course examination	70% of overall course marks
Total	100% of course materials

COURSE SCHEDULE

Work through each study unit carefully and take notes. Participate in the online real -time facilitation as arranged. If you missed the scheduled online real-time facilitation, you can watch the recorded session at your leisure time. Each live facilitation session will be video filmed and made available on the ODL student platform.

READER'S GUIDE

To achieve the maximum grade required in this course, carefully and thoroughly read through the different modules and section in the contents of the course. It is advised you read the references recommended for further reading.

MODULE ONE

INTRODUCTION TO EPIDEMIOLOGY

Study Section 1: Concepts of Epidemiology

Study Section 2: Principles of Epidemiology

Study Section 3: Types of Epidemiological Studies

STUDY SECTION 1: CONCEPTS OF EPIDEMIOLOGY

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3.2 Origin of Epidemiology

3.3 Aims of Epidemiology

3.4 Uses of Epidemiology

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4.0 Conclusion

5.0 Summary

6.0 Tutor- Marked Assignment

7.0 References/ Further Reading

Introduction:

Epidemiology as a concept is as old as medical practice, it makes references to disease causation, distribution, deterrent and determining factors of diseases. With a wide knowledge of epidemiology, you can easily embark on the control/prevention of diseases. Epidemiology will expose the students to origin, pattern spread of diseases and also proffer solution to prevention and control of communicable and non-communicable diseases.

2.0 Learning Outcomes

After reading this study section, the students should be able to:

- Define Epidemiology
- Discuss the origin of Epidemiology
- Discuss the aims of Epidemiology
- List the uses of Epidemiology
- Understand the process of Epidemiology

3.0 Main Concept

3.1 Definitions of Epidemiology

The term epidemiology is derived from three Greek words:

1. Epi, meaning Upon; among
2. Demos, meaning People and
3. Logos, meaning science, study.

Thus, it is the science of events that occur (come upon or among) in a community (the people.) Epidemiology is a very old world dating back to 3rd century BC, Hippocrates (460-377BC) regarded as the father of Clinical Medicine, gave accurate description of syndromes, characteristics, symptoms and findings. (Basavanthappa, 2008).

Now, epidemiology as viewed by many scholars as;

1. An inductive method applied to a large group.
2. A research method of public health.
3. The study of statistics of diseases in the population.
4. The quantitative science 'they measure quantitative and descriptive terms. used to describe groups (Friedman G,D 1980).
5. The measurement of risk of diseases in the community
6. The study of epidemics of hard to large group.
7. A method of diagnosing the conditions of the people (HILL A.B 1965).
8. The study of health of population in relation to their environment and ways of living (Lilienfield Am, 1936).
9. The study of the frequency of distribution, determinant of infectious process of disease, physiological state and their precursors in the community.

Onwasigwe, (2004), defined epidemiology as the causes, d determinants, distribution, and deterrents of diseases, injuries and other health-related conditions in human populations. It concerned itself with types and frequencies of illnesses and injuries in people; and with factors which influence their distribution. This is imperative because different sub-group of the population differ in the frequency health problems. Epidemiology may also mean health and disease of population in relation to their environment and ways of living. However, epidemiology also connotes determinants of disease frequency and its distribution in man. The predominant, though not exclusive purposes is the understanding of disease etiology and identification and preventive measures. (Ogeneh, 2006).

3.2 Origin of Epidemiology

Outbreaks of diseases in a community and concept of cause seem to be the origin of epidemiology. Therefore, the public health and epidemiology have some roots. The basic root of epidemiology is credited to the work of William farr. He was in charge of medical statistics in the office of Registrar General of England and Wales in 1839. He established the tradition of vital data to the problems of public health. These included the higher mortality rate in metal mine workers and other occupational settings, in prisons and other institutions, among married and single persons; and the use of marriage rate as an index of economic health (Ogeneh , 2006).

John Snow, a contemporary of Farr, demonstrated the spread of cholera by fecal contamination of drinking water in 1854. He noted that cholera rates were higher in areas of London supplied with water from River Thames at a point highly polluted with sewage. The subsequent relocation of the water supply companies and their water supply sources caused a reduction of the cholera epidemics. (Ogeneh, 2006).

3.3 Aims of Epidemiology

Epidemiology has three major aims:

- (a) To describe the distribution and magnitude of health and disease problems in human population
- (b) To identify etiological or risk factors in the pathogenesis of disease.
- (c) To provide data that are important for planning, implementation and evaluation of services for control, prevention and treatment of diseases and to the setting up of priorities for these services.

The aim of 'epidemiology' is to reduce or eliminate health problems or its consequences; and promote the health and wellbeing of society.

In brief, epidemiology is said to be concerned with 'health and illness' in population and with the factors including health services that affect them. The aims of epidemiology also include knowledge of distribution of disease in order to elucidate causal mechanisms, explain local disease occurrence, describe the natural history of a disease and provide guidance in the administration of health services.

3.4 Uses of Epidemiology

Epidemiology helps:

- (1) In the study effects of disease state in a population over a time and predict future health needs: Here epidemiologist studies history of health of populations and rise and fall of diseases and changes in their character and predict the future health needs.
- (2) In diagnose of community health. However, the epidemiologists study the health conditions of the people; and to measure the distribution and dimensions of illness in terms of disability, prevalence, and mortality. It also set health problems in perspective and define their relative importance and identify groups that need special attention. New methods of monitoring must be constantly sought. In short, it helps in diagnosing the health status of the community.
- (3) Evaluate health services: Here epidemiologists study the working of health services with a view to their improvement by evaluating the health care services in the community.

Operational research shows how expectations of community could result in actual provision of service. The successes with which the services achieve their stated goals and the effect on community health must be appraised in relation to resources. Action research can lead to plans for better services, e. g planning efficient research including drug trials and new method of treatment.

- (4) To estimate the individual risk from group experiences. The work of the epidemiologist here is to estimate the risks of diseases, accident and defect, and chances of avoiding them. So, it studies the effects of the disease state in populations over a period of time and predicts the future health needs and provides the base for preventive measure and their evaluation and also helps in logical planning of facilities for health care.
- (5) To complete the clinical description of chronic diseases and their history: it provides complete clinical picture of disease, so the preventions can be accomplished before it becomes irreversible.
- (6) To complete the clinical picture of chronic diseases and describe their natural history. It provides complete clinical picture of disease, so the preventions can be accomplished before disease becomes irreversible.
- (7) To search for causes of health and diseases; this can be done by comparing experience of groups that are clearly defined by their composition, inheritance, experience, behavior and environments, epidemiology helps in understanding the causation of disease and disability and providing data which helps to explain the etiology of disease and local disease patterns which in turn helps to test the hypothesis clinically or experimentally.

Uses of epidemiology encompass two main components:

- i. The systematic collection of health data (including the utilization of data collected for other purposes).
 - (a) Identification of health problems and assessment of priorities in allocations of resources, including surveillance.
 - (b) Detection of new problems or changes in frequency of existing problems.
 - (c) Identification of risk factors enabling efficient distribution of resources assigned to a particular problem.
 - (d) Evaluation of effectiveness of control programme.
 - (e) Formulation of hypothesis regarding the reasons for non-random disease distribution (Disease aetiology).
- ii. The search for causes of ill health.
 - (a) Identification of alterable causes.

- (b) Identification of susceptible groups for special surveillance.
- (c) Identification of disease entities.
- (d) Identification of early manifestation of disease or disease syndrome.

3.5 Epidemiology Process:

Basic concepts in epidemiology have been discussed to lay a foundation for epidemiological investigation of community health problems. These concepts aid in identifying variables that public health professionals consider when they described the distribution patterns and 'determinants of health', disease, and condition frequencies in populations. They help to analyze causal relationships in disease. To establish causal relationships, health experts use a specific process known as the epidemiological process.

The epidemiological process is a systematic course of action taken to identify:

1. Who is affected - (Persons)?
 - i. Where the affected persons reside - (Place).
 - ii. When the persons were affected - (Time).
 - iii. Causal factors of health and diseases occurrence - (host-agent-environment determinants).
 - iv. Incidence and prevalence of health and disease - (Frequencies); and
 - v. Prevention and control measures- (levels of prevention) in relation to the natural life history of a disease or a condition.

The epidemiological process has eight basic steps, which are illustrated below: Although each step is discussed separately, it is pertinent to remember that these steps overlap and may not always follow a sequential pattern. They are interrelated and interdependent:

- Determine the nature, extent, and scope of the problem.
 - A: Natural life history of condition.
 - B: Determinants influencing condition.
- 1. Primary data (essential agents)
 - (a) Parasite/bacteria/virus
 - (b) Nutritional
 - (c) Psychosocial
- 2. Contributory data
 - (a) Agent.
 - (b) Host.
 - (c) Environment.
- C: Distribution patterns: (1) Person (2) Place (3) Time.
- D: Condition frequencies: (1) prevalence. (2) Incidence (3) Other Biostatistical measurement.

- I. Formulate tentative hypothesis(es)
- II. Collect and analyze further data to test hypothesis.
- III. Plan for control
- IV. Implementation of control plan
- V. Evaluation of control plan
- VI. Appropriate reporting
- VII. Conduct research.

4.0 Conclusion

Epidemiology is a concept in community/public Health that dwells on, determinant, deterrents, causes and distribution of diseases in a specified populations, on the basis of the above public health practitioners will be able to prevent the outbreak of disease and that takes us to prevention is better than cure which is the dictum of public health.

