



# ONE HEALTH STUDENT MANUAL IN VIETNAM

Manual for Students

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## ABBREVIATIONS

|                 |                                                                          |
|-----------------|--------------------------------------------------------------------------|
| <b>AMR</b>      | Antimicrobial Resistance                                                 |
| <b>CDC</b>      | United States Centers for Disease Control                                |
| <b>CENPHER</b>  | Centre for Public Health and Ecosystem Research                          |
| <b>FAO</b>      | Food and Agriculture Organization                                        |
| <b>HMU</b>      | Hanoi Medical University                                                 |
| <b>INDOHUN</b>  | Indonesia One Health University Network                                  |
| <b>IUCN</b>     | The International Union for Conservation of Nature                       |
| <b>MPH - OH</b> | Masters Public Health, One Health program                                |
| <b>MYOHUN</b>   | Malaysia One Health University Network                                   |
| <b>OH</b>       | One Health                                                               |
| <b>OHCC</b>     | One Health Core Competency                                               |
| <b>OIE</b>      | World Organization for Animal Health                                     |
| <b>PBL</b>      | Problem Based Learning                                                   |
| <b>PH</b>       | Public Health                                                            |
| <b>SARA</b>     | The Support for Analysis and Research in Africa                          |
| <b>SEAOHUN</b>  | South East Asia One Health University Network                            |
| <b>SENASA</b>   | National Food Safety and Quality Service                                 |
| <b>THOHUN</b>   | Thailand One Health University Network                                   |
| <b>USAID</b>    | United States Agency for International Development                       |
| <b>UNICEF</b>   | United Nations Children's Fund                                           |
| <b>VOHUN</b>    | Vietnam One Health University Network                                    |
| <b>WASH</b>     | Water, Sanitation and Hygiene (formerly Water and Sanitation for Health) |
| <b>WHO</b>      | World Health Organization                                                |
| <b>WWF</b>      | World Wildlife Fund                                                      |

## DEFINITIONS

**Advocacy:** Promoting and encouraging decision-makers to issue policies in accordance to the needs and/or demands of groups or individuals.

**Antimicrobial Resistance:** The ability of a microorganism such as bacteria, viruses, and even some parasites, to stop an antimicrobial (like antibiotics, antimalarials, and antivirals) from working against it. As a result, treatments become ineffective, allowing the infections to continue and possibly spread to other agents. This is a prominent issue in both human and animal health.

**Collaboration and Partnership:** The capacity to maintain and strengthen collaboration in One Health initiatives among individuals, stakeholders, communities, and other key actors.

**Communication and Informatics:** The capacity to collect, analyze, review, share and exchange information among disciplines and sectors to establish, strengthen and promote One Health programming.

**Culture and beliefs:** The capacity to comprehend, analysis, and assess the diversity of social standard, responsibility, and practice of individuals, communities and organizations. This diversity may affect the planned outcomes of a One Health program.

**Eco-Health:** Aims to build capacity in participatory, collaborative and trans-disciplinary research, meaning participants and researchers need to develop skills and involve different stakeholders in the research and learning process. Eco-health is an emerging field of study that examines how change's in the earth's ecosystems affect human and animal health.

**Inter-disciplines:** A set of knowledge and theories that is produced as the result of the collaboration and interaction of two or more disciplines

**Leadership:** The capacity to build visions for interdisciplinary programs, to make strategic decisions in collaboration, and commitment to promoting an integrated approach in addressing One Health challenges.

**Management:** The capacity of planning, designing, implementing, monitoring and assessing the multidiscipline programs' activities to maximize the effectiveness of these programs.

**Multi-disciplines:** Involvement of two or more disciplines that has the same interests in solving a health related issue but with no previous interactions or different approaches.

**One Health:** An approach that encourages the collaboration of different sectors and disciplines (i.e. public health, veterinarian services, environmental science, etc.) at a local, national, and international level to use shared knowledge to improve human, animal, and environmental health.

**One Health Core Competency:** The basic knowledge, skill or behaviour that members of the One Health team needs to master to implement the best One Health intervention.

**Policy:** Action of a government, including socio-economic, environmental, and/or cultural, to achieve particular goals and actions.

**One Health Economics:** Considers the socio-economic burden of emerging infectious diseases, outbreaks, and other health related epidemics, will have on the economy, human beings, and the environment. This also includes the consideration of climate change and disease management.

**System thinking:** The ability to analyze the interactions and dependences among human, animal, environment and ecological factors and how these interactions have impacts on the relationship between individuals, groups, organizations and communities.

**Trans-discipline:** The integration of two or more disciplines to share knowledge and solve health related issues.

**Values and Ethics:** The capacity to identify and respond to One Health issues on different scales, with honesty, equality, responsibility and adaptability.

## CHAPTER 1

### Introduction to One Health

#### Overview/Background

One Health (OH) is a trans-disciplinary collaborative effort which aims to improve the health of animals, humans, and the environment. This knowledge can be applied for the optimal health of all communities, animals, and the environment on a local, national, and global scale. The OH approach calls for a shift in developing, implementing and sustaining health policies to engage with medicine, public health, veterinary science, environmental sciences and other fields that relate to health, land use and human interactions.

The South East Asia One Health Network (SEAOHUN) aims to foster sustainable trans-disciplinary capacity building in response to infectious and zoonotic diseases. This network includes South East Asian universities from Vietnam, Thailand, Malaysia, and Indonesia. Additional information can be found on the website link: <http://seaohun.org>

The network in Vietnam, known as Vietnam One Health University Network (VOHUN), focuses on applying OH policies and teachings in Vietnam. VOHUN was officially created in 2011 and is based out of the Hanoi University of Public Health in Hanoi, Vietnam. The vision of VOHUN aims to foster sustainable trans-disciplinary capacity-building in response to emerging and re-emerging infectious and zoonotic diseases throughout Vietnam. The VOHUN mission is to leverage the training, education, and research capacities of the university network to build the skills, knowledge and attitude base for OH leaders.

This manual will serve as a learning resource and reference source for students as they learn about the One Health approach, in courses, training sessions, and other programs. This can also be used to assist students as they enter into the workforce. This manual aims to guide aspiring OH professionals all the necessary knowledge and skills they need to address health related problems on a local and nation scale, while promoting solutions, mitigating potential disease outbreaks, and developing the One Health workforce in Vietnam and throughout South East Asia!

This manual was developed in collaboration between VOHUN, the Hanoi Medical University (HMU)'s Centre for Public Health and Ecosystem Research (CENPHER), and Veterinarians without Borders (VWB) Canada.

## Key Concepts

The VOHUN manual contains 16 modules which breakdown into seven core competency modules and eight technical modules. This manual will explain the basic terminology and fundamentals of the OH approach to students, either as individual modules or an integrated course. These modules will give students all the knowledge, abilities, and skills they need in identifying and solving OH problems.

| The Seven One Health Core Competency Modules                                                                                                                                                                                                                       | The Nine One Health Technical Modules                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Collaboration and partnership</li><li>• Values and ethics</li><li>• Leadership</li><li>• Planning and Management</li><li>• Communication and Informatics</li><li>• System thinking</li><li>• Culture and beliefs</li></ul> | <ul style="list-style-type: none"><li>• One Health Concepts and Knowledge</li><li>• Fundamentals of Infectious Disease</li><li>• Public Health</li><li>• Behaviour Change</li><li>• Ecosystem Health</li><li>• Infectious Disease Management</li><li>• Epidemiology and Risk Analysis</li><li>• One Health Economics</li><li>• Antimicrobial Resistance</li></ul> |

## Seven One Health Core Competency Modules

### 1. Collaboration and Partnership Module

A core principle of the OH approach focuses on forming partnerships on a local, national, and global scale to encourage collaboration and knowledge-sharing. This module builds an understanding of collaborating and partnering in the context of OH approaches in Vietnam. This will allow health challenges to be addressed while promoting inclusion and gender equity across human, animal, environmental health practices and in other relevant disciplines.

### 2. Values and Ethics

Students will learn how to demonstrate values and ethics, in a professional manner, throughout the planning and implementation of interventions. This will ensure that students understand the importance of respect and fairness, and select the most culturally appropriate interventions to solve OH problems. This module will create a comprehensive understanding of information sharing and analysis to select the most appropriate OH intervention.

### 3. Leadership

This module will discuss what leadership is and how a cultural/sector lens can impact perspectives on effective leadership. Students will learn how to develop their leadership skills, knowledge, and behaviours to be successful One Health professionals. This will allow for them to reflect on their own leadership styles, its impact on group scenarios, and how to encourage others to take action.

### 4. Planning and Management

Management and planning focuses on selecting and implementing the correct methodologies to OH interventions. This includes establishing policies, procedures, and systems to guide, monitor, and evaluate.

### 5. Communication and Informatics

This modules focuses on effective communication and information sharing throughout networks, disciplines, and sectors. Students will learn about effective verbal and non-verbal communication methodologies to improve their communication abilities. This competency will teach basic communication styles and techniques to increase understanding of the risks of communication, and the various ways information is shared.

### 6. System Thinking

Based on a problem-based learning approach, this module equips students with the necessary skills to use a systems thinking approaches to tackling health problems and/or emerging diseases. Students will learn to work with an OH team, using systems maps to develop solutions, integrate information, to develop strategies to address OH challenges, and to mitigate potential unintended consequences.

### 7. Culture and Beliefs

Culture and beliefs are a set of capabilities that focus on effective communication and interaction through an understanding of social norms, roles, and practices of individuals, communications and organizations. Understanding cultural competencies and beliefs will allow the students to generate trust in communities, by identifying different cultures, values, and ethics, and select the most appropriate intervention.

## **Eight One Health Technical Modules**

### **1. One Health Concepts and Knowledge**

Students will learn the history of One Health, setting from its origins to current issues and methodologies. This will allow them to explain how integrating humans, animals, and the environment can address emerging pandemic health threats.

### **2. Fundamentals of Infectious Disease**

This module will help students foster an understanding of infectious disease principles in the context of One Health. This module will use an OH approach to examine diseases in humans and animals so students will understand the ways in which infectious diseases spread and influence everyday life, in relation to culture and traditional practices.

### **3. Public Health**

This module integrates the OH approach into public health by looking at the relationship between humans, animals, and ecosystems. This explores how to prevent diseases and promotion of health within groups of people, from local communities to the entire country. Students will also use system thinking to analyze issues and create effective policies.

### **4. Behaviour Change**

Students will use research of behaviour modification from a health care perspective to develop behaviour change models for OH interventions. This will allow them to analyze how human behaviour impacts community, animal and ecosystem health.

### **5. Ecosystem Health**

The ecosystem health module will foster an understanding of the basic principles of ecosystem health through an OH approach. Students will explore three ecosystems: mangroves, tropical rainforests and coral reefs, and analyze how natural and anthropogenic changes to the environment can impact animal and human health on a local, regional, and national scale.

### **6. Infectious Disease Management**

This module provides a comprehensive understanding of analyzing infectious diseases through multiple perspectives for students. This covers the spectrum of disease management, including surveillance, health promotion, prevention, detection, treatment and rehabilitation. Students will develop an understanding of the concept within the One Health approach, on an individual and societal scales.

### **7. Epidemiology and Risk Analysis**

This module will focus on epidemiology, epizootiology, and population health. Students will also learn how to conduct a risk analysis assessment. Risk Analysis is the systematic approach to evaluating the likelihood of an occurrence and the magnitude of its impact. Together, epidemiology and risk analysis introduces students with limited knowledge to the history, concepts, theories, terminologies and practices.

### **8. One Health Economics**

Students will learn the economic approach in planning One Health interventions and preventative measures. They will learn how to consider human health, animal welfare, and the environment when analyzing the economic lens for disease outbreak and management practices. This will allow future OH practitioners to advocate for further OH interventions on a national and local scale in Vietnam, and worldwide.

### **9. Antimicrobial Resistance**

Due to the increasingly serious threat of antimicrobial resistance (AMR) to global public health, this module will equip students with an understanding of its foundation, evolution and challenges. They will learn about the impacts of AMR across society and government sectors, how to counteract AMR health-related problems present in human and animal health, and how to advocate for proper antibiotic usage.

## CHAPTER 2

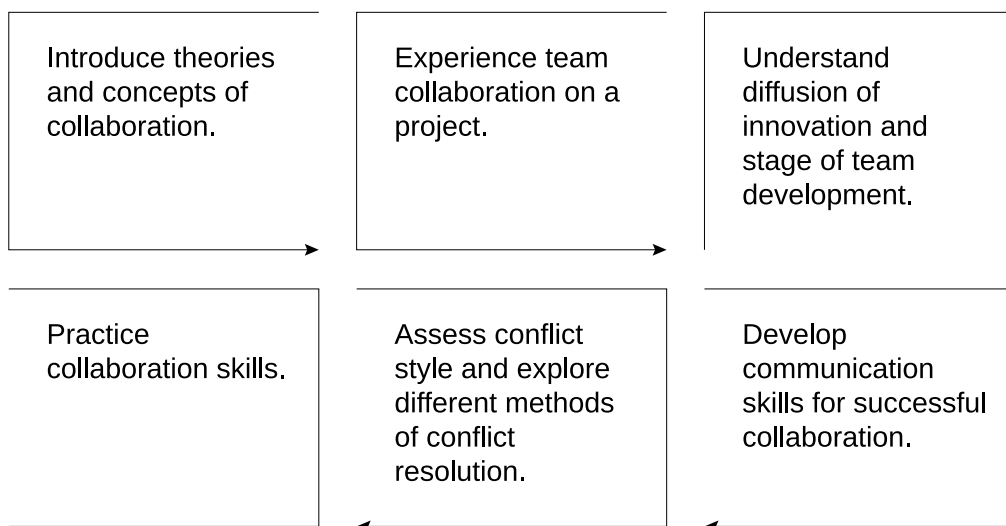
### One Health Core Competencies and Technical Modules Facilitator's Guide

## MODULE 1 - COLLABORATION AND PARTNERSHIP

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module builds an understanding of and aptitude in the basic principles of collaboration and partnership, in the context of a One Health approach to addressing complex health challenges. Key outcomes of the module are:</p> <ul style="list-style-type: none"> <li>• Have the knowledge, skills, and attitudes to complete a collaborative project</li> </ul> |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                                                           | Learning Objectives to Develop Competency                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Promote inclusion of diverse constituencies across human, animal & environmental health | <ul style="list-style-type: none"> <li>• Collaboratively organize a team and complete a project.</li> <li>• Listen, speak and write to be understood of all (gain understanding of personal working style, styles of others)</li> </ul> |

| Competency #2                                                                       | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Share vision, power, responsibility, accountability, and credit among collaborators | <ul style="list-style-type: none"> <li>• Compare and contrast individual work, group work, and team collaborative work.</li> <li>• Explain the typical stages in the development of a team.</li> <li>• Demonstrate active listening skills and conflict resolution skills</li> <li>• Demonstrate constructive conflict resolution skills</li> </ul> |

### Topic Breakdown

| What is Collaboration and Why Collaborate? |                                                                                                                                                                                                                                             |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                         | <ul style="list-style-type: none"> <li>• Compare and contrast multidisciplinary, interdisciplinary and trans-disciplinary</li> <li>• Describe what collaboration means, and its benefits and challenges in One Health situations</li> </ul> |

- Read Article, "Multi-Disciplinarity, Inter-Disciplinarity, and Trans-Disciplinarity in Health Research, Services, Education and Policy: 1 Definitions, Objectives, and Evidence of Effectiveness" (Choi, B. and A. Pak)

### Student Activity

In an individual activity, define each of the terms listed below:

| Term               | Definition |
|--------------------|------------|
| Discipline         |            |
| Multi-disciplinary |            |
| Inter-disciplinary |            |
| Trans-disciplinary |            |

## Motivations for One Health Collaboration

Where does One Health fit in with our definitions of different degrees of collaboration?

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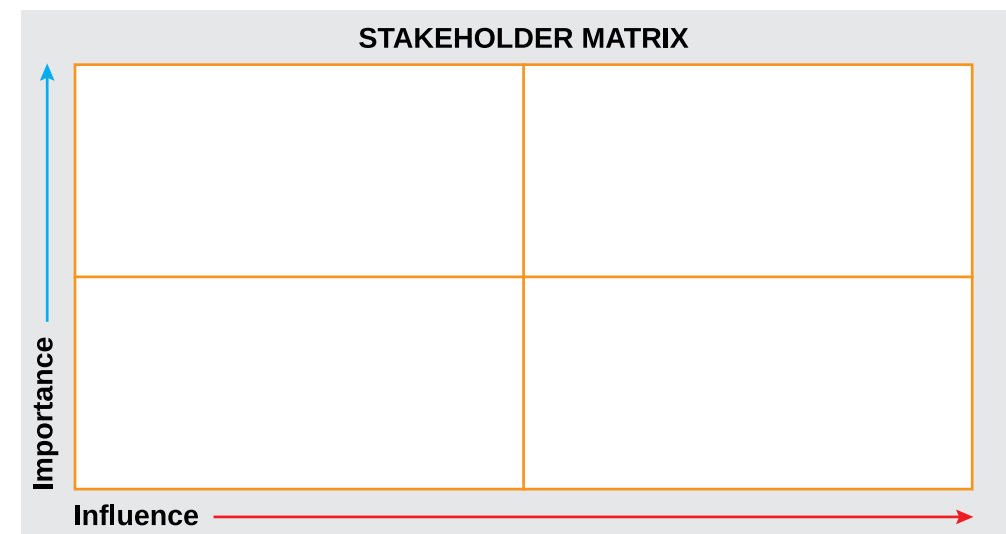
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## Benefits and Challenges of Collaboration

Consider your own experiences along with everything else you know about One Health. What do you anticipate are some of the benefits and challenges of collaborating in a One Health setting?

| Benefits of Collaborations | Challenges of Collaborations |
|----------------------------|------------------------------|
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |
|                            |                              |



## Developing Stakeholder Matrices

Directions:

- List the stakeholders who might be involved with the issue that you were assigned
- Create a grid where you think the stakeholders would fall, based not heir importance and influence

Consider the following questions:

- Which of the stakeholders can become partners to ensure the success of the One Health initiatives?
- How can you create these partnerships?

**Notes:** .....

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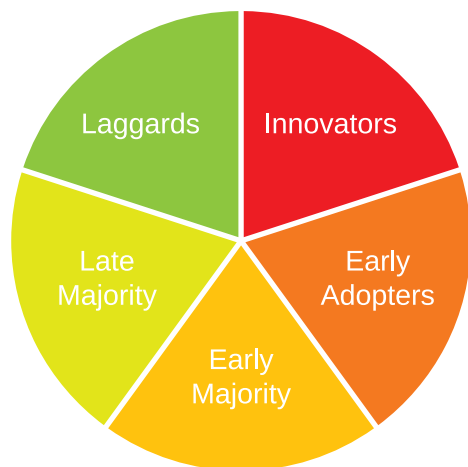
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## EFFECTIVE COLLABORATION

### Diffusion of Innovation and Stages in the Development of a Team

- |                     |                                                                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives | <ul style="list-style-type: none"> <li>• Assess adaptability to technological change</li> <li>• Explain the typical stages in the development of a team</li> </ul> |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|



### Diffusion of Innovation

What category are you?

### Reflection Questions:

- What are the benefits of working with your innovation type? Challenges?
- What challenges might this innovation type have when working with other types?
- How might they overcome these challenges?

Notes: .....

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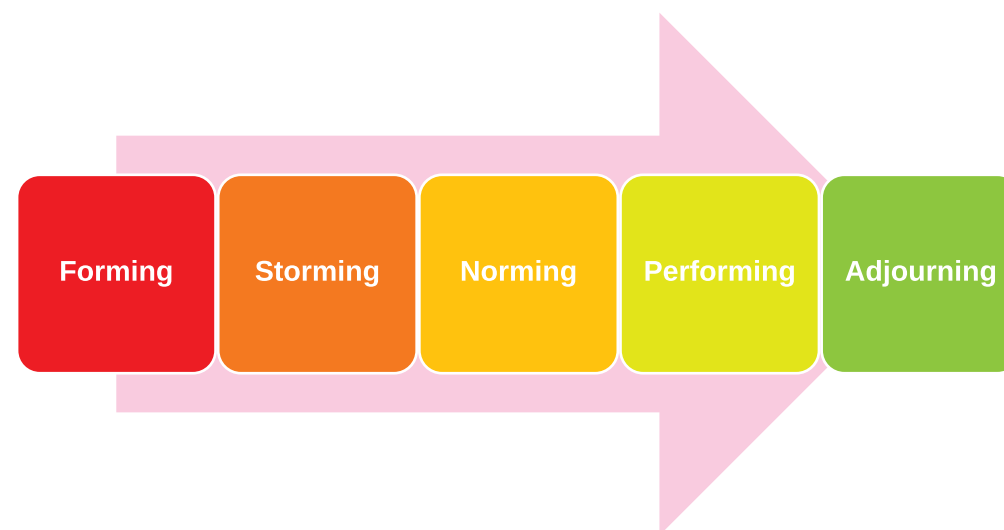
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### When Do You Collaborate?

Collaboration and teamwork does not mean that everyone has to do everything together all the time. What are some activities best done individually? In a small group? With the whole team?

Write the answers below.

| Individually | In a small group | With the whole team |
|--------------|------------------|---------------------|
|              |                  |                     |
|              |                  |                     |
|              |                  |                     |
|              |                  |                     |



Notes: .....

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### Team Development

Notes: .....

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### Homework Assignment

For the next week, keep a speech diary. Each day, record any acronyms, jargon, idioms or 'buzz' terms that you use either in speaking or writing. Do not censor what you say! But do note terms you use often when speaking and writing.

| Communication Skills for Collaboration |                                                                                                                                                                                                                                  |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives                    | <ul style="list-style-type: none"> <li>• Listen, speak and write different communication skills that can be understood by all individuals (community beneficiaries, team members, internal and external stakeholders)</li> </ul> |
| Pre-class Assignment                   | <ul style="list-style-type: none"> <li>• Have students keep a speech diary for a week</li> </ul>                                                                                                                                 |

## Communication for Collaboration

Communication responsibilities of One Health Team members:

- Take ownership for what you say
- Take responsibility for making sure you are heard and understood
- Use terminology and examples that your audience understands
- Be aware of body language
- Always work to maintain the trust and confidence of those with whom you are communicating/working

### George Orwell's Rules

- Never use a metaphor, simile, or other figure of speech which you are used to seeing in print.
- Never use a long word where a short one will do.
- If it is possible to cut a word out, always cut it out.
- Never use the passive where you can use the active. (NOTE: For this point make sure you pay particular attention to the active voice and alternatives.)
- Never use a foreign phrase, a scientific word, or a jargon word if you can think of an everyday English equivalent.
- Break any of these rules sooner than say anything outright barbarous.

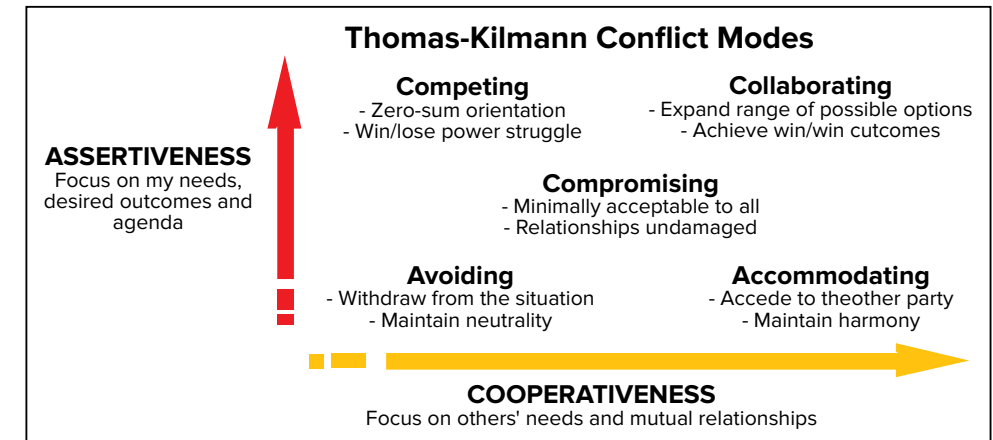
### Conflict Resolution and Collaboration

|                      |                                                                                                         |
|----------------------|---------------------------------------------------------------------------------------------------------|
| Learning Objectives  | <ul style="list-style-type: none"> <li>• Demonstrate constructive conflict resolution skills</li> </ul> |
| Pre-class Assignment | <ul style="list-style-type: none"> <li>• Thomas-Kilmann Conflict Modes Self-Assessment</li> </ul>       |

Take a self-assessment of how you handle conflict. A copy of the Thomas-Kilmann Conflict Modes Self-Assessment is listed below:

<http://www.wmcaclerks.org/Resources/Documents/2012-2013/2013%20Conference/Handouts/Dr.Seuss-KilmanConflictModeInstrument.pdf>

## Thomas-Kilmann Conflict Modes



In a small group, discuss and be prepared to share:

- How do you perceive 'conflict'? Develop a metaphor or think of an image you associate with conflict as a group.
- In what conflict situations is your style beneficial?
- In what conflict situations is your style not the best and why?

**Notes:** .....

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### Conflict Resolution Through:

- Negotiation
- Mediation
- Arbitration
- Collaboration
- Consensus

**Notes:** .....

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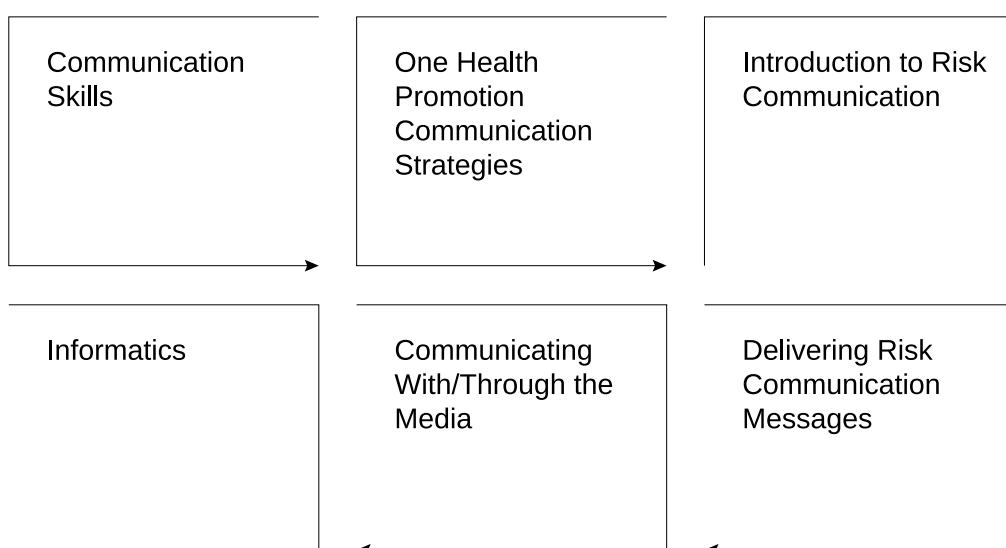
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## MODULE 2 - COMMUNICATION AND INFORMATICS

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module fosters an understanding of effective communication and information sharing across disciplines and sectors. Key outcomes include:</p> <ul style="list-style-type: none"> <li>• Describe how to use basic communication techniques and tools in the One Health approach</li> <li>• Demonstrate familiarity with various information management and technological applications that may be used in the One Health approach</li> </ul> |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Course Competencies

| Competency #1                                     | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe basic communication techniques and tools | <ul style="list-style-type: none"> <li>• Demonstrate communication skills that encourage the open communication needed during an effective One Health response.</li> <li>• Understand how a variety of communication techniques may be used to effectively articulate and exchange ideas on the implementation of One Health in various situations</li> <li>• Apply communication strategies for promotion OH concepts (including two-way communication)</li> </ul> |

| Competency #2                                                | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand the fundamentals of risk communication            | <ul style="list-style-type: none"> <li>• Identify the designated spokesperson(s) for particular issues</li> <li>• Demonstrate the ability to communicate risk at multiple levels</li> <li>• Communicate effectively with the media and public</li> </ul>                                                         |
| Competency #3                                                | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                        |
| Understand a variety of ways to manage and share information | <ul style="list-style-type: none"> <li>• Collect, manage, organize, and report data to ensure that each person in the team has the information they need to do their jobs</li> <li>• Organize and analyze data and disseminate findings using available tools, including database and social networks</li> </ul> |

### INTRODUCTION TO COMMUNICATION SKILLS

|                     |                                                                                                                                                                                                                                                                                             |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives | <ul style="list-style-type: none"> <li>• Demonstrate communication skills that encourage open communication</li> <li>• Understand how a variety of communication techniques may be used to effectively articulate and exchange ideas during the implementation of OH initiatives</li> </ul> |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### What is Communication?

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Before speaking, stop and ask yourself:

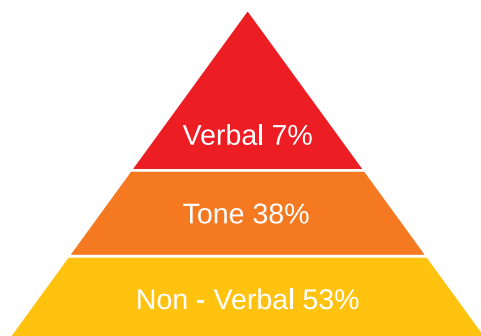
- What is the intent or purpose of the communication?
- What needs to be communicated?
- To whom is the information being communicated to?
- What do you know about the individuals receiving the information?
- How are you going to communicate the information?

## Body Language

You need to give a co-worker a message, either based on good or bad news. Then turn to your partner and only say: *"Our supervisor just asked me to let you know that...."*

What do you think about....

- How many people guessed right?
- How did you know if the message was positive or negative?
- Has this ever happened to you in real life?
- What are the lessons learned from this exercise?



Notes: .....

## Face-to-Face or In-Person Communication - Listening

What do you think?

- Have you ever had someone carefully listen to what you said?
- How did that make you feel?
- What did the person do that communicated to you that they were listening?

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### Personal Listening Assessment

| Rate how often you demonstrate the behaviours described in the statements |       |        |           |       |        |
|---------------------------------------------------------------------------|-------|--------|-----------|-------|--------|
| Statements                                                                | Never | Rarely | Sometimes | Often | Always |
| My family and friends say I am a good listener                            |       |        |           |       |        |
| I find myself daydreaming while I try to listen                           |       |        |           |       |        |
| I find myself pretending to listen                                        |       |        |           |       |        |
| I fidget a lot when I am trying to listen to others                       |       |        |           |       |        |

|                                                                                               |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------|--|--|--|--|--|
| I only focus on the parts of a conversation I am interested in                                |  |  |  |  |  |
| If I disagree with an opinion or statement someone else has made I have a hard time listening |  |  |  |  |  |
| I finish people's thoughts and sentences                                                      |  |  |  |  |  |
| I listen to part of a story and then start to think about what story I will tell next         |  |  |  |  |  |
| I can accurately repeat back what someone has told me                                         |  |  |  |  |  |
| I let the people I am listening to know that I am interested by using verbal and non-verbals  |  |  |  |  |  |

|           |               |         |               |      |
|-----------|---------------|---------|---------------|------|
| Excellent | Above Average | Average | Below Average | Poor |
|-----------|---------------|---------|---------------|------|

**Instructions:** Read the statements below and honestly assess how often you demonstrate these behaviours, then respond to the open-ended questions

Which word on the scale above best describes how you rate your listening skills?

.....

Explain why you gave yourself this rating

.....

.....

### Putting It All Together

**Instructions:** In groups of 3, assign the following roles: Interviewer, interviewee, and observer

- The interview topic is: Communication and culture
- The interviewer has 5 minutes to interview the interviewee on the topic.
- The observer should take notes on:
  - What did the interviewers do effectively (body language, tone and words) that helped them elicit information from the interviewee? What actions created barriers?
  - How did the body language of the interviewee portray confidence and competence? Were they able to get their message and thoughts across clearly?

### Self Reflection - What do you think?

- What did you do effectively in terms of your spoken words? Body language?
- How effective of a listener were you?
- What could you do to be more effective both as a speaker and listener?

### Forbes Magazine 10 Communication Tips

- Do what you say you will do and keep promises
- Get personal
- Get specific
- Focus on the leave-behinds not the takeaways
- Have an open mind
- Listen
- Replace ego with empathy
- Read between the lines
- When you speak, know what you are talking about

Notes: .....

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### ONE HEALTH PROMOTION COMMUNICATION STRATEGIES

Learning  
Objectives

- Apply communication strategies for the promotion of One Health Concepts

### Promoting a One Health Approach

In your group, select one of the following scenarios, develop a communication strategy for the threat and prepare a 5-10 minute presentation to give to the class. Your presentation needs to include:

- Name of community or organization
- Current One Health issues or challenges
- Key stakeholders
- Key messages
- Communication methods
- Resources and time needed



### Scenario 1: Outbreak of Salmonellosis from Wedding Reception

Laboratory tests on samples collected from victims of the wedding reception food poisoning in Tanjung Dawai, which claimed 4 lives last week, confirmed chicken served was contaminated with salmonellae.

State Health Department director Dr Ismail Abu Taat said the 2nd test on the samples confirmed the presence of the bacterium, which can cause a food borne illness. However, he said that salmonella bacteria are commonly found in livestock, and the department concluded that those who prepared the dish failed to clean the chicken properly.

Dr Ismail said earlier investigations revealed that the chicken used for the ayam masak merah dish had been sent to the host in Kampung Huma a day before the wedding reception. "The chicken was sent to the house on Friday [4 Oct 2013?] evening, but it was only cooked at 4:00 pm the next day. This had allowed the bacteria to replicate in the chicken." "Investigation also revealed that the chicken was contaminated and gave off a foul smell. However, those who prepared the dish only removed the spoiled portion and cooked the meat," he said. More than 280 guests, including the bride's family, suffered symptoms such as diarrhea and vomiting; after the feast, 4 guests died.

Health Minister Datuk Seri Dr S. Subramaniam said illness can also occur when there is a long delay between preparing and consuming food.

*Communicated by: ProMED-mail from HealthMap alerts promed@promedmail.org*

*Source: New Straits Times [edited]*

<http://www.nst.com.my/nation/general/chicken-dish-cause-of-food-poisoning-at-kenduri-1.370683>

### Scenario 2: Outbreak of Leptospirosis in Thailand

There is an outbreak of leptospirosis in the northeastern part of Surin district [Surin province]. 107 cases have been confirmed and 7 people are dead. Health authorities of the prefecture consider farmers at great risk and recommend that they wear rubber boots and rubber gloves in order to prevent infection during farm work. Leptospirosis is an infection caused by Gram negative bacteria of the genus *Leptospira* (the natural host are wild animals such as rats). It is a zoonotic disease and infection occurs orally and percutaneously from water and soil. In humans, the incubation period is about 3-14 days and symptoms include chills, fever, headache, malaise, and myalgia. In the mild form, patients soon recover. However, in the severe form (Weil's disease), jaundice, bleeding, kidney failure, and liver damage are observed, and the mortality rate is 5-50 percent. Epidemics

of leptospirosis occur from July to October in Southeast Asia, including Thailand. [Leptospirosis outbreaks occur with some regularity during periods of flooding in Thailand as a result of people wading through contaminated water. Most cases occur among agricultural workers, notably rice producers. The principal reservoirs in Thailand are chronically infected rats and dogs that excrete *Leptospira* in their urine (see ProMED-mail posts Leptospirosis - Thailand (02) 19971121.2345 and Leptospirosis - Thailand (Nan)(02): background 20060913.2592).

Communicated by: ProMED-mail from HealthMap alerts [promed@promedmail.org](mailto:promed@promedmail.org)  
 Source: Bangkok Shuho [in Thai, trans., edited]  
[http://www.bangkokshuho.com/article\\_detail.php?id=137](http://www.bangkokshuho.com/article_detail.php?id=137)

| Communication Strategies Worksheet |                        |                  |
|------------------------------------|------------------------|------------------|
| Description of the issue/problem:  |                        |                  |
| Key messages:                      |                        |                  |
| Audience                           | Communication Vehicles | Resources & Time |
|                                    |                        |                  |
|                                    |                        |                  |
|                                    |                        |                  |
|                                    |                        |                  |

| INTRODUCTION TO RISK COMMUNICATION |                                                                                                                                                                                                                                                                 |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives                | <ul style="list-style-type: none"> <li>• Understand the fundamentals of risk communication</li> <li>• Demonstrate the ability to effectively communicate risk to multiple audiences (public, politicians, media, stakeholders, health workers, etc.)</li> </ul> |

### Risky Behaviour

Think about a time when you:

- Wanted to do something that others considered risk, or not
- Saw someone taking a risk that made you worry

Write a short paragraph about the situation answering the questions below:

- How did you communicate about the risk to the other persons? (Either

the individual who thought you were taking a risk, or the individual that you thought was taking a risk)

- Was your communication well received?
- What made your message effective or ineffective?

### Paragraph

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**Risk Communication** - an open, two-way exchange of information and opinion about risk that leads to better understanding, and better risk management decisions by all involved.

Complete the following sentences:

I believe that risk is ...

.....

When I take a risk, I feel ...

.....

When I see someone else taking a risk, I feel ...

.....

### 10 Best Practices of Risk Communication

- Risk and crisis communication is an ongoing process
- Conduct pre-event planning and preparedness activities
- Cost partnerships with public
- Collaborate and coordinate with credible sources
- Meet the needs of media and remain accessible
- Listen to public's concerns and understand audience
- Communicate with compassion, concern and empathy
- Demonstrate honesty, candor and openness
- Accept uncertainty and ambiguity

## Applying the Knowledge: developing Talking Point

*For your assigned scenario and audience, prepare your talking points which follows after these scenarios.*

### Scenario 1: Rabies Case in Bali

Bali Island is one of the most important tourist destinations in Indonesia. Every year more than one million foreign and domestic tourists visit this Island. Tourism businesses now become primary income for people in this Island. This island is one among 35 Provinces in the Republic of Indonesia. With a total of 3,890,000 inhabitants, Bali Province consists of 9 Districts and 54 sub districts. Despite most of the Indonesian is Muslim, Hinduism is the religion of the majority of Balinese. Due to their practice and belief, Balinese show high compassion to animals, particularly dogs. In their belief, dog is the animal who will accompany their souls to enter the heaven. As a result of that belief, dogs are easily found in the streets because most of the owned dogs are roaming freely (74%), whereas the rest are kept in houses resulting the vaccination coverage is low.

Bali was historically rabies-free, but in 2008 rabies was detected on a peninsula on the South of the island, probably introduced by infected dogs travelling on fishermen's boats. Balinese government is very concern about this disease especially as it happens on the island of tourist holiday hotspots as it will ruin the tourism industry. Starting December 2008, the Balinese government began culling using strychnine-laced baits or blow darts to unconfined dogs in areas of big towns like Denpasar and Badung with confirmed rabies cases and began vaccinating dogs at fixed posts. It was estimated from a survey in Badung, where the ratio of human to dog ratio was 8.3 human to 1 dog.

