PRINCIPLES OF HEALTH
EOH 3401
Sem I, 2018/19

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Course Synopsis

- This course covers the concept and definition of health, wellness, disease processes, basic principles and strategies for disease prevention.

- The influence of environmental factors, risk factors, causative agents, lifestyles and behavioural factor; pathophysiology, impact, treatment, prevention and healthcare strategies are discussed by giving examples of infectious diseases, non-infectious diseases, cancer, injury and mental disorders.
Overview of Titles

1. Medicine and Public Health
2. Health and Illnesses.
3. Communicable Diseases
4. Non-communicable Diseases
5. Global trends in Diseases and Illnesses
6. Principal of Prevention and Control
7. Health Indicators
8. Social Determinants of Health
9. Mental Health
10. Malaysian Health Care System
<table>
<thead>
<tr>
<th>Assessments</th>
<th>Percentage (%)</th>
<th>Due Date (by)</th>
</tr>
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<tbody>
<tr>
<td>Mid-term examination (Chapter 1-5)</td>
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<tr>
<td>Continuous Assessments A (Assignment I)</td>
<td>15</td>
<td>26/10/2018</td>
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<tr>
<td>Continuous Assessments B (Assignment II)</td>
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<td>16/11/2018</td>
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<tr>
<td>Continuous Assessments B (Assignment III)</td>
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<td>18/12/2018</td>
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<td>Final Examination (Chapter 6-10)</td>
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Overview of lectures

1. Medicine and Public Health
2. Health and Illnesses.
3. Communicable Diseases
4. Non-communicable Diseases
5. Global trends in Diseases and Illnesses
• The word MEDICINE is derived from the Latinars medicina, meaning - THE ART OF HEALING.

• Medicine has been evolving since thousands of years ago which is believed to be started with ancient Egyptian Medicine (2500 B.C) to modern medicine (1600s)
Modern medicine was revolutionized in the 19th century where science and technology developed and medicine became more reliant upon medications.
PUBLIC HEALTH is the science and art of promoting health, preventing disease, and prolonging life, through organized efforts.

Core function of public health:

1. Diagnostic Function: Monitor population Health Status / Investigate & Diagnose Health Problem
2. Policy Development: For improving and protecting people’s health; health information, education / community empowerment, partnership / Quality of health care
3. Law and regulation enforcement: Assuring appropriate and adequate health services
## Difference Between Public Health & Medicine

<table>
<thead>
<tr>
<th></th>
<th>Public Health</th>
<th>Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patients</strong></td>
<td>Entire population</td>
<td>Individual</td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
<td>Monitor, Investigate &amp; Diagnose Health Problem, Policy development, Law Enforcement, Appropriate Health Services</td>
<td>Medical, Surgical treatment</td>
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<tr>
<td><strong>Process</strong></td>
<td>System management, Service management</td>
<td>Patient management</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>HEALTHY COMMUNITY</td>
<td>HEALING</td>
</tr>
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</table>
Definition of Health

• Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

• Determinants of health
Definition of Wellness

- The conscious and deliberate process by which people are actively involved in enhancing their well-being: intellectual, physical, social, emotional, occupational and spiritual"
Diseases and illness

DISEASES
An abnormal condition affecting an organism. This abnormal condition could be due to infection, degeneration of tissue, injury/trauma, toxic exposure, development of cancer, etc. This is what needs to be ‘cured’, especially if it’s life-threatening.

ILLNESS
The feelings that might come with having a disease. Feelings like pain, fatigue, weakness, discomfort, distress, confusion, dysfunction, etc. – the reasons people seek healthcare – and usually the way people measure their success with treatment.
Illness-Wellness Continuum

Wellness Paradigm
- Awareness
- Education
- Growth

Treatment Paradigm
- Disability
- Symptoms
- Signs

Neutral Point
(No discernable illness or wellness)
Non-Communicable

• A medical condition or disease which is non-infectious and non-transmissible between persons
• Heart disease, hypertension, diabetes, cancer, stroke and arthritis

Communicable

• Diseases that have a potential of transmission from one person or species to another
• Tuberculosis, dengue, malaria, measles, mumps, diphtheria
The web causation model represents the complex group of subjects and relationships that can contribute to occurrences and spread of a disease.
Epidemiologic Triangle Model

- **Agent** - An entity that causes the injury or disease
- **A host** is the human or organism that is susceptible to the agent
- **The environment** are not part of the host or the agent but influence their interaction
• **Definition:** The progression of a disease process in an individual over time, in the absence of treatment.

