(HEALTH EXTENSION SERVICE)

NTQF Level -III

Learning Guide -10

Unit of Competence: -	**Collect, Maintain and Utilize Community Health Data**
Module Title: -	**Collecting, Maintaining and Utilizing Community Health Data**
LG Code:	**H LT HES3 M03 LO2**
TTLM Code:	**HLT HES3 M03 TTLM 0919V1**

LO2. Collect, compile, interpret and utilize necessary health

Instruction Sheet-2	Learning Guide #-2

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- Basic statistical concepts and procedures
- Types of health data
- Health data collection
    - ✓ Data collection
    - ✓ Data organization
    - ✓ Data analysis
    - ✓ Data interpretation, presentation and utilization
- Vital event and surveillance
    - ✓ Introduction to vital events and surveillance
    - ✓ Data collection on vital events and surveillance
    - ✓ Data confidentiality

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, **you will be able to –**

- Collect necessary health data as per organizational guideline
- Classify Information collected or sorted out on the basis of a clear understanding of the purpose for maintaining the database system.
- Follow steps to maintain confidentiality according to prescribed procedures are taken.
- Collect and update timely vital events continuously and consistently in accordance with organization procedures and guidelines
- prepare and utilize data according to prescribed procedures and guidelines

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 6.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4,---” **in page ---, ---, --- and ---** respectively.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” ,---” **in page ---, ---, --- and ---** respectively

5. If you earned a satisfactory evaluation from the “Self-check” proceed to “Operation Sheet 1, Operation Sheet 2 and Operation Sheet 3 ” **in page ---.**
6. Do the “LAP test” **in page – ---**

Information Sheet-1	Basic statistical concepts and procedures

1.1. Introduction Basic statistical concepts and procedures

Statistics is the process of data collection, organization, Summarization, analysis and reporting. The word statistics can mean two things: the subject itself or data. Recently Statistics is defined as the science of uncertainty. The subject of Statistics is a wide discipline, ranging from ordinary use such as collection of data and its description to methods used in evaluation and research.

A statistic is a quantity computed from sample observations for the purpose of making an inference about the characteristic in the population. The characteristic may be any variable which is associated with a member of the population, such as age, income, employment status, etc. the quantity may be a total, an average, a median, or other quintiles. It may also be a rate of change, a percentage, a standard deviation, or it may be any other quantity whose value we wish to estimate for the population.

Health care statistics deals with the collection, organization, management, analysis and reporting of healthcare data in addition to using some of this data to assist in making decisions about planning and resource allocation. Healthcare data comes from all facilities; hospitals, health centers, clinics and health posts. Examples of how statistics (and collected data) can be used in a health care setting include assisting in decision-making for medical treatment, administrative decision-making, monitoring the incidence of disease and conditions, measuring and reporting quality initiatives, improving performance in clinical or administrative units, and reporting statistical data both internally and externally to meet governmental and other agency requirements..

There are some additional definitions that will be helpful before additional topics are discussed:

Variable: - a characteristic that can take on different values in different situations.

Data: - is a set of facts expressed in quantitative form usually obtained from a measurement, totals or from counting.

Population: the largest collection of entities used in a study. For example, the population could be hospital inpatients, all patients with a specific diagnosis, all of the inhabitants of Addis Ababa, or the population of Ethiopia.

Sample: a small group or subset of a population. For example, when the entire population of a city cannot be studied, a sample is used that would represent the entire population. Methods of sampling will be explained later in this module.

Parameter: - any numerical property, characteristics or facts that are descriptive of a population. (A statistic applies to a sample).

Data Sources: Data can also be data considered as primary or secondary Primary data is data obtained directly from a source or population. Secondary data is data that has been obtained and stored and can be used by anyone with access to the data.