Made, 27 years old, is a father of three children who lived in Village Api-api of Bali Island. On August 11th 2011, he was bitten by his dog's neighbour. The dog bite on Made's right heel and caused small laceration. His family later brought him to Private Practice Midwives nearby as there was no medical facility in the village. The midwife washed the wound according to the standard operating procedures. Made started to developed flu-like symptoms such as discomfort, fever, and headache. On December 3, 2011 Made developed delirium and seizures. He was taken to the sub-district health center by his family members who later referred him to the district hospital. However, on December 5, 2011 Made died.

The same dog who attacked Made somehow escaped to the nearby village which is Bota village, and attacked new victims including a human, a dog and cattle. Eventually, the dog died after being hit with stones by the angry Bota

villagers and the body of the dog was thrown into the nearby bushes. The new victim, Wayan, was taken to the district hospital for anti-rabies treatment. The wound of the victim was cleaned with disinfectant and was given anti-tetanus along with HRIG and initiated rabies vaccine. Wayan recovered 15 days later after being treated with anti-rabies treatment. The district hospital notified the case to the District Health Services, and District Livestock Services for the them to conduct further investigations.

The veterinarians from District Livestock Services conducted an investigation at Bota village by gathering the dogs with bite marks on the body inclusive the owned dogs, to be observed in a quarantine facility for 14 days. The villagers were very angry at the authorities and becoming less cooperative. Nevertheless the villagers obeyed the authority's advice after a public dialogue was carried out. At the same time, the District Livestock Services observed the bitten cattle for any abnormal behavior and clinical symptoms.

On the 10<sup>th</sup> day of the quarantine, the bitten dog were found dead at the quarantine facility. A sample from the unfortunate dog's brain was sent to the laboratory for microscopic examination. At the same time, the health authority conducted an enquiry of the history of the patient and found out that Wayan was bitten by a dog without prior provocation from the victim. They also found out that the dog was new to the area. Fortunate enough, the cattle did not show any sign of rabies infection.

At the Api-api village, more dogs were seen having abnormal behaviour and some villagers were getting bitten by these dogs. Most of the victims seek treatment at Private Practice Midwives and the same advice given to Made that they should go to the subdistrict health center at South Kuta to get anti-rabies vaccine. The victims complied with her advice and took the anti-rabies treatment. The victims recovered after 15-25 days and return to their daily activity soon after. The subdistrict health center notified the cases to the District Health Services, and District Livestock Unit, where the same actions to the dogs were applied.

Meanwhile, the result of laboratory examination showed positive rabies infection on sample of dog's brain that bitten Wayan. The District Livestock Services took the action of launching rabies control program in the areas by mass vaccination to the owned dogs and culling of the stray dogs. This program created conflict between District livestock authority and villagers to the extent that the villagers hide some dogs to other areas. Mass dog vaccinations substantially reduced rabies incidence in Bali.

## Scenario 2: Leptospirosis in Cambodia

Outside a coastal village in Cambodia that lies near a river there has been unusually heavy flooding this past monsoon season. Farmers growing rice and other crops were temporarily displaced from their homes, as were their animals, moving from the coastal areas to higher ground. Flooding has been occurring on a more frequent basis in Cambodia—six times over the last ten years. This is a sharp increase over previous decades. And floods are becoming more severe.

The process farmers use to plant rice is weather-dependent. The amount of rainfall determines the size and quality of the rice crop, with a potential for large variations from year to year. When floods occur, farming is disrupted, crops are damaged, and farmers lose money. Many farmers practice agriculture at a subsistence level, using traditional methods that are low in productivity. They depend on their oxen to help plough the fields, to furrow and turn up the soil, and to rake the fields before they plant rice. Most farmers have one bull, a couple of steer, and a couple cows with calves. After the flooding subsided and the farmers, with their animals, returned to their land from the hills, they noticed their cows experiencing “abortion storms” one to three weeks later. In addition, the calves were showing symptoms of illness, such as jaundice and pulmonary congestions. As a result, many of the calves couldn’t be used to cultivate the soil. Because of this, the farmers turned to scattering rice seed on the untilled soil. But soon rodents came and ate the seed. At the same time, many farmers and their families in the area were getting sick with high fevers, headaches, redness in the eyes, and jaundice. Word of their illness reached the district health office, which sent out public health workers to investigate the outbreak. When the health workers visited the farmers, they noticed that some of the animals were experiencing symptoms of illness.

Leptospirosis is an infectious disease that is dependent upon the interaction of humans, animals, and the environment. Increases in the frequency and intensity of flooding in Cambodia have had an effect on the regularity of the seasons. Global climate change, including extreme weather events, is resulting in a rise of leptospirosis outbreaks. Weather conditions and a decline in the population of farm animals are leading to lower farm productivity. Rural populations, in particular, have a strong dependence on the regularity of seasons, controlled by the climate, for their well-being.

Because the vast majority of Cambodians live in rural areas, the flooding of their farms makes them more vulnerable to poverty. Other factors, such as industrialization, deforestation, and changes in land use also contribute. Cambodia has one of the highest rates of deforestation in the world. Flooding

and mudslides are caused by the deforestation of the mountain ranges. Without vegetation to help hold the soil together, mountain ranges can erode by wind and water. These factors present serious challenges to reducing poverty, ensuring equity, and securing people’s livelihoods.

Only 30% of Cambodians have access to safe drinking water and 19% to adequate sanitation. Most get their drinking water by walking long distances to rivers. About 75% of the rural population practice open defecation. People use rice paddies, banana groves, and other water sources to dispose of their own waste, thus polluting the water on which they depend. A lack of proper sewage and waste-water treatment, coupled with poor standards of hygiene, results in many people being forced to drink contaminated water.

Persistent poverty, limited sources of land management, institutional and governmental constraints, poor sanitation and rodent management all contribute to the risk of spirochetes such as leptospirosis causing disease in humans and animals.

### Background on Leptospirosis

Leptospirosis is a disease that is caused by the bacteria *Leptospira* sp. There are multiple species and serovars (subspecies) that can infect a wide variety of animal species. The bacteria live in fresh water in many areas of the world and are especially common in tropical areas. Epidemics in humans are often associated with flooding events.

Rodents are the natural reservoir for leptospira and the bacteria are shed in the urine of rodents or other infected animals. Other animals, especially mammals, become infected when in contact with water, soil, or surfaces that have been contaminated with urine. Both wild and domestic animals can become infected and shed the bacteria into the environment. Infected animals may include cattle, deer, pigs, rats, buffaloes, sheep, goats, horses, and dogs, among others.

### Humans may become exposed through

- Drinking contaminated water
- Ingestion of food that has been contaminated by urine
- Direct skin contact especially through cuts and other wounds
- Contact with nasal, oral and conjunctival (eyelid) mucous membranes
- Human-to-human transmission does not generally occur

In humans, after an incubation period of 2-21 days, leptospirosis can cause high fever, severe headache, muscle pain, chills, redness in the eyes, abdominal pain, jaundice, hemorrhages in skin and mucous membranes (including pulmonary

bleeding), vomiting, diarrhea and a rash. Complications can include meningitis or severe bleeding and the case fatality rate for leptospirosis may be as high as 20%.

The symptoms of the disease can mimic other common diseases and diagnosis of leptospirosis can be difficult, especially in areas with poor medical care and diagnostic ability. If diagnosed appropriately, the infection can be treated with antibiotics along with supportive care, if needed. There is no vaccination available for humans. In animals, leptospirosis causes similar systemic signs. In cattle, leptospirosis can cause abortions or still births and may cause “abortion storms” (where the abortion rate can be as high as 80%?) in groups of animals. Young calves can become systemically ill and develop fever, icterus (jaundice), hemoglobinuria, depression, tachycardia, petechial hemorrhages, and pallor of mucous membranes due to anemia. The mortality rate can be 5 to 15% and recovered animals may suffer from loss of condition as a result of persistent kidney damage. Leptospirosis may also add indirectly to other problems in cattle, such as decreased milk production, increased susceptibility to the usual forms of mastitis, and poorer fertility.

Diagnosis in animals involves identification of the bacteria in the urine or antibody tests, although diagnosis may be more complicated in the case of abortions. There is a vaccination available for cattle but vaccination may not prevent shedding of the bacteria if already infected. Prevention strategies for leptospirosis have included rodent control, animal vaccination, chemo-prophylaxis, use of protective clothing, and water purification.

| How to Write Talking Points                                                                                                                                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>AUDIENCE</b><br>Identify your audience                                                                                                                                   |  |
| <b>YOUR AFFILIATION</b><br>Identify who you are.                                                                                                                            |  |
| <b>SITUATION</b><br>Describe the current situation or what you know in non-technical language. Acknowledge fear, uncertainty or pain.                                       |  |
| <b>ACTIONS</b><br>Describe what you are planning to do to solve the problem. Include 2-3 supporting statements for every action, including benefits from the audience's POV |  |

|                                                                                            |  |
|--------------------------------------------------------------------------------------------|--|
| <b>NEXT STEPS</b><br>Tell the audience what you need them to do. Keep it clear and simple. |  |
| <b>INFORMATION</b><br>Tell audience where they can get more information                    |  |

### What do you think?

- What made it difficult to write the talking points?
- What made it easier to write the talking points?
- What additional information would have helped you write the talking points?
- What questions do you have for your target audience?
- How confident are you that your messages will be accepted by the target audience? Why?

**Notes:** .....

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| DELIVERING RISK COMMUNICATION MESSAGES |                                                                                                                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives                    | <ul style="list-style-type: none"> <li>• Demonstrate ability to communicate risk at multiple levels</li> <li>• Communicate effectively with the media and public</li> </ul> |

### Preparing to Deliver Your Message

- What elements would you add?
- What words or language would you change?
- How would you make your messages more effective?

**Notes:** .....

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### Delivering Your Message

Practice delivering your message. Choose a partner:

- Decide who will share the message first.
- Deliver your message in 3 minutes. During the delivery, your partner will play the note of the target audience.

- Once you finish, give your partner time to complete the observation worksheet.
- Then switch roles and repeat steps 1 and 2

**Notes:** .....

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### Observation Worksheet

| Speaker                                                                       | Yes | No | Notes |
|-------------------------------------------------------------------------------|-----|----|-------|
| Acknowledge concerns, fears or other emotions                                 |     |    |       |
| Personalizes caring (within the first 30 seconds)                             |     |    |       |
| States confidence problems will be solved (even if not all info is available) |     |    |       |
| Uses short words (< then 3 syllables in English)                              |     |    |       |
| Uses common terms                                                             |     |    |       |
| Uses short sentences (< than 10 seconds)                                      |     |    |       |
| Describes risk or situation without statistics                                |     |    |       |
| Shows preparation and competence                                              |     |    |       |
| Describes commitment                                                          |     |    |       |

### What do you think?

- How did the limited amount of time affect which messages you were able to say?
- What makes it hard to show empathy or competence?
- What makes it easier to show empathy or competence?
- What makes it hard to use simple language?
- Who else can assist you in talking with people to establish trust and credibility?
- What differences do you notice between the different audiences?

**Notes:** .....

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### COMMUNICATING WITH OR THROUGH THE MEDIA

#### Learning Objectives

- Identify the designated spokesperson(s) for particular issues
- Communicate effectively with the media and public

### How the Media Covers Health Events

Think about a recent health event in your local community:

- How did the public get information on the health event?
- How did the media present the information?
- Was it done well or poorly?
- What spokespersons were involved? Were they credible? Why or why not?

**Notes:** .....

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### Reflection Questions

What makes a good spokesperson?

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Why is the media so important for One Health Communication?

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What might be some of the challenges of working with the media?

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Additional notes on communicating with the media:

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### Six Ingredients for a Successful Interview (AFENET Risk Communication)

The media are important during the first days of an outbreak. They are the fastest

and sometimes the only way to reach the public and the affected community. Six ingredients for a successful interaction with the press are as follows.

- Do your homework. Before going into an interview learn as much as you can about your interviewer and the audiences you are going to reach. Being familiar with their interview style and what they write about will better help you prepare for the interview.
- Have a purpose. Go into any media interview with a clear message to deliver. If you do not have a clear, concise message (three points or fewer messages) you do not have a reason to do the interview.
- Focus on the key messages. Make no more than three points, whether information or action related. Use simple language at the primary school level. It is okay to repeat the messages – repetition is a good learning tool.
- Stick to what you know. It is easy in a conversation to draw conclusions or answer hypothetical questions, but that can contribute to misinformation and rumors. Answer what you know and what you do not, say I don't know and I'll find out and get back to you.
- Do not go "off the record." In a crisis such an outbreak, everything you and your officials say to the media carries high value and therefore has deep implications. This means that the press is listening to everything you say. Choose your words wisely.
- Project confidence and manage expectations. You are the expert and need to show confidence while managing expectations so audiences are neither panicked nor uninformed.

### Interview Traps and Pitfalls

- Get your key message out first, clearly and distinctly.
- Listen to what the reporter asks and reframe questions that seem loaded or biased.
- Use your own words and language. Do not let a reporter put words in your mouth or lead you into an answer you do not mean.
- Do not assume the reporter's facts are correct. Say, "I have not heard that."
- If the reporter leaves a microphone in your face, do not keep speaking if you have already answered the question. Ask, "Do you have another question?"
- Anticipate questions. Use the most common questions and prepare your answers in advance.
- Do not assign blame and do not remove yourself from responsibility. In this situation you are the leader and the authority.
- Avoid saying, "No comment." All information (except for classified information)

should be shared as it becomes known. If you do not know the answer to a question, explain the steps you will take to obtain the answer.

- If you do not have the authority to speak on a particular topic or issue, say so and suggest who might be a better source. Then move on to the next question.

### Preparing for a Media Interview

Using the Rabies Case in Bali or Leptospirosis in Cambodia scenarios from the previous modules:

- You have been selected as the One Health representative responsible for speaking with the media. You will be interviewed by a local media representative and have a three minute time slot (or 10 minutes if you are working with a small group) that will be shown on the evening news
- Take 10 minutes to review and revise your talking points as needed before the interview

To help you prepare, below is a list of questions commonly asked by the media in a crisis or emergency situation.

- What is your name and title?
- How do you spell and pronounce your name?
- What are your job responsibilities? Who do you work for?
- When did your response to this begin?
- When were you notified that something had happened?
- Did you and other organizations disclose information promptly? Have you and there organizations been transparent?
- Can you tell us what happened? Were you there? How do you know what you are telling us?
- When did it happen? Where did it happen? Who was harmed?
- How many people were harmed? Are those that were harmed getting help?
- Who is conducting the investigation? Will the outcome be reported to the public?
- What are you going to do after the investigation?

### Preparation Notes:

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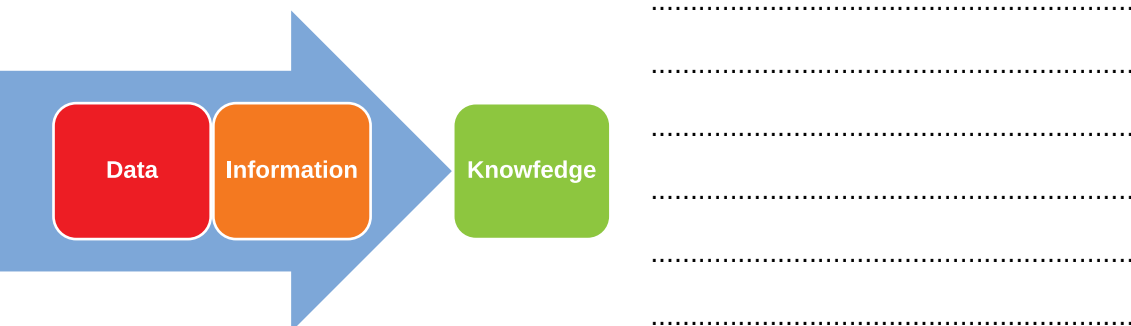
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## Media Interview Practice - Reflection

How did your media interview go? What did you do well? What will you do differently?



### What do you think?

- What made it easy to use the talking points?
- What was challenging about using the talking points?
- Was there more information that you wanted to provide? If so, what and why?
- What questions did the interviewer have that were off topic for you? How easy or difficult was it to redirect?
- What questions do you have about the skills on the observation sheet?
- If you had the opportunity to select the best spokesperson(s) for this topic, who would you choose? Why?

**Notes:** .....

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### Introduction to Informatics

*"Informatics studies the application of information technology to practically any field, while considering its impact on individuals, organizations, and society. It uses computation as a universal tool to solve problems in other fields, to communicate and to express ideas,"*

- Illinois Informatics Institute -

### Summary of Analysis:

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Your assignment is to 'analyze' the data collected in this class and decide how you will share the information back with the group. Create a spreadsheet with the following:

**Sharing this information is OPTIONAL and VOLUNTARY**

|           | Gender | Height | Weight | Age | Birth Month | Year in Program | Ethnicity |
|-----------|--------|--------|--------|-----|-------------|-----------------|-----------|
| Student 1 |        |        |        |     |             |                 |           |
| Student 2 |        |        |        |     |             |                 |           |
| Student 3 |        |        |        |     |             |                 |           |
| Student 4 |        |        |        |     |             |                 |           |
| Student 5 |        |        |        |     |             |                 |           |
| Student 6 |        |        |        |     |             |                 |           |

### What do you think?

- Do you believe the data you gathered is credible? Why or why not?
- What was it like to use Excel for data storage and manipulation?
- What process did you use to decide on your information/knowledge points? How did you move from data to information to knowledge?
- How might your experience with this exercise relate to real challenges and opportunities for One Health informatics?

**Notes:** .....

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### Web Information Scavenger Hunt

For the topic assigned to you, have 45 minutes to acquire, store and develop a 3 minute presentation on current data available via the web. Your presentation needs to include at least:

- One health human related data source
- One animal health related data source
- One environment related data source
- One Vietnam country related resource

**Notes:** .....

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#### What do you think?

- How easy or hard was it to acquire data? Why or why not? Do you believe the data you gathered is credible? Why or why not?
- How did you 'store' your data? Would your storage option work to share information with others? How about 6 months to 1 year from now?
- What process did you use to create the presentation? How did you move from data to information to knowledge?
- How might your experience with this exercise relate to real challenges and opportunities for One Health Information?

**Notes:** .....

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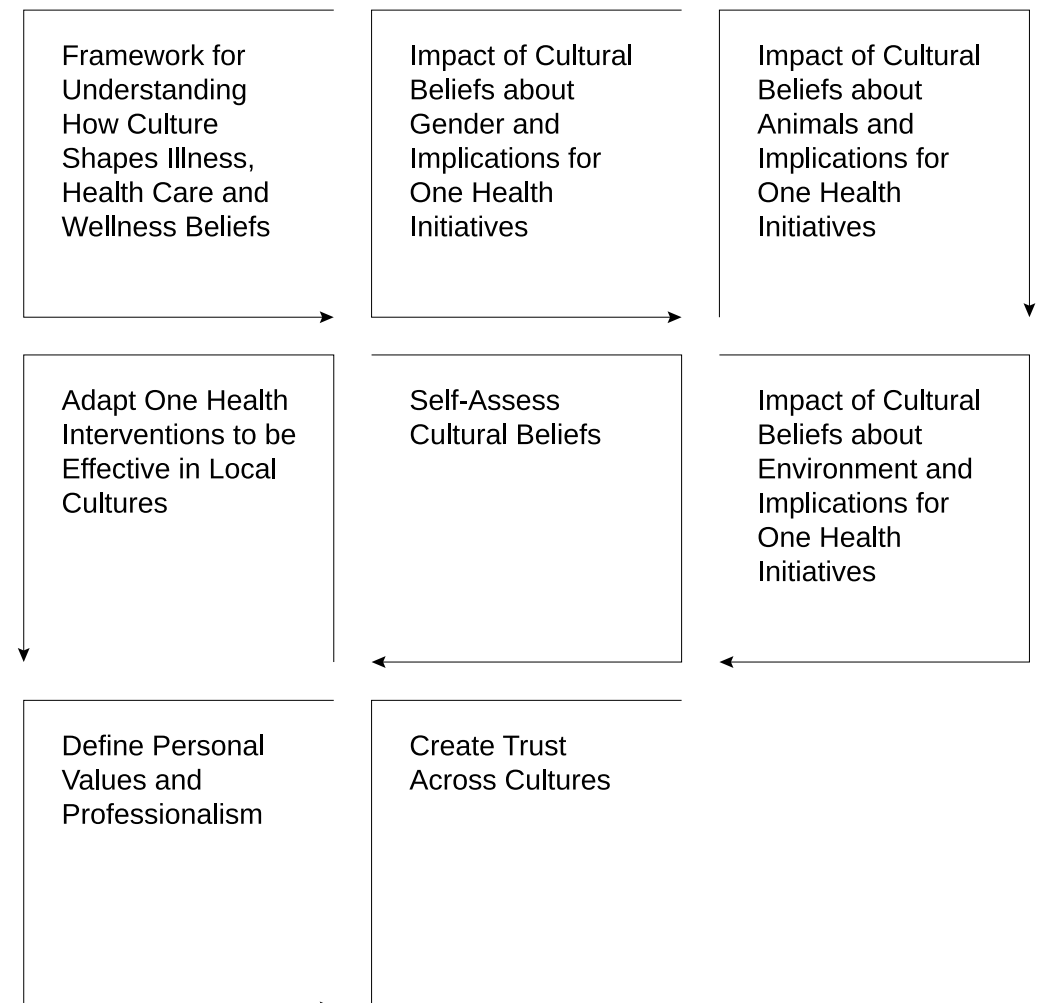
## MODULE 3 - CULTURE, BELIEFS, VALUES AND ETHICS

### Module Description and Learning Outcomes

This module provides learners with an understanding of culture, beliefs, values and ethics at the individual and societal level, which is critical when working in multiple disciplines. Key outcomes of this module include:

- Understanding, analyzing, and respecting social, religious and historical diversity for individuals, societies, and across cultures
- Know how to work professionally with One Health stakeholders across multi socio-economic and cultural differences

### Learning Map



## Course Competencies

| Competency #1                                                                                                | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify and interpret local norms, wisdoms, and culture regarding humans, animals, and environmental health | Understand and distinguish different cultures and beliefs about human, animal health, health care, and the environment, and the impact these beliefs have on One Health initiatives by: <ul style="list-style-type: none"> <li>Analyzing local cultures and their beliefs about illness, medical care and health</li> <li>Identifying common and specific cultural norms and sensitive topics</li> </ul>                           |
| Competency #2                                                                                                | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                          |
| Generate trust among the community within One Health interventions                                           | Understand personal beliefs about health/health care and how, as a OH practitioner, you can adapt OH interventions to be effective in local cultures and belief systems, by: <ul style="list-style-type: none"> <li>Demonstrate familiarity with local languages and/or working with a translator, local leader(s), and/or cultural guides</li> <li>Adapting appropriate disease management practices in outbreak areas</li> </ul> |
| Competency #3                                                                                                | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                          |
| Demonstrate values, professionalism, and ethics in planning and interventions                                | Define personal values, code of conduct and response(s) to ethical situations to model OH professionalism and demonstrate an understanding of cultural norms                                                                                                                                                                                                                                                                       |

## INTRODUCTION TO CULTURE AND HEALTH BELIEFS

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives | Learn the differences in culture and beliefs about healthcare, animals and the environment, and the impact that these beliefs have on OH initiatives by: <ul style="list-style-type: none"> <li>Analyzing notions of illness, medical care and health and understand the expected roles</li> <li>Identifying cultural norms and sensitivity issues around health/health care, animals and the environment</li> </ul> |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Simulation Background Information: Orangutans and the Minangkabau

The future of the orangutan (*Pongo spp.*) in Sumatra is far from secure despite the species' high profile and media attention. The traditional threat to the orangutan has been widespread logging, but the continuing conversion of their remaining habitat for oil palm (*Elaeis guineensis*) is hastening the orangutan's

extinction in the wild. This situation is driven by a robust global market for palm oil as a vegetable oil and biofuel. In tackling this conservation problem, therefore, economic factors cannot be overlooked. Of significance are the high opportunity costs of orangutan conservation and market failures associated with the public-goods nature of the orangutans' forest habitat. Conservationists should consider these constraints when formulating remedial action.

There have been reports that the local human community in Kalimantan living near oil palm plantations are suffering from higher than expected rates of infection of *Mycobacterium tuberculosis*. Some individuals believe this problem may be due to tuberculosis (TB) being transmitted to humans from orangutans being kept as pets (after being orphaned as a result of the forest clearing for plantations), so additional scientific studies are needed to determine whether the actual origin of this outbreak was TB infection among humans. The Indonesia Government is concerned whether a Minangkabau community in Saluang village in Sumatera is also vulnerable to such zoonoses because they, too, keep orphaned orangutans as pets. The government has assigned a group of One Health practitioners to assess the situation in Saluang village.

### Individual Reflections:

- What surprised you about your behaviour during the activity?
- What surprised you about the behaviour of others during the activity?
- What are your key learnings or take-aways from the activity?
- Why did individuals keep orang-utans as pets, and/or were there any socio-economic benefits, perceived health risks, etc.?

Notes: .....

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## CULTURAL DIMENSIONS AND MODELS

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives | Learn the different cultures and beliefs about health/health care, animals and the environment, and the impact these beliefs have on OH initiatives by: <ul style="list-style-type: none"> <li>Analyzing local cultures and their beliefs about illness, medical care and health</li> <li>Understanding the role of healthcare providers, healers and leaders in decision-making within the context of a culture</li> </ul> |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Prior to class, read the articles listed below.

- “Cultural Health Attributions, Beliefs, and Practices: Effects on Healthcare and Medical Education” (Lisa M. Vaughn, Farrah Jacquez and Raymond C. Baker)
- “Indigenous Healers in Southeast Asian Refugee Communities” (Janey Egawa & Nathaniel Tashima)



## Understanding Culture

### Culture is like an iceberg...

#### Three Models Explaining Cultural Differences

##### Hofstede

- Power distance
- Individualism vs. Collectivism
- Uncertainty Avoidance
- Masculinity vs. Femininity
- Long-term vs. Short-term

##### Trompenaars

- Universalism vs. Particularism
- Individualism vs. Collectivism
- Neutral vs. Emotional
- Specific vs. Diffuse
- Achievement vs. Ascription
- Sequential vs. Synchronic
- Internal vs. External Control

##### Hall

- High vs. low context
- Monocronic vs. Polychronic time
- High territoriality vs. Low territoriality

Notes: .....

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#### CULTURE AND GENDER

##### Learning Objectives

- Understand and distinguish the difference in cultures and beliefs, in relation to gender, and the impact that these beliefs have in the OH realm. This will include:
- Examining the impact of cultural beliefs about gender, the impacts of beliefs, and access/barriers to healthcare
  - Advocate for gender equality and equity in OH initiatives

Prior to class, read the article listed below:

- “Culture: Culture, Gender Equality, and Development Cooperation,” (Johanna Shalkwyk, CIDA)

#### Culture and Gender - Case Study Women in Indonesia

Women play a major role in family nutrition and efforts to improve nutrition. However, lower levels of female education result in a lack of understanding of nutrition. The lower socioeconomic level of women also has an effect on levels of malnutrition. The number of women and children younger than 18 years of age comprises more than half of Indonesia's population. Many of these women and their children have been categorized as vulnerable in the areas of health, education, employment and income. UNICEF reports that half a million women die from pregnancy complications each year. WHO reports that, globally, women represent about half of people with HIV infection. Given these statistics, it has been identified that vulnerable women need to be educated, protected and empowered.

#### What do you think?

- In your community, what do you see as the most-serious issue facing women? How are the issues facing women different from those facing men?
- How do the issues change over a women's life cycle (e.g. infant, childhood, adolescence, child-bearing, nursing, old age)?
- What is the impact of these challenges on women's health?
- How do women's health issues impact men?
- Think back to the Minangkabau people in the opening simulation:
- Would it be surprising if more women than men had evidence of TB infection? Why?
- How do men and women interact differently with domestic animals? With wildlife?
- What is the impact of deforestation on women?

Notes: .....

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#### Debate Topic I am a Woman - The Relationship Between Gender, Education, Regulation and Health

**Topic:** *There is a difference in health care so that women receive lesser quality health care than men receive.*

Notes: .....

### What Do You Think?

- How difficult was it for you to play the other gender?
- As you assumed the opposite role, what stereotypes did you make about the role you played?
- How do these possible stereotypes become reflected in health care systems?
- What are your recommendations for bringing more equality in healthcare?
- How do men benefit when women are treated equally in culture?

Notes: .....

| CULTURE AND ANIMALS |                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives | Understand and distinguish the difference in cultures and beliefs regarding animals, and the impact that these beliefs have on OH initiatives by: <ul style="list-style-type: none"><li>• Examining the impact of cultural beliefs about animals and the impact these beliefs have on human relationships, both with domestic and wild animals</li></ul> |

### Food, Pet or God

Brainstorm all the:

- Domestic animals in your region
- Wildlife in your region

*Classify each of the domestic and wildlife animals you identified as a pet, food or god:*

| Wildlife Animals in Our Region | Pet | Food | God |
|--------------------------------|-----|------|-----|
|                                |     |      |     |
|                                |     |      |     |
|                                |     |      |     |
|                                |     |      |     |

| Domestic Animals in Our Region | Pet | Food | God |
|--------------------------------|-----|------|-----|
|                                |     |      |     |
|                                |     |      |     |
|                                |     |      |     |
|                                |     |      |     |

### What do you think?

- Why do you think we see certain animals as food or a pet or a god?
- Have you been to another culture or know about another culture that might classify these animals differently?
- What would you do if you were in another culture and you were given an animal as food to eat, but in your culture, the animal is seen as a pet or a god?
- What are the One Health implications for how different cultures view animals differently?

Notes: .....

### Activity #1:

- What animal(s) are symbols of your culture?
- What are the attributes ascribed to the animal(s)?
- Find a common graphic representation of the animal and copy it into your Student Guide.
- How can learning about the ways that other cultures view animals bring insight into your own culture?
- How can this insight help a One Health practitioner?

### Activity #2:

- Select a culture different from your own.
- What animal(s) does the culture use as a symbol?
- What attributes are ascribed to the animal(s)?
- Find a graphic representation of the animal and copy it into your Student Guide
- How can learning about the ways that another culture views animals bring insight into that culture?
- How can this insight help a One Health practitioner?

Notes: .....  
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| CULTURE AND THE ENVIRONMENT |                                                                                                                                                                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives         | Understand and distinguish the difference in cultures and beliefs about the environment, and the impact that these beliefs have on OH initiatives by: <ul style="list-style-type: none"><li>• Examine and evaluate the impact of cultural beliefs about the environment on OH initiatives</li></ul> |

Proverbs and What They Tell You About A Culture

What proverb did you choose? .....  
.....  
.....

What do you think?

- What is the meaning of the proverb?
- What does the proverb say about the culture’s view of nature?
- What does the proverb say about the culture’s relationship with the environment?
- How might the culture’s relationship with the environment impact a One Health initiative?

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Individual Reflection: What is a proverb you remember hearing about nature that has shaped your relationship with nature?

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How do your views about nature/the environment shape you as a One Health practitioner?

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| CREATING TRUST ACROSS CULTURES |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives            | Understand how personal beliefs about healthcare, animals, and the environment impact the ways a community responds to emerging pandemics and how to adapt OH interventions in local cultures and belief systems, by: <ul style="list-style-type: none"><li>• Being aware of one’s own culture and beliefs</li><li>• Demonstrating familiarity with local languages and/or working with a translator</li><li>• Understanding gender diversity</li><li>• Adapting disease management in order to effectively involve ethnic groups in outbreak areas</li></ul> |

Culture Self-Assessment

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Large Group Discussion

How can a One Health practitioner develop trust when working across cultures within a One Health team and within the community they are serving?

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Field Assignment

Identify a vulnerable group in your local community. Use one or more models about culture - from the three authors (Hofstede, Trompenaars or Hall); see the table below to gain insight into how the community might view health, animals, and the environment.

### Three Models Explaining Cultural Differences

#### Hofstede

- Power distance
- Individualism vs. Collectivism
- Uncertainty Avoidance
- Masculinity vs. Femininity
- Long-term vs. Short-term

#### Trompenaars

- Universalism vs. Particularism
- Individualism vs. Collectivism
- Neutral vs. Emotional
- Specific vs. Diffuse
- Achievement vs. Ascription
- Sequential vs. Synchronic
- Internal vs. External Control

#### Hall

- High vs. low context
- Monocronic vs. Polychronic time
- High territoriality vs. Low territoriality

**Create a checklist of what you want to observe to learn more about the community. Some ideas might be:**

- How do men and women interact? How do men interact with men? How do women interact with women? Does there appear to be a hierarchy?
- How do men and women interact with domestic animals? Is it the same or different?
- How do men and women interact with wildlife? Is it the same or different?
- Who provides health care/animal care leadership?
- What are the roles of the healthcare provider, traditional healers, veterinarians and community or government leaders?
- How are decisions made about healthcare and wellness?
- How do people see the relationship between health/illness and the environment?
- How might the community be culturally vulnerable to emerging pandemic disease? What aspects might increase risk of coming into contact with a pandemic disease? What aspects might make treatment difficult?

#### Assignment:

Plan how you will go into the community and develop trust.

Spend time in the community, meet with leaders to explain and get agreement about your planned activity

Create a 10-to-15 minute photo essay or short documentary about the community and your experience as a student of One Health in working with a vulnerable population.

Notes: .....

#### Debriefing the Field Experience

- Consider the presentations. What can we conclude about the communities visited? What do they have in common? How are they different?
- If teams selected the same group to observe, how were the observations similar? Different? What could cause groups to see the same community differently?
- What advice would you give a One Health practitioner to be effective in preventing disease in the community visited? For promoting human, animal and ecological wellness?

Notes: .....

### PERSONAL VALUES AND PROFESSIONALISM

#### Learning Objectives

- Define personal values, code of conduct and response to ethical situations in order to model OH professionalism, by:
- Articulating personal views and reviewing professional codes of conduct
  - Identifying ethical issues that occur in OH interventions
  - Determine the most appropriate/professional response.

#### Discovering Your Core Values

##### Values Clarification: A Self-Assessment

by A. Bronwyn Llewellyn with Robin Holt, M.A.

Clarifying your personal values is a critical step toward understanding your own definition of success, finding new career options, evaluating specific organizations to work in, and understanding how to change your current work situation to make it more meaningful and fulfilling. The process gives you a deeper sense of what makes your life meaningful and helps you see how certain career decisions affect your life. Knowing your values makes you resilient. Just like that storm-lashed tree with deep roots, a person with strong core values doesn't bend every which way the workplace wind blows.

This test is designed to help you identify your core values. Values are highly individual; therefore, there are purposely no definitions given for the words following. Each word means something different to different people. Reflect on what each value word means to you. Think about how these values might influence how you adapt to living and working in a culture that is new to you.

**Step 1: Circle Your 10 Most Important Values on the Chart Below:**

| VALUES         |               |                |                 |
|----------------|---------------|----------------|-----------------|
| Accomplishment | Curiosity     | Justice        | Self-Discipline |
| Adventure      | Diversity     | Knowledge      | Self-Restraint  |
| Affiliation    | Duty          | Leadership     | Spirituality    |
| Authority      | Family        | Love           | Stability       |
| Autonomy       | Friendship    | Loyalty        | Structure       |
| Balance        | Fun           | Meaning        | Status          |
| Challenge      | Health        | Nature         | Time Freedom    |
| Community      | Helpfulness   | Obligation     | Trust           |
| Competence     | High Earnings | Pleasure       | Variety         |
| Competitions   | Honesty       | Predictability | Wisdom          |
| Contribution   | Humility      | Recognition    |                 |
| Control        | Independence  | Respect        |                 |
| Cooperation    | Influence     | Responsibility |                 |
| Creativity     | Integrity     | Risk-Taking    |                 |

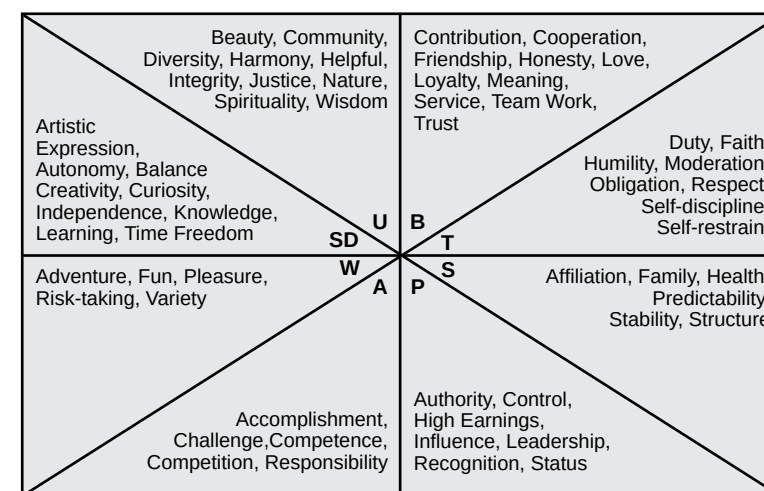
**Step 2: Now, select the five that are the most important to you.**

**Step 3: Finally, narrow this down to the 3 values that are core to you.**

In the following ValueSearch™ Map, eight value categories are defined and connected to a cluster of values. Read the definitions for each category. Most people can categorize their specific values as indicated on the map. However, your personal experience or value definitions may reflect a different category than those shown here. Balance, spirituality, and family are examples of values people often move to different categories. Highlight or circle each of your top ten values in the suggested categories only if the category represents your personal definition of the value. If another category feels like a better fit, simply write the value word in that category.

Now see if your values cluster in one or more categories. If they do not cluster, go back to the value word list and select your next ten most important values. Categorize those values on the map below:

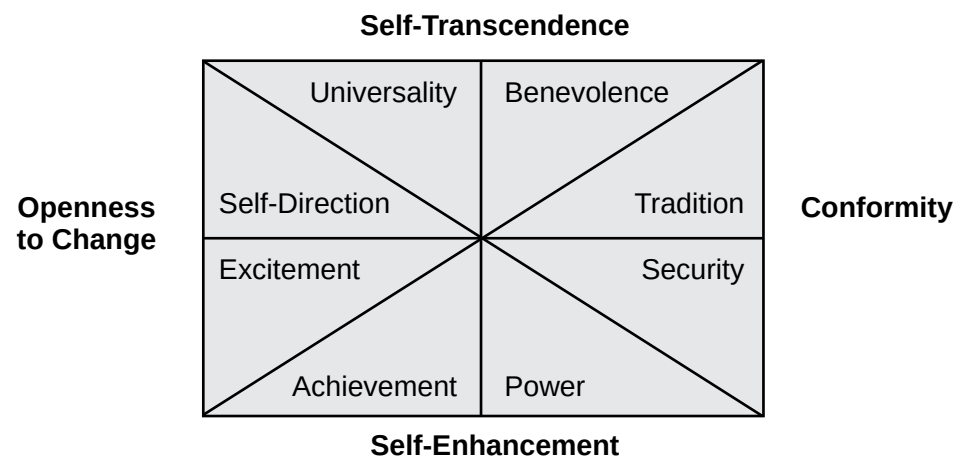
| Value Search Map |    |                                                                                                                   |
|------------------|----|-------------------------------------------------------------------------------------------------------------------|
| Universality     | U  | Understanding, appreciation, tolerance and protection for the welfare of people and nature                        |
| Benevolence      | B  | Concern for the protection and enhancement of the welfare of people with whom one is in frequent contact.         |
| Tradition        | T  | Respect, commitment and acceptance of the customs and ideas that one's culture or religion expects of individuals |
| Security         | S  | Desire for safety, harmony, and stability of society, relationships and self.                                     |
| Power            | P  | Attainment of social status, prestige, influence, authority or leadership of people and resources                 |
| Excitement       | E  | Seeks pleasure or sensuous gratification. Enjoys unpredictability and variety in life.                            |
| Achievement      | A  | Desire for personal success or accomplishments; need to demonstrate competence in everyday life                   |
| Self-direction   | SD | Pursues independent thought or action. Enjoys the ability to choose, create and explore.                          |



Values, as you now realize, strongly influence your behaviour, decisions, and actions. This process of defining and mapping your values can help you better understand how your values can influence and motivate your career decisions. A simpler way to understand your values is to see the map as being composed of four value types (see the following). Write the word for the value type that most closely resembles you on the chart.

