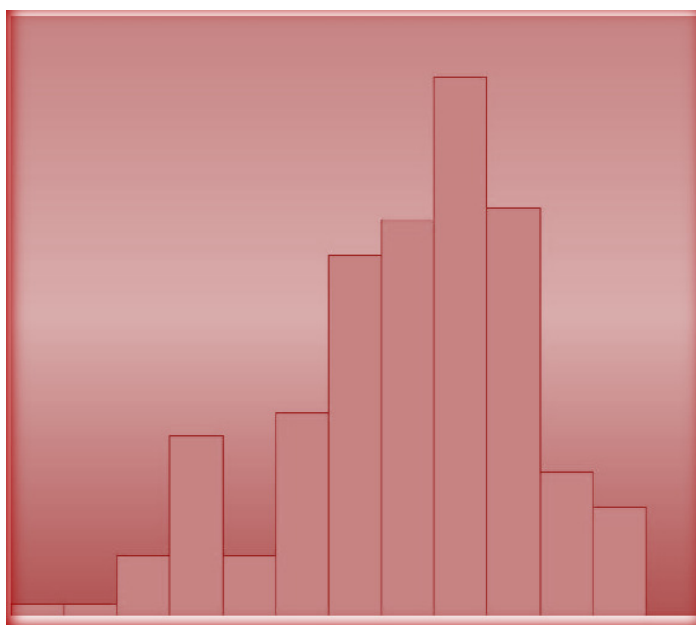# Basic Level Public Health Emergency Management Training Module

Participant Modules

October 2012

Basic Level Public Health Emergency Management Training Module

Participant Modules

Module 1: Introduction to the modules

Module 2: Early warning and Surveillance

Module3: Public Health Emergency Response

Module 4: Public Health Emergency Preparedness

Module 5: Recovery from Public Health Emergency

Abbreviations

ANGT	Adult Nasogastric Tube
CRF	Case Fatality rate
DERF-R	Daily Epidemic Reporting Format for Region
DERF-W	Daily Epidemic Reporting Format for Woreda
EHNRI	Ethiopian Health and Nutrition Research Institute
EPRP	Emergency Preparedness and response plan
FETP	Field Epidemiology Training Program
HEW	Health Extension Worker
ICT	Information Communication technology
IDSR	Integrated Disease Surveillance and Response
IV	Intra venous
MOH	Ministry of Health
ORS	Oral rehydration salt
PEA	Post Epidemic Assessment
PHEM	Public Health Emergency management
PHEMC	Public Health Emergency Management Committee
PNGT	Pediatric Nasogastric Tube
RRT	Rapid Response Team
TTC	Tetracycline
WHO	World Health Regulation

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All Regional PHEMs

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Module 1: Introduction to the Modules

1.1 Introduction

Since the past decade, the African region has faced challenges with new diseases, conditions and events that resulted in revision of public health priorities. Although communicable diseases have predominated as the leading cause of illness, death and disability in African setting, non-communicable diseases such as hypertension and diabetes are emerging as threats to the well-being of its communities. For instance the lessons learned from the emergence of pandemic influenza have casted the importance of building a strong surveillance system at the grass root level involving community surveillance. In recent years, the concept of one health through the integration of human and animal health surveillance has become a high priority for many countries demonstrating the relevance of extending multi sectoral and multidisciplinary approach. Moreover, the adoption of the International Health Regulations (2005) by countries in the African region including Ethiopia has underscored the need to strengthen national core capacities for surveillance and response across all health systems.

In Ethiopia the ability to detect problems and respond to health emergencies through proper surveillance system has been largely limited. As a result prevention and control of epidemics was weak and this was partly due to lack of skilled personnel. The Federal Ministry of Health identified Public Health Emergency Management as one of the core processes for intervention during its Business Process Reengineering exercise.

PHEM is designed to ensure rapid detection of any public health threats, preparedness related to logistic and fund administration, and prompt response to and recovery from various public health emergencies in Ethiopia. It is the process of anticipating, preventing, preparing for, detecting, responding to, controlling and recovering from consequences of public health threats in order that health and economic impacts are minimized. In view of this, PHEM guideline was developed as a working document.

In order to address the human resource needs of PHEM, the Federal Ministry of Health in collaboration with partners established the Ethiopia Field Epidemiology Training Program (FETP) in 2009. Based on the lessons learned from other successful programs over the globe, the pyramidal model has been adopted and tailored to the needs of the country. Hence, the advanced training is designed and given at the top of the pyramid for addressing human resource needs at higher level. However, it is realized that the advanced training could not address the high demand for human resource at all levels of the PHEM system of Ethiopia. Therefore, PHEM has designed the basic level training to strengthen the capacity of the PHEM system at Woreda and zone level where there is a huge gap in implementing its activities.

The training strategy in the modules has been adapted from the experiences and materials in field epidemiology programs, PHEM and the WHO IDSR guidelines.

Generally, the modules of the training course introduce you to:
1. The objectives of Public Health Emergency Management (PHEM)
2. The objectives for this training course and how to participate in the course
3. How to apply the skills learned in the course to implement the activities of PHEM

1.2 Learning objectives

By the end of the training, you will be able to
- Describe the background for developing each of the modules
- Acquire knowledge and skill related to the the objectives of the course and types of training modules
- Familiarize yourselves with the purpose of the modules, scope, and be able to use of the modules and training methods and resources

1.3 Content

1.3.1 Purpose of the modules

The purpose of the PHEM modules is to provide guidance on how to implement the designed Public Health Emergency Management using the skills and knowledge of the basics of field epidemiology training at woreda level which is the lowest functional unit. The modules are designed in such a way that they serve to capacitate all midlevel public health professionals. The public health system, stakeholders and partners who take part in public health emergency management and in the implementation of the new approach are taken into consideration when designing the training curriculum.

1.3.2 Scope of the modules

The training will equip and extend opportunities for you and other health workers to obtain knowledge and skills of PHEM through sharing knowledge. As a trainee you will be able to use the data you collect from the system, detect and respond to priority diseases, risks, conditions and events and thereby contributing to reduction of the burden of illness, death and disability in the Ethiopian Communities.

As indicated in the PHEM guideline, the modules emphasize and include nine major health risks:
These include:
- Epidemics of communicable diseases
- Drought conditions with malnutrition
- Food contamination
- Flood
- Pandemic influenza
- Diseases that affect people during conflicts and in displaced populations

- Accidents including chemical spills
- Earthquake and volcanic eruptions
- Bioterrorism

1.3.3 Objectives of the course

The training will enable you to:

- strengthen capacity in recognizing and responding to public health emergencies during the pre-emergency phase
- strengthen the early warning & surveillance system and conduct effective surveillance activities
- Introduce modern multi hazard approach and PHEM system specific to protection, prevention and response.
- improve the use of information for detecting, investigating and responding to public health threats and recovery
- improve the flow and use of surveillance information throughout the health system
- manage coordination and collaboration with partners and stakeholders to avoid crisis and catastrophes through mobilizing resources and capacity building

- acquire basic skills learn in applied epidemiology i.e. : 1) how to plan for, conduct, interpret the results of the investigation, and communicate the results to those with a need to know; 2) the application of descriptive epidemiology (time, place, person, agent, transmission, host, and environment) to investigating disease in communities; 3) the application of analytic epidemiology as appropriate to developing data in the field, including how to collect the data, analyze the data, and interpretation of the data; 4) the application of the descriptive epidemiology and analytic epidemiological data to developing control and prevention measures

In this course, you have an opportunity to know and use skills that are relevant to carrying out PHEM activities especially at the zonal and woreda level.

1.4 Target group for the course

The training is intended to build the skills and knowledge of the Public Health Emergency Management teams at woreda and zonal level with special emphasis on woreda PHEM staff, surveillance officers/focal points and health facilities. Therefore the modules will help to improve your knowledge and practice at your working environment in PHEM. Public health officers, environmental health technologists, laboratory technologists, nurses and others who are assigned as focal points at the woreda health system including personnel at health facilities are target groups for the training.

1.5 How to use the modules

In order to meet the training objectives, the course consists of 5 modules. These include: Module 1 Introduction, Module 2 Early warning & Surveillance, Module 3 Response, Module 4 Preparedness and Module 5 Recovery. The modules are interrelated to one another and are provided in sequence for a complete understanding of PHEM with the provision of concepts of Basic Field Epidemiology. Hence, each preceding module is a prerequisite for the subsequent module. Each module consists of learning objectives, course content, training methods, exercises or case studies, reference materials and subject specific guidelines or modules for further reading. You are expected to attend all the sessions, do all the exercises, read the participant modules and reference materials as instructed in the modules.

1.6 Learning methods and Resources

The learning approach follows that of an adult learning indicating that it is learner-centered. You are expected to share your experiences and challenges in the PHEM system for obtaining maximum benefit from the course.