Database: A database is an organized way to store data for easy access

Self-Check -1	Multiple choice question

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The process of data collection, organization, Summarization, analysis and reporting is called as
   a. Health care statistics
   b. Statistics
   c. Characteristics
   d. Age
2. Recently Statistics is defined
   a. as the science of uncertainty
   b. a median
   c. a collection of data
   d. a quantity whose value we wish to estimate for the population
3. how statistics can be used in a health care setting include
   a. assisting in decision-making for medical treatment
   b. assisting administrative decision-making
   c. monitoring the incidence of disease and conditions
   d. measuring and reporting quality initiatives and improving performance in clinical or administrative units
   e. All
4. A characteristic that can take on different values in different situations.
   a. Data
   b. Information
   c. Variable
   d. Population
5. When the entire population of a city cannot be studied, a ____ is used to represent the entire population.
   a. Sample
   b. Data
   c. Variable
   d. Population
6. A _____is an organized way to store data for easy access
   a. Data source
   b. Database
   c. Statistics
   d. Population

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. ___
2. ___
3. ___
4. ___
5. ___
6. ___

Information Sheet-2	Types of health data

2.1. Types of health data

Data, the basic unit in statistics, are also classified as quantitative or qualitative based on its measurability.

a. **Quantitative data** can be expressed as a number, or quantified. Examples of quantitative data are scores on achievement tests, number of hours of study, numbers of patients with a specific disease, or heights and weight of a subject. Quantitative data is a useful method when you want to know how much or how many related to the topic. Because quantitative data are reported in numbers be used to manipulate and report this data. These data can also be represented by ordinal, interval or ratios scales which will be discussed below.
b. **Qualitative Data** cannot be expressed as a number. Data that represent nominal scales such as gender, socioeconomic status, and religious preference are usually considered to be qualitative data. Data from qualitative studies often result in themes, perceptions or categories of data such as nominal data. Nominal data really means data that is “named” or assigned a category.

Both types of data are valid types of measurement but yield different results. The data that results from quantitative studies are numbers or scores (quantitative data) and the data resulting from qualitative studies is more thematic or answers a “why” question. Only quantitative data can be analyzed statistically, and thus more rigorous assessments of the data are possible.

2.2. COMMON TYPES OF HEALTH CARE DATA

Health is influenced by a wide variety of determinants, from an individual’s social condition and environment to the health care services they receive. While social and environmental factors are powerful determinants of health, health care data provides specific and measurable insights into community and population health interventions. Data is collected about both health conditions and related factors (health data) and services provided (health care data).

Some typical types of health care data are grouped below according to the stakeholders who typically create or use the data, but it is important to note that there is wide variation in whether or not these data are available in one’s local community, city, county, or state. Some types of data may fall under more than one category and may be available either at an individual or aggregate level. Each type of data can support multi-sector initiatives.

1. INDIVIDUAL DATA

Information that identifies an individual and their health conditions and services is often protected by HIPAA privacy laws at the state and federal level and is called protected health information (PHI). Technological innovations have made accurately collecting, storing and sharing this type of data easier than ever. While individuals have some access to their individual information, often there is a fee for medical records requests.

Personal devices that automatically track blood pressure, heartbeat, sleep, and physical activity levels, along with programs that can store information about doctor visits, prescriptions and other health information has created an explosion of granular health data that exists outside of the health care system and the associated protections.

2. PROVIDER DATA

Health care providers typically collect Protected Health Information to help identify and track services and outcomes of treatment offered to individuals. This data may be privacy-protected, but often can be de-identified, aggregated, and shared to respond to population-level health trends.

3. DEMOGRAPHICS

In the health care sector, demographic information can include personally identifiable information such as name, date of birth, address, and account or medical record numbers, and descriptive information such as race, gender, income level, educational status, nativity, immigration status, and housing status.

4. DIAGNOSES

A description of the health status of an individual, typically used to describe a variation from normal (i.e. “healthy”) to a presence of disease, infection, or injury, and often includes a prognosis or information on the severity of the condition.

Procedures: Procedures describe the medical interventions or services a medical professional provides to a patient (as opposed to what a patient might do on doctor’s orders).

Screening tests, laboratory information, and radiology data: This data can include the types of tests ordered, dates of service, lab and other test results, and pictures such as ultrasound or x-ray images.