## Outer Layer Definitions

- **Self-Transcendence:** Combines values of universality and benevolence, which motivate people to transcend selfish concerns in order to promote the welfare of others and nature. Working on a well-functioning project team or for a company or department with a compatible organizational culture may satisfy these values.
- **Openness to Change:** Combines values of self-direction and excitement, indicating a desire by individuals to follow their own intellectual and emotional interests in unpredictable and uncertain directions. Many creative people fall within this category, as well as those who value intellectual challenge and stimulation. Flexibility may be an important factor for your satisfaction at work. You may find it appealing to have some degree of variety or unpredictability in your life.
- **Conformity:** Combines values of tradition and security, leading to a desire to preserve the status quo and the predictability this provides in relationships with other people, institutions and traditions. If your values cluster in this area, stability may be quite important to you. You also may need to have a clear sense of your job's required tasks and responsibilities.
- **Self-Enhancement:** Combines values of achievement and power by indicating a desire of individuals to enhance their own personal interests. If your values fall into this category, you may need to perform a job that is quite challenging or work where you can feel as if you are accomplishing something. Also, your job satisfaction may be dependent on the opportunity for increasing levels of responsibility and/or power.



## Connecting Your Values to Your Work

The purpose of this exercise is to help you identify how your values may be satisfied or challenged as you live and work in a culture that is new to you. It also provides you with an opportunity to consider what strategies you can use to enhance your effectiveness in this new culture.

Pick one of the communities/cultures that you learned about during the previous session that seems to be the most different from cultures with which you are most familiar. Based on what you learned about that community/culture consider the following questions:

- Which of your highest priority values do you think may be tested in the community that you selected?
- How have you felt when these priority values have been challenged in the past?
- How have you dealt with challenges to these values in the past?
- What would you do differently if you were in this country setting?

**Notes:** .....

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- What do you think are the core values of One Health?
- How do your values align with the core One Health values?
- As a One Health practitioner, what do you do if you perceive a value conflict with your values and the community that you are working in? With the One Health values and the community that you are working in?
- Is it difficult for one group of professionals to work collaboratively with other professionals on important health issues? Why?

**Notes:** .....

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## Connecting Your Values to Professionalism

Identify a professional association in your discipline.

- Does this association have a professional code of ethics?
- If so, how does the professional code of ethics match your values?

- If the code of ethics does not match your values what does this ‘value conflict’ mean to you?
- If they do not have a code of ethics, why do think there is not one? What are the ramifications of not having a code?

**Notes:** .....

### One Health Ethical Issues

- What do you think are the core values of One Health?
- How do your values align with these core values?
- As a One Health practitioner, what do you do if you perceive a value conflict with your values and the community that you are working in? With the One Health values and the community that you are working in?

**Notes:** .....

Create a list of potential ethical situations that they may face in One Health initiatives. For examples:

- A palm oil company is asking you to help them persuade the Salung people to sell the company some land. They offer to fund portions of your One Health project in the area.
- You are working in a very poor area and you see a farmer selling deer bushmeat.
- You are in the market and see a vendor selling expired medicines at a very low price.
- Villagers have told you that the palm oil plantation has filled the local streams with sediments and pesticides.
- You see an orangutan tied to a tree. The animal is spluttering and seems to be in distress.

Select one of these issues and develop it into a scenario that a One Health practitioner might face. Create a creative presentation that explores the scenario and methods for addressing the ethical challenges. You might want to create a role play, a video, a mural, etc.

## PROTECTION OF HUMAN SUBJECTIVES, CONFIDENTIALITY AND VOLUNTARY PARTICIPATION

### Learning Objectives

To raise awareness about the issues of protecting human subjects and assuring voluntary participation according to the existing legal framework and consistent with the need for involvement of Institutional Research Boards at universities, as part of the development of One Health professionals.

### The Historical Background about Rules of Conducting Medical Research in Human Populations

- Why are international and national standards governing the ‘protection of human subjects’ important?
- What developments have happened in our institutions?

**Notes:** .....

### What do you think?

- How can universities with Institutional Research Boards (IRBs) and/or Ethical Committees assure compliance to the principles of protecting human subjects when researchers work with human populations?
- How important is this matter, and are there examples of medical research that caused harm to human participants?
- When researchers discuss risks and benefits with potential participants, discuss issues that might be important when working with “high-risk” populations which can include neonates, children or pregnant women, or sub-groups that speak unusual dialects, or among persons who are illiterate, or have disabilities (e.g., blindness)?

**Notes:** .....

### Useful WebLinks

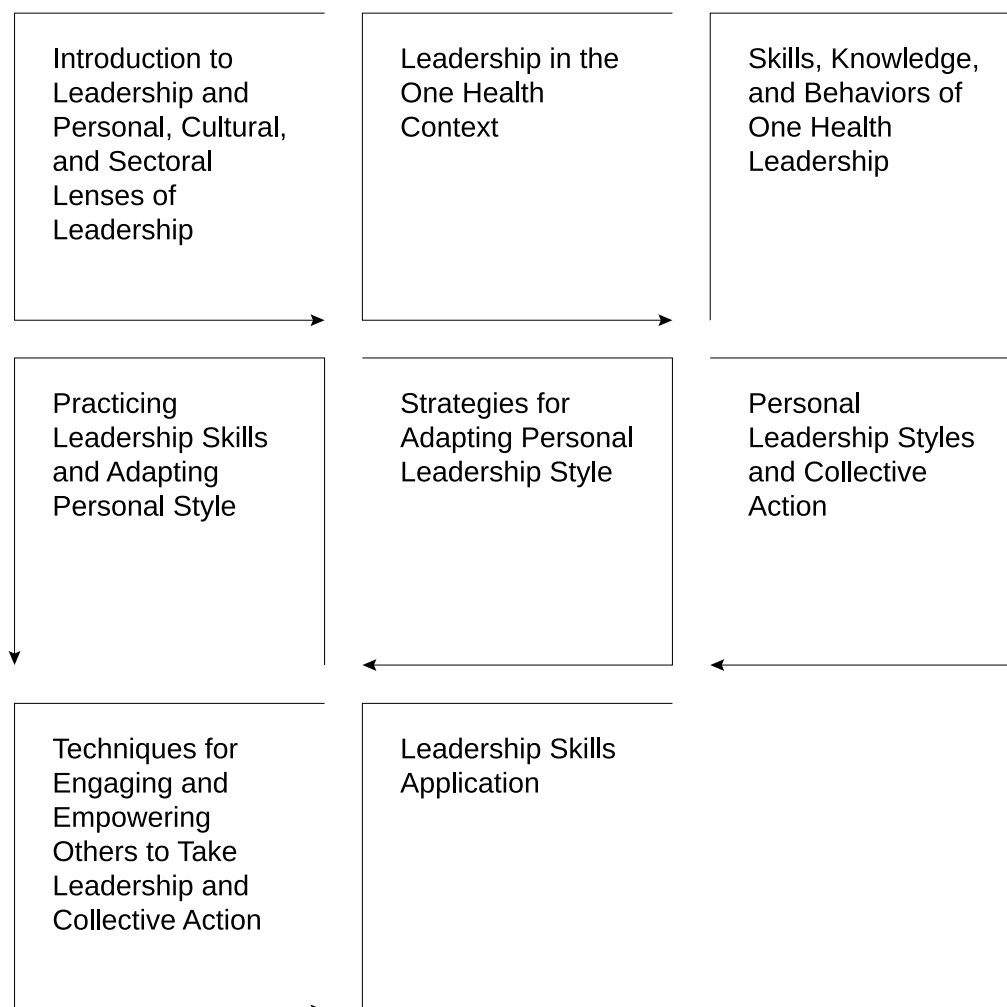
- World Medical Association / Helsinki Declaration:  
Accessed at: <http://www.wma.net/en/60about/70history/index.html>
- US Government regulation regarding Human Subjects Protection during Research:  
Accessed at: <http://www.hhs.gov/ohrp/humansubjects/commonrule/index.html>

## MODULE 4 - LEADERSHIP

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | This module discusses leadership in the OH context. It is defined as the ability to catalyze collective action for positive change. Students will explore a range of leadership skills, knowledge, and behaviours that OH professionals must demonstrate to be effective in their work. They will examine personal leadership styles and the impact it has. Also review techniques for empowering others to take collective action. |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Course Competencies

| Competency #1                                                                             | Learning Objectives to Develop Competency                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Develop a shared vision of leadership                                                     | <ul style="list-style-type: none"> <li>Discuss what leadership is and how cultural and sectoral lenses impact our perceptions of effective leadership</li> </ul>                                                                                                        |
| Competency #2                                                                             | Learning Objectives to Develop Competency                                                                                                                                                                                                                               |
| Demonstrate an understanding of effective leadership in the OH context                    | <ul style="list-style-type: none"> <li>Describe the skills, knowledge, and behaviours necessary to promote collective action in the OH context</li> <li>Assess OH situations to identify what is working and what leadership challenges need to be addressed</li> </ul> |
| Competency #3                                                                             | Learning Objectives to Develop Competency                                                                                                                                                                                                                               |
| Understand and adapt personal leadership styles                                           | <ul style="list-style-type: none"> <li>Assess personal leadership styles and discuss strengths and weaknesses</li> <li>Reflect on the impact of your own styles and how to adapt effectively in different situations</li> </ul>                                         |
| Competency #4                                                                             | Learning Objectives to Develop Competency                                                                                                                                                                                                                               |
| Develop and apply strategies for engaging and empowering others to take collective action | <ul style="list-style-type: none"> <li>Understand different perspectives on complex issues</li> <li>Identify and apply techniques for engaging, empowering and influencing others to take collective action in different leadership situations</li> </ul>               |

### INTRODUCTION TO LEADERSHIP AND ONE HEALTH

|                    |                                                                                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>Discuss what leadership is and how cultural and sectoral lenses impact our perceptions of effective leaderships</li> </ul> |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Pre-Work

- What is leadership? Write down a few sentences or bullet points.
- Who are two leaders you admire?
- What is their role and what skills or attributes do you think makes them an effective leader?

*Come to class prepared to share your answers!*

### Leadership Definition Mingle

Share your definition of leadership with your classmates and listen to their definition. Take some notes on what you hear that is similar to your definition and what is different. Also, write down how many people you exchanged definitions with.

How many people did you share definitions with?.....

Notes: .....

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In a small group, create a shared definition of leadership....in 32 words or less.

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### More definitions of leadership:

- Leadership is a process of social influence in which one person can enlist the aid and support of others in the accomplishment of a common risk..
- Leadership is the are of leading others to deliberately create a result that wouldn't have happened otherwise (a blog post)
- Leadership is the capacity to translate vision into reality (Warren Bennis)
- Leadership is influence - nothing more, nothing less (John Maxwell)
- Leadership is an opportunity to serve. IT is not a trumpet call to self-importance." (J. Donal Walters)

### What Makes Good Leader?

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### Lenses on Leadership

For the topic assigned to your group:

- Discuss what additional or unique leadership qualities and skills/attributes are important when you look at leadership through a different lens.
- Identify at lease one leader in this sector to talk about
- You can do research, but include your own personal ideas and opinions as well.

- Be prepared to do a 15 minute presentation and answer questions in the next session.

Topic: .....

Notes: .....

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| THE ROLE OF LEADERSHIP IN ONE HEALTH |                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                   | <ul style="list-style-type: none"> <li>• Describe the skills, knowledge, and behaviours necessary to motivate and inspire teams across sectors to organize, manage, and foster action in the OH context</li> <li>• Be able to assess One Health situations and identify what is working and the leadership challenges that need to be addressed</li> </ul> |

### One Heath Leadership

- Key challenges include:
- Coordination across multiple sectors and disciplines
- Integrated nature of One Health issues
- Collective action is often needed to make a difference
- Impacts and is impacted by social, political, and economic considerations
- Can be at many levels - community level to global

What do you think an effective One Health leader needs in order to be successful?

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### One Health Leadership Domains

- Shared vision
- Strategic and critical thinking
- Decision-making
- Collaborative solutions
- Team Commitment

Notes: .....

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### A Leadership One Health Case Study: The Eradication of Rinderpest

- Refer to the Joint FAO/OEI Committee report on the Global Rinderpest Eradication that you read for homework. In your small group, discuss and prepare a 10-minute presentation on:
- Who were the partners involved in the eradication of Rinderpest? Why did they make an effective partnership?
- What was the vision or goal, if any? Was it 'shared'?
- What leadership styles and/or decisions may have contributed to the eradication of the Rinderpest?
- In your opinion, what leadership barriers slowed down the eradication of Rinderpests?

Notes: .....

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| LEADERSHIP STYLES  |                                                                                                                                                                                                                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Assess personal leadership styles and discuss the strengths/weaknesses</li> <li>• Understand how your personal leadership style impacts OH action when working in groups or in a team</li> <li>• Understand self-reflection and the impact of your own style in different situations</li> </ul> |

Complete Northhouse's Leadership Self-Assessment available online: [www.sagepub.com/northhouseintro2e/study/resources/questionnaires/89527\\_03q.pdf](http://www.sagepub.com/northhouseintro2e/study/resources/questionnaires/89527_03q.pdf)

*Bring your self-assessment to class*

### In your small group, discuss:

- Do you agree with the author's description of your leadership style? Why or why not?
- Share some examples of how this leadership style looks in action. Pick 2 or 3 concrete examples to share with the rest of the group.

| Authoritarian/<br>Directive | Democratic/<br>Participative | Laissez-Faire/<br>Delegative |
|-----------------------------|------------------------------|------------------------------|
|                             |                              |                              |
|                             |                              |                              |
|                             |                              |                              |
|                             |                              |                              |
|                             |                              |                              |

- What are the pros/cons of this leadership style in the One Health context? (Pick 1 or 2 pros and 1-2 cons)

Notes: .....

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### Leadership Self-Assessment Based on Rooke Model

*Rooke/Tobert propose a different theory on leadership: One that focuses on growing our leadership skills. Their framework is shown below.*

| Action Logic | Characteristics                                                            | Leadership Strengths                                                  | Weaknesses                                                                                |
|--------------|----------------------------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Opportunist  | Wins anyway possible; self-oriented; manipulative; might makes right       | Good in emergencies and in sales opportunities                        | Forcibly self-interested and manipulative. Rejects feedback and externalizes blame        |
| Diplomat     | Avoids conflict. Wants to belong; obeys group norms; rarely rocks the boat | Good as supportive glue within an office; helps bring people together | Avoids conflict, rigidly conforms and status-driven. Sees negative feedback as punishment |
| Expert       | Rules by logic and expertise. Seeks rational efficiency                    | Good as an individual contributor                                     | Critical and dogmatic. Chooses efficiency over effectiveness. Resists subjective feedback |

| Action Logic  | Characteristics                                                                                                                                           | Leadership Strengths                                                              | Weaknesses                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Achiever      | Meets strategic goals. Effectively achieves goals through teams juggles managerial duties and market demands                                              | Well-suited to managerial roles; action and goal oriented                         | Can be over-driven to achieve self chosen 'objective' standards. Blind to complex subjectivity |
| Individualist | Interweaves competing, personal and company action logics. Creates unique structures to resolve gaps between strategy and performance                     | Effective in venture and consulting roles.                                        | Can be a maverick, an outsider or a rebel. Their independence can work against collaboration   |
| Strategist    | Generates organizational and personal transformations. Exercise the power of mutual inquiry, vigilance and vulnerability for both the short and long term | Effective as a transformational leader within large context such as organizations | Tempted by the dark side of power. May not employ their skills in a given context              |
| Alchemist     | Generates social transformation. Integrates material, spiritual and societal transformation                                                               | Good at leading society wide transformations                                      | Personal suffering may obstruct the use of their skills                                        |

Source: <http://www.harthill.co.uk/leadership-development-framework/seven-action-logics.html>

#### Looking at the Rooke/Tobert model:

- What action logic are you at now?
- What are some examples to back up your thought?

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#### Small Group Activity

- How does the Rooke/Tobert model compare with Lewin? Are they complementary? Contradictory?
- What are the pros and cons of each?
- How could this leadership framework help to address one Health leadership challenges? What might not be addressed?

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#### One Health Leadership Challenge

##### One Health Challenge: H5N1 Outbreak

An outbreak of H5N1 (Highly pathogenic avian Influenza) has occurred in a nearby village. You know that the village you are working in goes to market each week with poultry and many people work in poultry processing plants. What do you do?

Case scenario adapted from *The Compendium of Case studies* found at: [http://www.onehealthinitiative.com/publications/OHOW\\_Compendium\\_Case\\_Studies.pdf](http://www.onehealthinitiative.com/publications/OHOW_Compendium_Case_Studies.pdf)

- What types/styles of leadership are needed to address this case?
- Who would you, as a leader, need to work with?

Notes: .....

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#### ADAPTING YOUR LEADERSHIP STYLE - Working Collectively

|                    |                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Assess personal leadership styles and discuss the strengths and weaknesses of each</li> <li>• Understand how your personal leadership style impacts OH action when working in groups or in a team</li> <li>• Understand self-reflection to understand the impact of your own style in different situations and how to adapt</li> </ul> |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Toxic River

- Reflecting on the activity, what do you think?
- What happened? What did you notice about how people crossed the river?
- What were the leadership dynamics (e.g. were there discussions about who would lead? Did different people assume leadership at different times)?
- What did the leader(s) do that was effective? Not as effective?
- As a team member, how did you communicate to leadership your needs?
- Did you feel you were competing with the other teams to be the first to cross? Or did the teams collaborate?
- Why will you do differently next time...as a leader? As a follower?

Notes: .....

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### ENGAGING AND EMPOWERING OTHERS TO TAKE ACTION (Part 1)

#### Learning Objective

- Understand perspectives of different stakeholders on complex issues
- Identify and apply techniques for engaging, empowering and influence others to take collective action in different One Health leaderships scenarios and/or issues

## What is the Issue?

JAKARTA, Indonesia (AP) - Villagers and park rangers are using torches and firecrackers to herd out about 20 endangered Sumatran elephants that wandered into an Indonesian village in search of food. Local forestry office head Warsito said the elephants entered Braja Indah village in Lampung province Thursday and were still there Friday night.

More than 200 elephants live within Way Kambas National Park near the village. Fewer than 3,000 Sumatran elephants are left in the wild, and environmentalists warn they'll go extinct without protection. Warsito told El-Shinta radio that a negotiation is ongoing to compensate villagers since the expulsion route passes through their farms.

At least five elephants have been poisoned since April, while in December a farmer was trampled to death. Villagers say they'll kill the elephants if authorities don't protect their farms.

## What were the underlying issues impacting the community?

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## What do you think?

- What similarities/differences did you hear?
- What helped us to have some similar interpretations? Why are other interpretations so different?
- What does this exercise begin to illustrate about stakeholder engagement?

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**Collective Action:** "Behaviour or actions of a group working toward a common goal. When individuals engage in collective action, the strength of the group's resources, knowledge and efforts is combined to reach a goal shared by all parties."

*What are some examples you have seen of people taking collective action?*

## Group Assignment:

- Community
- Regional
- Country

## What do you think:

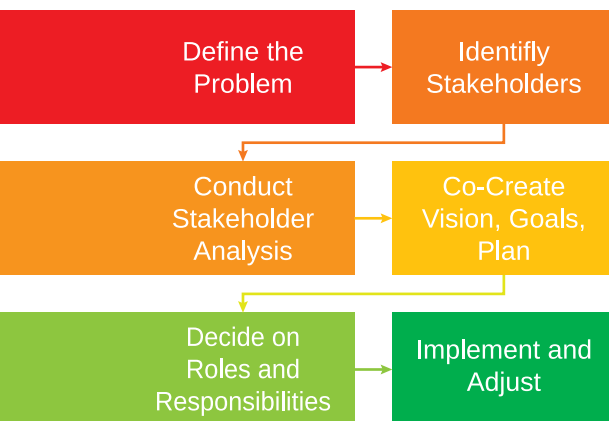
- Why is collective action critical to the success of One Health at this level?
- What might be some of the challenges in getting stakeholders to engage and take leadership in One Health at this level?

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## Stakeholder Engagement Principles, Assumptions and Process

Notes: .....

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### Active Listening

How to listen to stakeholders - RASA

- **Receive:** Sit back and actually listen! Turn your commentary off.
- **Appreciate:** Utilize body language and verbal signals to show you are listening and understanding.
- **Summarize:** Repeat back what you have heard to demonstrate your understanding.
- **Ask:** Follow up with questions that build on what they have said or transition to another topic if needed.

Notes: .....

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### What do you think?

- Think of your own communities. Which of these methods would work best and why?
- Think about the issue you identified and your stakeholders. Which methods do you believe would work best to get them engaged?
- Develop a set of questions (3-5) that you would ask and which methods you would use to collect the data

Notes: .....

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### Homework

Between now and the next session, each group needs to conduct a stakeholder analysis using the methods and questions they developed. Prepare a short presentation that highlights the stakeholder perspectives from the assessment.

| ENGAGING AND EMPOWERING OTHERS TO TAKE ACTION |                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                            | <ul style="list-style-type: none"> <li>• Understand perspectives of different stakeholders on complex issues</li> <li>• Apply techniques for engaging, empowering and influence others to take collective action in different OH leaderships scenarios and/or issues</li> </ul> |

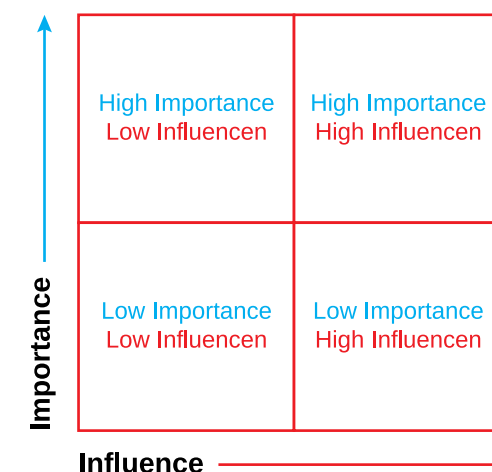
### Stakeholder Analysis

Notes: .....

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### Stakeholder Analysis and Strategic Planning

Using the community you assessed:

- Create an importance/impact grid for your issues and stakeholders
- Based on your analysis and the data collected, develop a strategy for how you would move forward. Consider what elements of engagement, empowerment and influencing would be needed. Build off of what we have discussed, but include your own ideas as well.

Notes: .....

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**What do you think?**

- Reflect on your own leadership style. What has been helpful over these sessions as you have been working in groups? Where have you needed to adjust?
- How did the leadership competencies play a role in our work throughout the class?
- What key lessons are you taking away on working with stakeholders? How do our learnings apply to One Health issues?

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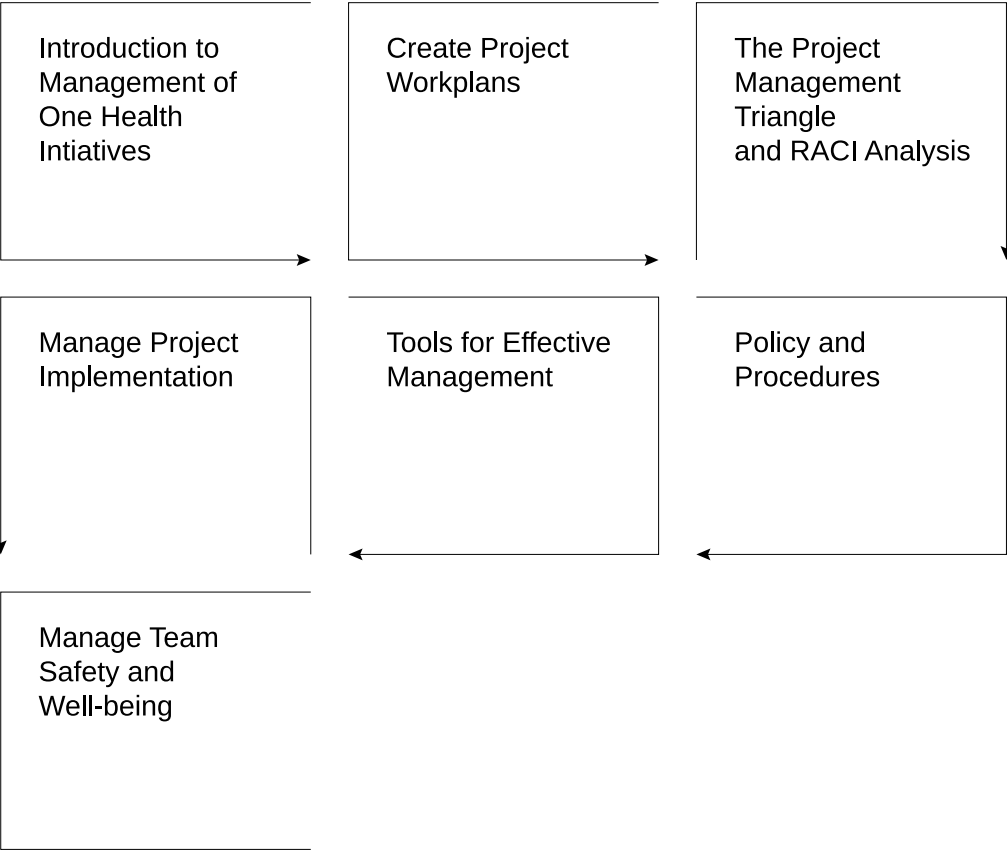
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**MODULE 5 - MANAGEMENT**

**Course Overview**

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module provides learners with an understanding of the skills needed to manage an OH initiative, including:</p> <ul style="list-style-type: none"><li>• Planning for staffing, budget, and resources</li><li>• Implementing policies and procedures needed to guide and support the day-to-day operation of the initiative</li><li>• Managing and monitoring the initiative to maximize effectiveness of One Health actions and the achievement of desired health outcomes</li><li>• Problem solving and taking corrective action during the initiative, as well as learning and sharing post-project</li><li>• Ensuring the safety and well-being of the OH team</li></ul> |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Learning Map**



## Module Overview

| Competency #1                                                                                                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand the difference between managing and leading, and the importance of each to a successful One Health initiative      | <p>Understand the different roles an individual plays in a One Health initiative through a project's life cycle, including:</p> <ul style="list-style-type: none"> <li>• Managing to create a predictability and ensure that results are produced</li> <li>• Leading to create positive disruption and large-scale change</li> </ul>                                                                                                                                               |
| Competency #2                                                                                                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Develop work plans to monitor and achieve progress                                                                            | <p>Create work plans that will achieve the following outcomes:</p> <ul style="list-style-type: none"> <li>• Clearly identified activities/tasks and outcomes</li> <li>• Staffing, budget, and resources needed to achieve results</li> <li>• Timelines to ensure that sequential and parallel activities are completed so that the initiatives finish on time</li> </ul> <p>Understand the relationship among the project scope, timelines, resources, and quality of outcomes</p> |
| Competency #3                                                                                                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Ensure policies, procedures and systems are in place to support the OH Initiative                                             | <p>Understand the role policies and procedures play in One Health initiatives.</p> <p>Define the elements for good policies and procedures</p>                                                                                                                                                                                                                                                                                                                                     |
| Competency #4                                                                                                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Oversee implementation and monitor the One Health initiative to maximize the effectiveness of OH actions and desired outcomes | <p>Manage and monitor a One Health initiative to ensure that the initiative is:</p> <ul style="list-style-type: none"> <li>• Tacking indicators</li> <li>• Operating within a budget</li> <li>• Being on time</li> <li>• Achieving results and meeting outcomes</li> <li>• Demonstrating excellence, competence, and professionalism</li> </ul>                                                                                                                                    |
| Competency #5                                                                                                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Overcome barriers, solve problems and apply corrective actions during initiatives.                                            | <p>Identifying and overcoming barriers</p> <p>Proactively addressing and solving problems</p> <p>Adjusting plans and applying corrective actions in response to changes and/or new information</p>                                                                                                                                                                                                                                                                                 |

| Competency #6                                           | Learning Objectives to Develop Competency                                                                                                                                                                                                    |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ensure the safety and well-being of the One Health team | <ul style="list-style-type: none"> <li>• Prepare a communication and emergency action plan for the team</li> <li>• Monitoring the physical and mental health of team members</li> <li>• Providing mechanisms for stress reduction</li> </ul> |

## Topic Breakdown

| INTRODUCTION TO ONE HEALTH MANAGEMENT |                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                    | <p>Understand the different roles one plays in a OH initiative throughout the project life cycle, including:</p> <ul style="list-style-type: none"> <li>• Managing to create predictability and order to ensure results are produced</li> <li>• Leading to create positive disruption and large scale change</li> </ul> |

## Pre-Work

Prior to the first session, watch one of the following videos by John Kotter, a Harvard Business School professor who did ground-breaking work on the difference between management and leadership.

**Video Option 1:** The Differences between Management and Leadership

**Video Option 2:** The Key Differences between Leading and Managing

<https://www.kotterinc.com/our-principles/change-leadership>

## First Management Assignment

Imagine that your professor asked you to organize a one-day symposium for a visiting scholar. You are to invite everyone in the department and the leaders of the university. Write down all of the things you will need to do to make this event successful. You have 5 minutes.

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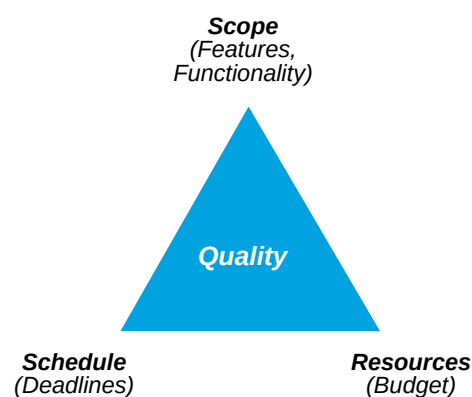
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## Class List of Tasks and Times

| Step | Task | Time |
|------|------|------|
| 1    |      |      |
| 2    |      |      |
| 3    |      |      |
| 4    |      |      |
| 5    |      |      |
| 6    |      |      |
| 7    |      |      |
| 8    |      |      |
| 9    |      |      |



### Project Management Triangle

Notes: .....

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## Rules of the Manager

### What do you think?

- What do you feel is/are the primary roles of a manager?
- Can you separate leadership from management?
- What has been your experience?

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## WORK PLANS

### The Key to Successful OH Initiative Management

#### Learning Objective

Create work plans that are designed to achieve outcomes with:

- Identified activities/tasks and outcomes
- List of staff, budget, and resources required
- Project implementation schedule

## Designing Project Work Plans

### A project work plan answers the basic questions of:

- Why? - Why are we doing this initiative?
- What? - What is the work that needs to be performed to successfully complete the initiative? What are the major projects/deliverables?
- Who? - Who will be involved and what will be their responsibilities within the initiative? How will they be organized?
- When? - What is the timeline and when will milestones be completed?
- Where? - Where is the One Health initiative taking place (e.g. the location)?

These questions define the initiative's scope, resources, schedule and the quality of outcomes (i.e. activity, service or product), also known as the "Project Management Triangle."

### Key project management terms are:

- Schedule - The amount of time available to complete a project
- Resources - Include people, equipment and materials
- Scope - What must be done to achieve the initiative's outcomes

## Creating a Project Work Plan for a Meeting

### Challenge - Scrub Typhus Outbreak Planning Meeting

Your Dean has asked you to quickly convene a group of One Health professionals to discuss how to respond to the threat of a scrub typhus (tsutsugamushi disease) outbreak. The Dean just finished a conference call with representatives from the Ministry of Health and Department of Ecology and Wildlife Protection in which they request help from your university saying that they are worried about the possibility of an outbreak of scrub typhus in the northern region.

*At the end of the class, record in the table on the next page the class's decisions about how to plan the meeting. This will involve filling in each column.*

## Work Planning Document

| Initiative: Scrub Typhus Outbreak Planning Meeting |          |                |            |          |                        |                     |                                       |
|----------------------------------------------------|----------|----------------|------------|----------|------------------------|---------------------|---------------------------------------|
| Expected Outcomes:                                 |          |                |            |          |                        |                     |                                       |
| Step                                               | Category | Activity/ Task | Begin Date | End Date | Responsible Individual | Status of Indicator | Potential Risks & Mitigation Measures |
| 1                                                  |          |                |            |          |                        |                     |                                       |
| 2                                                  |          |                |            |          |                        |                     |                                       |
| 3                                                  |          |                |            |          |                        |                     |                                       |
| 4                                                  |          |                |            |          |                        |                     |                                       |
| 5                                                  |          |                |            |          |                        |                     |                                       |
| 6                                                  |          |                |            |          |                        |                     |                                       |
| 7                                                  |          |                |            |          |                        |                     |                                       |
| 8                                                  |          |                |            |          |                        |                     |                                       |
| 9                                                  |          |                |            |          |                        |                     |                                       |
| 10                                                 |          |                |            |          |                        |                     |                                       |
| 11                                                 |          |                |            |          |                        |                     |                                       |
| 12                                                 |          |                |            |          |                        |                     |                                       |
| 13                                                 |          |                |            |          |                        |                     |                                       |
| 14                                                 |          |                |            |          |                        |                     |                                       |
| 15                                                 |          |                |            |          |                        |                     |                                       |
| 16                                                 |          |                |            |          |                        |                     |                                       |



## Scrub Typhus

Centre for Disease Control  
December 2012

### What is scrub typhus?

Scrub typhus is a disease caused by bacteria called *Orientia tsutsugamushi*, which is in the rickettsia family.

### How is it spread?

The germ infects people when they are bitten (usually painlessly) by an infected larval mite called *Leptotrombidium delense*. The mite is very small (0.2 – 0.4mm) and can only be seen through a microscope or magnifying glass. The mites live in grassland areas at the edge of dense monsoon forests or forested creeks. Mites usually feed on marsupials and other native animals such as rats but they can attach to passing humans and bite for a blood meal. Scrub typhus cannot spread from one person to another.

### Where is the disease found?

Scrub typhus is found in Asia and the Pacific region including northern Australia. The endemic area extends from south-eastern Siberia and northern Japan, through eastern and south-east Asia, to Vanuatu in the east and Pakistan in the west. Other countries may have small foci. Thailand has the highest prevalence of disease. There have been 17 reported cases infected in the Top End of the Northern Territory since 1990 with 1 death in 1996. More than half of the cases were infected in Litchfield National Park. Other areas associated with cases have been the Batchelor area, Melville Island, Groote Eylandt and Emu Point near Peppimenarti in the Daly River area.

Risk areas in the Top End are described as locations near well watered escarpment slopes that have associated creeks and

### How can scrub typhus be prevented?

You should take precautions to avoid being bitten by mites when visiting "at risk" areas. These include:

- Wear footwear such as runners or boots with socks rather than walking barefoot or wearing sandals. Long trousers are preferable when "bushwalking"
- Apply insect repellent that contains DEET or picaridin to all exposed skin areas on

seepage areas with monsoon forest and grasslands in close proximity.

### What are the symptoms?

The symptoms usually occur within 1 to 2 weeks of being bitten. They may include fever, chills, sweating, headache, cough, swollen glands and sometimes a dull red skin rash. The bite site often ulcerates and becomes red with a central black scab, called an "eschar".

Any person with these symptoms who has recently visited a risk area, in particular Litchfield Park, should mention the possibility of scrub typhus to their doctor. The diagnosis is made by a blood test.

### Who is at risk?

Anyone visiting areas near well watered escarpment slopes of the Top End that have associated creeks and seepage areas with monsoon forest and grasslands in close proximity are at risk.

The warning particularly applies for:

- Bushwalkers
- Off road tourists
- Aboriginal people pursuing traditional lifestyles
- Military personnel on bush exercises
- Park rangers
- People clearing virgin land in high risk areas.

### What is the treatment?

Treatment with antibiotics is necessary and very effective. Doxycycline is the drug of choice. Often people require treatment in hospital.

the legs, onto socks and the bottom half of trousers (this is the same repellent you use to prevent mosquito bites)

- Do not sit or lie on bare ground or grass, use a suitable ground sheet or other ground cover
- Camp in cleared areas away from dense forests. Use tents with attached floors. People who are working in infested areas should consider wearing permethrin impregnated clothing.

## The RACI Model

Rarely does everyone on a team have the same understanding of who is responsible for what. RACI charts are a simple way to clarify roles and responsibilities, making sure that nothing is overlooked. RACI charts also eliminate duplicative efforts and confusion by assigning clear ownership for each task.

- **Responsible.** The person who performs the work. There must be at least one “R” for each task or activity.
- **Accountable.** The person ultimately accountable for the work or decision being made. The individual carries the “yes” or “no” authority and has full veto power for an activity. Only one “A” can be assigned to a task or activity and authority must accompany accountability. Some tasks or activities may not have an “A.”
- **Consulted.** Anyone who must be consulted prior to a decision being made and/or the task or activity being completed. There can be as many “C’s” as are appropriate in each row. Consulting involves two-way communication.
- **Informed.** Anyone who must be informed when a decision is made or work is completed. There can be as many “I’s” as are appropriate. Informed may only involve one-way communication.

### Checking a RACI Analysis

| Vertical Analysis     | Horizontal Analysis   |
|-----------------------|-----------------------|
| • No empty columns    | • No empty rows       |
| • Too many R’s or A’s | • No R’s              |
| • Qualifications      | • Too many R’s or A’s |
|                       | • Too many C’s        |
|                       | • Too many I’s        |

### A RACI Analysis

- Clarifies individual roles, responsibilities and hand-offs.
- Establishes expectations
- Eliminates duplication of efforts
- Improves internal and external communication

On the next page, create a RACI analysis for the individuals in the scrub typhus outbreak work plan.

## RACI ANALYSIS

### Initiative: Planning Meeting to Respond to a Scrub Typhus Outbreak

| Step | Category | Activity | Functional Roles |  |  |  |
|------|----------|----------|------------------|--|--|--|
|      |          |          |                  |  |  |  |
| 1    |          |          |                  |  |  |  |
| 2    |          |          |                  |  |  |  |
| 3    |          |          |                  |  |  |  |
| 4    |          |          |                  |  |  |  |
| 5    |          |          |                  |  |  |  |
| 6    |          |          |                  |  |  |  |
| 7    |          |          |                  |  |  |  |
| 8    |          |          |                  |  |  |  |
| 9    |          |          |                  |  |  |  |
| 10   |          |          |                  |  |  |  |

### Notes and Reflection

#### What do you think about:

- Creating work plans for One Health Initiatives?
- Using a RCI analysis for One Health initiatives?