1.6.1 Teaching Methods:

- Lecture with discussion by facilitators
- Exercises (individual and group)
- Case studies
- Reading assignments (Individual and group reading)
- Mentorship during on-job-training

1.6.2 Teaching Resources

- PHEM guideline
- Specific reference materials/guidelines
- Other reading materials
- Case studies
- PHEM data
- PowerPoint slides
- Video films
- Pictures
- Computer
- Flipchart
- Markers
- White or black board

1.7 Duration of the training

The training has two parts. Part I, the intensive phase is a 07-day training that requires classroom-based teaching -learning and dedicated time for undergoing through the 5 modules of the training. Part II is an on-job training which is part and parcel of the

PHEM activities in the respective woredas. This phase of the training is assisted by mentors who are experts in the field epidemiology including the respective PHEM staff. Two different outputs are expected from the on-job training (E.g. surveillance data analysis and outbreak investigation or woreda health profile or any other combination suggested by mentors). The outputs will be presented and delivered to zonal or regional PHEM with approval of the respective mentors. A description of the mentorship is provided as part of the participant modules.

1.8 Monitoring and evaluation

Indicators for monitoring and evaluation of the PHEM activities are included in each module. Therefore you are expected to study and use them as part of the training and activities of PHEM at the woreda including zonal and regional level.

In addition to PHEM monitoring, the progress of the training will be evaluated on daily basis in order to improve the quality of the training and solve day-to-day problems. Specific forms are prepared that will be filled by the participants at the end of the daily activities.

1.9 Updating the modules and availing them

The modules will be live and updated regularly. When there are some changes of policies concepts and practices it is the responsibility of course facilitators and program owners to include updated versions in the PowerPoint presentations as well as including corresponding references and guidelines for the updates.

The modules would be printed and provided to each participant in hard and soft copies.

1.10 References

1. Federal Democratic Republic of Ethiopia, EHNRI – PHEM, Public Health Emergency Management: Guidelines for Ethiopia, February 2012, Addis Ababa, Ethiopia. Pp 1-5.
2. The WHO, Regional Office for Africa, Integrated Disease Surveillance and Response: District Level Training Course, July 2011. Pp 3-11.
3. WHO, International Health Regulation, 2005.

Module 2: Early Warning, Surveillance and Field Epidemiology

2.1 Introduction

Early Warning is a process with set of defined activities that helps to provide advance information of an incoming threat in order to facilitate the adoption of measures to reduce its potential health impact.

The purpose of early warning is to enable the provision of timely and effective information to the public and to responders, through identified institutions that allow preparing for effective response or taking action to avoid or reduce risk.

Surveillance is the process of gathering, analyzing, and dissemination of information for the purpose of proper planning, implementation, and evaluation of health services/interventions. It is also defined as "Information for Action". A functional disease surveillance system is essential for defining problems and taking action. Proper understanding and use of this essential epidemiological tool (public health surveillance) helps health workers at the woreda and health units to set priorities, plan interventions, mobilize and allocate resources, detect epidemics early, initiate prompt response to epidemics, and evaluate and monitor health interventions. It also helps to assess long term disease trends.

Field Epidemiology in Public Health Practice - is the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems. The term Field Epidemiology is sometimes used to describe the application or practice of epidemiology in the field to address public health issues by carrying out simple data collection, analysis, and reporting in support of surveillance and epidemiologic investigations. The skills that you will learn in applied epidemiology will be: 1) how to plan for, conduct, interpret the results of the investigation, and communicate the results to those with a need to know; 2) the application of descriptive epidemiology (time, place, person, agent, transmission, host, and environment) to investigating disease in communities; 3) the application of analytic epidemiology as appropriate to developing data in the field, including how to collect the data, analyze the data, and interpretation of the data; 4) the application of the descriptive epidemiology and analytic epidemiological data to developing control and prevention measures. Applied epidemiology is best learned by doing, which is actually conducting an investigation

For this modules the emphesise is on the concepts of basic epidemiology and the following functions of surveillance:
- Identifying priority disease and conditions for surveillance

- Reporting priority disease and conditions under surveillance
- Data analysis, interpretation and communication of findings

2.2 Learning objectives

The general objective:

The general objective of this training is as Woreda PHEM officers you will have the opportunity to acquire basic skills for the activities involved in surveillance and disease control. You will gain appropriate knowledge and skills for using data to identify report and analyze priority diseases, conditions and events and thereby help for response and control. You are expected to share your experiences and challenges in the PHEM system for obtaining maximum benefit from the training program.

The specific objectives:

- Identify cases and events of public health importance
- Report suspected cases or conditions or events of public health importance
- Analyze and interpret data on priority diseases and events

By the end of this module, you will be able to:
- Explain the basic concepts of applied epidemiology
- Describe early warning and surveillance systems
- Identify priority diseases and conditions for surveillance and define reportable disease based on standard and community case definitions
- Identify sources of information for event base surveillance
- Describe laboratory based surveillance
- Describe reporting of priority diseases, conditions, and events under surveillance,
- Perform surveillance data analysis, interpretation, and communicate results

2.3 Learning methods and Resources

The learning approach follows that of an adult learning indicating that it is learner-centered. You are expected to share your experiences and challenges in the PHEM system for obtaining maximum benefit from the course.

2.3.1 Teaching Methods:
- Lecture with discussion by facilitators
- Exercises (individual and group)
- Case studies
- Reading assignments (Individual and group reading)
- Mentorship during on-job-training

2.3.2 Teaching Resources

- Participants training module for early warning and surveillance
- PHEM guideline
- Case studies
- PHEM data
- PowerPoint slides
- Pictures
- Computer
- Flipchart
- Markers
- White or black board

2.4   Content of the Module

- Definitions of Terms
- Epidemiological concepts in public health
- Early warning and surveillance

2.4.1 Definitions of Terms:

Attack rate: The number of new cases during specified period divided by the number of persons at risk

Case definition: A set of criteria used to decide if a person has particular disease or if the case can be considered for reporting and investigation.

Case-Fatality Rates (CFR): Then number of disease from specified disease divided by total number of cases from that specific disease.

Completeness of a report: The number of health facilities reported by that week divided by total number of health facilities expected to report.

Distribution: Frequency and pattern by time place and person.

Epidemiology: The study of the distribution and determinants of health related states in populations.

Incidence: The number of new cases or events for a given time interval divided by the total population at risk.

Morbidity rate: The number of diseases occurring in a population in a specific period (usually a year) divided by the number of persons at risk of being sick during that period

Mortality rate: The number of deaths occurring in a population in a specific period (usually a year) divided by the number of persons at risk of dying during that period.

Prevalence: The number of cases of disease or event at a specific time divided by the proportion at risk at that time.

Threshold: The level or marker that should be reached to indicate that something should happen or change.

2.4.2 Epidemiological concepts in public health

What is epidemiology?

Epidemiology is the study of the distribution and determinants of disease in human populations.

What are epidemiological concepts and Principles?

The core concepts and principles that guide the discipline of epidemiology are:

- Health events and diseases are not randomly distributed in a population, but rather that they occur according to a pattern or patterns of some sort.
- Observing and recording these patterns allows us to identify the determinants, or causes, of health events and diseases.
- The focus is not on individuals, but rather on entire populations, in which the distribution and determinants of events and diseases are studied.
- Epidemiology uses rates to compare distributions and determinants of events and diseases among populations of different sizes, providing the basis for the development of public health prevention and control programs.

What are rates commonly used in Epidemiology?

The three key rates commonly used in public health are:
- Mortality rates - relates the frequency of these deaths to the size of the population, allowing comparison of the mortality occurrence in populations of different sizes.
- Incidence rates – New cases in a time period divide by total number people at risk
- Prevalence - is the proportion of the population that has a certain disease or characteristic at one point in time.

What do we mean by distribution?

There are four aspects distribution:
1. The first aspect is the burden of the disease —"how many persons are affected?" although numbers, or counts, are the raw data from which we

begin, usually describing the burden of disease in terms of an incidence or mortality rate or prevalence is preferable.

2. The second aspect of the distribution of a disease is the question "who is getting the disease, or who are the persons affected?" in basic descriptive epidemiology we often use information readily available from disease reports, vital statistics, or other sources (such as age, race, gender, or sometime marital status) to describe who is getting the disease or experiencing the event.

3. Third, we describe disease or health in terms of place—"where are the affected persons?" This description can be as broad as noting in which woredas the disease rates are highest.

4. Finally, we ask questions about the disease in relation to time—"when are persons most commonly affected or when is the disease most common, and is the frequency or distribution changing over time?"

The answers to these epidemiological questions about a disease or event can be useful in many ways; they can provide us with information to better predict and therefore provide a response to outbreaks, and can also provide clues to the determinants, or causes, of a disease.

2.4.3 Early warning and surveillance

What is Early Warning and Public Health Surveillance?

- **Early Warning**
  - o Is the identification of a public health threat by closely and frequently monitoring identified indicators and predicting risk it poses on the health of the public and the health system
- **Public Health Surveillance**
  - o Systematic collection of information on a specific disease or other health-related event
  - o Must occur on an ongoing basis with sufficient accuracy and completeness for data analysis
  - o Utilization of information for disease prevention and control

What are the major indicators of early warning system?

