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SCHOOL OF VETERINARY &
SCHOOL OF MEDICINE

MASTERS PROGRAMME

MSc One Health Analytical Epidemiology (MSc.OHAE)

MODULE NO.5

VMM 7701: One Health Medicine and Globalization

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1. INTRODUCTION

Welcome to **Module 5** on One Health Medicine and Globalization Health.

The Module introduces the postgraduate students undertaking the Master of Science (MSc) in One Health Analytical Epidemiology (OHAE) course VMM7722 to the concepts and applications of One Health Medicine and Globalisation health realities. It has been organized into eleven (11) important Units: **Units 1-6** of this module will be devoted to **"One Health Medicine: Concepts and Applications"**, while **Units 7-12** will be concentrated on the issues of **"Globalization Health and Effects on One Health,"** respectively.

Other than the theoretical perspectives of both One Health and Globalization health, you will be equipped with skills to identify and analyse the ecosystem and the globalization health effects on human and animal populations, health and environment. Furthermore, you will be expected to critically review the policies and legislative measures governing movements of flow of goods (humans, animals and other goods alike), services, capital and technology in the globalised world (Jenkins 2004) for the control of emerging and re-emerging diseases and their effects on health and environment.

The Module further examines one health concept on the rationale that global trends in the emerging infectious diseases of animal origin are increasingly affecting human health and welfare. Even though, many existing diseases remain important, there is the anticipation that new diseases will emerge in the future, noting that in the last 25 to 30 years, some 70-80% of new emerging human infectious diseases originated from animals (Brownlie et al. 2006). Economic development, changes in habitation and agricultural systems, globalisation of travel and trade as well as climatic variations, are likely to increase the spread of infectious diseases. Major infectious diseases are endemic in Africa and Asia constituting to a high risk for future marginalisation of Africa (Rweyemamu et al.2006). Furthermore, human mobility and access to international markets for African animal and plant commodities could be severely constrained by infectious diseases in Africa. In addition societal contexts will be crucial in realizing the benefits of the new technological systems. Culture and governance issues are often underrated in disease management programmes in Africa (Coker et al.2011). Therefore, substantial advances in infectious disease prevention and management will be made through inter-sectoral approach for a strategic, cost-effective and efficient way to accelerate the integrated development of African research capacity building.

The Module exposes students further to the ecology of health and disease, and the ecological anthropology on how they influence health outcomes of populations and environment, and the understanding of the contextual human behavioural challenges. Aspects of behavioural research are presented to expose students to qualitative methods, analysis and interpretation of qualitative data to gain better understanding of human behavioural challenges for re-thinking strategic approaches in the control of infectious diseases in the region. Ecological risk analysis management approach for disease control in humans and animals is also presented in this course.

Other components of the Module, which include the review of the space and strategy of demographic growth of humans and animals and environmental constraints, the demographic transition, reproduction and survival, and determinants and effects on population structure are additional parts of these initial Units. The Globalisation Health concepts and applications for Units 7-12 provide the contextual understanding of globalization and its effects on populations,

health and environment; linkages between globalisation in relation to the fiscal flow of trade, human and animals and health outcomes on these populations; health risks and systems. The relationships between globalization, health risks and health systems, and the policies governing globalization for public health control measures of infectious diseases are essential components discussed in this module.

We hope that you will reflect on the content and activities in this module coupled with your experience in the areas of specialization. This will help you to develop competences to be able to develop and manage One Health and globalization Health measures for promoting Public Health and Control of infectious diseases (through research, health system management and evaluation) in the Region and in your specific countries.

AIM

The aim of the module is to enable you acquire knowledge and skill applications in One Health and globalization health effects on local and international realities in disease control and prevention through research, health systems management and evaluation for improving health of human and animal populations in your specific countries and Sub Region.

OBJECTIVES

At the end of the 2-weeks training of this Module, students should be able to:

i. Apply the concept of One Health medicine to the substantial advances in infectious disease prevention and management through inter-sectoral approaches of strategic, cost-effective and efficient ways to integrate research capacity in Africa.
ii. Explain and discuss the effects of globalisation related to cross border flows, the opening of national economies to such flows, the development of international rules/policies and the institutional architecture governing the cross border flows on health, populations and environment.
iii. Explain the ecosystem health and ecology of disease and health, and how medical anthropology encourages a better understanding of the socio-economic, socio-cultural components that underlie improvements in the health status of both human and animal populations through research and health systems development.
iv. Explain the definitions, determinants of health, the space and the strategy of demographic growth of humans and animals and their reproduction and survival, and environmental constraints
v. Describe and discuss the linkages between globalisation and health outcomes in accelerating infectious disease outbreaks in local and international situations.

The following section pres
ents the description of the structure of the Module and its linkages to other modules that has been broadly organised into two main Units.

MODULE STRUCTURE & LINKAGES

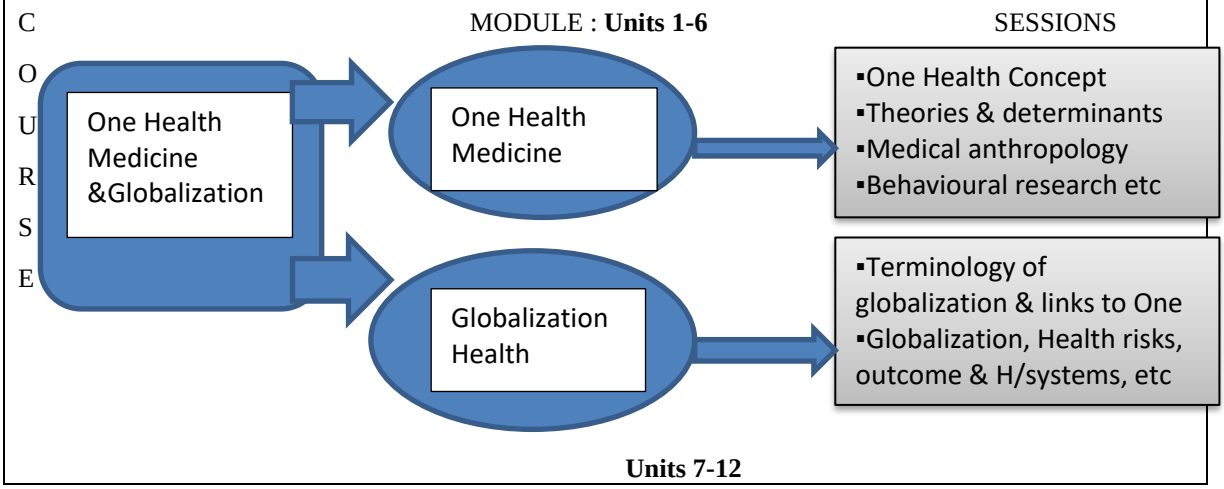
The Module is taught as the advanced **'Core Course'**, meaning that it is imperative and one of the basic requirements that all students undertaking the Masters programme must attend. It has a pre-requisite links to other modules of zoonosis, emerging and re-emerging diseases, epidemiology and biostatistics, disease surveillance and risk analysis, and research

methodology, including computer applications. The Module is broadly divided into eleven (11) main distinct Units, with several sub-units. **Units 1-6** are devoted to the conceptualization of One Health Medicine: Concepts and Applications; and **Units 7-12** focus mainly on globalization health and demographic effects on populations, health and environment.

Conceptual Outline

Figure 1 below provides a summary of the course module component structure of this course module.

FIGURE 1: One Health Medicine & Globalization Health Module Component Structure



Units 1- 6 of the Module consists of terminologies (One Health, Human Health and Animal Health, including the Five Freedoms alike), theories of One Health and concepts of Health & wellbeing; The Space and Strategy of Demographic Growth of human and animals, their reproduction and survival, and environmental constraints; Principles of one health and concept of medical evolution; components and determinants of health; Medical anthropology: dynamics of traditional medicine in influencing health outcomes; Ecology of health and disease & implications for human and animal well-being. It elaborates further the concepts of ecosystems and ecosystem health, and the applications of problem based learning (PBL) approach with relevant examples. The PBL is a tool for providing better understanding of problem identification and the means of solving such problems through a multidisciplinary and inter-sectoral approach.

During this Unit module, students will learn the qualitative research design and methods for a behavioural research application; principles of questionnaire design and data collection, and ethical considerations; and gain practical skills in data processing and analysis using N'VIVO computer soft-ware and also manual analysis of qualitative data by applying content analysis and displaying data using matrices, diagrams, flow charts and in narrative form.

Units 7-12 are composed of the following sub-topics: Theories and Terminology of globalization terminology; Health effects of Globalization: Cross border flows of goods on human and animal populations, Globalization, health risks and health systems; globalization effects on populations, health and environment; Trade Liberalization, World Trade Regime (WTR) and Transnational Corporations; Health Implications & conflicts of the World Trade

Organization (WTO) Agreements with Public Health Principles, including Globalization regulations/policies for health, environment, populations and cross border flows; Actions and globalized efforts for Health equality; and finally, the Key Definitions of Globalizations, Trade and Work, and Learning Points..

Teaching Method

Learning will be based on lectures and exercises/practicals on some relevant sub-topics.

Learning Time

Total learning time is 60 hours for 2-weeks, consisting of 2 three-hour sessions and 3 two-hour sessions per week.

Assessment

Continuous Assessment:	**40%**
1 Assessment:	15%
1Group exercise/Practical:	10%
1 Test:	15%
Final Examination:	**60%**

Needy Help?

In case you have difficulties, please get in touch with the following contact Person:

The Course Coordinator,
OHAE Post Graduate Programme
The University of Zambia
School of Veterinary Medicine
Department of Disease Control
P. O. Box 32379,
Lusaka
Zambia

Additional Readings

1. Birn A.F.,Pillary Yogan., Holtz Timothy H.2009. Textbook of International Health: Global Health in a Dynamic World, 3rd Edition, Oxford University Press
2. Keesing Roger.M., and Strathern Andrew J. 1998. Culture and Anthropology: A Contemporary Perspective,3rd Edition, Harcourt Brace & Company,

Philadelphia
3. Massimo Livi-Bacci. 1998. A Concise History of World Population: Humans and Animals,2nd Edition. Blackwell Sciences Publishers
4. Park K. 2011. Textbook of Preventive and Social Medicine, 21st Edition. Banarsidas Bhanot Publishers
5. Wallace Robert.B., Kohatsu Neal. 2008.Public Health & Preventive Medicine,15th Edition.McGrawHill Medical

Recommended Readings

1. Schwabe, C. 1984. Veterinary medicine and human health, 3rd ed. Baltimore: Williams and Wilkins

Apart from the prescribed readings stated, you are expected to read widely around all the topics covered in this Module. You may find the references provided at the end of the Module useful, but you could, also, explore other sources of information, particularly the internet, which has voluminous websites with invaluable information.

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UNIT 1
DEFINITIONS AND CONCEPTS OF ONE HEALTH, HEALTH AND WELL-BEING

1.1 Introduction

Unit 1 introduces you to the concepts of one health medicine, understanding the terminologies of Health and well-being, One Health, Human and Animal Health. The first part of this Unit will be devoted to the terminologies of understanding One Health, human health and animal health. It will explain further the 'Five Freedoms of animals' to provide the relationship links to humans that there is a strong connection between the animals and humans in attaining and understanding health. Other components of this Unit will cover aspects of discussing the concepts of health and wellbeing, which will explain the definitions of Health, discuss the New philosophy of Health, Dimensions of Health, and the concept of Well-being. It is anticipated that through this Unit, you will begin to appreciate the various stages this field has gone through

1.2. Objectives

By the end of the sessions in this Unit, you should be able to:

(i) Demonstrate the basic understanding of One Health Concept, human health and animal health

(ii) Discuss the holistic approach of understanding the concept of health and well-being to One Health application.

(iii) Demonstrate the extent to which the new philosophy of health points to the varied dimensions of health required for promoting health and well-being of human and animal species.

1.3. Reflection

1) In your own understanding, what is the meaning of One Health?
2) How do you define a human health?
3) How do you define an animal health?

Well, whether you have considered them or not, pose for a little while, reflect and write down your own definitions of these three concepts.

We want to imagine that within your definitions, we will build on your definitions and highlight what others consider as definitions of these three linked concepts. We hope you will have a clearer understanding of the concepts of one health, human health and animal health by the time we get to the end of this module.

1.4. Definition of 'Health'

The concept of '**health'** as a desirable state is one that lies central to the philosophy of One Health. But just reflect on some of the following questions that may stimulate productive discussions around the topic of health:

- What do we mean when we speak of health?
- Whose health is that we are referring to?
- Is it possible, or even desirable to arrive at a definition of health that encompasses all of the elements under the One Health umbrella- humans, domestic animals, wild animals, and the environment in which they live and interact?
- Are there common threats that appear when we consider the concept of health at the level of the individual organism, the population, the community, and the ecosystem?

- Could these common features be useful to us when thinking about and applying the One Health concept?

"Health"- is one of those terms which most people find it difficult to define. Many definitions of health have been offered from time to time, including the following:

a. 'The condition of being sound in body, mind or spirit, especially freedom from physical disease or pain' (Webster).
b. 'Soundness of body or mind; that condition in which its functions are duly and efficiently discharged' (Oxford English Dictionary).
c. ' A condition or quality of the human organism expressing the adequate functioning of the organism in given conditions, genetic and environmental' (WHO 1957).
d. 'A modus vivendi enabling imperfect men to achieve a rewarding and not too painful existence while they cope with an imperfect world' (Dubos 1968).
e. 'A state of equilibrium of body form and human function which results from its successful dynamic adjustment to forces tending to disturb it. It is not a passive interplay between body substance and forces impinging upon it, but an active response of body forces working towards re –adjustment' (Perkins 1956).

WHO definition (1948) of health- is the widely accepted definition stating: ' Health is a state of physical, mental and social well-being and not merely the absence of disease or infirmity.' How about the new philosophy of health?

1.4.1. New Philosophy of Health

In recent years, there is a new philosophy of health acquired which is stated as a diversity of varied concepts:

Box 1: New Philosophy of Defining 'Health'

Health – is a fundamental human right.
Health- is the essence of productive life, and not the result of ever increasing expenditure on medical care.
Health- is inter-sectoral function
Health- is an integral part of development
Health- is central to the concept of quality of life
Health – involves individuals, state, and international responsibility.
Health and its maintenance is a major investment and
Health –is a world-wide social goal.
(Park 2011,page 215)

This new philosophy of health illustrated in Box 1 points to the varied dimensions of health that are required for promoting health and well-being of not only human species, but also animals.

1.4.2. Dimensions of Health

Health is dimensional.

WHO definition states three specific dimensions- the physical, the mental and the social dimensions.

Many more may be cited as –spiritual, emotional, vocational and political dimensions. Although these dimensions function and interact with one another, each has its own nature.

These are broadly itemized as:

- ***Physical Dimensions*** of health- which conceptualizes health biologically.
- ***Mental Dimensions*** of health- relating to good mental health – as the ability to respond to the many varied experiences of life with flexibility and a sense of purpose.
- ***Social Dimensions*** of health- social well-being implies harmony and integration within the individuals and members of society in which they live.
- ***Spiritual dimension*** of health-
- ***Vocational dimension***- is the vocational aspect of life related to physical work to build physical capacity.
- Others are: **philosophical dimension, cultural dimension, socio-economic dimension, environmental dimension, educational dimension, nutritional dimension and curative dimension.**

1.4.3. Concept of Well-being

- WHO definition of health- introduces the concept of 'well-being'
- 'Well-being' –is the standard of living to promote quality of life.
- Psychologists have pointed out that the 'well-being' of an individual or group of individuals have **'objective'** and **'subjective'** components.

The **'subjective** 'component refers to the '**quality of life**.' The **'objective'** component relates to **'Standard of living'**- the term standard of living refers to – weighted scale of expenditure, the goods we consume, and the services we enjoy. It includes- education attained, employment status, food, house, dress, comforts of modern life. Quality of life- is the condition of life resulting from the combination of the effects of the complete range of factors.

The factors are: those determining health, happiness, education, freedom of speech, justice that have composite measure of physical, mental and social well-being as perceived by each individual or by group of individuals. 'Physical quality of Life Index'- is a measure of country's performance based on three defined indicators- infant mortality, life expectancy at birth, and literacy. For each component, the performance of individual countries is placed on a scale of 0 to 100. '0' represents an absolutely defined 'worst' performance.'100' represents an absolutely defined 'best' performance. The composite index is calculated by averaging the three indicators, giving equal weight to each of them.

The theme will provide some background and stimulate some discussions around the concept of health and that of One Health.

To stimulate the discussions of understanding the concept of health and its linkages to One health, there are three broad definitions that will be considered in this topic to fully understand the concept of One Health which are:

- Definition of 'One Health'
- Definition of 'Human health,' and

- Definition of 'Animal health'

1.5. Definition of 'One Health' (OH)

There are many similar definitions developed by health organizations. The American Veterinary Medicine Association (2008) defined OH as: "the collaborative effort of multiple disciplines working locally, nationally, and globally to attain optimal health for people, animals (livestock and wildlife alike), and the environment."

This has made infectious diseases a shared responsibility of the human and animal health sectors, and their control a common objective of One Health initiatives.

The concept of One Health Medicine was transformed in a broader context of 'One Health' to include aspect of integration, defined as- 'an integrated approach of bringing together physicians, veterinarians and social scientists to recognize that human and animal health are closely interconnected and linked to the health of ecosystems on which wildlife, humans, and livestock all depend upon.'

An integrated approach to bring together physicians and veterinarians was first conceived in the 19entury, and re-emerged in the late 20 Century, when it was termed as "One Medicine" as the initial concept forwarded by Schwabe (1960, 1984). This has evolved into the broader concept of One Health in the recent years.

By taking a One Health approach, the key players can anticipate and prepare for the human health consequences of the growing use of antibiotic drugs in livestock, or the emergence of new human diseases from deforestation of wildlife-rich habitats.

One Health has now become a global movement with its first international congress in 2011 held in Australia and a special session held in 2012 at Davos, organized around the World Economic Forum.

Having defined OH, we will move on to the definition of human health discussed in the following topic.

1.6. Definition of 'Human Health'

The World Health Organization (WHO) at its creation in 1948 attempted to capture the concept of human health into a single definition, with the objective of ensuring " the attainment of the highest possible of level of health by all people.

WHO (1948) defined health as:

'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity,'

The WHO definition of health was an ambitious attempt at a positive definition of health, rather than considering it simply absence of disease, and has remained unmodified for over 60 years (Jadad et al. 2008; Park 2011). It explicitly expresses three domains, which are:

- Physical
- Mental &
- Social well being

Recent years have however seen a growing criticism of the WHO definition. The definition includes the word, " complete", and it is this word that is arguably responsible for much of the criticism.

The argument is, how many of us feel in "complete" health all the time, particularly when we consider not just our physical state, but also our mental and social well-being? Does feeling tired, lonely or depressed make someone intrinsically unhealthy? Does having slightly elevated blood pressure or cholesterol level, in the absence of any ill-effects?

Some critics argue that this requirement for complete health **"would leave most of us unhealthy most of the time"** (Huber et al. 2011). They feel that the definition is impracticable, because "complete" is neither operational nor measurable If the goal is to ensure the "attainment of the highest possible level of Health," what is the point of a definition of health that is either inherently unattainable, or against which you cannot measure your success.

The growing criticism of the WHO definition has led to renewed debate on how human health should be defined. As part of your prescribed reading for this topic and to prepare you for the later discussion, please read the following resources

Think about some of the conceptualizations of health that are proposed by the authors and commentators. Bring some of these ideas above with you to the discussion as we continue conceptualizing the theory of One Health and health. Our next related discussion will be

1.7. Definition of 'Animal Health'

Can we extend something like the WHO definition to incorporate animal health as well?

