PRINCIPLE OF HEALTH
EOH3401
Principle Of Health
EOH3401

FACULTY OF MEDICINE
AND HEALTH
SCIENCES

PROGRAM PENDIDIKAN JARAK JAUH
UNIVERSITI PUTRA MALAYSIA
Penulis modul : 1) Dr. Irniza Rasdi/ Universiti Putra Malaysia

Hak Milik : UPM Education & Training Sdn Bhd

Hak cipta © Universiti Putra Malaysia (UPM)
# TABLE OF CONTENT

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>TITLE</th>
<th>PAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Guidelines</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1. INTRODUCTION</td>
<td>viii</td>
</tr>
<tr>
<td></td>
<td>2. TEACHING SCHEDULE</td>
<td>viii</td>
</tr>
<tr>
<td></td>
<td>3. COURSE OUTLINE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>i. Course title</td>
<td>ix</td>
</tr>
<tr>
<td></td>
<td>ii. Course code</td>
<td>ix</td>
</tr>
<tr>
<td></td>
<td>iii. Course credit</td>
<td>ix</td>
</tr>
<tr>
<td></td>
<td>iv. Pre-requisite</td>
<td>ix</td>
</tr>
<tr>
<td></td>
<td>v. Learning outcome</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>vi. Course synopsis</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>vii. Course content</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>viii. Assessment</td>
<td>xi</td>
</tr>
<tr>
<td><strong>UNIT 1</strong></td>
<td>MEDICINE AND PUBLIC HEALTH</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.1 INTRODUCTION</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.2 MEDICINE</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.3 PUBLIC HEALTH</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1.4 HISTORY OF MEDICINE AND HEALTH IN MALAYSIA</td>
<td>7</td>
</tr>
<tr>
<td><strong>UNIT 2</strong></td>
<td>HEALTH AND ILLNESSES</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>2.1 INTRODUCTION</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2.2 HEALTH</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2.3 WELLNESS</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>2.4 DISEASES AND ILLNESSES</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td>2.5 ILLNESS-WELLNESS CONTINUUM</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>2.6 DISEASES</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>2.7 EPIDEMIOLOGY</td>
<td>23</td>
</tr>
<tr>
<td><strong>UNIT 3</strong></td>
<td>COMMUNICABLE DISEASES</td>
<td>26</td>
</tr>
<tr>
<td>UNIT 4</td>
<td>NON-COMMUNICABLE DISEASES</td>
<td>48</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------</td>
<td>----</td>
</tr>
<tr>
<td>4.1 INTRODUCTION</td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>4.2 COMMON RISK FACTORS</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>4.3 CARDIOVASCULAR DISEASES</td>
<td>51</td>
<td></td>
</tr>
<tr>
<td>4.4 CANCER/TUMOR</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>4.5 DIABETES</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>4.6 CHRONIC RESPIRATORY DISEASES</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>UNIT 5</td>
<td>GLOBAL TRENDS IN HEALTH AND DISEASES</td>
<td>69</td>
</tr>
<tr>
<td>5.1 INTRODUCTION</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>5.2 RICH AND POOR COUNTRIES</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>5.3 CHANGES IN THE PAST DECADE</td>
<td>74</td>
<td></td>
</tr>
<tr>
<td>5.4 TRENDS OF DISEASES IN MALAYSIA</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>UNIT 6</td>
<td>PRINCIPLE OF PREVENTION AND CONTROL</td>
<td>79</td>
</tr>
<tr>
<td>6.1 INTRODUCTION</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>6.2 PRIMARY PREVENTION</td>
<td>81</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>Topic</td>
<td>Page</td>
</tr>
<tr>
<td>------</td>
<td>--------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>6.3</td>
<td>SECONDARY PREVENTION</td>
<td>84</td>
</tr>
<tr>
<td>6.4</td>
<td>TERTIARY PREVENTION</td>
<td>86</td>
</tr>
<tr>
<td>6.5</td>
<td>APPLICATION</td>
<td>87</td>
</tr>
<tr>
<td>6.6</td>
<td>CONTROL</td>
<td>89</td>
</tr>
<tr>
<td>7.1</td>
<td>HEALTH INDICATORS</td>
<td>92</td>
</tr>
<tr>
<td>7.2</td>
<td>RATIO</td>
<td>93</td>
</tr>
<tr>
<td>7.3</td>
<td>PROPORTION</td>
<td>94</td>
</tr>
<tr>
<td>7.4</td>
<td>RATE</td>
<td>94</td>
</tr>
<tr>
<td>7.5</td>
<td>MEASURES OF MORBIDITY</td>
<td>95</td>
</tr>
<tr>
<td>7.6</td>
<td>MEASURES OF MORTALITY</td>
<td>97</td>
</tr>
<tr>
<td>8.1</td>
<td>SOCIAL DETERMINANTS OF HEALTH</td>
<td>101</td>
</tr>
<tr>
<td>8.2</td>
<td>INTRODUCTION</td>
<td>102</td>
</tr>
<tr>
<td>8.3</td>
<td>HEALTHY PEOPLE 2020</td>
<td>103</td>
</tr>
<tr>
<td>8.4</td>
<td>APPROACH IN MALAYSIA</td>
<td>105</td>
</tr>
<tr>
<td>8.5</td>
<td>EDUCATION AND HEALTH</td>
<td>107</td>
</tr>
<tr>
<td>8.6</td>
<td>ECONOMIC, SOCIAL ADVANTAGE AND HEALTH</td>
<td>108</td>
</tr>
<tr>
<td>8.7</td>
<td>HEALTH INEQUALITIES</td>
<td>109</td>
</tr>
<tr>
<td>8.8</td>
<td>THE COMMISSION ON SODH</td>
<td>111</td>
</tr>
<tr>
<td>9.1</td>
<td>MENTAL HEALTH</td>
<td>114</td>
</tr>
<tr>
<td>9.2</td>
<td>MENTAL ILLNESSES</td>
<td>116</td>
</tr>
<tr>
<td>UNIT</td>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>--------------</td>
<td>--------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>UNIT 10</td>
<td>9.3  MENTAL HEALTH APPROACH IN MALAYSIA</td>
<td>124</td>
</tr>
<tr>
<td>UNIT 10</td>
<td>HEALTH CARE SYSTEM IN MALAYSIA</td>
<td>127</td>
</tr>
<tr>
<td>10.1</td>
<td>INTRODUCTION</td>
<td>128</td>
</tr>
<tr>
<td>10.2</td>
<td>PRIMARY HEALTH CARE</td>
<td>130</td>
</tr>
<tr>
<td>10.3</td>
<td>SECONDARY AND TERTIARY HEALTH CARE</td>
<td>135</td>
</tr>
<tr>
<td>10.4</td>
<td>OTHER MEDICAL SERVICES</td>
<td>137</td>
</tr>
<tr>
<td>TEST AND EXAM SIMULALATION</td>
<td></td>
<td>143</td>
</tr>
<tr>
<td>RUJUKAN</td>
<td></td>
<td>146</td>
</tr>
</tbody>
</table>
COURSE GUIDELINE
INTRODUCTION