5. MEDICATION PRESCRIPTIONS AND ADHERENCE DATA

Information on prescribed medications including drug name, dosage, if the prescription was filled and picked up by the patient, and compliance with prescribed medications over time

Self-Check -2	True False Question

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Based measurability data are classified as quantitative or qualitative only
2. Qualitative data can be expressed as a number
3. numbers of patients with a specific disease is an example of quantitative data
4. health data and health care data are the same
5. Information that identifies an individual and their health conditions and services are called as individual data
6. personally identifiable information such as name, date of birth, address, and account or medical record numbers, and descriptive information such as race, gender, income level, educational status, nativity, immigration status, and housing status can be an example of demographic data.
7. Radiology data are an example of diagnosis data

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Information Sheet-3	Health data collection

3.1. Introduction to Health data collection

Collecting data in the health care delivery system can be quite challenging. There are many sources of data (disease indexes, register data, surveillance data, performance indicators, etc.) that make the data collection process time consuming. Data collection techniques allow us to systematically collect data about our objects of study (people, objects and phenomena) and about the setting in which they occur. The best way to collect the data that needs to be organized or reported is to use the best method available. Some of those methods are listed here below:

a) Observation and measurement

b) Face-to-face and self-administered interviews (questionnaires or surveys)

c) Postal or mail methods and telephone interviews

d) Focus group discussions (FGD)

e) Use of Documents

The most appropriate method might be a form, a questionnaire or a survey. We will discuss the tools and methods here below as each of them require adequate pre-planning and design before the actual data is collected.

3.2. The selection of the method of data collection is also based on practical considerations, such as:

I. The need for personnel, skills, equipment, etc.

In relation to what is available and the urgency with which results are needed

II. The acceptability of the procedures to the subjects

The absence of inconvenience, unpleasantness, or untoward consequences

III. The probability that the method will provide a good coverage

This means the method that will supply the required information about all or almost all members of the population or sample. If many people will not know the answer to the question, the question is not an appropriate one. The investigator's familiarity with a study procedure may be a valid consideration. It comes as no particular surprise to discover that a scientist formulates problems in a way which requires for their solution just those techniques in which he himself is especially skilled.

3.4. Data organization

Data organization, in broad terms, refers to the method of classifying and organizing data sets to make them more useful. Some IT experts apply this primarily to physical records, although some types of data organization can also be applied to digital records.

There are many ways that IT professionals work on the principle of data organization. Many of these are classified under the more general heading of "data management." For example, re-ordering or analyzing the arrangement of data items in a physical record is part of data organization.

3.5. Data analysis

Analysis of data is a process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making. Data analysis is a process, within which several phases can be distinguished. Processing of Data Refers to concentrating, recasting and dealing with data in such a way that they become as amenable to analysis as possible. The purpose of Data Analysis Is to answer the questions and to help and determine the trends and relationships among the variables.

- Steps in Data Analysis
    - ✓ Before Data Collection, the investigator should accomplish the following:
    - ✓ Determine the method of data analysis
    - ✓ Determine how to process the data
    - ✓ Prepare dummy tables
    - ✓ Process the data
    - ✓ Prepare tables and graphs
    - ✓ Analyze and interpret findings
    - ✓ Consult again the statistician
    - ✓ Prepare for editing
    - ✓ Prepare for presentation
- Types of Data analysis

I. Descriptive Analysis

II. Inferential Analysis

I. Descriptive Analysis

Refers to the description of the data from a particular sample; Hence the conclusion must refer only to the sample. In other words, these summarize the data and describe sample characteristics. Descriptive Statistics: Are numerical values obtained from the sample that gives meaning to the data collected.

II. Inferential type of data Analysis

The use of statistical tests, either to test for significant relationships among variables or to find statistical support for the hypotheses is inferential analysis. Inferential Statistics: Are numerical values that enable the researcher to draw conclusion about a population based on the characteristics of a population sample. This is based on the laws of probability.

3.6. Data interpretation, presentation and utilization

3.6.1. Interpretation of Data

After analysis of data and the appropriate statistical procedure, the next part is to present the interpretation of the data, which is the final step of data analysis process.

The three areas:

I. Summary of Findings
II. Conclusions
III. Recommendations

3.6.2. Data Presentation

There are various methods of data presentation

I. Textual
II. Graphical Displays
III. Tabular

I. **Textual Methods of data presentation:** The data are presented in the form of texts, phrases or paragraphs. It is common among news paper reports depicting specifically the salient or important findings.

II. **Graphic display of health data:** Frequency distributions and are usually illustrated graphically by plotting various types of graphs

III.**A tabular method:** A table is an organized set of data elements (values) using a model of vertical columns (which are identified by their name) and horizontal rows, the cell being the unit where a row and column intersect. A table has a specified number of columns, but can have any number of rows. Each row is identified by the values appearing in a particular column subset which has been identified as a unique key index.