We usually think about animal health, particularly that of production or domestic animals in terms of **'the absence of disease,'** but are there other aspects of animal well-being that should be considered? These are the **'Five Freedoms'**

1.7.1. The Five Freedoms for Animals

The 'Five Freedoms' are an established set of welfare standards for animals under human control (domesticated or captive). They are:

1 Freedom from hunger or thirst by ready access to fresh water and a diet to maintain full health and vigour.
2 Freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting area.
3 Freedom from pain, injury or disease by prevention or rapid diagnosis and treatment.

4 Freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering.
5 Freedom to express normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind.

We can readily identify three dimensions in this list: 1-3 refers to 'physical aspects' , 4 to mental aspects and 5 to social aspects of health. There are the same three domains captured in the WHO definition of health as: 'a state of complete physical, mental and social well-being.' Just as with the WHO definition, there are intrinsic complications when we consider the concepts of animal health and the well-being in more depth.

1.7.2. Wild Animal Health

What of the health of 'wild animals?'

To many people, images of free-roaming wildlife are the epitome of freedom. Wild animals are less likely to enjoy many of the 'five freedoms' listed above than their domestic counterparts, existing as they do in natural ecosystems that they share with predators, competitors, parasites and pathogens (Costanza 1992).

How can one address the concept of 'health' in these animals? Is it even useful to consider that health of individuals wild, free-roaming animals?

To answer these questions, provide a positive 'yes' in certain circumstances- for example, interventions in individual animals in small endangered or vulnerable populations.

Ecologists and others involved in the management of free-ranging wildlife consider 'health' as **'a characteristic of the whole population or more broadly of the entire ecosystem'** (Costanza et al.1992)

Definition of **a Population**:
'A group of organisms of one species that interbreed and live in the same place at the same time (e.g. deer population).
Definition of **an Ecosystem**:
'A system that includes all living organisms (biotic factors) in an area as well as its physical environment (abiotic factors) functioning together as aunit.'

If the entire system is not understood, the consequences of interventions aimed at improving the health of individual species- no matter how good the intention- could be to the detriment of the environment, animal communities, and the system itself.

Similarly, to what extent are the possible consequences on various systems taken into consideration when animal disease control policies are being made and implemented? Could it be that the control of an animal disease through measures that ignored the possible negative effects on socio-ecological and even socio-economic systems, could contribute to the vulnerability of the ecosystems and livelihoods these controls aim to serve? We shall dwell with the possible answers to these unexplained questions when we will discuss further on the ecosystems health and its effects on human, animals, environment and other species in other units of this module.

1.8. Summary

We have now reached the end of our sessions for this first part of the module. I hope you have grasped the concepts taught diligently in order to apply them to other parts of the module. We covered that:

- Although the concept of 'health' is a desirable state of lying central to the philosophy of One Health, it has series of questions that are subject to stimulating productive discussions around the topic of health highlighted in this part. Review them further for you to come up with your own understanding of health.
- The concept of health and well-being as defined by the World Health Organization (WHO) is still subject to further debate for linking the concept of "complete" to physical, mental and social well-being. It has been viewed as an ambitious attempt of focusing at a positive definition of health, rather than considering it simply as 'absence of disease,' and has remained unmodified for over 60 years. The growing criticism of WHO definition of "complete" is arguably that how many of us still feel in " complete" health all the time, particularly when we consider some of the pertinent aspects of our lives discussed that would leave most of us unhealthy most of the time (e.g. loneliness, depression, tired, etc)? However, it expresses most important three domains: 'physical,' 'mental,' and 'social well-being' that lie central to the welfare of human and animal species to which One Health is explicitly connected.
- We also learnt that health is dimensional and all its dimensions are connected around the domains of physical, mental and social well-being of individuals.
- Moving on to the concept of One Health (OH), defined as " an integrated collaborative effort of multiple disciplines working locally, nationally, and globally to attain optical health for human population, animals (livestock and wildlife alike) and the environment," addresses it as an approach to solving human and animal health and environment.
- Human health is defined as stated by WHO as " a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity," a definition which is still subject for debate.
- The definition of animal health and that of the wildlife are embraced within the " Five freedoms," especially the domesticated ones, which incorporate the three domains of physical, mental and social aspects of health as captured by WHO. By contrast, the wild animals are less likely to enjoy many of the five freedoms as their domestic counterparts as they are free-roaming wildlife which is the epitome of freedom. Health is considered by their existence in the natural ecosystems that they share with predators, competitors, parasites and pathogens. The concept of health in wild animals is therefore addressed in the management of free-roaming wildlife as "a characteristic of the whole population or more broadly of the entire ecosystem. If the entire system is not understood, the consequences of interventions aimed at improving the health of individual wildlife species- no matter how good the intention- could be to the detriment of the environment, animal communities, and the system itself.

We hope that this summary has provided an insight perspective view of the concepts discussed to move on to the next part of the discussion concerned with the historical context of One Health and its principles.

1.9. Performance Evaluation: Exercises

Before we leave this part of the module, reflect for a moment on some of the conceptualizations of human health proposed by the authors in the prescribed readings and read through the

various concepts given to you, and provide your own criticisms on the following subject themes in relation to:
a). human health,
b). concept of health and well-being, and
c) animal health including wildlife

Reflect on each one of them and construct your own definition embracing the three domains of 'physical', 'mental' and 'social well-being' as stated in WHO definition of human health. Can we apply similar concepts to the health and welfare of both domesticated and wild animals?

Your performance will be assessed upon submission of this exercise.

Additional Readings

1. Jadad Alex & O'grady (2008). How should health be defined? BMJ 337:a2900
2. Huber et al. (2011) How should we define health? BMJ 343:d4163

UNIT 2

THEORIES, CONCEPT OF MEDICAL EVOLUTION AND PRINCIPLES OF ONE HEALTH

2.1 Introduction

The topics in Unit 2 are concerned with historical context of One Health (OH) and to provide a rationale why training in One Health is needed in Africa. It will further discuss the principles of One Health and the concept of medical evolution that are all inter-related as both address a broader and holistic approach of promoting the health of human and animal species, through provision of curative and preventive medicine in the control of diseases. The understanding of this relationship is through the aetiology and epidemiology of diseases, discovery of primitive medicine to modern medicine, medical evolution and understanding the concept of health and disease.

2.2. Objectives

By the end of this Unit, you should be able to:

i. Apply the theories of One Health to the practical realities of evidence-based information to influence policy change for effective implementation of the One Health approach in the Sub Region of Africa.
ii. Demonstrate the ability to understand the scope and the principles of One Health and its applicability to the medical evolution.
iii. To discuss the contextual issues warranting OH approach in Africa.

2.3. Historical Context of OH

The purpose of the historical profile is to demonstrate that OH is a well-grounded and thought out process that has grown in recognit

ion overtime. It has the following milestones:

- It started from the Hippocrates to the middle ages.
- In 1940's, the first Veterinary of Public Health (VPH) service was established in USA to re-think on the control of zoonosis and the applicable measures required to control such diseases.
- Initial concept forwarded by Schwabe in 1960s with the theme of 'One medicine' which advocated for the integration of services, jointly with the veterinary medicine and the physicians of human health.
- The Wildlife Council for Services further advocated for the concept of 'One World One Health' in early 2000s to involve wildlife and environment.
- The outbreak of the 2005 Highly Pathogenic Avian Influenza (HPVI) pandemic lead to recognition of the value of collaboration in health fields. The HPVI caused by H5N1 influenza virus is an emerging zoonotic Transboundary Disease. It can result in catastrophic production losses that can negatively affect food security, disrupt trade in animal products in the increasing globalizing world, and harmful to human health due to its zoonosis effect (FAO 1999). Its occurrence in a country can have a major constraint to the profitable livestock operations, and poses a very high risk for Public Health at both regional and global levels (Modibe et al. 2008). WHO (2006) estimates that should the pandemic occur, millions of people could die of the disease.
- Subsequent international meetings, including that of the WHO/OIE/FAO tripartite agreements led to the adoption of One Health (OH) concept, which has been further advanced into subsequent action plans by various organizations.

Over 75% of emerging human infectious diseases are "zoonotic", that is, they are shared with, and sometimes originate from wild and domestic animals. This includes many of the more recently emerging human disease threats, such as SARS, avian and swine influenza. The drivers for the apparently increasing rate of emergence of novel zoonotic pathogens are largely anthropogenic. Pathogens may "jump" hosts as a result of increased contact between the exploding human population and animal species. Natural pathogens from animals may also evolve and amplify in rapidly expanding and homogeneous livestock populations, experience increasing selection pressure for pathogenicity and drug resistance, and subsequently spill into human populations and the environment through contact, waste products and food.

In recent examples of this trend, human and animal health research and training programmes are linking up around the world to find a common "One Health" approach to reducing these threats. Although most of the emergence of novel disease agents has been detected in the developed world, this is probably due to better technology and surveillance in those regions. Some of the most dramatic examples of zoonotic disease emergence are from Africa where, for example, HIV (the cause of AIDS) and Ebola virus were first detected. Africa is currently in a cycle of rapid development and, where the highest human population growth rates occur, it needs special attention in the context of One Health. Here humans and animals share space intimately, with high biodiversity and 10-fold higher infectious disease burden than in developed countries.

In most African countries, medical and veterinary services need strengthening and the ability to detect and monitor diseases is weak. Increasing connectivity between African environments and the rest of the world through burgeoning trade, human and animal movements, creating opportunities for emergence of novel pathogens and global spread is vital to the holistic understanding of One Health.

2.4. Rationale and Scope of OH

The rationale for OH is based on the following elements:

- Increasing globalization providing risk to health of humans and animals
- Increasing interface between human/livestock/wildlife
- Pathogen evolution and increasing rate of new emerging infectious diseases
- Increasing negative socio-economic and public health impact of diseases
- Increasing food insecurity and limited access to safe food products
- Increasing habitat loss and decreasing biodiversity
- Collaboration between sectors is both successfully and cost effective
- The objective of OH is to create stronger and more efficient integrated health systems, with input from multiple stakeholders in addressing global, regional and local health issues.

To address health issues that cannot be solved through a single disciplinary entity approach should cover the scope of OH in the following aspects for appropriate interventions:

- Zoonosis and other pathogens
- Food security and safety
- Antimicrobial resistance and residues
- Translational/evidence-based research and medicine
- Pandemic and epidemic response and control
- Ecosystem goods and services.

2.5. Context of OH in Africa

Why is training in One Health needed in Africa?

Contextual issues warranting OH approach in Africa can be summarised as:

- Widespread poverty
- High population growth
- Persistence of disease and high disease burden
- A very prominent human/livestock/wildlife interface
- Weakness of capacity to address disease detection, identification and monitoring
- Shortage of trained professionals in health sectors
- High utilization of wild products, including bushmeat
- Expansion of agriculture and extractive industry increasing interface
- Inadequate of political will and resources dedicated to the health sector
- Weak sanitary regulation and control measures
- Climate change impacting on ecosystem

Infectious diseases of humans and animals are increasingly important to human welfare and economic development. The fact that most emerging human pathogens are of non-human origin (Brownlie et al. 2006; Jones et al. 2008) is not surprising given that humans are only one animal species amongst millions and have common ancestry with these.

In low-income countries, infectious diseases are responsible for nearly 40% of the burden of human sickness and death, and one fifth of this is attributable to zoonotic diseases (Jones et al. 2011).

Sub-Saharan Africa has the highest burden of infectious diseases of both humans and animals in the world. It is the world epicentre for the three major infectious disease killers of humans, namely HIV-AIDS, tuberculosis and malaria, and also the exclusive or predominant home of a number of major, internationally notifiable, infectious diseases, including zoonotic diseases like Ebola, Marburg, Rift Valley fever and plague. Many of these African human disease threats are Zoonotic. Besides the human health dimensions of those Africa's animal diseases which are zoonotic, animal diseases themselves create a profound economic burden in Africa, where about one third of the agricultural GDP is generated by livestock production. Livestock are particularly important to poor rural communities, where they have a key role in risk reduction and wealth accumulation.

African economies also depend, more than those in wealthier regions, on ecosystem services which support not only agriculture but tourism, making wildlife a critical resource and animal disease management an even greater priority. The enormous diversity of wildlife, livestock and zoonotic diseases in Africa creates a unique context for research on understanding how zoonotic disease threats arise in the first place, which would be of global importance.

Therefore, the need of Africa for high quality research on prevention and management of human and animal diseases is considerable. The medical and veterinary resources for this, in terms of skilled personnel and facilities, are currently very limited. In Africa more than in any other region, there exists an opportunity to make best use of limited human and animal healthcare capacity by sharing professional skills and resources across medical and veterinary disease management problems. The fact that so many of these disease problems are zoonotic, entails need for expertise from both sectors, to make a One Health approach particularly significant for Africa. In 2006, the UK Foresight Programme published its report on Infectious Disease: Preparing for the Future (Brownlie et al. 2006; King et al. 2006), which strongly advocated better integration of human and animal health research and development.

In particular, it identified an increasing convergence of technologies for the detection, identification and monitoring of infectious diseases of humans and animals**.** The Foresight project also devoted a substantial part of its work to Africa, producing a report that particularly recommended such an inter-sectoral approach would be a strategic, cost-effective way to accelerate the development of African research capacity in infectious disease prevention and management (Rweyemamu, Otim-Nape and Serwadda 2006).

This concept was subsequently endorsed and formally adopted by the African Union and led to the formation of the Southern African Centre for infectious Disease Surveillance (SACIDS) as a One Health collaboration between medical and veterinary research in that region. SACIDS aims at enhancing collaboration between animal and human health sectors in research and teaching, raising national and regional capacity on infectious diseases detection, surveillance and management, and providing evidence for better policy making.

2.6. Concept of Medical Evolution

The concept of medical evolution provides a broader and holistic approach of promoting health of human and animal species through provision of curative and preventive medicine in the control of diseases.

The understanding of this concept is articulated better through aetiology and epidemiology of diseases, discovery of primitive medicine to modern medicine and medical evolution of understanding the concepts of health and disease. We will start by discussing the aetiology of disease.

2.6.1. Aetiology of Disease: Germ Theory or Causation of Disease

Several theories were advanced from time to time to explain disease causation, such as supernatural theory of disease, the theory of humors by Greek and Indians, the theory of contagion and **‘ miasmatic theory’**.

Miasmatic theory attributed disease to infected air. It was based on the idea that when the air was of a 'bad quality'- the persons breathing that air would be ill.
For example, malaria (bad air) –is a classic example of a disease that was long attributed to **miasmata.** 'Miasma' was believed to pass from cases to others as infectious diseases.

The break through the miasmatic theory came in 1860, when the French bacteriologist, Louis Pasteur, who demonstrated the presence of bacteria in air. He disapproved the miasmatic theory and advanced the 'germ theory of disease'. Another scientist, Robert Koch (1843-1910) showed that anthrax was caused by bacteria. The discoveries of Pasteur and Koch confirmed the germ theory- a true scientific knowledge exploration became a reality.

It was the beginning of bacteriology and more bacteria causing other diseases continued to be discovered- typhoid bacillus, pneumococcus, tubercle bacillus, etc. The germ theory of disease came to the fore front, surpassing the earlier theories of disease causation. It marked the beginning of scientific medicine discovery.

2.6.2. Medical Evolution or Modern Medicine Evolution

The concept of medical evolution – is a broader approach of medical care involving curative, public health/preventive medicine and control of diseases which embraces biomedical, ecological, psychosocial and holistic concepts to bring about change in the health status of individuals and that of the surrounding species (i.e. domestic animals, wild animals alike) and environment.

The division of medicine into two major branches- curative medicine and preventive medicine (public health) was evident late 19 century. After 1900, medicine moved faster towards specialization, with a rationale for scientific approach to disease and the pattern of disease begun to change.

With the control of infectious diseases, other modern diseases started emerging, such as cancer, diabetes, heart disease, mental illness and accidents becoming leading causes of death in modern times. These diseases could not be explained on the basis of germ theory of diseases. With the continued concept of modern medicine evolution, it was realized that there were other factors or causes in the aetiology of disease. These factors are those associated with- social, economic, genetic, environmental and psychological which are equally important. Most of these factors are linked to people's life style and behaviour. The germ theory of disease, therefore gave chance to a newer concept of disease- "multifactorial causation." The developments in modern medicine evolution can be reviewed broadly in the context of- curative medicine, preventive medicine and social medicine (encompasses-sociology, anthropology and psychology). It has also become the science for prevention of diseases and the promotion of health.

The scope of medicine has expanded over the last few decades to include, not only health problems of individuals, but those of communities as well. It is in this context that the principle of One Health should be approached in a similar manner to prevent and control diseases, and promote health of both the humans and animals and their environment. This can be achieved by a better understanding of social medicine to provide explanations of disease occurrences and measures of control for the human and animal populations.

2.7. Principles of OH

The principles of OH have involved:

- Use of a holistic approach in the management of health challenges that affect human and animal welfare
- Multidisciplinary and/or inter-sectoral collaboration
- Sharing of resources: technical, information, structural, human etc necessary to implement OH in an integrated approach
- Promotion of transparent communication and sharing of information between stakeholders,
- Enhancing cooperation between the public and private sectors
- Unified and cooperative capacity building within the health sector and at the higher learning institutions.

2.8.Summary

In this second part of the module, we provided to you the historical context of One Health and the rationale for this approach to be implemented both, at globally and in Africa as a whole, and embrace the medical evolution, including the principles of OH. The main theme highlights that came from this section are that:

- OH is a well-grounded and thought out process that has existed overtime, starting from the Hippocrates to the middle ages. It was introduced first by the Veterinary of Public Health service association, through the initial concept of a well renowned professional, Schwabe to re-think on the control of zoonosis and the applicable measures required to control and prevention of such diseases. It was at this stage where the theme of "one medicine" was sought to advocate for the integration of services, jointly with the veterinary medicine and the physician of human health.
- The rationale for OH is based on the prominence that: a) increasing globalization provide health risk to humans and animals; b) there is increasing interface between human, livestock and wildlife; c) pathogen evolution increase rate of new emerging infectious diseases; d) there is increasing negative socio-economic and public health impact of diseases; e) there is increasing food insecurity and limited access to safe food products; g) there is increasing habitat loss and decreasing biodiversity; and finally, collaboration between sectors is both successfully and cost effective.
- In the context of Africa, there is a remarkable increases in the spread of infectious diseases that are mainly of zoonotic in nature; widespread poverty; high population growth; A very prominent human, livestock and wildlife interface; weakness capacity to address disease detection, identification and monitoring; shortage of trained professionals in health sectors; high utilization of wild products, including bushmeat; weak sanitary regulation and control measures; and climate change impacting on ecosystem.
- The application of the principles of OH has involved the use of a holistic approach in the management of health challenges that affect human and animal welfare. This can be achieved by multidisciplinary and inter-sectoral collaboration, sharing of resources, promoting transparent communication and sharing information between stakeholders, and enhancing cooperation between the public and private sectors.

We are certain that you have understood the themes covered in this second part of the module, which will direct you to yet another third part of this module focusing on determinants of health.

2.9. Performance Evaluation: Exercises

The exercise for this part of module is for you to review the historical context of One Health and its rationale. Reflect on these issues and write down whether they also apply in your own respective country. Submit your work after a week for assessment.

Additional Readings

1. Brownlie, J, Peckham, C, Waage, J, Woolhouse, M, Lyall, C, Meagher, L. Tait, J, Baylis, M &Nicoll, A. (2006). Foresight. Infectious Diseases: preparing for the future - Future Threats. Office of Science and Innovation,London p1-83.
2. Rweyemamu, M., Otim-Nape, W., Serwadda, D. (2006). Foresight. Infectious Diseases: preparing for the future. Africa. Office of Science and Innovation, London, p1-121.
3. Park K. 2011. Preventive and Social medicine, 18th Edition.

UNIT 3
DETERMINANTS OF HEALTH

3.1. Introduction

Health is multifactorial. The factors which influence health lie both within the individual and externally in the society in which he or she lives. Health depends on two sets of factors- 'genetic' factors and the 'environmental' factors to which individuals are exposed. These factors interact and these interactions may be health-promoting or deleterious. Conceptually, the health of individuals and whole communities may be considered to be the result of many interactions.