5.0 Summary

The study section has successfully defined epidemiology, discuss the origin of epidemiology, process of epidemiology and its uses including the aims.

6.0 Questions

1. The term epidemiology is obtained from -----words
2. Epidemiology is an old concept dated back to ----- century
3. ----- is regarded as the father of medicine
4. Onwasigwe defined epidemiology as -----
5. Logos in epidemiology represent -----
6. Epidemiology is the science of ----- and -----

Answers:

- 1). 3 Greek Words
- 2). 3rd Century BC
- 3). Hippocrates
- 4). Causes, distribution, determinants and distribution of diseases
- 5). People
- 6). 'Preventive and Social Medicine'

7.0 References / Further Reading:

1. Onwasigwe C (2004). Principles and Methods of Epidemiology, Enugu, Institute of Development Studies, University of Nigeria.
2. Stanhope M, And Lancaster J. (2014). Community and Public Health Nursing, USA, Mosby.
3. Ogeneh, B (2006). Microbes in Public Health, Sungu; E.I Demark Publishers.
4. Obionu C.N (2007). Primary Health Care in Developing Countries. Institute for Developmental Studies, Enugu

5. Park K (2009). Text book of Preventive and Social Medicine, India, Prem Nagar Publishers, Nagpur.
6. Lucas A.O, and Gilles H.M (2008). Short Text Book of Public Health Medicine for the Tropic, Malta, Power Book (ELST)

SECTION 2: Principles of Epidemiology

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 - 3.5 General Guidelines for Outbreak Investigations
 - 3.6 Reasons for outbreak investigation
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1.0 Introduction

Public health personnel apply the principles of epidemiology as the bases for the surveillance of and investigating activities. This section will expose the students to the basic principles of epidemiology.

2.0 Learning Outcomes

After completing this section, the students should be able to

- Define epidemiology
- State the investigation purposes of Communicable Disease
- State the basic Principles of Preventing disease transmission
- State General Guidelines for Outbreak Investigations
- Identify Reasons for outbreak investigation

3.0 Main Content

3.1 Definition of Epidemiology

Epidemiology is the causes, distribution, deterrent and determinants of diseases; and health-related conditions in a particular population, and control of the disease is the implementation

of this process. Every health personnel should be acquainted with the philosophy of this definition and its relevant.

- **Distribution** - Epidemiology is consonance with the happening and system of health programs in an area. Excessive happening consist of the number of programs in a population and the risk factors of disease in the population. To ascertain the disease extent is fundamental to make comparisons across within populations.
- **Determinants** - Epidemiology can be used to find out the causes and other related factors which may orchestrate the occurrence of health-related issues. Occurrence of a health-issues is related to various determining factors that must be considered. For example, determinants may include susceptibility of host to illness, environmental toxin, exposure to a microorganism, insect vector or other infected client that cause risk for acquiring disease.
- **Specified populations** – The study of epidemiology relates with the health of individuals, families, groups of people in the community ; and the impact of health process on that population.
- **Application** - Epidemiology make available data for piloting the affairs of public health policy implementation. An epidemiologist employs the use of scientific methods of descriptive and analytic epidemiology in "diagnosing the problems" of the health of a community, but must use experience and creativity when planning epidemiologic situations. Overseeing diseases normally begins with descriptive epidemiology that defines time of event, who and when including the place of health-related issues.
- **what** – Explain the health-related issues and/or its determining factors
- **who** – This describe the demographic features and are useful in finding which groups are at risk for certain outcome? Features usually include sex, age and ethnicity or race. Other include history of occupation, socioeconomic status, or life styles, which provide important clue as regards client's exposure to a risk. History of background diseases may be relevant for ascertaining susceptibility to certain conditions.
- **when** -Altering the rate of diseases over a long-term, disease knowledge and trends helps identify abnormal occurrences that may define epidemics. Temporal associations between illnesses give understanding about incubation periods and exposures thereby posing risk to populace.
- **where** – Having knowledge of the geographical event of health-related issues gives information as to where the agent which causes a disease usually lives and multiplies; what may transmits it and how it is distributed.

3.2 Purposes of Communicable Disease Investigation and General Principles of Preventing Transmission Introduction

These principles or policies have been penciled down to assist the public health personnel engaged in investigating activities of communicable diseases. Their aim is to give fundamental, practical, easy-to-understand , up-to-date information that has been interpreted from variety of sources. These policies have been written with all sense of professionalism to balance the amount of work needed to follow a reported case of the probability of controlling spread of the disease. Certain diseases are part of these guidelines. This is based on their complexity and frequency. Take notice that these are the only guidelines. Situations differ, and best judgment should prevail. Some conditions demand a strict approach while others require a less stringent approach.

3.3 Purposes of Communicable Disease Investigation

Communicable diseases are diseases that can be transmitted from one person to the other, it can be from animal to human or other means as the case may be. For an individual to carry out in investigating activities on communicable diseases, there must be a purpose and they include:

1. Prevent Transmission from Cases to Contacts
2. Identify Sources of Diseases
3. Identify Other Cases
4. Conduct Surveillance
5. Ensure Adequate Medical Supervision of patient

3.4 General Principles of Preventing Transmission

This section describes management of ‘cases and contacts’ to prevent transmission.

3.5 Case Management

1. **Verify Diagnosis:** It is relevant to adequately confirm the causative agent for the diseases. For several diseases reported by doctors, there are little or no reliable laboratory data available to confirm diagnosis. Since control and efforts depend on accurate diagnosis, it is important to: a. ascertain if this information exists; b. arrange for laboratory investigation if the information does not exist; c. make the best guess about diagnosis if it cannot be obtained.
2. **Find out if the case is infectious:** for instance, if is infectious, you will find solution for preventing or controlling the transmission. Two methods can be adopted:
 - **estimation**-uses the onset of illness, commencement of treatment, and periods of infection for an illness. For example, hepatitis-A is no longer infectious after one week of its symptoms. Strep throat is not infectious after a day of its treatment.
 - **verification**-This requires laboratory investigation of specimens. Example, a stool specimen for a food handler with salmonellosis. The method you adopt is based on disease, the quality of information about the case, and whether the case is infectious.

In practice, bottleneck in reporting diagnosis , individuals have skipped the infectious process when they are unveiled. In this case, the chance to prevent transmission is lost, but prophylactic measures can be directed to the case's contacts, and other reasons of probing into the case can be fulfilled

3. Reduction in the Infectivity of case duration: Chemical agents like drugs (broad spectrum antibiotics) are the efficient means to reduce the time of infectiousness of many disease conditions. Usually, decisions on drug treatment will be made when you investigate. However, sometimes it may be important to work with patient and physician to ensure patient is appropriately treated.

4. Preventing Transmission should be put in practice: These practices should rely upon diseases and other circumstances. In case the disease is substantiated, then the principles above may have to be adopted.

- Contaminated materials such as blood, saliva, urine, eating utensils, faeces, bedding, toys, clothes, etc should be disinfected and disposed of.

- clothing, disinfect the case, bedding, etc. (e.g., lice)
- covering the nose and mouth when coughing or sneezing, handwashing, protecting lesions from contacts with others should be a behavioural practice.

Contact Management

1. **Find out the risk of contacts to infections:** How often is the infection and length of dosage to the exposure? Such characteristics can be vaguely described and it is reasonable to suspect a person living in same household as it exposes one to an infection.

How susceptible is the contact? Is the person been infected or vaccinated? Is the immune system compromised based on facts? Was the client immune system raised after the attack by the infection or how susceptible are the people?

2. **Ascertain if the contact is infected/ill:** Find out ‘clinical signs or symptoms’ and if the contact is in the early stages of an illness or there are no observable signs you must depend on during diagnosis. Manage the client if you observe that he/she is ill or infected as the case may be.
3. **Prevent illness in susceptible:** It may be necessary to think of contacts in two dimensions: The exposed and yet be exposed persons, either to the source or to a contact who subsequently acquires an infection. The choice of the measure depends on the disease. Identification of susceptible is paramount. Take notice that vaccines normally require a time greater than one incubation period to develop antibody. Therefore, they often prevent illness in the initial but later generation of contacts. Immune globulins must be given within a few days of contact to prevent or modify an infection; but they provide only short-term protection. Antimicrobials are important for contacts exposed to tuberculosis, strep, and meningitis.

The exposed person’s activities should be reduced. Sometimes, it may be cost effective to recommend isolation of contact between from the source. Another example is quarantining where the exposed persons is protect from others not yet exposed. Surveillance of the exposed should be conducted, it may be important to call an exposed person after the maximum incubation period to see if he is ill (e.g., for hepatitis A), or ask the contact to call you if he or she develops symptoms. The intensity of the surveillance depends on the degree of importance attached to preventing transmission from that client.

3.6 Investigations Guidelines for Outbreak of diseases

Authority of health immediate action is to embark on investigation when it receives a report of a cluster of cases or a case of a disease. The investigation may just be a phone call to a confirmed information or extensive field investigation that coordinates efforts of many people to find the extent and cause of a large outbreak.

Outbreaks may be noticed when routine and timely analysis of surveillance data shows a rise in reported cases or an abnormal clustering of cases. In Southern Carolina, the weekly tabulation of disease reports is a useful means to monitor trends, identify possible clusters and evaluate geographical distribution within the state..