- An increase in the number of cases beyond expected/occurrence of outbreaks
- Unexplained morbidity and mortality
- Malnutrition
- Evidence of increase in zoonotic disease and/or related vectors
- Environmental changes such as air pollution, water quality change, contamination

- Drought, flood, severe weather (metrological information)
- Agricultural events such as reduced harvest, occurrence of pets or disease
- Refugees, internally displaced people, disruption of health services, and infrastructure
- Important industrial accidents, chemical spills etc.

What are the two components of early warning system?

1. <u>Indicator-based surveillance</u> refers to structured data collected through routine integrated disease surveillance, nutritional and laboratory surveillance.
2. <u>Event-based surveillance</u> refers to unstructured data gathered from sources such as media reports, community concern, and rumours etc.
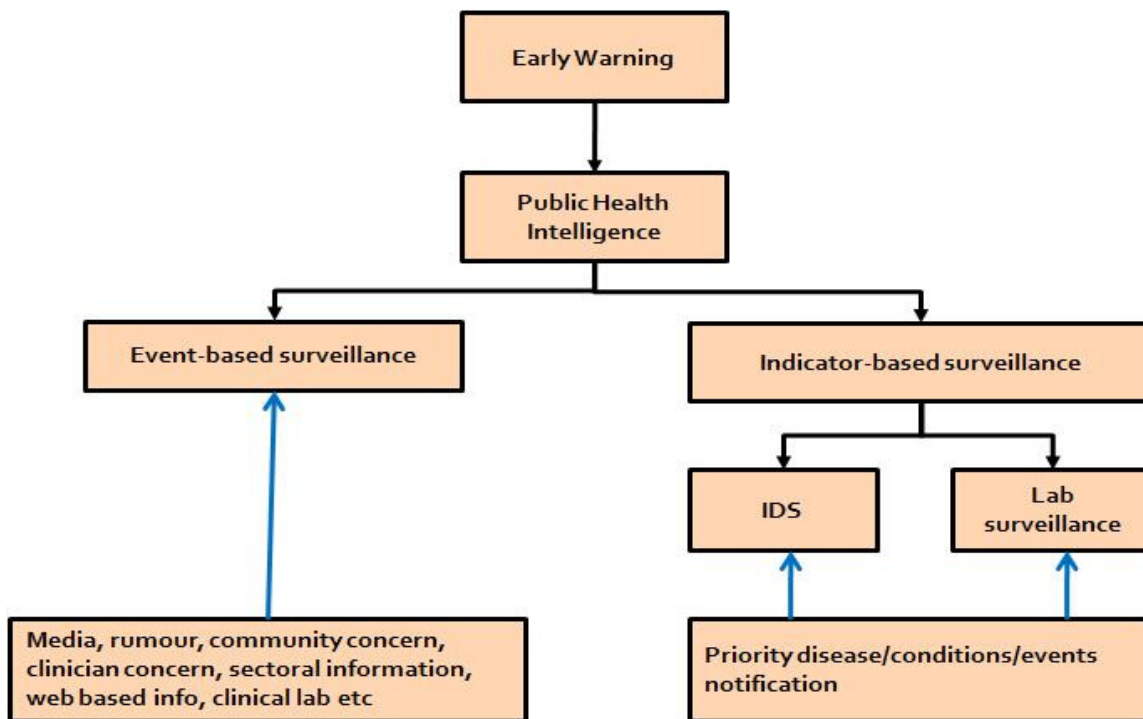
Objectives of Surveillance:

What are the objectives of public health surveillance?

- To detect epidemics/outbreaks so that they can be controlled in a timely manner,
- To predict epidemics so that health services can plan to respond, prevent where possible, treat and control priority diseases,
- To monitor trends of priority diseases in order to facilitate policy decision,

- To evaluate an intervention so that effective and efficient actions/policies are identified and supported.

What are the definitions of disease surveillance for different health levels?

Surveillance is the ongoing, systematic collection, analysis, and interpretation of health data. It includes the timely dissemination of the resulting information to those who need it for action. Surveillance is also used for planning, implementation, and evaluation of public health practices at any level of the health system. There are several types of surveillance used in disease programs:

- **Health facility or community-based surveillance:** a term to describe when a particular location is the focus of surveillance activities
- **Sentinel surveillance**: a health facility or reporting sit designated for early warning of pandemic or epidemic events. The site is usually designated because it is representative of an area or is in an area of likely risk for a disease or condition of concern.
- **Laboratory-based surveillance**: surveillance conducted at laboratories for detecting events or trends that may not be seen as a problem at other locations
- **Disease-specific surveillance**: This is surveillance that involves activities aimed at targeted health data for a specific disease.

What are the core functions of surveillance?

The PHEM Guidelines for Ethiopia (2012) presents a comprehensive vision of a disease surveillance and response system. In PHEM, all levels of the health system are involved in surveillance activities for responding to priority diseases and conditions. These activities include the following core functions:

- Identify cases and events
- Report suspected cases, conditions or events to the next level
- Analyze and interpret findings
- Investigate and confirm suspected cases, outbreaks or events
- Prepare to respond to public health events
- Respond to public health events
- Communicate with and provide feedback to health workers and the community
- Evaluate and improve the system.

Core Functions of Surveillance

Detection → Reporting → Investigation → Confirmation → Analysis → Interpretation → Response → Detection
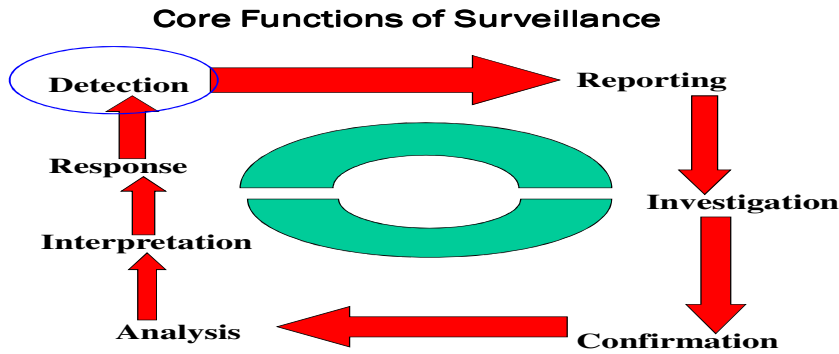
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What is the impact of early and late detection of an outbreak?

Early detection can have a major impact in reducing the numbers of cases and deaths during an outbreak.

The surveillance system will ideally have detected an outbreak in the early stages. Once an outbreak occurs, investigation will be required to:
- Confirm the outbreak,
- Identify all cases and contacts,
- Detect patterns of epidemic spread,
- Estimate potential for further spread,
- Determine whether control measures are working effectively.

The impact of EARLY detection and response in reducing the disease burden caused by an outbreak in an emergency situation is WIDE OPPORTUNITY FOR CONTROL.

What is the reporting periodicity of surveillance data in Ethiopia?

The identified 20 disease and conditions in Ethiopia are classified in the PHEM guideline in to two reporting periods depending on their epidemic potential, diseases targeted for elimination and eradication (see table 2.2)

Immediate reporting: Currently 13 diseases are identified to be reported immediately to next reporting level. Notification of the suspected identified outbreak should be notified to the next level within 30 minutes as follows:
- From community or health post or health centre to woredas health office within 30 minutes,
- From Woreda health office to zone/region within another 30 minutes,
- From Zone to regional within another 30 minutes,
- From Region health bureau to Federal level within another 30 minutes,

- MOH to WHO within 24 hrs of detection,

You can report the information verbally or by telephone, radiophone or use an electronic methods such as email, fax, mobile short message service, tall free call service (a service doesn't charge you when you call and accessible 24 hr a day. The **number for this service at Federal level is 971.** Official reporting using Case Based Reporting format or line listing should follow immediately.

Weekly reporting: Currently 7 diseases and conditions are identified to be reported weekly to the next reporting level in Ethiopia. Reporting of the total number of cases and deaths seen within a week (Monday to Sunday) and should be reported to the next level as follows:
- Health facilities report data from Monday to Sunday to Woreda every Monday till midday;
- Woredas to zone/region every Tuesday till midday;
- Zone to region every Wednesday till midday;
- Region to EHNRI every Thursday,
- EHNRI to WHO every Friday.

What are the reporting data *tools* of surveillance?

Different reporting tools are developed to facilitate the reporting of the identified diseases and conditions to be utilized at different levels of the health system. These include:
- Weekly reporting form for health post / HEW
- Weekly reporting format for other levels)
- Daily epidemic reporting format for Woreda (DERF-W)
- Daily epidemic reporting format for Region (DERF-R)
- Case based reporting format (CRF) for many diseases
- AFP case investigation form
- Guinea worm case based reporting format
- Guinea worm line list
- Influenza case based reporting format
- Line list (for all diseases)
- Rumor log book for suspected epidemics (for any type of public health rumors).

Page 32 Table3- 4 of the PHEM guideline shows different formats to be used by different levels of the health system and periodicity of reporting.

Surveillance data analysis, interpretation
Measuring events, such as disease or health events through data analysis, is at the heart of public health surveillance and resource allocation. One of the simplest methods

of measuring is just simply counting. However, simple counts often do not provide all of the information needed to understand the relationship of a health event to the population in which the event occurred. Counts alone are also insufficient for describing the characteristics of a population and for determining risk.