Constructing a table should require some common issues

- ✓ All tables should have a clear title and clear headings for all rows and columns.
- ✓ All tables should have a separate row and a separate column for totals to enable you to check if your totals are the same for all variables and to make further analysis easier.
- ✓ All tables related to a certain objective should be numbered and kept together so the work can be easily organized and the writing of the final report will be simplified.

3.7. Health data utilization

In a health care setting, you may not have a choice about which type of data you use depending on the task at hand. Primary data has the advantage of being original, reliable and accurate as it is gathered by you as the researcher so you know firsthand that it is correct. It is also current and timely. However, it is also costly to obtain you must allocate time and resources to conduct a survey, interviews or focus groups. you may have to travel for the interviews and/or have expenses for mailing surveys, phone calls, etc. Another disadvantage of using primary data is that the research can be biased or prejudiced during the gathering and interpretation of data. This will be discussed later in this module.

Using secondary data is relatively inexpensive and this type of data is usually readily available having been collected for various purposes. Some disadvantages of secondary data, however, are that the data may not be complete or may be lacking a piece of information that is important for your report preparation. If that occurs, you may have to merge more than one database or initiate more data collection. There are usually no costs associated with secondary data unless an external database must be purchased.

Self-Check -3	True False Question

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Collecting data in the health care delivery system can be quite challenging
2. The selection of the method of data collection is not based on practical considerations
3. A process of inspecting, cleaning, transforming, and modeling data with the goal of discovering useful information, suggesting conclusions, and supporting decision making is called data analysis
4. Description of the data from a particular sample is called as descriptive analysis
5. The use of statistical tests, either to test for significant relationships among variables or to find statistical support for the hypotheses is inferential analysis.
6. The final step of data analysis process is presenting the interpretation of data.
7. Graphical displays are grouped under the method of data interpretation.
8. In health data utilization using primary data is relatively inexpensive and this type of data is usually readily available having been collected for various purposes.

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____ Date: _____

Short Answer Questions

8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____

Information Sheet-4	Vital event and surveillance

4.1. Introduction to vital events and surveillance

The vital statistics are a critical national information resource for understanding public health and examining such key indicators (vital events) as fertility, mortality, and causes of death, and the factors associated with them. Vital statistics begin as individual, geographically focused vital events that are registered or certified after their occurrence. Vital events in their basic content include the measurement of births and deaths as one of the longest-standing data collection.

Historically focused on communicable diseases, the scope of modern health surveillance extends to a broader range of health conditions such as injuries, occupational health and safety, environmental exposures, birth defects, addictions, chronic diseases, mental health and health behaviors. Until the 1950s, surveillance referred to the close observation of persons exposed to a communicable disease, in order to detect early symptoms of the disease and take measures to isolate the individual to control the disease in the population. This is now referred to as medical surveillance, to distinguish it from public health surveillance. An example of medical surveillance is the effort to detect early symptoms and to isolate individuals with tuberculosis.

Currently the term public health surveillance defined as the systematic and continuous collection, analysis, and interpretation of data, closely integrated with the timely and coherent dissemination of the results and assessment to those who have the right to know so that action can be taken. It is often distinguished from monitoring by the notion that surveillance is continuous and ongoing, whereas monitoring tends to be more intermittent or episodic

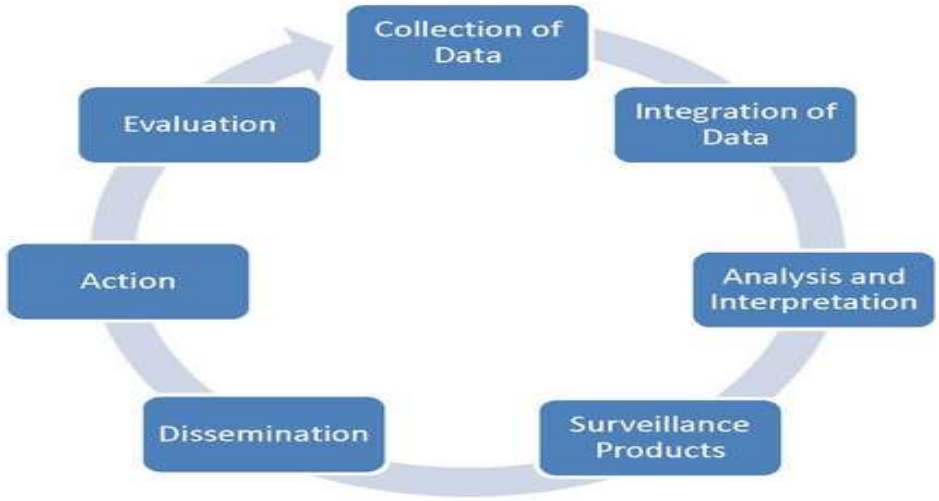
Surveillance is one of the six **core functions** of public health