Reasons for outbreak Investigation

The health agency /authority has a role to play to institute prevention/control measures. Training exercises for investigators may be their chance to study disease events. If new cases beginning to occur, the goal may be to prevent/control them. If an outbreak is almost over, the goal is to prevent outbreaks in the future. The goal is to identify factors that contributes to the outbreak and implement measures that could prevent serious outbreaks in the future. Concerns like political concerns, public relations, and legal obligations may also be taken into consideration.

Steps for the Investigation

- Arrange for field trip - discuss with experienced personnel, review related literature.
- Establish existence of an outbreak – Epidemic is the appearance of cases of disease more than expected in a specified area or among a specific population of people in a particular period of time. A **cluster** is an aggregation of cases in each area over a particular period of time without regard to whether the number of cases is more than expected. Defining an epidemic requires one to find out what the expected number of cases would be from surveillance data. Some reasons for a "false" epidemic may be reports of sporadic cases of the same disease, reports of similar cases but unrelated diseases, or changes in surveillance or reporting procedures.
- Confirmation of diagnosis – obtain data clinically, discuss with the physician and confirm whether laboratory tests results were done.
- Define and identify cases - Establish a case definition for the disease using a standard set of criteria for deciding whether an individual should be classified as having the health condition of interest.
- Perform descriptive epidemiology - Collect information to characterize an outbreak by time, place and person. Remember the what, who, when and where of descriptive epidemiology.
- Develop hypotheses - After collecting some of the initial information characterizing the outbreak, one should be able to formulate a hypothesis that addresses the source of the agent, the mode (and vehicle or vector) of transmission, and the exposures that caused the disease.
- Evaluate hypotheses - Compare your hypothesis with the established facts. Is it plausible and consistent? If not, the hypothesis should be revised.
- As necessary, reconsider/refine hypotheses and execute additional studies.
- Implement control and prevention measures - This is the primary goal of most outbreak investigations. Although mentioned far down on the list, prevention and control measures should be implemented as soon as possible in an outbreak setting. This may be accomplished by destroying contaminated foods, removing an infected food- handler from the job, or immunizing and providing prophylaxis to a population at risk.
- Findings should be communicated to the appropriate quarters and oral statement/document report are always important to summarize an investigation activity. Presenting recommendations formally provides a blueprint for action and may serve in the health authority as a reference if the health authority encounters a similar situation later.

4.0 Conclusion

Epidemiology prepares the mind of public health practitioners to embark on proper investigation and proffer solution to the identify problems associated with the community.

5.0 Summary

This section described the distribution, determinants specified population and

application of epidemiology. It also highlighted purposes of communicable diseases investigation and general principles of preventing transmission and purposes of communicable disease investigation. Furthermore, reasons for outbreak investigation, steps in the investigation were not left out.

6.0 Questions

1). ----- Is defined as aggregation of cases in a given area over a particular period without regards to whether the number of cases is more than expected

2). ----- Uses the date of onset of illness, date of known treatment, and known period of infectiousness for an illness

Enumerate reasons for communicable disease investigation

3). -----

4). -----

5). -----

6). -----

Answers (1). Cluster, (2) Estimation (3) Prevent transmission cases to contact

(4) Identify sources of diseases (5) Identify other cases (6) Conduct Surveillance

7.0 References/ Further Reading

1. Onwasigwe C (2004). Principles and Methods of Epidemiology, Enugu, Institute of Development Studies, University of Nigeria.
2. Stanhope M, And Lancaster J. (2014). Community and Public Health Nursing, USA, Mosby.
3. Ogeneh, B (2006). Microbes in Public Health, Sungu; E.I Demark Publishers.
4. Obionu C.N (2007). Primary Health Care in Developing Countries. Institute for Developmental Studies, Enugu
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6. Lucas A.O, and Gilles H.M (2008). Short Text Book of Public Health Medicine for the Tropic, Malta, Power Book (ELST)

SECTION 3: TYPES OF EPIDEMIOLOGICAL STUDIES

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- 3.0 Main Content
 - 3.1 Types of Epidemiological Study
 - 3.2 Relevance of the Epidemiological Methods
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor- Marked Assignment
- 7.0 References/ Further Reading

1.0 Introduction

The epidemiologist is concerned with studying disease occurrence in people and the numerous factors which people are often exposed to that play a significant role in disease occurrence. Thus, the epidemiologist employs carefully designed strategies to determine this. This unit aims at exposing students to different methods of epidemiological studies. In all, it is crucial that you have a clear definition of the case under review and of the person involved. Failure to obtain the required information will make the interpretation of data difficult.

2.0 LEARNING OUTCOMES

At the end of this section, students should be able to:

- Explain the types of epidemiological study
- Describe the relevance of these methods

3.0 MAIN CONTENT

3.1 Types of Epidemiological Studies

Epidemiological studies comprise of the following:

1. Descriptive Epidemiology

- a. Cross Sectional Study (Prevalence) with individuals as unit
- b. Longitudinal (Incidence)

2. Analytical Epidemiology

- a. Case-control (Case-reference) with individuals as unit of study
- b. Cohort (absolute, relative, attributable risk or follow-up with individuals as unit of study)

3. Experimental / Interventional Studies

- a. Randomised controlled trials/or Clinical trials with patients as unit of study
- b. Field trials or community intervention studies with healthy people as unit of study
- c. Community trials with communities as unit of study.

3.2 Observational Studies

This is made up of the descriptive and analytical studies.

3.3 Descriptive Studies

This is the study of the frequencies and distribution of a disease within a population by persons, place and time. The three broad questions necessary to describe the occurrence of a disease fully relating to persons, place and time are:

- **Person**-who is getting the disease (person characteristics)? i.e. male or female, the age range, ethnicity, marital status, social and economic factors, social class, education, occupation, income level, family variables such as size, type, birth order, maternal age, parental deprivation and personal habits.
- **Place**- where is it occurring (place characteristics)? This will answer for region, state, district, LGA, local community, towns, village and wards either in the city or rural areas. Boundaries are also considered with precise location.
- **Time**-when is the disease occurring (time characteristics)? This includes the year, season, and day of the week, month and the time of the day. Certain diseases are common during the year for example measles in dry season.

The procedures in descriptive studies are:

defining the population to be studied defining the disease under study describing the disease

by: time, place and person measurement of disease

comparing with known indices formulation of an aetiological hypothesis.

The description of diseases is usually done based on some characteristics which are shown in the table below:

Table 3.1: Characteristics Frequently Examined

The procedures in descriptive studies are:

defining the population to be studied defining the disease under study describing the disease

by: time, place and person measurement of disease

comparing with known indices formulation of an aetiological hypothesis.

The description of diseases is usually done based on some characteristics which are shown in the table below:

Time	Place	Person	
Year, season	Climatic zones	Age	Birth order
Month, week	Country, region	Sex	Family Size
Day, hour of Onset	Urban/rural, local community	Marital state	Height; Weight
Duration	Towns, Cities and Institutions	Occupation, Social status, and Education	Blood pressure, Blood cholesterol and personal habits

3.4 Analytical Studies

This is the second major type of epidemiological studies. While descriptive studies look at the entire population, analytic studies only look at the individuals so affected within the population. The focus is not to formulate but to test hypothesis. However, even though individuals are evaluated in analytical studies, the inference is made in respect of the population so selected. Analytical studies comprise of two distinct types of observational studies. These are: **retrospective or case study and prospective or cohort study**. From here, we can determine whether or not a statistical association exists between a disease and a suspected factor and if it does, what is the strength of association. In prospective or cohort studies, a group of persons are exposed to causative factors while others are not. A follow-up is made in the nearest future to check the proportion of effects on the exposed and the non-exposed and comparison is then made.

3.5 Relevance of Epidemiological Methods

- Epidemiological methods are used for disease surveillance to identify which hazards are the most important.
- Epidemiological studies are also used to identify risk factors which may represent critical control points in the food production system.

4.0 Conclusion

All the epidemiological studies complement one another. An observational study allows nature to take its course. The investigator measures do not intervene. Descriptive study is limited to describing disease occurrence in a population. Analytical goes on to examine the relationship between health status and variables. Experimental or interventional studies involve an active attempt to change disease determinant or the progress of a disease. It is clearly acknowledged that epidemiology is a major tool in the formulation and implementation of national, regional and local health policy and providing evidence on which policies can be based.

5.0 Summary

This unit has touched on the various types of epidemiological studies with particular reference to their importance.

6.0 Questions

1. Enumerate the types of epidemiological studies
2. Epidemiologist is concerned with studying ----- in people and ----- which people are often exposed

Answers: (1).