The key is to relate the frequency of an event to an appropriate population. For this purpose we use:

- **Ratios** - A ratio is obtained by dividing one quantity by another. For example, to find the ratio of woreda x women ages 65 and older to woreda x men ages 65 and older, we would divide the number of women by the number of men.,
- **Proportions** - A proportion is a ratio in which the numerator is included in the denominator.
- **Rates** - Rates measure the frequency at which a health event occurs over a period of time. Later, we'll go through examples of how rates are calculated, but for now, let's just say that a rate is a numerator divided by a denominator times a standard unit of population size (like 100 or 1000 or 100,000 people). A rate represents the burden of disease or other health related outcome during a specific time period.

The four measures of disease frequency or severities that are commonly used in public health are: Prevalence, incidence, mortality, and case-fatality.

2.5   Practical Exercises

Case Study 1:

1. In a country X, in 2004, 44,770 residents died and the country's population was 6,207,046 that year. Calculate the mortality rate for country X?
2. From Meskerem 1 to Pagumen 5 in 2003, there were 586 cases of new cases of measles diagnosed in Woreda X, and the Woreda population 935,670 that year. What is the incidence rate of measles in Woreda X in 2003?
3. In Woreda Y there were 20,000 residents living with diabetes, and the total population that year was 663,661. What is the prevalence of diabetes in Woreda Y?
4. Bases on your experience of reporting diseases and conditions under surveillance in your Woreda:
   - a What diseases or conditions do you report to the next level immediately or weekly?
   - b How do you report immediately and weekly data to the next level?
   - c Is there a standard form that you use?
   - d What methods of communication do you normally use for immediately or weekly reporting?
5. Have you ever needed to report an unusual event or cluster due to an unknown cause? What were the signs and symptoms that you reported?
6. Use the information on your 1st case (Worknesh) above fill in the cases based reporting format (CRF) on page 109 of the PHEM gridline.
7. What other different reporting tools are being used in your woreda to facilitate the reporting of identified diseases and conditions to the next level?
8. The reportable 20 disease and conditions in Ethiopia are classified in to two reporting periods depending on their epidemic potential, diseases targeted for elimination and eradication (see page 23 and 30).
   - a. What steps and procedures do you follow for immediate reporting:
   - b. What steps and procedures do you follow for weekly reporting:

Case Study 2:

A number of Meningococcal Meningitis cases are being reported from 2 adjacent health posts in your woreda which has a total of 1 government hospital, 2 government health centres, 34 health posts, 2 missionary health centres, and 1 police hospital. The same week 35 health facilities reported to you on time. The number of Meningococcal Meningitis cases were; week1 it was 4; week2 also 4, week3=3; week4=4; week5=5; week6=7; week7=8; week8=10; week9=9; week10=8 and week11=6. The Meningococcal Meningitis cases were 40 males and 28 females. There age groups were: 0-4 years were 8. 5-14 years were 20, 15-30 years were 25, and 15 were above 30 years old. 38 were from Kebele X and 30 were from Kebele Y. The total population

of the 2 kebeles where the report come from is 27000 (Kebele X=15,000, Kebele Y=12,000). From the information given:

1. Before you analyze the Meningococcal Meningitis cases you received for your Woreda, you need to check the completeness of the data. Calculate the **completeness** of the report?
2. On which day of the week (**timeliness**) do you have to report your Woreda meningitis cases to the Zonal health department?

3. Draw a line graph showing the trend of Meningococcal Meningitis cases in your Woreda?
4. Bases on the above data do you suspect an outbreak of Meningococcal Meningitis cases in your Woreda? If yes what is your justification?
5. Calculate the attack rate of Meningococcal Meningitis for Kebele X, Y and your Woreda as a whole?
   a. Analyze the meningitis data of your Woreda by place, person and time.
   b. Place – Calculate the percentage and rates of meningitis by the two kebeles and compare?
   c. Person – Calculate the percentage and rates of meningitis by age groups and sex in your Woreda and compare?
   d. Time – Compare the number of meningitis cases reported in your Woreda by week of report and draw a histogram and compare?

6. Draw
   a. A bar graph by age group
   b. A pie chart by sex
7. How do you interpret the finding?
8. How do you communicate about your finding with Your Woreda RRT?

Module 3: Public Health Emergency Response

3.1 Introduction

Public health emergency response comprises from case investigation to result communication. Rapid response limits the number of cases and geographical spread, shortens the duration of the outbreak and reduces fatalities. These benefits not only help save resources that would be necessary to tackle public health emergencies, but also reduce the associated morbidity and mortality. It is therefore important to strengthen epidemic response, particularly at woreda and community levels.

Public health emergency response has to be initiated upon receipt of an alert or rumor, or detection of a deviation of the disease trends from the expected trend while performing weekly surveillance data analysis.

3.2 Learning Objectives

At the end of this training module you will be able to:

- Define cluster, outbreak, and epidemic
- List the reasons that health agencies investigate reported outbreaks
- List and describe the steps in the investigation of an outbreak
- Draw and interpret an epidemic curve
- Calculate the appropriate measure of the association from two by two table
- Identify Interventions of specific outbreak
- Communicate findings of outbreak investigation in scientific way

3.3 Teaching Methods and Resources

3.3.1 Teaching Methods
- Brainstorming
- Lecture presentation
- Exercises
- Group presentations

3.3.2 Teaching resources
- Participants Basic Level PHEM Training Module
- PHEM guideline
- LCD projector
- Computer
- Flip chart
- Marker
- Notebook and pen

3.4 Contents of the module

The major contents of this module are the following:
- Definition of Terms
- Purpose of outbreak investigation
- When to conduct an outbreak investigation
- Steps of outbreak investigation
- Monitoring and Evaluation
- Practical Exercises

3.4.1 Definition of Terms

Epidemic: the occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time. Usually, the cases are presumed to have a common cause or to be related to one another in some way

Outbreak: epidemic limited to localized increase in the incidence of disease

Cluster: aggregation of cases in a given area over a particular period without regard to whether the number of cases is more than expected

3.4.2 Purpose of Outbreak Investigation

- Verify the outbreak or the public health event and risk.
- Identify and treat additional cases that have not been reported or recognized.
- Collect information and laboratory specimens for confirming the diagnosis.
- Identify the source of infection or cause of the outbreak.
- Describe how the disease is transmitted and the populations at risk.
- Select appropriate response activities to control the outbreak or the public health event
- Communication

3.4.3 When to Conduct an investigation

Conduct an outbreak investigation when:
- A report of a suspected epidemic of an immediately notifiable disease is received,
- An unusual increase is seen in the number of deaths during routine analysis of data,
- Alert or action thresholds have been reached for specific priority diseases,
- Communities report rumors of deaths or about a large number of cases that are not being seen in the health facility,
- A cluster of deaths occurs for which the cause is not explained or is unusual (for example, an adult death due to bloody diarrhea).

It is important that after receiving the alert report the Woreda PHEM Committee or Taskforce need to be activated. Note that woreda should aim to initiate investigation of the suspected outbreaks within three hours.

3.4.4 Steps of Outbreak Investigation

In investigating an outbreak it is an important to follow the following steps. However, in reality it might not follow the steps mentioned
1. Prepare for fieldwork
2. Establish the existence of an outbreak
3. Verify the diagnosis
4. Define and identify cases
5. Analyze data collected in terms of time, place and person
6. Develop hypotheses
7. Evaluate hypotheses
8. Refine hypotheses and carry out additional studies
9. Implement control and prevention measures
10. Communicate findings

Read the detail of these steps from PHEM guideline section 4 (Page 49-67).

3.4.5 Monitoring and Evaluation

As woreda PHEM Officer you have to closely monitor and evaluate the response activities during emergency to ensure the effectiveness of the intervention and to support resource mobilization efforts. Read the detail from PHEM Guideline page 87-88.
What elements are to be monitored for response activities?

The following are some of the elements to be monitored:
- Disease trends in order to assess the effectiveness of the response measures, the extension of the outbreak and risk factors
- Resources assessment of the rational utilization, adequacy and sufficiency and determination of additional needs
- Effectiveness of the response: case fatality rate, incidence rate
- Implementation status of the identified intervention activities (program coverage, safe water coverage, immunization, hygiene and sanitation activities, public communication and education, ITNs distribution, etc.

What are the key monitoring indicators for public health emergency response?

Monitoring indicators for public health emergency response
- Proportion of rumors of PHE verified within 3 hours of initial notification
- Percentage of woredas with functional RRTs

- Percentage of out breaks that have been investigated within 48 hours
- Percentage of outbreaks that have CFR within the accepted norm
- Proportion of suspected outbreaks of epidemic prone diseases in which lab confirmation are completed according to the guideline
- Proportion of PHE with prevention and control measures initiated within 48 hours of identification of risks and characterization of threats
- Percentage of out breaks contained with an acceptable containment time (as per specific guidelines recommendation)

3.5 Practical Exercises

In this exercise, you will read about an outbreak and the steps that were taken to investigate it and then answer the questions that follow each section. Your facilitator may suggest that participants do this exercise in pairs or small groups of 3 to 4 people.