- Stage of pathologic onset
- Pre-symptomatic stage
- Clinically manifest disease
- Progress to a fatal termination
- Remission and relapses
- Regress spontaneously, leading to recovery
Epidemiology

- The study of the distribution and determinants of health-related states and events in specified populations and the application of this study to the control of health problems.

- Identifying and understanding the distribution of a disease or a health event by;
  1. Persons,
  2. Place and
  3. Time
The Iceberg Concept of epidemiology

For every apparent case of a disease there is a larger population who are at the pre or sub-clinical phase of that disease.
Communicable diseases

• A disease that can be spread to a person from another person, an animal or object. Eg: common cold, influenza, mononucleosis, etc.
A pathogen is an infectious agent ("germ") that causes disease or illness in a host.

Definition of an agent ability:

1. Infectivity: ability of an agent to enter and grow in the host
2. Pathogenicity: capability of an agent to cause disease in a susceptible host
3. Virulence: ability to cause death
## Types of pathogens

<table>
<thead>
<tr>
<th>Type of pathogen</th>
<th>Description</th>
<th>Human diseases caused by pathogens of that type</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bacteria</strong></td>
<td></td>
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<tr>
<td><em>Escherichia coli</em></td>
<td>Single-celled organisms without a nucleus</td>
<td>Strep throat, staph infections, tuberculosis, food poisoning, tetanus, pneumonia, syphilis</td>
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<tr>
<td><strong>Viruses</strong></td>
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<tr>
<td><em>Herpes simplex</em></td>
<td>Thread-like particles that reproduce by taking over living cells</td>
<td>Common cold, flu, genital herpes, cold sores, measles, AIDS, genital warts, chiken pox, small pox</td>
</tr>
<tr>
<td><strong>Fungi</strong></td>
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<td><em>Death cap mushroom</em></td>
<td>Simple organisms, including mushrooms and yeasts, that grow as single cells or thread like filaments</td>
<td>Ringworm, athlete’s foot, tinea, candidiasis, histoplasmosis, mushroom poisoning</td>
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<tr>
<td><strong>Protozoa</strong></td>
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<td><em>Giardia lamblia</em></td>
<td>Single-celled organism with a nucleus</td>
<td>Malaria, “traveler’s diarrhea” giardiasis, trypanosomiasis (“sleeping sickness”)</td>
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Chain of infection

- Infectious agent
- Reservoir
- Susceptible host
- Portal of entry
- Portal of exit
- Mode of transmission
**Mode of infection**

**Direct transmission**  
Immediate transfer of disease agent between infected and susceptible individuals

**Indirect transmission**  
Microbes transferred through contaminated intermediate object/living things

**Droplet Transmission**  
Respiratory droplets carrying infectious pathogens

**Airborne Transmission**  
Dissemination of droplet nuclei containing infectious agents. Dispersed over long distances
Timeline for Infection

- Susceptible host
- Infection
- Latent period
- Infectious period
- Non-infectious period
- Subclinical disease
- Clinical
- Death/recovery
- Incubation

Dynamics of infectiousness

Time
Pattern of Diseases Occurrence

Increasing amount of disease

- Pandemic
- Epidemic
- Endemic
- Sporadic
Types of infectious diseases

- Food and water-borne
- Sexually transmitted diseases (STD)
- Airborne
- Vector-borne
- Nosocomial
Human body protection mechanism

1st Line: Skin, mucous, saliva, tears and stomach acid
2nd Line: White blood cells
3rd Line: Antibodies
Antigens and Antibodies

What’s the difference between the two?

- **Antigens**: a substance that sends your immune system into action when your body is invaded by pathogens. The body sees these as “invaders”.

