



# Midwifery Level III

NTQF Level III

# Learning Guide -28

**Unit of Competence: Promoting and Providing Immunization and Managing Cold Chain**

**Module Title: Promoting and Providing Immunization and Managing Cold Chain**

**LG Code: HLT MDW3 M08 LO1-LG28**

**TTLM Code: HLT MDW3 TTLM 0919v1**

## LO 1: Plan EPI activities



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

- ✓ Introduction to immunization
- ✓ Types and categories of immunization
- ✓ Strategies of EPI
- ✓ Resource mapping
- ✓ Calculation of EPI eligible
- ✓ Planning EPI on available data

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 –

- Explain definition, types and categories of immunization
- Describe strategies of EPI
- conduct resource mapping using the standard format of FMOH.
- Identify and calculate EPI eligible from the catchment area.
- collect , compile, and analyze Data for planning including defaulters .
- develop plan of action to reach the eligible

#### Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 13.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 5.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 1-6).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your trainer for further instructions or go back to Information sheet 1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page 6.
10. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).
11. Read the information written in the “Information Sheets 3”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3” in page 8.
13. Ask your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 3).



|                            |                                   |
|----------------------------|-----------------------------------|
| <b>Information Sheet-1</b> | <b>Definition of immunization</b> |
|----------------------------|-----------------------------------|

### 1.1. Definition of Immunization

-**Immunity** is a state in which the body has sufficient defense to be able to resist the development of communicable diseases caused by infectious agents.

- **The immune system** is the name given to the network of cells, proteins, tissues and organs within the body , which act together to protect us against infectious agents

- **Immunization** is the process of introducing harmless preparation of the antigens from an infectious agent into the body of a person, who becomes immune to the infectious agent as a result



|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -1</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

1. ----- is the name given to the network of cells, proteins, tissues and organs within the body , which act together to protect us against infectious agents. **(3 points)**
- A. Immunity
  - B. Immune system
  - C. Immunization
  - D. All

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

|               |
|---------------|
| Score = _____ |
| Rating: _____ |

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1. \_\_\_\_\_





|                            |                              |
|----------------------------|------------------------------|
| <b>Information Sheet-2</b> | <b>Types of immunization</b> |
|----------------------------|------------------------------|

### 2.1 .Immunization types

o Immunization can be

✓ Active immunization

Active immunization is brought about by stimulating the individual's own immunity by introducing either inactivated (killed) or attenuated (live, but enfeebled) agents.

✓ Passive immunization

Passive immunization is obtained by giving pre-formed, antibodies. These are usually injected in the form of human immunoglobulin or, rarely, antisera prepared in animals. Protection is usually rapid, but the immunity derived is often short-lived, being limited to the time taken for the antibodies to be broken down in the body — from a week or so, with animal antisera, to about six months for protection against hepatitis A by human normal immunoglobulin.

|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -2</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

1. ----- is brought about by stimulating the individual's own immunity by introducing either inactivated (killed) or attenuated (live, but enfeebled) agents **(3 points)**
  - A. Active immunization
  - B. Passive immunization
  - C. Herd immunity
  - D. All of the above

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

### Answer Sheet

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1.\_\_\_\_



|                            |                                   |
|----------------------------|-----------------------------------|
| <b>Information Sheet-3</b> | <b>Categories of immunization</b> |
|----------------------------|-----------------------------------|

### 3.3. Categories of immunization

- **Children need immunizations to protect them from dangerous childhood diseases.**

These diseases can have serious complications and even kill children. Children under 5 are especially susceptible to disease because their immune systems have not built up the necessary defenses to fight infection. By immunizing on time (by age 2), you can protect your child from disease and also protect others at school or daycare.

- **Immunization can be done through various techniques, most commonly vaccination.**

Vaccines against microorganisms that cause diseases can prepare the body's immune system, thus helping to fight or prevent an infection. The fact that mutations can cause cancer cells to produce proteins or other molecules that are unknown to the body forms the theoretical basis for therapeutic cancer vaccines. Other molecules can be used for immunization as well, for example in experimental vaccines against nicotine (NicVAX) or the hormone ghrelin (in experiments to create an obesity vaccine).