- Descriptive epidemiology
- Analytical epidemiology
- Experimental epidemiology

(2). Diseases occurrence and numerous factors

7.0 References/ Further Reading

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Module 2 - Triad, Models and Applications in Epidemiology

Section 1: Epidemiological Triad

Section 2: Epidemiological models

Section 3: Epidemiological Applications

STUDY SECTION 1: Epidemiological Triad

1.0 Introduction

2.0 Learning Outcomes

3.0 Main Content

4.0 Conclusion

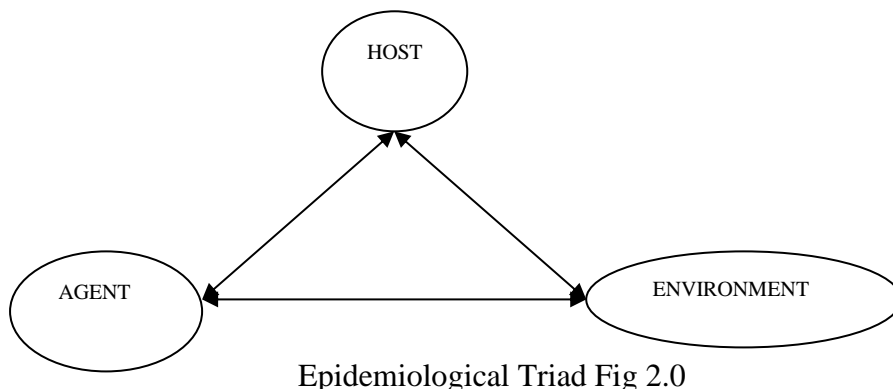
5.0 Summary

6.0 Tutor- Marked Assignment

7.0 References/ Further Reading

1.0 Introduction

Epidemiologists understand that disease results from complex relationships among causal agents, susceptible persons, and environmental factors. These three elements-agent-, host, and environment- are called epidemiologic triangle. (Lacanster and Stanhope, 2000).



2.0 Learning Outcomes

After the study the students should be able to:

- Explain Concept of epidemiological triad
- Definition of epidemiological triad
- Discuss the importance of epidemiological triad

3.0 Main Content

3.1 Concept of Epidemiological Triad

The epidemiological triad consists of an external agent, a susceptible host, and an environment that brings the host and agent together. In this model, disease results from the interaction between the agent and the susceptible host in an environment that supports transmission of the agent from a source to that host.

Changes in one of the elements of the triangle can influence the occurrence of disease by increasing or decreasing a person risk for disease. Risk is understood as the probability that an individual will experience an event (Last in Stanhope and Lacanster, 2001) fig 2.0 above, suggests that both agent and host, as well as their interaction, are influenced by the environmental context in which they exist, and that they in turn may influence the environment, some examples of three component are listed below.

Agent:

- Infectious agents (bacteria, viruses, fungi, parasites).
- Chemical agents (heavy metals, toxic chemicals, pesticides).
- Physical agents (radiation, heat, cold, machinery).

Host

- Genetic susceptibility.
- Immutable characteristics (immunologic status).
- Acquired characteristics (age, sex).
- Lifestyle factors (diet and exercise).

Environment

- Climatic (temperature, rain fall).
- Plant and animal life (agents or reservoir or habitats for agents).
- Human population destitution (crowding, social support).
- Social economic factors (education, resources access to care).
- Working conditions (levels of stress, noise, satisfaction).

3.2 Definition of Epidemiological Triad

Epidemiological triad is defined as the interphase between agent, host and environment which form the basis of prevention and control of diseases in a specified population.

3.3 Importance of Epidemiological Triad

The Epidemiologic Triangle is a model that scientists have developed for studying health problems. It can help public health practitioners to understand infectious diseases and how they spread.

Epidemiological information is used to plan and evaluate strategies to prevent illness and as a guide to the management of patients in whom disease has already developed. Like the clinical findings and pathology, the epidemiology of a disease is an integral part of its basic description.

4.0 Conclusion

Epidemiological triad is the basis for which public health practitioners can embark on the control and the prevention of diseases. This cannot be over emphasized.

5.0 Summary

This study discussed the Concept of epidemiological triad, definition of epidemiological triad, including the importance of epidemiological triad to the public health practitioners.

4.0 Conclusion

The importance of epidemiological triad cannot be over emphasized in terms of disease control and prevention. For an epidemiologist to get acquainted with disease control and prevention, he must have a good understanding of agent, the host, and the environment.

5.0 Summary

This section defined the epidemiological triad and also described the agent, host, and the environment which are the components of the triad. The importance of the triad was also mentioned.

6.0 Questions

1. List the components of epidemiological triad
2. Define epidemiological triad
3. Discuss the relevance of epidemiological triad

Answers

1. Agent, Host and Environment
2. Epidemiological triad is defined as the interphase between agent, host and environment which form the basis of prevention and control of diseases in a specified population.
3. Epidemiological triad helps in breaking the chain of transmission of diseases.

7.0 References/Further Reading

1. Onwasigwe C (2004). Principles and Methods of Epidemiology, Enugu, Institute of Development Studies, University of Nigeria.
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STUDY SECTION 2: EPIDEMIOLOGICAL MODELS

CONTENTS

- 1.0 Introduction
- 2.0 Learning Outcomes
- 3.0 Main Content
 - 3.1 Definition of Epidemiological Models
 - 3.2 Concept of Epidemiological Model
 - 3.3 Uses of Epidemiological Model
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor- Marked Assignment
- 7.0 References/ Further Reading

1.0 Introduction:

In epidemiological model, the population under consideration can be divided into different classes which change with time t . These are divided into susceptible ($S[t]$) infective($I[t]$) and removed ($R[t]$) Infective classes of population are those which are actively passing on the disease to others.

2.0 Learning Outcomes

After reading this section, students should be able to:

- Define epidemiological Model.
- Explain the Concept of Epidemiological Model and
- The uses of the Model.

3.0 Main Content

3.1 Definitions of Epidemiological Model

The definition of ‘epidemiological models’ is very important for this technical item. However, a clear definition of the term does not seem to exist. An epidemiological model is usually defined as ‘a mathematical and/or logical representation of the epidemiology of disease transmission and its associated processes.

3.2 Concept of Epidemiological Model

These quantitative models provide a representation of the transmission dynamics of animal diseases among animals, and/or among groups of animals in time and/or space. An epidemiological model therefore facilitates the evaluation of the efficacy of the potential

control measures and provides estimates of the future magnitude, duration and geographical extent of an outbreak given the application of specific control measures. However, in relation to the management of animal diseases epidemiological models could be defined more broadly to include a range of statistical/mathematical models, which do not necessarily provide just a description of disease spread. Related aspects to be considered include e.g. the design of surveillance systems.

Overview of disease models are by nature, simplifications of more complex systems. Disease models can be classified into various categories depending on their treatment of randomness or variability, time, space and the structure of the population. The approaches will vary from simple deterministic mathematical models through to complex spatially-explicit stochastic simulations. The most appropriate type of model to use in a given situation will depend on the sorts of issues being studied. For example, while deterministic models, which are typically based on average or expected value parameters, may be useful for understanding basic infection dynamics, they are of limited use as a predictive tool since any one epidemic is unique and unlikely to follow an ‘average’ pattern. However, when epidemiological knowledge and good quality data are available, more elaborate models that provide a range of possible epidemics can be developed. The increasing sophistication of computers, together with greater recognition of the importance of spatial elements in spread of disease, and interest in specific spatially targeted strategies like emergency ring vaccination or contiguous slaughter, mean that models which incorporate spatial components are becoming more important in epidemiological studies. As well, network-based modelling is a relatively new but growing field to study the spread of diseases through contact networks. The process of model building must start with specific questions to answer in order to provide its scope. The choice of model will depend on how well the epidemiology of a disease is understood, the amount and quality of data available and the background of the modelers themselves. The level of complexity to include in a model is an art as well as a science. Adding additional elements may increase complexity without necessarily improving quality of the outputs. On the other hand, ignoring factors that are clearly important in the epidemiology of a disease may result in model findings that are misleading. A critical step in model development is the process of model verification and validation to ensure that it behaves like the system it is designed to represent. Verification is defined as the process that ensures that the logic, formulae, and computer code of the model correctly reproduce the logical framework conceived by the model designer. Validation ensures that the model is ‘true to life’. This implies that the assumptions underlying the model are correct and that the model’s representation of the studied system is reasonable for the intended purpose. A more

comprehensive view of validity considers: ‘data validity’, or the correctness of the data used to construct and parameterize the model; ‘conceptual validity’, or the correctness of the mathematical and epidemiological logic upon which the model is built; and ‘operational validity’, or the ability of the model, as implemented, to produce results of sufficient accuracy.

3.3 Uses of Epidemiological Model:

Epidemiological Model can be used to make medium -term projections (typically 2-3 months) of epidemic trajectory if conditions stays as they are, or change in some specified way like relaxing public health measures. Models can also be used to investigate longer-term scenarios. Government may use modelling results to help inform decisions about policy. However, models are not the only factor considered and decisions based on a range of data and evidence. A model on its own can tell you what to do, but it can help weigh up the pros and cons of alternative options.

4.0 Conclusion

Epidemiological model

Epidemiological model mimic Mathematical modeling, it is a pathway to monitor the outbreak of diseases. It has increasingly played an intrinsic part in managing outbreaks and epidemics and informing public health decisions. The use of the epidemiologic model cannot be over emphasized in prevention and control of diseases.

5.0 Summary

This study section has discussed the concept of epidemiological model, defined epidemiological models and the uses of the model in outbreak investigations.

6.0 Questions

- 1 Define epidemiological model
- 2 Explain the concept of epidemiological model
- 3 List the uses of epidemiological model

Answers:

1. An epidemiological model is defined as ‘a mathematical and/or logical representation of the epidemiology of disease transmission and its associated processes.
2. These quantitative models provide a representation of the transmission dynamics of animal diseases among animals, and/or among groups of animals in time and/or space. An epidemiological model therefore facilitates the evaluation of the efficacy of the potential

control measures and provides estimates of the future magnitude, duration and geographical extent of an outbreak given the application of specific control measures.