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### POLICIES AND PROCEDURES: The Key to Guiding and Supporting One Health Initiatives

#### Learning Objective

- Understand the role that policies and procedures play in One Health initiatives
- Define the elements of “good” policies and procedures



## Definitions and Importance of Policies and Procedures

If policies are tools that set boundaries within which we operate, what value do they bring to:

- Universities?
- Government ministries?
- One Health Initiatives?

Notes: .....

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Procedures are series of steps or actions that are used to accomplish specific tasks and are required for staff to follow. Given this definition, what do you think procedures add to a One Health initiative?

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What makes a good policy and/or what makes a good procedure? Record your answers below.

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## One Health Policies and Procedures

|              |                                                                                                                                                                                                                                                           |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Group 1 Task | Find a health related policy in your school, locality, or nation. Summarize it and use the checklist from class to outline why you think it is a good policy or why you think it is not a good policy. Be prepared to discuss this.                       |
| Group 2 Task | Find a health related procedures in your school, locality, or nation. Summarize it and use the checklist from class to outline why you think it is a good procedure or why you think it is not a good procedure. Be prepared to discuss your conclusions. |

Notes: .....

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## Think about....

- Are there any revisions we need to make to our checklist on what makes a good policy/procedure?
- How do you think policies/procedures benefit One Health initiatives?
- When managing a One Health initiative, what do you think will be the challenge of getting teams to follow policies/procedures?

Notes: .....

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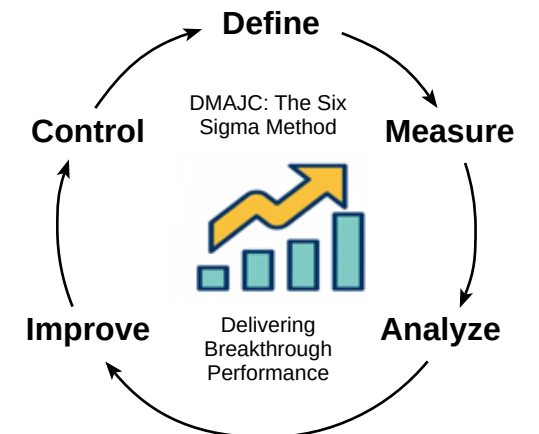
## TOOLS FOR MANAGING ONE HEALTH INITIATIVES

Learning Objective

- Identifying and overcoming barriers
- Proactively addressing and solving problems
- Adjusting plans and activities to include new information

## Introduction to Six Sigma

Six Sigma is a set of tools and techniques/ strategies for process improvement. The Six Sigma process seeks to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability in manufacturing and business processes. At the core of Six Sigma is the DMAIC (Define, Measure, Analyze, Improve, Control) process



<http://www.dmaictools.com/wp-content/uploads/2009/05/Six-Sigma-DMAIC-Methodology.png>

Notes: .....

### Six Sigma Tools

From the list below, select a tool below that sounds interesting and which you would like to learn more about. You and your group have 60 minutes to research the tool and prepare a 10-minute presentation, teaching the tool to the class.

Notes: .....

|             |                                                                                                                        |
|-------------|------------------------------------------------------------------------------------------------------------------------|
| Define      | <ul style="list-style-type: none"><li>• Affinity diagram</li><li>• Process flow</li></ul>                              |
| Measure     | <ul style="list-style-type: none"><li>• Histogram</li><li>• Pareto chart</li></ul>                                     |
| Analyze     | <ul style="list-style-type: none"><li>• 5 Why Analysis</li><li>• Cause and effect diagram</li><li>• Fishbone</li></ul> |
| Improvement | <ul style="list-style-type: none"><li>• Brainstorming</li><li>• Systems diagram</li></ul>                              |
| Control     | <ul style="list-style-type: none"><li>• CHECK process</li></ul>                                                        |

Notes: .....

### MONITORING IMPLEMENTATION TO ACHIEVE OUTCOMES

#### Learning Objective

- Tracking indicators, results and meeting outcomes
- Demonstrating excellence, competence, and professionalism
- Operating within budget and on time
- Preparing a communication and emergency action plan for the OH team
- Monitoring the physical and mental health of team members
- Providing mechanism for stress reduction
- Providing “employee assistance” support during post initiatives

### Status of Indicators and Potential Risks and Mitigation Measures

Return to the work plan you developed earlier in this module for planning a meeting to respond to a scrub typhus outbreak. For each step, fill in the columns for:

- Status of indicators
- Potential risks and mitigation measures

### Addressing Obstacles and Challenges to the Work Plan

#### Obstacles:

You have 20 minutes to plan how you will adjust your project workplace given the obstacle on your card. Prepare a 5 minute report to share with the class.

Notes: .....

### Managing Team Safety and Well-being

#### Daily Stress Diary

HOMEWORK - (The Daily Stress Log will be submitted either by email or discussed in the last class.)

The Daily Stress Log is a diary to record when you are feeling stressed in order to increase your awareness of what causes you stress. For two or three days before this class, note any and all activities that put a strain on your energy and time, trigger anger or anxiety, or precipitate a negative physical response. Also note your reactions to these stressful events.

When you have completed a daily log for a few days, review the log and identify two or three stressful events or activities that you can modify or eliminate. It has been said that awareness is half the battle. As you track the events that happen during a day and notice patterns in which you find yourself getting more stressed, you can begin to take steps to make adjustments in those damaging patterns. The following is an example of a Daily Stress Log.

### Daily Stress Log

Name: .....

Date: .....

| Time | Place | Source of Stress | Tension | Coping Strategy |
|------|-------|------------------|---------|-----------------|
|      |       |                  |         |                 |
|      |       |                  |         |                 |
|      |       |                  |         |                 |
|      |       |                  |         |                 |
|      |       |                  |         |                 |

*Assessment of how you managed stress today.*

*Tension level: 1 = Slight 2 = Moderate 3 = Strong 4 = Intense*

Major source of stress today: .....

### Emergency Action and Communication Plans

Emergencies happen when they are least expected; therefore, preparation is key. The focus of the session is emergency communication plans. These plans allow a manager to lead a One Health team effectively and efficiently during a crisis. What should be included in an emergency communication plan?

Notes: .....

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## MODULE 6 - POLICY, ADVOCACY, AND REGULATION

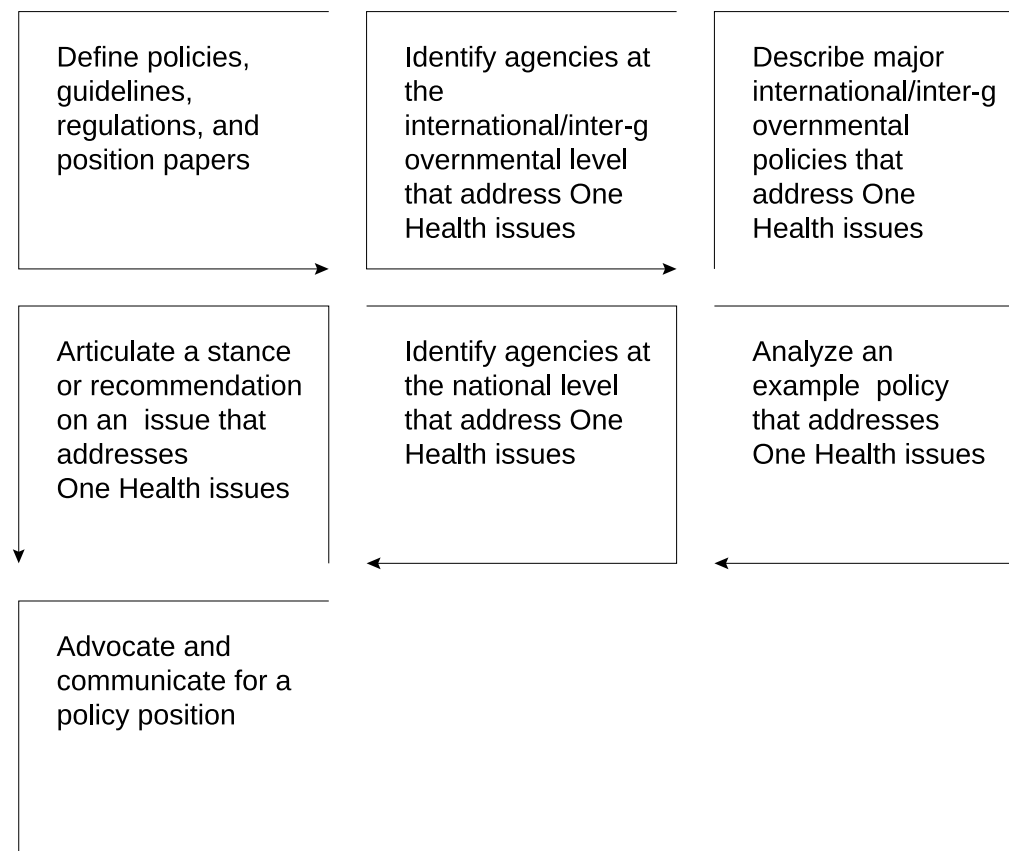
### Course Overview

#### Module Description and Learning Outcomes

This module provides learners with an understanding of policy frameworks conducive to achieving OH outcomes, Key outcomes include:

- Understanding how policies, regulations and guidelines are developed and implemented
- Identify local, national, and intergovernmental agencies that create and oversee policies, guidelines, and regulations that impact OH issues
- Advocate across multiple agencies and organizations for a position on an OH issue

### Learning Map



## Module Overview

| Competency #1                                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify and understand the role of international agencies and their policies as influence OH approaches | <ul style="list-style-type: none"> <li>Define the differences among policies, guidelines, and regulations</li> <li>Identify agencies on the international/ intergovernmental level that participate and/ or affect in the health sector, OH issues, and describe their scope and roles</li> </ul>                 |
| Competency #2                                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                         |
| Identify the role of national ministries/ agencies and policies on OH issues                             | <ul style="list-style-type: none"> <li>Identify agencies in the national level that are involved in OH issues and describe their roles and scope</li> <li>Identify national level policies that support/affect One Health initiatives to evaluate and make recommendations</li> </ul>                             |
| Competency #3                                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                         |
| Advocate for a policy that addresses OH issues                                                           | <p>Understand systems thinking, identify OH problems and potential policy recommendations, by:</p> <ul style="list-style-type: none"> <li>Identify key stakeholders and considering pros/ cons of a policy recommendation</li> <li>Communicate potential conflicts and consider different perspectives</li> </ul> |
| Competency #4                                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                         |
| Analyze the effects of regional/local policies, economics and cultures on OH issues                      | <p>Describe health infrastructure (veterinary, medical, public health, environmental, etc.) in the context of :</p> <ul style="list-style-type: none"> <li>Regional politics, economics and infrastructure</li> <li>Regional sociology and behaviour</li> </ul>                                                   |

## INTRODUCTION TO POLICY, ADVOCACY, AND REGULATION

|                    |                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <p>Give learners an overview of the module and learning objectives which include:</p> <ul style="list-style-type: none"> <li>Advocate for OH policies</li> <li>Identify and understand the role of and policies enacted by international and national agencies that impact OH</li> <li>Advanced course: Analyze impact of regional policies, economics, and culture on OH policies</li> </ul> |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Introduction to Policy and One Health

- Define the difference among policies, regulations, guidelines, procedures, and position papers
- Identify agencies at the international/intergovernmental level

Notes: .....

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Read the Centres for Disease Control paper titled: "Operationalizing One Health: A Policy Perspective - Taking Stock and Shaping an Implementation Roadmap"

Notes: .....

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Regulations are a set of enforced rules established by a competent authority and typically are created to support the implementation of policies. Regulation creates, limits, or constrains a right, creates or limits a duty, or allocates a responsibility. Regulation can take many forms: legal restrictions promulgated by a government authority, contractual obligations that bind many parties, self-regulation by an industry such as through a trade association, social regulation (e.g., norms), co-regulation, third-party regulation, certification, accreditation or market regulation. In its legal sense regulation can and should be distinguished from primary legislation (by Parliament of elected legislative body) on the one hand and judge-made law on the other.

- Guidelines are recommendations or instructions that provide a framework for achieving compliance with policies. They are more technical in nature than policies and standards and are updated on a more frequent basis.
- Standards are typically the minimum requirements designed to address

specific requirements that ensure compliance with a policy, regulation or standard. These provide a basis for verifying compliance through audits and assessments.

- Procedures are step-by-step instructions for accomplishing tasks or activities that are part of a regulation or standard.
- Processes are a series of actions that produce something or that lead to a particular result and are often documented in procedures.
- A position paper is an essay that presents an opinion, typically that of a recognized expert or organization, about an issue.

### International/Intergovernmental Organizations

The major international/intergovernmental organizations that create health-related policy are:

- World Health Organization (WHO)
- World Organization for Animal Health (OIE)
- Food and Agriculture Organization (FAO)

### Web Scavenger Hunt for International/Intergovernmental Organizations - Instructions

- Visit the websites for WHO, OIE, and FAO
- Find as much information as you can about the organizations focusing on:
  - Mission of the organization
  - One Health strategic plans/areas of focus, themes, and agenda
  - Policies, guidelines or procedures that impact human, animal or ecological health and would benefit from a One Health approach
- Other international/intergovernmental organizations related to One Health

| International/<br>Intergovernmental<br>Organization                                   | Organizations<br>Mission | One Health<br>Strategic Plan/<br>Areas of Focus/<br>Themes/Agenda | Policies and<br>Procedures that<br>Impact Human,<br>Animal or<br>Ecological Health |
|---------------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------|
| World Health<br>Organization<br>(WHO)<br><a href="http://www.who.int">www.who.int</a> |                          |                                                                   |                                                                                    |

|                                                                                                     |  |  |  |
|-----------------------------------------------------------------------------------------------------|--|--|--|
| World<br>Organization for<br>Animal Health<br>(OIE)<br><a href="http://www.oie.int">www.oie.int</a> |  |  |  |
| Food and<br>Agriculture<br>Organization (FAO)<br><a href="http://www.fao.org">www.fao.org</a>       |  |  |  |
|                                                                                                     |  |  |  |
|                                                                                                     |  |  |  |
|                                                                                                     |  |  |  |
|                                                                                                     |  |  |  |

### What do you think?

- Do WHO, OIE, and FAO have One Health policy?
- Do they use a One Health approach?
- Why do you think they do or do not use a One Health approach?
- How would a One Health approach benefit these organizations?

**Notes:** .....

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## Anatomy of an International/Intergovernmental Policy

### Learning Objective

Describe major international/intergovernmental policies that support and/or affect OH initiatives

### International Health Regulation

Read Article “High-Level Technical Meeting to Address Health Risks at the Human-Animal-Ecosystems Interfaces” (WHO, OIE, FAO 2011)

**Notes:** .....

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Find and analyze another policy, regulation or guideline from WHO, OIE, FAO or another international/intergovernmental organization. Prepare a 5-minute presentation on the policy, regulation or guideline:

- If the organization is not WHO, OIE or FAO, give a short overview of the organization.
- Explain why you selected the organization and policy.
- Describe the purpose of the policy, regulation or guideline.
- Provide highlights of the policy, regulation or guideline.
- How does the policy, regulation or guideline represent a One Health perspective? Please highlight the relevant features.
- How could the policy, regulation or guideline be amended or revised to better reflect a One Health perspective? Explain how it could be revised and expanded to address the human-animal-ecological interface)?

**Notes:** .....

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## Analyzing WHO, OIE, and FAO policies, regulations, guidelines, and policy papers

### Learning Objective

Describe major international/intergovernmental policies that support and/or affect OH initiatives

## Policy Presentation Notes:

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### What do you think?

- Do the policies, regulations and guidelines overlap or complement one another? If yes, how?
- Do the policies, regulations and guideline differ from or contradict one another?
- As a One Health practitioner, how would you address the differences among policies, regulations or guidelines established by international entities? In what scenario might this play out?
- Do any of the policies, regulations or guidelines take a One Health perspective? If yes, how was this perspective incorporated? If no, how would you modify the policy, regulation or guideline to achieve a One Health perspective?
- How does or would a One Health perspective strengthen the policies, regulations or guidelines?
- Do any of the existing policies promote prevention of and response efforts to emerging pandemic threats? Could a One Health perspective improve the policies?

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## Discovering National Policies

### Learning Objective

- Identify national agencies and describe their scope and role(s)
- Identify national-level policies that support/affect OH initiatives
- Evaluate recommendations for policies supporting an OH approach

Read “Enhancing Health Policy Development: A Practical Guide to Understanding the Legislative Process,” (WHO 2004) and come prepared to give a brief presentation to the class on how legislation is promulgated in your country. As a class, identify all the different governmental organizations in your country that have policies on:

- Agriculture
- Animal health
- Protection of the environment
- Public health
- Wildlife

**Notes:** .....

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Select one of the five areas and identify:

- Two or three national policies in your policy area.
- Stakeholders affected by the policy.
- Whether the policy, regulation or guideline takes a One Health perspective, integrating human, animal, and ecological health.

| Focus                         | Ministries, Agencies, Departments or Organizations | National Policy | Stakeholders | One Health Perspective (Yes/No) |
|-------------------------------|----------------------------------------------------|-----------------|--------------|---------------------------------|
| Agriculture                   |                                                    |                 |              |                                 |
| Animal Health                 |                                                    |                 |              |                                 |
| Protection of the Environment |                                                    |                 |              |                                 |
| Public Health                 |                                                    |                 |              |                                 |

| Becoming an Advocate for OH Policies |                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                   | <p>Using systems thinking, identify an OH problem and potential policy recommendation(s) by:</p> <ul style="list-style-type: none"> <li>• Identifying key stakeholders and articulating their stance on the problem</li> <li>• Considering the pros and cons of a policy recommendation on the affected stakeholders</li> <li>• Communicating potential conflicts with interests and perspectives</li> </ul> |

Why are policy advocacy skills important for a One Health professional?

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What does policy advocacy involve?

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How do I advocate for a policy?

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## Becoming an Advocate

Using the Advocacy tools in the Resources section of the module (“How to Make Your Point with Government” or “How Do Journalists Work”) write a letter to a government official or draft a press release or create a poster about a One Health related issue that you feel needs policy support.

### Letter, Press Release, Poster...

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**Within a small group, share your letter, press release or poster. You will have:**

- 3 minutes to share letter, press release or poster
- 7 minutes for the group to offer feedback on how it worked well and what needs to be changed to have a greater impact
- Then have the group select one person to share their work with the class

**What do you think? Were you persuaded by your classmates’ letters, press releases or posters?**

- If yes, what was effective about your presentation?
- If not, what would it have taken to persuade you?

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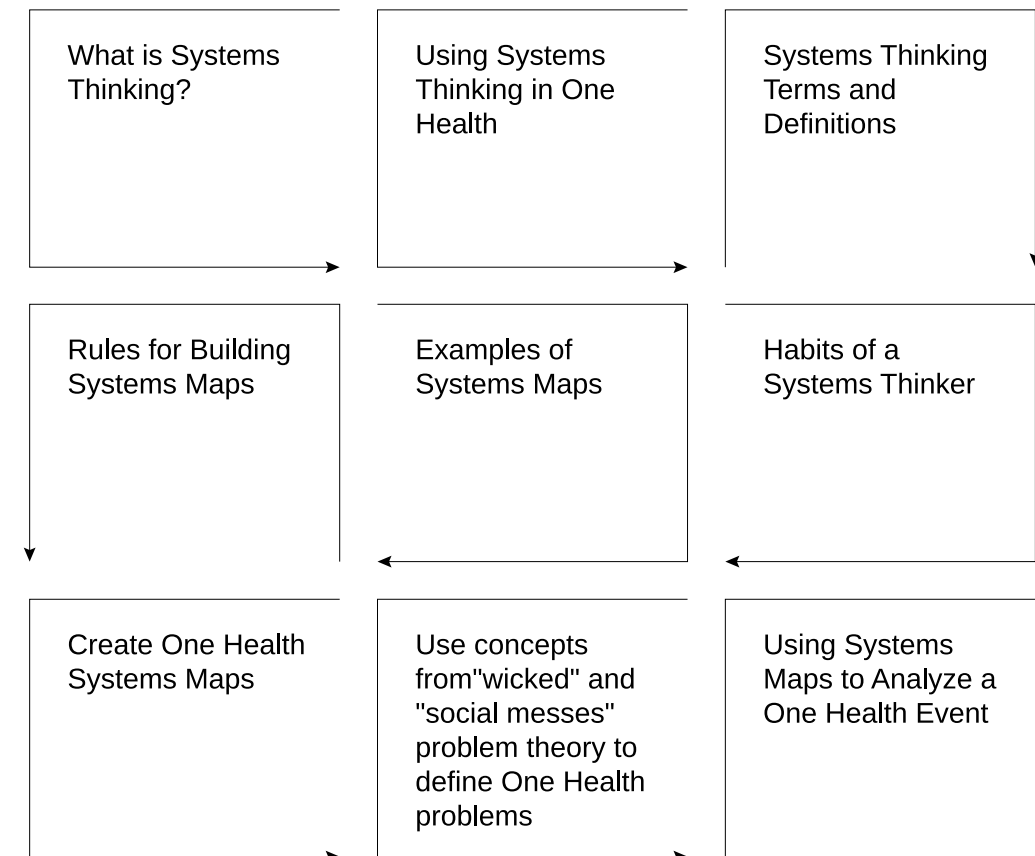
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## MODULE 7 - SYSTEM THINKING

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module equips students with the skills necessary to take a systems thinking approach to emerging pandemic diseases. Key outcomes include:</p> <ul style="list-style-type: none"> <li>• Using systems thinking to create maps of complex and complicated systems that include human, animal, environment, and ecological health and components.</li> <li>• Operate as part of a OH team that uses systems maps to integrate information from multiple disciplines and sectors, to develop strategies to address challenges</li> </ul> |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



## Module Overview

| Competency #1                                                                                                         | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe the elements of complex problems and systems thinking                                                        | Understand core concepts of systems thinking and their application in OH interventions by: <ul style="list-style-type: none"> <li>Describing key systems concepts (complex, complicated and adaptive systems)</li> </ul>                                                                                                                                                                                                                                                                        |
| Competency #2                                                                                                         | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Create and use systems mapping to strengthen the understanding of OH challenges                                       | Create systems maps of OH challenges, by: <ul style="list-style-type: none"> <li>Identifying the elements of the OH problem and the connections between the humans, animals and environment</li> <li>Mapping the integration points where individual system elements interact</li> </ul>                                                                                                                                                                                                        |
| Competency #3                                                                                                         | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Partner with OH team members to develop solutions for complex problems, using system thinking and relevant tools/maps | Contribute on an OH team to developing solutions to problems, by: <ul style="list-style-type: none"> <li>Using concepts from wicked and super wicked problem theories to understand how to formulate and approach OH challenges</li> <li>Integrating information and actions across disciplines/sectors using system thinking tools</li> <li>Determining and mitigating unintended consequences of planned interventions</li> <li>Creating essential feedback and feed-forward loops</li> </ul> |

## INTRODUCTION TO SYSTEMS THINKING

|                    |                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | Give students an overview of the Systems Thinking module and its learning objectives. Key outcomes include: <ul style="list-style-type: none"> <li>Describing the elements of complex problems and systems thinking</li> <li>Creating systems mapping to deepen understanding of OH problems</li> <li>Partnering with OH teams to develop solutions to complex problems</li> </ul> |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Notes: .....

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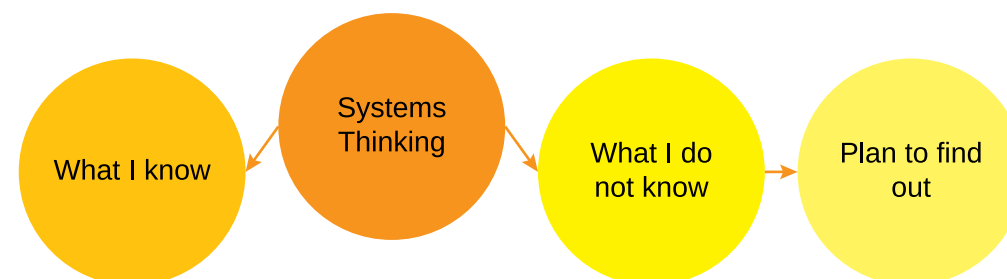
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## WHAT IS SYSTEMS THINKING?

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | Understand core concepts of systems thinking and their application in OH interventions, by: <ul style="list-style-type: none"> <li>Accurately describing key system concepts (complex, complicated and adaptive systems)</li> <li>Understanding what is distinctive about systems thinking as opposed to other forms of thinking (logic, causal, etc.)</li> <li>Evaluating the advantages and implications of taking a systems approach to OH problems</li> </ul> |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Creating a Learning Plan to Learn about Systems Thinking



Complete the table below:

| Things we know about systems thinking | Things we do not know what about systems thinking |
|---------------------------------------|---------------------------------------------------|
|                                       |                                                   |
|                                       |                                                   |
|                                       |                                                   |
|                                       |                                                   |
|                                       |                                                   |

Find two or three other students with whom you feel you can successfully learn about systems thinking. As a team, take 25 minutes to create a plan to learn more about systems thinking. Begin by discussing:

- What do you need to know about systems thinking in order to use a systems thinking approach in addressing One Health problems?
- In what order should you research the items identified in the previous question?
- What are the primary resources that you will use?
- What will you do when you cannot find the information that you want?
- What will you do when you have questions?
- How will you know when you have enough information?

After considering these questions, complete the table.

### Our Plan to Learn About Systems Thinking

| Things we know about systems thinking | Things we do not know | Plan for learning more |
|---------------------------------------|-----------------------|------------------------|
|                                       |                       |                        |
|                                       |                       |                        |
|                                       |                       |                        |

### WHAT IS SYSTEMS THINKING?

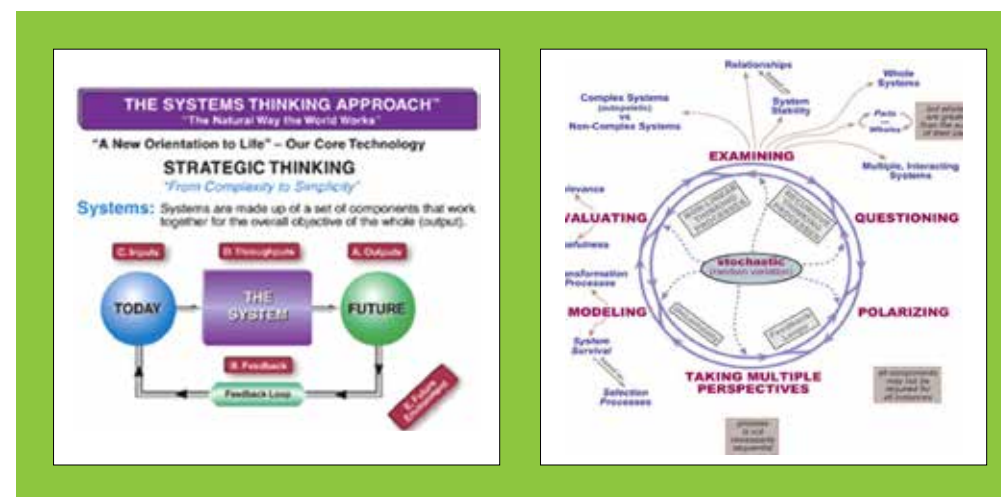
#### Finding Solutions to OH Problems through System Thinking

|                    |                                                                                                                                                                                                                                                                                              |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <p>Create system maps of OH problems by:</p> <ul style="list-style-type: none"> <li>• Identifying the elements to an OH problem and the linkage between humans, animals, and the environment</li> <li>• Mapping the integration points where individuals system elements interact</li> </ul> |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Creating a Systems Thinking Map

- Create a poster using systems mapping techniques to:
- Define systems thinking and summarize key systems thinking concepts
- Explain the distinctive elements of systems thinking as opposed to other forms of thinking
- Demonstrate how to create a systems map
- Evaluate the advantages and implications of taking a systems approach to understanding One Health problems

### Examples of Systems Maps



### Systems Thinking

Space to plan you systems thinking poster about systems thinking:

### WICKED PROBLEMS

#### Finding Solutions to One Health Problems through Systems thinking

|                    |                                                                                                                                                                                                                                                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <p>Create system maps of OH problems by:</p> <ul style="list-style-type: none"> <li>• Identifying the elements to an OH problem and the linkage between humans, animals, and the environment</li> <li>• Mapping the integration points where individuals system elements interaction with human, animals and the environment</li> </ul> |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Wicked Problems

- A wicked problem is a social or cultural problem that is difficult or impossible to solve for as many as four reasons:
- Incomplete or contradictory knowledge
- The number of people and opinions involved
- The large economic burden
- The interconnected nature of these problems with others problems

**Notes:** .....

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## Three One Health Challenges - Solve Using Systems Thinking

|                    |                                                                                                                    |
|--------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Challenge 1</b> | There is an outbreak of influenza like illness among people and animals in a small town in Thailand                |
| <b>Challenge 2</b> | Fifty chickens die before the TET holiday in one village in Vietnam                                                |
| <b>Challenge 3</b> | Three individuals come to a health station showing signs and symptoms of dengue fever in a small town in Indonesia |

### Challenge Directions:

- Use systems thinking to explore the challenge you selected, answering the following questions:
- Who? Who has the disease? Who else does the disease impact? Who should be on a One Health team?
- Where? Where was the first case discovered? Where has it spread?
- When? When was the first case discovered? How quickly is it spreading?
- How? How is the disease transmitted? How serious is it? How can the disease managed and controlled?
- What? What are the implications for human, animal, and ecological health?
- Why? Why did the outbreak occur?

Then propose solutions to the challenge

**Create a poster and be prepared to present your ideas to the class**

# CHAPTER 3

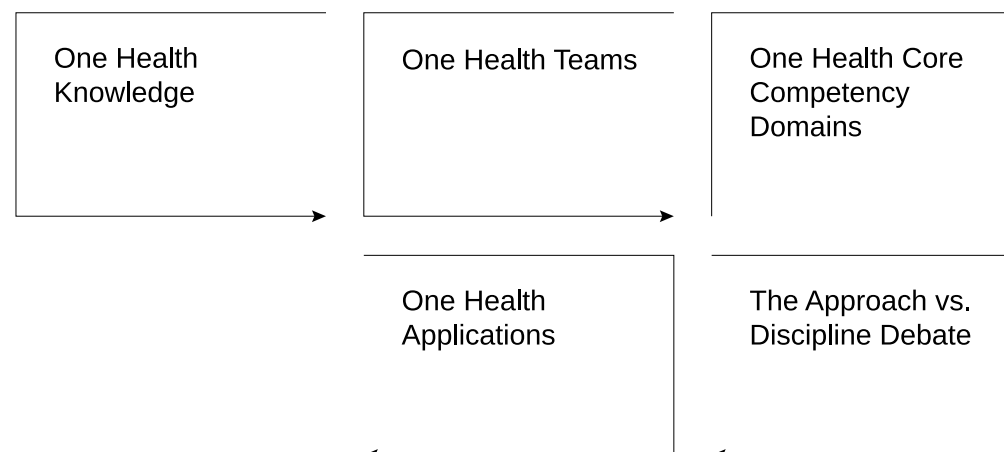
## Eight One Health Technical Modules

## MODULE 1 - ONE HEALTH CONCEPTS AND KNOWLEDGE

### Course Overview

|                                                 |                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Module Description and Learning Outcomes</b> | <p>This module provides students with an understanding of the OH approach, including its history, key players, and application. Key outcomes include:</p> <ul style="list-style-type: none"> <li>• Understanding the history, concepts and applications of the OH approach</li> <li>• Explain the OH approach to others</li> </ul> |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                 | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explain the history and concept of One Health | <p>Explain the One Health approach by being able to:</p> <ul style="list-style-type: none"> <li>• Define One Health, identify key concepts and describe it in a historical context</li> <li>• List stakeholders currently using the OH approach</li> <li>• Compare and contrast OH with eco-health, ecosystem health, global health and environmental health</li> </ul> |

| Competency #2                                                         | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe the One Health Core Competency domains and their application | <p>Demonstrate an understanding of the OHCC domains by being able to:</p> <ul style="list-style-type: none"> <li>• Describe who should be involved in a OH team approach and how to work together</li> <li>• Describe the OHCC domains, including their purpose and how they can be used</li> </ul>                                          |
| Competency #3                                                         | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                    |
| Describe the application of the One Health Approach                   | <p>Demonstrate understanding of the application of the One Health approach by being able to:</p> <ul style="list-style-type: none"> <li>• Explain how One Health is an approach and trans-disciplinary</li> <li>• Explain how One Health brings together stakeholders to address complex emerging and re-emerging disease threats</li> </ul> |

| ONE HEALTH KNOWLEDGE |                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective   | <p>Explain the One Health approach by being able to:</p> <ul style="list-style-type: none"> <li>• Define One Health and describe it in a historical context</li> <li>• Identify One Health concepts</li> <li>• List stakeholders using the One Health approach</li> <li>• Compare and contrast One Health with eco-health, ecosystem health, global health and environmental health</li> </ul> |

### Introduction to One Health

- Explain the One Health approach by being able to:
- Define One Health and describe it in a historical context
- Identify One Health concepts
- List stakeholders currently using the One Health approach
- Compare and contrast One Health with eco-health, ecosystem health, global health and environmental health



### What is One Health?

Define “One Health.” On the sheet of paper your instructor gives you, label one side ‘A’ and the other side ‘B.’ On side A, define “One Health.” Get creative. You can create an acronym, a sketch or use words or symbols, or any other way to explain your thoughts on what One Health encompasses.

*Copy your definition from Side A of the paper into the space below.*

### One Health Definitions and Stakeholders

**Individual challenge:** Carry out an internet search to define the following terms:

- Eco-health
- Ecosystem Health
- Global Health
- One Health
- Environmental Health

*As you are searching, write down the local, regional, and international organizations that work in these sectors.*

**Reexamining how you first defined One Health, how would you define One Health now? Write down, sketch or use any other creative way to explain One Health on side B of the paper your instructor gave you.**

Copy your definition from side B into the space below and turn the paper into your instructor.