This course describes and discusses the basic concept of health specifically for human being. Students are encouraged to self-directed and self-motivated learning by using this book as a guideline. This course comprised of 10 chapters. Students will be asked to submit 2-3 assignments throughout the semesters.

TEACHING SCHEDULE

There will be only two face-to-face sessions throughout the semester. The main mode of learning is independent self-learning. Notes and notification will be uploaded via the video on demand (VOD) system.
COURSE OUTLINE

i. Course Title
   
   Principal of Health

ii. Course Code

   EOH3401

iii. Course credit-hours

   3+0

iv. Pre-requisite

   None
v. Learning Outcome

1. Explain the concept of health, wellness and disease, disease prevention and health care (C3, CTPS)
2. Describe the basic epidemiology, pathophysiology basis, treatment and impact of the disease on individuals and society and disease prevention measures. (P3, TS)
3. Distinguish each occurrence of the disease process and the history of the disease and their correlation with disease-causing factors and environment. (A3, CS)

vi. Course Synopsis

This course covers the concept and definition of health, wellness, disease, processes, principles and strategies for disease prevention; the influence of environmental factors, risk factors, causative agents, lifestyles and behavioural factors, patho-physiology, treatment and prevention strategies are discussed by Giving examples of infectious diseases, non-infectious diseases, cancer and mental Disorders.

vii. Course Content

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
viii. **Assessment**

<table>
<thead>
<tr>
<th><strong>g. Course Assessment</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Course assessments are divided into two :</td>
<td></td>
</tr>
<tr>
<td>(i) Course work</td>
<td>40%</td>
</tr>
<tr>
<td>• Assignment 1</td>
<td>15%</td>
</tr>
<tr>
<td>• Assignment 2</td>
<td>15%</td>
</tr>
<tr>
<td>• Assignment 3</td>
<td>10%</td>
</tr>
<tr>
<td>(ii) Mid Term Examination</td>
<td>20%</td>
</tr>
<tr>
<td>(i) + (ii)</td>
<td>60%</td>
</tr>
<tr>
<td>(ii) Final exam</td>
<td>40%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Assessment is changed from time to time depending on the lecturer / instructor during the course.**

**Proposed Schedule and Learning Activities**

1. Face-to-face session 4 hours
2. Self-learning 45 hours/week
3. Tutorial session (4-6 session) 8 – 12 hours
4. Group work 24 hours
5. Online / Email/Telephone/LMS/Online classes with lecturer 10 hours
6. Exercises/Quizzes 5 hours
7. Assignments/Practical and project 20 hours

*Total credit hours* 120 hours
Unit 1 ➔
MEDICINE AND PUBLIC HEALTH

INTRODUCTION

This unit define medicine and public health and the differences between them.

OBJECTIVE

To outline the following areas of concern
1. What is Medicine?
2. What is Public Health
3. History of medical & Health services in Malaysia
4. What is Public Health?
5. History of Medicine and Public Health in Malaysia
1.1 INTRODUCTION

1.1.1 INTRODUCTION

- All human societies have MEDICAL beliefs that provide explanations for:
  a) birth
  b) death, and
  c) diseases

- Throughout history, illness has been attributed to WITCHCRAFT, devil, unpleasant ASTRAL (Planetary) influence, or the will of the GODS.