Case study 1

Scenario 1: A suspected outbreak of a food borne disease which occurred after attending a wedding ceremony on morning of Tir 27, 2003 in a small town X was reported to your Woreda health office on the same day in the afternoon. The patients present with vomiting, diarrhea and abdominal pain.

1. As Woreda PHEM Officer what first actions do you take?
2. What is the composition of the team that you need to send to the field to investigate the situation? Why?

Scenario 2: The Woreda RRT who went to the site (town X) has found the list of 25 cases who have the symptoms mentioned above form Health Center record and 5 more cases by searching among of most of the attendants of the wedding ceremony. Part of the line list of the suspected cases is as follows.

SN	Name	Town	Sex	Age	Time of onset	Vomiting	Diarrhea	Abdominal pain	Others
1	GK	X	F	20	7:30	1	1	1	0
2	PG	X	M	44	8:00	1	1	1	0
3	JK	X	M	7	8:30	1	0	1	1
4	WL	X	F	47	8:45	1	0	1	0
5	WW	X	F	10	8:45	1	0	1	1
6	OM	X	M	13	8:45	1	1	1	0
7	SO	X	F	20	7:30	1	1	1	0
8	OD	X	F	39	7:30	1	1	1	0
9	ER	X	F	17	7:30	1	0	1	0
10	DS	X	M	44	7:00	1	1	1	0
11	LK	X	M	46	8:30	0	1	1	0
12	RE	X	M	38	9:00	1	0	1	0

13	LO	X	M	40	8:00	0	1	1	0
14	KO	X	F	60	8:00	1	0	1	0
15	PO	X	M	22	7:00	0	1	1	0
16	DE	X	F	28	8:45	0	1	1	0
17	GS	X	F	20	7:30	1	1	1	0
18	FK	X	F	44	7:00	0	1	1	0
19	NU	X	M	7	8:00	1	0	1	1
20	PQ	X	F	47	7:30	1	0	1	0
21	KS	X	M	40	8:30	1	0	1	0
22	KA	X	F	40	8:00	0	1	1	0
23	NK	X	F	20	7:30	0	1	1	0
24	HD	X	M	24	8:00	1	1	1	0
25	XE	X	M	22	7:00	1	1	1	0
26	MA	X	M	20	6:00	1	0	1	0
27	ER	X	F	50	8:30	1	1	1	0
28	BN	X	M	26	7:30	1	0	1	0
29	MZ	X	F	16	7:00	1	0	1	0
30	MX	X	M	10	8:30	1	0	1	1

3. What could be the case definition that was used by the Woreda RRT? What information helped them to generate case definition?

4. Draw an epidemic curve of the outbreak and tell the type of "source of outbreak" it was.
5. What further information the RRT need to collect to know the possible source of infection?
6. To identify the cause of the outbreak what kind of the samples and at least how many samples the RRT should collect? To which laboratory they could send?

Scenario 3: The Woreda RRT was informed that 80 people attended the wedding. The teams managed to interview 72 of them, 30 met the case definition. All cases ate from 7 items served at wedding. The investigation team identified the number of wedding attendees those ate and did not eat from each food items according to the table below.

Exposed to	People Who Ate				People Who Did not Eat				RR
	Ill	Not Ill	Total	AR (%)	Ill	Not Ill	Total	AR (%)	
	(a)	(b)	(c = a+b)	(d = a/c)	(e)	(f)	(g = e+f)	(h = e/g)	(d/h)
Doro wat	7	35	42		7	23	30		
Kitfo	10	26	36		8	28	36		
Kurt (Beef)	8	36	44		6	22	28		

Tibs	5	45	50		4	18	22		
Rice	8	33	41		7	24	31		
Fruits cocktail	6	22	28		9	35	44		
Mixed salad	20	11	31		3	38	41		

7. To test the association between exposure and the illness, what kind of analytical study is more appropriate? What is the appropriate measure of the association?
8. Calculate the attack rate for all food items.
9. Which food item shows the highest attack rate?
10. Is the attack rate low among persons not exposed to that item?
11. Calculate and interpret the relative risk for each food items?
12. Which items were associated with the illness? Interpret it
13. If the lunch was served at 6:30 and the source of the outbreak is mixed salad, what could be the possible explanation for the case happened at 6:00?

Case Study 2

Scenario 1: On 17 Meskerem 2004, the health officer working in Y Health Center reported one death associated with acute watery diarrhea and vomiting. By 20 Meskerem, the health officer reported 6 cases and 3 deaths to you, as Woreda PHEM Officer, by telephone. Since 2 weeks ago, you also have previous report that there was a confirmed cholera outbreak in neighboring Woreda X.

1. List all possible reasons that might justify initiation of an investigation?
2. How do you verify the existence of the outbreak?
3. List all materials you must have before deployed to field?
4. If the laboratory personnel have no this information so far, what kind of information do you give so that he or she has to prepare to take all laboratory materials required?
5. To whom do you talk after you arrived at affected site?
6. How do you verify the diagnosis?

Scenario 2: The Woreda RRT reached the site on 23 Meskerem and developed a summary of information about cases and deaths that occurred during the outbreak. The RRT identified a total of 33 cases and 8 deaths since the onset of the first case. To have more information they talked to some patients in the community. Up on the discussion, one of the patients told them that on 16 Meskerem 2004 one of their Kebele resident was died of diarrhea and vomiting after returning back from funeral ceremony of his relative in Woreda X. Following the funeral ceremony of his dead body on 18 Meskerem 2004,the cases were more expanded in the community by affecting new villages.The RRT sent five stool specimens to regional public health laboratory, four of them were tested positive for Vibrio-Cholera.

7. Q1. What prevention and control measures should RRT take at this stage? When?
8. How frequently should they communicate with Woreda Health Office?

Scenario 3: The RRT together with Kebele Administration, start providing health education to the community at large, provide case management training for health workers and established cholera treatment center (CTC) on 24 Meskerem. On Tikimt 3, 2004 heavy rain occurred and the area was flooded. Following this situation the number of cases had been increasing and the RRT widely distribute water purification chemicals and kebele administration together with HEW conduct social mobilization on latrine construction, hand washing and utilization of water chemicals starting on Tikimt 6, 2004. At the end of the outbreak the RRT identified and summarized a total of 113 cases with 14 deaths from four villages in which a total of 6176 population lives. Review the tables below and then answer the questions that follow.

Village	Population			Case		
	Total	Male	Female	Total	M	F
Village A	1300	663	637	29	13	16
Village B	789	454	436	26	15	11
Village C	1987	526	505	39	16	23
Village D	2100	1071	1029	39	20	19
Total	6176	2714	2607	133	64	69

9. By looking at the table which village do you think is most affected?
10. Calculate crude and sex specific attack rates and interpret the findings? Which Village is most affected?
11. Look at the following graph and interpret. Why most of the deaths happened at the beginning of the outbreak? Why the trends is decreasing after 24-Meskerem? Why it rises again on 5-Tikimt? Why do cases kept decreasing significantly after Tik-8? What is the possible explanation for the occurrence of this outbreak?

Figure 1: Cholera Cases Distribution by date of onset, Woreda X, Meskerem 2004
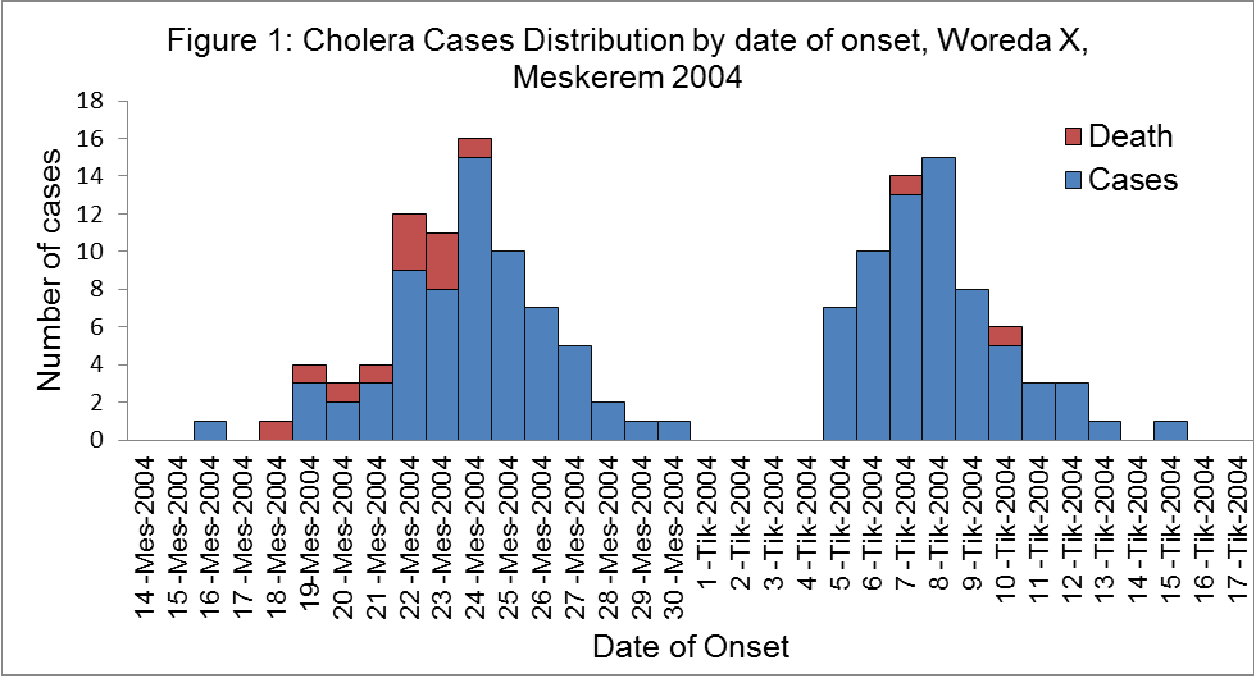
12. To whom do you report the findings of the outbreak investigation and how?
13. Mention the major components of outbreak reporting format.