3. Epidemiological Model can be used to make medium -term projections (typically 2-3 months) of epidemic trajectory if conditions stay as they are, or change in some specified way like relaxing public health measures.

4. Models can also be used to investigate longer-term scenarios.

5. Government may use modelling results to help inform decisions about policy

5.0 References/Further Reading

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STUDY SECTION 3: EPIDEMIOLOGICAL APPLICATIONS

CONTENTS

1.0 Introduction

2.0 Learning Outcomes

3.0 Main Content

3.1 Concept of Epidemiological Applications

3.2 Uses of the Applications in Outbreak Investigation

4.0 Conclusion

5.0 Summary

6.0 Tutor-Mark Assignment

7.0 References/Further Reading

1.0 Introduction

Epidemiology is not just “the study of” health in a population; it also involves applying the knowledge gained by the studies to community-based practice. Like the practice of medicine, the practice of epidemiology is both a science and an art. To make the proper diagnosis and prescribe appropriate treatment for a patient, the clinician combines medical (scientific) knowledge with experience, clinical judgment, and understanding of the patient. Similarly, the epidemiologist uses the scientific methods of descriptive and analytic epidemiology as well as experience, epidemiologic judgment, and understanding of local conditions in “diagnosing” the health of a community and proposing appropriate, practical, and acceptable public health interventions to control and prevent disease in the community.

2.0 Learning Outcomes

At the completion of this study section, students should be able to:

1. The concept of epidemiological Application
2. Uses of the Application

3.0 Main Content

3.1 Concept of the Application

Epidemiology is a scientific field that focuses on developing and researching probable public health concerns; applied epidemiology refers to the application of the practice of epidemiology to produce outcomes or research efforts design to address public health issues.

It is therefore considered to be a discipline ensconced in public health, an issue that is of great importance to every government. Epidemiologists are the professionals who work in the scientific field to research and develop specific efforts to influence the outcomes of such issues, such as the spread of infections or diseases among a population.

3.2 Uses of the Application

Epidemiology utilizes an organized approach to problem solving by:

1. Confirming the existence of an epidemic and verifying the diagnosis;
2. Developing a case definition and collating data on cases;
3. Analyzing data by time, place, and person;
4. Developing a hypothesis;
5. Conducting further studies if necessary;
6. Developing and implementing control and prevention measures;
7. Preparing and distributing a public report; and
8. Evaluating control and preventive measures.
9. Epidemiologic methods can be used for a number of distinct purposes

Disease surveillance:

This is defined as the regular collection, summarization and analysis of data on newly diagnosed cases of infectious disease for the purpose of identifying high-risk groups in the population, understanding the mode(s) of transmission of the disease, and reducing or eliminating its transmission.

Information on the patients should include; date of onset of symptoms, diagnosis, name, age, sex, address of residence, telephone number, and his or her source of referral. Regular analysis of such data should lead to recognition of seasonal and long-term trends, geographic areas concerned, high-risk groups and occupational diseases.

Perhaps the most basic question that can be asked is “what is the frequency with which the disease occurs?”. To answer this question, is necessary to know the number of persons who acquire the disease (cases) over a specified period of time, and the size of the unaffected population.

Measure of frequency of occurrence of a disease are used to characterized the patterns of the occurrence of a disease and the medical surveillance of the disease, typically, the criteria used to define the occurrence of a disease depends on current knowledge of a disease, sure criteria may become more defined as the causes of a disease are delineated and new diagnostics test are introduced. For example, in 1992 the CDC created an initial, relatively simple surveillance definitions for aids.

A more specific definitions became possible once the causative agent, HIV was identified and test for the detection of anti-bodies to the virus where develop. In 1997 the CDC surveillance definition was expanded to incur operate clinical conditions that are indicative of AIDS.

The identifications of patient with a disease can occur through various mechanism, most commonly by physician and laboratory reporting.

Surveillance Data

- They are many potential benefits from the collection of surveillance data
- This type of information (1. can help to identify the new outbreak of an illness, sure as AIDS. 2 can provide clues, by considering the population group that are most affected by the illness, to possible causes of the condition. 3.can be used to suggest strategies to control or prevent the spread of disease, 4.can be used to measure the impact of disease prevention and control efforts,5. Can provide on the burden of illness, that are necessary for determining health and medical service need. Other applications include incidence rates, diagnostic testing, natural history of disease, testing new treatments.)

4.0 Conclusion Epidemiology cannot be discussed without mentioning its applications. Epidemiologists are the professionals who work in the scientific field to research and develop specific efforts to influence the outcomes of such issues, such as the spread of infections or diseases among a population.

5.0 Summary

This section described the concept of the application as it affects disease outbreak and the prevention/control of diseases in a specified population. It also takes cognizance of the concept of epidemiological applications and its uses.

6.0 Questions

- 1) List the uses of epidemiological applications
- 2) Define disease surveillance

Answers

1).

- Confirming the existence of an epidemic and verifying the diagnosis;
- Developing a case definition and collating data on cases;
- Analyzing data by time, place, and person;
- Developing a hypothesis;
- Conducting further studies if necessary;
- Developing and implementing control and prevention measures;
- Preparing and distributing a public report; and
- Evaluating control and preventive measures.
- Epidemiologic methods can be used for a number of distinct purposes

2). This is defined as the regular collection, summarization and analysis of data on newly diagnosed cases of infectious disease for the purpose of identifying high-risk groups in the population, understanding the mode(s) of transmission of the disease, and reducing or eliminating its transmission.

7.0 References/Further Reading

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MODULE 3-EPIDEMIOLOGY AND COMMUNICABLE DISEASES

Study Section 1: Strategies of Epidemiology

Study Section 2: Epidemiology of Communicable Diseases

Study Section 3: Epidemics

STUDY SECTION 1: STRATEGIES OF EPIDEMIOLOGY CONTENTS

- 1.0 Introduction
- 2.0 Learning Outcomes
- 3.0 Main Content
 - 3.1 Chain of Epidemiology
 - 3.2 Disease Causation
 - 3.3 Factors Precipitating Causation
 - 3.4 Interrelated Factors
 - 3.5 Levels of Prevention
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 Introduction

Your understanding of epidemiology with the **3Ds**, namely disease frequency, distribution of disease and determinants of disease requires some strategies which provide a search for causal association between disease and other biological processes and experiences. This unit will expose you to those strategies.

2.0 Learning Outcomes

At the end of this unit, students should be able to:

1. Identify the main strategies for epidemiological studies
2. Interpret its usefulness in disease management
3. Apply them in the overall health care of the patient/client.

3.0 MAIN CONTENT

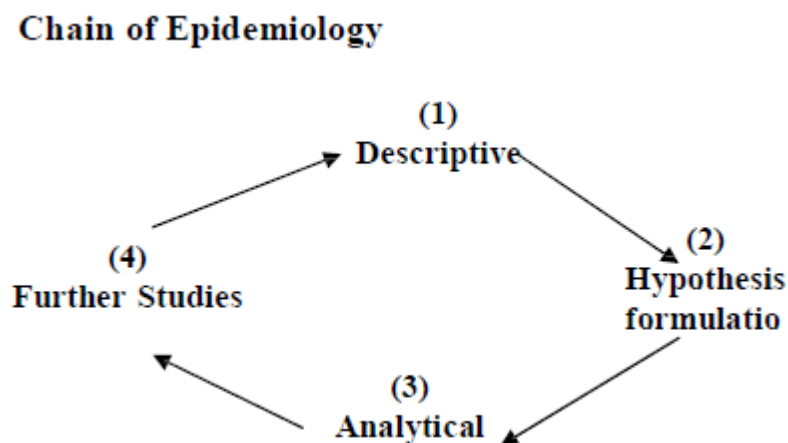
3.1 Chain of Epidemiology

The following chains exist in the study of epidemiology: These are: Descriptive studies: in which there is data aggregation and analysis.

Hypothesis testing- This is based on the result of your analysis in the descriptive studies, you can build a model and formulate hypothesis

Analytical study – The hypothesis generated in phase II is tested and this can be either observational or experimental. Analysis obtained here may suggest further studies or generate new hypothesis.

Chain of Epidemiology Diagram



3.2 Disease Causation

In disease causation, ecological factors are important. You may ask, what is ecology? Ecology is the study of relationship of organisms including humans to each other as well as other aspects of the environment. This has given rise to the concept of the multiple causation of disease (that is multi-factual aetiology of disease).

There are other factors necessary for the development of disease namely:

- a. level of immunity
- b. the environmental conditions
- c. the agents-factors which must be present for the particular disease to occur (i.e.) a sinequa non (without which nothing will happen).

3.3 Factors precipitating Disease Causation

There are factors that precipitate the cause of diseases. These are the Host Factor (HF) and the Environmental Factor (EF).

1. **Host Factors:** these are intrinsic factors, genetic (inborn) in a person. It can be
 - **specific** (i.e.) not inborn but acquired by immunisation and natural infection
 - **personality** – people working hard, ambitious with strong drive
 - **social class membership:** peer grouping, organisation.