- These ideas still retain some power, with FAITH HEALING and SHRINES (Place of Worship) still used in some places, although the rise of SCIENTIFIC MEDICINE over the past millennium has altered or replaced mysticism in most cases.

1.2 MEDICINE

1.2.1 DEFINITION OF MEDICINE

- The word MEDICINE is derived from the Latin *ars medicina*, meaning - THE ART OF HEALING.

- It encompasses a variety of health care practices evolved to maintain and restore health by:
  a) preventing disease and damage to the body or mind
  b) treatment of illness

- Modern medicine applies health science, biomedical research, and medical technology to diagnose and treat injury and disease, through
  a) Medication
  b) Surgery
  c) Psycho-therapy
  d) Herbalism
  e) Physiological healing (i.e. Homeopathy)
1.2.2 HISTORY OF MEDICINE

- Medicine has been evolving since thousands of years ago. Following are among the most well-known medicine practiced by trained professionals in ancient times and the beginning of modern medicine.

  a) Ancient **Egyptian** Medicine (2500 B.C)
  b) Classical **Chinese** Medicine (Predecessor to the modern Traditional Chinese Medicine)
  c) Ayur-vedic **Indian** Medicine (Yoga / Herb / Aromatherapy / Music therapy)
  d) **Greek** physician Hippocrates (400 B.C)- the father of Western medicine
  e) Medicine in Ancient **Rome** (by 27 B.C)
  f) Medicine in the middle age (By the 14th Century)
  g) **Islamic** Medicine: Islamic civilization rose to primacy in medical science as Muslim physicians contributed significantly to the field of medicine, including anatomy, ophthalmology, pharmacology, pharmacy, physiology, surgery, and the pharmaceutical sciences.
  h) **Christian Medicine** (Anatomy Lesson of Dr. Nicolaes Tulp" by Rembrandt van Rijn, 1632)
  i) **Modern Medicine** has its roots in the 1600s; during the early seventeenth century the English doctor William Harvey made important advances in medicine by understanding the workings of the human body

1.2.3 HISTORY OF MICROBES RECOVERIES

- Modern medicine has been progressing well and few important microbes which cause diseases in human being were recovered.

<table>
<thead>
<tr>
<th>Year</th>
<th>Microbe</th>
<th>Discoverer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880-82</td>
<td>Typhoid</td>
<td>Carl Joseph Eberth from Germany</td>
</tr>
<tr>
<td>1883</td>
<td>Cholera</td>
<td>Team lead by Robert Kochin Germany</td>
</tr>
<tr>
<td>1884</td>
<td>Tetanus</td>
<td>Arthur Nicholaier from Germany</td>
</tr>
<tr>
<td>1886</td>
<td>Pneumonia</td>
<td>Albert Fraenkel from Germany</td>
</tr>
<tr>
<td>1894</td>
<td>Plague</td>
<td>Shibasaburo Kitasato from Japan and Emile Yersin working at the Pasteur Institute in Indo-China. Both worked independently of the other</td>
</tr>
<tr>
<td>1949</td>
<td>Polio</td>
<td>David Bodian from America identified three different strains of polio virus.</td>
</tr>
</tbody>
</table>
1.2.4 MODERN MEDICINE

- Modern medicine was revolutionized in the 19th. century where science and technology developed and medicine became more reliant upon medications.
- Economic activity grew rapidly during the 18th Century in Western Europe and the Americas. It was the beginning of the Industrial Revolution.
- During the 19th century economic and industrial growth gathered pace; it was also a period of scientific discovery and invention.
- Old ideas of infectious disease epidemiology (incidence, distribution, and control of diseases) made way to virology and bacteriology.
- Microbiology made advances, a science that started with Antonie Philips van Leeuwenhoek (1632 - 1723), who first observed microorganisms with a microscope.
- Enormous developments were made in identifying and preventing illnesses.
- Louis Pasteur (1822-1895), a chemist and microbiologist from France, is known as one of the founders of medical microbiology. He demonstrated that bacteria caused the souring of wine and beer, and later on showed that a similar process occurred in milk. He also explained that by boiling and the cooling a liquid, such as milk, the bacteria could be removed. The process we know as pasteurization comes from his surname.
1.3 PUBLIC HEALTH

1.3.1 WHAT IS PUBLIC HEALTH?

- **PUBLIC HEALTH** is the science and art of promoting health, preventing disease, and prolonging life, through organized efforts for;

  a) the sanitation of the environment (i.e. clean water / safe waste disposal / safe workplace)
  b) the control of communicable and non-communicable diseases,
  c) the education and empowering the individuals about health issues
  d) principles of personal hygiene and
     - healthy behaviors.... Non-risk behaviors
     - the organization of medical services for preventing illness, early diagnosis and treatment of diseases
  e) the development of rule and regulations to ensure a healthy life for every individual

- In public health,
  a) the **health of population** is assessed,
  b) the **problems** related to health in the population is diagnosed,
  c) the **causes** of this problem is analysed, and
  d) the strategies to **cure** the problems is formulated

- Public health is not just treating the illness, but rather preventing the illness of the entire population.