Important determinants or variables are:

- Heredity
- Environment
- Life-style
- Socio-economic conditions
- Health and family welfare services
- Other factors-food security and agriculture, education, industry, social welfare, and rural development.

3.2. Objectives

By the end of the sessions for this Unit, you should be able to

i. Demonstrate your ability to understand the determinants of health and their applicability to OH
ii. Discuss their relevance to improving health of the humans/livestock/wildlife and environment and the entire ecosystem

3.3. Heredity

The physical and mental traits of every human being are to some extent determined by the nature of his genes at the moment of conception. The genetic make-up is unique- in that it cannot be altered after conception. A number of diseases are known to be of genetic origin, for example- chromosomal anomalies, errors of metabolism, mental retardation, some types of diabetes (diabetes mellitus), sickle cell anaemia, etc. The state of health therefore depends partly on the genetic constitution of human being.

Regardless of genetic defects, WHO advocates for 'positive health'. The 'Positive health' advocated by WHO implies that a person should be able to express as completely as possible the potentialities of his/her genetic heritage. The person should be allowed to live in a healthy relationship with his environment- an environment that can transform genetic potentialities into structural realities.

3.4. Environment

Environment is classified as **'internal'** and **'external'**. **'Internal' environment** of a person – pertains to each and every component of part of the body- every tissue, organ and organ-system and their harmonious functioning within the system. Internal environment is the domain of internal medicine.

The **'external' or macro- environment**- consists of those things to which a person is exposed after conception. It is defined as 'all that which is external to the human host. It can be divided into physical, biological and psychosocial components, any or all of which can affect the health

of an individual and his susceptibility to illness. Some epidemiologists have used the term 'microenvironment' (or domestic environment) to personal environment. These include:- the individual's way of living and life style, e.g. eating habits, other personal habits (such as smocking or drinking alcohol), use of drugs, etc. External environment also includes- occupational environment, socio-economic environment and moral environment. Environment has a direct impact on the physical, mental and social well being of those living in it. The environmental factors range from housing, water supply, psychosocial stress, family structure, socio-economic support system, organisation of health system to social welfare services in community. Protecting and promotion of family and environment is important to the survival of humans and animals.

3.5. Lifestyle

The term 'lifestyle' – is defined as ' the way people live', reflecting a whole range of social values, attitudes and activities. It is composed of cultural and behavioural patterns and life long personal habits (e.g. smocking, alcoholism) that have developed through processes of socialization. Lifestyles are learnt through social interaction with parents, peer group, friends and siblings, and through school and mass media.

Health requires the promotion of healthy lifestyle. Many current daily health problems, especially in developed countries, e.g. coronary heart disease, obesity, lung cancer and drug addiction are associated with life style changes. In developing countries, such as India where traditional life style still exist, risks of illness and death accounting to lack of sanitation, poor nutrition, personal hygiene, elementary human habits, customs and cultural patterns.

It should be noted that not all lifestyle factors are harmful. There are many that can actually promote health. For example, adequate nutrition, enough sleep, sufficient physical activity, etc. The achievement of optimum health demands adoption of healthy lifestyle. Health is both a consequence of an individual's life style and that of the animals, as well as a factor in determining it. The life style of an individual can have a serious consequence on the health of the animals as they are constantly in contact with the humans, especially those related to sanitation, nutrition, personal hygiene, human habits, customs and cultural patterns, that may reverse to re-infect the humans.

3.6. Socio-economic Conditions

Socio-economic conditions have long been known to influence human health. For the majority of the world's population, health status is determined primarily by their level of socio-economic development, for example, per capita GNP, education, nutrition, employment, housing, the political system of the country. Those of major importance are:

i). Economic status- The per capita GNP is the most widely accepted measure of general economic performance. It is the economic progress that has been the major factor in reducing morbidity, increasing life expectancy and improving the quality of life. The economic status determines the purchasing power, standard of living, quality of life, family size, pattern of disease and deviant behaviour in the community.

ii). Education- a second major factor influencing health status.

iii). Occupation- the state of being employed in productive work promotes health. The unemployment has a high risk to incidence of ill health and death.

iv). Political system- Health is also related to the country's political system. Decisions concerning resource allocation, manpower policy, choice of technology and the degree to which health services are made available or accessible to communities are examples of the manner in which the political system can shape community health services.

3.7. Health Services

The term health and family welfare services cover a wide spectrum of personal and community services. The purpose of health services is to improve the health status of population. To be effective, the health services must reach the social periphery, equitable distributed, accessible at a cost the country and community can afford and socially accepted. All these are ingredients of what is now termed as 'primary health care' which is seen as the way to better health.

The other determinants, such as food security and agriculture, industry, social welfare, and rural development that are likely affect health.

3.8. Summary

In this third part of the module, we dwelt much on the determinants of health that has a bearing on One Health. It explained and articulated the varied factors that influence health as: hereditary related to genetic issues of health; environment; life-style; socio-economic conditions that are linked to: economic status, education, occupation and political system; and health and family welfare services. Other determinants discussed are food security and agriculture, industry, social welfare and rural development. These determinants help to recognize that health is multi-factorial in nature that determines also the holistic approach of One Health. In the following part four of the module, we will discuss further on how these determinants are linked to the concepts of ecosystem and ecosystem health.

3.9. Perfomance Evaluation: Exercises

Explore the determinants and determine how each of them influence health and disease, using some of the references provided to you during this part of the module..

Additional Readings

1. Bartley M, Ferrie J, and Montgomery S.1999. Living in a High-unemployment Economy: understanding the Health Consequences. In Marmot M and Wilkinson R, editors, Social Determinants of Health. New York: Oxford University Press
2. Briggs d. 2003. Environmental Pollution and the Global Burden of Disease. British Medical Bulletin 68 : 1-24
3. Denton M, Prus S, and Walters V.2004. Gender Differences in Health: A Canadian Study of the Psychosocial, Structural and Behavioural Determinants of Health: Social Science and Medicine 58(12): 2585-2600

UNIT 4
ECOLOGY AND ECOSYSTEM HEALTH

4.1. Introduction

You may recall that the word 'ecosystems has been repeatedly mentioned in the previous sections of other Units discussed earlier to demonstrate its linkages to other Units. The purpose of this Unit is to provide a better understanding of the concepts of ecology, ecosystems and ecosystems health and their relationship link to OH. The themes of this Unit are organized into three broad and important dimensions: ecology of health; ecosystems; and the ecosystems health. It will further provide a practical demonstration on the application of the 'Problem Based Learning' (PBL) approach in solving community health challenges, through a multidisciplinary approach of addressing issues.

4.2. Objectives

By the end of this unit, you should be able to:

i. Demonstrate the ability of explaining the meaning of ecosystem and ecosystem health
ii. Discuss the concept of ecosystem health and its relevance to One Health approach
iii. Apply the problem based learning (PBL) approach to demonstrate the interconnectivity of health challenges and the benefit of a multidisciplinary approach in solving community health problems.

4.3. Ecology of Health

Ecology is a key word in present –day health philosophy. It originates from the Greek "Oikos", meaning a house. Ecology is defined as the science of mutual relationship between living organisms and their environments. Human ecology is a subset of more general science of ecology. A full understanding of health requires that humanity be seen as part of an ecosystem.

The human ecosystem in addition to the natural environment, are all the dimensions of the man-made environment- physical, chemical, biological, psychological: in short, our culture and its products. Disease is embedded in the ecosystem of man. Health, according to ecological concepts, is visualized as a state of dynamic equilibrium between a human being and his environment.

By constantly altering his environment or ecosystem by such activities as- urbanization, industrialization, deforestation, land reclamation, construction of irrigation canals and dams, creates new problems to the human beings. Human being's intrusion into the ecological cycles of disease has resulted in zoonotic diseases, such as kyasanur forest disease, rabies, yellow fever, malaria, monkey pox, lassa fever. The nuclear disaster in Soviet Russia in April 1986 is another reminder of environmental pollution.

The construction of dams, irrigation systems and artificial lakes has created ecological disaster for favouring the breeding of mosquitoes, snails and spread of filariasis, schistosomiasis and Japanese encephalitis. Ecological factors are at the root of the geographical distribution of disease. It is stated that good public health is basically good ecology.

4.4. Ecosystems and Socio-Economic Systems

4.4.1. Definition and Contextual Features of Ecosystems

As stated earlier in the previous session, ecosystem is defined as- ' a system that includes all living organisms- biotic factors- in an area as well as its physical environment-abiotic factors- functioning together as a unit'(http://www.biology-online.org/dictionary; Constaza et al. 1992). The theme is important to the understanding of One Health for maintaining health and the well-being of human and animal species.

Throughout human history population has been synonymous with prosperity, stability and security. A valley, or plain teeming with houses, farms and villages has always been a sign of well-being. Similarly, every living collectively develops particular strategies of survival and reproduction which translate into potential and effective growth rates of varying velocity.

A brief analysis of these strategies as demonstrated by Livi-Bacci (1997) serves as the best scenario to consideration of the specific case of human and animal species. Biologists have identified two large categories of vital strategies, called **'r'** and **'K'** , which represent simplification of a continuum (Livi Bacci 1997).

Insects, fish, and some small mammals who practice an 'r'- strategy live in generally unstable environments and take advantage of favourable periods (annually or seasonally) to reproduce prolifically, even though the probability of little ones' (offspring) survival is small. It is because of this environmental instability. For this reason, they have to depend upon large numbers and 'life' is somehow a chance.

By contrast, the 'K' strategy type of organisms- are mammals, particularly medium and large size and some birds including humans- who colonize relatively stable environments, and become populated with competitors, predators, and parasites. 'K' strategy organisms are forced by selective and environmental pressure to compete for survival, which in turn requires considerable investment of time and energy for the raising up children. This investment can only be possible if the number of children is small. Box 1.below provides a practical scenario of these differentiated groups of organisms.

'r' strategy	**'K' strategy**
▪ Precarious equilibrium with the environment	▪ Stable equilibrium with environment
▪ High rates of increase	▪ Rates of increase compatible with environment
▪ Violent and in some cases Regular cycles of growth and decline	▪ Slow and irregular cycles
Example: Rabbits, rats, etc	Examples: Elephants, Humans, etc
Bioreproductive characteristics	
▪Small bodies	**▪ Large bodies**
▪Short lives	**▪ Long lives**
▪Large litters (multiple births)	**▪ Long gestation**
▪Short intervals between births	**▪ Single Births**
▪Short length of generation	**▪ Long generation**
▪ High potential rates of growth	**▪ Low potential rates of growth**

Box 1: r Strategy and K Strategy: ecosystem bio-reproductive characteristics: Adopted from Livi-Bocci (1997)

The ideas have been well known since the time of Darwin and Wallace (1960,1987), founders of natural selection, which provide a useful demonstration to the inhabitants within the ecosystem and the factors influencing survival life span in the environment.

There are now emerging interests in bio-cultural-environmental health problems. Ecosystems in anthropology- are an interacting group of plants and animals along with their non living environment. This environment or 'habitat' may range in size, complexity, and duration from a single drop of pond water with its micro-organisms to the entire earth with all its plant and animal life (Geertz 1963).

The common types of ecosystems studies by ecologists are things, such as the Kalahari Desert with its plant, animals and human life; Arctic Tundra, the Amazon rain forest, and interrelationships between human being's natural and social environments, his behaviour, his diseases, and the ways in which his behaviour and diseases have influenced his evolution and culture, through feedback processes.

The study of the diseases of ancient people, tells us much about how our ancestors were influenced by the environments in which they lived and about their way of life.

Knowledge about their diseases in turn helps us to understand human evolution, the ways in which succeeding generations of human beings adapted biologically as well as culturally to the health threats they encountered. For example, disease is part of the human environment and involves pathogens. The next section discusses further the ecosystems health

4.5. Ecosystem Health

We introduced the concept of ecosystem health as one of the tenets of the One Health approach in the previous Units of this module. Let us now consider this concept in more detail. First pose for a little while to consider the following questions:

- What do you mean by 'healthy ecosystems?
- Are there ways by which we can objectively measure and compare the health of ecosystems?

Much of the discussion on the subject of ecosystem health revolves around the concept of **ecosystem services,** for the reason that functional ecosystems provide resources and processes that directly or indirectly benefit human populations. The United Nations (2005) Millennium Ecosystem Assessment, which examined the consequences of ecosystem change for human well-being, grouped ecosystem services into four categories:

- First, provision of services, such as food, water, timber, fibre and genetic resources.
- Second, regulating services, such as the regulation of climate, floods, disease, and water quality including waste treatment.
- Third, cultural services, such as recreation, aesthetic enjoyment, and spiritual fulfilment, and
- Fourth, supporting services, such as soil formation, pollination and nutrient cycling.

The concept is further illustrated on the WHO webpage as: ' Ecosystem goods and services for health.'

Although this is also an inherently anthropocentric view, it is tempered by the recognition that humans are an integral part of many ecosystems, and that human health and well-being is intrinsically linked to the state of the earth's ecosystems.

The field of ecosystem health arose from a recognition that many of these ecosystems are 'unhealthy' in the sense that their functions (and particularly those vital to sustaining human populations), are impaired. This dysfunction has in most cases arisen as a consequence of anthropogenic actions (Costanza et al. 1992).

4.5.1. Definition of Ecosystem Health

How then might one define ecosystem health? Several definitions have arisen in an attempt to define it. A concise definition is given by Costanza (1992) as, ' an ecological system is healthy, if it is stable and sustainable- that is, if it is active and maintains its organism and autonomy overtime and is resilient to stress.' One could therefore argue that under such a definition, we are talking about the proper functioning of ecosystems, something that ecologists and conservation biologists already address within their discipline. What does this have to do then with the medical and veterinary professions?

Other definitions of ecosystem health explicitly recognize its importance to human health. The Journal of Ecosystem Health (in Raport et al. 1999) defined it as 'a system approach to the preventive, diagnostic and prognostic aspects of ecosystem management, and to the understanding of relationships between ecosystem health and human health.' From this definition, we see that ecosystem health, like the broader One Health concept, is an approach and not a discipline in its own right. It also relies on effective collaborations between multiple disciplines to understand and solve complex problems. It recognizes that if an ecological system is not healthy, if it is unstable and unstainable, and not resilient to stress, it has implications to human health.

4.5.2. Effect of Ecological System on Human Health

A good example of a direct link between an ecological system and human health is that of the 'Lyme disease emergence in the North-Eastern part of the United States of America (USA) provided as a case study to illustrate the biodiversity and disease risk (Ostfeld and Keesing (2000). This example is demonstrated in Box 2 below for the purpose of understanding the effect of Lyme disease on human health. The idea that healthy ecosystems may provide services that regulate and mitigate pathogen transmission may best be illustrated by means of a case study, as it will be shown below.

Example: Case Study of Lyme Disease: Biodiversity and Disease Risk:

"Lyme disease, named after the town in the north-east USA where a number of cases occurred in 1975, is a disease of humans caused by infection with the spirochaete bacteria, *'Borrelia burgdorferi'*, transmitted by a tick vector, the black-legged tick, called ***Ixodes scapularis***. Lyme disease is one of the most common vector borne-diseases in the United States of America, and is prevalent in the north-east of the country. Ixodes Scapularis is a three-host tick, and takes two (2) years to complete its life cycle. Female adult ticks lay eggs in the spring. These eggs hatch into larvae, which seek a host, often a small mammal or a bird. Each larva takes a single blood meal from its host during summer, then drops off and molts into the nymphal stage. The nymphal stage stays overwinters, and then seeks a host the following late spring, or early summer. After a single blood meal, the nymph drops off its host and molts into the final stage, an adult. In the autumn of that year, the adult seeks a host, often a white-tailed deer called *Odocoileus virginianus* for its final blood meal. The adults mate while on the deer, and then the female drops off to overwinter before laying her eggs the following spring.

Transovarial transmission of the Borrelia burgdorferi in Ixodes scapularis is rare, therefore virtually all larvae are free from infection. However, transtadial transmission is common, and larval that feed on an infected vertebrate host may acquire and retain the infection throughout their life, transmitting it to their subsequent

hosts as nymphs or adults. The nymphal stage is the most dangerous to humans because nymphs are tiny (approximately 1 mm diameter) and hard to detect, and the most active in summer when human outdoor activity in that area typically peaks. Nymphal infection prevalence (NIP), the proportion of host-seeking nymphs infected with the spirochaete, is an important measure of the rsik of human exposure to Lyme disease. There is substantial variation in NIP across the geographical distribution of the tick and pathogen, resulting in high geographical variation in risk of exposure to Lyme disease. What then might be responsible for the spatial variation in disease risk?

The immature stages of the tick vector are non-host-specific, and have been reported on >100 species of mammals, birds and reptiles. The probability that a larval tick will become infected when taking its blood meal from a vertebrae host does, however, depend on the species of that host. Most vertebrae species have low capacity to infect feeding larvae, but certain competent reservoir species do exist. In the eastern and central United States, the white-footed mouse called '*Peromyscus leucopus'* is the principal natural reservoir for the Lyme disease spirochaete. Up to 92% of Ixodes scapularis larvae feeding on free-ranging white-footed mice acquire infection and molt into infected nymphs. White- footed mice are extreme habitat and dietary generalists and are among the most abundant vertebrates within forested landscapes of the eastern and central United States."

(Source: Keesing et al.2010."Impact of biodiversity on the emergence and transmission of infectious diseases".**Nature 468**: 647-652

Evidence drawn from the case study has clearly demonstrated that white-footed mice occur in both species from 'poor' and 'rich'communities. As a result, a host community of poor species from the low diversity tends to have a disproportionately high representation of white-footed mice, resulting in a high percentage of tick meals taken from this competent reservoir, and consequently, the high infection prevalence in the tick population (Keesing et al.2010). As species are added to the host community, these alternative hosts dilute the effect of white-footed mice by increasing the proportion of blood meals that are taken from incompetent hosts. For example, one host species, the western fence lizard, called *'Sceloporus occidentalis'* produces a circulating protein that kills Lyme disease spirachaetes within the gut tissue of feeding ticks. Low infection prevalence of Ixodes ticks in areas within the geographic range of the western fence lizard has been attributed to the abundance of this incompetent reservoir (Myers et al.2012).

Because white-footed mice are: i) the most competent reservoir in this system, and ii) the most ecologically resilient species (i.e. the most abundant and relatively least sensitive to human disturbance of natural habitats through for example, fragmentation of forests), it

means that, as host diversity declines the number of larval blood meals taken from white-footed mice increases risk of human exposure to the pathogen (Keesing et al. 2010). Conversely, high diversity in the vertebrate host community will provide a strong 'dilution effect', which protects humans from Lyme disease risk. Similar observations have been made in other disease systems. For example, recent studies showed that strong correlations between low bird diversity and increased human risk or incidence of West Nile encephalitis in the United States. Communities with low bird diversity tend to be dominated by species that amplify the virus, inducing high infection prevalence in mosquitoes and people. For hantavirus pulmonary syndrome, a directly transmitted zoonosis disease, studies have shown that a lower diversity of small mammals increases the prevalence of hantavirus in their hosts, thereby increasing risk to humans.

4.5.3. Healthy Livelihoods

The concepts of health of complex ecosystems can also be applied to human communities. The concept of 'sustainable rural livelihood' (or healthy livelihood) is central to the debate about rural development, poverty reduction and natural resource management.

Scoones (1998) adopted the definition for the Institute of Development Studies as:

" A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base."

One can see that, within a particular context, the other components of health that we have discussed are important to this concept of sustainable rural livelihoods: the **health of people** is an important **capabilit**y when it comes to making a living; the **health (and productivity) of livestock** is an important **asset** and one of the most important means of survival by which people make use of the natural resource base in many rural communities; and the **health of ecosystem** provides for the **sustainability** of the livelihood that are dependant in part or in whole on the **natural resource base.**

The link between livestock and livelihoods is illustrated by the results of a recent survey among subsistence farmers in communities that are exposed to high levels of interaction with wildlife in the eastern Caprivi of Namibia. Van Roover (2012) reported that most livestock owners regarded their cattle as their main source of *' living'* or their *'livelihood.'* Some quotations of the farmers clearly stated that their cattle were:

- *'our only means of livelihood' (interview 20)*
- *It's our source of livelihood- education, food, everything if you are not working'(interview 23)*
- *'Life depends on it: it is our livelihood' (interview 30)*

When asked if their cattle were their main source of income, everybody replied that it was. One farmer said, *'Them only* (cattle being their main source of income), *if they* die *–we die'* (interview 19).