- **Passive and active immunization - vaccination is an active form of immunization.**
- ✓ **Active immunization** -Active immunization entails the introduction of a foreign molecule into the body, which causes the body itself to generate immunity against the target. This immunity comes from the T cells and the B cells with their antibodies.
- ✓ **Passive immunization** -Passive immunization is where pre-synthesized elements of the immune system are transferred to a person so that the body does not need to produce these elements itself. Currently, antibodies can be used for passive immunization. This method of immunization begins to work very quickly, but it is short lasting, because the antibodies are naturally broken down, and if there are no B cells to produce more antibodies, they will disappear.



|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -3</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

1. vaccination is an active form of immunization **(3 points)**  
A True  
B False

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1.\_\_\_\_







#### 4.4.EPI strategies

- **Static:** immunization performed as part of routine activity of the health units
- **Outreach:** an immunization approach in which the staffs of health unit go out and administer vaccine to mothers and children in their catchment area
- **Mobile:** an immunization approach only single dose vaccination (measles, BCG) in nomadic, settlement areas and mostly used for controlling epidemics of measles



|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -4</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

1. -----is an immunization approach in which the staffs of health unit go out and administer vaccine to mothers and children in their catchment area **(3 points)**  
A Static  
B Out reach  
C. Mobile  
  
D.all of the above

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

|               |
|---------------|
| Score = _____ |
| Rating: _____ |

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1.\_\_\_\_



|                            |                         |
|----------------------------|-------------------------|
| <b>Information Sheet-5</b> | <b>Resource Mapping</b> |
|----------------------------|-------------------------|

### 5.5. Mapping a resource for immunization

Community maps can help you to identify households ,community water points, health services, etc. The mapping exercise is done with the participation of the community members, and helps the community to explore and visualise the community and their local environment.

Prior to the mapping, do the following:

- ✓ Choose a place where most of the community members can participate.
- ✓ Involve the community to collect materials like ash or sand to sketch the map.
- ✓ Go round the localities on foot, or do a walk to see the key areas like the site of the health centre ,the kebele office , the church,the main road ,the river, etc.
- ✓ Ask the community members to sketch the map, and put signs for those key areas using ash or sand.
- ✓ Clearly ,community mapping is a collective exercise. But if you have not done it before ,begin by just trying out a map for yourself on a piece of paper.
- ✓ Do a walk about and draw in a rough plan of the village — where the crops are, where the various public places .
- ✓ After you have done this, you may want to try thinking about where there are particular pockets of poverty in the village, or locations where you know there are more health problems than others.



|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -5</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

1. Community maps can help you to identify households ,community and , health services **(3 points)**  
A True  
B False

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1. \_\_\_\_\_



|                            |                                    |
|----------------------------|------------------------------------|
| <b>Information Sheet-6</b> | <b>Calculation of EPI eligible</b> |
|----------------------------|------------------------------------|

### 6.6. Calculating of EPI for the eligible groups

There are three methods used to calculate vaccine needed for your health post. This are:

- Size of the target population for immunization
- Previous vaccine consumption data
- Size of the scheduled immunization sessions.

The target population is the number of people who are eligible for vaccination with a particular vaccine. We use the letters  $_{pt}$  to represent the target population in calculations.

✓ For BCG vaccine, the target population is all live births (i.e. complete expulsion from the mother, regardless of duration of pregnancy, showing any evidence of life).

In Ethiopia, it is estimated that all live births and surviving infants account for 4% of total population, while 23% of the population is a figure for women of child bearing age.

✓ Immunization coverage rate is the percentage of the eligible population that has been agreed as your objective for immunization with each of the EPI vaccines this year.

✓ The wastage factor is the factor (number) that you multiply your estimated vaccine needs by, in order to allow for some doses being wasted. We use the letters  $_{wf}$  to represent the wastage factor in the following equation:

Wastage factor (wf) =  $100 \div (100 \text{ minus the \% wastage rate})$ ; where the wastage rate is the number of doses wasted, expressed as a percentage.

Therefore, vaccine needed for your immunization program based on the size of target population is calculated by using the equation:

|                     |   |  |
|---------------------|---|--|
| Midwifery Level III | <b>Annual vaccine needs = <math>pt \times dn \times ic \times wf</math></b> |  |
|---------------------|---|--|



The equation uses the following values:

- target population (pt)
- number of doses in the schedule (dn)
- target immunization coverage (ic) expressed as a decimal number (not a percentage)
- wastage factor (wf).

#### **Calculating vaccine needs based on previous consumption**

Even though some adjustments are acceptable because of possible increase in population size since the previous year, you can calculate vaccine need based on the previous year consumption using the equation:

$$\text{Annual vaccine needs (in doses)} = (i+r) - (f+l)$$

The equation includes the following numbers of doses:

- Initial vaccine stock at the beginning of the period (i)
- Vaccines received during the period (r)
- Stock remaining at the end of the period (f)
- Lost, destroyed or expired doses (l)

#### **Calculating vaccine needs based on the size of immunization sessions**

If you cannot determine the rates of vaccine wastage, or vaccine stock management is not important, you can use immunization sessions to calculate your vaccine need. The equation is

$$\text{Annual vaccine needs} = \text{posts} \times \text{weeks} \times \text{sessions} \times \text{vials} \times \text{doses}$$

Where,

- posts = number of immunization sites
- weeks = number of weeks the service is delivered during the year
- sessions = number of immunization sessions per week
- vials = number of vials opened per immunization session
- doses = number of doses per vial.