- Some examples of the many field of public health is;
  - Health inspectors
  - Health educators
  - Scientist and Researchers
  - Nutritionist
  - Social workers
  - Epidemiologist
  - Public Health Physicians
  - Public Health nurses
  - Occupational health and safety professionals
  - Public policymakers
  - Health educators
1.3.2 THE CORE FUNCTION OF PUBLIC HEALTH

- The core function of public health are;

  a) **Diagnostic Function**: Monitor population Health Status / Investigate & Diagnose Health Problem

  b) **Policy Development**: For improving and protecting people’s health; health information, education / community empowerment, partnership / Quality of health care

  c) **Law and regulation enforcement**: Assuring appropriate and adequate health services
  - The responsibility of assuring the acceptable, affordable, available and accessible services to where people live and work (i.e. safe and healthy environment)

1.3.3 THE HISTORY OF PUBLIC HEALTH

a) In **Germany** – (1779 -1816 ) - the first major contribution to public health occurred, by proposing governmental regulations and programs to protect the population against diseases.

b) In **England** - (1842):

  - Sewerage, portable water supply, refuse disposal, proper ventilation of residences and places of work, supervision of public works by qualified professionals, and legislative authorization of health measures were put forward.

  - In 1853 –There was a severe outbreak of cholera where 616 people died. John Snow, the physician who eventually linked the outbreak to contaminated water.

c) By mid-20th. Century: Basic Public health Programs had been widely recognized in the industrialized world namely;

  - communicable diseases control,
  - environmental sanitation,
  - maternal and child health services,
  - health education,
  - occupational and industrial hygiene,
  - nutrition.
1.3.4 DIFFERENCES 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</td>
<td>Medical, Surgical treatment</td>
</tr>
<tr>
<td></td>
<td>Policy development</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Law Enforcement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Appropriate Health Services</td>
<td></td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>System management</td>
<td>Patient management</td>
</tr>
<tr>
<td></td>
<td>Service management</td>
<td></td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td>HEALTHY COMMUNITY</td>
<td>HEALING</td>
</tr>
</tbody>
</table>

1.4 HISTORY OF MEDICINE AND HEALTH IN MALAYSIA

1.4.1 HOSPITAL DEVELOPMENT

Hospital was first build by the colonial as early as 16th century.

<table>
<thead>
<tr>
<th>Year</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1514</td>
<td>1st. 2 Hospitals In Malacca were built by Portuguese</td>
</tr>
<tr>
<td>1872</td>
<td>District Hospital in JalanPahang, Kuala Lumpur was built</td>
</tr>
<tr>
<td>1883-1910</td>
<td>General Hospitals were established in all state capitals</td>
</tr>
<tr>
<td>1900</td>
<td>Institute of Medical Research (IMR) was established; to research causes and control of infectious diseases</td>
</tr>
<tr>
<td>1920</td>
<td>Hospital KL was designated as National General Hospital</td>
</tr>
</tbody>
</table>
1.4.2 PUBLIC HEALTH DEVELOPMENT

Public Health begins to develop at late 1800s.

<table>
<thead>
<tr>
<th>Year</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>A &quot;Sanitary Board&quot; was set up in KL by British (Bangsar)</td>
</tr>
<tr>
<td>1957</td>
<td>Permanent Health department was established</td>
</tr>
<tr>
<td>1961-1995</td>
<td>Establishment of Primary health care services &amp; Programs (2 Tier Health Care System)</td>
</tr>
<tr>
<td>1956</td>
<td>Medical &amp; health Services became Federal Gov. Responsibility</td>
</tr>
<tr>
<td>1996-now</td>
<td>Integrating primary health care services – Linking the three levels of health care service in KDs – KKs – Hospitals</td>
</tr>
</tbody>
</table>

1.4.3 MEDICAL EDUCATION

Public Health begins to develop at late 1800s.

<table>
<thead>
<tr>
<th>Year</th>
<th>Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>1st. Medical school was established in University Malaya</td>
</tr>
<tr>
<td>1972</td>
<td>Medical Faculty Universiti Kebangsaan Malaysia was established</td>
</tr>
<tr>
<td>1979</td>
<td>The Universiti Sains Malaysia School of Medical Science was established</td>
</tr>
<tr>
<td>1992</td>
<td>Malaysia’s first private medical and healthcare university</td>
</tr>
<tr>
<td>1997</td>
<td>Faculty Medicine &amp; Health Sciences in UPM was built.</td>
</tr>
</tbody>
</table>

**ACTIVITY 1.1**

(a) Go to the official website of Ministry of Health, find the public health department and learn about their main activities.
Public health concerns about the health of the population and medicine concern about the health of an individual

**KEYWORDS**
- Medicine
- Public Health

**SEMAKAN KENDIRI 1.1**
- Are you able to answer the questions listed in the outline of this unit?

**RUMUSAN**

**EXERCISE 1.1**
1. Discuss the differences between public health and medicine (12 marks)
2. Describe the main activities done by the people working in public health sectors (15 marks)
INTRODUCTION

This unit describe the basic concept of health and illnesses.