**Notes:** .....

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#### WHO MIGHT BE ON A ONE HEALTH TEAM

Learning  
Objective

- Understand who should be involved in a One Health approach and what role they should play within a team

#### A One Health 'Wordle'

| One Health Core Competency (OHCC) Domain Framework |                               |                                |                                |                               |                                 |
|----------------------------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|---------------------------------|
| Global Domains (Feb. 2013)                         | SEAOHUN Regional Domains      | Malaysia                       | Indonesia                      | Thailand                      | Vietnam                         |
| Management                                         | Management                    | Management                     | Management                     | Planning and management       | Planning and management         |
| Communication                                      | Communication and Informatics | Communication                  | Communication                  | Communication and Informatics | Communications and informatics  |
| Culture and beliefs                                | Culture and beliefs           | Culture and beliefs            | Culture and beliefs            | Culture and ethics            | Culture and beliefs             |
| Leadership                                         | Leadership                    | Leadership and professionalism | Leadership and professionalism | Leadership                    | Leadership                      |
| Collaboration and partnership                      | Collaboration and partnership | Collaboration and partnership  | Collaboration                  | Collaboration and partnership | Collaboration and partnership   |
| Values and ethics                                  | Values and ethics             | Ethics                         | Values and ethics              |                               | Values and ethics               |
| Systems thinking                                   | Systems thinking              | Systems thinking               | Systems thinking               | Systems thinking              | Systems thinking                |
|                                                    |                               |                                |                                | One Health knowledge          | Policy, Regulation and advocacy |

**Notes:** .....

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#### Jeopardy Notes

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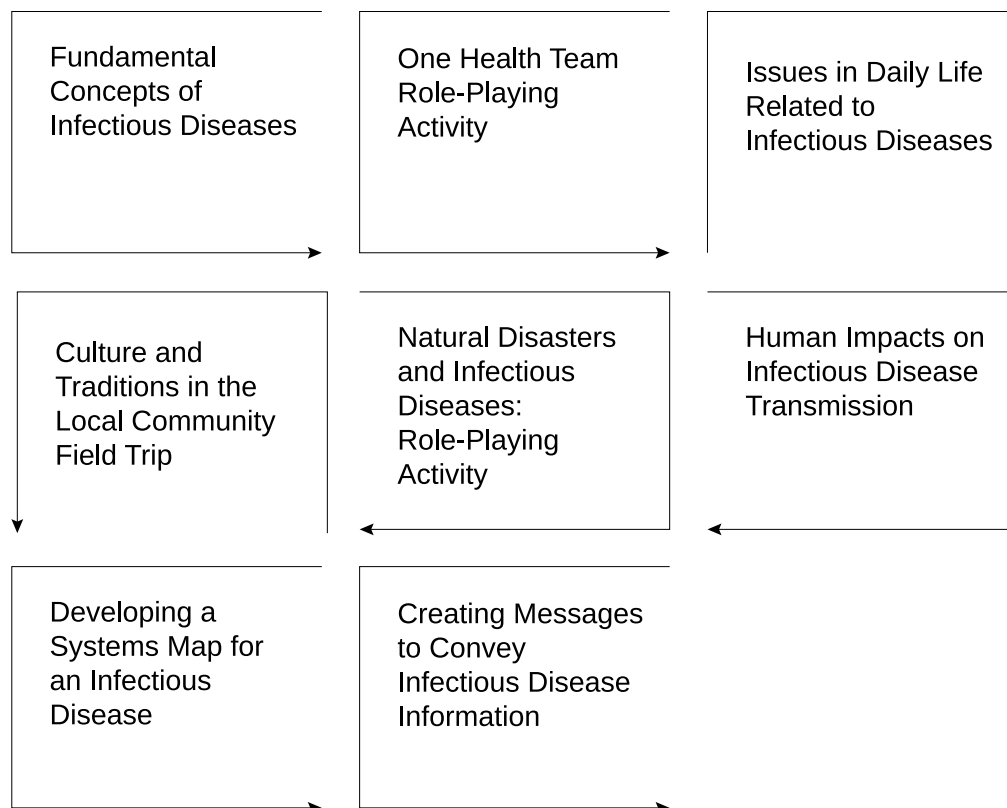
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## MODULE 2 - FUNDAMENTALS OF INFECTIOUS DISEASE

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module provides an understanding of the basic principles of infectious diseases in the context of OH. The module uses an OH approach to examine various important zoonotic infectious diseases of animals and humans, while helping students understand the fundamentals of infectious disease ecology and their impacts on humans, animals, and the environment. Key outcomes of the module are the ability to:</p> <ul style="list-style-type: none"> <li>Describe and interpret fundamental concepts of selected infectious diseases and how they affect human, animal and environmental health</li> <li>Understand how culture and tradition influence infectious diseases</li> <li>Use systems thinking in the context of infectious diseases</li> </ul> |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

|                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Competency #1                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                              |
| Describe the fundamental concepts of Infectious Diseases                         | <ul style="list-style-type: none"> <li>Describe the ethology and epidemiology of infectious diseases</li> <li>Compare the pathology, pathogenesis, clinical manifestations and treatments of various infectious disease</li> <li>Apply fundamental concepts to develop an OH approach in the context of infectious disease control</li> </ul>                                                          |
| Competency #2                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                              |
| Interpret fundamentals of infectious diseases and daily impacts                  | Use fundamental concepts of infectious disease to be able to identify and classify the types of infectious diseases endemic in a given area in humans and animals.                                                                                                                                                                                                                                     |
| Competency #3                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                              |
| Identify infectious disease issues relating to culture and traditional practices | <p>Understand problems associated with culture, beliefs, values, and ethics that are related to infectious disease by being able to:</p> <ul style="list-style-type: none"> <li>Describe traditional livestock production practices and livestock-transmitted infectious diseases</li> <li>Understand how local cultural practices can influence the emergence and transmission of diseases</li> </ul> |
| Competency #4                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                              |
| Integrate the concepts of infectious disease                                     | Understand systems thinking in relation to infectious diseases and use it to describe the fundamental concepts and how they are related. Students will develop a transmission diagram that incorporates components of the system for an infectious disease.                                                                                                                                            |
| Competency #5                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                              |
| Apply various communication strategies                                           | <p>Understand how to use methods to convey information about an infectious disease issues by being able to:</p> <ul style="list-style-type: none"> <li>Effectively communication information about an infectious disease to professionals and laypersons</li> <li>Describe the history, current epidemiology, pathology, treatment, control and prevention</li> </ul>                                  |

## FUNDAMENTAL CONCEPTS OF INFECTIOUS DISEASE

### Learning Objective

- Describe the ethology and epidemiology of important infectious diseases
- Compare the pathology, pathogenesis, clinical manifestations and treatments of various infectious diseases
- Apply fundamental concepts useful to develop a OH approach to the control and prevention of an infectious disease

### Fundamentals of Infectious Disease Module Competencies

Read: "Interdisciplinary approaches to understanding disease emergence: the past, present, and future drivers of Nipah virus emergence." Article available free online at PubMed Central:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3586606/>

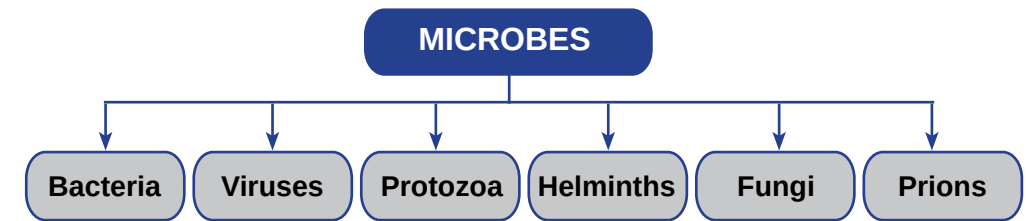
### Overview of Key Terms and Concepts

- Infectious diseases of medical and veterinary importance
- Concept of zoonotic diseases
- Biological classification of the causative agents
- Common nomenclatures
- Concepts of host pathogen relationships
- Specific and non-specific clinical manifestations
- Cross reactivity between the agents

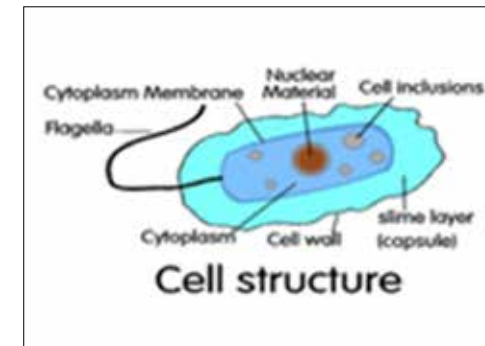
| Term           | Definition |
|----------------|------------|
| Pathogen       |            |
| Infection      |            |
| Carrier        |            |
| Virulence      |            |
| Latent         |            |
| Reservoir Host |            |
| Prophylaxis    |            |

## Microbes

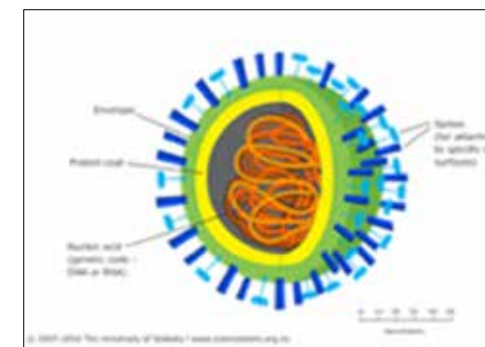
### Classification of Organisms that Cause Infectious Disease



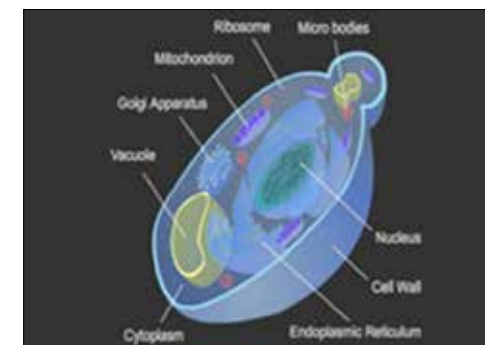
### Bacteria

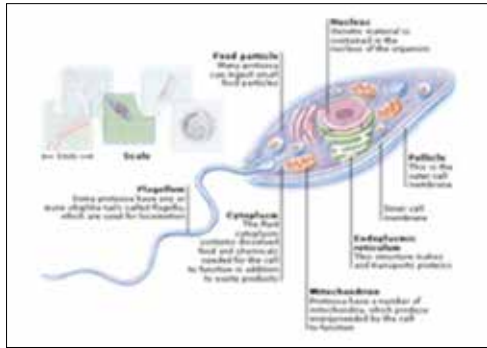


### Virus



### Fungi





### Protozoa

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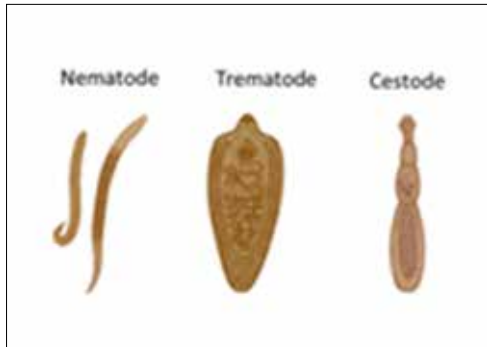
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### Helminths

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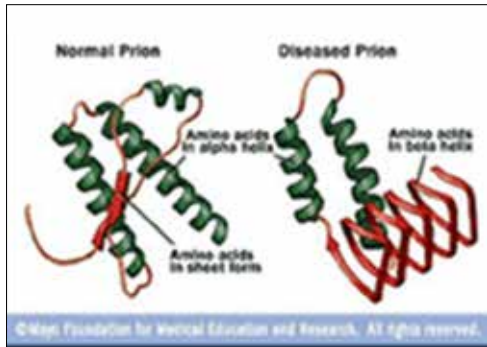
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### Prions

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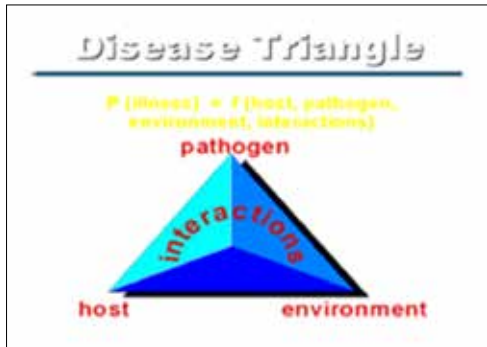
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### Disease Triangle

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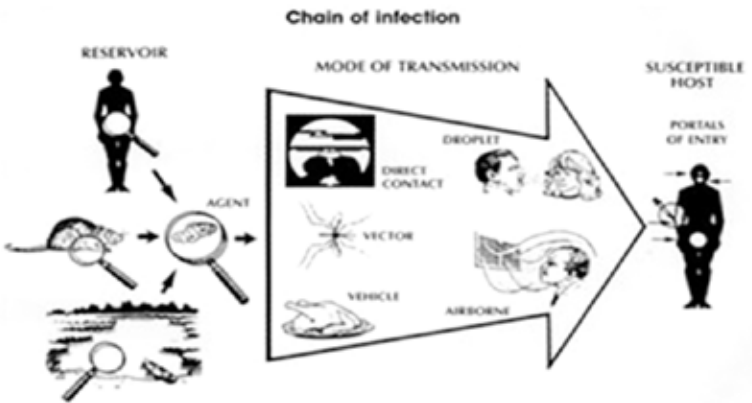
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Notes: .....

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### Infectious Disease: Interdisciplinary Approaches to Nipah Virus

“Nipah Virus Infection (NiV) is an emerging infectious disease of public health importance in the South-East Asia Region. The virus is named after the Malaysian village where it was first discovered. This virus along with Hendra virus comprises a new genus designated Henipavirus in the subfamily Paramyxovirinae. Fruit bats of the genus Pteropus have been identified as natural reservoirs of NiV. A sero-epidemiologic study in Malaysia implicated four fruit bat species, Pteropus hypomelanus, P. vampyrus, Cynopterus brachyotis, Eonycteris spelaea, and an insectivorous bat, Scotophilus kuhlii. Nipah virus has been isolated from the brain and spinal fluid of victims in Malaysia. Infective virus has also been isolated from environmental samples of bat urine and partially-eaten fruit in Malaysia.”

#### What do you think?

- What is a reservoir of disease?
- What is Nipah virus and where did it first emerge?
- What are the pathological manifestations of Nipah virus in humans?
- What are the pathological manifestations of Nipah virus in other animals?
- What is meant by drivers of emerging infectious diseases?
- How did Nipah virus emerge from animal populations and infect humans?
- How does climate change relate to disease emergence?
- What strategies can help us predict future disease emergence?
- Describe how a One Health approach is important for understanding disease emergence.

Notes: .....

### Identifying Infectious Organisms

- Practical laboratory session:
- Direct fecal examination
- Thin and thick blood smears
- Bacterial culture and staining

Notes: .....

### ONE HEALTH TEAM ROLE-PLAYING ACTIVITY

Learning  
Objective

- Describe how various stakeholders are involved in an infectious disease outbreak and how they may be impacted by the disease
- Use a role-play scenario to demonstrate how to communicate with various stakeholders following an outbreak of a new infectious disease
- Design a One Health approach for health promotion related to infectious diseases at the community level

### Components of Disease

### Management and Stakeholder

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### Outbreak of an Unknown Infectious Disease - Role Play

Imagine an outbreak of a novel (“emerging”) zoonotic infectious disease. You know that this disease is causing high fever, headache, and muscle aches in human patients, and leads to neurologic disease causing death in 10% of human patients with this illness (i.e., “cases”) reported by local hospitals and clinics. You also have reports of undiagnosed illness in cattle in the area, which have not yet been fully investigated. There have been reports of some farmers sending sick animals to the slaughterhouse before death. People in the village have also noticed an apparent increase in mortality of birds around town, but it is not known if this is related to the human cases. The area has recently begun clearing existing forest areas to make room for farmland. The following stakeholders are involve:

- Veterinarian from World Organization for Animal Health (OIE)
- Public health expert from Centers for Disease Control (CDC)
- International health agency staff from World Health Organization (WHO)
- Government officials – national and local (e.g., district) levels

### Community members:

- Farmers
- Local doctor and nurse at health clinic
- Local veterinarian
- Community member: shop owner
- Community member: raw food sales at market
- Community member: customer of the market
- Slaughterhouse workers

As a group of stakeholders you need to decide how to best work as a One Health team, what each person’s role on the team will be, and then to develop a plan involving all members to investigate, identify and respond to the emergency of the outbreak. Your role during the role play will be:

- What activities would be implemented in the community by the stakeholders to respond to the disease?
- How do you think you are involved in transmission of this disease?
- How do you solve issues related to your role?
- What is each stakeholder’s responsibility?
- How should members of national or international health agencies work with local (e.g., district level) health officials, and university experts, and how should they communicate to the local community?

- How can local community members best work with members from outside agencies?
- What are the challenges and obstacles to working with all stakeholders to address the emergence of the new disease?
- How can all members feel important and necessary as part of a One Health team trying to improve the health of the local community?

#### What do you think?

- How did the team do?
- What did you learn about how to design a One Health approach?
- What did you learn about implementing stakeholder activities during an infectious disease outbreak?

Notes: .....

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| ISSUES IN DAILY LIFE RELATED TO INFECTIOUS DISEASES |                                                                                                                                                                                               |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                  | <ul style="list-style-type: none"> <li>• Give examples of infectious diseases in humans and animals</li> <li>• Explain their effect on the daily lives of the affected populations</li> </ul> |

Complete a personal activity log for two or more days to record your daily activities and how those activities may relate to the risk of transmission of an infectious disease.

| PERSONAL ACTIVITY LOG |          |                          |
|-----------------------|----------|--------------------------|
| Hour                  | Activity | Infectious Disease Break |
|                       |          |                          |
|                       |          |                          |
|                       |          |                          |
|                       |          |                          |
|                       |          |                          |

#### Additional Observations

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#### Infectious Disease and Daily Life

Daily activities for:

| Individual                                                                                                                                                                                                                                     | Family                                                                                                                                                                                                           | Community                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Food preparation</li> <li>• Eating and serving food</li> <li>• Care of pets</li> <li>• Interaction with other animals</li> <li>• Personal hygiene</li> <li>• Interaction with other people</li> </ul> | <ul style="list-style-type: none"> <li>• Sharing meals and food preparations</li> <li>• Care of children and elders</li> <li>• Cleaning</li> <li>• Celebrations</li> <li>• School</li> <li>• Funerals</li> </ul> | <ul style="list-style-type: none"> <li>• Food markets</li> <li>• Restaurants and catered events</li> <li>• Gatherings - religious, celebrations, school, lectures</li> <li>• Theatre</li> </ul> |

Notes: .....

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#### Interview about Issues in Daily Life Related to Infectious Disease

Choose a family member or friend from your local community and interview them about their daily life activities and knowledge of how those activities might relate to transmission of infectious disease. Record their answers to the questions below and add any other questions appropriate to your family or local community.

Start by explaining to the person you will interview that you are taking a class on One Health and you are studying ways that normal activities in daily life can relate to the spread of infectious diseases. Tell them that you have already made a log of your own daily activities and would like to ask them questions about their activities and knowledge of infectious disease. Before starting, you can answer

any questions the interviewee may have about what you mean by infectious disease or how they spread.

Name of Interviewee: .....

Date of Interview: .....

What meals are usually prepared in the home on a daily basis? Who is involved in the cooking?

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How do you usually serve food prepared at home?

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How do you store food in your home? Ask more specifically about raw meats, vegetables, milk and eggs.

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What meals do you and your family eat in a restaurant?

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How do you think food preparation and serving may relate to spread of infectious diseases? Explain what you mean by infectious disease to the interviewee, if needed.

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Are you aware of any specific diseases that may be transmitted by food?

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What household cleaning or hygiene activities do you usually perform on a regular basis? Who is responsible for most of the cleaning in your home?

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Do you know of any ways that cleaning activities or food storage practices could relate to spread (or the prevention) of infectious disease?

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Do you have children in your home? Who usually cares for the children?

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Do you have pets in your home or livestock on your property? Who usually cares for pets or livestock?

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Do you have pets in your home or livestock on your property? Who usually cares for pets or livestock?

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Are you aware of any infectious disease that may spread from animals to people during routine interactions?

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What activities do you usually do in the community on a regular basis? Think of buying food at a market or grocery store, attending school, going to work, religious activities, group gatherings, etc.

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Can you think of anyways that you could personally be at risk for an infectious disease during one of these activities?

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What animals, including pets, livestock or wildlife are present in your community? Where are these animals located?

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How can animals present in the community be involved in the spread of infectious disease? Can you think of any specific diseases that are spread from animals to people?

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#### Additional Questions/Observations

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### HUMAN IMPACTS ON INFECTIOUS DISEASE TRANSMISSION

#### Learning Objective

- Give examples of infectious disease in humans and animals, and explain their effects on the daily lives of affected populations
- Understand local cultural practices influence the emergence and transmission of an infectious disease
- Analyze an infectious disease problem and identify solutions to conflicts with culture and traditional practices

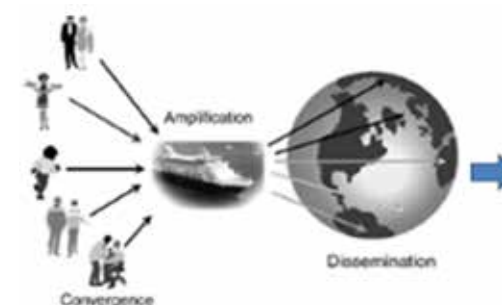
#### Human Impact

Notes: .....

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#### Human Ecology and Human Related Change to the Environment

Please read the paper below and plan to discuss in a small group.

Murray, K.A., and P. Daszak. Human ecology in pathogenic landscapes: two hypotheses on how land use change drives viral emergence. *Curr Opin Virol.* Feb 2013; 3(1): 79–83.

Complete article available online at:

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3713401/>

- What is meant by human ecology?
- How can human-related (anthropogenic) changes to the landscape result in disease emergence?
- What are some local cultural, traditional or livestock husbandry practices that may result in infectious disease?
- How do human activities resulting in a local change in land use impact the global system?
- What are some human impacts that can result in disease emergence?
- How can we advocate for a One Health approach to deal with human-influenced impacts on disease transmission, including land use change, culture, traditions and livestock practices?

Notes: .....

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### CULTURE AND TRADITIONS IN THE LOCAL COMMUNITY

#### Learning Objective

- Classify infectious diseases influencing human and animal health
- Describe traditional livestock production practices and disease transmission
- Understand how local cultural practices influence the emergence and transmission of an infectious disease
- Convey information about an infectious diseases in written forms.

Prepare for your field trip by going to the website Dimensions of Culture and reading about “Traditional Asian Health Beliefs & Healing Practices” at [www.dimensionsofculture.com/2010/10/traditional-asian-health-beliefs-healing-practices/](http://www.dimensionsofculture.com/2010/10/traditional-asian-health-beliefs-healing-practices/)

#### Culture and Tradition in the Local Community - Field Trip Notes

Location: .....

Date: .....

During the field trip notes on any cultural or traditional practices you observe and answer the following question:

What are the cultural practices that you observe?

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What populations are you observing?

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What animals are present? Pets? Livestock?

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What livestock husbandry practices are used?

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How are pets treated and cared for in the community?

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What is the ecosystem in and around the community?

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What factors related to the humans, animals, and their environment could impact infectious disease transmission?

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How have infectious disease influenced local culture or practices?

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What is the direct impact of infectious diseases on the families and the community (economic impacts, loss of time, etc.)?

What is the indirect impact of infectious diseases to the family and community (economic impact, loss of time, etc.)?

What is the impact of culture on the families and the community when a member of a family or community suffers from an infectious disease?

General Observations and Additional Notes

### Debrief and Concluding Remarks

Based on your readings and your new found knowledge of the community, share your general observations and discuss the following questions:

- What is meant by culture and traditional practices?
- Describe culture and beliefs in the local area of the field trip.
- What are traditional practices observed in this community?
- What are examples that you observed of how culture can play a role in the transmission of infectious diseases?
- What are examples of traditional livestock production? Did you observe any of these in the community? How could these practices impact on infectious disease transmission?

### DEVELOPING SYSTEMS MAPS FOR INFECTIOUS DISEASES

Learning Objective

- Develop a transmission diagram that incorporates all components of the system for an infectious disease, including downstream effects.
- Describe how various stakeholders are involved and how they may be impacted by the disease
- Describe the fundamental concepts for an infectious disease and their relation



### Systems Thinking

Nourish Food Systems Map

Creating a Systems Map for an Infectious Disease

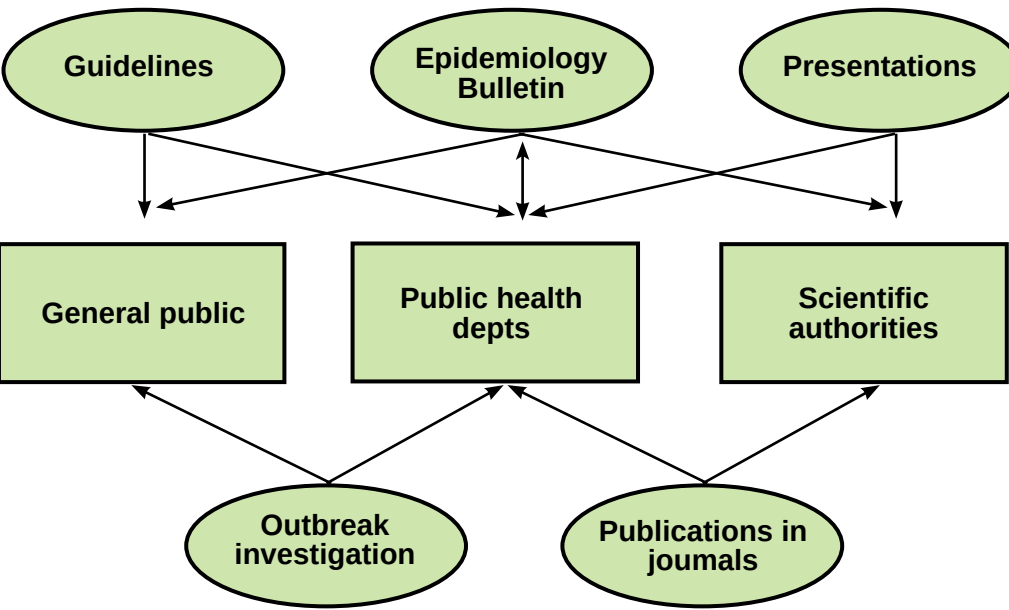
- Create a systems map for avian influenza. In creating your map:
- Put your central idea or concept in the middle.
- Use connecting lines and arrows to show interrelated part of the system.
- Organize the map into related areas (could be human, animal, environment for an infectious disease).
- Use colours to differentiate related areas.

Notes: .....  
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Avian Influenza

| CREATING MESSAGES TO CONVEY INFECTIOUS DISEASE INFORMATION |                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                         | <ul style="list-style-type: none"><li>• Convey information about an infectious disease to professionals and the vernal public in written communication forms.</li><li>• Describe the history, current epidemiology, pathology, treatment, control, and prevention of an infectious disease</li></ul> |

Communicating About Infectious Diseases



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## Creating a Message about Infectious Diseases

Select a disease and write a comprehensive message to be delivered orally, aimed at the community to convey information about the disease. Make sure your message covers:

- General information about the disease outbreak, agent, background, etc.
- Impact of this disease on human and animal health
- Remember to use language appropriate for audience
- Economic impact of the disease
- Important points about the epidemiology, symptoms, pathology related to disease
- Effective measures for prevention and control of the disease
- Measures for proper treatment
- Appropriate community activities to mitigate the effects of the disease

*Be prepared to present your message to the class*

### Message:

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What feedback did you get about the message after your presentation? How would you improve your message and presentation?

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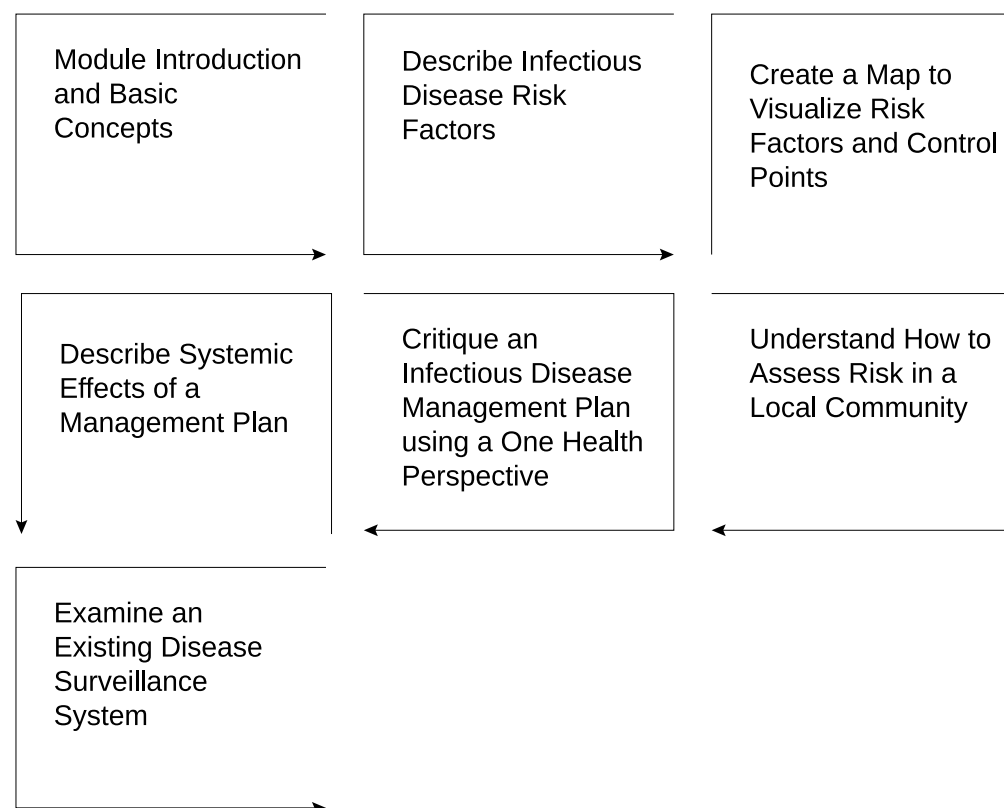
## MODULE 3 - INFECTIOUS DISEASE MANAGEMENT

### Course Overview

#### Module Description and Learning Outcomes

Infectious disease management focuses on thinking about the problem of diseases and strategizing to minimize its impact on the global economy and public health. This module fosters a better understanding of infectious disease management from an OH perspective at the individual and societal levels. Educational topics reviewed in this module include the classical “epidemiological triad,” representing the important interrelationships among three key factors: the infected host, the etiological agent, and the environment). We also view infectious disease management and on emerging zoonotic diseases, disease surveillance systems, outbreak detection, health promotion and health education, disease prevention and control, and treatment and rehabilitation.

### Learning Map



## Module Overview

| Competency #1                                                                                                   | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identify and analyze the risk factors associated with illness during an infectious disease outbreak or epidemic | <p>Understand how to identify factors associated with an increased risk of an infectious disease during an outbreak and the impact they have on OH program, by:</p> <ul style="list-style-type: none"> <li>• Identify the principles of infectious disease and factors associated with a increased risk</li> <li>• Understand the modes of infectious disease transmission</li> <li>• Describing examples of risk factors with various zoonotic diseases</li> <li>• Analyzing the potential impact of risk factors on the population during a disease outbreak</li> </ul> |
| Competency #2                                                                                                   | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Design an infectious disease management plan                                                                    | <p>Create a OH protocol to manage a specific infectious disease outbreak by:</p> <ul style="list-style-type: none"> <li>• Understanding diagnostic tests and quarantine concepts</li> <li>• Developing an effective infectious disease management plan</li> <li>• Strengthening disease prevention activities, including public awareness plans</li> </ul>                                                                                                                                                                                                                |
| Competency #3                                                                                                   | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Evaluate the effectiveness of OH actions in infectious disease management                                       | <p>Evaluate disease control activities and strategies of programs, and conduct situational assessments for effective outbreak response by being able to:</p> <ul style="list-style-type: none"> <li>• Understand what measures are useful to evaluate a management plan</li> <li>• Evaluate and critique an infectious disease eradication plan</li> <li>• Describe advantages and disadvantages of disease control strategies</li> </ul>                                                                                                                                 |

| Competency #4                                       | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Design a disease surveillance and monitoring system | <p>Developing new strategies for infectious disease surveillance by:</p> <ul style="list-style-type: none"> <li>• Understanding core concepts in surveillance methods</li> <li>• Describing components and methods for evaluating surveillance system</li> <li>• Creating a plan for collection of disease surveillance data</li> <li>• Describing the data collection procedures and techniques</li> <li>• Performing quantitative and qualitative data analysis</li> </ul> |

## INTRODUCTION AND BASIC CONCEPTS

|                    |                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Understand the principles of risk during an infectious disease outbreak</li> <li>• Understand various possible modes of disease transmission and their influence on designing effective disease control measures</li> <li>• Describe possible risk factors for zoonotic diseases</li> </ul> |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Overview of Key Terms and Concepts

- Infectious organisms
- Transmission
- Risk
- Management concepts

## Avian Influenza H5N1

- What species are infected by avian influenza H5N1?
- What is the role of live bird markets in the transmission of H5N1, and why were they a focus of this investigation?
- What is the difference between susceptibility and infectiousness in terms of the live bird markets studied in this paper?
- What are the management recommendations for H5N1 in the live bird markets?

Notes: .....

For your assigned group, prepare a 10-to-15 minute presentation:

|                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Group 1<br/>Transmission Dynamics<br/>for H5N1</b>     | <p>Create a presentation, including a diagram for transmission. Make sure to include:</p> <ul style="list-style-type: none"> <li>• Type of organism</li> <li>• Host range (include reservoirs)</li> <li>• Route(s) of transmission</li> </ul>                                                                                                                                                                                                                                                                        |
| <b>Group 2<br/>Risk Factors for H5N1<br/>Transmission</b> | <p>Create a presentation describing risk factors for transmission of avian influenza H5N1 between animals and humans. Make sure to include:</p> <ul style="list-style-type: none"> <li>• Risk factors for infection (in humans and non-human animals)</li> <li>• Environmental factors that increase or decrease risk</li> <li>• Human behaviour and cultural/traditional factors that increase or decrease risk of H5N1 transmission</li> <li>• Animal behaviours that increase or decrease risk of H5N1</li> </ul> |
| <b>Group 3<br/>Management of H5N1</b>                     | <p>Create a presentation describing the management recommendations for H5N1 in live bird markets proposed in the paper. Make sure to include:</p> <ul style="list-style-type: none"> <li>• Management recommendations</li> <li>• Aspects of transmission dynamics influenced by implementation of the management plan</li> <li>• How risk factors may be mitigated by the management plan suggested in the paper</li> </ul>                                                                                          |

Notes: .....

## DESCRIBING POSSIBLE RISK FACTORS FOR AN INFECTIOUS DISEASE DURING AN OUTBREAK SCENARIO

Learning  
Objective

- Identifying and analyze risk factors associated with infection during a disease outbreak or epidemic

**Prior to this session, read about the risk factors for rabies:**

- “The Human Risk Factor: Rabies” (Texas A&M University )
- “Rabies and Rabies-Related Lyssaviruses” (The Center for Food Security and Public Health, Iowa State University)

### Rabies Outbreak Case Scenario

Observing that almost a year had passed since the last rabies case was reported on the island of Bali, Indonesia, the provincial administration expressed confidence that the island would soon be completely free of rabies. To be officially categorized as “rabies free,” an area must have two consecutive years without a single occurrence of rabies in either animals or humans. “It could be possible that Bali will be free of rabies because the last rabies case found in a human was last April,” the head of the Bali Health Agency, I Ketut Suarjaya, was quoted as saying.

Sanglah Hospital reported that, overall, only about 2 percent of dog bite cases developed rabies. Disease surveillance data showed that in 2008 a total of four persons with rabies infection (“cases”) were reported, compared to 48 cases reported during 2009 and 82 cases during 2010. Following implementation of a mass dog vaccination campaign, a substantial reduction in the number of persons with rabies infection (“cases”) was observed, a total of 24 in 2011, and by 2012, only 8 human cases were reported.

Meanwhile, Sanglah Hospital’s Secretary of the Rabies Mitigation Team, Dr. Ken Wiransadhi, acknowledged that rabies vaccine distribution had become more selective recently. Distribution was prioritized for multiple and deep wounds caused by stray dogs. Free-of-charge rabies inoculations are provided at state-owned hospitals only for humans with dog bite wounds in vital organs, including the head, face, fingers and genitalia. The vaccine can also be purchased at medical clinics. Last week, the Bali Health Agency stocked up with 5,000 vials of anti-rabies vaccine, an amount estimated to be sufficient for approximately 1,250 people during the next few months. Some 750 vials have been distributed to rabies centers in regencies.

Over the past several years, Bali has attempted to control the spread of rabies through a mass dog vaccination program and sterilization. The head of Bali's Husbandry Agency, Putu Sumantra, recently announced that stage four of the mass dog vaccination campaign, which will include vaccine for all 300,000 dogs on Bali, would start mid-April and run through June this year. According to agency records, the latest mass rabies vaccination resulted in the immunization of approximately 80 percent of the dog population on the island (approximately 250,000 dogs), while 500 more had been sterilized. The Balinese administration remains confident that the island will be able to achieve its target of being a "rabies-free" area by 2015.

Residents are expected to bring their dogs to receive this free vaccination. But since the rabies outbreak began on the island in 2008, some experts have maintained that there has not been much improvement in behaviors related to rabies prevention strategies among pet owners in Balinese communities. "There's only been a small change in attitude in the way they care for their dogs. The dogs are still let loose to look for food on the streets," chairman of the Bali chapter of the Indonesian Association of Veterinarians, Gusti Ngurah Mahardika, said recently. Mahardika stated it was urgent for Balinese communities to properly care for their dogs by feeding them at home and vaccinating them regularly because, "Dogs do bite. Thus, preventing them from contracting rabies is most important." The virologist further stated that the main methods of prevention include the proper care and regular vaccination for dogs, as well as increasing public awareness about the need to have proper treatment, including a rabies shot, after being bitten by a dog.

Arie Rukmantara, spokesperson for the National Commission on Zoonoses, said that the main challenge to free the island from rabies was maintaining the commitment and participation of both individuals and communities. "If an outbreak occurs for several years, it is crucial to maintain the commitment of local people to participate in the eradication efforts." He said the 2015 target for being rabies-free was reasonable, considering that the administration had implemented efforts to accomplish this since the first case of rabies was found in Jimbaran during 2008.

*Retrieved from the Jakarta Post*

### Prepare to discuss the following questions in small groups:

- How serious is the rabies outbreak?
- What are the most significant risk factors in the rabies outbreak?
- Who is responsible for monitoring risk factors for this disease?
- What is a major concern in a rabies outbreak situation?
- What would you do to mitigate the factors for rabies during an outbreak?
- What is your group's plan of action?
- Is it possible that an additional unidentified case of human rabies may have occurred, and was not properly diagnosed, or not reported to officials due to lack of awareness (e.g. in a remote rural area)?

Notes: .....

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### CREATING A CONCEPTUAL MODEL TO VISUALIZE RISK FACTORS AND CONTROL POINTS

|                    |                                                                                                                                                                                                                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Identifying disease transmission and design effective control measures</li> <li>• Describe zoonotic disease risk factors, prevention and public awareness</li> <li>• Create a map to visualize risk factors, modes of transmission and risk control</li> </ul> |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## A Review of Infectious Disease Prevention Strategies

### Concept Map for Avian Influenza

Think about:

- Risk factors related to the host
- Risk factors related to the virus (i.e. the agent)
- Risk factors related to the environment
- Transmission routes
- Control or intervention points

Notes: .....

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### Visual Understanding Environment (VUE) Mapping

Free download at: [sourceforge.net/projects/tuftsvue/files/latest/download](https://sourceforge.net/projects/tuftsvue/files/latest/download)

Leptospirosis is a zoonotic waterborne infection with a global distribution caused by bacteria of the genus *Leptospira*. Leptospirosis in humans may result in damage to the liver, kidneys and the central nervous system. Human infection usually results from contact with water, or vegetation or soil contaminated by the urine of infected animals. Possible animal reservoirs include livestock, dogs, rodents and wild animals. Leptospire enter the body through contact with cuts or abrasions in the skin, or contact with mucous membranes (e.g., nose, mouth, eyes) and, occasionally, via drinking contaminated water. Upon entering the body, there is widespread dissemination to tissues and blood, and central nervous system infection may occur. Person-to-person transmission is rare. The occurrence of leptospirosis in humans depends on a complex set of interactions between ecological and social factors. Although leptospirosis is

present ("endemic") worldwide, it is more common in tropical and sub-tropical regions where abundant precipitation, regular flooding and high temperatures enhance the distribution and survival of leptospire in the environment. Animal vaccination is practiced in some countries, but immunity is short-lived; human vaccination is not widely practiced.

*Streptococcus suis* is an important bacterial cause of zoonotic disease in both swine (pigs) and humans in many areas of the world. The organism may be isolated from healthy pig carriers, but reported infections in swine due to *Streptococcus suis* include arthritis, meningitis, pneumonia, septicaemia, endocarditis, abortions and abscesses. Humans at higher risk for infection include persons in direct contact with pigs or raw pig products, including farmers and abattoir workers, and those with pre-existing illness or immunodeficiency. Human infection is thought to occur through cuts or abrasions on the skin when handling infected pig material, or possibly inhalation or ingestion. In humans, infection due to *Streptococcus suis* may cause meningitis, endocarditis, pneumonia, septic arthritis, and/or toxic shock-like syndrome.

Rabies is an important preventable zoonotic disease (i.e., a disease transmitted to humans from animals) caused by the rabies virus. The disease is endemic in many countries, affects both domestic and wild animals, and is transmitted to humans through contact with infectious material, usually saliva, via bites or scratches by a rabid animal. Rabies is present on all continents with the exception of Antarctica, but more than 95% of human deaths occur in Asia and Africa, most often following contact with dogs, other canines/carnivores or bats with rabies infection. Once symptoms of the disease develop, rabies is nearly always fatal; currently, WHO estimates rabies causes 60,000 human deaths per year. The high mortality highlights the importance of a canine rabies elimination strategy based on dog vaccination. Rabies is 100% preventable, so humans exposed to rabid animals should receive proper wound care and post-exposure prophylaxis including rabies vaccine.

Dengue is a mosquito-borne viral infection found in tropical and sub-tropical regions around the world. Dengue virus (DENV) is in the genus *Flavivirus* and exists in four serotypes (DENV 1, 2, 3 and 4). In recent years, DENV transmission has increased, predominantly in urban and semi-urban areas and has become a major international public health concern. Severe Dengue (previously known as Dengue Haemorrhagic Fever) was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand. Today, Severe Dengue affects most Asian and Latin American countries and has become a leading cause of hospitalization and death among children in these regions. Dengue virus control strategies have focused mainly on vector control activities and enhanced disease

surveillance. No vaccine has yet been shown to be effective against all four DENV serotypes. DENV transmission in forest monkeys may occur, but human infection is sufficient to maintain transmission cycles in cities, particularly in crowded urban areas where mosquito vectors breed in uncovered water storage containers, including flower vases, metal cans or discarded glass bottles plastic containers, or auto tires containing water.

For your assigned disease, create a map using VUE software and be prepared to share with the class:

- How is your conceptual model/map organized?
- What are the risk factors related to the host, the agent and the environment?
- What is the transmission cycle for the disease?
- What are possible control or intervention points?
- What is the group's plan to control the disease based on the known risk factors and possible interventions?

**Notes:** .....

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#### Think about:

- What you noticed about each group's model? Are they similar or different for the various zoonotic disease?
- What are common risk factors for zoonotic disease?
- What are common intervention points?
- What is the best organizational strategy for a model showing risk and control points?