Module 4: Public Health Emergency Preparedness

4.1 Introduction

A public health emergency such as an acute outbreak or public health event calls for an immediate response. Preparedness is defined as "the range of deliberate, critical tasks and activities necessary to build, sustain, and improve the operational capability to prevent, protect against, respond to, and recover from incidents". Being prepared to detect and respond to such an event is an essential role of the PHEM. **Preparedness** helps the health workers, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions

This module describes steps for organizing preparedness activities in the woreda/ zone. Preparedness involves a range of players and partners engaging in initiatives that promote health prevent and control diseases and conditions and protect people from the consequences of health emergencies due to man-made and natural causes. Therefore, preparedness is a responsibility shared by all levels of government sectors, private sectors, not-for profit sectors, research and academic institutes, and professionals associations. The way forward to implement sound preparedness measures is to accomplish first and foremost a paradigm shift from managing emergencies to managing risks. The aims of public health emergency preparedness include: Preventing avoidable crisis and catastrophes; reducing morbidity, mortality and disability effects; mobilizing and availing resources; minimizing disruption to health services; maintaining business continuity as far as possible and reducing disruption to society as much as possible

4.2 Learning Objectives

This module describes and allows you to practice the following skills:
1. identify government sectors and other partners, with respect to their areas of intervention , functions and roles and responsibilities
2. identify focal points and mechanisms for coordination
3. explain the steps in vulnerability and risk mapping for public health events
4. describe the content of an epidemic preparedness and response plan
5. define capacity required for public health emergency preparedness
6. identify indicators to monitor and evaluate level of preparedness of PHEM

4.3 Teaching methods and resources

The learning approach follows that of an adult learning indicating that it is learner-centered. You are expected to share your experiences and challenges in the PHEM system for obtaining maximum benefit from the training program.

4.3.1 The main methods include:
- Lecture discussion by facilitators
- Exercises (individual and group)
- Case studies
- Reading assignments (Individual and group reading)

4.3.2 Teaching Learning Resources
- PHEM guideline
- LCD projector
- Flip Chart
- Markers
- Other reading materials
- Case studies
- PowerPoint slides

4.4   Content of the module
- Coordination and collaboration
- Vulnerability assessment and risk mapping
- Planning for identified risks
- Capacity building
- Monitoring and Evaluation
- Exercises

4.4.1 Coordination and collaboration
A coordinated disaster preparedness and response system is an essential condition for effective management of public health emergencies. **Horizontal coordination** addresses links between among different sectors and institutions at national, regional, zone, woreda and kebele levels. Horizontal coordination also includes cross-border coordination with neighboring countries and inter-regional, between zones or woredas or kebeles within the country. **Vertical coordination** addresses the hierarchy from the national level to the Kebele level. There is no need of creating new committee for emergency preparedness. Instead, work within established structures and systems such as Public Health Emergency Management Task Force, outbreak committee, or health committee etc. This committee should be, as much as possible, led by the correspondent administrative authority at different levels and will include representatives from relevant sectors and institutions such as water, agriculture, health facilities, universities, and partners to ensure comprehensive preparedness.

Coordination will be better managed if a committee or task force of all the stakeholders is established. Existing structures at woreda and zonal level may include the following:

Public Health Emergency Management Committee: The Woreda-level public health emergency management committees (PHEMC) work closely with their counterparts at different levels to plan and monitor the implementation of public health emergency plans. PHEMCs are coordinating committees composed of technical and non-technical members from health and other sectors. The role of the PHEMC is to develop and oversee the implementation of emergency preparedness and response plans, and achievements of the PHEM unit.

PHEM – Technical committee: This committee focuses on information sharing, technical issues and other interests to its member agencies. Participating members represent selected sectors and partners working in the area of emergency.

Rapid Response Team: A Rapid Response Team is a technical, multi-disciplinary team that carries out activities of emergency and epidemics Preparedness and Response at different levels.

4.4.2 Vulnerability assessment and risk mapping

It is indispensable to undertake vulnerability assessment and risk mapping as essential components of preparedness.

Vulnerability: The susceptibility of a community, service, or infrastructure to damage or harm by a realized hazard or threat.

Vulnerability Assessment: A vulnerability assessment is a continuing, dynamic process of assessing hazards and risks that threaten the population and the health system and determining what can be done about it. Vulnerability assessments also include a method of structured data collection geared towards understanding the levels of potential threats, population likely to be affected, coping capacity, relief needs and available resources to address them.

Risk: The probability of harmful consequences or expected loss (of lives, people injured, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards conditions.

Risk mapping of exposure and vulnerability including the physical, social, health, economic and environmental dimensions; and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios. For example: Measles epidemic (hazard) in a community - The potential impact (and risk) will depend on vulnerability based on the immunization level, nutrition status etc. Floods (hazard) - the lower in altitude and closer to a river, the more susceptible to flooding.

Steps for conducting vulnerability assessment and risk mapping

Step 1: Contextualization
Contextualization is a matter of looking at the impact severity of hazards in the sector's area of concern. It needs to define the physical, social, environmental and statutory environment within which the risk exists. It should take into account all the stakeholders relevant to the risk management. It also requires describing the relevant characteristics of the area for which the risk assessment is being completed as this will influence the likelihood and the impact of an emergency on the community. The MOH may need to consider some or all of the following aspects of its area, identifying emerging trends and possible future events, in addition to recording the current situation: however this module has only included the health aspect. For the details trainees are encouraged to read the PHEM guideline from page 8-14.

For example: for assessing the context of health the following points need to be considered
What is the current health status of the community? Does it have any particular vulnerability in health terms (e.g. high level of chronic malnutrition, large population of elderly people)? What health facilities are available in the area, and would they be able to cope with the scale of event envisaged?

Step 2: Hazard identification
Each level of the health system should identify those hazards that, in its view, present significant risks (i.e. could give rise to an emergency) in functional areas for which they have lead responsibility

Step 3: Risk analysis
Assessing the likelihood of hazards
The likelihood of a hazard in a particular geographical area or function in Ethiopia may vary .For example, the likelihood of an infectious disease epidemic in humans might vary from place to place. Similarly the likelihood of flooding is very dependent on the geography and hydrology of a particular area. While a national likelihood assessment forms a useful starting point for a regional, zone or woreda level likelihood assessment, each level needs to carry out their own assessment.

Assessments of the likelihood of the hazards occurring within the next two years should always be done .When assessing the likelihood of a hazard it is necessary to refer to the description of an outcome of an incident. The outcome can be defined in various ways. For flooding, it may be appropriate to talk in terms of the area flooded. For many incidents it may be necessary to use numbers of fatalities or population affected. Although both measures – area flooded and fatalities – are consequences of the

hazards, they are immediate or primary consequences that can be used as proxy measures to describe the outcome of the hazard.

Assessing the impact of hazards

The potential impact of each hazard is assessed in four different categories, health, social, economic, and environment. The health sector is primarily concerned with the first category although other categories may have indirect impact (loss of income leads to malnutrition for instance). Rating the severity of health impacts should make every effort to back up what is a subjective judgment with evidence (for example measures from a previous similar incident) and to record what assumptions have been made.

A risk graph will be created based on the calculation of impact and likelihood. The hazards can be written in the next table to show the risk ranking.

level	Descriptor	Categories of Impact	Description of impact
1	Insignificant (likelihood over 2 years> 0.005%)	Health risks	Insignificant number of injuries or impact on health
2	Minor (likelihood over 2 years> 0.05%)	Health risks	Small number of people affected, no fatalities, and small number of minor injuries with first aid treatment
3	Moderate (likelihood over 2 years> 0.5%)	Health risks	Sufficient number of fatalities with some causality requiring hospitalization and medical treatment. Activation of major incident procedures in one or more hospitals
4	Significant (likelihood over 2 years> 5%)	Health risks	Significant number of people in the affected area impacted with multiple fatalities, multiple serious or extensive injuries. Significant hospitalization and activation of major incident procedures across a number of hospitals
5	Catastrophic (Likelihood over 2 years> 50%)	Health risks	Very large number of people affected area (s) impacted with significant number of fatalities, large number of people requiring hospitalization with serious injuries with long term effects

N.B. This example focuses only on health for a broader impact of hazard assessment; you are advised to refer PHEM guideline, page 11.