Livestock diseases, predation, and access to grazing were the main causes of cattle losses (in that order of priority) in the area that is characterized by a mosaic of different land uses. No fences are used to separate these land use systems and people, livestock and wildlife interact freely. The dominant land uses are conservation and tourism, livestock production and agriculture. Income from livestock is mostly used for education, food, and emergency cash, whereas cattle themselves are a major source of draught power, milk and to some extent meat. With people dependant on livestock for important aspects of their livelihood, such as paying for education, food, or any emergency, a couple of animals lost in a year could be experienced as a **household shock** that significantly affect their livelihood strategies. The average herd size found in that survey was 55 animals and the lower the number of animals, the higher the risk and the higher their vulnerability, especially in such a high risk environment.

Returning to the definition proposed by Scoones (1998), what are some of the **"stresses**" and **"shocks**" that might impact on livelihoods? First of all, it may be useful to consider the distinction between these terms. Scoones (1998) defined a **stress** as 'a small, regular,

predictable disturbances with a cumulative effect'; while a **shock** as 'a large infrequent, unpredictable disturbance with immediate impact.' These can affect individuals, households or whole communities.

What are examples of stresses and shocks?

Chambers and Conway (1991:10) provide examples of these terms

1. Examples of Livelihood **Stresses** are:

- Declining labour work available
- Declining real wages
- Declining yields on solids which degrade through salinization, acidity or erosion
- Declining water tables
- Declining rainfall
- Population pressures on resources leading to declining farm size and declining return to labour
- Ecological change leading to lower bio-economic productivity
- Physical disabilities like river blindness-the effect of which build up to gradually affecting the whole household
- Regularly occurring stresses arise from cycles which are either 'diurnal,' or 'seasonal'. For the sustainability of livelihoods, seasonal stresses are more significant than the diurnal.

2. Examples of Livelihood **Shocks** are:

- Wars
- Persecutions and civil violence
- Droughts
- Storms
- Floods
- Fires
- Famines
- Landslips
- Epidemics of crop pests or of animal, or human illness, and the collapse of a market
- Examples of shocks affecting individuals and households include, accidents and sudden sickness; the death of a family member or of a valued animal; loss of assets through theft, fire or other disaster; and loss of a job

In this section, we have touched on some of the conceptualizations of health, individual organisms (people and animals) of more complex systems (i.e. populations, ecosystems and human communities). What do you think of these definitions? Are there any common themes that you have noticed in your reading around these apparently disparate topics? Do you think that it is useful, or even possible, to take an holistic view of these various components, as is suggested with a One Health approach? Let us discuss!

4.6. Problem Based Learning (PBL) Approach

4.6.1. Definition

Problem Based learning(PBL) is- 'an integrated participatory approach, which is applied through a team work process of 'learning by doing' in order to demonstrate the ability of understanding the nature and causes of the health problems that affect people and animals in communities, while at the same time seeking ways on how to solve them.' It is a tool used to identify and solve community health problems by applying a One Health integrated multidisciplinary approach.

4.6.2. Application of Problem Based Learning (PBL) Approach

What is involved in the Problem Based Learning Approach?

- First, you need to **identify** and **describe** the problem scenario (i.e. where is the problem? Who is affected? How is it distributed to the population in terms of geographical areas? And how severe is the problem?)
- Second, **develop objectives-** that should explain how each is translated into learning by the participants.
- Objectives should be re-phrased into learning objectives.
- Third step, is to **develop questions** for action to solve the problem

Examples of PBL Exercises

 # 1: Exercise on Ecosystem: Describe the principles of ecosystem health and the concept of interface:

"A remote community in one district of Tanzania, with a population of 1,500 people, 3,000 heads of cattle, 200 goats and sheep and 50 dogs in an area with diverse species of wildlife. The community traditional healer notices a number of members are coughing and losing weight, sores in the legs, adults and young ones. A wildlife ranger, also notices that buffaloes are also in poor condition in an area.

You are a member of the flying doctor services or medicine frontiers visit this area and decide to carry out an investigation of problems affecting this population. You learnt these things from the village headman/community traditional healer."

Objectives:

- By the end of the investigation, team members should be able to:

- Understand how the interface between livestock-wildlife-human and multiplicity of factors influence disease and health

- Provide action on how to address disease issues at the interface should be resolved.

Questions:

- What do you think could be the possible causes of the health problems affecting the community?
- How would you investigate the problem? (consider what simple steps can be taken to investigate the problem?

- How would you manage these types of conditions? i.e. how would you treat and how would you prevent these conditions?
- How would you do the follow up in a pastoralist community that is nomadic?

PBL Exercise #2: Ecosystem health situation:

A river system in Kenya arises in the mountain and runs a major city, rural communities, agricultural and mining areas before it enters the park. The river then runs into a dam in a gorge where a lot of sedimentation takes place. The river is used for consumption, fishing and tourism. There have recently been heavy rains upstream in the river. Many crocodiles have been dead and some alive, but unable to move at the entry point of the river into the dam. Initial post-mortem findings of crocodiles reveal that there is evidence of steatitus- hardening and yellowing of the fat tissue.

Objectives:

- Understand different elements of ecosystem
- Involvement of multidisciplinary team in the investigation
- Ability to consider river systems as covering large geographical areas

Questions

- How would you proceed with the investigations of the problem? (i.e. testing up the multidisciplinary team participation).
- How could this condition affect the human population?
- What would be the possible measures to manage this problem?

Try to reflect on the above situations and attempt to answer the questions by applying a One Health approach of solving the problems. We hope you have now grasped the concept of ecosystem health and its relevance application to One Health approach.

4.7. Summary

The fourth part of this module has elaborated the themes of ecosystem and ecosystem health providing a greater detailed explanation of their concepts and the interface links between human, animals and wildlife and the influence on health and disease. We began by explaining the concept of ecology as the science of mutual relationship between living organisms and their environments. Human ecology is a subset of more general science of ecology seen as part of an ecosystem. We proceeded to state that human ecosystem in addition to the natural environment are all the dimensions of the man-made environment-physical, chemical, biological, culture and its products. Disease is embedded in the ecosystem of man. Health, according to the ecological concepts, is visualized as a state of dynamic equilibrium between a human being and his environment. By altering his ecosystem or environment with activities, such as urbanization, industrialization, deforestation, land reclamation, construction of irrigation canals and dams creates new problems to the human beings. People's intrusion into the ecological cycles of disease has resulted in zoonotic diseases, such as those examples provided to you earlier.

The second aspect of discussion was devoted to the ecosystem health stating that:

- Ecosystem health is a system approach to the preventive, diagnostic and prognostic aspects of ecosystem management and to the understanding of relationship between ecosystem health and human health.
- An ecological system is healthy, if it is stable and sustainable, if it is active and maintains its organism and autonomy overtime and is resilient to stress. It recognizes that if an ecological system is not healthy, if it is unstable and unstainable, and not resilient to stress, it has implications to human health.
- The concept of healthy livelihood or sustainable rural development is central to the debate about rural development, poverty reduction and natural resource management in the promotion of ecosystem health.
- The health of ecosystem provides for the sustainability of the livelihood that is dependant in part or in whole on the natural resource base. There are important factors exposing humans and animals to stress and shocks which affect sustainable livelihood that have been given, as examples, in this part of module

The third part of discussion was related to the application of a problem based learning (PBL) approach as a tool for understanding the health problems and the means of solving them through a multidisciplinary and inter-sectoral approach of One health.

The tool was applied by first providing the definition of the problem based learning approach and then we provided a guide on the procedure of its application with appropriate examples related to the ecosystem interface.

We envision that the concepts given to you have been understood. If in doubt, revisit the notes provided in this part of the module and refer to some of the prescribed readings provided to you. The next theme of discussion in the fifth part of this module will deal with the aspect of understanding culture and its links to One Health.

4.8. Performance Evaluation: Exercises on PBL

Present the individual/group-work assignment on the following PBL exercises:

Exercise #1: **PBL Exercise on ecosystem:** Describe the principles of ecosystem health and the concept of interface.
:
A remote community in one district of Tanzania, with a population of 1,500 people, 3,000 heads of cattle, 200 goats and sheep and 50 dogs in an area with diverse species of wildlife. The community traditional healer notices a number of members are coughing and losing weight, sores in the legs, adults and young ones. A wildlife ranger, also notices that buffaloes are also in poor condition in an area.
You are a member of the flying doctor services or medicine frontiers visit this area and decide to carry out an investigation of problems affecting this population. You learnt these things from the village headman/community healer.
Questions:

- What do you think could be the possible causes of the health problems affecting the community?

- How would you investigate the problem? (consider what simple steps can be taken to investigate the problem?
- How would you manage these types of conditions? i.e. how would you treat and how would you prevent these conditions?
- How would you do follow up in a pastoralist community that is nomadic?

Exercise#2: PBL exercises: One Health Management &Leadership Skills:

In one district of Eastern Zambia, there have been concerns about increased number of cattle aborting alongside with a number of people dying during the prolonged heavy rainy season. The Area Member of Parliament (MP) receives information from the Constituents of the people's concern. The MP seeks clarification from the Regional Veterinary Officer who advises that the MP should get in touch with the District Veterinary Officer (DVO) because he is the one responsible.

DVO informs the MP that the only concern the community has expressed is increased number of deaths of some people in the community. He consults the District Medical Officer (DMO) who informs him that the only concern raised by some community leaders was the increased number of abortions in cattle.

Questions:

- How best would you present these two scenarios to the Community leaders including the Member of Parliament?
- What would have been the role of the leaders of the Animal and Human Health sectors in addressing the community concern? How would their role be strengthened?
- Discuss how the information could have been disseminated between the lower administrative organs and the higher levels to address the problems? and how this could be strengthened to reduce health problems in community?

Present report of this exercise by the end of two weeks for assessment.

Additional Reading

1. Constanza R., Norton B.G., Haskell B.D.1992. Towards an Operational definition of Ecosystem Health, in Ecosystem Health: New Goals for Environmental Management. Island Press, Washington DC: 239-256
2. Ostfeld R.S., and Keesing,F.2000. Biodiversity and Disease Risk: the case of Lyme Disease. Conservation Biology 14: 722-728
3. Keesing ,F et al. 2010. Impacts of Biodiversity on the Emergence and Transmission of Infectious Diseases. Nature 468: 647-652
4. Livi-Bacci.1997. A Concise History of World Population, 2nd Edition.Blackwell Sciences Publishers
5. Myers,P.R., Espinosa.C.S., Parr.T., Jones. G.S., Hammond and Deway.T.A.2012. The Animal Diversity Web (online),Accessed at http://animadiversity .org
6. Van Rooyen,J.2012. The Integration of Livestock and Wildlife Conservation systems in the eastern Caprivi: Towards Improved compatibility through a community-based trade policy Framework. Draft Report. Development of export opportunities for beef productys from the Caprivi. Millennium Challenge Account, Namibia,Windhoek

UNIT 5
ROLE OF MEDICAL ANTHROPOLOGY IN ONE HEALTH

5.1 Introduction

In the recent previous section, we dwelt much about ecosystems and ecosystem health and the relationship link to OH. Similarly, Unit 5 of this section discusses further the role of medical anthropology in OH, which links culture and traditional medicine in understanding of the bio-ecological and socio-cultural factors have influenced health and disease throughout human history and in the recent times. The themes of this section deal with the understanding of the concept of medical anthropology by attempting to understand its: (a) terminology; (b) the scope and origin of medical anthropology, in relation to the role of physical anthropology in medical anatomy, and ethno-medicine (traditional medicine) of primitive medicine in curing ill-health or disease

5.2. Objectives

By the end of this Unit 5, you should be able to:

i. Demonstrate the understanding the meaning of medical anthropology and its application to OH.
ii. Discuss the roles of physical anthropology and ethno-medicine in influencing health and disease in primitive societies
iii. Discuss the implications of ethno-medicine for OH approach

5.3. Definition of Medical Anthropology

Medical anthropology- is the cross- cultural study of medical system linking the bio-ecological and socio-cultural factors that influence the incidence of health and disease now and throughout human history. The field was introduced since the end of the world II for the purpose of understanding the human health behaviour in its broad manifestation and the belief that anthropological research techniques, theories and data can be used in programmes designed to improve health care in developed and developing countries.

In short, medical anthropology is viewed by its practitioners as ‘ a bio-cultural discipline concerned with both the biological and sociocultural aspects of human behaviour and particularly with the ways in which the two interact and have interacted throughout human history to influence health and disease.

5.4. Scope and Origin of Medical Anthropology

The origins of medical anthropology are concerned with ‘roots’- how the contemporary field came into being. The **roots of Medical anthropology-** is traced through four differential sources:

1. The interest of physical anthropologists in topics, such as- evolution, adaptation, comparative anatomy, racial types, genetics and serology.
2. The traditional ethnographic interest in primitive medicine, including witchcraft and magic.
3. The ‘culture and personality’ movement of the late 1930s and 1940s, with collaboration between psychiatrics and anthropologists, and
4. The international public health movement after World War II.

5.4.1. Physical anthropology

- Long before there were cultural medical anthropologists, physical anthropologists taught and did research in schools of medicine in the department of anatomy.
- By definition, physical anthropologists are medical anthropologists concerned with human biology.
- For many decades, physical anthropologists have been engaged in 'forensic medicine'- an area of medico-legal problems involving identification as to age, sex, and race of human remains where foul play is suspected, and through blood type for determination of paternity.

The application of physical anthropology in human biology is not differentiated from the animal biology. This implies that physical anthropology is applied to the aspects of veterinary medicine making it an important component of One Health Medicine.

5.4.2. Ethno medicine (Traditional Medicine)

Ethno medicine- is concerned with 'those beliefs and practices relating to disease which are the products of indigenous cultural development and are not explicitly derived from the conceptual framework of modern medicine.'

Ethno medicine to the present time is associated with religion, magic, supernatural and application of primitive medicine.

The recognition of ethno medicine in the contemporary field of medicine has stimulated renewed interest in ethno medical research, elevating it to major importance in medical anthropology.

5.5. Summary

In this fifth part of the module, we covered mainly the role of culture or medical anthropology in One Health. We discussed that:

- The medical anthropology is the cross cultural study of medical system linking the bio-ecological and socio-cultural factors that influence health and incidence of diseases in the recent times and throughout mankind.
- The field was introduced since the end of the World War II for the purpose of understanding the human health behaviour in its broad manifestation and the belief that anthropology research techniques, theories and data can be used in programmes designed to improve health care in developed and developing countries.
- That the origins of medical anthropology are traced through four differential sources: a) the interest of physical anthropology in topics, such as evolution, adaptation, comparative anatomy, racial types, genetics and serology; b) the traditional ethnographic interest in primitive medicine, including witchcraft and magic; c) The culture and personality movement of the late 1930s and 1940s, with collaboration between psychiatrics and anthropologists; and d) the international public health movement after World War II.

The concept of medical anthropology has stimulated renewed interest in ethno medical research, elevating it to major importance in One Health. In the final part of the themes around One Health Medicine for this module, it will deal with the application of cultural research translated into qualitative or behavioural research applications to better understand how

cultural research can be applied to solve the many One Health challenges affecting people and implementers of this approach.

5.6. Performance Evaluation: Exercises

Reflect on the aspects of the medical anthropology and identify cultural issues that are related to solving aspects of One health

Additional Reading

1. Anderson BG., Foster George M. 2002. Medical Anthropology. Fourth Edition,Alfred Knopi,New York
2. Keesing Roger.M., Strathern Andrew.J.1998. Cultural Anthropology: A Contemporary Perspective, Third Edition, Harcourt Brace & Company, Philadephia

UNIT 6
ROLE OF BEHAVIOURAL/QUALITATIVE RESEARCH IN ONE HEALTH

6.1. Introduction

Unit 6 is concerned with the role of cultural or behavioural research in influencing health outcomes and disease in communities. The first part of this theme will dwell with the explanation of understanding the term behavioural research and the role it has played in the international Public Health. The following subsequent sections and sub-themes are concerned with the real application of behavioural research in the context of qualitative research, involving its methodology and the techniques of writing a research report.

6.2. Objectives

By the end of Unit 6 section of this module, you should be able to:

i. Describe the term behavioural research and its relevance to OH approach
ii. Apply qualitative research methodology to the relevance themes or topics of One Health approach in your community or country
iii. Demonstrate the ability to understand the distinction between qualitative research and quantitative research methodologies learnt in other modules.

6.3. Definition of Behavioural Research

What is behavioural research?

Jary and others (2000) define **'behaviour'** as 'the alteration, movement or response of a any entity, person or animal or system acting within a particular context.' In other words, 'it is the externally observable response of an animal or human being to an environmental stimulus.'

The term behavioural research refers to 'qualitative research' application or 'action research' The research application seeks to explore the behaviour of individuals, through provision of in-depth or insight information on the beliefs, opinion and solutions for the problems affecting them. The methodology applied in behavioural research involves- application of qualitative methods and sampling methods are mostly non-probability types. Analysis is also of qualitative in nature, or in triangulation form- where qualitative data can be transformed into quantitative data for statistical analysis, for example in structured questionnaires where the use of open-ended questions have been applied.

It is concerned with the study of observable responses of human beings and animals which provides comprehensive description and interpretation of bio-cultural interrelationships between human behaviour, past and present, disease level and health outcomes. Behavioural research provides in-sight explanations and understanding of the relationships between bio-sociocultural phenomena and health, and the changing health behaviour in directions believed to promote better health of the human and that of the animals alike.

6.4. Culture and Behavioural (Personality) Research

Culture and personality or simply behavioural research is concerned with the ways in which anthropological knowledge can be used to raise levels of health care.

Previous studies in which the problems of interpersonal relations were described between health providers and the clients of different racial groups showed how the role perceptions and cultural differences prevented the most effective therapeutic interaction.

6.4.1. Role of Behavioural Research in International Public Health

After cold war, major bilateral and multilateral public health programmes in developing countries became part of global assessment.

Health workers in cross-cultural settings became to realize that health and disease are as much social and cultural phenomena as they are biological.

Anthropology provided insight into why many programmes were less successful than anticipated and could suggest ways of improvement, through their research methods.

Medical anthropology is the term used by anthropologists to describe: First, their research which aims at comprehensive description and interpretation of bio-cultural interrelationships between human behaviour, past and present, and health and disease levels.

Second, enhance professional participation in programme to improve health, through greater understanding of the relationships between bio-sociocultural phenomena and health, and through the changing of health behaviour in directions believed to promote better health.

The following sections will dwell with the application of the behavioural research in the context of qualitative research by demonstrating its methodological approach to OH.

6.5. Behavioural/Qualitative Research Methodology

Qualitative research methodology application is concerned with the understanding of the various designs that are applied in qualitative research; type of sample size and sampling methods used; data collection methods and tool, and issues of ethical considerations; data quality management; and methods used for analysing qualitative data and interpretation. It will also cover the ways in which qualitative data yielded from the field can be written (report writing. The following provides description of varied study designs employed, with other subsections of the methodology:

6.5.1. Qualitative Research Designs

Qualitative research designs are applicable to behavioural research studies. Common designs applied are:

6.5.1.1. Explorative studies:

An **Exploratory study** is a small-scale study of relatively short duration, which is carried out when little is known about a situation or a problem. For example- establishing Counselling services for HIV positive and AIDS patients, but lacks information on specific needs patients have for support. To explore these needs, a number of **in-depth interviews** are held with various categories of patients (males, females, married, singles etc) and some counselors in the

program under way. Exploratory studies **describe** the needs for various categories of patients and the possibilities for action. You may need to **Compare groups** (e.g males and females).