OBJECTIVE

To outline the following areas of concern
1. Introduction
2. What is wellness
3. What is wellness?
4. What is diseases and illnesses
5. Understanding the basic concept of epidemiology
2.1 INTRODUCTION

2.1.1 INTRODUCTION

- Good health is of primary importance for human beings.
- People wish for long span of healthy life.
- The definition of health is more than freedom from illness and disease.
- Wellness reflects how people feel about life and their ability to function effectively.
- Many illnesses are manageable and have only limited effect on total health if managed properly.

2.2 HEALTH

2.2.1 DEFINITION OF HEALTH

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

(Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948)

- This definition emphasizes the three keywords for a healthy person:
  a) physical health and well-being
  b) mental health and well-being
  c) social health and well-being
2.2.2 DETERMINANTS OF HEALTH

A multitude of different social, economic and cultural factors determine a person's health. This means that people living in the same community, or people of the same age, can have vastly different chances of good health.

- **Home**: is there clean and safe water and air? Is housing safe and not overcrowded? Is there good sanitation? What are levels of crime like? How safe are roads? Are there jobs with decent working conditions?
- **Genetics**: Some people inherited greater likelihood of certain illnesses.
- **Income**: Higher income is linked with better health.
- **Nutrition**: Food intake determine if people have enough nutrition for health
- **Education**: Education and information determine how people prevent or seek treatment for diseases
- **Relationships with friends and family**: Better support networks are linked with better health.
- **Gender**: Men and women face different diseases at different ages. In many countries, women also face many extra challenges that affect their health.
- **Culture**: customs, traditions and beliefs can all affect health for better or worse.
- **Social status and social exclusion**: People who are excluded, or on the margins of society, have worse health chances.
- **Access to and use of health services**: The availability of good health can prevent and treat poor health?
- **Personal behaviours**: Intake of abusive substances such as alcohol and drugs deteriorate people's health.
2.3 WELLNESS

2.3.1 DEFINITION OF WELLNESS

Wellness defined by Hatfield as:
“The conscious and deliberate process by which people are actively involved in enhancing their well-being: intellectual, physical, social, emotional, occupational and spiritual”.

- Wellness is considered to be the positive component of good health which reflects how one feels as well as one’s ability to function effectively.
- It emphasizes individual responsibility for wellbeing through the practice of health-promoting like style behaviors.
- Wellness is therefore a state to be attained before disease starts or even risk factors set in.
- Wellness also can be promoted and inspired for at any stage of illness so that further progress of disease and deterioration of quality of life is prevented.

Source: Dahlgren, G. and Whitehead, M. (1993) Tackling inequalities in health: what can we learn from what has been tried?
2.3.2 DIMENSION OF WELLNESS

- There are seven dimension of wellness.

(Source: ‘Dimension of Wellness’, Copyright 2008 by Pearson Education, Inc.)

- **SPIRITUAL**
  The ability to establish peace and harmony in lives. A personal dimension that involves possessing a set of guiding beliefs, principles, or values that help give direction to one’s life.

- **PHYSICAL**
  The ability to maintain a healthy quality of life that allows people to get through daily activities without undue fatigue or physical stress. The ability to recognize that some behaviors have a significant impact on wellness and adopting healthful habits (routine check ups, a balanced diet, exercise, etc.) while avoiding destructive habits (tobacco, drugs, alcohol, etc.)
- **EMOTIONAL**
  The ability to manage stress and to express emotions appropriately. Emotional wellness involves the ability to recognize, accept, and express feelings in a productive manner.

- **SOCIAL**
  The ability to interact successfully with people (family, friends and co-workers) and within the environment.

- **ENVIRONMENT**
  The ability to recognize people’s responsibility for the quality of the air, the water and the land. It includes being involved in socially responsible activities to protect the environment. It could involve reducing, reusing, recycling, and conservation practices.

- **OCCUPATIONAL**
  The ability to get personal fulfillment from jobs or any chosen career fields while still maintaining balance in lives.

- **INTELECTUAL**
  The ability to learn and use information effectively for personal, family, and career development. The desire to learn new concepts, improve skills and seek challenges in pursuit of lifelong learning.
2.4 DISEASES AND ILLNESS

2.4.1 DEFINITION OF DISEASES AND ILLNESS

“Disease, is something an organ has; illness is something a man has.”
(Eric J. Cassell, 1978)

- **DISEASE**
  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.

- Feelings of illness can be vastly affected by many non-disease factors, such as expectations, beliefs, fears, feelings/moods, and culture. Being ill is a very personal experience, and can vary tremendously and be affected by very different things between people with the same ‘disease’.

2.4.2 THE RELATIONSHIP BETWEEN DISEASES AND ILLNESS

- ‘Disease’ usually causes ‘Illness’ – Most of the time, a disease will be accompanied by illness. A decrease in feelings of illness can indicate the passing of a disease. However, people can have one without the other.