#### **Calculating quantities of vaccine for a particular supply period**

The vaccine needs for a specific storage or supply period (in this case, 12 months or 48 working weeks) can be calculated using the following equation:

q period = (q year ÷ 12) x p supply when the supply period is given in months, or



$q$  period = ( $q$  year  $\div$  48)  $\times$   $p$  supply when the supply period is given in working weeks.

where:  $q$  =vaccine needs for the period

$q$  =annual vaccine needs

$p$  supply = supply period (in months or weeks).

### Calculating the minimum stock level

The **Minimum stock level** (also known as the re-order level) implies the least amount that you should have in stock or the level which, when reached, initiates a re-order; usually expressed as the number of weeks/months of supply. It is the amount of stock you will use in the time between placing and receiving an order plus the buffer stock. The minimum stock level is the level below which stocks should never drop without having placed an order. Usually, the minimum stock is taken as 25% of the total vaccine needs for the supply period.

The minimum stock level can be calculated using the following equation:

$$s_{\text{mini}} = q_{\text{period}} \times 25\% \text{ (or } 0.25)$$

Where,

$s_{\text{mini}}$  is the minimum stock level and  $q_{\text{period}}$  is the vaccine needs for the period.

### Calculating the maximum stock level

The **Maximum stock level** implies the largest amount of stock that you should have, usually expressed as the number of weeks/months of supply. It is the minimum stock plus the amount of stock used between orders. The maximum stock level is set to guard against excess stock which results in losing vaccines to expiration before use. The maximum stock level is the maximum number of vaccine doses that should be present in the refrigerator immediately after a new supply has been collected from the health center.

The maximum stock level can be calculated using the following equation:

$$s_{\text{maxi}} = q_{\text{period}} + s_{\text{mini}}$$

Where,

$s_{\text{maxi}}$  is the maximum stock level,  $q_{\text{period}}$  is the vaccine needs for the period, and  $s_{\text{mini}}$  is the minimum stock level.

### Calculating the critical stock level

The critical stock level (or 'time to order' level) is the number of vaccine doses in stock at the time when it is absolutely necessary to place a new order. The delivery time is the time interval between the day the vaccines are ordered and the day that you collect them from the health center.

The critical stock level can be calculated using the following equation:

$$s_{\text{critical}} = q_{\text{delivery}} + s_{\text{mini}}$$

where:

- $s_{\text{critical}}$  is the critical stock level
- $q_{\text{delivery}}$  is the number of doses needed during the delivery time, and
- $s_{\text{mini}}$  is the minimum stock level.

The number of doses required during the delivery time ( $q_{\text{delivery}}$ ) can be calculated using the following equation:

$$q_{\text{delivery}} = (q_{\text{period}} \times t_{\text{delivery}}) \div n$$





where:

- $t$  delivery is the number of days between placing the order and collecting new vaccines
- $n$  is the number of days in the supply period (i.e. the period that the health facility maintains its vaccine stocks at, or above, the minimum level).

#### . Planning EPI on available data

Planning is a methodically organized process designed to achieve a defined objective and answers the questions of what must be done, how, when, by whom, and with what. The planning process is reflected in an instrument, “the plan,” which is the means to formalize a set of actions that need to be carried out in the future in order to achieve the proposed objectives.

- Situation analysis

EPI planning begins with studying and assessing the health of the community, the locality, or the country, using local, national, regional and global policies as a framework.

- Setting priorities

The purpose of this phase of the planning process is to set national objectives and goals that are consistent with regional and global goals and are based on the health situation analysis and on the available resources.

- Formulating objectives and goals

When the health situation analysis has been completed, and the problems that will be targeted for intervention have been prioritized, the establishment of objectives for the plan of action, consistent with the program’s standards, should follow logically. An **objective** is defined as the achievement or outcome sought, while a **goal** is the expected result for the period covered by the plan, expressed quantitatively and measured by a performance indicator.

- Creating the plan of action: description of components and selection of strategies and tactics

For the formulation of the plan of action, a Excel matrix has been created. Accompanying instructions for filling out the matrix

- Implementation of activities

The implementation of the activities provides an excellent opportunity for the members of the program to work as a team. The description of the tasks to be carried out should be accompanied by an indication of responsibilities and by a chronology or definition of the stages of implementation. This is important in order to avoid overlapping responsibilities, and to ensure that efforts are integrated and directed toward the central objectives of the action, with adequate horizontal and vertical communications in place (coordination) so as to optimize yield

- Monitoring and supervision of the plan

Monitoring and supervision constitute a basic management task to ensure that activities are carried out as planned, with due observation of quality requirements. A supervision plan should be created that allows for the active implementation of corrective measures, and that supports decision-making to solve problems in a timely fashion. This plan should be a dynamic document.