Comparison –is a fundamental research strategy to identify variables that help explain why one group of persons or objects differs from another. Small-scale studies that compare extreme groups are very useful for detecting management problems. For example: performance of health providers in health facility, community participation in malaria control, etc.

Purposes of Exploratory studies:

•To seek new insights

•To explore ways of how to ask questions for further studies

•To assess phenomena in a new situation

Explorative study design is necessary for qualitative data

6.5.1.2. Surveys- descriptive in nature:

Small scale surveys are also applicable in behavioural research to determine the **behaviour** of people, knowledge, attitudes, beliefs and opinions that may help to explain the behaviour (KAP studies).

6.5.1.3. Case –studies:

Case studies- are small scale descriptive study designs- describe in depth the characteristics of one or a limited number of cases.- A case may be, for example- a patient, a health centre, or a village. A descriptive study is a study that includes as subjects, all persons in the population including those who have the disease, and objectives limited to describing the population at that time, e.g. prevalence of disease.

Case studies are common in social sciences, management sciences, and clinical medicine.

-For example- in clinical medicine, the characteristics of unrecognized illness may be documented as **a case study- a first step towards building up a clinical picture of that illness.**

6.5.1.4. Triangulation

One important way to strengthen a study design is through **'triangulation'** , or the combination of different methodologies in the study of the same phenomena or programmes. This can mean using several kinds of methods or data, including using both qualitative and quantitative approaches. Denzin (1978) has identified four basic types of triangulation: (1) ***data triangulation***- the use of a variety of data sources in a study; (2) ***investigator triangulation***- the use of several different researchers or evaluators with varied disciplines or expertise; (3) ***theory triangulation***- the use of multiple perspectives to interpret a single set of data; and (4) ***methodological triangulation***- the use of multiple methods to study a single problem or programme.

The term 'triangulation' is taken from land surveying. Knowing a single landmark only locates you somewhere along the line in a direction from the landmark, whereas with two landmarks

you can take bearings in two directions and locate yourself at their intersection. The logic of triangulation is based on the premise that:

> 'no single method ever adequately solves the problem of rival causal factors…. Because each method reveals different aspects of empirical reality, multiple methods of observations must be employed. This is termed triangulation. I now offer as a final methodological rule, the principle, that multiple methods should be used in every investigation' (Denzin 1978:28).

Therefore, triangulation is ideal in qualitative or behavioural research. It can also be expensive. An evaluation's limited budget, short time-frame and political constraints will affect the amount of triangulation that is practical.

Triangulation can be achieved within a qualitative inquiry strategy by combining different kinds of qualitative methods and mixing purposive samples. It is also possible to achieve triangulation by combining qualitative and quantitative methods.

6.5.2. Sample Size and Sampling Methods

6.5.2.1. Sample Size

Sample size employed in qualitative behavioural research is small, with a maximum number of 20-30 depending on the type of qualitative methods and design of study.

Sample size for focus group discussions (FGDs) are translated in number of FGDs conducted in a study area that constitutes a sample.

Sampling methods are non-probability in nature which are:

6.5.2.2. Purposive sampling

The principle of selection in purposive sampling is the researcher's judgement as to typically or interest. A sample is built up which enables the researcher to satisfy her or his specific needs in a project. It is an approach commonly used within case studies.

6.5.2.3. Convenience sampling

It is sometimes used as a cheap and dirty way of doing a sample survey. It does not produce representative findings. It involves choosing the nearest and most convenient persons to act as respondents. The process is continued until the required sample size has been reached. This is probably one of the most widely used and least satisfactory method of sampling (Robson 2002; Patton et al.2002). The term 'accidental sample' is sometimes used, but is misleading as it carries some suggestion of randomness, whereas all kinds of largely unspecifiable biases and influences are likely to influence who gets sampled. There are sensible uses of convenience sampling, but they are more to do with getting a feeling for the issues involved, or piloting a proper sample survey.

6.5.2.4. Quota Sampling

Here the strategy is to obtain representatives of the various elements of a population, usually in the relative proportions in which they occur in the population. If socio-economic status was

considered of importance in a particular survey, then the categories might be used. Interviewers would be given a quota of category. Within the category, convenience sampling is normally used. The interviewer will, for example, seek to interview a given number of, for example, unskilled community health workers, a given number of these unskilled community health workers can be obtained by say, stopping passers-by to interview them, and will continue until her or his quota for the day is complete.

The common use of the term 'representative' in quota sampling has to be looked at with some care. The findings are representative only in number, not in terms of the type of persons actually selected. All such means of gathering quota samples are subject to bias. Careful planning, experience and persistence can go some way to addressing obvious biases. If, for example, home visits are involved, avoiding houses where there are fearful dogs or impassable roads may be understandable behaviour on the part of sensitive interviewer, but mitigates against representativeness in householders in the sense of all householders having an equal chance of being selected in the sample.

6.5.2.5. Snowball sampling

here the researcher identifies one or more individuals from the population of interest. After they have been interviewed, they are used as informants to identify other members of the population, who are themselves used as informants, and so on. This is a useful approach when there is difficulty in identifying members of the population.

6.5.3. Qualitative Data Collection Methods

Qualitative methods consist of three kinds of data collection: (1) in-depth and open-ended interviews; (2) direct observations; and (3) written documents. **Data from interviews** consist of direct quotations from people about their experiences, opinions, feelings and knowledge about certain situations or phenomena. **Data from observations** consist of detailed description of people's activities, behaviours, actions and full range of interpersonal interactions and organisational processes that are part that are part of observable human experience. **Document analysis** in qualitative inquiry yields quotations, or entire passages from organizational, clinical or programme records; memoranda and correspondences; official publications and reports; and open-ended written responses to questionnaire and surveys. Common methods applied are:

- Observations
- Unstructured Interviews/ Semi-structured interviews
- Focus group discussions
- Norminal group technique,
- Delphi techniques,
- Life histories, scales ,essays, case studies, mapping, rapid appraisal techniques,
- Participatory research

6.5.3.1. In-depth and open-ended interviews

The interview is a kind of conversation, i.e. a face-to-face interaction between the interviewer and the interviewee (respondent).

Purpose

The purpose of interviewing is to find out what is in and on someone else's mind. The purpose of open-ended interviewing is to access the perspective of the person being interviewed. People are interviewed to find out from them the things that cannot be observed. Interviews carried out for research purposes are very common to obtain research-relevant information based on focused contents specified by research objectives of systematic description, prediction or explanation (Patton 2002).

Advantages and disadvantages of interviews

The interview is a flexible and adaptable way of discovering issues. The human use of language is fascinating, both as a behaviour in its own right and for what lies behind individual's action. Asking people directly about what is going on is an obvious way of seeking answers to research questions. In-depth interviews provide inner perspective of individuals on opinions, beliefs, attitudes, knowledge and behaviour about situations or events in the populations.

Face –to-face interviews offer the possibility of modifying one's line of inquiry, following up interesting responses and investigating underlying motives in a way that postal and other self-administered questionnaire cannot. Non-verbal responses too, may give messages which help in understanding the verbal responses, possibly changing or even, in extreme cases reversing its meaning.

There are also several disadvantages with interviews. Considerable skill and experience in the interviewer is required. Lack of standardization raises concerns about reliability and biases can be difficult to rule out. Interviewing is time-consuming.

6.5.3.2. Focus Group Discussions

Characteristics and Uses of FGDs

A focus group discussion is a group discussion of 6-12 persons guided by a facilitator during which members talk freely and spontaneously about a certain topic. Purpose is to obtain in-depth information on concepts, perceptions and ideas of the group. It aims at question-answer interaction.

Focus group discussion technique is useful to:

- Focus research and develop relevant research hypotheses by exploring in greater depth of problem to be investigated and its possible causes.
- Formulate appropriate structured questions for large scale surveys
- Supplement information on knowledge, beliefs, attitudes and behaviour already available, but insufficient.
- Develop health education messages.
- Exploring controversial topics or issues.

Conducting a FGD

a) **Preparation**:

- **Selection of a Facilitator and Recorder**
- **Recruitment of participants**- should be the same socio-economic background. Age and gender composition should facilitate free discussion- Obtain information from different categories. e.g. group of men and group of women, or young men/ women and older men/women.
- **Physical arrangements-** conducive atmosphere to allow free discussions.

- **Preparation of a discussion guide-** Written list of topics and questions is required, e.g weaning practice of children < 24months, tuberculosis, perception of foot and mouth disease in animals and so on relevant to your research question.

b) Conducting a Focus Group Discussion:

One of the research team must be **facilitator** and the other serves as **recorder**

Functions of Facilitator:

- Introduce the session: Research team should introduce themselves and participants to introduce themselves by name.
- Encourage discussion
- Encourage involvement
- Build rapport, empathize- observe non-verbal communication, or ask your self what are they saying?
- Control rhythm of the meeting-listen carefully and move the discussion from topic to topic.
- Take time at the end of meeting to summarize, check for agreement and thank the participants.

Functions of recorder:

- Keep record of the content of discussion, emotional reactions and important aspects of group interaction
- Record date, time, place; Names and characteristics of participants

- Record general description of the group dynamics- level of participation, presence of a dominant participant, level of interest and so on.

- Record opinions of participants, recorded as much as possible in their own words,e.g key statements.
- Record emotional aspects-e.g reluctance, strong feelings attached to certain opinions and vocabulary used

c) Analysis of Results

- After each FGD, facilitator and recorder meet to review and complete notes taken during the meeting.
- Write full report of the discussion using participants' own words.

- List key statements, ideas and attitudes expressed for each topic of discussion.
- Code statements using left margin, eg 'tyf' for type of food, 'wp' for weaning practice
- Write comments on right margin.
- Further categorize statements for each topic, if required, e.g. compare answers of different subgroups (e.g answers of young mothers and those above child-bearing age on the changes in weaning practices, for example.
- Summarize them in matrix or diagram, flowchart or narrative form and interpret the findings.
- Analysis should be in relation to the themes or variables of your study to achieve the objectives or research question (s).
- Select most useful quotations that emerged from the discussions to illustrate the main ideas.

d) Report Writing:

- Start with a description of the selection and composition of the groups of participants.
- Write in relation to the main themes (variables) of the topic (s)
- Provide a commentary on the group process, so that the reader can assess the validity of the reported findings.
- Present findings according to list of topics and guided by the objectives of your FGD.
- Include quotations whenever possible, particularly key statements.

6.5.3.3. Rapid Appraisal Techniques or Soundings

Rapid appraisal techniques are concerned with obtaining information rapidly without a degree of precision. Rapid appraisal techniques can be used for insufficient data available to identify and describe a health problem. Information is obtained in an easy, quick, and inexpensive way. Useful in the pilot phase of research or for evaluation purposes to strengthen programme development. It involves the use of mixed qualitative methods, e.g. focus group discussions combined with semi-structured in-depth interviews for key informants, or observations etc.

6.5.3.4. Participatory Research

Participatory research is the involvement of both researchers and target population together. All phases of research (from problem identification, setting the objectives to using the results) are planned and conducted by the researchers and informants/ people affected with the problem. The results of participatory research should be useful to those who participated in the research. This helps to explore and develop approaches interventions to solve community health problem.

A good example of participatory research is conducting community diagnosis- in which research is conducted with the people and for the people (as research). Without involvement of people, it is likely that researchers or service managers can be likely to collect information only on issues of importance to them.

6.5.3.5. Mapping

Mapping is a valuable qualitative technique for visual displaying relationships and resources. For example: in a water supply project, mapping is invaluable. It can be used to represent the location of wells, distance of the living areas from wells, other water systems etc. It gives researchers a good overview of the physical situation and may help to highlight relationships between variables. It is a useful measure for pre-stage sampling.

6.5.3.6. Life Histories

Life histories are a special application of interview technique. The technique allows people to tell stories which provide insights into what they consider important .Life-history taking in a special form is interviewing. It is usually conducted on a very limited number-maximum 20. Technique is applicable to rural traditional communities .Issues of life-history are concerned with- patterns of reproduction, perceptions of marriage or domestic animal rearing, childbirth, cultural values, lifestyle, etc.

6.5.3.7. Essays

Essays help to explore hidden values and aspirations of affected people and community in which they live. It determines differences in beliefs concerning perceived causes of illness, popular theories of illness causation, rationale for health-related behaviour and outcomes.

6.5.3.8. Nominal Group Techniques

A nominal group technique (NGT)- is a group of discussion technique that is useful when one wants to obtain a consensus from a group on a topic where decision-making can be usefully guided by the perceptions and opinions of the various group members. Sequence of group discussion is usually individual expression followed by ‘ voting’, followed by further discussion and another round of discussion, then voting.

The group discussion comes to an end when there is ‘one’ vote. Steps in applying NGT:

- Individual listing of ideas on paper
- Display of lists produced, followed by discussion
- Voting and ranking
- Summarising the results
- Discussion of the results
- Second vote and re-ranking

- There should be a moderator to facilitate discussion and score rates- ideas are ranked according to score T.

6.5.3.9. Observation

Observation is a technique that involves systematically selecting, watching and recording behaviour and characteristics of living species, objects or phenomena. Observation of human behaviour is a much-used data collection technique. It can be undertaken in different ways:

- **Participant observation**: the observer takes part in the situation he or she observes.
- **Non-participant observation**: the Observer watches the situation openly or concealed, but does not participate.

Observation serves different purposes:

- They provide additional accurate information on behaviour of people than interviews or questionnaires.

- Observation can provide a check on information collected, e.g. on sensitive topics, such as alcohol, or drug abuse, or stigmatization of HIV/AIDS patients, Leprosy, Tuberculosis and epilepsy.

- They may be a primary source of information, such as observations of a field veterinarian officer administering vaccines or treatment to animals.

Observations of Human behaviour can form part of any type of study, but as they are time consuming, they are most often used in small-scale studies. Observations can also be made on Objects. For example, the presence or absence of a latrine and its state of cleanliness may be observed. If observations are made using a defined scale, they may be called **measurements. Measurements** usually require additional tools. For example, in nutritional surveillance, we measure weight and height by using weighing scales and a measuring board, and thermometers used for measuring body temperature.

6.6. Qualitative Data Analysis

Qualitative research techniques are used to describe in depth certain procedures, beliefs and knowledge related to health issues among the population and health staff. These techniques are suitable for exploring the reasons for certain behaviour or opinions of respondents on certain aspects. The researcher ends up with substantial number of pages of **written text** that need to be analyzed.

6.6.1. Principles of Qualitative Analysis:

Procedures and outcomes of qualitative data analysis differ from those of quantitative data analysis. Qualitative analysis is performed in form of '**Content' analysis or 'Theme'**

Principles of analyzing data are similar in both qualitative and quantitative analysis. They are:

- Application of data processing involving a coding system

- Analysis involves displaying data, interpretation and drawing conclusions.
- Describe the **sample population**
- Order and reduce or code the data- **data processing**
- Involve process of **"cutting" and "pasting" ideas or themes** extracted from field notes
- Use of qualitative computer software packages, such as Intrinsic P4.2, Gutterman, Microsoft word, Lispqual software programme, N'Vivo, etc.or you may analyze manually.
- Display summaries of data for easy interpretation
- Draw conclusions, and
- Develop strategies for testing or confirming findings to prove their validity.

6.6.2. Procedures for Processing and Displaying Qualitative Data

6.6.2.1. Description of the sample population

- First step of data processing- provide characteristics of sample population, e.g by residence, age, sex, occupation, education, or marital status
- Qualitative data originate from small samples, (e.g a handful of key informants or focus group discussions).
- For example, who were the key informants? How representative were the participants of the groups they represented? etc

6.6.2.2. Ordering and Coding Qualitative Data

- Ordering is done in relation to the objectives or discussion topics
- Codes for qualitative data are usually **labels** –which can be easily remembered.
- For example: P's Reacts Prog- Participants' reactions to the Programme.
- The codes will closely follow the topics of the discussions or of the checklist for observations
- Coding should be done in **pencil**- as there may be changes
- Put the codes in the **left margin**
- Use **right margin** for remarks that come up when reading your field notes: conclusions, incompleteness of data, further questions, or even topics to be added, or meanings of those codes /symbols.

6.6.2.3. Summarizing Data: Graphic Displays in Charts and Figures

After ordering the data, you can summarize them by using the following steps:

First step: listing data that belong together:

- If you coded the data, list all the data that have been given the same code.
- List the data in more condensed form to make it easy to answer research questions
- When listing data, remember to identify the source for each item (interview number or field note page number, etc)- to enable you to go back to its original context.

Second step: Summarize the data graphically in a chart (e.g a matrix) or a figure (e.g diagram, flow chart), or in a narrative form.

Third step: Interpret the data for each graphic display by using the following examples:

Example #1: Use of Matrix

A matrix is a chart that looks like a table, but contains words or themes instead of numbers.

For example: Matrix on introduction of soft baby foods among mothers of different age-groups of Human Species

Matrix 1: Initiation of baby solid food among women of different ages

Age-Group	**Onset Soft Food**	**Type of Food**	**Frequency of SF/Day**
Young mothers (20-30 yrs)	Range: 4-7months Average: 6 months	-soft porridge -soft porridge with pounded groundnuts, Potatoes, fruit biscuits	1-2 times daily -Depends on availability of mother or care taker -Depends on appetite
Mothers over reproductive age (>45 yrs)	Range: 5-11months Average: 8.5 months	Soft porridge Soft fruits	1-2 daily -Depends on avail.of mother, or caretaker & appetite.

Interpretation:

This type of display makes it easy for the researcher to conclude that:

- Young mothers start giving soft foods, on average 2.5 months earlier than the older mother or generation of their own mothers.
- Young mothers use a larger variety of soft weaning foods than older mothers
- The two generations do not seem to differ in the frequency with which they give /gave soft foods to their babies.

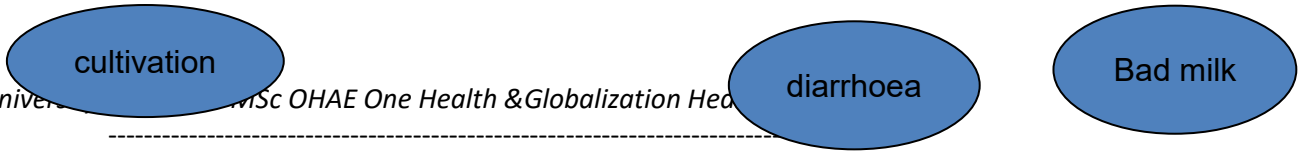
Matrices are the most common form of graphic display of qualitative data.They can be used to order information in many ways, e.g:

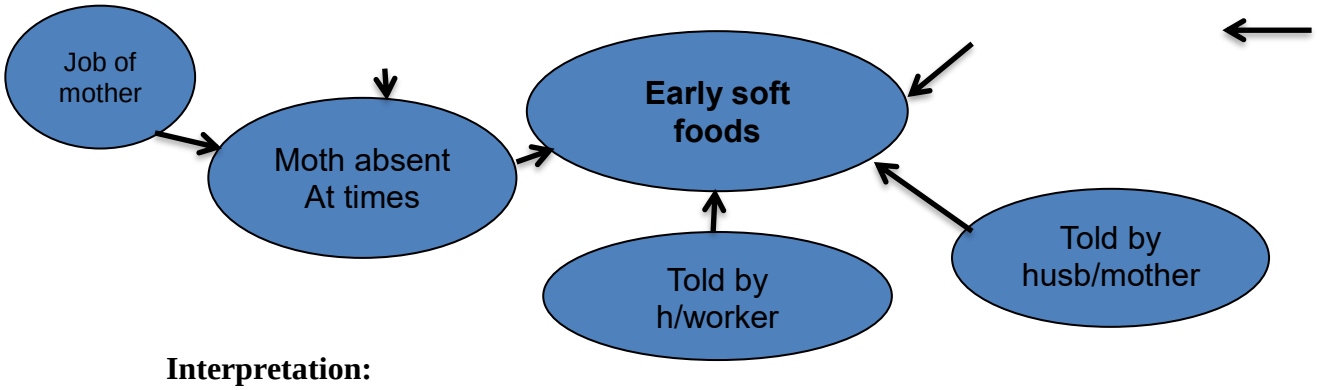
- Time sequence of procedures being investigated
- Type of informants
- Location of data collection
- Type of activity
- Reasons for certain behaviour.