- ‘Disease’ without ‘Illness’ – It’s not uncommon for a person to have a disease but have no experience of illness. People can have something as simple as high blood pressure, or as serious as a cancer, and not even know it.
- 'Illness' without 'Disease' – 'Somatoform disorders' are those that cause physical symptoms, but no organic cause that can be detected through medical examination. Examples include 'hypochondria' – thinking they have a disease when they don’t.

- 'Illness' can affect 'Disease' – An illness can affect a disease process, and perhaps even start it. For example, if people begin to develop a stomach ulcer because of the H. Pylori bacterium, the pain may cause them a lot of stress. But stress has been shown to cause an increase in stomach acid, and that bacteria thrives in an acidic environment.

- Why is it important?
  A person could feel great after receiving a treatment, while the disease remains in their body.

2.5 ILLNESS – WELLNESS CONTINUUM

- Health is ever changing. The well person usually has some degree of illness and the ill person usually has some degree of wellness.
2.3.1 DEFINITION OF DISEASES

- **Definition:**
  A disease is disorder of structure or function in a human, animal, or plant. This abnormal state causes the organ or body incapable of responding to or carrying on its normally required functions.

- It is often regarded as an illness, sickness or ailment and is often characterized by a typical patient problems (symptoms) and physical findings (signs).

- There is also a failure of the adaptive mechanism to counteract adequately the invasion of the body by a foreign substance resulting in a disturbance in the function or structure of some part of the organism.

- This may be the result of genetic or developmental errors, and/or exposure to infection, poisons, nutritional deficiency or imbalance, toxicity, or unfavorable environmental factors.
Diseases can generally be divided into non-communicable disease and communicable disease.

a) **Non-communicable disease**, or NCD, is a medical condition or disease which is non-infectious and non-transmissible between persons.

b) **Communicable diseases** are diseases that have a potential of transmission from one person or species to another.

<table>
<thead>
<tr>
<th>Non communicable disease</th>
<th>Communicable disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart disease</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Dengue</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Malaria</td>
</tr>
<tr>
<td>Cancer</td>
<td>Measles</td>
</tr>
<tr>
<td>Stroke</td>
<td>Mumps</td>
</tr>
<tr>
<td>Arthritis</td>
<td>Diphtheria</td>
</tr>
</tbody>
</table>

Diseases can also be divided into acute or chronic diseases

a) **Acute disease** – diseases occurrence less than 3 months

b) **Chronic disease** – disease occurrence more than 3 months

**Aetiology**
This is the study of what causes a disease. It is basically how scientists/doctors pinpoint what created the disease in order to better understand how to cure it or prevent it from spreading.

### 2.3.1 WEB OF DISEASE CAUSATION MODEL

- The occurrence and spread of a disease is usually not a simple cause and effect factor. It is usually caused or affected by multiple factors.

- The web causation model represents the complex group of subjects and relationships that can contribute to occurrences and spread of a disease.

- For example, the spread of tuberculosis is usually due to multiple social and medical factors affecting various individuals.

- Interaction between these factors leads to more cases of tuberculosis seen in certain population especially those with pre-disposing factors i.e. migrants, immuno-compromised population
2.3.1 EPIDEMIOLOGIC TRIANGLE MODEL OF DISEASE CAUSATION

- Each factor constantly interacts with the others. When in balance, health is maintained. When not in balance, disease occurs.
A host is the human or organism that is susceptible to the agent. Some human are more susceptible than others. For example;

a) children are more susceptible to some illness compared to adults
b) immuno-compromised patients may be more susceptible to infection.

The susceptibility differs due to various factors as sex, age, race and family history (i.e. genetic profile); immune status (e.g. cancer and AIDS patients).

The response of a host to an agent varies from no effect, sub-clinical disease, mild illness and severe illness.

### Environmental factors
The environment are not part of the host or the agent but influence their interaction.

Environment are influenced by physical, biologic, climatic, social and economic factors.

Example of components in Epidemiologic triangle model of disease causation

<table>
<thead>
<tr>
<th>Host factors</th>
<th>Agent</th>
<th>Environment Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Biologic (bacteria, viruses, parasites)</td>
<td>Physical</td>
</tr>
<tr>
<td></td>
<td>Chemical (poison, alcohol, smoke, lead)</td>
<td>Biologic (extreme conditions e.g winter, floods)</td>
</tr>
<tr>
<td></td>
<td>Physical (trauma, radiation, fire)</td>
<td>Social, political and economic factors</td>
</tr>
<tr>
<td></td>
<td>Medication / allergen (drugs)</td>
<td>- crowded homes, premises, institutions</td>
</tr>
<tr>
<td></td>
<td>Psychological (stress)</td>
<td>- poor restaurant sanitation</td>
</tr>
<tr>
<td>Genetic profile</td>
<td></td>
<td>- occupation (Exposure to chemicals, noise, microbes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- disruption (war, flood)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- socio-economy (poverty, economic downturn, industrialization, urbanization)</td>
</tr>
<tr>
<td>Marital status</td>
<td>Family background</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Previous disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Immune status</td>
<td></td>
</tr>
</tbody>
</table>
2.3.1 NATURAL HISTORY OF A DISEASE

- Definition: The progression of a disease process in an individual over time, in the absence of treatment.