**Notes:** .....

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## RISK ASSESSMENT

### Learning Objective

- Engage in the risk assessment process (hazard identification, exposure assessment, dose-response evaluation and risk characterization)

#### Prior to class, give students the following homework assignment:

- Read "Introduction to Risk Assessment Concepts" (European Environmental Agency):  
<http://www.eea.europa.eu/publications/GH-07-97-595-EN-C2/chapter1h.html>
- "The Basics of Risk Assessment" (FAO Corporate Document Repository):  
<http://www.fao.org/docrep/007/y4722e/y4722e05.htm>
- Advanced Reading: Nurminen M, Nurminen T, Corvalan CF. Methodologic Issues in Epidemiologic Risk Assessment. Epidemiology. 1999 Sep; 10(5): 585–93.



#### Principles of Risk Assessments

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#### In Class Exercise

The aim of this exercise is to understand what is in a microbial risk assessment and what type of information is needed to complete one. Groups of 4-to-5 people will select one of the case studies that can be found on QRMA Workshop pages: [http://qmrawiki.msu.edu/index.php?title=Case\\_Studies#tab=QMRAII\\_Workshop](http://qmrawiki.msu.edu/index.php?title=Case_Studies#tab=QMRAII_Workshop)

Each group will briefly summarize the overall case study and for each section discuss the type of data that were used and where these were found.

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### COLLECTING COMMUNITY-BASED DATA TO SUPPORT INFECTIOUS DISEASE INVESTIGATIONS OR RISK ASSESSMENT

Learning Objective

- Understand how to collect data and use data throughout the risk assessment process

Prior to the class, gather information on the community selected for the field trip. Consider accessing websites such as the state-, national- and regional-level health and agriculture departments or international sources of data about infectious diseases such as the Centers for Disease Control (CDC), the World Health Organization (WHO), the World Organization for Animal Health (OIE) or the United Nations Food and Agriculture Organization (FAO).

Also ask them to read the following documents:

- Read Article – Nurminen M, Nurminen T, Corvalan CF. Methodologic Issues in Epidemiologic Risk Assessment. Epidemiology. 1999 Sep; 10(5): 585–93.
- “Choosing Data Gathering Methods” and specifically Method 7: Using Community Measures.

**Notes:** .....

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With your group, plan how you will carry out a risk assessment for infectious diseases in the community or location selected. Your assessment needs to include:

- Hazard identification
- Exposure assessment
- Dose-response assessment
- Risk characterization

The assessment isn't expected to be as comprehensive as some of the examples that we have examined but it should provide the available information for each element and should identify where additional data are needed and how the data should be gathered.

### Field Trip Observation Notes

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### DEVELOPING INFECTIOUS DISEASE AND PUBLIC AWARENESS MATERIALS

#### Part 1

Learning Objective

- Develop infectious disease prevention and public awareness materials

### Developing Public Awareness Materials

Audiences:

- Children/teenage/adults
- General/specific audiences
- Public and private sectors
- Minority or subgroup

Effective messages are:

- Concise: As few words as possible, but no fewer
- Clear: Your grandparents can understand it
- Compelling: Explains the problem
- Credible: Explains how you solve the problem
- Conceptual: No unnecessary detail
- Concrete: Specific and tangible
- Customized: Addresses audience's interests
- Consistent: Same basic message
- Conversational: Aims to engage the audience

## Develop a Public Awareness Message



Create a 10-to-15 minute presentation sharing your public awareness material

To develop your materials, discuss:

- What is the infectious disease for which you want to conduct the public awareness?
- Who is the target audience(s)?
- What are the messages you want to deliver to the target audience(s)?
- What is the best method for relaying these messages? What types of materials are appropriate?
- How can the materials be adapted to target other audiences(s)?
- Are your materials supportive of, or consistent with, the existing public health policy for this disease?
- Do you have materials that target minority populations, such as illiterate persons or persons who do not speak the primary language?

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## CRITIQUE OF AN INFECTIOUS DISEASE MANAGEMENT PLAN (EXAMPLE) USING A ONE HEALTH PERSPECTIVE

### Learning Objective

- Understand what measures may be used to determine the strategy of an infectious disease management plan
- Evaluate and critique an infectious disease management plan
- Assess an infectious disease management plan and how these plans may have unintentional effects when implemented
- Describe the pros and cons of an infectious disease control strategy

Prior to class, read the following paper:

- “Designing Programs for Eliminating Canine Rabies from Islands: Bali, Indonesia as a Case Study” (Townsend, et al.)

### Assessing a Canine Rabies Management Plan Using a One Health Approach

From your reading, discuss the following questions:

- What led to the introduction of rabies in Bali? What are possible interventions to consider including in a rabies management plan?
- What is R0? What is the calculated R0 for rabies in this paper?
- Reduction of dog density is discussed as a possible rabies management measure. What do the authors conclude about this for a management plan and why?
- What are the dog vaccination campaigns discussed in the paper and how would their use in a management plan vary?
- In what ways does the rabies management plan discussed in the paper use a One Health approach?
- What aspects of this management plan could be improved from a One Health perspective?

Notes: .....

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## SYSTEMIC EFFECTS OF AN INFECTIOUS DISEASE MANAGEMENT PLAN

### Learning Objective

- Recognize when a OH approach is being applied to an infectious disease management plan or program
- Evaluate and critique an infectious disease management plan
- Assess infectious disease control plans and understand how (and why) they may have unintentional effects if implemented
- Describe pros and cons of any control strategy

**Before class, have students read the following articles:**

- “Influenza at the Human-Animal Interface” (WHO)
- “Thailand to Cull Ducks in Avian Flu Fight” (Center for Infectious Disease Research and Policy)
- “Thai Farmers Worry Controls on Bird Flu Threaten Livelihoods” (The Washington Post)
- “Improving Risk Models for Avian Influenza: The Role of Intensive Poultry Farming and Flooded Land during the 2004 Thailand Epidemic” (Van Boeckel TP, Thanapongtharm W, Robinson T, Biradar CM, Xiao X, et al.)

### Thailand to Cull Ducks in Avian Flu Fight

- Why are ducks important to consider in the transmission of avian influenza?
- How many ducks contribute to the spread of avian influenza to humans?
- Why was duck culling part of the management plan for controlling avian influenza in Thailand?

Create a list or map with pros and cons of the possible systemic effects of Thailand’s Duck culling program.

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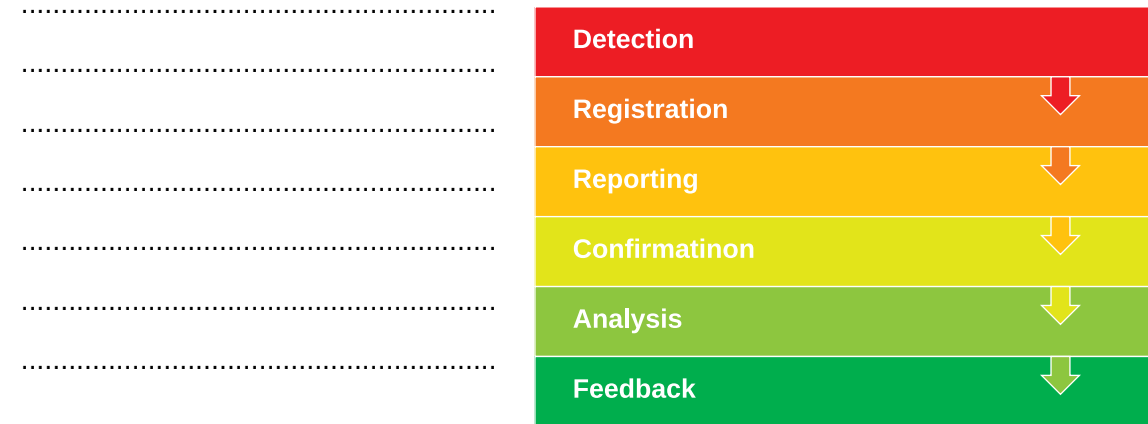
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## EXAMINE AN EXISTING INFECTIOUS DISEASE SURVEILLANCE SYSTEM

### Learning Objective

- Understand core concepts in infectious disease surveillance methods
- Describe the components and methods for evaluating a public health surveillance system

### Core Concepts in Surveillance Methods



### Surveillance Websites

Explore the disease surveillance websites of the CDC, WHO, OIE and the European CDC. Then choose a zoonotic disease and create a plan for data collection, including procedures and techniques covered in the class lecture.

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## ANALYSIS OF DISEASE SURVEILLANCE DATA USING HEALTH MAP

### Learning Objective

- Understand core concepts in disease surveillance
- Create a plan for surveillance data collection
- Describe the data collection procedures and techniques
- Perform quantitative and qualitative data analysis

### HealthMap Data Assignment:

- Select a disease that has more than 10 reports globally or in your region of interest.
- Look at surveillance data for the past year.
- Collect the following information:
  - Disease
  - Countries included (can be national, regional or global)
  - Species of host affected
  - Total reports of the disease for the year
  - Total cases of disease in each affected species

Notes: .....

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#### ONE HEALTH TEAM ROLE-PLAYING ACTIVITY A Management and Surveillance Plan

Learning  
Objective

- Developing skills in collaboration and partnership and understanding of how to select members of an OH team
- Developing an OH action approach for disease investigation and control
- Developing part of a plan to control disease through appropriate diagnosis, disease prevention and public awareness

### H5N1 Scenario

#### The first reports

Rumors of an outbreak of unusually severe respiratory illness in two villages in a remote province prompted WHO to dispatch a team to investigate. The team found that people in the villages had been falling sick for about a month and that the number of persons with acute illness (i.e., “cases”) had increased each day. The WHO team was able to identify at least 50 cases over the previous month; all age groups had been affected. Twenty patients are currently in the provincial hospital. Five people have already died of pneumonia and acute respiratory failure.

### Specimens sent to the laboratory

Surveillance in surrounding areas was enhanced, resulting in new cases being identified throughout the province. Respiratory specimens collected from several case-patients were tested at the national laboratory and found to be positive for type A influenza virus. Isolates sent to the WHO Reference Centre were found to be a subtype of influenza A (H5N1) never isolated from humans before. Gene sequencing studies further indicated that most of the viral genes are from a bird influenza virus, with the remaining genes derived from a human strain. More cases appeared in surrounding towns and villages.

### Spread to neighboring countries and attempts at quarantine

The new influenza virus begins to make headlines in every major newspaper, and becomes the lead story on news networks. Countries are asked by WHO to intensify influenza surveillance and control activities. Key government officials throughout the region are briefed on a daily basis, while surveillance is intensified. Over the next two months, outbreaks began to take place in neighboring countries. Although cases are reported in all age groups, young adults seem to be the most severely affected. One in every 20 patients dies. The rate of spread is rapid, and countries initiate travel restrictions and quarantine measures.

### Social effects

Educational institutions are closed. Widespread panic begins because supplies of antiviral drugs are severely limited and a suitable vaccine is not yet available. One week later, there are reports that the H5N1 virus has been isolated from airline passengers with respiratory symptoms arriving from affected countries.

### Other continents affected

A few weeks later, the first local outbreaks are reported from other continents. Rates of absenteeism in schools and businesses begin to rise. Phones at health departments ring constantly. The spread of the new virus continues to be the major news item in print and electronic media. Citizens start to clamor for vaccines, but they are still not available. Antiviral drugs cannot be obtained. Police departments, local utility companies and mass transit authorities experience significant personnel shortages that result in severe disruption of routine services. Soon, hospitals and outpatient clinics are critically short-staffed as doctors, nurses and other healthcare workers themselves become ill or are afraid to come to work.

Fearing infection, elderly patients with chronic medical conditions do not dare to leave home. Intensive care units at local hospitals are overwhelmed, and soon

there are insufficient ventilators for the treatment of pneumonia patients. Parents are distraught when their healthy young adult sons and daughters die within days of first becoming ill.

### Role Play Roles:

- Transportation security administrator - receive information from the government about the situation and then respond to provide information for travelers and apply the regulations for the emergency situation.

[illegible]

## MODULE 4 - EPIDEMIOLOGY AND RISK ANALYSIS

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>Epidemiology, epizootiology and population health describe the study of health and disease in populations. Risk analysis is a systematic approach to evaluating the likelihood of occurrence and the magnitude of impact if a particular adverse event occurs, and taking steps to mitigate those risks while communicating with key stakeholders and populations. Epidemiology and risk analysis are crucial to the One Health approach, as professional health science programs incorporate these topics into their curricula. Recognizing that an OH approach is broad and includes many disciplines distinct from health sciences. This module will introduce students to the history, concepts, theories, terminology and practices of epidemiology. Key outcomes include</p> <ul style="list-style-type: none"> <li>• Defining epidemiology and basic terminologies and concepts</li> <li>• Explaining critical components of the practice of epidemiology</li> <li>• Explaining major components of disease risk analysis, its process, and how disease risk analysis links science to policy.</li> </ul> |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Module Overview

| Competency #1                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Define epidemiology and basic epidemiology terminology/ concepts | <p>Explain epidemiological terms and concepts by being able to:</p> <ul style="list-style-type: none"> <li>• Define epidemiology and public health</li> <li>• List the core human and veterinary public health functions</li> <li>• Explain the concept of causal webs and the interactions among host, environment and agent</li> </ul> |

| Competency #2                                                                                                                   | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explain critical components of epidemiology                                                                                     | <p>Explain critical components in the practice of epidemiology, including being able to:</p> <ul style="list-style-type: none"> <li>• Describe how epidemiology used by human, animal, and environmental health professionals</li> <li>• Identify some of the diverse specialities in the field of epidemiology</li> <li>• List the different types of epidemiological studies and the advantages and disadvantages of each</li> <li>• List the steps to follow in a disease outbreak investigation</li> <li>• Explain the general principles of surveillance and the challenges associated with collecting and interpreting data</li> </ul> |
| Competency #3                                                                                                                   | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Explain the major components in and the process of disease risk analysis and how disease risks analysis links science to policy | <ul style="list-style-type: none"> <li>• Understand the purpose and basic terminology of risk analysis</li> <li>• Describe the components of the risk analysis process</li> <li>• Use examples of risk analysis for selected zoonotic infectious diseases</li> <li>• Explain how some of the more commonly recognized risk analysis frameworks are used</li> </ul>                                                                                                                                                                                                                                                                           |

### Overview of Epidemiology and Risk Analysis Module

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| EPIDEMIOLOGY IS A BASIC PUBLIC HEALTH SCIENCE |                                                                                                                                                                                                                                                         |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                            | <ul style="list-style-type: none"> <li>• Define epidemiology</li> <li>• Give examples of useful applications of epidemiological principles</li> <li>• List the core functions of human public health and veterinary public health activities</li> </ul> |

Overview of Key Terms and Concepts in Ecosystem Health

**Epidemiology**

Epi = 'upon'  
Demos = 'weage' of 'the people'  
Logos = 'thought' of 'study'

- Traditional: 'studying something happening upon the people'
- Modern: 'The study of the distribution, deferminants and deterrents of disease occurrence in populations'

Notes: .....

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Answering Epidemioloigcal Questions for Zoonoses

Who/Which? ... get the condition or disease?

When? ... do people or animals get the condition?

How? ... is the condition contractcd and spread?

Where? ... does the condition occur?

Notes: .....

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| Disease | Who/Which | When | How | Where |
|---------|-----------|------|-----|-------|
|         |           |      |     |       |
|         |           |      |     |       |
|         |           |      |     |       |
|         |           |      |     |       |
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|         |           |      |     |       |

Epidemiology and Zoonotic Diseases

Module Introduction and Basic Concepts

Module Introduction and Basic Concepts

Module Introduction and Basic Concepts

Module Introduction and Basic Concepts

Module Introduction and Basic Concepts

Module Introduction and Basic Concepts

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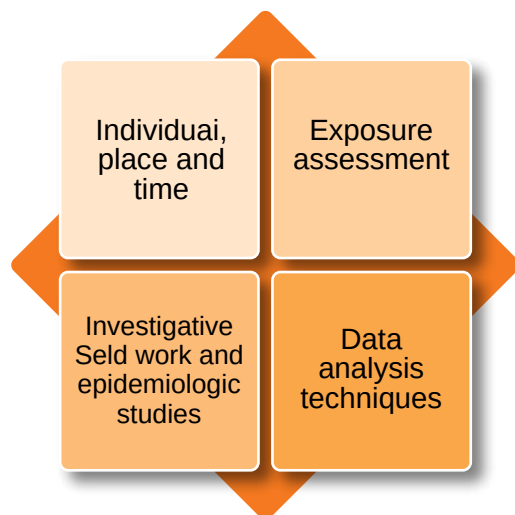
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EPIDEMIOLOGICAL TOOLS AND METHODS

Learning Objective

- List methods that can be used for the epidemiological assessment of a health problem
- Identify ways that public health laboratories carry out epidemiological functions
- Identify data collection methods to use in an epidemiological investigation

Look for various types of images (maps, graphs, charts, tables) that show infectious disease surveillance data and to bring several examples to class. Good sources include Google images, WHO, OIE, FAO, HealthMap, CDC, and national, state, or local health departments.



## Tools and Methods

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## What did you find?

Share examples of different ways to display disease surveillance data that you found as you completed the pre-work for this session.

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## EPIDEMIOLOGY PARTNERS AND RESOURCES

Learning Objective

- Identify allied health and community partners in the practice of epidemiology
- List ways in which epidemiologists work with the media and the five components of the HWO Outbreak Communication Guidelines
- Describe how the WHO, OIE, FAO, and CDC serve as resources for training, technical support, and surveillance and reporting of epidemiological data

Find and bring to class articles or reports, preferably in the local and national media (can be print, television, radio) related to health and disease.

## Communicating with Partners

### WHO Guidelines on Risk Communication During a Crisis

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Trust

Announcing early

Transparency

The public

Planning

## DESCRIPTIVE EPIDEMIOLOGY

Learning Objective

- Define descriptive epidemiology
- List of two major descriptive epidemiological study designs
- List examples of the use of descriptive data

## Simple Questions with Complex Answers

| Descriptive epidemiology | Analytical epidemiology |
|--------------------------|-------------------------|
| Who? Which?              | Why?                    |
| What?                    | How?                    |
| When?                    |                         |
| How much?                |                         |

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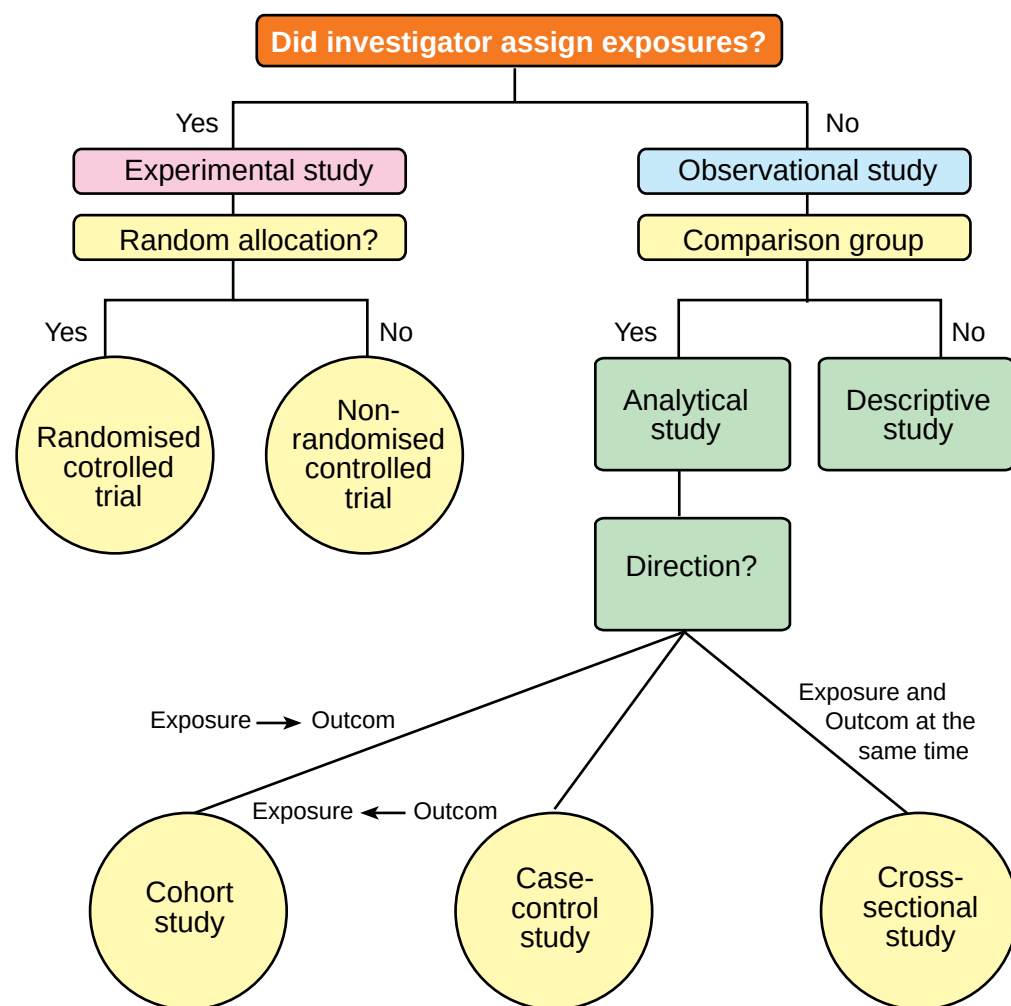
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## Class Exercise - As Assigned by the Instructor

As a class, come up with examples of diseases illustrating the following characteristics of descriptive epidemiology:

- Diseases that have different temporal/seasonal patterns of occurrence (for example: malaria and other mosquito borne diseases during rainy seasons, influenza, etc.)
- Diseases with different spatial patterns of occurrence
- Diseases with different patterns of occurrence by age (young/old) and sex (male/female)
- Brainstorm about lists of diseases that the students consider to be an epidemic. Are there both recent and historical examples (SARS vs. MERS coronavirus, canine rabies, avian influenza, etc.)



## Descriptive Epidemiology

Provides a systematic method for characterizing a health problem

Ensures understanding of the basic dimensions of a health problem

Provides a systematic method for characterizing a health problem

Provides a systematic method for characterizing a health problem

Provides a systematic method for characterizing a health problem

Provides a systematic method for characterizing a health problem

Provides a systematic method for characterizing a health problem

## Exercise - As Assigned by the Instructor

As a class, discuss the following types of zoonotic diseases, and decide which type of observational study (from the choice within descriptive and analytical study designs) is best suited to investigation of:

- A newly emerged zoonosis
- A zoonosis with a long incubation period
- Disease prevalence and incidence
- A zoonosis in a remote or inaccessible area

| Criteria         | Cross-Sectional                            | Case-Control                                              | Cohort                                                  |
|------------------|--------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------|
| <b>Sampling</b>  | Random sample of study population          | Separate samples of diseased and non-diseased individuals | Separate samples of exposed and non-exposed individuals |
| <b>Time</b>      | Single point                               | Usual retrospective                                       | Usually prospective (but may be retrospective)          |
| <b>Causality</b> | Associated between disease and risk factor | Preliminary causal hypothesis                             | Causality through evidence of temporality               |

|                            |                            |            |                                         |
|----------------------------|----------------------------|------------|-----------------------------------------|
| <b>Risk</b>                | Prevalence                 | None       | Incidence density, cumulative incidence |
| <b>Comparison of risks</b> | Relative risks, odds ratio | Odds ratio | Relative risk, odds ratio               |

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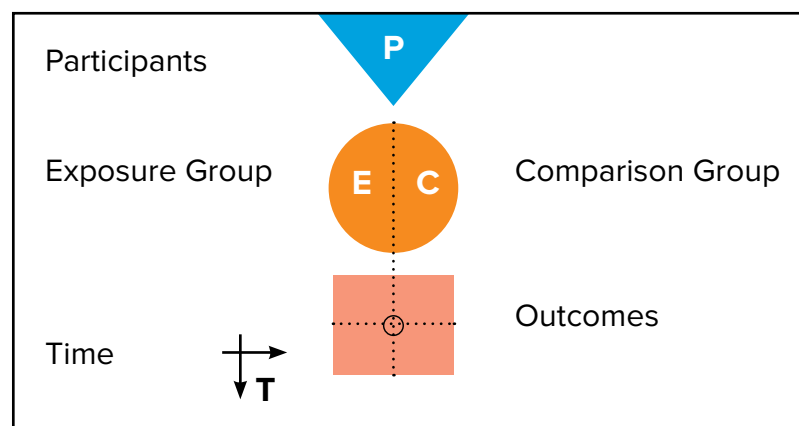
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| <b>PECOT</b><br><b>Teaching Critical Appraisal of Published Epidemiology Literature</b> |                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                                                      | <ul style="list-style-type: none"> <li>• Explain the basic components of observational epidemiological studies from publishes peer-reviewed articles</li> <li>• Optional: Use the PECOT method to assess completeness and accuracy of popular press reports of epidemiological studies</li> </ul> |



## Applying PECOT

Your instructor will assign you an article to read and interpret using PECOT.

- **Prospective Cohort:** Khuntirat, B. P., Yoon, I. K., Blair, P. J., Krueger, W. S., Chittaganpitch, M., Putnam, S. D. and Gray, G. C. (2011). Evidence for subclinical avian influenza virus infections among rural Thai villagers. *Clinical Infectious Diseases*, 53(8), e107–e116.
- **Retrospective and Prospective Cohort:** Moen, A. R., Wouda, W., Mul, M. F., Graat, E. A. M., and Van Werven, T. (1998). Increased risk of abortion following *Neospora caninum* abortion outbreaks: a retrospective and prospective cohort study in four dairy herds. *Theriogenology*, 49(7), 1301–1309.
- **Corss-sectional:** Suwanchaoen, D., Chaisakdanugull, Y., Thanapongtharm, W., and Yoshida, S. (2013). Serological survey of leptospirosis in livestock in Thailand. *Epidemiology and infection*, 141(11), 2269–2277.
- **Case-Control:** Parashar, U. D., et. al. (2000). Case-control study of risk factors for human infection with a new zoonotic paramyxovirus, Nipah virus, during a 1998–1999 outbreak of severe encephalitis in Malaysia. *Journal of Infectious Diseases*, 181(5), 1755–1759.

*Be prepared to present your analysis to the class.*

**Notes:** .....

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| <b>INTRODUCTION TO DISEASE SURVEILLANCE</b> |                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                          | <ul style="list-style-type: none"> <li>• Explain the surveillance “feedback loop” of data and information flow through local, state and federal channels</li> <li>• Describe characteristics of three different methods of surveillance: Active, passive, and syndromic</li> <li>• List five applications of public health surveillance</li> </ul> |

## SMART Surveillance

- Strategic
- Measurable
- Adaptable
- Responsive
- Targeted

### Surveillance Websites

- Explore the surveillance website assigned to your group:
- US CDC – <http://www.cdc.gov/surveillancepractice/>
- WHO Global Influenza Surveillance and Response System [http://www.who.int/influenza/gisrs\\_laboratory/en/](http://www.who.int/influenza/gisrs_laboratory/en/)
- WHO Global Outbreak Alert and Response Network (GOARN) <http://www.who.int/csr/outbreaknetwork/en/>
- OIE – World Animal Health Information System <http://www.oie.int/animal-health-in-the-world/the-world-animal-health-information-system/the-oie-data-system/>
- FAO – EMPRES-I <http://empres-i.fao.org/eipws3g/#h=0>
- European CDC - <http://www.ecdc.europa.eu/en/activities/surveillance/Pages/index.aspx>
- HealthMap - <http://healthmap.org/en/>

### Directions:

Choose a zoonotic disease and create an evaluation plan for data collection, including procedures and techniques covered in the lecture. Create a poster or flip chart to display your plan and be prepared to share your plan with the class. Plans will be evaluated on simplicity, flexibility, acceptability, sensitivity, specificity, accuracy, positive, predictive value, representativeness, sustainability and timeliness.

### THE CONTAGIOUS CLASSROOM: An Outbreak Investigation

#### Learning Objective

- Experience a disease outbreak and investigation
- List the typical steps followed in a disease outbreak investigation

### An Outbreak in Your Classroom

From bubonic plague to malaria to leptospirosis, scientists, and public health officials have struggled to understand and contain the spread of infectious diseases. Today, we will simulate a disease outbreak!

|           | Person 1 | Person 2 | Person 3 | Person 4 | Person 5 |
|-----------|----------|----------|----------|----------|----------|
| Contact 1 |          |          |          |          |          |
| Contact 2 |          |          |          |          |          |
| Contact 3 |          |          |          |          |          |
| Contact 4 |          |          |          |          |          |
| Contact 5 |          |          |          |          |          |

### What do you think?

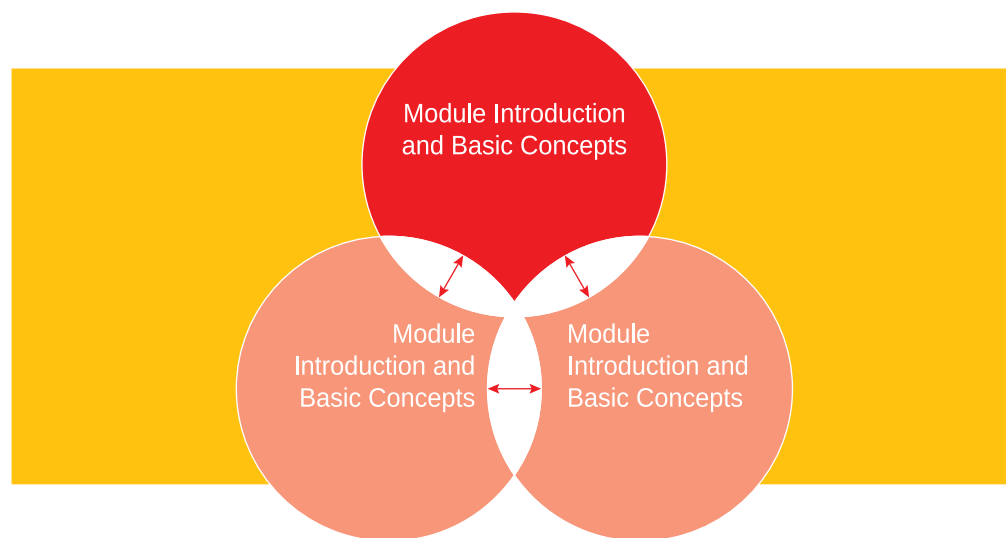
- List the steps that you followed in the outbreak investigation. Are any critical steps missing?
- What are the major objectives of a disease outbreak investigation?

### INTRODUCTION TO DISEASE RISK ANALYSIS

#### Learning Objective

- Understand the purpose and basic terminology of risk analysis
- Describe the components of the risk analysis process
- Give applications of risk analysis for zoonotic infectious diseases
- Explain some of the commonly recognized and used risk analysis frameworks

## Risk Assessment, Management, and Communication



### Articles on Disease Risk Analysis

- Your instructor will assign your group a research article from the list below:
- de Man, H., Bouwknecht, M., van Heijnsbergen, E., Leenen, E. J. T. M., van Knapen, F. and de Roda Husman, A. M. (2014). Health risk assessment for splash parks that use rainwater as source water. *Water Research*.
- Dom, N. C., Ahmad, A. H., Latif, Z. A., Ismail, R. and Pradhan, B. (2013). Coupling of remote sensing data and environmental-related parameters for dengue transmission risk assessment in Subang Jaya, Malaysia. *Geocarto International*, 28(3), 258–272
- Jones-Engel, L., Engel, G. A., Schillaci, M. A., Lee, B., Heidrich, J., Chalise, M. and Kyes, R. C. (2006). Considering human–primate transmission of measles virus through the prism of risk analysis. *American Journal of Primatology*, 68(9), 868–879. Abstract available at: <http://www.ncbi.nlm.nih.gov/pubmed/16900498>.
- Lau, C. L., Clements, A. C., Skelly, C., Dobson, A. J., Smythe, L. D., and Weinstein, P. (2012). Leptospirosis in American Samoa – estimating and mapping risk using environmental data. *PLoS Neglected Tropical Diseases*, 6(5), e1669. Article available free online at: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3362644/>.

## Analyze the article by answering the questions below:

- What is the framing question?
- What is/are the hazard/hazards identified?
- What are risks?
- Is the risk analysis qualitative, quantitative or both?
- Who are the stakeholders identified?
- Who will be informed of the results?
- How could result be applied?

Notes: .....

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| DISEASE RISK ANALYSIS: A FIELD EXERCISE FOR RISK ASSESSMENT |                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                          | <ul style="list-style-type: none"> <li>• Complete a basic risk assessment for a zoonotic disease in a local community</li> <li>• Ensure all necessary human and animal subjects protection approvals are in place</li> <li>• Ensure that appropriate contact with and permission from community leaders and local officials have been organized</li> </ul> |

### Preparing for the Field Trip

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### Field Notes

During field trip take notes on practice you observe and all factors that may influence transmission of zoonotic diseases that could impact human health, animal health, etc. Find answers to the following questions:

- Have any zoonotic diseases outbreaks occurred in the community? If yes, focus on this disease.
- What can you observe in the community (jobs, agriculture, livestock kept, food consumed, food and water supply, food preservation, environmental sanitation, waste management, trade and tourism, and so on).

- What animals (livestock, wildlife, pets...) are present? Management systems, environment, animal waste management?
- What ecosystem or ecosystems have been noted? Are any known diseases associated with those ecosystems?
- What factors related to the humans, animals and their environment may impact zoonotic disease transmission?
- Is there access to human and animal health care?

**Notes:** .....

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### Vocabulary

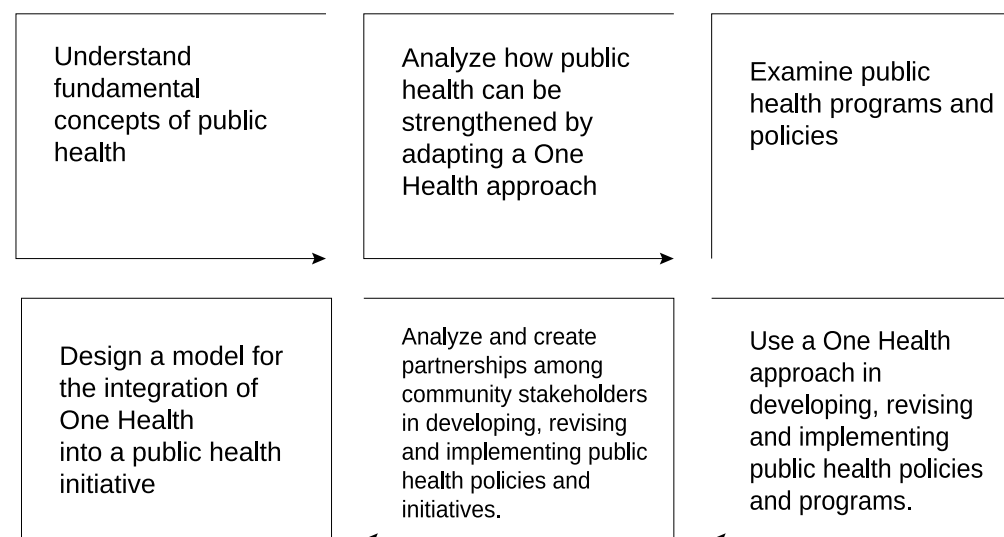
|                         |                   |                       |
|-------------------------|-------------------|-----------------------|
| Agent                   | Incubation Period | Resistant             |
| Bacteria                | Index case        | Susceptible           |
| Carrier                 | Infective         | Transmission          |
| Endemic                 | Outbreak          | Vaccine               |
| Enzootic                | Outbreak curve    | Vector                |
| Epidemic                | Pandemic          | Vertical Transmission |
| Epizootic               | Parasite          | Virus                 |
| Fomite/Vehicle          | Pathogen          | Zoonosis              |
| Horizontal Transmission | Recovered         |                       |
| Host                    | Reservoir         |                       |

## MODULE 5 - FUNDAMENTALS OF PUBLIC HEALTH

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                  |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | This module fosters an understanding of the basic principles of public health as they relate to the One Health context and approach. By the end of this module, students should have a sufficient understanding of public health to be able to contribute to the development a One Health policy |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                                        | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand public health practice and its relationship to One Health | <p>Understand the breadth and scope of public health practice in a student's country as related to One Health, including:</p> <ul style="list-style-type: none"> <li>• Environment and public health</li> <li>• Animals, infectious diseases and public health</li> <li>• Domestic animals and public health</li> <li>• Food safety and hygiene</li> <li>• Community health monitoring, disease surveillance, disease investigation and outbreak response</li> </ul> |

| Competency #2                                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand the relationship between government authorities, policymakers, industry & researchers | Explain how public health programs are developed and implemented for water, food, wildlife, domestic animals, wildlife, etc.                                                                                                                                                                                                                                                    |
| Competency #3                                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                       |
| Analyze national or local public health policies                                                 | <p>Examine existing national and local public health policies and consider the following questions:</p> <ul style="list-style-type: none"> <li>Do policymakers and agencies responsible for public health use OH approaches? Which do and which do not?</li> <li>Is a OH approach appropriate for the topic or context</li> <li>Why has a OH approach not been used?</li> </ul> |
| Competency #4                                                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                       |
| Using systems thinking to analyze/create a public health policy                                  | <p>Use system thinking to develop a new model for regional public health policies and regulations that would promote a OH approach to public health issues:</p> <ul style="list-style-type: none"> <li>Who are the stakeholders?</li> <li>What are the push-pull factors in engaging stakeholders and getting their acceptance?</li> </ul>                                      |

| INTRODUCTION TO PUBLIC HEALTH |                                                                                                                              |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective            | <ul style="list-style-type: none"> <li>Articulate the role and position of public health in a One Health approach</li> </ul> |

### Design of the Module

Public health is the practice of preventing disease and promoting good health within groups of people, from small communities to entire countries.

*American Public Health Association*

The concept of One Health has been characterized using various approaches but all involve the convergence of health risks at the human-animal-ecosystem interface. One Health is about working inclusively across disciplines, professions,

and sectors from the local to global level, to improve the health of humans, animals, and the environment

*One Health Talk*

### What Do You Think?

- How does taking One Health approach to public health strengthen a community's ability to address complex health issues?