Example #2: Use of Diagrams/Root Analysis:

A diagram is a figure with boxes or circles containing variables and arrows indicating the relationship between the variables. For example:

Figure 1: Reasons for early introduction of soft foods by young mothers of Human Species:





Interpretation:

The findings in figure 1 show variety of factors that influences young mothers to start introducing soft foods to their babies. These range from **absenteeism** of mothers due to **seasonal cultivation** and their **employment status**; **peer influences** of health workers, male partners, female parents and friends to **quality of breast milk or milk.**

The interpretation can be compared with other groups to draw some conclusions in their differences and similarities (if any). In such situations, it is considered as **cross-case content analysis.**

6.6.2.4. Confirming Validation of Qualitative Data

Review objectives and variables of the study to make sure that the research questions are answered.
Review process of the coding systems used and categorization of the responses obtained from the field notes.
Cross check findings obtained from other sources of information, such as key informants, men, or different FGDs performed to detect similarities in responses.

For **analysis of a focus group** discussion must be that:

- After each FGD, facilitator and recorder meet to review and complete notes taken during the meeting.
- Write full report of the discussion using participants' own words.
- List key statements, ideas and attitudes expressed for each topic of discussion.
- Code statements using left margin, eg 'tyf' for type of food, 'wp' for weaning practice
- Write comments on right margin.
- Further categorize statements for each topic, if required , e.g. compare answers of different subgroups (e.g answers of young mothers and those above child-bearing age on the changes in weaning practices, for example.
- Summarize them in matrix or diagram, flowchart or narrative form and interpret the findings.
- Select most useful quotations that emerged from the discussions to illustrate the main ideas.

6.6.2.5. Focusing Qualitative Analysis

The first task in qualitative analysis is descriptive analysis.
The descriptive analysis answers basic questions. For example, for programme evaluation, basic descriptive questions include:

- What are the goals of the programme?
- What are the primary activities of the programme?
- How do people get into the programme ? etc

Description must be separated from interpretation.
Interpretation involves explaining the findings, answering "why?" questions attaching significance to particular results and putting patterns into an analytic framework.
Focus in analyzing qualitative data comes from the research questions generated at beginning of the research process during the conceptual and question-focusing phases of the study.
Once data are collected, analysis begins.

6.6.2.6. Strategies for Analyzing Interviews

First decision to be made in analyzing interviews is whether to begin with **case analysis** or **cross-case analysis**
Beginning with **case analysis** means writing a case study for each person interviewed or each unit studied (e.g., reach critical event, each group, and son on).
Beginning with cross-case analysis means grouping together responses from different people to common questions or analyzing different perspectives on central issues or themes.

If a standardized open-ended interview (e.g. semi-structured interview), it is easy to do cross-case or cross-interview analysis for each question in the interview.

With an interview guide approach (as in FGDs), answers from different people can be grouped by topics from the guide, but the relevant data won't be found in the same place in each interview. An interview guide constitutes a descriptive analytical framework for analysis.

Begin with individual case studies where variations in individuals are the primary focus of the study. This strategy requires writing a case-analysis using all the data for each person before doing a cross-case analysis. For example, if one has studied 10 juvenile delinquents, the analysis could begin by doing a case description of each juvenile before doing cross-case analysis.

6.6.2.7. Strategies for Analyzing Observations

Initial analysis of observational data is facilitated by clarity about how it will be most helpful to present the findings.
Options include the following:

- **Chronology:** Describe what was observed chronologically, over time, to tell the story from beginning to end.
- **Key events:** Present the data by critical incidents, or major events not necessarily in order of occurrence, but in order of importance.
- **Various Settings**: Describe various places, sites, settings, or locations (doing case studies of each) before doing cross-setting pattern analysis.
- **People:** If individuals or groups are the primary unit of analysis, then case studies of people or groups may be the focus for case studies.

- **Processes**: the data may be organized to describe important processes according to research questions.

There must be an initial framework for managing the voluminous data collected during fieldwork.

6.7. Qualitative Data Report Writing

Start with a description of the selection and composition of the groups of participants.

Provide a commentary on the group process, so that the reader can assess the validity of the reported findings.

Present findings according to list of topics and guided by the objectives of your interviews or discussions, just like in quantitative data approach.

You must make use of tables or matrices, diagrams, flow charts (if applicable) to interpret data and make inferences or draw conclusions.

Include quotations whenever possible, particularly key statements to validate your report.

Provision of practical examples and exercises by students

6.8. Summary

The theme in the sixth part of the module was mainly devoted to the understanding of behavioural research or simply qualitative research. We began by explaining the meaning of behavioural research and cultural research as the action research seeking to explore the behavior of individuals, through provision of in-depth or insight information on the beliefs, opinion and solutions to the problems affecting people.

We further explained to you that behavioural research is described to serve two purposes: First, is to aim at providing comprehensive description and interpretation of bio-cultural interrelationships between human behavior in the past and present, and health and disease levels. Second, is to enhance professional participation in programme to improve health, through greater understanding of the relationships between bio-sociocultural phenomena and health, and through the changing of health behaviour in directions believed to promote better health.

Other components of this theme are concerned with the methodological application of this particular research in terms of- its designs, sampling, methods of data collection and tools, analysis frameworks, with relevant examples, and the techniques of writing a qualitative research report including the various ways of ensuring data quality.

We hope that you have grasped adequately the topics taught. If in doubt, revisit the notes provided in the module. We shall now move on to the other part seven of the module discussing issues of globalization and health that is also directly linked to the concept of One Health approach briefly introduced in the second part of this module.

6.9. Performance Evaluation: Practical Field Data Exercises

Attempt to conduct a focus group discussion for men or women on a topic applicable to One Health approach, analyse and write a report using the guide given to you in this module on the techniques of how to conduct and analyse a FDG, including report writing

Additional Reading

1. Patton Micheal Quinn.2000.Qualitative Evaluation and Research Methods. Second edition, Sage Publication
2. Park K.2011.TextBook of Preventive and Social Medicine. 21st Edition. Banarsidas Bhanot Publishers
3. Robson Colin. 2002. Real World Research.Fourth edition, Blackwell
4. Walance Robett,B.,Kohatsu Neal. 2008. Public Health & Preventive medicine Fifteenth edition. McGrawHill Medical

UNIT 7
DEFINITION & THEORIES OF GLOBALIZATION

7.1. Introduction

Unit 7 introduces you to the concepts of globalization, trade and its effects on health, how it influences health and generates health inequities as one the major components of One Health discussed earlier in the previous sections of this module..

7.2. Objectives

By the end of this module, students should be able to:

i. Describe the features of the contemporary globalization and interpret the meaning of neoliberal globalization and trade
ii. Determine the health effects of globalization and the extent to which it influences health and generates health inequities.
iii. Debate the global workforce, occupational health and safety affect developing countries
iv. Explore globalized efforts for promoting health equality.

7.3. Definition of Globalization

Jenkins (2004) has been described Globalisation as 'a process of greater integration within the world economy through movements of goods(humans, animals and other goods alike) and services, capital, technology and labour, which lead increasingly to economic decisions being influenced by global conditions.'

It is a process whereby people worldwide are becoming more interconnected and interdependent through the political-economic relations that work to compress time at a faster rate, space (i.e. geographic boundaries) and cognition (i.e awareness of the world as a whole).

7.3.1. Dynamic Interrelated Phenomena of Globalization

There are three Interrelated and Dynamic Phenomena that are directly linked to its definition, which are:

- **Increasing cross-border flows** of goods, services, finance, people and ideas driven by technology changes and decreasing communication costs
- **The opening of national economies** to such flows, and
- **The development of international rules** and the institutions governing the cross-border flows

All these factors strongly influence occupational health, welfare policies and other health outcomes.

7.3.2. Linkages Between Globalization and Health Outcomes

There are four main linkages between globalization and health outcomes:

- **Effects on exposure to risk factors-** e.g food safety, tobacco, alcohol, international transmission of communicable diseases, global environmental change and cross-border disposal of hazardous wastes.

- **Effects on Health services-** e.g international trade in health sector inputs and in health services, migration of health professionals, and governmental health expenditures and input costs.

- **Effects on incomes and prices-** affecting the living conditions of populations and health related behaviours, especially in the context of financial market instability, and

- **Linkages through other sectors with important impacts on health,** e.g. employment, education, agriculture, tourism and the environment.

7.4. Theories of Globalization Trends

Globalization can be divided into several eras

- Comparing the period between 1890 and 1914 to today, the late 19th Century had a highly internationalized economy measured by the some of exports plus the imports as percentage of gross national product (GNP).
- This globalization index fell by 1960, then grew rapidly in 1990s leading to the event being observed in the recent times.
- In the 19th Century, global economic expansion was promoted as the key to progress by establishing larger businesses, trusts and encouraging investors, especially in Europe and North America.
- On the other hand, colonial dominion facilitated the extraction of precious raw materials enforced by exploitative relationship between the Belgium government and Central Africa that included abusive treatment of slave holdings in Democratic Republic of Congo (DRC).

7.4.1. The dynamics of globalization Growth

- Between 1991 and 2001 produced steady increases in cross-border movements of people and in cross-border flows of goods and services, finance and technology.
- The volume, direction and distribution of these flows influence the nature and magnitude of the health effects in different countries.
- Despite the effects of financial crises of 1997-8, the value of world trade in goods and services grew by 8.6 percent per year between 1991 and 1999.
- Trade in services grew more than trade in goods (IMF 2000).
- Temporary movements of people (travel and tourism) also increased considerably.
- Some developed countries are increasing their openness to migration of skilled workers.
- Cross-border flows of ideas, knowledge and technology, although difficult to measure, are powerful forces of global integration, through their influence on culture, marketing techniques and government policy.

7.4.2. Historical Characteristics

Although societies have traded goods, ideas and even people throughout human history, it is the speed at which current exchange is taking place, combined with dominant ideology that marks globalization as a distinct historical phenomenon.

Comparing the period between 1870 and 1914 to recent times, the late 19th century had a highly internationalized economy as measured by the sum of exports plus imports as a percentage of gross national product (GNP) (Hirst and Thompson 1966). This 'globalization index' fell by the 1960, then grew rapidly into the 1990s leading to the phenomenon being observed today. The mobility of capital, i.e. the international flow of money, was higher in the 1890s than in the 1990s (Chernomas and Sepehri 2002). Methods of communication and transportation also changed rapidly during the late 19th century, as finance overtook labour in its ability to move across borders easily. Many characteristics of the 19th century still persist.

7.4.3. Neoliberal Globalization (Neoliberal Economic Model) Trade

The model of neoliberal globalization assumes that (a) free markets bring growth in annual per capita gross domestic product (GDP), (b) economic growth is synonymous with development, and (c) economic growth is necessary and sufficient to reduce poverty (Gershman and Irwin 2000).

The key elements of neoliberal globalization focus on promoting 'free markets' and reduction of trade barriers, which are related to the following:

- Reduction in subsidies for the poor
- Cost recovery/user fees for essential services
- Privatization of public assets
- Weakened role of government
- Growing dominance of western-based transnational capital, and
- High military expenditure

Defined by these neoliberal terms, trade that occurs as part of globalization incur multiple implications. First, to a currency trader, it might mean the speed at which multimillion dollars transactions are completed anywhere in the world at any time of day. Second, to the poor rural farmers, globalization might mean a new distractive way of market sell of crops and at low prices, particularly in towns where competition could be high. Third, to other workers, it might mean a low-wage job to meet the essential needs, with lack of adequate safety measures.

The neoliberal globalization has accelerated the growth of free trade zones in developing countries. Free trade zones further shifts employment patterns within developing countries and exempt multinational employers from laws safeguarding workers and the environment.

How globalization affects the health of people around the world depends on who controls the flow of capital, labour, and knowledge around the world, and who benefit from it.
Therefore, power and politics are central to any assessment of the health effects of globalization

7.5. Summary

In this part of module, we introduced to you the concept of globalization and its relevance to One Health. We stated that:

- Globalization is a process of greater integration within the world economy through movements of goods- humans, animals, and other goods alike- and services, capital, technology and labour which lead to increasingly economic decisions being influenced by global conditions.
- There are three interrelated dynamic phenomena that are directly linked to its definition which are: a) increasing cross-border flows of goods, services, finance, people and ideas driven by technology changes and decreasing communication costs; b) the opening of national economies to such flows; and c) the development of international rules and the institutions governing the cross-border flows.
- There are also four main linkages to globalization and health outcomes that are: a) effects on exposure to risk factors; b) effects on health services, such as international trade in health sector inputs and in service etc; c) effects in incomes and prices affecting the living conditions of populations and health related behaviours; and d) the linkages to other sectors with important impacts on health, e.g. employment, education, agriculture, tourism and the environment.
- Theories of globalization depict several eras of comparison between, as far back from the periods of 1890 and 1914 to the late 19th Century showing a highly international economic progress of gross national product (GNP) for the developed countries of Europe and North America.
- In the 19th Century, global economic expansion was promoted as the key to progress by establishing larger businesses, trusts and encouraging investors, especially in Europe and North America
- Colonial dominion facilitated the extraction of precious raw materials enforced by exploitative relationship between the Belgium government and Central Africa that included abusive treatment of slave holdings in Democratic Republic of Congo (DRC) affected globalization growth in Central African countries.
- The dynamics of globalization growth in different countries including Africa between 1991 and 2001 produced steady increases in cross-border movements of people and in cross-border flows of goods and services, finance and technology.
- The historical characteristics of globalization show that even though societies have traded goods, ideas and even people throughout human history, it is the speed at which current exchange is taking place, combined with dominant ideology that marks globalization a distinct historical phenomenon.
- The model of neoliberal economic globalization of trade is expected that: a) free markets bring growth in annual per capita gross domestic product (GDP); b) economic growth is synonymous with development; and c) economic growth is necessary and sufficient to reduce poverty.
- The neoliberal globalization has accelerated the growth of free trade zones in developing countries. Free trade zones further shifts employment patterns within developing countries and exempt multinational employers from laws safeguarding workers and the environment.

How globalization affects the health of people around the world depends on who controls the flow of capital, labour, and knowledge around the world, and who benefits from it. Therefore, power and politics are central to any assessment of the health effects of globalization to be discussed in the next part of the module.

7.6. Performance Evaluation: Exercises

Reflect on the theories of globalization on how it has contributed to the GDP of your country.

UNIT 8
HEALTH EFFECTS OF GLOBALIZATION

8.1. Introduction

The causal pathways linking globalization with ill-health, death or injury are explained in the five major multiple determinants, which are: Trade liberalization changes and the world trade regime; Global re-organization of production and labour markets; Debt crises and structural adjustment of developing countries; Environmental damage; and Financial liberalization. It is in this context that the health effects of globalization will be presented and discussed in this Unit 8 part of this module.

8.2. Objectives

By end of this Unit, you should be able to:

i. Explain and discuss the health effects of globalization
ii. Demonstrate the ability to understand and debate the effects of globalization on work and occupational health in developing countries
iii. Develop possible solutions of action to improve working conditions and occupational health of workers in Development countries.

8.3. Trade Liberalization

Trade liberalization has effect on the changes of employment patterns in variety of ways:

- For example, some farmers are pushed out of agri-business, others are de-industrialized, i.e loss of their factory jobs and move to sector jobs, while others remain industrialized. These changes subject people to a system of social stratification that increase exposure and susceptibility to disease.
- Second, trade liberalization disproportionately affects agricultural workers and small entrepreneurs with no safety net on women and children. Jobs for these workers are usually in the informal economy and poorly regulated.
- At the same time, greater labour mobility of professionals, including the health workers has led to the emigration from developing countries of needed professionals to other developed countries.

8.4. Global Reorganization of Production and Labour Markets

The global re-organization of production and labour markets has resulted in the exportation of jobs and entire industries to areas where regulations are conducive. This contributes to jobs being lost leading to unemployment, stress and poor health outcomes.

8.5. Debt Crisis and Structural Adjustment of Developing Country Economies

Debt crisis and structural adjustment of developing country economies constrain investments in public health, education, water and sanitation, nutrition and neighbourhood improvement by governments. High debt-servicing payments limit public provision of these social goods. The introduction of the International Monetary Fund (IMF) policies for economic reforms subjected

many countries to a number of negative health effects. In a most recent study, it was found that communist countries that underwent IMF economic reform programme experienced significantly worst TB incidence and mortality than those that did not (Stuckler, King and Basu 2008).

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For example, in Zimbabwe, user fees implemented during structural adjustment led to reduced use of health services (even when people required care for disabling or fatal illnesses), an increa se in IMR, and increased incidence of malnutrition among rural children.

In most Southern American Countries that implemented social adjustment programmes (SAPs), growth in average per capita income fell steadily between 1990 and 2001.

8.6. Environmental Damage and Health

The effects on health from globalization and transnational corporate activity shape local communities, natural habitats and ecosystems in very costly or irreparable ways:

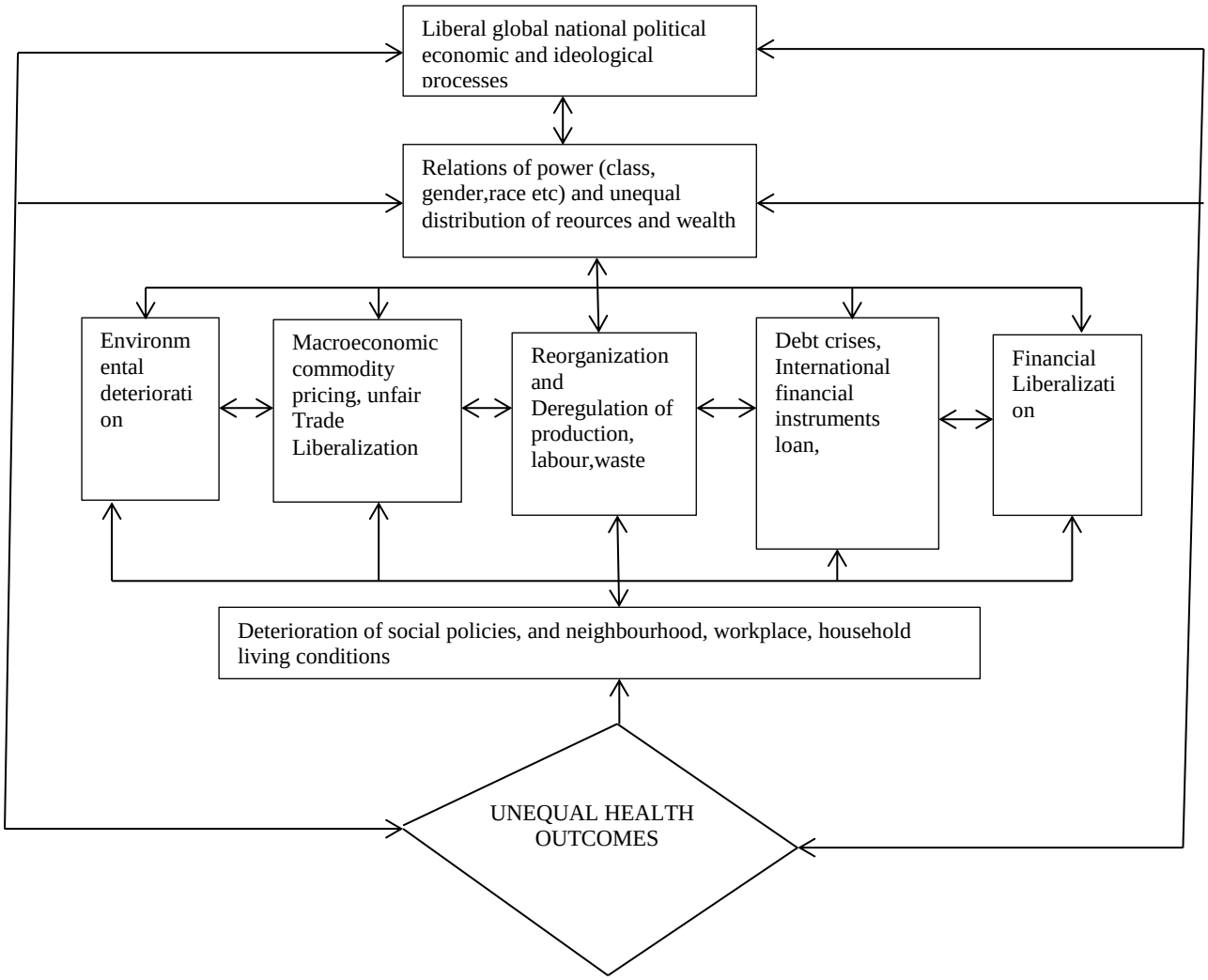
- Raw material extraction, chemical manufacturing, agri-business and construction of industries are harmful to health and environments.
- Multiple epidemiological studies documented a range of worsened health outcomes directly linked to oil operations including adverse pregnancy outcomes and increased rates of some cancers.
- For example, in Nigeria, the Niger River Delta remains one of the poorest regions of the country. Due to the ecological unfriendly exploitation of the oil in this region, the indigenous people of the delta have been stripped of their rights and left poor on account of oil riches of the country accounting to over 85% nation's GDP. The devastation incurred by the national oil drilling has rendered farming and fishing, the main sources of income for the local tribes, useless in many areas. The environment degradation has left local people in worse health and exacerbated their poverty.