1. Health Protection
2. Health Promotion
3. Disease and Injury Prevention
4. Population Health Assessment
5. Surveillance
6. Emergency Preparedness and Response

Model of the Cycle of Surveillance

The surveillance process has seven fundamental steps or components, each one of which is integral to a fully functioning system.

The following image illustrates the component steps and the cyclical nature of the surveillance process: data is collected, integrated, analyzed and interpreted, developed into surveillance products, and disseminated to allow informed public health action. Additionally, the system itself is evaluated and results fed back into the cycle.



4.2. Data collection on vital events and surveillance

Data collection on vital events and surveillance refer to the data collected concerning the progression of human life, from birth through death. This data is often used to calculate population related data for municipalities, states, nations or regions of the world. Vital statistics are also collected on an individual level, in which case they are often used to gauge the well-being of the person for whom the data has been collected.

Ratio: A ratio quantifies the magnitude of one occurrence or condition in relation to another. Eg) Sex ratio

Proportion: - is a type of ratio which quantifies occurrences in relation to the population in which these occurrences take place. I.e., the numerator is also included in the denominator.

Example: The proportion of malaria cases among inhabitants of a certain locality.

Rate: A rate is a proportion with a time element, i.e., in which occurrences are

quantified over a period of time. The term rate appropriately refers to the ratio of demographic events to the population at risk in a specified period.

Measures of Mortality (Crude Death Rate (CDR)): is defined as total number of deaths due to all causes occurring in a defined area during a defined period per 1000 midyear population in the same area during the same period.

4.3. Data confidentiality

Data confidentiality is one of the fundamental principles in terms of security. This principle refers protecting information from disclosure to unauthorized parties. When a file is created by a certain user who becomes its owner, for example, the owner can control who has read access to the file if file data confidentiality is desired.

Self-Check -4	True False Question

Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Vital events in their basic content include the measurement of births and deaths as one of the longest-standing data collection
2. The scopes of public health surveillance is greater than that of vital event registration
3. The close observation of persons exposed to a communicable disease, in order to detect early symptoms of the disease and take measures to isolate the individual to control the disease in the population is called as medical surveillance
4. surveillance tends to be more intermittent or episodic than monitoring
5. Data collection on vital events and surveillance refer to the data collected concerning the progression of human life, from birth through death
6. This principle refers protecting information from disclosure to unauthorized parties is called as data confidentiality

Note: **Satisfactory rating - 3 points** **Unsatisfactory - below 3 points**

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Operation Sheet-1	Techniques of Collecting data that needs to be entered into the health database system

Techniques of collecting data that needs to be entered into SPSS software

Step 1- collect data by using given questionnaire

Step 2- Define your variable on spss

Step 3- enter your first case

Step 4- continue filling out variables

Step 5- finish filling out your cases

Step 6- save your data on spss databases

Operation Sheet-2	Steps of Collecting vital events and surveillance data

Techniques for Collecting vital events and surveillance data

Step 1- select a vital events and surveillance data capturing form

Step 2- identify dataset of the given vital event

Step 3- enter dataset of the given vital event

Step 4- save/submit for the required body

Operation Sheet-3	Techniques of Compiling, interpreting and utilizing data

Techniques for preparing referral

Step 1 define your questions

Step 2- set clear measurement priorities

Step 3- collect data

Step 4- analyze your data by creating pivot table in ms excel

Step 5- interprete your result by defending against any objection

Step 6- identify the status of the performance and the next job

LAP Test	Practical Demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within --- hour.

Task1. Collect data that needs to be entered into the health database system

Task2. Collect vital events and surveillance da ta

Task3. Compile, interpret and utilize data

Reference

1. Public health surveillance and vital statistics http://myhero.com
2. Data definition/data-organization https://www.techopedia.com
3. data across sectors of health.pdf march 2018
   http://www.dashconnect.org

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