- Enables physicians to anticipate prognosis and to identify opportunities for prevention and control. Example, for patient Type 2 diabetes, Patient may face visual impairment, kidney failure, and possible amputation if she does not take measures to control her disease.

- Understanding the natural history can also tell us roughly the time frame within which we have to intervene to alter the clinical course of her diabetes and prevent the development of more serious consequences.

- **Subclinical phase**: Nearly or completely asymptomatic (no signs or symptoms).

  **Clinical phase**: When symptoms appears. **Post-clinical phase**: When all symptoms disappeared.

- There should be a balance between human factors and environmental factors.
2.7 EPIDEMIOLOGY

2.3.1 INTRODUCTION

- **Definition:** 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:
  - a) Persons,
  - b) Place and
  - c) Time and

- By understanding the distribution of a disease, a programme for prevention of that particular disease may be formulated.

- Diseases and health do not occur at random but have causal and preventive factors.

- Disease causation is multi-factorial and multiple factors interact to create an environment in which the disease occurs.

- Epidemiology focuses on populations rather than individual persons, tissues or organs.

2.3.1 THE ICEBERG CONCEPT OF EPIDEMIOLOGY

- By understanding the natural history of disease, clinicians know that a disease may be initiated by several factors.

- Whether the disease would progress in an individual would depend on the risk and protective factors that are present at the time of initiation or exposure.

- The disease would then go through an ‘invisible’ or in-apparent phase called the sub-clinical phase.

- The duration of this phase varies and would depend on the disease itself and the host’s response.
In the 1960s epidemiologic studies revealed that for every apparent case of a disease there is a larger population who are at the pre or sub-clinical phase of that disease. The term ‘The Iceberg’ was coined during that era to reflect the actual prevalence of an illness in the general population.

**ACTIVITY 1.1**

(a) Choose a disease that you are very familiar of then try to identify what is agent, host and environment factors for that disease.

**KEYWORDS**

- Health and well-being
- Diseases and illnesses
- Epidemiology

**SELF-CHECK 1.1**

- Are you able to explain the difference between health and diseases?
Health is not only the absences of diseases, it involves many aspects of life including social, environment, emotional and spiritual, occupational and intellectual

EXERCISE 2.1

3. Describe by using example the epidemiologic triangle of diseases causation (12 marks)
Unit 3 ➔
COMMUNICABLE DISEASES

INTRODUCTION

This unit describe the definition, and the main types of communicable diseases.

OBJECTIVE

To outline the following areas of concern
1. Introduction
2. Types of communicable diseases
3. Mode of transmission
4. Chain of infection
5. Timelines of infection
6. The body human system
7. Prevention and control
3.1 INTRODUCTION

- **Definition of communicable diseases:** A disease that can be spread to a person from another person, an animal or object. Eg: common cold, influenza, mononucleosis, etc.

- Also known as infectious diseases which are caused by germs or pathogens.

- A pathogen is an infectious agent (“germ”) that causes disease or illness in a host.

- Definition of an agent ability:
  a) **Infectivity:** ability of an agent to enter and grow in the host
  b) **Pathogenicity:** capability of an agent to cause disease in a susceptible host
  c) **Virulence:** ability to cause death

- The host is the organism in which a parasite or pathogen does damage (e.g. human, animals).

- When pathogens enter a healthy body through infected food and water, air, contact or insects, they multiply and upset the normal functioning of the body, thus, producing the symptoms of the diseases.

- Uncontrolled communicable diseases will lead to diseases outbreak which kills thousands of people and threaten the world population.
3.2 BIOLOGICAL AGENTS

**Pathogens**
Any agent causing disease. Usually a living microorganism. Capable of producing infection. Poisons like Arsenic would be excluded.

**VIRUSES**
- Multi-celled but can only reproduce inside a plant, animal, or person.
  - Hepatitis
  - Herpes, Mono
  - Warts
  - Chicken Pox
  - Small Pox
  - Bird Flu H5N1
  - Norovirus
  - Yellow Fever
  - Ebola Hemorrhagic Fever

**BACTERIA**
- Tiny one-celled creatures
- Can live inside or outside the body.
  - Tuberculosis
  - Pneumonia
  - Anthrax
  - Urinary Tract Infection
  - Staph
  - Peritonitis
  - E.Coli
  - Strep Throat
  - Typhoid
  - Stomach Ulcers
  - Salmonella
  - Tularemia
  - Morgellons?
  - Lyme Disease

**FUNGI**
- Multi-celled but plant-like similar to tree fungus.
- Takes nutrition from a plant, tree, or animal.
  - Ringworm
  - Adv Pneumonia
  - Candidiasis
  - Yeast Infection
  - Histoplasmosis
  - Cryptococcosis

**PROTOZOA**
- One-celled creatures.
- Usually spread through water.
  - Malaria
  - Giardiasis
  - Chagas Disease
  - Cryptosporidiosis

**PARASITES**
- Actual complex living organism.
- Can live in intestinal tract or blood stream.
  - Round Worm
  - Tape Worm
  - Morgellons?
  - Trichinosis

**PROTEIN**
- Multi-celled but can only reproduce inside a plant, animal, or person.
  - BSE Mad Cow Disease
  - vCJD Disease

Incomplete list gathered from various medical books.
3.3 CHAIN OF INFECTION

3.3.1 INTRODUCTION

- Chain of infection: A step by step model to conceptualize the transmission of a communicable disease from its source to a susceptible host.