8.7. Financial Liberalization

The final liberalization exposes national economies to the uncertainties created by large capital flows and intensifies the effects of inequity on the social determinants of health like public health, education, nutrition, housing, safe water and sanitation etc. Daily currency transactions in foreign currencies (of US $ per local currency) have caused enormous instability in many countries, with sudden devaluations affecting purchasing power and undermining the livelihood of hundreds of millions people.

The following framework in Figure 3 below provides a summary of the pathways of globalization and their effects on health as described by Labonte and Schrecker (2007).

Figure 3: Pathways of Globalization and their effects on Health



Source: Adapted from Labonte and Schrecker 2007:5

The framework of globalization pathways and effects on health shows that:

- ***Trade liberalization***- changes employment patterns in a variety of ways: for example, some peasant farmers are pushed out by agri-business, other workers are deindustrialized (i.e. lose factory jobs and must move to service sector job), while still others are industrialized and subjected to a system of social stratification that increases exposure and susceptibility to disease. It means that trade liberalization disproportionately affects agricultural workers and small –scale entrepreneurs who have no safety net, women and children. Jobs of these workers are usually in the informal economy and thus poorly regulated. At the same time, greater labour mobility of professionals(including health workers) has led to emigration from developing countries of needed professionals.

- ***The global re-organization of production and labour markets***- has resulted in the exportation of jobs and entire industries to areas where regulation is weak. This has

contributed to job loss from industrialized countries (leading to unemployment, stress and poor health outcomes), and are located to poor countries where wages are inadequate and labour organization is suppressed. Similarly, with increased pressure of liberal globalization, the environment has suffered. The environmental regulation is non-existent in many locations.

- Due to the ***debt crisis and imposition of structural adjustment policies*** on many economies of the developing countries, the ability of governments to invest in many public health, education, water and sanitation, nutrition, and neighbourhood improvement has been constrained. High debt-servicing payments limit public provision of these social goods, while loan conditions have stipulated decreased food subsidies for humans, reduced state investment in social programmes, and decreased public sector incomes, disproportionately affecting poor women and marginalized communities as a whole.

- ***Financial liberalization*** exposes national economies to the uncertainties created by large and increased capital flows. This intensifies the effects of inequality on the social determinants of health, such as life-course exposure (e.g. child health and childhood social class that are strong determinants of adult health, class stratification, gender, race and racism); health behaviours; water and sanitation; nutrition and food security; housing and human settlements; neighbourhood conditions (affecting quality of housing, water and sanitation, food availability including that of animals); Public health and health care services and policies; culture and religion; and transport. The monetary daily currency transactions has caused enormous instability in many countries, with sudden currency devaluations diminishing purchasing power and undermining the livelihood of human population, with adverse effects on animal well- being.

8.8. Globalization Effects on Work and Occupational Health, and Safety in Developing Countries

Globalization effects on work and occupational health, and safety in development countries are viewed in two dynamic conditions which are;

8.8.1. Working Conditions

Working conditions in developing countries for most workers have historically been poor, unsupervised, and difficult to regulate.

- Since the 1980s, economic globalization has expanded the industrial workforce in developing countries. Yet, despite side agreements to trade treaties that have included occupational safety and health provisions have not improved the working conditions of workers.

- Protective legislation is also much weaker compared with developed countries.

- Working conditions affect health in a variety of ways- through poor wages, stress, bad environmental working conditions, toxic exposures, and the use of harmful substances.

- According to WHO, about 45% of the world's population (and 58% of the population over 10 years old) contribute to the global work force.
- Although more men are registered in the workforce than women, these numbers do not include work at home or in the informal sector
- Health at work and healthy work environments (as laid out in the Declaration of Human Rights) are among the most valuable assets that employers, communities, and governments can cultivate.
- Work can have positive and adverse effects on the health of workers and their families. It provides income and material goods necessary for living.
- Positive work environments can contribute to improved work motivation, job satisfaction and self-esteem, and to high overall wellbeing of individuals and families.
- On the other hand, poor work environments can lead to job stress, ill health, low living standards and an overall poor quality of life.

8.8.2. Workplace as a 'Hazardous Environment'

Workplace is considered 'hazardous,' especially, where occupational safety and health receive little attention.

- WHO estimates that from 33% to 50% of workers worldwide are exposed to serious physical, chemical, or biologic agents, or to unreasonably heavy loads that may be hazardous to health.
- Psychological overload can also contribute to stress and chronic physical complaints.
- WHO estimates that as many as 250 million occupational accidents (with 330,000 fatalities) and over 70 million new episodes of occupational-related disease occur every year.
- Labour advocates estimate that there may be as many as one million fatalities and one billion accidents every year.
- The direct and indirect costs of illnesses account to 5% of a country's GNP (WHO 2007)
- Workers in developing countries experience high rates of workplace illness and death.

8.9. Summary

In this part eight of the module, we discussed the globalization factors that influence ill-health and death among populations. These causal pathways are influenced by:

- Trade liberalization
- The global re-organization of production and labour markets
- Debt crisis and imposition of structural adjustment policies, and
- Financial liberalization

Another feature explored is that the globalization effects on work and occupational health, and safety in development countries have resulted in poor and unsupervised working conditions

that have been difficult to regulate. Poor work environments can lead to job stress, ill health, low living standards and an overall poor quality of life.

Second, is that workplace has been considered hazardous especially where occupational safety and health receive little attention, as workers worldwide are exposed to serious risk of physical, chemical or biologic agents, or to unreasonably heavy loads. Evidence has shown that workers in developing countries experience high rates of workplace illness and death.

We hope that the above highlights have provided you with a clear understanding of the globalizations health effects on works and occupational health and safety of people in developing countries. The next issue of this module will be concerned with the trade liberalization, world trade regime and the transnational corporation on how they affect health.

8.10. Performance Evaluation: Exercises

In order to understand clearly the subject matter of this theme, try to reflect on the following key questions and provide your own answers:

- What makes the workforce a hazardous environment?
- What Social forces are necessary to improve workers safety and health in developing countries?
- Where and how should hazardous waste be dumped?

UNIT 9

TRADE LIBERALIZATION, WORLD TRADE REGIME (WTR) AND TRANSNATIONAL CORPORATION

9.1. Introduction.

Unit 9 further introduces you to, yet, another concept of discussing the links between trade liberalization, the world trade regime (WTR) and the transnational corporation. It explains the effect of trade on the determinants of health and disease, through the world trade regime and the transnational corporation.

9.2. Objectives

By the end of this Unit, you should be able to:

i. Demonstrate the ability to understand the relationship between trade liberalization, world trade regime and transnational corporation and its influence on health and disease outcome.

9.3. Trade liberalization, World Trade Regime (WTR) and Transnational Corporations

- Health concerns resulting from changing patterns of trade and the global economy are slowly entering the debate about globalization and its benefits.
- Trade affects the determinants of health and disease in a variety of ways.
- First, the increasing fluidity of global production has facilitated the transfer of production technologies to poor countries.
- This poses hazards to both the newly unprotected employed population and to the overall population.
- Second, **labour market 'flexibility**,' like in export processing zones (EPZs),- is often a pretence for minimal regulation, antiunion legislation and unsafe working conditions.
- Third, **increased movements of people and goods** can lead to increased exposure to infectious diseases, through rapid cross-border contamination, disruption of animal habitats and rapid urban growth, which increases exposure to diseases with animal hosts, and unregulated food production and markets (as in case of avian flu).
- Fourth, Trade can also raise the **probability of developing chronic diseases,** through the marketing of unhealthy products, such as tobacco or alcohol, through the promotion of unhealthy behaviours, such as the consumption of trans-saturated fatty acids in fast foods, and through increased environmental degradation.
- Fifth, Trade affects health by **reducing the provision and distribution of health-related goods, services and personnel.**

- For example, extended patent protection may lead to decreased access to medical technologies.
- Another example is the 'trade treaties' which may restrict national governments from investing in or regulating health care.
- Lastly, **relaxed trade rules** can also result in the importation of insufficiently regulated or contaminated goods.

9.4. Summary

In this part of the module, you learnt that health concerns resulting from changing patterns of trade and the global economy are slowly entering the debate about globalization and its benefits. Trade affects the determinants of health and disease by:

- Increasing fluidity of global production to facilitate the transfer of production technologies to poor countries.
- Allowing the labour market 'flexibility,' like in export processing zones (EPZs), which have minimal regulation, antiunion legislation and unsafe working conditions.
- Increasing movements of people and goods leading to increased exposure to infectious diseases, through rapid cross-border contamination, disruption of animal habitats and rapid urban growth, which increases exposure to diseases with animal hosts, and unregulated food production and markets (as in case of avian flu).
- Raising the probability of developing chronic diseases, through the marketing of unhealthy products, such as tobacco or alcohol, and through the promotion of unhealthy behaviours, such as the consumption of trans-saturated fatty acids in fast foods, and through increased environmental degradation
- Relaxing trade rules resulting in the importation of insufficiently regulated or contaminated goods.

We hope that you have understood the trade effects on health and disease outcome. Reflect on them and compare with other readings provided to you. Linking to this section are the health implications and conflict with the world trade organisation agreements with the public health principles to be discussed in the next subsequent section of this module, which is part ten.

9.5. Performance Evaluation: Exercises

Reflection on trade effects on health and disease by exploring other literature and re-think on possible ways of reducing trade effects on health and disease..

Additional Reading

1. Birn A, Pillay Yogan, and Holtz T.H.2009. Textbook of International Health: Global Health in a Dynamic World, 3rd Edition.Oxford University Press
2. Ladou J.2005. World Trade Organization, ILO Convention and workers'Compensation: International Journal of Occupational and Environmental Health 11(2): 210-211

UNIT 10

HEALTH IMPLICATIONS & CONFLICTS OF WORLD TRADE ORGANIZATION (WTO) AGREEMENT WITH PUBLIC HEALTH PRINCIPLES

10.1. Introduction

Unit 10 will be concerned with the health implications and conflicts of the world trade organization (WTO) agreement with public health principles. The first part of this unit will articulate each WTO agreement and its health effects on human populations and environment, while the second part will dwell mainly with the WTO agreement conflict with the public health principles of using **genetically modified organisms (GMOs)** detected as causing a health risk to human populations.

10.2. Objectives

By the end of this Unit, you should be able to:

i. Demonstrate the ability to understand the various types of WTO agreements and their health effects on human populations and environment.
ii. Discuss the nature of these agreements and the extent to which they influence trade with ultimately health effects on populations.
iii. Discuss the WTO agreement conflict with the public health principles relating to the use of genetically modified organisms causing risk to human and animal health

10.3. Health Implications of World Trade Organization (WTO) Agreements

- There are several WTO agreements which directly influence the health of the poor.
- Most prominent is - the 'Agreement on Trade –Related Intellectual Property Rights (TRIPS)'-which protects patented pharmaceuticals, processes and medical technologies.
- TRIPS was enacted in January 1995- stipulates that all WTO member states must abide by patents covering medicines and other technologies, and are issued for minimum period of 20 years.
- It means that, within the period of patent protection, a pharmaceutical manufacturer can only produce patented drugs and technologies with a licence- usually very costly from the patent holder.
- The regulation affects the producers of generic medications in developing countries and the million of people who cannot afford to purchase patent drugs, especially in settings with no domestic pharmaceutical production.

- It means that, within the period of patent protection, a pharmaceutical manufacturer can only produce patented drugs and technologies with a licence- usually very costly from the patent holder.
- The regulation affects the producers of generic medications in developing countries and the million of people who cannot afford to purchase patent drugs, especially in settings with no domestic pharmaceutical production.
- High prices charged by large pharmaceutical companies based on wealthy countries which are protected by TRIPs, drastically limit the availability of life –saving generic ARVs, for example, to millions of people with HIV/AIDS.
- The US bilateral policy on patents, influenced by Big Pharma's quest to curve off generic competition has pursued a similar or even more strict policy through its own trade treaties, called **'TRIPs-plus'** provision.
- High prices charged by large pharmaceutical companies based on wealthy countries which are protected by TRIPs, drastically limit the availability of life –saving generic ARVs, for example, to millions of people with HIV/AIDS.
- The US bilateral policy on patents, influenced by Big Pharma's quest to curve off generic competition has pursued a similar or even more strict policy through its own trade treaties, called **'TRIPs-plus'** provision.
- Examples of such treaties are- **the Central America Free Trade Agreement (CAFTA**) and free trade agreements with Australia and Chile.
- In 2001, opponents of the **Doha Development Round-** charged that proposed new rules of TRIPs- plus and TRIPS were bad for development and interfered with domestic policies- including access to generic drugs- that protect local economies.
- After a careful intense lobbying by the opponents, the Doha Declaration agreed that TRIPS should be implemented in a manner that supports the right of countries- **' to protect public health and to promote access to medicines for all'** in times of emergency.
- The Declaration openly states: " we agree that the TRIPS agreement does not and should not prevent members from taking measures to protect public health" (WTO 2001:1).
- With that statement, countries that declare public health emergencies can overcome patent barriers by granting compulsory licenses for production of generic medicines, or through parallel imports of medicines if they do not have manufacturing capacity.
- The Doha Declaration also extended the deadline for TRIPS compliance for the 30 least developed countries until 2016.
- But, countries without manufacturing capacity are unable to grant compulsory licenses to improve access to drugs.
- Several countries have used the "flexibilities" of the TRIPS Agreement to challenge the high cost of patent-protected drugs.

- For example, in Zimbabwe's government declared a national emergency in 2002. It issued compulsory licenses for import or local production of ARVs, leading to price reductions of 60% to over 90%.
- Mozambique also followed suit in 2006.
- Brazil, India, Kenya, South Africa and Thailand have also employed these provisions.
- Another WTO agreements- is the **'Agreement on Sanitary and Phyto-Sanitary Measures (SPS)'**- allows each country to set its own standards for food and drug safety regulations.
- The agreement requires them to be based on a scientific risk assessment without discriminating between domestic and imported food products.
- Example, Canada, United States and Brazil launched a WTO dispute to compel the EU to permit imports of hormone-treated beef despite EU probihition on this product.
- The EU lost, but its member countries still do not allow these imports and must pay millions euros per year in trade sanctions.
- In effect, the SPS places free trade above human health and safety.

10.3.1. Agreement I: Agreement on Trade-Related Intellectual Property Rights (TRIPS)

Health Effects:

- Extended patent protection limits access to essential medicines.
- Higher resulting cost of drugs drains money from Primary Health care (PHC) and other determinants of health, such as education, nutrition, services etc

10.3.2. Agreement 2: Agreement on Sanitary and Phyto-Sanitary Measures (SPS)

Health Effects:

- Requires scientific risk assessments even though foreign goods cannot be treated differently from domestic goods (i.e. there is no discrimination).
- Such assessment are costly and imperfect, and can affect health.

10.3.3. Agreement 3: Technical Barriers to Trade Agreements (TBT)

Health Effects:

- Requires that any regulatory barrier to the free flow of goods be as " least trade restrictive as possible."
- Many trade disputes over domestic health and safety regulations have invoked this agreement.

- TBT stipulates that all "like products" be treated alike, that all domestic regulations be " least trade restrictive."
- Invoking the agreement arises if a country uses the TBT to charge another country's ban on, for example, asbestos products as being discriminatory since asbestos is a "like product" to glass fibre insulation
- WTO realization on the effects of asbestos on human health, made its decision favouring health over trade.
- Production of asbestos is globally slowly being replaced by other like products on the market with less effects on human health and safety.

10.3.4. Agreement 4: Agreement on Trade Related Investment (TRI) Measures

Health Effects:

- Prohibits governmental abilities to place domestic purchase requirements on foreign investment.
- Such requirements can increase domestic employment, which can be important to improving population health

10.3.5. Agreement 5: Agreement on Government Procurement

Health Effects:

- Limits governmental abilities to use contracts or purchases for domestic economic development, regional equity, employment equity, or other social goals.
- All strongly are linked to better population health.

10.3.6. Agreement 6: Agreement on Agriculture

Health Effects:

- Allows continuation of export and producer subsidies by the United Nations, the EU, Japan and Canada, which depress world prices, costing developing countries hundreds of millions of dollars in lost revenue that could fund PHC, education and other health-promoting services.
- Subsidized food imports from wealthy countries undermine domestic growers' livelihood.
- Market barriers to food products from developing countries persist and deny poor countries trade-related earnings

10.3.7. Agreement 7: General Agreement on Trade in Services (GATS)

Health Effects:

- Locks in privatization levels in committed service sectors.
- Several of which, like health care, education, and environmental services, are important in promoting public health.

- These are frequently prone to market failure.
- That is, private provision often reduces access to services by most poor families and individuals or groups.
- Once a service sector is committed, there is no cost-free way to extend public provision of that service in the future.
- GATS encourages private investment and locks in existing levels of private provision of services, and indirectly creates incentives for foreign investors to lobby for privatization
- GATS treats human services that are key social determinants of health.
- It includes the opening to commercialization of health care and health insurance markets, education sector and even water and sanitation services.
- Any state subsidies for public services, including the care of the poor, can be challenged by other countries and potentially barred.
- Services, such as water, sanitation and education can be sold to the lowest bidder, resulting in increased costs and reduced coverage to those in need.
- Privatization of water has resulted in serious consequence of health outcomes in numerous communities and is a violation to health and human rights.

10.4. WTO's Conflict with Public Health Principles

The conflict is to do with the EU's concern over the agricultural use of **genetically modified organisms (GMOs).**

- Since 1970s, the environmental health field has made growing use of the "precautionary principle" which calls on policymakers to take-preventive anticipatory measures when an activity raises threats of harm to- the environment, wildlife or human health.
- The preventive measures should be considered even if some cause- and –effect relationships are not fully established.
- Invoking the precautionary principle and the need to protect health and environment was pursued.
- For example, the EU and other various European countries banned the import of genetically modified foods (GMOs)in the early 1990s, Arguing that they have not been proven safety for human consumption.
- In contrast, the United States holds that in the absence of scientific evidence based on- **'risk assessment'**- proving that GMOs harm human health, any limit on importing GMOs constitutes an unfair trade barrier.
- In 2003, the US government with support from other countries (i.e. Canada, Argentina, alike) appealed to WTO charging that the EU's use of precautionary principle was inhibiting free trade and harming domestic farmers.