It is advisable to hold periodic meetings with the personnel or networks involved in executing the plan of action, to review progress or to reprogram activities according to the findings.

- Evaluation of the plan



The objectives and goals of the EPI must be evaluated to analyze the extent to which what is planned actually occurs. This evaluation, which may be semiannual or annual, facilitates:

- Updating or modifying the content of the plan of action based on the execution of what was planned.
- Identifying actions that are not moving forward, assessing the reasons, and formulating solutions to facilitate execution in the future.
- Having information available to provide feedback to the people involved in executing the plan of action.

|                      |                     |
|----------------------|---------------------|
| <b>Self-Check -6</b> | <b>Written Test</b> |
|----------------------|---------------------|

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

EPI planning begins with studying and assessing the health of (3 points) :

- A. the community                      B. the locality                      C. the country                      D. all of the above

**Note: Satisfactory rating - 3 points**

**Unsatisfactory - below 3 points**

**Answer Sheet**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_



Name: \_\_\_\_\_

Date: \_\_\_\_\_

**MCQ**

1.\_\_\_\_

### List of Reference Materials

- 1- Ethiopia. Blended Learning immunization Module for the Health Extension Programme.
- 2- Ministry of health.
- 3- Ethiopia. Refresher Training for Frontline Health Workers in Expanded Program of
- 4- Immunization (EPI). EPI target diseases, vaccines and their administration. Module1.
- 5- Addis Ababa: ministry of health: 2010.
- 6- Ethiopia. Refresher Training for Frontline Health Workers in Expanded Program of
- 7- Immunization (EPI). Module. Addis Ababa: ministry of health: 2010.



- 8- Practice Standards and Guidelines for Nurses and Midwives
- 9- with Prescriptive Authority 2010
- 10- Organización Panamericana de la Salud. Curso de gerencia para el manejo efectivo del Programa Ampliado de Inmunización, 2006.  
[http://www1.paho.org/english/ad/fch/im/isis/epi\\_mod/spanish/home.asp](http://www1.paho.org/english/ad/fch/im/isis/epi_mod/spanish/home.asp).
- 11- Movilización social para el control del cáncer en Colombia, 2007. Ministerio de la Protección Social. Instituto Nacional de Cancerología. República de Colombia.
- 12- [http://www.cancer.gov.co/documentos/SerieDocumentosTecnicos/Serie\\_N2\\_2007.pdf](http://www.cancer.gov.co/documentos/SerieDocumentosTecnicos/Serie_N2_2007.pdf) .
- 13- Pan American Health Organization. EPI plan of action software: user's quick guide. 2006.
- 14- Moraes IHSD. Informações em saúde: da prática fragmentada ao exercício da cidadania. São Paulo: Editora Hucitec/Rio de Janeiro: ABRASCO; 1994.

| Prepared By |                         |                        |       |        |             |  |              |
|-------------|-------------------------|------------------------|-------|--------|-------------|--|--------------|
| No          | Name                    | Educational Back grand | LEVEL | Region | College     | Email  | Phone Number |
| 1           | Masresha Leta           | Midwifery              | A     | Harari | Harar HSC   | <a href="mailto:masreshaleta3@gmail.com">masreshaleta3@gmail.com</a>       | 0911947787   |
| 2           | Gosaye T/haymanot Zewde | Midwifery              | A     | Harari | Harar HSC   | <a href="mailto:Zewegosa@yahoo.com">Zewegosa@yahoo.com</a>                 | 0913227450   |
| 3           | Amare Kiros             | Midwifery              | A     | BGRS   | Pawi HSC    | <a href="mailto:amarekiros9@gmail.com">amarekiros9@gmail.com</a>           | 0920843010   |
| 4           | Jalele Mosisa           | Midwifery              | B     | oromia | Nekemte HSC | <a href="mailto:jalemosis2018@gmail.com">jalemosis2018@gmail.com</a>       | 0939316415   |
| 5           | Serkalem Fetene         | Midwifery              | A     | oromia | Mettu HSC   | <a href="mailto:serkefetene@gmail.com">serkefetene@gmail.com</a>           | 0912022476   |
| 6           | Balela Kadir            | Midwifery              | B     | oromia | Nagelle HSC | <a href="mailto:balela.kedirbedu@gmail.com">balela.kedirbedu@gmail.com</a> | 0916633542   |
| 7           | Sadeya Mohamed          | Midwifery              | A     | Somali | Jigjiga HSC | <a href="mailto:yanaan261@gamil.com">yanaan261@gamil.com</a>               | 0915076012   |