2. **Environmental Factors:** these are sub-divided into three namely: biological, physical and social factors.
 - **Biological factors:** these includes the infectious agents, reservoirs which may be human, animal or soil, transmitting vectors, plants and animals in their environment which may serve as foods or drugs, antibiotics, antigens and antibodies.
 - **Physical factors:** it includes heat, light, air, water, radiation, chemical agent, atmospheric pressure, etc.
 - **Social factor:** this is defined as the overall economic and political organisation of a society and the institutions by which individual are integrated into the society at various ages of their lives. Social environment is man- made environment which includes what he has created to make life worth living e.g. housing. It also includes the people's customs, levels of integration of the community, levels and systems of Medicare, the degree of enforcement of health law and code.

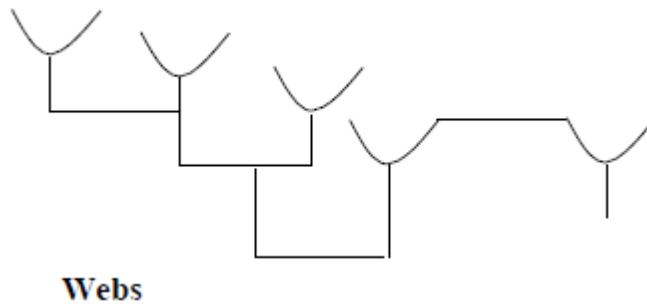
3.4 Interrelated Factors

Our state of health depends on a balance of forces in a dynamic equilibrium. If the equilibrium is precarious, then the disease occurs easily. If the equilibrium is stable then the disease does not occur very easily. See this ecological model showing the state of equilibrium in disease state.

B. Web of Causation

Diseases do not just happen rather it develops as a result of a chain of position in which each link is the result of a complex genealogy of antecedence.

Web Diagram



If the link in the chain is broken anywhere, the disease may not occur. For example, if a man changes his job and stop been a long-time driver.

4.0 Conclusion

You have been enlightened on the strategies that provide a search for causal association between disease and other biological /specific biological experiences. Host and environmental factors play a key role in disease causation with an unparalleled interrelation of the factors. The levels of prevention are well laid out to assist you in providing the needed support to facilitate recovery.

5.0 Summary

This section discussed the followings: chain of epidemiology, disease causation, factors precipitating disease causation, interrelated factors and levels of prevention.

6.0 Tutor-Marked Assignment

Describe environmental factor as it affects disease causation.

Answers

- **Environmental Factors:** these are sub-divided into three namely: biological, physical and social factors.
 - Biological factors: these includes the infectious agents, reservoirs which may be human, animal or soil, transmitting vectors, plants and animals in their environment which may serve as foods or drugs, antibiotics, antigens and antibodies.
 - Physical factors: it includes heat, light, air, water, radiation, chemical agent, atmospheric pressure, etc.
 - Social factor: this is defined as the overall economic and political organisation of a society and the institutions by which individual are integrated into the society at various ages of their lives. Social environment is man- made environment which

includes what he has created to make life worth living e.g. housing. It also includes the people's customs, levels of integration of the community, levels and systems of Medicare, the degree of enforcement of health law and code.

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STUDY SECTION 2: Epidemiology of Communicable Diseases

1.0 CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Definition
 - 3.2 Disease-Causing Agents
 - 3.3 Infectious Agents
 - 3.4 Concepts in Communicable Disease
 - 3.5 The General Methods of Control
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment

7.0 Reference/Further Reading

1.0 Introduction

The epidemiology of communicable disease is an important aspect of this course. You will remember the place of who, what, where, and when in the understanding of epidemiology. To this end, therefore, the relationship of epidemiology, communicable disease will form the basis of our discussion in this section.

2.0 Learning Outcomes

At the end of this study students should be able to:

- Define communicable diseases
- Describe infectious agents
- Enumerate the concepts that apply to communicable disease
- Discuss the general methods of control of communicable diseases.
- Enumerate problems of investigating communicable diseases
- Discuss the significant changes in the health and disease pattern.

3.0 Main Content

3.1 Definition

A communicable disease is an illness that occurs due to a specific causative agent or its toxic products which arises through transmission of that agent or its products from a reservoir to a susceptible host. It could be directly as from an infected person or animal or indirectly through an intermediate plant or animal host, vector or the inanimate environment.

3.2 Disease-Causing Agents

We shall now consider some of the key points in the definition above:

Agents and Diseases Caused

Agents	Diseases Caused
Viruses	Measles, small pox,
Rickettsiae	Typhus organism and tapeworm
Fungi	Candidiasis, Tinea capitis, Histoplasmosis

Protozoa	Malaria, Trypanosomiasis, Amoebiasis
Helminthes	Nematodes: roundworms, guineaworms, onchocerchiaiis: Trematodes and Cestodes: Schizomiasis, Paragomiasis, Flat worms, Tapeworms, Tinea Sadinasa
Anthropoda	Gigar

3.3 Infectious Agents

An infectious agent is any organism or agent that is capable of producing infection or infectious diseases. Infection is the successful invasion of the body by micro organisms. Please note that infection is not the same as infectious disease.

Reservoir

A reservoir is any human being/animal/anthropoid/plants/soil or inanimate matter in which an infectious agent normally lives and multiply and on which it depends primarily for survival. It reproduces itself in such manner that it can be transmitted to successive host. Man is the only reservoir of infection from many diseases (man to man). Occasionally, an animal may serve as the reservoir.

A zoonosis is an infectious disease transmissible under natural conditions from vertebrae animal to man. For example, rabies, sleeping sickness, yellow fever (jungle type), anthrax, Lassa fever (from rat and tape worm).

3.4 Concepts in Communicable Disease

The following concepts are very important in understanding communicable diseases.

Incubation Period: This is the period between the exposure to an infectious agent and the appearance of the first signs and symptoms of disease.

3.5 Characteristics of organisms that influence diseases/illness formation

There are characteristics that influence disease/illness formation in the body. These are: infectivity pathogenicity virulence antigenic power.

Resistance

This is the sum total of body mechanism that provides a barrier to the progress of invasion or multiplication of infectious agents and damage their toxic products. This is made possible through immunity.

Carrier

A carrier is someone who though has disease causing organism in his body but does not show any sign of infection. The carrier has the ability to harbour and disseminate the parasite without showing any clinical evidence of infection. There are times when even carriers of a disease are more than those showing the signs of the disease. They often become chronic carriers but this does not last long. Some of the disease known to have carriers include: cholera, salmonella typhi, poliomyelitis and diphtheria.

Types of Carrier

1. Incubatory carrier is one that is transferred during incubation period
2. Convalescent carrier is one that is transferred during recovery period
3. Intermittent carrier is one that is on and off
4. Chronic carrier is one in which the individual keeps carrying the disease on for a long time
5. Healthy carrier is someone who does not show the manifestation at any time but keeps on transmitting it to people.

Immunity

This is the resistance usually associated with possession of antibodies having specific actions on the micro-organism concerned with a particular infectious disease or its toxin. An individual is considered immune when he possesses specific protective antibodies or cellular immunity as a result of previous infection or immunisation or by previous experience. Immunity can be natural or acquired. Natural is inherent in the individual or specie and it is independent of previous infection. Acquired immunity can be active and passive. Active acquired immunity can be natural or induced, while passive acquired may be natural/trans-placental or passive induced.

Active Immunity: This is the immunity an individual develops as a result of infection or specific immunization and usually associated with antibodies or cells having a specific action on the disease or toxin. This can be acquired through any of the following:

After infection e.g. measles

After in-apparent infection e.g. poliomyelitis

After immunisation

Passive Immunity: This is the transference of antibodies produced in one body to another to induce protection against disease. This is useful for individual who cannot form antibodies or

for the normal host who takes time to develop antibodies after active immunisation. Here, the body depends solely on ready-made antibodies. This can be derived from any of the following: when an antibody is administered transfer of maternal antibodies across the placenta transfer of lymphocytes to induce passive cellular immunity.

Herd Immunity: The level of immunity in the community as a whole is termed ‘herd immunity. When herd immunity is low, introduction of the infection is likely to lead to severe epidemics. For example, the introduction of measles vaccine into an island population which had no previous experience of the infection resulted in massive epidemics. On the other hand, when herd immunity is high, the introduction of infection may not lead to a propagated spread. A disease may be brought under control when a high proportion of the population has been immunized; even though a small proportion remains non-immune the transmission of infection may eventually cease.

Vaccine: This is an immuno-biological substance designed to produce specific protection against a given disease. It stimulates the production of protective antibody and other immune mechanisms. It may be prepared from live modified mechanism or inactivated or killed organisms e.g. BCG

3.6 General Methods for the Control of Communicable Diseases

Preventive measure	Control of patient, contact and environment	Epidemic measures	International measures
Vaccination against epidemic	Measures designed to prevent spread of infection matters to person and to the environment	Measures to limit spread of communicable disease which has developed widely in a group or community within an area, state or nation:	Control of international travellers, immigrant, goods, animals product and the means of transport of the above
Chlorination of water supplies	Keeping contacts under surveillance	Notification of occurrence to the	Intergovernmental arrangement, national laws

		during incubation periods	appropriate health authority	
	Pasteurisation of milk	Keeping records under control until found to be free of infectious agents	Mass immunisation	Monitoring immunisation posts especially at the boarders and ports,
	Control of rodent arthropod, animal	Reporting to local authority	Health education	
	Immunisation	Isolation	Source and contact investigation	
	Public health education	Concurrent disinfection		
	Improvement of environmental sanitation and personal; hygiene	Quarantine i.e Limitation of person exposed to infection		
	Chemoprophylaxis e.g. malaria, filariasis, meningococcal meningitis, bacillary	Immunisation of contact		
	Dysentery	Investigation of contact		
		Specific treatment		

Adapted from Community Health Nursing

4.0 Conclusion

Communicable diseases are the one transmitted either from one person to another, it can also be through fomites and other varieties of ways e.g. through contact with blood and bodily fluids, through the air as in the case of tuberculosis and other air borne infections. It is important for students to be knowledgeable with the above concept to enable the prevent/control communicable diseases.