- In 2006, the WTO determined that the EU's 2003 prohibition on import of GMOs created an unnecessary obstacle to international trade.
- As such, the EU has authorized traces of GMOs in its food imports to animal feed, but has not retracted its own ban on GMOs for human consumption.
- The EU maintains facilities across Europe that test imported products for traces of GMOs, particularly those intended for human consumption.
- Despite the WTO's decision, in addition to EU, and various countries including Japan, and Venezuela have moved to ban GMOs regardless of scientific uncertainity.
- On the other hand, The US maintains its argument that banning GMOs hinders global efforts to address starvation and malnutrition.
- Numerous developing countries facing problems of food insecurity, such as Malawi, Mozambique, Zambia and Zimbabwe have also moved to ban GMOs of their own accord.
- Despite the desire to ban GMO food stuffs, many countries, especially in the developing countries continue to import GMO products due to the problem of food insecurity.

10.5. Summary

In this part of the module, we presented to you the various world trade organization (WTO) agreements or regulations called treaties and their effects on health noting that:

- There are several WTO agreements which directly influence the health of the poor.
- The 'Agreement on Trade –Related Intellectual Property Rights (TRIPS)'-which protects patented pharmaceuticals, processes and medical technologies stipulates that all WTO member states must abide by patents covering medicines and other technologies, and are issued for minimum period of 20 years. It means that, within the period of patent protection, a pharmaceutical manufacturer can only produce patented drugs and technologies with a licence- usually very costly from the patent holder. The regulation affects the producers of generic medications in developing countries and the million of people who cannot afford to purchase patent drugs, especially in settings with no domestic pharmaceutical production. Health Effects associated with TRIPS are that extended patent protection limits access to essential medicines. Second, Higher resulting cost of drugs drains money from Primary Health care (PHC) and other determinants of health, such as education, nutrition, services etc
- Agreement on Sanitary and Phyto-Sanitary Measures (SPS) requires scientific risk assessments even though foreign goods cannot be treated differently from domestic goods to state that there is no discrimination. Such assessment are costly and imperfect and can affect health.
- Technical Barriers to Trade Agreements (TBT) requires that any regulatory barrier to the free flow of goods be as " least trade restrictive as possible." TBT stipulates that all "like products" be treated alike, that all domestic regulations be " least trade restrictive." Invoking the agreement arises if a country uses the TBT to charge another country's ban on, for example, asbestos products as being discriminatory since asbestos is a "like product" to glass fibre insulation

- Agreement on Trade Related Investment (TRI) Measures Prohibits governmental abilities to place domestic purchase requirements on foreign investment. Such requirements can increase domestic employment, which can be important to improving population health

- The conflict is to do with the EU's concern over the agricultural use of **genetically modified organisms (GMOs).** Since 1970s, the environmental health field has made growing use of the "precautionary principle" which calls on policymakers to take-preventive anticipatory measures when an activity raises threats of harm to- the environment, wildlife or human health. This principle has been invoked for the reason that it will affect trade ignoring the health effects on people and its ecosystem.

10.6. Performance Evaluation: Exercises

Review the notes and make critics of these agreements

Additional Reading

1. Birn A.M, Pillay Yogan and Holtz T.H. 2009. Textbook of International Health: Global Health in a Dynamic World, 3rd Edition, Oxford University Press
2. Mabika A and Makombe P.2006. Claiming our space: Using the Flexibilities in the TRIPS agreement to protect access to medicine: Policy Series No.16.Harare, Zimbabwe

UNIT 11

ACTIONS AND GLOBALIZED EFFORTS FOR HEALTH EQUALITY

11.1. Introduction

In the previous sessions, we dwelt much on the WTO agreements' implications and the conflict arising with the public health principles of regulating the health risks on populations and environment. This Unit will discuss further the actions and globalized efforts for ensuring health equality.

11.2. Objectives

By the end of the Unit 11 deliberations, you should be able to:

1. Demonstrate the ability of understanding the various actions and globalized efforts for health equality.
2. Discuss key players' involvement in globalization and health improvements
3. Debate and provide critics on government's action on liberal globalization to protect the well-being of populations.

11.3. Governments' Involvement in Globalization and Health Improvement

While globalization has created gross inequalities in wealth and health, it has some beneficial for social justice and public health, such as increased ability of public health activists to communication through internet connection.

For minimizing pressures of liberal globalization, a number of governments have taken concrete measures to protect the well-being of their population.

Various national governments have ensured access to generic drugs or to lower-priced patented drugs through legislation, standing up not only to Big Pharma, but also to pressure from the US government.

Before 2005, India recognized only process patents, not product patents, allowing its pharmaceutical companies to reproduce patented drugs inexpensively.

The Indian House of Parliament also blocked proposed government legislation conforming to the guidelines of the WTO, which India joined in 1995.

Such legislation would have made essential drugs unaffordable for the poor and hurt small farmers by making the price of seeds expensive.

India refused to have any changes in its patent laws dictated by the United States to be against patent laws that suit their "best national interests."

As a result, many medicines in India are significantly cheaper than in many other countries, enabling access to many poor people in the country.

India has also dealt with the pressures of compliance with TRIPS legislation as a matter of aligning international policy with domestic laws regarding patent eligibility.

To obtain a patent in India, companies must demonstrate a high standard of " novelty," i.e. newness

Each new drug must bring significant efficacious benefit to patients beyond that of existing drugs

This approach is one of the most restrictive standards in the world.

One of Pharmaceutical giant of the world charged India for violating TRIPS Agreement.

The court ruled in 2007 that it had led no jurisdiction over the issue and India's policies remained intact

Another action of improvement is that of Brazil who fought to reduce drug prices through other means.

Despite pressure from the US govt in early 2000s, the Brazilian govt interpreted the TRIPS Agreement liberally.

Its intellectual property law includes a provision that unless locally manufactured, pharmaceutical products could be subject to compulsory licensing by the government.

Drug companies have been compelled to substantially lower prices of HIV/AIDS drugs.

Brazil has continued to make expert use of the limited flexibilities within the TRIPS Agreement, together with its own manufacturing capacity- to ensure access to patented pharmaceuticals for its population.

It has used the compulsory licensing clause included in TRIPS as an effective tool for two reasons:

- First, by threatening the industry with issuing compulsory licenses, it has obtained price reductions of patented drugs.
- Second, by actually issuing a compulsory license to manufacture a patented ARV drug domestically.

Brazil now serves as an international role model of how to ensure that the pressures of globalization do not undermine domestic social policies.

There are always rooms for adjustment to serve the interest of each country.

Many countries (like most Asian Countries) have now made changes to the pressures of globalization.

Lesson learned from the above examples of Action Experiences is that governments can change as a result of pressure from globalization.

Second, public participation can and does play a role in setting public policy in democratic societies.

11. 4. Multilateral Agreement on Investment and the Council of Canadian

One success of community and civil society organizing over the power of transnational corporate (TNC) business - is the defeat of the Multilateral Agreement on Investment (MAI) in the 1990s.

The 29 countries of the Organization for Economic Cooperation and Development (OECD)- began secretly negotiating a global investment treaty to grant enormous rights to investors abroad, and to solidify a set of global investment rules.

The global investment rules are designed to impose tight restrictions on what national governments could and could not do in regulating their economies.

Provision of OECD MAI agreements- would open most economic sectors and natural resources to foreign ownership (not subject to environmental laws) that require fair and equal treatment of foreign firms, removal of restrictions against the movement of capital and allowing individual firms to sue foreign governments before an international mediation panel.

It means that the agreement would allow the transnational corporations (TNCs) to have the unrestricted "rights and freedom" to buy, sell, or move their operations whenever or wherever they wanted to around the world without interferences by the national governmental regulations.

Even though TNCs would have had rights equal to nation states in this agreement, there were no corresponding obligations or responsibilities related to- jobs, workers, consumers, or environment.

Community groups in Canada were further organized to protest against secret negotiations for the MAI and succeeded.

MAI proposal was then let down and eliminated.

11.5. Jubilee Movement

Jubilee 2000 debt cancellation campaign begun in the late 1990s to force the G7 countries " to cancel the unpayable debts of the poorest countries by the year 2000 under a fair and transparent process."

The campaign was based on readings from the Old Testament of the Bible, where in a " jubilee" was declared when the slaves were freed and debts were forgiven at the turn of every century.

In total, by the time 2000 arrived there was 24 million signatories to a global petition and campaign in over 60 countries represented by local volunteers consulting with citizens and campaigning within each country and around the world.

Celebrities were included in the campaign which relied on support from President Bill Clinton and UN Secretary General Kofi Annan.

In 2005, US$ 110 billion in debt relief was declared for the 20 most highly indebted countries. The relief was accompanied by conditionalities.

There is now a global Jubilee Debt Campaign made up of many of the original members of the Jubilee 2000 with a network of organizations in many countries.

11.6. 50 Years Is Enough Network

The 50 Years Is Enough Network was founded in 1994 during the 50 anniversary of the formation of the Bretton Woods Institutions.

The aim of the coalition is to transform the World Bank and IMF policies and practices to end the imposition of liberal economic policies and to remake the system of loans to poor countries into a more democratic and transparent process.

It is done by primarily using grassroots activities and community organizing through 65 country partner groups and 200 grassroots, solidarity, faith-based, economic justice, youth, labour, and development membership organizations.

The coalition principles involve changes in the Bretton Woods organizations including completing debt cancellation for the poorest countries, an end to Structural Adjustment policies or programmes (SAPs) and other conditionalities.

These principles also involve changes to ensure transparency in decision processes, corrections of the damage made from past SAPs and those for social and ecological devastation by the World Bank.

50 Years Is Enough is a member of the organizing committee of the World Social Forum (WSF) and actively participates in public forum debates with leaders from the World Bank and IMF.

11.7. World Social Forum (WSF)

The World Social Forum was created in 2001 to counterbalance the effects of the Davos World Economic Forum, which meets every January in Switzerland.

Using the slogan " Another World is Possible," the WSF challenges the liberal economic model as being outdated and harmful to poor people in developing countries.

From its beginning in Porto Alegre, Brazil, the WSF has sponsored annual forums in Asia, the Mediterranean and the United States.

In January 2007, over 75,000 attendees were at the Nairobi conference, followed by the first ever conference in the United States in Atlanta, Georgia.

The fora are informed by the WSF Charter of Principles.

Popular grassroots movements make up most of the membership.

The WSF is – "an open meeting where groups and movements of civil society opposed to liberalism and a world dominated by capital or by any form of imperialism come together to pursue their thinking, to debate ideas democratically, formulate proposals, share their experiences freely and network for effective action."

11.8. NGOs Working on Trade and Health

There are a number of organizations challenging the status quo on trade and health issues.

Global Trade Watch (GTW) was founded in 1995 as part of public citizen.

GTW challenges the current mechanisms of globalization and it promotes government and corporate accountability, performs public education and lobbies the U.S. Congress on behalf of those affected by trade issues.

GTW was a chief organizer of the opposition to WTO meeting in Seattle in 1999.

The other organization is the Centre for Policy Analysis on Trade and Health (CPATH) conducts research, policy analysis and advocacy on trade laws in the interest of improving the health of the communities and population.

CPATH is one of the few public health-oriented NGOs that studies trade laws, analyzes their potential and real effects on public health, and educates the wider community about the global trade regime.

Their overall goal is to advance global economic policies that are democratic, sustainable and economically sound.

11.9. International Labour Standards on Occupational Safety and Health Policy

The International Labour Organization (ILO) –plays an important role in promoting occupational safety and health by promoting uniform policies and standards.

ILO sets minimum standards that have strong ethical and human rights components.

More than half of the 184 conventions adopted by ILO cover issues related to occupational safety and health, which are:

1. No.81 – labour inspection
2. No.87 – freedom of association
3. No. 98 – freedom to organize and bargain collectively
4. No. 105 – freedom from forced labour
5. No. 155 – occupational safety and Health
6. No. 161- occupational health services
7. No. 174- prevention of major industrial accidents

WHO is only responsible for technical aspects of occupational safety and health, such as promotion of medical standards, hygienic standards and examination.

Despite the availability of these standards, or policies, international occupational health and safety is a critically neglected area in international health.

It is also one that has not been substantially improved with an increasingly globalized economy.

With the demonstration of various dimensions having great relationships between globalization and health, places globalization as one of the critical determinant of One health.

11.10. Summary

We hope that you have understood the actions and globalized efforts for health equality of globalization to minimize health risks on people and environment. These are:

- Government's involvement in globalization and health improvement. A number of governments have taken concrete measures to protect the well-being of their population. Various national governments have ensured access to generic drugs or to lower-priced patented drugs through legislation, standing up not only to Big Pharma, a USA regulating authority of patented drugs.
- The global investment rules designed to impose tight restrictions on what national governments could and could not do in regulating their economies, through a multilateral investment agreement.
- International Labour Standards on Occupational Safety and Health Policy have been developed by ILO.
- A number of Non-governmental organizations (NGOs) challenging the status quo on trade and health issues are available. Global Trade Watch (GTW) challenges the current mechanisms of globalization and it promotes government and corporate accountability, performs public education and lobbies the U.S. Congress on behalf of those affected by trade issues.
- World Social Forum (WSF) as an open meeting where groups and movements of civil society opposed to liberalism and a world dominated by capital or by any form of imperialism come together to pursue their thinking, to debate ideas democratically, formulate proposals, share their experiences freely and network for effective action.
- The 50 Years Is Enough Network founded in 1994 aim at transforming the World Bank and IMF policies and practices to end the imposition of liberal economic policies and to remake the system of loans to poor countries into a more democratic and transparent process.
- Jubilee 2000 debt cancellation campaign begun in the late 1990s to force the G7 countries " to cancel the unpayable debts of the poorest countries by the year 2000 under a fair and transparent process

We hope that you have taken note of the progress being made on globalization health improvement. The next final part of this module is concerned with simply the key definitions and the learning points for you to understand the themes outlined in this module adequately.

11.11. Performance Evaluation: Exercises

Reflect and read through the actions and globalized efforts and provide your own analysis on the progress being made by many key players resolving issues of globalization and health improvement

Additional Reading

1. Birn A.M, Pillay Yogan and Holtz T.H. 2009. Textbook of International Health: Global Health in a Dynamic World, 3rd Edition, Oxford University Press
2. Mabika A and Makombe P.2006. Claiming our space: Using the Flexibilities in the TRIPS agreement to protect access to medicine: Policy Series No.16.Harare, Zimbabwe

UNIT 12

KEY DEFINITIONS OF GLOBALIZTION, TRADE AND WORK & LEARNING POINTS

12.1. Introduction

Unit 10 of this module provides a summary of the learning point covered in the previous Units of Globalization and Health topics. It elaborates further the key definitions useful for understanding globalization, trade and work essential for One Health.

12.2. Objectives

By the end of this Unit 12, you should be able to:

i. Explain the key concepts of globalization, trade and work
ii. Provide a summary of the major learning points grasped in globalization and health topics and the extent to which they affect One Health.

12.3. Key Definitions of Globalization, Trade and Work

The following are the key definitions of globalization, trade and work:

- Free Trade Zones: Areas of a country where tariffs and quotas are eliminated and regulations and labour protections are lowered in the hopes of attracting new business and foreign direct investment. Most free trade zones are labour intensive manufacturing centres that involve the import of raw materials and the export of factory products.
- Deregulation: Reduction of the role of the state in goods, services, and labour market.
- Multinational and Transnational Corporation: Enterprises that own, manage, or oversee production and Deliver goods and services in at least two countries.
- Capital: Owners, investors, financial and physical resources.
- Gross National Product (GNP): A measure of national income and output that estimates the value of all goods and services produced includes personal and government expenditures, private domestic investment, export minus imports, as well as net income from assets abroad. GDP, by contrast, does not include income from abroad, which for some countries can be substantial.
- Free Trade: A market model in which trade in goods and services between and within countries flow unhindered by government imposed

restrictions. In reality, most 'trade free' is not truly free, as the government creates regulations and loopholes that favour large enterprises at the expense of small businesses.

- Currency Devaluation: A reduction in the value of a currency with respect to other monetary units, as opposed to inflation, which implies a reduction in the value of a currency in terms of ability to obtain goods and services.
- Tariffs and Duties: A tax on foreign goods upon importation. Tariffs can be a set Amount or a percent of the total value of imports, or be set According to weight or volume.
- Subsidies: Governmental financial assistance, usually in the form of grants, tax breaks, or trade barriers, in order to encourage the production or purchase of goods.
- Liberalization: Policy that allows prices to be determined by market forces, Including exchange rates, interest rates, real wages, lifts barriers to trade and investment, such as tariff barriers; open economies; reduces the subsidies that keep the prices of some essential goods artificially low, so that the price is right, and reflects the actual value of the good in the market.

12.4. Learning Points

The following are some learning points for you to remember about the previous topics covered in the latter six topics on globalization and health as means of understanding the holistic approach of One health:

- Globalization, including financial integration, faster communication, and an internationally mobile labour force, has the potential both to benefit and cause risk to population health.
- Trade liberalization, labour market re-organization, structural adjustment, financial liberalization, and damage on the environment can all harm public health and damage communities alongside animal population.
- Transnational corporations provide employment, but can also harm communities, through exploitation of workers, contamination of the environment, and undemocratic political influence.
- International occupational health and safety is a critically neglected area in global health and one that has not been substantially improved with an increasingly globalized economy.
- Community organizing and advocacy can confront undemocratic and unaccountable global financial and trade institutions and catalyse change for better.
- Neoliberal globalization is associated with unregulated markets and policies that favour growth over economic equity, profit over people, and free trade over fair trade.
- Globalization affects countries to varying degrees of unequality and has direct relevance to health input.
- Finally, free markets, however, have led to increased exposure to infectious diseases, reduction in available generic medications, an inability of governments to regulate harmful products and food, and increased foreign ownership of essential services for public health, e.g. water and sanitation.

12.5. Summary

This is the last part of the module that has provided you with the key definitions and some learning points that can be useful in explaining the concepts around globalization and health. We hope that you have understood them well. Reflect on some of the issues discussed by reading further in other literatures.

12.6. Performance Evaluation: Exercises

Individual reflections on themes and understand them .

Additional Reading

1. Birn A.E., Pillary Yogan., Holtz Timothy H.2009. Textbook of International Health: Global Health in a Dynamic World, third edition, Oxford University Press
2. Labonte R and Schrecker T.2007. Globalization and Social Determinants of Health: the role of the global marketplace. *Globalization & health* 3:6-15
3. Lettieri M.2006. Bolivia's gas nationalization: Morales does the unthinkable-he carries out His campaign pledge_2006/06/27_Morales_Nationalization.html http://www.coha.org

13.0: Module Summary

We are glad that you have successfully completed the fifth module of One Health Medicine and Globalization and Health in the VMM 7722 course. We hope that you are confident and diligent enough to:

(i) Define the key concepts of One Health, human health, animal health, and health and well-being
(ii) Theorize the concept of medical evolution and principles of One Health alongside its history context
(iii) Explain the determinants of health
(iv) Discuss and apply the ecological system and ecosystem health to the concept of One Health approach
(v) Demonstrate the extent to which a problem based learning (PBL) tool can be used for identifying and solving community health problems, through a multidisciplinary One Health approach
(vi) Describe the role of medical anthropology or culture in understanding health and disease outcome in human and animal populations
(vii) Apply behavioural or qualitative research in One Health to provide explanations for the salient issues affecting health and disease
(viii) Define and conceptualize the theories of globalization and their effects on health
(ix) Describe the trade liberalization and the health implications of the world trade organization agreements and the WTO measures of global economy conflicting with the public health principles for ensuring reduction in the health risks.
(x) Debate on the international occupational health and safety as being a critically neglected area in global health and one that has not been substantially improved with an increasingly globalized economy.
(xi) Recognize community organizing and advocacy can confront undemocratic and unaccountable global financial and trade institutions and catalyse change for better.

Just in case you are doubtful on some of the issues highlighted above, please do not hesitate to revise your module again. This module has prepared you to link to other modules covered for the whole One Health Analytical post graduate programme of your course. It will assist you further in the development of your research area in One Health.

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