Step 4: Risk Evaluation

Risk assessments are produced by combining the assessed likelihood and impact scores of a hazard or threat by plotting them on a risk matrix. The preparation of a risk matrix is an essential part of the risk assessment process. The formula used to combine likelihood and impact scores varies from one risk assessment approach to another. The guidance presented here is consistent with a number of the major standards and consistent in the application of this risk matrix is essential if the results of the local risk assessments are to be easily compared.

Very High Risk – these are classed as primary or critical risks requiring immediate attention. They may have a high or low likelihood of occurrence, but their potential consequences are such that they must be treated as a high priority.

High Risk – these risks are classed as significant. They may have high or low likelihood of occurrence, but their potential consequences are sufficiently serious to warrant appropriate consideration after those risks classed as 'very high'.

Medium Risk – these risks are less significant, but may cause upset and inconvenience in the short-term. These risks should be monitored to ensure that they are being appropriately managed and consideration given to their being managed under generic emergency planning arrangements.

Low Risk – these risks are both unlikely to occur and impact. They should be managed using normal or generic planning arrangements and require minimal monitoring and control unless subsequent risk assessments show a substantial change, prompting a move to another risk category.
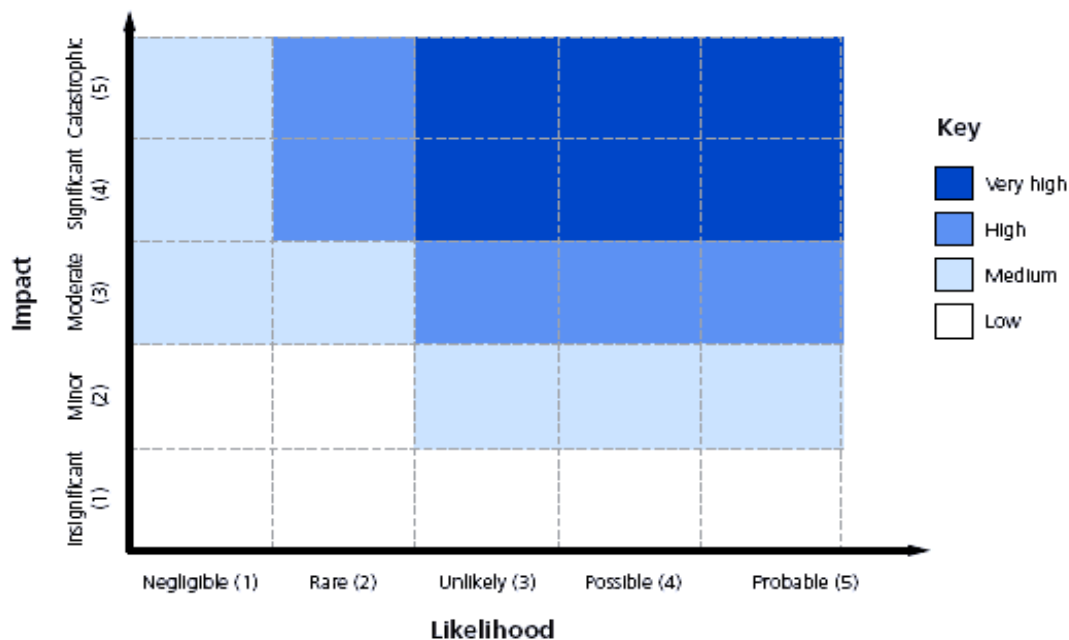
Figure 2-1Risk Matrix

Step 5: Risk Reduction

Risk assessments are not an end in themselves. Assessments allow their contingencies activities on an objective basis and to measure the effect actions in reducing risk or making response plans. Therefore at the risk reduction stage of the process, sectors should prioritize their own risk reduction measures in accordance with the size of the risks and the gaps in the capabilities priority will be expressed on a 1-5 scale with 1 as the lowest priority and 5 as the highest risk priority.

The process of risk reduction has a number of stages that are described below:
- Assess the type and extent of the capabilities (equipment, trained staff, facilities, plans) required for managing and responding to the hazards.
- Identify the capabilities that are already in place
- Identify the additional resources needed with a priority order keeping in mind the economic reality of the region.
- Identify what other organizations may contribute.
- Align actions with what is available at hand and other organizations' contributions to minimize or fill gaps.

Step 6: Monitoring, reviewing and publishing

Risks and risk treatment programs should be reviewed regularly:

4.4.3 Preparing an epidemic preparedness and response plan

Planning is the theme of the whole emergency preparedness exercise. Plans should be updated regularly especially following major incidents and mock exercises to include lessons learned. The plans should form the basis of estimation of required resources for predictable emergencies including training. It should be exercised periodically to ensure that partners are familiar with the plan and able to execute their assigned role

The activities and steps in the process of planning include:
- Identify and convene preparedness planning team(s)/experts from different sectors including partners,
- Coordinate and integrate all response and recovery agencies/organizations in the planning process,
- Identify needs required to respond to potential emergencies,
- Discuss with partners to endorse and agree on their roles and responsibilities,
- Develop plans, to prevent, protect against, respond to, and recover from natural and man-made disasters,
- Prepare monitoring mechanisms and tools to ensure preparedness plan is operationalized,
- Ensure the integration of the plan in the sector regular plan.

4.4.4 Capacity Building

Capacity building activities shall be carried out in order to effectively mitigate, prepare for identified risks, and respond to any occurrence of PHE events. The capacity building activity could focus on establishing and/or strengthening system and human resource needs related to PHEM: surveillance system, communication, laboratory and logistics.

4.4.4.1 Planning for Logistic

The logistic part focuses on stockpiling drugs, vaccines (buffer stocks), personal protection equipment (PPE), emergency health kits, medical supplies required for prevention and control of epidemics, and nutritional supplements. This has to be augmented with securing funds for related operational activities.

4.4.4.2 System Development
- Strengthen the inflow of gathered information from all sources in a timely fashion,
- Develop/strengthen communication procedures, and systems that support required communications with all levels,
- Provide ICT support to early warning sub process,
- Coordinate procurement and placement of communication systems based on a gap analysis of requirements versus existing capabilities

4.4.4.3 Human resource needs
- The woreda health office identifies the health workers by profession, number and placement.

- The woreda health office forecasts and conducts planning of the human resource needs for emergency and identifies the gaps.
- Increases the proficiency of volunteers and staff performing collateral duties in performing epidemiology investigation and mass prophylaxis support tasks
- Increase the number of physicians/health officers and other providers with experience and/or skills in in the diagnosis and treatment of infectious, chemical, or radiological diseases or conditions possibly resulting from a terrorism-associated event who may serve as consultants during a public health emergency
- Plan to mobilize additional human resource from other sources as deemed necessary
- Provide appropriate training for the health workers and RRTs

4.4.5 Monitoring and Evaluation of PHEM preparedness

Measuring the level of preparedness of the PHEM system at different levels is critical to know the capacity of the program to handle outbreaks and any other emergencies in effective manner

Monitoring: It is a routine and continuous tracking of planned activities over the process. This activity focuses on monitoring the implementation of identified activities indicated in the sub-process. Operationalizing developed plans through exercising, training, and real world events, and use after-action reports to support validation and revision of operational and Epidemic Preparedness and Response Plan (EPRP) is also a major activity that contributes to identifying flaws in our plan.

Evaluation: Assesses whether the objectives set are achieved or not**.**

Examples of monitoring indicators for preparedness

a. Coordination and collaboration
   - Number of coordination forum activity reports
   - Number of coordinated responses given to health emergencies
b. Vulnerability assessment and risk mapping
   - List of hot spot areas identified by type of hazard
   - Vulnerable groups identified by type of hazards
c. Planning
   - Preparedness plan available
   - Number of Rehearsal exercise per year
d. Capacity building
   - Proportion of zones, and woredas with PHEM structure
   - Number of need-based trainings conducted

- Proportion of ,zone, and woredas with available stockpile to cover at least one month at lower levels

4.5   Practical Exercises

Exercise 4 .1: Coordination and Collaboration

In this exercise, you will share your experiences by answering the questions given below. First document your individual experiences. Second share your experiences with smaller group. Third each small group selects the best experience and present to the larger group.

1. What is your experience in public health emergency?

2. What structures do exist with regard to collaboration and coordination?

3. Who should be included as members of the emergency management committee? What will be their roles?

4. Who should the Woreda health Office send to the field to investigate? What was the role of RRT?

5. What do you want to improve?

Exercise 4.2: Vulnerability assessment and risk mapping and planning

In this exercise, you will share your experiences by answering the questions given below.

1. Document your individual experiences by listing risks in your woreda
2. Analyze the risks and prioritize using impact and likelihood table
3. Conduct risk evaluation using the risk matrix and develop EPRP plan.
4. Each small group selects the best exampled woreda and present to larger group

Exercise 4.3: Capacity Building
Your woreda has 8 kebeles, with a population as follow:-Kebele Aa= 45000, Bb= 35000, Cc= 45000, Dd=50000, Ee= 30000, Ff=10000, Gg=80000, &Hh = 55000

The tables below provide a national assumption and can give you a general approach on how to estimate of the amount of supplies needed according to the number of people in area at risk. Construct a simple excel spread sheet to calculate the logistic, human resource, operational budget and supplies that are required for your planning exercise.