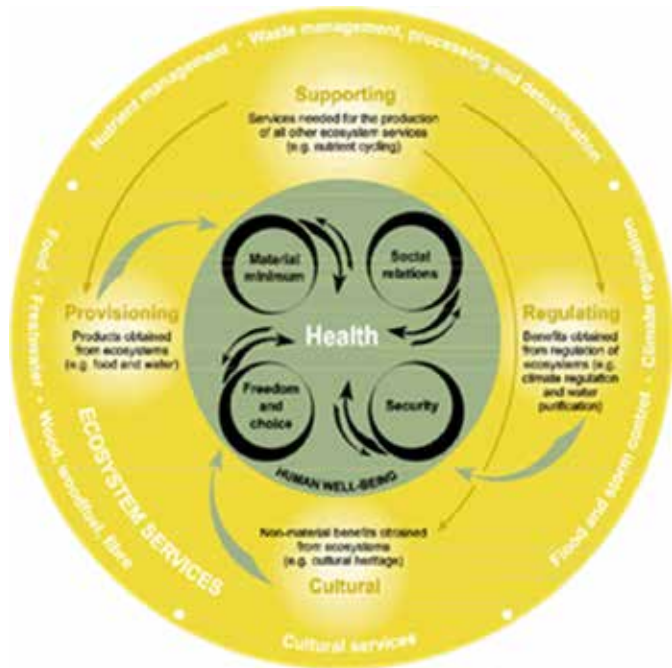
| ECO-SYSTEM HEALTH, CLIMATE CHANGE AND PUBLIC HEALTH |                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                  | <ul style="list-style-type: none"> <li>Define the term ecosystem and understand the importance of the relationship between ecosystems and human and animal health</li> <li>Describe examples of ecological and social changes and their impacts on global health</li> <li>Explain why and how environmental changes (such as climate change) affect global health</li> </ul> |

## Pre-Class Reading

- Patz, J.A., P. Daszak, G.M. Tabor, A.A. Aguirre, et al. "Unhealthy Landscapes: Policy Recommendations on Land Use Change and Infectious Disease Emergence." *Environ Health Perspect.* 2004 Jul; 112(10): 1092K8.
- McMichael, A.J., R.E. Woodruff, and S. Hales. "Climate change and human health: risks and responses." *Lancet* 2006 Mar 11; 367(9513): 859–69

## Overview of Key Terms and Concepts in Ecosystem Health

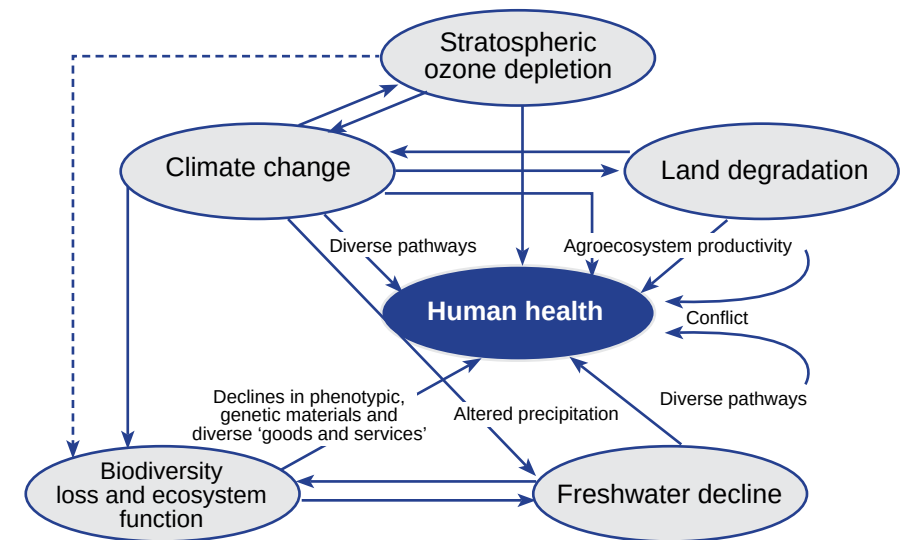
An ecosystem is a community of living organisms (plants, animals, and microbes) in conjunction with the non-living components of their environment (things like air, water, and mineral soil), interacting as a system. These biotic and abiotic components are regarded as linked together through nutrient cycles and energy flows.



Notes: .....

## What do you think?

What is the impact of landscape change and climate change on public health? How can a One Health approach effectively address the impact of these changes on emerging and re-emerging pandemic threats?



McMichael et al. (eds) 2003 *Climate change and human health: risks and responses*, World Health Organization. Geneva, Switzerland.

Notes: .....

## What do you think?

- What did all the diseases have in common?
- What made each unique?
- How could adopting a One Health approach help control an emerging or re-emerging pandemic threat of the diseases?

Notes: .....

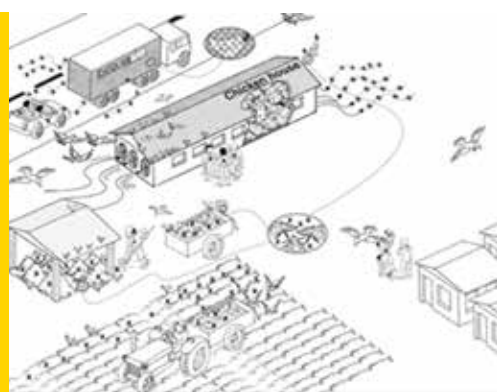
## ANIMALS AND PUBLIC HEALTH Human/Wildlife Interactions (Zoonoses)

### Learning Objective

- Define the terms 'zoonoses' and 'emerging diseases'
- Explain the importance of zoonoses in One Health and public health
- Discuss the key reasons for disease emergence and re-emergence
- Provide examples of selected zoonoses pertinent to the region

## The Origin of Human Pathogens

With a small group of your fellow students, discuss the article sharing your ideas on the pre-work questions.



**Photovoice** - a method mostly used in the field of community development, public health and education, which combines photography with grassroots social action. Participants are asked to represent their community or point of view by taking photographs, discussing them together, developing narratives to go with their photos, and conducting outreach or other action.

Source: Concentrated Animal Feeding Operation, drawing by Salvador Saenz

Notes: .....

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This drawing is of a concentrated animal feeding operation. What potential pathways for exposure to and transfer of pathogens do you see in this picture?

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## Observing Human/Domestic Animal Interactions

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Using the internet, with a small group of your classmates, ac create a Photovoice presentation illustrating:

- Diseases that have been transmitted from animals (pets and livestock) to humans throughout history and identify which diseases are sporadic or have become pandemics and/or epidemics
- How these diseases are commonly transmitted
- Type of transmission would probably result in large epidemics or even pandemic. What are the characteristics of this type of transmission.
- Potential ways to prevent transmission

Notes: .....

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## What do you think?

- From the presentations, what modifications - add, change or remove - would you make to your presentation?
- How does understanding human/domestic animal interaction strengthen an understanding of human health

Notes: .....

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## FOODBORNE DISEASES, FOOD SAFETY AND FOOD PRODUCTION

|                    |                                                                                                                                                                                                                                                                                                                        |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Identify causative agents, sources, habitat and risk factors, and disease budder of food borne illnesses</li> <li>• Describe good hygienic practices and food safety measures</li> <li>• Define hazards and critical control points on the food production process</li> </ul> |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



Prepare a checklist on a flip-chart to share your ideas with the class

Notes: .....

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After completing the checklists - answer the following questions:

- How can good hygiene and sanitation in the food industry positively impact human health?
- How is HACCP related to public health?
- What zoonotic disease are of animal origin and can be transmitted through foods?
- Should hygiene and sanitation be regularly monitored, or is a single inspection or evaluation adequate?

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## Field Trip

Prepare for a field trip to either a slaughterhouse, food industry or food market. Use the checklists on the following pages to assess the facility.

*See the checklists on the following pages*

## Food Safety and Sanitation

### Checklist for Good Manufacturing Practices (GMPs): Buidling and Facilities

| Criteria                                                                                                                          | Good | Needs Work |
|-----------------------------------------------------------------------------------------------------------------------------------|------|------------|
| • Is the area around your firm clear of litter, weeds, grass and brush?                                                           |      |            |
| • Is there any standing water on your grounds (which also attract pests)?                                                         |      |            |
| • Are floors, wall, ceiling, windows and screens properly maintained and cleaned?                                                 |      |            |
| • Do production area doors and windows to the outside have fine mesh screens to keep out insects? If not are they tightly sealed? |      |            |
| • Is there any evidence of the presence of domestic animals, such as cats or dogs?                                                |      |            |
| • Are restrooms cleaned regularly? Are there hand washing stations with soap and paper or hand dryers?                            |      |            |
| • Are there any leaks in the roof, skylights, windows, screens or overhead piping?                                                |      |            |

Total Checked:

### Checklist for GMPs: Production and Process Control

| Criteria                                                                                                  | Good | Needs Work |
|-----------------------------------------------------------------------------------------------------------|------|------------|
| • Are products and stocks stored on the first-in/first-out basis to reduce contamination and/or spoilage? |      |            |
| • Are all incoming products dated to ensure a proper rotation of stocks and for internal tracking purpose |      |            |
| • Are items overstocked?                                                                                  |      |            |
| • Are incoming vehicles inspected?                                                                        |      |            |
| • Are dusty, faded or discolored containers checked regularly?                                            |      |            |
| • Are such quarantined items disposed of quickly to prevent the development of pest breeding places       |      |            |
| • Are incoming materials inspected so that damaged or contaminated items can be rejected?                 |      |            |
| • Are unused materials properly resealed to prevent contamination?                                        |      |            |
| • Are materials stored in a safe manner?                                                                  |      |            |
| • Do you have an effective recall procedure in place?                                                     |      |            |

Total Checked:

### Checklist for GMPs: Equipment

| Criteria                                                                                                                                | Good | Needs Work |
|-----------------------------------------------------------------------------------------------------------------------------------------|------|------------|
| • Is all equipment that comes in contact with food cleaned and sanitized as often as necessary to prevent contamination of the product? |      |            |
| • Is there a build-up of food or other material on the equipment?                                                                       |      |            |
| • Is the equipment hard to disassemble for clean-up and inspection?                                                                     |      |            |
| • Is there a lot of “dead space” in or around the machinery where food and other debris can collect as a nest for insects and bacteria? |      |            |
| • Can the surface of the equipment be sanitized?                                                                                        |      |            |

**Total Checked:**

### Checklist for GMPs: Personal Hygiene

| Criteria                                                                                                                            | Good | Needs Work |
|-------------------------------------------------------------------------------------------------------------------------------------|------|------------|
| • Are the employees well-trained in what they do?                                                                                   |      |            |
| • In handling food products, do your employees wear the proper hair covering, breast covering, disposable gloves and clean uniform? |      |            |
| • Are your employees wearing jewelry, rings, watches, fingernail polish or bandages?                                                |      |            |
| • Do your employees have any illness, infections or injuries that could contaminate the production area?                            |      |            |
| • Do your employees wash and sanitize their hands after each visit to the toilet?                                                   |      |            |
| • Do your employees maintain clean personal habits?                                                                                 |      |            |
| • Do visitors wear proper outfits and helmets?                                                                                      |      |            |

**Total Checked:**

### Checklist for GMPs: Sanitation Operations - Pest Control

| Criteria                                                                      | Good | Needs Work |
|-------------------------------------------------------------------------------|------|------------|
| • Do you have professional pest control services?                             |      |            |
| • Do you check regularly on what the pest control operator is doing?          |      |            |
| • Do you have documentation on what chemicals are being used?                 |      |            |
| • Are mites, weevils or roaches apparent in the plant?                        |      |            |
| • Are the pest control logs and documentation readily available?              |      |            |
| • Are pesticides or application equipment stored safely?                      |      |            |
| • Are products stored on a pallet and at least 18 inches away from the walls? |      |            |
| • Is your facility well maintained?                                           |      |            |

**Total Checked:**

### Checklist for GMPs: Sanitation Facilities and Control

| Criteria                                                                                                          | Good | Needs Work |
|-------------------------------------------------------------------------------------------------------------------|------|------------|
| • Are trash, debris and clutter picked up, both inside and outside the plant?                                     |      |            |
| • Do employees eat, drink and use tobacco products in designated areas and not in production areas or warehouses? |      |            |
| • Is the food spilled or uneaten by employees cleaned up quickly so as not to attract pests or bacteria?          |      |            |
| • Is the garbage quickly removed and dumped in appropriate bins?                                                  |      |            |
| • Is the garbage kept covered?                                                                                    |      |            |
| • Is the water used in your firm from an approved source?                                                         |      |            |

**Total Checked:**

### Checklist for GMPs: Sanitary Procedures for Cleaning and Sanitizing

| Criteria                                                                                                                                                           | Good | Needs Work |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|
| • Is the equipment disassembled?                                                                                                                                   |      |            |
| • Is product debris removed?                                                                                                                                       |      |            |
| • Is the equipment sanitized with an approved sanitizer and rinsed with potable water, if required                                                                 |      |            |
| • Are facilities cleaned with an approved cleaner, according to the manufacturers' directions/instructions?                                                        |      |            |
| • Are facilities rinsed with potable water, as necessary?                                                                                                          |      |            |
| • Do the employees clean hands, arms, gloves, aprons, boots, etc. as often as necessary during the handling procedures?                                            |      |            |
| • Do the employees clean and then sanitize any equipment as often as necessary during handling procedures to prevent contamination of food or packaging materials? |      |            |

**Total Checked**

### Checklist for GMPs: Hazard Analysis and Hazard Plans

| Criteria                                                                                                                                   | Good | Needs Work |
|--------------------------------------------------------------------------------------------------------------------------------------------|------|------------|
| • Does the hazard analysis include food safety hazards?                                                                                    |      |            |
| • Does the hazard analysis include a flow chart that describes (diagrams) the steps of each process and product flow in the establishment? |      |            |
| • Does the hazard analysis identify the intended use or consumers of finished product(s)?                                                  |      |            |
| • Does the Hazard Analysis and Critical Control Point (HACCP) plan list the food safety hazard(s) identified in the hazard analysis?       |      |            |
| • Does the HACCP plan list critical control points (CCPs) to each food safety hazard?                                                      |      |            |
| • Does the HACCP plan list critical limits to be met at each CCP?                                                                          |      |            |
| • Does the HACCP plan list the procedures to be used to monitor each CCP and the frequency with which these procedures will be performed?  |      |            |
| • Does the HACCP plan identify the corrective action to be followed in response to a deviation from a critical limit at a CCP?             |      |            |

**Total Checked:**

**Notes:** .....

### Field Trip Debrief

Share your observations about where you saw good hygiene and sanitation practices and areas for improvement and what improvements should be put in place.

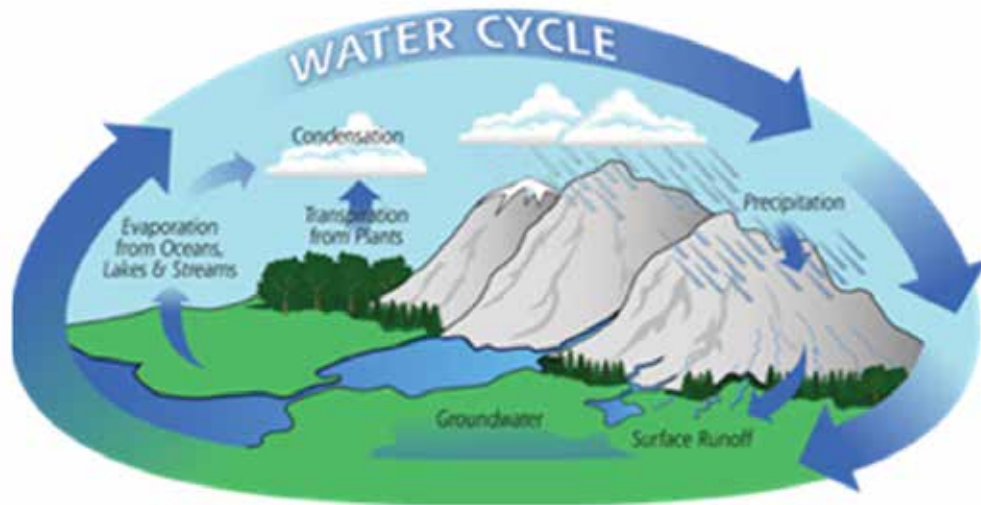
### What do you think?

- What are the impacts of good hygiene and sanitation in food industry on human health?
- How do these relate to the hazard analysis and critical control point and public health?
- What zoonotic diseases can be transmitted through foods from animal origin?

**Notes:** .....

### WATER QUALITY, SANITATION AND WATERBORNE DISEASE

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Describe the importance of water quality and sanitation in relation to human health</li> <li>• Describe water sources, uses, infrastructure and threats to water quality</li> <li>• Explain the global status of drinking water and sanitation</li> <li>• Discuss the relationship between water and health</li> <li>• Give examples of water borne disease and their associated pathogens</li> </ul> |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



**Topics Include:**

- Water sources and uses
- Water cycle and why water has a role in health
- Water as a human right
- Drinking water - global perspective
- Sanitation - global perspective
- Water infrastructure and threats to water quality
- Threats to water quality
- Waterborne diseases and pathogens

**Notes:** .....

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**DISEASE MONITORING AND SURVEILLANCE:**

**Basic Epidemiological Terms/Disease Investigation**

Learning Objective

- Describe the principles of basic epidemiology and discuss its application in disease surveillance and monitoring

**Epidemiological Definitions**

- Epidemiology: The study of how disease is distributed in populations and of the factors that influence or determine this distribution.
- Endemic: The habitual presence of a disease within a given geographic area.
- Epidemic: The occurrence in a community or region of illnesses or similar nature, clearly in excess of “normal” or “expected” rates, and derived from a common or a propagated source.
- Incidence: The number of new cases of a disease that occur during a specific period of time in a population at risk for developing the disease.
- Prevalence: The number of affected persons present in the population at a specific time divided by the number of persons in the population at that time.
- Passive Surveillance: Routine reporting of cases of disease.
- Notifiable Diseases: Every country has a list of diseases that must be reported to health departments.
- Active Surveillance: Proactively seeking out cases of a specific disease in an area; this could be through door-to-door surveys or by contacting health care providers or health facilities.

**Notes:** .....

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**DISEASE MONITORING AND SURVEILLANCE:**  
**Local and Global Disease Surveillance**

Learning Objective

- Build the skills and knowledge necessary to critically analyze available disease surveillance information (local and global) and resources to determine the key issues and stakeholders involved in disease trends, and outbreaks or epidemics

For each of the websites listed below, consider the following questions:

- What is its purpose?
- What is the source of information they use?
- Do you think it would be a reliable source for determining if an outbreak has occurred?
- When would someone use the website?
- Is there a resource that you can monitor to know what is going on in an area that you care about?
- Can you find the incidence and prevalence data for your area?

#### Disease Surveillance Websites

- World Health Organization (WHO) – Global Health Observatory: [http://www.who.int/gho/publications/world\\_health\\_statistics/2013/en/](http://www.who.int/gho/publications/world_health_statistics/2013/en/)
- U.S. Centers for Disease Control and Prevention (CDC), Morbidity and Mortality Weekly Report: <http://www.cdc.gov/mmwr/>
- Promed: <http://www.promedmail.org/>
- Health Map: <http://healthmap.org/en/>
- Global alert and response: <http://www.who.int/csr/en/>
- Google flu: <http://www.google.org/flutrends/about/how.html>
- Mekong Basin Disease Surveillance: [http://www.mbdsoffice.com/index\\_vn.php](http://www.mbdsoffice.com/index_vn.php)

#### COMMUNITY HEALTH

Learning  
Objective

- Examine community health from an OH perspective

#### Preparation for Observing Your Community

The overall questions that you want to answer when observing your community are:

- What is the relationship of the on-campus community with the environment?
- What is the relationship of the on-campus community with wildlife and domestic animals?

Develop a checklist to evaluate how and where the community is vulnerable to exposure from environmental or zoonotic pathogens. To create your checklist, you may want to use some of the questions from the sample community health checklist below.

#### Campus Assessment - Sample Checklist

##### COMMUNITY HEALTH - Sample Checklist

- Are pest control/management measures in place to minimize interaction with wildlife or to prevent wildlife from accessing the facilities?
- Do on-site features exist that could attract wildlife (food storage, food waste storage, waste accumulation, open water sources, agricultural production, livestock, pets)?

##### Do they address:

- Food storage protection provisions
- Food waste storage and disposal
- Housing protection
- Safe removal of animal droppings and nests
- Controls at disposal areas
- Food crop protection
- Livestock protection

##### Are specific measures in place to address the following:

- Rodents
- Bats
- Non-human primates
- Other species of concern: .....

##### ON-SITE INFRASTRUCTURE

##### ON-SITE HOUSING

- Pests can reside in housing. In addition, inadequate space, food storage, sanitation, etc. can amplify any disease incident.
- Are student housed on-site?
- Are there adequate beds for the number of students?
- Are washing facilities adequate?
- Are sanitation facilities adequate?
- Are waste disposal facilities sufficient?

| FOOD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Are students fed on campus?</li> <li>• Is a Hazard Analysis Critical Control Point (HACCP) system or comparable food safety program in place? (See: <a href="http://www.fda.gov/food/guidanceregulation/haccp/ucm2006800.htm">http://www.fda.gov/food/guidanceregulation/haccp/ucm2006800.htm</a>)</li> <li>• Are WHO's Five Keys to Safer Food implemented? (See: <a href="http://www.who.int/foodsafety/consumer/5keys/en/">http://www.who.int/foodsafety/consumer/5keys/en/</a>)</li> <li>• Is food stored in rodent-proof locations or containers?</li> <li>• Are measures in place to ensure that meat is bought only from vendors who do not sell bushmeat?</li> <li>• Are measures in place to inspect fruits and vegetables to prevent serving food that has been contaminated by animals (presence of feces, bite marks)?</li> </ul> |
| WATER                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>• Is the site checked regularly for standing/stagnant water, structures, or debris that can act as insect breeding areas?</li> <li>• Do workers have access to an adequate and convenient supply of free potable water, and is it always available to workers?</li> <li>• Does drinking water meet national/local or WHO drinking water standards?</li> <li>• Is drinking water quality monitored or treated regularly?</li> <li>• Are water storage tanks that are used for drinking water covered to prevent the water from becoming polluted or contaminated?</li> </ul>                                                                                                                                                                                                                                                                     |

| SOLID WASTE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     |    |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----|
| <ul style="list-style-type: none"><li>• Are wastewater, sewage, food and any other waste materials disposed of according to local or World Bank standards?</li><li>• Are containers for trash collection provided and emptied on a regular basis?</li><li>• Is pest/vector control and disinfection conducted throughout the living facilities?</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |     |    |     |
| TERRESTRIAL BIOLOGICAL RESOURCES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     |    |     |
| <ul style="list-style-type: none"><li>• Loss of vegetation/habitat and creation of edge effect</li><li>• Are measures in place to minimize additional loss of wildlife habitat/fragmentation?</li><li>• Are measures in place to re-vegetate areas disturbed by construction or maintenance using native vegetation?</li><li>• Are plans in place to manage natural vegetation in areas adjacent to cleared areas/the project site?</li></ul> <p><b>Biodiversity Monitoring</b></p> <ul style="list-style-type: none"><li>• Are measures in place to minimize wildlife disturbance (e.g., migration)?</li><li>• Is a biodiversity monitoring plan in place?</li><li>• If yes, has it been integrated with operations to ensure the appropriate best management practices (BMPs) are in place?</li><li>• Are measures in place to address biodiversity loss?</li></ul> |     |    |     |
| Local Relationship with Wildlife                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes | No | N/A |
| <ul style="list-style-type: none"><li>• Are local wildlife possible carriers of zoonotic diseases?</li><li>• Is bushmeat used as a source of protein?<ul style="list-style-type: none"><li>• What species are hunted?</li><li>• What's their definition of bushmeat?</li></ul></li><li>• How are bushmeat/domestic animals harvested?</li><li>• How are bushmeat/domestic animals transported?</li><li>• How are bushmeat/domestic animals prepared?</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                        |     |    |     |

## Additional Observations

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## What do you think?

- How did other's observations compare with yours? What are the three top issues that the campus needs to address to become more "One Healthy"?
- As a class, come to a consensus not he top three issues?
- What would be your recommendations to address these issues?

**Notes:** .....

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## POLICIES AND PROGRAMS

Learning  
Objective

- Understand the relationships among government ministries, local organizations, policies, and programs

## National and Local Policies and Programs

- Using the table on the following pages:
- Identify the different governmental organizations in your country that have policies on one of the following topics:
- Water consumption/use
- Grains/fruits/vegetables
- Cows/pg/poultry
- Bats/primates
- Rodents
- Provide an example of a program and policy for each category

**Notes:** .....

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| Resource              | Topic                       | Ministry | Policy | Implementing Agency | Program | Stakeholders |
|-----------------------|-----------------------------|----------|--------|---------------------|---------|--------------|
| Water Sanitation      | Consumption/ Use            |          |        |                     |         |              |
|                       | Quality                     |          |        |                     |         |              |
|                       | Quantity                    |          |        |                     |         |              |
| Fruits and Vegetables | Production                  |          |        |                     |         |              |
|                       | Pesticide or fertilizer use |          |        |                     |         |              |
|                       | Runoff/ Wastewater          |          |        |                     |         |              |
| Cows and Pigs         | Water use                   |          |        |                     |         |              |
|                       | Production                  |          |        |                     |         |              |
|                       | Water use                   |          |        |                     |         |              |
|                       | Runoff/ Wastewater          |          |        |                     |         |              |
|                       | Waste disposal              |          |        |                     |         |              |



An outbreak of Nipah has occurred on the mainland among people who harvest date palm sap. Date palm sap is consumed widely among the population of Atangua. The tourism bureau of the country is afraid that the fear of Nipah virus will discourage tourists from coming to the island. The resort developer is threatening not to build the resort unless bats are removed from a 10–square-mile radius from the resort area. The Governor has assembled a group of committees to address the bat conservation management issue with the mandate that, by the end of the session, they must have a framework for the bat policy.

Each person must assume a role and advocate on his/her behalf. The Governor will hear the positions of each group for 3 minutes. The facilitator will write on flipcharts the position of each group and their proposal. The facilitator will have groups with opposing policies or views to meet, to arrive at a consensus, and to cooperatively develop a bat policy that will be implemented on the island.

**Notes:** .....

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#### What do you think?

- What happened during the meeting?
- What was the result?
- Are you satisfied with the outcome? If “YES” why? If “NO” why not?
- Were you able to successfully reach consensus and create a One Health policy?
- What do you feel are the strengths of the policy? What are areas you feel still need to be strengthened?

**Notes:** .....

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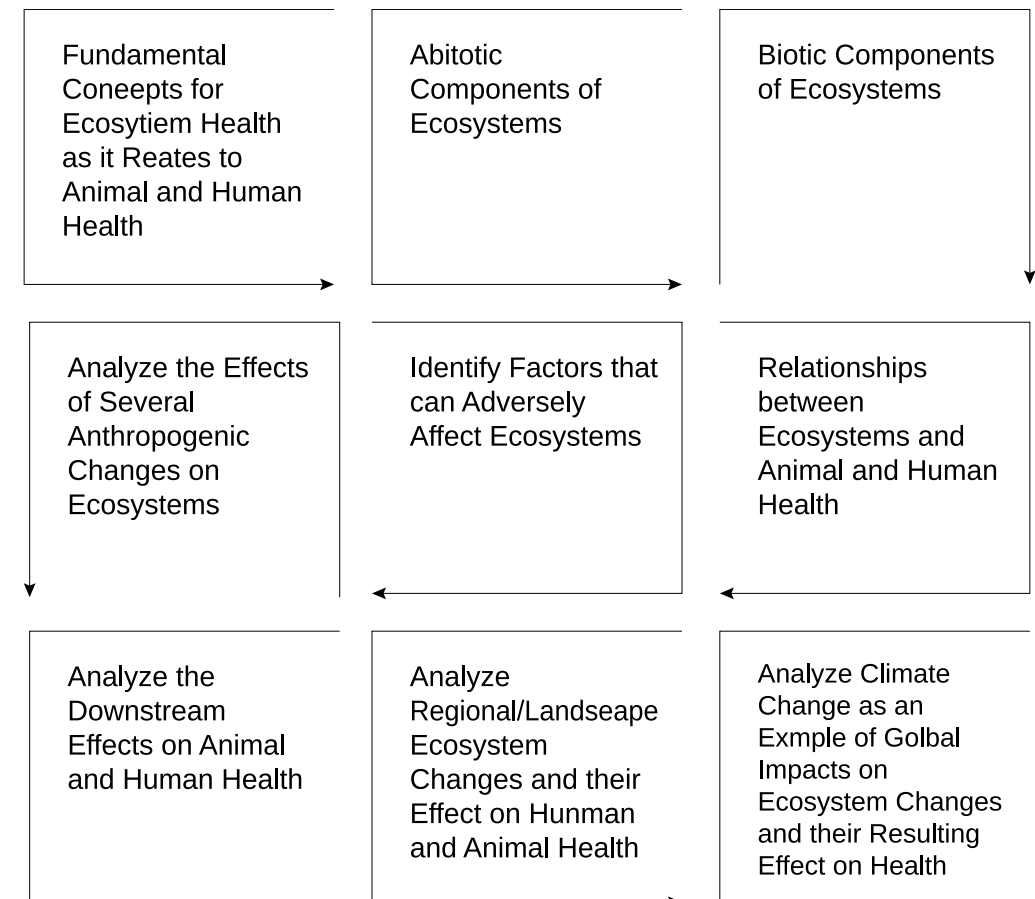
## MODULE 6 - ECOSYSTEM HEALTH

### Course Overview

#### Module Description and Learning Outcomes

This module fosters an understanding of the basic principles of ecosystem health in the context of OH. At the end of the course, students should have a sufficient understanding of ecosystems dynamics so that they can work with environmental professionals to analyze how natural and anthropogenic changes to the environment that can affect animal and human health, locally, regionally, and nationally. At the end of the class, the student should know how to look for the answers, when to call in a professional and have the vocabulary and sufficient background knowledge to be able to work with professionals.

### Learning Map



## Module Overview

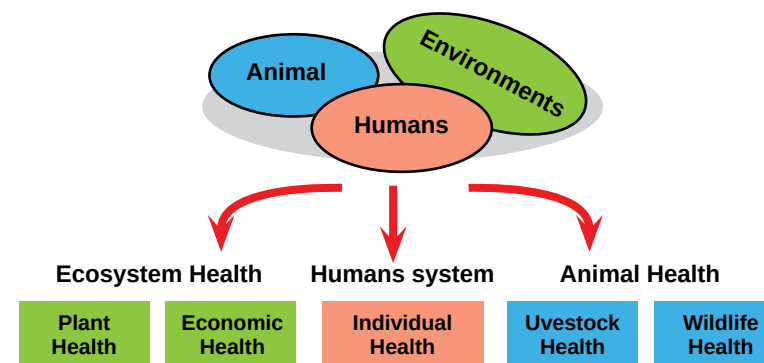
| Competency #1                                                               | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand fundamental ecological/ecosystem principles                      | Understand basic ecological and ecosystem principles related to human health by being able to describe: <ul style="list-style-type: none"> <li>Abiotic components of an ecosystem: water, carbon and nitrogen</li> <li>Biotic components of an ecosystem such as trophic levels, including primary and secondary producers, and consumers</li> </ul> |
| Competency #2                                                               | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                            |
| Recognize interrelationships among ecosystems, animal health & human health | Be able to explain how ecosystem health affects animal and human health. <ul style="list-style-type: none"> <li>Air quality</li> <li>Water equality</li> <li>Soil</li> <li>Habitat</li> <li>Biodiversity</li> <li>Role of underdeveloped areas in cultural, spiritual wellbeing</li> </ul>                                                           |
| Competency #3                                                               | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                            |
| Analyze the effects of direct impacts on the environment                    | Analyze how anthropogenic and natural changes directly affect ecosystems and that can affect animal and human health: <ul style="list-style-type: none"> <li>Forest conversion</li> <li>Industrial and urban development</li> <li>Natural disasters</li> </ul>                                                                                       |

### INTRODUCTION TO ECOSYSTEM HEALTH

|                    |                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>Describe the basic principles of ecosystems</li> <li>Present the scope and objectives of the class</li> </ul> |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|

Prior to class, have students read the following article. The article will likely be difficult to understand, but it covers most of the critical concepts and overarching themes of this module. It will give students an excellent overview and they should be able to fully grasp it by the end of the course.

- “Assessing Ecosystem Health,” by D.J. Rapport, R. Constanza, and A.J. McMichael. TREE v. 13, no. 10 October 1998



### Introduction to an Ecosystem Health

An ecosystem is a community of living organisms (plants, animals and microbes) in conjunction with the nonliving components of their environment (things like air, water and mineral soil), interacting as a system. These biotic and abiotic components are regarded as linked together through nutrient cycles and energy flows. Healthy ecosystems are stable and sustainable, maintaining its character in composition, organization and function over time, and its resilience to stress.

### What do you think?

- What are the ecosystems in the area around this university?
- How do you derive benefits from these ecosystems?
- How does your health depend on ecosystems?

Notes: .....

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### ABIOTIC CYCLES

|                    |                                                                                                                       |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>Describe abiotic cycles of an ecosystem: water, carbon and nitrogen</li> </ul> |
|--------------------|-----------------------------------------------------------------------------------------------------------------------|

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## THE CONCEPT OF ECOSYSTEMS

- Ecology
  - Individuals
  - Populations
  - Communities
- Ecosystem
  - Abiotic components
  - Biotic components
- Ecosystem Ecology
  - Functional aspects



## BIOTIC CYCLES, FOOD WEBS AND SOUTHEAST ASIAN ECOSYSTEMS

### Learning Objective

- Explain the concept of biotic cycles and food webs
- Demonstrate how those apply to the major South East Asian ecosystems
- Discuss the basic dynamics of mangroves, tropical rainforests, and coral reefs

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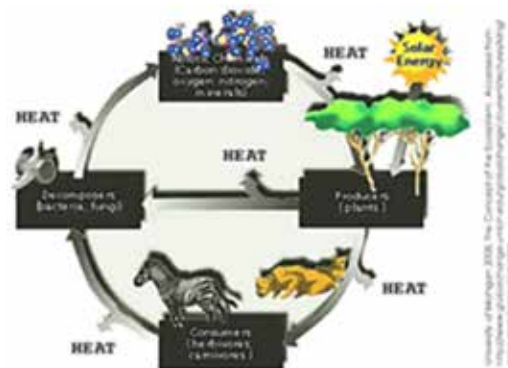
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### Food Webs

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## Ecosystems of Southeast Asia



Mangroves

Tropical Forest

Coral Reef

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### Homework Assignment

Become an expert on your assigned ecosystem:

#### Mangroves

#### Tropical Forest

#### Coral Reef

Learn about the ecosystem including:

- Nutrient cycling
- The food web
- Status in their country (as applicable)
- The threats to the ecosystem
- Services that the ecosystem provides
- What can disrupt the functioning of the ecosystem
- How does the ecosystem affect animal and human health

Prepare a creative presentation on a food web for your ecosystem. Note: There are versions on the internet, but make sure they are recently updated and accurate! Often, they include animals that are not found on the same continent, so try to focus on animals found in South East Asia. Make sure that your food web is accurate for your selected region and that you are able to explain each role.

## ECOSYSTEMS OF SOUTHEAST ASIA Values and Services

### Learning Objective

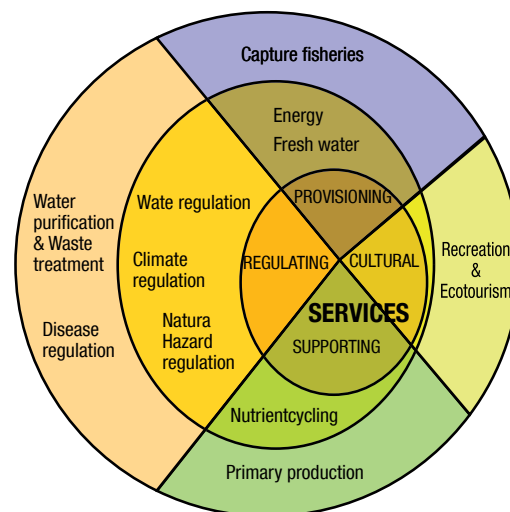
- Identify and compare values and services of ecosystems in Southeast Asia
- Appreciate the differences in values and services of each country in Southeast Asia

In addition to preparing the Ecosystem Food Web Presentations, students should review the following documents:

- Skim Reading – Ecosystems and human well-being: health synthesis. World Health Organization (2005)
- Skim Reading – The value of the world's ecosystem services and natural capital, Costanza, R., d'Arge, R., de Groot, R. (1997)
- Skim Reading – Ecosystem functions and services in Sodhi, N.S. and Ehrlich P.R. Conservation Biology for All.

### Mangrove, Tropical Rainforest and Coral Reef Food Webs

### Ecosystem Services and Values



Source: [www.unep.org](http://www.unep.org)

### Ecosystem Services Include:

- Fresh water
- Food
- Timber, fuel
- Biological products
- Regulations of infectious diseases
- Nutrient and waste management, processing and detoxification
- Climate regulation

### Ecosystems Values include:

- Aesthetic appreciation
- Tourism
- Recreation
- Education
- Motivation
- Genetic resources
- Motivation
- Culture and spirituality

Notes: .....

Using the following articles as references, identify at least 5 ecosystem services provided by each of the following ecosystems (Mangroves, Tropical Rainforests, Coral Reefs, etc) in South East Asia

### Resources

- Chapter 2: Services Provided by Forests. In Ecotourism and Other Services Derived From Forests in the Asia-Pacific Region: Outlook to 2010, Lindberg. K.
- Economic Values of Coral Reefs, Mangroves, and Seagrasses: A Global Compilation, 2008. Conservation International, The Ocean Foundation. ICRI and NOAA.
- Ecosystem service values for mangroves in Southeast Asia: A meta-analysis and value transfer application. Ecosystem Services. Brander, L., Wagtendon, A., Hussain, S.

Notes: .....

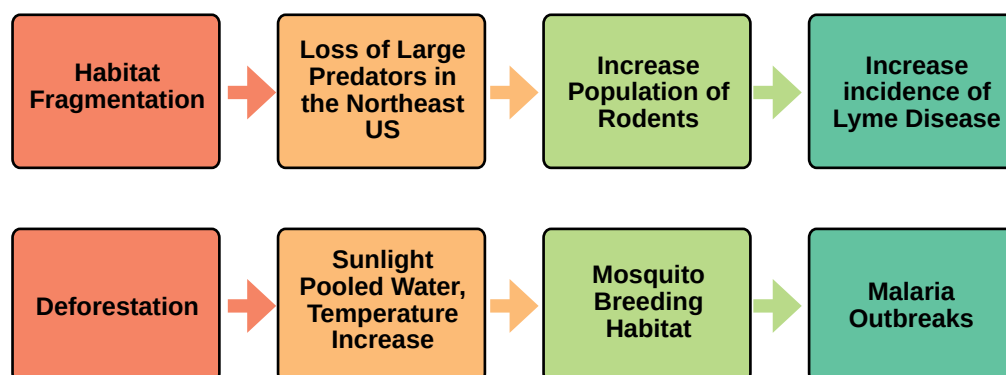
## FACTORS THAT DISRUPT ECOSYSTEMS Natural and Man-Made

### Learning Objective

- List common factors (both natural and man-made) that disrupt ecosystems
- Identify impacts of those factors to human and animal health

| Factors that directly disrupt ecosystems:                                                                                                                                                                                                                                                                                                                       | Factors that indirectly disrupt ecosystems:                                                                                                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Changes in local land use and cover</li> <li>• Changes in climate</li> <li>• Species introduction or removal</li> <li>• Fishing</li> <li>• Nutrient loading from activities such as fertilizer, pest control, irrigation</li> <li>• Modification of rivers</li> <li>• Water withdrawal</li> <li>• Pollution</li> </ul> | <ul style="list-style-type: none"> <li>• Population growth</li> <li>• Economic (e.g. globalization, trade, market, and policy framework)</li> <li>• Socio-political (e.g. governance, institutional and legal framework)</li> <li>• Science and technology</li> <li>• Cultural and religious (e.g. beliefs, consumption)</li> </ul> |

#### Two examples of impacts on public health:



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#### Factors Disrupting My Ecosystem

For your ecosystem, develop a list of the factors that are disrupting the system. Prepare a comprehensive list for the challenge

#### List:

|  | Mangroves | Tropical Rainforests | Coral Reefs |
|--|-----------|----------------------|-------------|
|  |           |                      |             |
|  |           |                      |             |
|  |           |                      |             |
|  |           |                      |             |
|  |           |                      |             |

*Feel free to change the table to include additional information*

#### What do you think?

- What is the current status of the ecosystem in your province or country in Southeast Asia? Discuss the historical changes that have occurred.
- What functions does your ecosystem serve that affects animal and human health?
- What are the factors disrupting your ecosystem? What functions are being disrupted and how do they affect health locally, regionally, and nationally?
- What actions should be taken to address the health consequences of ecosystem change?