- **Antibodies**: proteins that attach to antigens, keeping them from harming the body. How our body responds to antigens, by producing antibodies – our body’s “army of soldiers”. 
ACQUIRED IMMUNITY

PASSIVE
NATURAL
E.g. maternal antibodies

ARTIFICIAL
E.g. anti-snake venom serum

ACTIVE
NATURAL
E.g. infection with a virus

ARTIFICIAL
E.g. vaccination
Non-Communicable Diseases

NCDs can refer to chronic diseases which last for long periods of time and progress slowly.
Cardiovascular diseases

Cardiovascular disease is caused by disorders of the heart and blood vessels, and includes:

- coronary heart disease (heart attacks),
- cerebrovascular disease (stroke),
- raised blood pressure (hypertension),
- peripheral artery disease,
- rheumatic heart disease,
- congenital heart disease and heart failure.
Cancer

- Cancer is the uncontrolled growth and spread of cells that arises from a change in one single cell.
- The change may be started by external agents and inherited genetic factors and can affect almost any part of the body.
- The transformation from a normal cell into a tumour cell is a multistage process where growths often invade surrounding tissue and can metastasize to distant sites.
Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin (a hormone that regulates blood sugar) or alternatively, when the body cannot effectively use the insulin it produces.

| Type I                      | Insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes.  
|                            | Develops when the body’s immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose |
| Type II                    | Non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes.  
|                            | Begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. |
| Gestational diabetes       | A form of glucose intolerance that is diagnosed in some women during pregnancy |
| Others                     | Result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses. |
Chronic respiratory diseases (CRDs)

- Diseases of the airways and other structures of the lung.
- Some of the most common are:
  - chronic obstructive pulmonary disease (COPD),
  - asthma,
  - occupational lung diseases and
  - pulmonary hypertension.
- In addition to tobacco smoke, other risk factors include:
  - air pollution,
  - allergen
  - occupational chemicals and dusts, and
  - frequent lower respiratory infections during childhood.
Risk Factors

RISK FACTORS

- Tobacco use
- Alcohol
- Raised blood glucose
- Decreased vegetable & fruit intake
- High blood pressure
- Physical inactivity
- Obesity
- Raised cholesterol
Global Trends in Diseases
Global Trends of diseases
Global trends of disease
Causes of global death

68% NCD
4 main NCD cardiovascular diseases, cancers, diabetes and chronic lung diseases

23% Communicable diseases, maternal, neonatal & nutrition

9% Injuries
What kills more people: infectious diseases or non-communicable diseases?

- Non-communicable diseases were responsible for 68% of all deaths globally in 2012.
- The 4 main NCDs are cardiovascular diseases, cancers, diabetes and chronic lung diseases.
- Communicable, maternal, neonatal and nutrition conditions collectively were responsible for 23% of global deaths,
- Injuries caused 9% of all deaths.
Cardiovascular diseases killed 17.5 million people in 2012 = 3 in every 10 deaths.

- 7.4 million people died of ischaemic heart disease and
- 6.7 million from stroke.
• 28 million of the 38 million of global NCD deaths in 2012 occurred in low- and middle-income countries.

• Proportion of deaths that are due to NCDs;

- High income countries – 87%
- Upper middle-income countries – 81%
- Low-income countries – 37%
- Lower-middle income countries – 57%
Trends of diseases in rich countries

• 7 in every 10 deaths are among people aged 70 years and older.

• People predominantly die of chronic diseases: cardiovascular diseases, cancers, dementia, chronic obstructive lung disease or diabetes.

• Lower respiratory infections remain the only leading infectious cause of death.

• Only 1 in every 100 deaths is among children under 15 years.
Trends of diseases in poor countries

- Nearly 4 in every 10 deaths are among children under 15 years,
- 2 in every 10 deaths are among people aged 70 years and older.
- People predominantly die of infectious diseases: lower respiratory infections, HIV/AIDS, diarrhea diseases, malaria and tuberculosis collectively account for almost one third of all deaths in these countries.
- Complications of childbirth due to prematurity, and birth asphyxia and birth trauma are among the leading causes of death, claiming the lives of many newborns and infants.
Why do we need to know the reasons people die?