At risk woredas = woredas affected at least once
Attack Rate = 0.2% (National attack rate) Depends on the region (you can calculate the exact figure if you have previous data)
Severe cases= 20% (you can calculate the exact figure if you have previous data)

Adult = 85%
Children U5 = 15%
Pregnancy = 2%
RL = 120 bag per 20 severe cases
ORS sachet (for 1 liter each)= 650 sachets for 100 cases
Doxycycline = 3 capsules per one severely ill case
Amoxicillin, 250 mg/5ml susp, 100ml/bottle= one bottle for one severely ill CHILD case
Erythromycin, 250 mg= 12 capsuls for 1 severely ill Pregnant case
Tetracycline (TTc) , 250 mg= 24 capsules for 1 severely ill case
IV cannuala = one cannula for sever case
Scalp vein sets = one cannual for one sever case and 50% require it.
Adult Nasogastric Tube (NGT) = one for one sever case, & 15% require it.
Pediatric Nasogastric Tube (NGT) = One tube for one severe case, & 15% requir it
Large water dispensers with tap (marked at 5 & 10 liter level) for making ORS soluation in Bulk= 2 for every 100 patients
Bottles (1 liter) for ORS e.g empty IV bottles) = 20 for sever 100 patients
Bottles (0.5 liter) for ORS = 20 for sever 100 patients
Tumblers, 200 ml = 40 for every 100 patients
Wastage factor = 15%
CTC = 1 CTC with 10 bed. Bed occupancy rate 3 days

Table 2.1 Sample 'excel' worksheet to estimate required supplies for management of cholera

AWD supply plan

S. No	Kebele	Pop	Total Expected cases	sever cases	ORS [satchets]	Zinc 20mg tablets (children)	RL/NS bag of 1000ml	Doxacycline 100 m, tab (Adults)	Amoxicillin 250mg disp.tab/PAC-100 (children)	Tetracycline 20mg, tab (PW)	Tetracycline 20mg, tab (PW)	PNGT	ANGT	IV Cannula	Scalp Vein	CTC
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1			B=0.2% XA	C = 20% XB	D = 6.5 x B x1.15	E = B x 15% x 10 x1.15	F= C x 6 x1.15	G = 3 x C x 85% x1.15	H= C x 15% x12 x 1.15	I = C x 2% x 12 x 1.15	J = C x 2% x 24 x 1.15	K = 15% x C x1.15	L = 85% x C x 1.15	M= 1.15% x C	N= 0.5 x C x1.15	O = C/100
2																
3																
4																
5																
6																
7																
8																
	Total															

Module 5: Recovery from Public Health Emergency

1.1   Introduction

Recovery is defined as the process of rebuilding, restoring, and rehabilitating the community following an emergency, but it is more than simply the replacement of what has been destroyed and the rehabilitation of those affected. It is a complex social and developmental process rather than just a remedial process. The manner in which recovery processes are undertaken is critical to their success. Recovery is best achieved when the affected community is able to exercise a high degree of self-determination.

The recovery phase should begin at the earliest opportunity following the onset of an emergency, running in cycle with the response to the emergency. It continues until the disruption has been rectified, demands on services have returned to normal levels, and the needs of those affected have been met.

1.2   Learning Objectives

- Define recovery, rehabilitation and reconstruction
- Define major public health emergencies
- Understand post emergency assessment process
- Identify the possible intervention after public health emergencies

1.3   Teaching Methods and Resources

1.3.1 Teaching Methods
- Brainstorming
- Lecture presentation
- Exercises
- Group presentations

1.3.2 Teaching resources
- Participants Basic Level PHEM Training Module
- PHEM guideline
- LCD projector
- Computer
- Flip chart
- Marker
- Notebook and pen

1.4 Contents of the module

The major contents of this module are the following:
- Definition of Terms
- Purpose of Recovery from Public Health Emergencies
- When to Conduct recovery activities
- Scope and challenge
- Post Epidemic Assessment and its interventions
- Practical Exercises

1.4.1 Definition of Terms

Read the following definition of terms

Disaster: A disaster is a serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceed the ability of affected society to copy using only its own resources. Disasters are often classified according to their speed of onset (sudden or slow), or according to their cause (natural or man-made).

Recovery: Recovery is defined as the process of rebuilding, restoring, and rehabilitating the community following an emergency, but it is more than simply the replacement of what has been destroyed and the rehabilitation of those affected. It is a complex social and developmental process rather than just a remedial process. Actions taken during the period following the emergency phase is often defined as the recovery phase, which encompasses both rehabilitation and reconstruction. Recovery is a complex and long running process that will involve many more sectors and participants.

Rehabilitation: It refers to the actions taken in the aftermath of a disaster to enable basic services to resume functioning, assist victims' self-help efforts to repair physical damage and community facilities, revive economic activities and provide support for the psychological and social wellbeing of the survivors. It focuses on enabling the affected population to resume more-or-less normal (pre-disaster) patterns of life. It may be considered as a transitional phase between immediate relief and more major, long-term development.

Psychosocial Support: Psychosocial support is an approach to victims of disaster, catastrophe or violence to foster resilience of communities and individuals. It aims at easing resumption of normal life; facilitate affected people participation to their convalescence and preventing pathological consequences of potentially traumatic situations.

Major public health incident: It is defined as the occurrence of an outbreak or another disaster which disrupted the social, cultural, and psychological integrity of the community, interrupted health service provision or required additional health manpower and requires attention of the health sector.

Post Epidemic Assessment: It is the process of determining the impact of a disaster on a society. It is an interdisciplinary process undertaken in phases and involving on-the-spot surveys and the collation, evaluation and interpretation of information from various sources.

1.4.2 Purpose of Recovery from Public Health Emergencies
- To rebuild, restore, and rehabilitate the community following an emergency
- To reduce pathological consequences of potentially traumatic situations
- To identifying the extent of damage caused by an incident thorough conducting post-event assessments
- To determining and providing the support needed to minimize future loss from a similar event.

1.4.3 When to Conduct recovery activities

For the purpose of PHEM, the recovery phase is needed when a major public health incident occur. When the emergency disrupted the social, cultural, and psychological integrity of the community, interrupted health service provision or required additional health manpower and requires attention of the health sector.

1.4.4 Scope and challenge

The scope of the recovery activities range from identifying the extent of damage caused by an incident, conducting thorough post-event assessments and determining and providing the support needed for recovery and restoration activities to minimize future loss from a similar event.

The challenge is to find the right balance in restoring the system to its previous level and how much better it needs to be rebuilt. This will depend on the status of development of a country and what a country can afford to sustain. For a detail, read page 68 on the PHEM guideline.

1.4.5 Post Epidemic Assessment and its interventions

The primary objective of assessment is to provide a clear, concise picture of the post-disaster situation, to identify relief needs and to develop strategies for recovery. It determines options for humanitarian assistance, how best to utilize existing resources, or to develop requests for further assistance. Define the actions and resources needed to reduce immediate threats to health and safety and to pre-empt future serious problems. The assessment must also identify the local response capacity, including

organizational, medical, and logistical resources. The assessment must help decide how best to use existing resources for relief. It must also identify the priorities of the affected people themselves. Knowledge of base line data is essential to identify the "starting point" for post-epidemic needs.

Read the following sections from PHEM Guideline (page 70-76)
- Health system framework
- Health sector PEA and analysis matrix
- Using the analytical matrix for the assessment and monitoring
- Managing the PEA process and its outputs
- Staffing requirements and logistics for PEA health team
- Data collection process, assessment tools, methods and indicators
- Capacity assessment
- Links to other sectors and cross cutting issues

1.4.6 Monitoring and Evaluation of Recovery and Rehabilitation
Read monitoring and evaluation section of recovery and rehabilitation from PHEM Guideline page 89.

1.5   Practical Exercises

Case Study 1

Scenario 1: On 26 Nehase 2004 heavy rain fell in Town A. The rain fell for 24 hours and the environment was over flooded. Hundreds of thousands of people were stuck in office buildings, homes and bus stations around the town. The flood damaged living houses, schools, health centers, bridges and disrupted businesses, traffic and transportation, telephone and internet service. More than 100 people in and around the town lost their lives while thousands were left homeless and stranded with no food and supplies. Drinking water schemes were also damaged. Drug medical supply store was destroyed and taken by flood. Finally, after huge social and economic disruption the flood come back to normal. The town administration office reports the situation to Woreda health office.

1. If you were Woreda PHEM officer, what first action you could take at this moment?
2. How you identify priority for recovery activities
3. If you need to conduct Post disaster assessment, list the possible steps you need to follow?
4. Health center was disrupted and health service was interrupted by flood, what could you do to continuous the service?
5. What kind of health threats you might suspect and why?

Scenario 2: as a result of health section post disaster assessment, a lot of losses were identified. A total of 500 houses were destroyed and 2800 peoples were left without house. 300 were severely wounded and 150 were lost their child. Approximately, more than 100,000,000 birr economy was destroyed.

6. What kind of possible recovery activities you undertake?
7. How you undertake recovery activities?
8. What kind of reconstruction activities you suggest as part of development