5.0 Summary

This section has successfully discussed the concept of communicable diseases, its prevention/control, and the various types of diseases that can be transmitted through different means.

6.0 Questions

1. Define Carrier
2. List the types of carriers
3. Explain Herds immunity

Answers

1. A carrier is someone who though has disease causing organism in his body but does not show any sign of infection. The carrier has the ability to harbour and disseminate the parasite without showing any clinical evidence of infection. There are times when even carriers of a disease are more than those showing the signs of the disease. They often become chronic carriers but this does not last long. Some of the disease known to have carriers include: cholera, salmonella typhi, poliomyelitis and diphtheria.

2.

- Incubatory carrier is one that is transferred during incubation period
- Convalescent carrier is one that is transferred during recovery period
- Intermittent carrier is one that is on and off
- Chronic carrier is one in which the individual keeps carrying the disease on for a long time
- Healthy carrier is someone who does not show the manifestation at any time but keeps on transmitting it to people.

3. Herd Immunity: The level of immunity in the community as a whole is termed 'herd immunity. When herd immunity is low, introduction of the infection is likely to lead to severe epidemics. For example, the introduction of measles vaccine into an island population which had no previous experience of the infection resulted in massive epidemics. On the other hand, when herd immunity is high, the introduction of infection may not lead to a propagated spread. A disease may be brought under control when a high proportion of the population has been

immunized; even though a small proportion remains non-immune the transmission of infection may eventually cease.

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STUDY SECTION 3: EPIDEMICS

CONTENTS

- 1.0 Introduction
- 2.0 Objectives
- 3.0 Main Content
 - 3.1 Definition and Terms in Epidemics Outbreak
 - 3.2 Propagation of Epidemics
 - 3.3 Types of Spread
 - 3.4 Investigation of Epidemic
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References/Further Reading

1.0 INTRODUCTION

In this section, we will discuss epidemics and its related concepts. While epidemics expresses the occurrence of a particular group of illness far beyond as expected in nature, surveillance entails the continuous scrutiny of and watchfulness over the distribution and spread of infection to provide the basis for effective prevention/control.

2.0 Learning Outcomes

At the end of this section, students should be able to:

- define epidemics
- explain various terms related to epidemics
- discuss the sequence of events associated with epidemics investigate epidemic cases.

3.0 MAIN CONTENT

3.1 Definition and Terms in Epidemics

Epidemics is defined as the occurrence in a community or region or a member of a defined population or a group having illness of a similar nature in excess of a normal expectancy in that population.

In epidemics, any kind of disease or injury may be involved and there are no universally applicable number of cases and no clear geographical extent e.g. food poisoning.

However, it can affect a large population which cuts across boundaries not really world-wide (pandemic) and not specific to time.

A disease can be said to be endemic in contrast to epidemics. This is a constant spread of a disease or an infective agent within a given geographical area. It is the usual prevalence of a given disease within an area.

Hyperendemic is a term that expresses a persistent intense transmission of the disease e.g. malaria

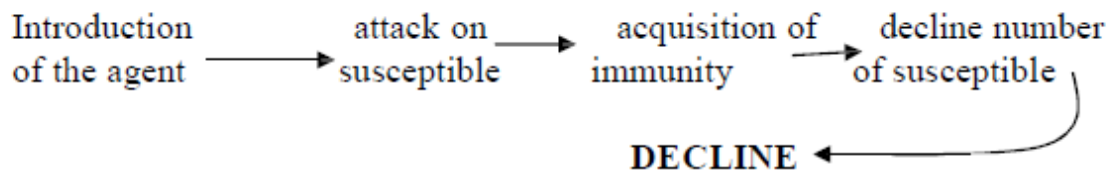
Epizootic and Enzootic are expressions that are equivalent of epidemic and endemic as they apply to animals e.g. epizootic of yellow fever in monkey which precedes that of yellow fever in man.

Herd Immunity: this is a condition in which community immunity is low. It is the measure of the proportion of the immune to the susceptible. When the herd is low, the infection can start and progress because the greater numbers of people are not immune.

3.2 Propagation of Epidemics

Epidemics only affect a susceptible number of the population. There is an incubation period before manifestation of symptoms. However, susceptible may develop in apparent infection. The infectious agent may leave the host during the communicable period which varies in timing, and duration with each disease. The following are the sequence of events:

introduction of the agent attack on susceptible acquisition of immunity reduction in the number of susceptible declines of the epidemic.



* The Epidemic Cycle

However, it is worth noting that the cycle can be influenced by any of these factors: immunity decline, migration and birth/death.

3.3 Types of Spread

There are two major types of spread in any epidemic. These are common vehicle epidemic and latent case. We shall consider each of the spread in turns.

The Common Vehicle Epidemic: this is also called the point source. Transmission here may be through water, food, air or by inoculation. When the epidemic results from a single exposure of the population it is called a point source epidemic. Sometimes, there may be repeated multiple exposure or a continued exposure over a period of time e.g. a contaminated well (point source). It is a point source at the closing up and if from the closing up there is continuous drinking from the source (contaminated well), then it becomes a multiple source.

Characteristics of common vehicle epidemics

explosive in onset limited in time, place and person (i.e.) there is geographical limitation serial transfer or propagation: this usually involves a transfer from host to host. The spread can be by contact, direct or indirect between the infected and susceptible.

Route is respiratory, oral-fecal or genital-ingestion

Typically, a common vehicle epidemic shows a rapid rise and a fall within one incubation period whereas in propagated epidemic, new cases continue to develop beyond one incubation period.

Please note the followings:

that a typical point source epidemic may be affected by the development of secondary source. For example, water that is infected gives diarrhea.

by the continuous contamination of the source, it ceases to give the picture of point source but multiple sources a disease that has a long incubation period will give the type of a long epidemic curve with serial transfer on the other hand, a propagated epidemic may look highly infectious with short incubation period geographical marking can be done to determine the geographical location of the victims and a spread can occur from centre to sub- boundary regions. The geographical marking and epidemic curve can help determine the type of epidemic and the source.

4.0 Conclusion

An epidemic is an unusual occurrence in a community. It is a disease or specific health related behaviour that is in excess of expected occurrence. The technique and methods of surveillance can be applied not only to communicable diseases but also non-communicable disease such as environmental hazards, cancer and other degenerative diseases as well as social problems such as drug addiction.

5.0 Summary

This unit has examined epidemics and surveillance. You have examined the various components of epidemics, propagation, spread, characteristics and methods of investigating epidemics. The importance of surveillance for effective control and prevention which includes the collection, analysis, interpretation and distribution of relevant data for action was also discussed.

6.0 Tutor-Marked Assignment

Clearly differentiate between index case and common vehicle onset.

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MODULE 4

STUDY SECTION 1: EPIDEMIOLOGY OF NON- COMMUNICABLE DISEASES.

CONTENTS

- 1.0 Introduction
- 2.0 Learning Outcomes
- 3.0 Main Content
 - 3.1 Concept of Non- Communicable Disease
 - 3.2 Risk factors of Non-Communicable Diseases
 - 3.3 Problems of Investigating Non-Communicable Disease
- 4.0 Conclusion
- 5.0 Summary
- 6.0 Tutor-Marked Assignment
- 7.0 References / Further Reading

1.0 Introduction

The incidence of non-communicable diseases in many developing countries has been rising in the last three decades. Unlike in developed countries, the probability of dying from this disease is also high largely because of poor health care delivery in most third world countries. As for communicable diseases, emphasis must therefore, be on prevention.

2.0 Learning Outcomes

After reading this study section, the students will be able to:

- Explain the concept of non-communicable diseases
- Discuss the risk-factors of non-communicable diseases
- Discuss the problems of investigating non-communicable diseases

3.0 Main Content

3.1 Concept of non- communicable diseases

3.2 Risk-factors of non-communicable diseases

3.3 Problems of investigating non-communicable diseases

3.1 Concept of Non-communicable Diseases

Non-communicable diseases are illness that occurs due to a specific causative agent or its toxic products but not transferable from persons to persons. It may be acute or chronic e.g cancer,

diabetes mellitus, hypertension, etc. For the purpose of this study, the discussion will cover the chronic diseases. This will include all ailments or deviation from normal which have one or the following characteristics: permanent disability leaves residual disability caused by non-reversible pathological change, it requires the special training of the patient for rehabilitation, it may be expected to require a long period of supervision, observation and care.