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## EFFECT OF DISRUPTION OF ECOSYSTEMS AND THE IMPACTS ON HUMAN AND ANIMAL HEALTH

### Learning Objective

- Explore impacts of ecosystem disruption on human and animal health
- Explain what can happen as a result of ecosystem disruptions on local, regional, and national scales

### Homework Assignment

For your ecosystem-Mangrove, Tropical Rainforest, or Coral Reef—use your creativity to create a presentation answering the following questions. Ensure that your responses address the challenge at the local, the regional and the national scales.

- What is the current status of your ecosystem in a province, region, country, and in Southeast Asia? Discuss the historical changes that have occurred.
- What function(s) does your ecosystem serve that affects animal and human health?
- What are the factors disrupting your ecosystem? What functions are being disrupted and how do they affect health locally, regionally, nationally?
- What actions should be taken to address the health consequences of ecosystem change?
- Is there hope? What can be done?



### Presentations

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## CLIMATE CHANGE, ECOSYSTEMS, HUMAN AND ANIMAL HEALTH

### Learning Objective

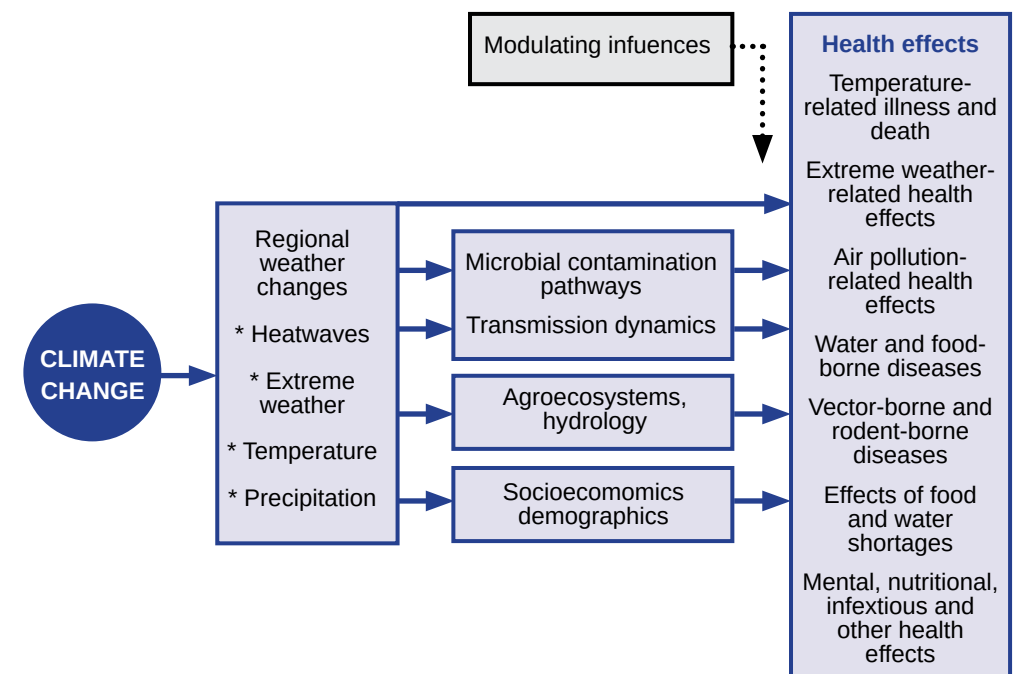
- Be able to analyze regional climate changes and their resulting effects on ecosystem health.

### Reading Assignments

You professor will assign you one of the following papers on the impacts of climate change. Read the paper prior to class and come prepared to discuss it:

- “Climate Change Impacts on Streamflow and Subbasin-Scale Hydrology in the Upper Colorado River Basin” (Ficklin, D.L., I.T. Stewart, and E.P. Maurer)
- “Cumulative Impacts of Human Interventions and Climate Change on Mangrove Ecosystems of South and Southeast Asia: An Overview” (DasGupta, R. and R. Shaw)
- “Climate Change and Agricultural Development: Adapting Polish Agriculture to Reduce Future Nutrient Loads in a Coastal Watershed” (Piniewski, M. et al.)
- “Climate Change and Ecosystems” (United States Environmental Protection Agency)

### Climate and One Health



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### Climate Changes and Animal Health

- What do you think?
- How does climate change affect animal health?
- What adaptation strategies are applicable here?

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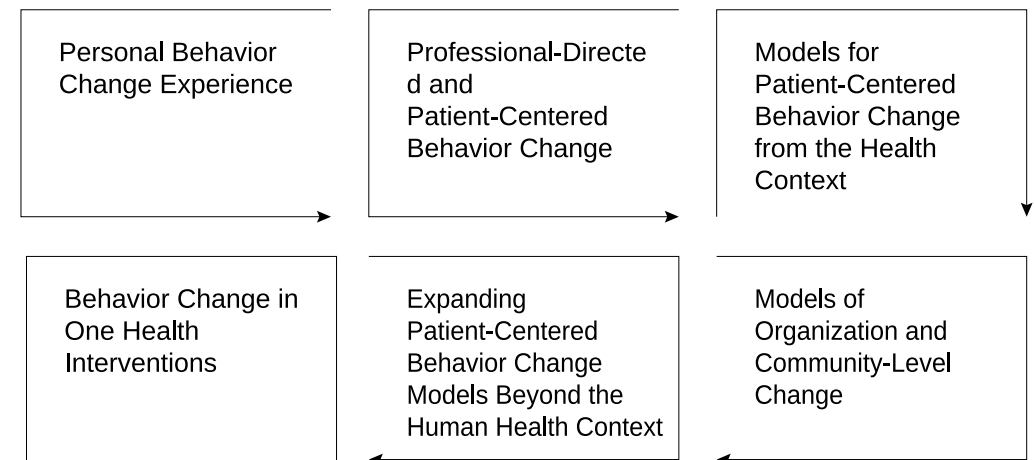
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## MODULE 7 - BEHAVIOURAL CHANGE

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module will teach students about the models of behavioural changes at individual, organizational, and community levels. Students will evaluate models used, then discuss behavioural change approaches for a One Health context. Key outcomes of this module are:</p> <ul style="list-style-type: none"><li>• Understand the behaviour modification concepts of change management theories</li><li>• Create behaviour modification/organization and community change strategies for OH interventions</li></ul> |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                                    | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Explain behaviour change theories and change management concepts | <p>Understand principles, concepts, and theories of behaviour change by:</p> <ul style="list-style-type: none"><li>• Defining behaviour in observable, measurable terms</li><li>• Explaining individual, organizational and community level behaviour change theories</li><li>• Reviewing stages of the change process</li></ul> |

| Competency #2                                                                  | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Adapt and apply models for individual behaviour change to One Health contexts  | <ul style="list-style-type: none"> <li>Evaluate different models of behaviour change and adapt the models for One Health</li> <li>Evaluate different models of organizational and community change and adapt the models for One Health</li> </ul>                                                                                                                                                          |
| Competency #3                                                                  | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                  |
| Demonstrate cultural competency and professionalism in leading change          | Demonstrating sensitivity to context and professional integrity in adapting and implementing behaviour change models by: <ul style="list-style-type: none"> <li>Assessing the impact of culture, beliefs, and values on behaviour change</li> <li>Recognizing and responding appropriately to ethical issues in behaviour change</li> </ul>                                                                |
| Competency #4                                                                  | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                                  |
| Design behaviour change strategies for One Health interventions in communities | Create behaviour change strategies for One Health interventions by: <ul style="list-style-type: none"> <li>Adapting and expanding behaviour change strategies for human health to address the human, animal and ecological health interface</li> <li>Defining an individual or community readiness to change score</li> <li>Describing the complexity of behaviour change in One Health context</li> </ul> |

| PERSONAL BEHAVIOUR CHANGE |                                                                                                 |
|---------------------------|-------------------------------------------------------------------------------------------------|
| Learning Objective        | <ul style="list-style-type: none"> <li>Personal behaviour change experience pre-work</li> </ul> |

### Pre-Work

One week before you start this class, select a personal health or wellness behaviour that you would like to change. For example, you may want to take at least a 15 minute break for lunch to de-stress or you may want to cut down on the number of cups of coffee that you drink each day or you may want to make sure to follow your doctor's advice to limit your salt intake.

Write down the personal health or wellness behaviour that you would like to change and then list 3 positive steps that you will take over the next 7 days to accomplish this goal. Finally, write down some initial reflections on how you feel about making the change. Be prepared to share your experience on the first day of class.

### Reflection Questions

For seven days, I am going to:

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I will take the following steps:

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| This goal is... | • Not important to me                   | • Somewhat important to me                   | • Very important to me                  |
|-----------------|-----------------------------------------|----------------------------------------------|-----------------------------------------|
| I am...         | • Not confident I can make this change  | • Somewhat confident I can make this change  | • Very confident I can make this change |
| I am...         | • Not ready to start making this change | • Somewhat ready to start making this change | • Very ready to make this change        |

Check how you feel:

## Behaviour Change Journal

|       | How well did I do? on a scale from 1 to 10, with 1 = not well and 10 = very well | What made it easy to do? | What made it hard to do? | What do I need to continue to do or do differently tomorrow? | How confident am I that I can succeed? on a scale from 1 to 10, with 1 = not well and 10 = very well |
|-------|----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Day 1 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 2 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 3 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 4 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 5 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 6 |                                                                                  |                          |                          |                                                              |                                                                                                      |
| Day 7 |                                                                                  |                          |                          |                                                              |                                                                                                      |

**Notes:** .....

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## INTRODUCTION TO BEHAVIOUR CHANGE

### Learning Objective

- Analyze attempt to change a personal behaviour
- Understand the role of behaviour change in One Health responses

### Personal Behaviour Change Experience Debrief

In your group, share your experiences in personal behaviour change. Discuss the following questions:

- What made your attempt at behaviour change easy?
- What made your attempt at behaviour change difficult?
- What can you do to help individuals that you work with change their behaviour?

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## PROFESSIONAL DIRECTED AND PATIENT CENTERED BEHAVIOUR CHANGE APPROACHES

### Learning Objective

- Understand principles, concepts and theories of behaviour change
- Discover elements of patient-centered and professional-directed behaviour change

### Experiencing Different Approaches to Change

What role did you get?

- Patient
- Change Agent 1
- Change Agent 2

In your trio, from the patient's perspective, discuss:

- How likely he/she is on a scale of 1 to 10 to change the behaviour?
- The effective elements of the Change Agent's approach
- The ineffective elements of the Change Agent's approach

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### What do you think?

- What required skills do both approaches have in common?
- What skills did you see Change Agent 1 use?
- What skills did you see Change Agent 2 use?
- From patient's point of view, which method is the most effective?

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## MODELS FOR PATIENT CENTERED BEHAVIOUR CHANGE

### The Health Belief Model

Learning  
Objective

Understand principles, concepts and theories of a patient  
entered behaviour change approach

### Health Belief Model

For a patient to change his/her behaviour, the patient must:

- Know that they have a particular health condition
- Believe that having the condition is serious and harmful
- Perceive that the benefits of changing their behaviour outweighs the challenges
- Feel that there are treatment options
- Feels a call to action to spark change
- Perceives that s/he can successfully perform the behavior

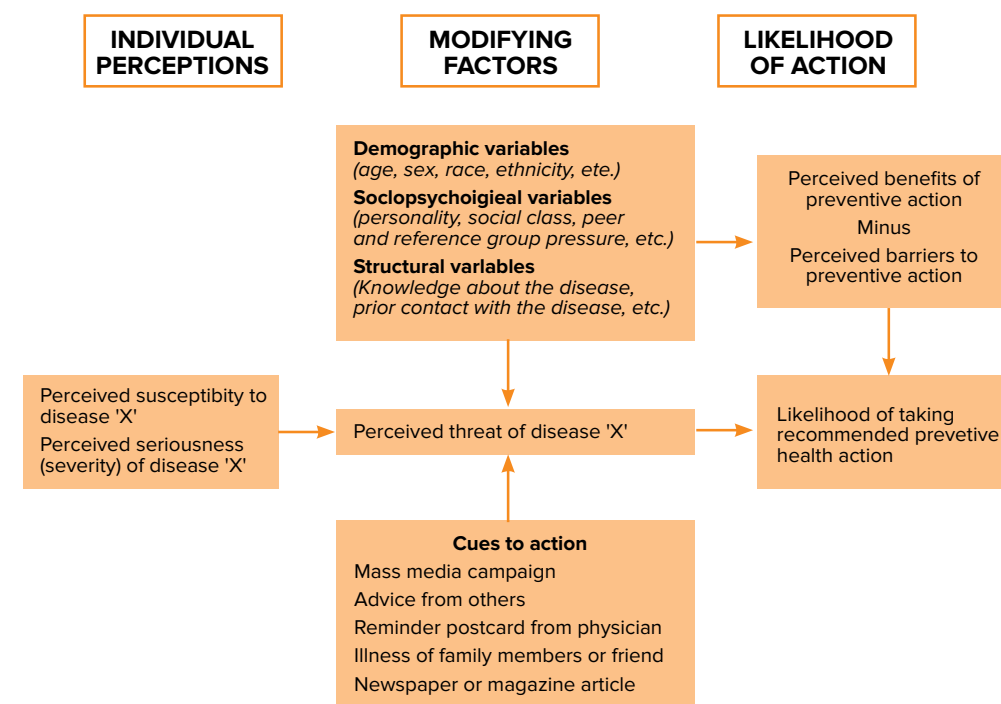


What do you think are the strengths of the Health Belief Model? What do you think are the limitations?

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### Factors Impacting Likelihood for Change in the Health Belief Model

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## MODELS FOR PATIENT CENTERED CHANGE

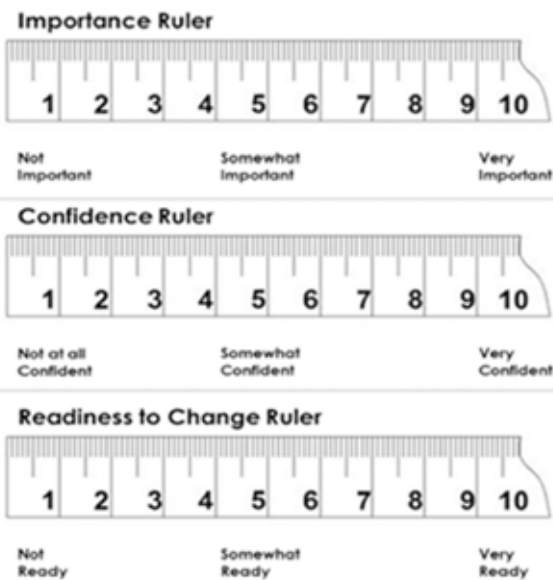
### Readiness to Change and Motivational Interviewing

#### Learning Objective

- Understand principles, concepts and theories of a patient entered behaviour change approach

### Assessing Readiness to Change

Read the article “Facilitating Behavior Change” and review the “Readiness to Change Instructions and Tool” in the reference section of this module.



Thinking back to the change you made as pre-work for this module, on the rulers below, circle on a scale from 1 to 10 how important you felt the change was, how confident you were you could make the change, and how ready you were to make the change.

**What do you think?** Given what you read about Motivational Interviewing...

- How can asking about readiness, importance or confidence help an individual in the behaviour change process?
- In what scenario might you use these rulers?

**Notes:** .....

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## Motivational Interviewing

### Spirit of Motivational Interviewing: ACE

#### A. Autonomy

Physicians demonstrate respect for patients' ability to make their own decisions and adopt new behaviors. Simply telling people why and how to behave is not effective in helping them change. Acknowledging a person's right NOT to change and freedom to choose how to change can limit defensiveness and encourage an open mind.

#### C. Collaboration

Physicians and patients should work together as partners to reach a common goal. Clinicians view patients as experts in their own lives and create safe and collaborative environments. They encourage/facilitate joint decision-making and problem-solving.

#### E. Evocation

Clinicians can draw out patients' own ideas and motivations for change. Patients are more likely to change when they express their own perspectives and uncover personal values and goals that support health behavior change.

### Guiding Principles of Motivational Interviewing: RULE

#### R. Resist the Righting Reflex

There is a tendency for health professionals to advise patients about the right path for good health. Motivational Interviewing requires clinicians to suppress this initial righting reflex so that they can explore a patient's motivations for change. People often believe what they hear and say themselves, and can react in opposition to what others insist that they do.

#### U. Understand your Patient's Motivations

A patient's own reasons for change will ultimately result in behavior change. By approaching a patient's interest, concerns and values with curiosity and openly exploring the patient's motivations for change, the practitioner gain a better understanding of the patient's motivations and potential barriers to change.

#### L. Listen to your Patient

Effective listening skills are essential for identifying what motivates a patient, as well as what barriers an individual might face. Many answers lie within the patient.

#### E. Empower the Patient

Patient outcomes improve when they actively participate in their treatment. Empowering patients involves exploring their own ideas about how they can make changes to improve their health and drawing on the patient's personal knowledge about what has succeeded in the past.

Notes: .....

Identify one skill from the above assessment that you would like to develop and create a personal change plan to develop that skill.

### Personal Plan

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## MODELS OF ORGANIZATION AND COMMUNITY CHANGE Kotter and Lewin

Learning  
Objective

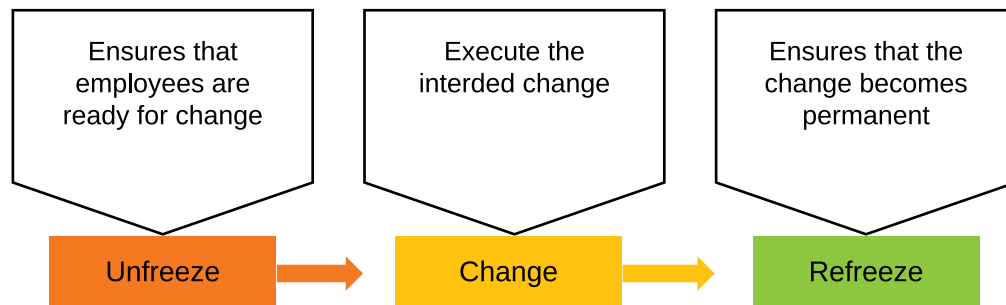
- Research two leading theories on organizational change

### Introduction to Two Theories of Organizational Change: Kotter and Lewin

**John Kotter** proposed eight essential steps for leading change:

- Establishing a Sense of Urgency
- Creating a Guiding Coalition
- Developing a Vision and Strategy
- Communicating the Change Vision
- Empowering Board-Based Action
- Generating Short-Term Wins
- Consolidating Gains and Producing More Change
- Anchoring New Approaches in the Culture

**Kurt Lewin** proposed a three step model:



### Your Assignment

Select one of the two models and learn more about it. Then, in small groups, prepare a 20-minute presentation to teach the model to the class. Get creative in your presentation: a role play, a video, a story...

Some references to get started include:

#### John Kotter

- John Kotter's Website, [www.kotterinternational.com](http://www.kotterinternational.com)
- John Kotter, "Leading Change: Why Transformation Efforts Fail," <http://hbr.org/2007/01/leading-change-why-transformation-efforts-fail/ar/1>
- John Kotter Explains the 8 Steps to Create Successful Change, <http://hbr.org/web/tools/2008/12/kotter-8-steps>

#### Kurt Lewin

- Bernard Burnes, "Kurt Lewin and a Planned Approach to Change". <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-6486.2004.00463.x/pdf>
- Lewin's 3-Stage Model of Change: Unfreezing, Changing and Refreezing. <http://education-portal.com/academy/lesson/lewins-3-stage-model-of-change-unfreezing-changing-refreezing.html>

#### What do you think?

- What did you like about each model?
- What more do you need to learn about each model?
- Are the models exclusive of one another? Complementary?

Notes: .....

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## BEHAVIOUR CHANGE IN ONE HEALTH INTERVENTIONS Expanding Patient-Centered Behaviour Change Models Beyond the Human Health Context

Learning  
Objective

- Use concepts derived from patient entered behaviour change models to explore behaviour change in the human, animal, and environmental interface

### In your region, culture or discipline:

- How would the Health Belief Model work in your region or culture?
- How would you modify Motivational Interviewing and Readiness to Change to work most effectively in your region or culture?

*Create a flip-chart to share your answers with the class!*

### What do you think?

- As a member of One Health team, what do you feel is your role in changing people's behaviours?
- Create a model for behaviour change that you can use as part of a One Health team. Have this model relate to your speciality/discipline

**Notes:** .....

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| BEHAVIOUR CHANGE IN ONE HEALTH INTERVENTIONS |                                                                                                                            |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                           | <ul style="list-style-type: none"> <li>• Develop behaviour modification strategies for One Health interventions</li> </ul> |

### Create Your Model for Organizational Change for a One Health Initiative?

Think of a situation you have faced or might face that involves changing individual and/or community behaviours. What is your model for change? Spend the next 30 minutes reflecting on your ideas from the previous session in which you created your own personal model for behaviour change and the two models for community change, Kotter and Lewin.

*Summarize your model on a flipchart. At the end of the hour, we will share our models*

### What do you think?

- In looking at your classmates' models, what elements might you want to adopt to ensure a successful One Health change initiative?

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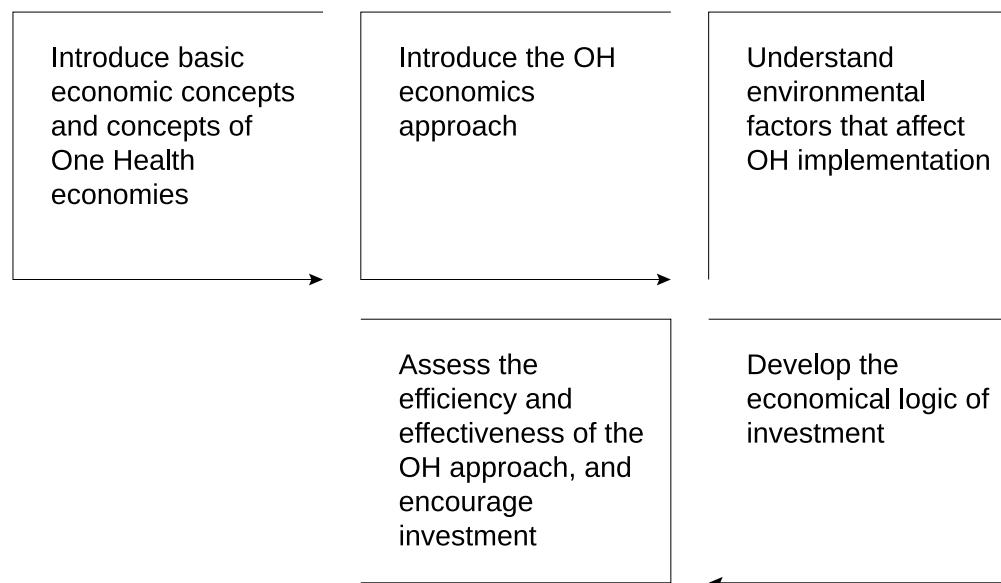
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## MODULE 8 - ONE HEALTH ECONOMY

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module will help student understand some basic concepts in economics and the application in OH intervention assessments. Key outcomes of this module are:</p> <ul style="list-style-type: none"> <li>• Understanding basic concepts of economics through the OH lens</li> <li>• Defining the One Health Economic approach and why it is important</li> <li>• Understanding economic logic in One Health investment and why the One Health approach is cost-effective</li> </ul> |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                              | Learning Objectives to Develop Competency                                                                                                                                                   |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand basic concepts of economics through the OH lens | <ul style="list-style-type: none"> <li>• Explain basic concepts and terminology used in relation to the One Health approach and economics</li> <li>• Define One Health Economics</li> </ul> |

| Competency #2                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Understand factors that can improve or hinder the implementation of One Health Economics | <ul style="list-style-type: none"> <li>• Compare and contrast individual work, group work, and team collaborative work.</li> <li>• Explain the typical stages in the development of a team.</li> <li>• Demonstrate active listening skills.</li> <li>• Demonstrate constructive conflict resolution skills</li> </ul> |
| Competency #3                                                                            | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                             |
| Understand basic concepts of economics through the OH lens                               | <ul style="list-style-type: none"> <li>• Explain basic concepts and terminology used in relation to the One Health approach and economics</li> <li>• Define One Health Economics</li> </ul>                                                                                                                           |

### Topic Breakdown

| Introduction to Basic Concepts in Economics |                                                                                                                                                                                                                                                                                               |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                          | <ul style="list-style-type: none"> <li>• Define key concepts related to economics and resource allocation</li> <li>• Understand how OH issues challenge economic approaches</li> <li>• Describe what collaboration means, and its benefits and challenges in One Health situations</li> </ul> |

### Introduction to Basic Concepts in Economics

Economics is the science that studies how a society will solve the problem of limited resources, or in other words, economics is the science to study how the social need to (or should) allocate/ use scarce resources in order to meet the unlimited wishes and needs of the people, to study the allocation of limited and scarce resources for a myriad of choices.



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### Define the Following Three Factors

Consumers: .....

Business: .....

Society and National Economy: .....

### What do you think?

- What would you define the One Health economic approach to be?
- Why or why not is it important to integrate economics into the One Health approach?

Notes: .....

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### Reflection Questions

How does your definition of the One Health economic approach affect human and animal health, and the environment? To what extent?

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How do you make the OH approach cost-effective and sustainable to ensure human health, animal welfare, and the environment are all incorporated?

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Answer the following question: “Thinking about your own experience and the One Health approach, what do you anticipate to be some of the benefits and challenges of One Health economics?”

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*List some benefits and challenges you identify with the One Health Economic Approach below:*

| Benefits | Challenges |
|----------|------------|
|          |            |

Reflection Question: Is this approach feasible for all countries? Or will individual country wealth affect success?

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| Environmental Factors Facilitating the Emergence of Health Problems |                                                                                                                                                                                                               |
|---------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objectives                                                 | <ul style="list-style-type: none"><li>• Understand different environmental factors that influence the emergence and development of Health problems.</li><li>• Learn current and emerging challenges</li></ul> |

**Environmental Factors Notes**

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**Key Factors to Consider with an OH Approach**

- Increasing Population
- Migrant Patterns
- Livestock and Farming Systems:

**Notes:** .....

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## Response to Current and Emerging Challenges

### What do you think:

- What would your response be to current and emerging challenges?
- How do you think climate change will impact One Health, economics and health related planning?

Notes: .....

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### Economical Logic of Investment to One Health

#### Learning Objectives

- Consider the financial burden of diseases and what an investment in the OH approach would be
- Learn what prevention and disease management systems cost

Review the following aspects of investing in the One Health and One Health economics:

### Investment to One Health in considering the impact of diseases

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### Investment in One Health in considering preventive measures

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### What do you think?

- What are the costs and effects for human health when infected by diseases transferred from animals?
- What happens when vaccinations, such as Yellow Fever or Rabies, are limited?
- What is the burden of zoonotic diseases?

To study the economical approach of One Health, three of the following aspects of resources allocated for the medical system will be reviewed:

- Resources for specific matters on disease transmission between people and animals
- Regions with limited resources and access
- The flexibility of resources allocated for human and animal health

Notes: .....

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### Lecture - Resource Allocation for Medical System

#### Resources for specific matters on disease transmission between people and animals

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#### Regions with limited resources and access

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## The flexibility of resources allocated for human and animal health

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### Efficiency and Effectiveness of One Health

#### Learning Objectives

Students will be able to explain the efficiency and effectiveness of using the innovation OH approach in developed and developing countries

- Explain the economic incentive to using the OH approach

### Lecture - Efficiency and Effectiveness of One Health

#### Define: Efficiency

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#### What do you think?

- What are some benefits of investigating in the OH approach?
- Why do you think people are hesitant to implement the OH approach?
- How do you track the benefits?

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To track the benefits of integrating the OH approach relies on a qualitative assessment. So it is different in two ways:

- Intensive detection and control with close coordination between health care services for people, livestock and wild animals will lead to the full and faster epidemic diagnostics.
- When there is lack of information and interaction between humans, livestock and wild animals, the definition of epidemic root might be slow, leading to the increase of cost for disease control.

### Group Activity

The teacher will divide you into groups of 3-5 and discuss the following questions with your team:

- *If you have 5 minutes with healthcare practitioners, hospitals, international donors and government agencies. They want to invest in a new health approach for 5 million dollars, how would your group sell the One Health approach to them?*
- *What are some key selling points?*

Your assignment is to design a 3 minute presentation to advocate for the integration and cost effectiveness of the One Health approach on a national scale in Vietnam.

Remember: Investing in the One Health approach has longterm benefits, as it combats climate change, builds local and national resilience, and encourages multi-sectoral innovation with resource management.

Notes: .....

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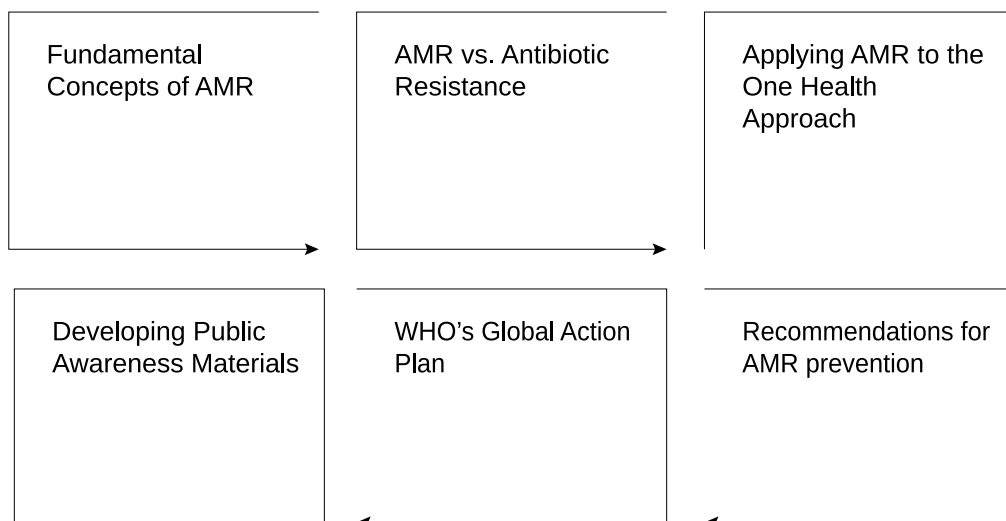
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## MODULE 9 - ANTIMICROBIAL RESISTANCE

### Course Overview

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Module Description and Learning Outcomes | <p>This module provides an understanding of the basic principles of antimicrobial resistance (AMR) in the context of OH. The module uses an OH approach to examine various challenges associated with AMR, as it impacts the treatment of animals and humans. Students will learn basic terminologies, its local and national problems, and its impact on humans, animals, and the environment. Key outcomes of the module are the ability to:</p> <ul style="list-style-type: none"> <li>• Describe fundamental concepts of AMR</li> <li>• How the OH approach can offer longterm solutions to AMR at various levels</li> <li>• How to advocate for proper diagnosis and treatment of health related illness in humans and animals</li> </ul> |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Learning Map



### Module Overview

| Competency #1                                                 | Learning Objectives to Develop Competency                                                                                                                                                         |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe the fundamental concepts of Antimicrobial Resistance | <ul style="list-style-type: none"> <li>• Describe the development of AMR and its key definitions</li> <li>• Apply fundamental concepts to develop an OH approach in the context of AMR</li> </ul> |

| Competency #2                                                              | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interpret fundamentals of AMR, its daily impacts and associated challenges | Use AMR fundamentals to identify and classify health related problems present in humans and animals, on a local, national, and international scale. Students will study a case study example of AMR.                                                                                                                                                                                          |
| Competency #3                                                              | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                     |
| Integrate AMR concepts into present context                                | Understand the associated problems and challenges developing with AMR to propose possible health interventions with the OH approach. Students will look at human, environmental, and animal                                                                                                                                                                                                   |
| Competency #5                                                              | Learning Objectives to Develop Competency                                                                                                                                                                                                                                                                                                                                                     |
| Apply communication strategies to increase general awareness               | <p>Understand communication methods to convey information about AMR and increase awareness by being able to:</p> <ul style="list-style-type: none"> <li>• Effectively communicate information about AMR to professionals and the general public</li> <li>• Propose possible solutions or prevention techniques</li> <li>• Design an advocacy campaign to increase public awareness</li> </ul> |

### FUNDAMENTAL CONCEPTS OF ANTIMICROBIAL RESISTANCE

|                    |                                                                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective | <ul style="list-style-type: none"> <li>• Describe the development of AMR, its key definitions, and why it is an OH related problem</li> <li>• Apply fundamental concepts to develop an OH approach in the context of AMR</li> </ul> |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Fundamentals of Antimicrobial Resistance Lecture

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**Why does this matter?**

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**What do you think?**

- What are some examples of misusing antibiotics?
- How does antimicrobial resistance relate to the One Health approach?
- What solutions can you think of to mitigate these problems?

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| Antibiotic Resistance vs. Antimicrobial Resistance |                                                                                                                                                          |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                 | <ul style="list-style-type: none"><li>• Define antibiotic resistance</li><li>• Distinguish Antibiotic resistance from antimicrobial resistance</li></ul> |

**Individual Activity Assignment**

In your own words, define antimicrobial resistance (AMR). Think of 1 example in relation to human health, animal health, and ecosystems. How does AMR hinder health initiatives?

*Tip: If you do not know what antimicrobial resistance is, write what it IS NOT!*

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**Antibiotic Resistance Lecture**

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**Antibiotic vs. Antimicrobial Resistance (AMR)**

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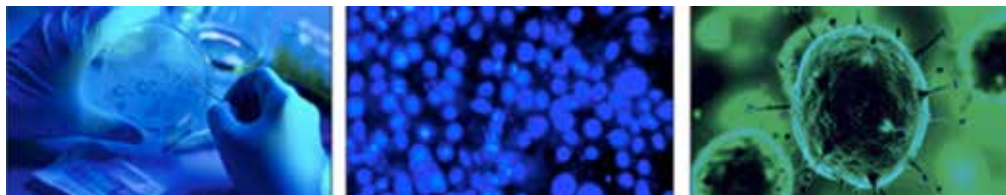
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## AMR in a One Health Approach

### Learning Objective

- Identify how the One Health approach will help solve AMR challenges for animal and human health.
- Students will look at common AMR challenges between human, animal, and agriculture



Prior to class, have students read the following article: “One Health Approach to Tackle Antimicrobial Resistance in South East Asia.”

Singh Poonam Khetrapal. “One Health approach to tackle antimicrobial resistance in South East Asia,” BMJ 2017; 358 :j3625

<https://www.bmj.com/content/358/bmj.j3625>

Source: [http://www.who.int/foodsafety/areas\\_work/antimicrobial-resistance/amr\\_tripartite\\_flyer.pdf?ua=1](http://www.who.int/foodsafety/areas_work/antimicrobial-resistance/amr_tripartite_flyer.pdf?ua=1)

## The One Health Approach to Antimicrobial Resistance - Lecture Notes

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### What do you think:

- How do you think antimicrobial agents can be effective and useful in curing animal and human diseases?
- How would you advocate for the proper use of antimicrobial agents?
- What is the global impact to AMR? How do you ensure global access to medicines, proper diagnosis and international guidelines?

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### What do you think?

- What actions should be taken to combat the threat of AMR?
- What does the World Health Organization recommend?
- What does the United Nations' Food and Agriculture Organization recommend?
- What does the World Organization for Animal Health recommend?

Write a one page reflection on your thoughts regarding AMR and the One Health Approach. Below are some questions that might help stimulate some reflection.

- What are barriers in Vietnam to integrating AMR and the One Health approach?
- How is using the One Health approach beneficial to solving the AMR problem in Vietnam and South East Asia?
- What recommendations would you have for a National Action Policy incorporating the One Health approach and combat AMR?

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## Recommendations for Solving AMR with a One Health Approach

### Learning Objective

- Provide AMR recommendations to present problems in Vietnam and South East Asia
- Learn prevention and control measures for individuals, policy makers, health professionals, etc.

What are some WHO recommendations of prevention and control for policy makers, health professionals, the healthcare industry to combat AMR?

Complete the chart below - Use the WHO website for more information

| Individuals | Policy Makers | Health Care Professionals |
|-------------|---------------|---------------------------|
|             |               |                           |

| Healthcare Industry | Agriculture Sector |
|---------------------|--------------------|
|                     |                    |

Your teacher will divide you into four large groups (local communities, government, a health NGO, or a branch of ministry). The Ministry branch can include health, agriculture, labour & trade, etc. Make sure you get your teacher’s approval before beginning the assignment. Design recommendations.

Notes: .....

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| World Health Organization’s Global Action Plan for AMR |                                                                                                                                                                                                                                                              |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Learning Objective                                     | <ul style="list-style-type: none"><li>• Review WHO’s action plan for addressing AMR and learn the 5 strategic objectives and the implementation process</li><li>• Students will learn how to effective communication about the emerging AMR threat</li></ul> |

What is the global action plan?

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What are the 5 Strategic Objectives for the WHO’s Global Action plan?

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## What do you think?

- What do you think of WHO's Global Action Plans? If you could make any recommendations, what would they be?
- What media initiative do you think will be the most successful in increasing the public's awareness of antimicrobial resistance?
- What would be an effective plan to implement antimicrobial resistance awareness in Vietnam?

For additional information on the initiatives, visit: <http://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>

## Group Assignment

Your teacher will divide you into groups of 3. Within your groups, you have the task of preparing either a 5 minute presentation OR a poster for the general public to learn about AMR. Make sure you focus on either human health or animal health. Make sure to include recommended actions!

**\*\*\*If it is easier, have the entire class design posters to advocate for antimicrobial resistance awareness. Topics should focus on animal health and human health. Bonus points will be awarded if you can integrate ecosystems into your poster!**

*Get creative!*

Examples of posters: <http://www.who.int/campaigns/world-antibiotic-awareness-week/2017/posters/en/>

**Notes:** .....

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### Additional Notes

This image shows a single page of white paper designed for handwriting practice. It features 20 evenly spaced, horizontal dashed lines that run across the entire width of the page. The lines are thin and black, providing a guide for letter height and placement. There are no margins, text, or other markings on the page.

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