With the control of communicable disease in some part of the world, a change occurs in the demographic picture leading to an older population. This is why chronic disease has become the commonest cause of morbidity and mortality. An estimated 43% of all Daly's globally were attributable to non-communicable diseases. However, in low- and middle-income countries the figure was 39%, while in high income countries was 81%. Non-communicable diseases include cardiovascular, renal, nervous and mental diseases, muscular-skeletal conditions such as arthritis and allied diseases, chronic non-specific respiratory diseases (e.g. chronic bronchitis, emphysema, and asthma), permanent results of accidents, senility, blindness, cancer, diabetes, and obesity and various other metabolic and degenerative diseases and chronic results of communicable diseases. Disorders of unknown cause and progressive cause and often labelled "degenerative".

3.7 The Risk Factors of Non-communicable Disease

There are six (6) major key sets of risk factors that are responsible for major distribution of non-communicable disease in relation to its morbidity and premature mortality. These are: use of cigarette and other forms of smoking and alcohol abuse, failure or inability to obtain preventive health services e.g. hypertension control, cancer detection and management of diabetes. life-style changes e.g. dietary patterns, physical activity environmental risk factors e.g. occupational hazards, air and water pollution and possession of destructive weapons stress factors.

3.8 Problems of Investigating Non-communicable Disease

There are some problems in the understanding of the natural history of chronic/non-communicable disease. They include: absence of a known agent. In some chronic diseases, such as silica in silicosis, the absence of a known agent makes both diagnosis and prevention difficult. An example of this is cancer, the multi-factoral nature of the aetiology because most chronic diseases are caused by multiple factors. There is rarely a simple one-to-one cause-effect relationship and in the absence of a known agent, the term "risk factor/s" is used to describe certain factors in relation to a person's background or lifestyle. Occasionally, it can

result from cumulative effects of multiple factors and may be addictive or synergistic long latent period (incubation period) between the first exposure to suspected cause and the eventual development of disease which is often difficult to determine. It is assumed that what is happening now to someone may result from the effect of past happenings, indefinite onset so that the incidence rate is difficult to calculate. Most chronic disease is slow in onset and development and the distinction between diseased and non-diseased states may be difficult to establish. An example of this is cancer which by the time the patient seeks medical attention, the damage would have been irreversible or difficult to treat, the differential effect of the factors on the incidence and the cause of the disease.

4.0 Conclusion

The prevalence of chronic disease reveals an upward trend all over the world and for obvious reasons. This trend is likely going to increase. Some of the adduced reasons are: that life expectancy is increasing with a greater number of people living to older ages and are at risk of chronic diseases of various kinds relative to ageing; changing life-style and behavioural patterns which are favourable to onset of chronic diseases and modern medical care has enabled chronic disease sufferers to survive. However, the impact of the disease on the lives of the people is serious when measured in terms of loss of life, disability, family stress, poverty and its resultant effect on the nation's economy.

5.0 Summary

In this unit, we have discussed the definition of infection and disease-causing agents. Infectious agents and reservoir are concepts worthy of note in the discussion of communicable disease and the general methods of control. We also examined the chronic non-communicable diseases which are assuming higher increase among the young and adult population in both developed and developing countries with its attendant changes in the patterns of health and disease.

6.0 Questions

1. Differentiate between infection and contamination.
2. What are the risk factors for hypertension?
3. List non-communicable diseases

Answers

1. Infection deals with invasion of the body by pathogenic micro-organism thereby causing diseases. On the other hand, contamination is compromising sterility of an instrument or a sterile field.

2. The risk factors for hypertension include the following:
 - Smoking

- Drinking
- Drug addiction
- Obesity
- Diabetes mellitus
- Unhealthy diet
- Physical Inactivity
- Genetics and family history

3. Non-communicable diseases:

- Hypertension
- Diabetes mellitus
- Cancer
- Heart diseases
- Stroke
- Mental health conditions etc

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STUDY SECTION 2: Roles of Nurses in Integrated Disease Surveillance and Response

CONTENTS

- 1.0 Introduction
- 2.0 Learning Outcomes
- 3.0 Main Content
- 3.1 Definition of Disease Surveillance

1.0 Introduction:

The World Health Organization Africa Region (AFRO WHO) in 1998 approved Integrated Disease Surveillance and Response (IDSR) as a strategy to improve the availability and use of surveillance data for the control of priority communicable diseases responsible for ill health in the region. IDSR aims at generating reliable information for timely action against this disease thereby reducing the accompanying deaths, morbidity and misery: The IDSR strategy is now being implemented in East Mediterranean and South East Asia regions of WHO.

2.0 Learning Outcomes:

After reading this section, the students should be able to:

- Define disease surveillance
- Explain Surveillance Approach

3.0 Main Content:

3.1 Definition of disease Surveillance

3.2 Concept of surveillance Approach

3.3 Concept of indicator based-Surveillance

3.1 Definition of Disease Surveillance

This is the exercise of continuous scrutiny of and watchfulness over the distribution and spread of infection and the related factors with sufficient accuracy and completeness to provide the basis for effective control. This idea has three main features namely:

systematic collection of all related data orderly collation and evaluation of each data
prompt dissemination of results for action to relevant authority.

The following are examples of sources of epidemiological data in the surveillance of disease: registration of deaths, notification of disease and reporting of epidemics, laboratory investigations, data from routine screening e.g. blood donors, investigation of individual cases and epidemics, epidemiological surveys, data from clinics, distribution of the animal reservoir and the vector production and distribution and care of vaccines, serum and drugs, demographic and environmental data and non-medical statistics.

Objectives of Surveillance

There are five main objectives of surveillance which are;

- define the problem
- define priorities
- determine strategy
- evaluate control and
- preventive measure to suggest further research.

3.2 Surveillance Approaches:

Integrated Disease Surveillance and Response: It is an approach that aims at collecting health data for multiple diseases, using standardised tools. To ensure robust early warning and prompt response, the IDSR data collection and analysis system relies on two main channels of information or signal generation: indicator-based surveillance (IBS) and event-based surveillance (EBS).

3.3 Indicator-based Surveillance

Indicator-based surveillance is the systematic (regular) identification, collection, monitoring, analysis and interpretation of structured data, such as indicators produced by well-identified, mostly health-based formal sources. Common methods of indicator-based surveillance are case-based which is usually used for epidemic prone diseases, sentinel surveillance which is usually used for specific conditions in a specific cohort, syndromic surveillance which is done using standard case definitions, disease-based surveillance, community-based surveillance etc.

Event - Based Surveillance

Event-based surveillance is the organised and rapid capture of information about events that are of potential risk to public health. Information is initially captured as an alert, considered by the early warning and response system as representing a potential acute risk (such as an outbreak) to human health. All alerts may not necessarily become real events, and as such, need to be triaged and verified before a response is initiated. Alerts which may signify potential risks include:

Event-based surveillance also involves media monitoring, which entails regular scanning of newspapers, internet sites and media alert systems, such as ProMed, blogs, social media, radio, and television etc. The event-based surveillance system is very sensitive, and information received through it should be synchronised with IBS and rapidly assessed for the risk the event poses to public health and responded to appropriately.

Integrated Disease Surveillance and Response Strategy

The Integrated Disease Surveillance and Response (IDSR) strategy was adopted by WHO/AFRO Member States in September 1998 as the approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, LGA and national levels. IDSR promotes rational and efficient use of resources by integrating and streamlining common surveillance activities and functions. Surveillance activities for different diseases involve similar functions (detection, sample collection, reporting, analysis and interpretation, feedback, and action), and often use the same structures, processes and personnel. As such, the principles of surveillance are the same whether applied to a single disease, condition or event or multiple diseases. What may differ is whether the target is elimination or eradication, which may require time-limited intensive efforts aimed at proving the absence of disease.

Integration:

This refers to the efficient use of human resources, and harmonising different methods, software, data collection forms, standards and case definitions in order to prevent inconsistent information and maximise efforts among all disease prevention and control programmes and stakeholders. IDSR involves full-time coordination of surveillance activities and joint action (planning, implementation, monitoring and evaluation), whenever possible and useful. To facilitate coordination and collaboration, a national, state and LGA multisectoral, multidisciplinary coordination body, the Epidemic Preparedness and Response committee (EPRC) is formed to coordinate surveillance activities in close collaboration or synergy with the committee set up for epidemic response (See chapter 5 of these guidelines). In Nigeria, NCDC has the mandate to coordinate the surveillance of communicable diseases (NCDC Act, 2018).

4.0 Conclusion

You have been enlightened on the strategies that provide a search for causal association between disease and other biological /specific biological experiences. Host and environmental factors play a key role in disease causation with an unparalleled interrelation of the factors. The levels of prevention are well laid out to assist you in providing the needed support to facilitate recovery.

5.0 Summary

This unit discussed the following: chain of epidemiology, disease causation, factors precipitating disease causation, interrelated factors and levels of prevention.

6.0 Tutor-Marked Assignment

1. Define disease Surveillance
2. Explain the term IDSR

Answers

1. Surveillance of disease means the exercise of continuous scrutiny and watchfulness over the distribution and spread of infections and related factors, with sufficient accuracy and completeness to provide the basis for effective control.

2. The Integrated Disease Surveillance and Response (IDSR) strategy was adopted by WHO/AFRO Member States in September 1998 as the approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, LGA and national levels. IDSR promotes rational and efficient use of resources by integrating and streamlining common surveillance activities and functions. Surveillance

activities for different diseases involve similar functions (detection, sample collection, reporting, analysis and interpretation, feedback, and action), and often use the same structures, processes and personnel.

7.0 References/Further Reading

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