- Infectious agent: A pathogen that causes diseases.

- Reservoir: The habitat in which the agent normally lives, grows, and multiplies (e.g. Human, animals, and environment).

- Portal of exit: The site from where an agent leaves the reservoir to enter another host and cause disease/infection. Example, the agent may leave a reservoir through its nose and mouth.

- Mode of transmission: How the agent is transmitted from a host to another host. It bridges the gap between the portal of exit from the reservoir and the portal of entry into the host.

- Portal of entry: the site through which an agent enters the susceptible host and cause the host disease/infection.
3.3.2 MODE OF TRANSMISSION

- Mode of transmission can be divided into two main types

a) Direct transmission
   - Immediate transfer of disease agent between infected and susceptible individuals
   - Examples
     - Contact with blood or other body fluids
     - Ungloved contact with a scabies-infested patient
     - Ungloved contact with wounds or mucous membranes

b) Indirect transmission
   - Microbes transferred through contaminated intermediate object/living things
   - Examples
     - Healthcare personnel not performing adequate hand hygiene between patients
     - Sharing medical equipment without cleaning or disinfection between patients
     - Defective medical equipment allowing for inadequate disinfection or sterilization

c) Droplet Transmission
   - Respiratory droplets carrying infectious pathogens
   - Generated during coughing, sneezing, talking, or certain medical procedures (e.g. suctioning)
   - Droplets traditionally defined as > 5 µm
   - Typically refers to distances within 3 feet of infected patient

d) Airborne Transmission
   - Dissemination of droplet nuclei containing infectious agents
   - Dispersed over long distances
   - Face-to-face contact not required
   - Special ventilation systems are required to prevent airborne transmission

- Example:
  Agent (cold/flu virus), leaves reservoir (throat of infected person), when host sneezes (portal of exit-nose and mouth). Direct transmission (saliva droplets) enter respiratory tract of susceptible host at close range (portal of entry-mouth). New infection possibly established.

- If one link is missing, then the chain is broken
3.4 NATURAL HISTORY OF DISEASES

- Natural history of disease refers to the progression of a disease process in an individual over time, in the absence of treatment.
- For example, untreated infection with HIV causes a spectrum of clinical problems beginning at the time of seroconversion (primary HIV) and terminating with AIDS and usually death.

**Timeline for Infection**

- **Latent period**: Time interval from infection to development of infectious (note: this definition differs from that used for non-infectious diseases).
- **Infectious period**: Time during which the host can infect another host
- **Incubation period**: Time from infection to development of symptomatic disease
- **Symptomatic/Clinical period**: A period in which symptoms of the disease are present
- **Subclinical period**: A period in which the person is infected but still no symptoms.
- It can also be applied for non-communicable diseases
3.5 PATTERN OF DISEASES OCCURRENCE

- **Level of Disease** is amount of a particular disease that is usually present in a community.

- **Sporatic** is the cases that occur irregularly, haphazardly from time to time, and generally infrequently. The cases are few and separated widely in time and place. It show no or little connection with each other, nor a recognizable common source of infection e.g. polio, meningococcal meningitis, tetanus.

- **Endemic** refers to the constant presence of a disease or infectious agent within a given geographic area or population group. It is the usual or expected frequency of disease within a population (En = in; demos = people).

- **Epidemic** is the unusual occurrence in a community of disease, specific health related behavior, or other health related events clearly in excess of expected occurrence (epi= upon; demos= people).

- **Pandemic** is an epidemic usually affecting a large proportion of the population, occurring over a wide geographic area such as a section of a nation, the entire nation, a continent or the world e.g. Influenza pandemics.

- **Propagated epidemic** is an outbreak in which the disease propagates in one or more initial cases and then spreads to others, a relatively slow method of spread. It often involves vectors or carriers.
3.5.1 FOOD AND WATER BORNE DISEASES

- Infectious diseases caused by contamination of food and/or water with certain bacteria, viruses or parasites.
- A person can come into contact with food or water-borne bacteria by eating or drinking something that has pathogen in it.
- The onset of symptoms may occur within minutes to weeks and often presents itself as flu-like symptoms, as the ill person may experience symptoms such as nausea, vomiting, diarrhea, or fever.
- Those at greater risk are infants, young children, pregnant women and their unborn babies, older adults, and people with weakened immune systems.
- The greatest common of food- and water-borne illnesses to be from among the following bacteria:
  a) **Salmonella**: bloody diarrhea, fever, headache, lack of energy
  b) **Shigella**: blood or mucus in the stool
  c) **E.coli**: bloody diarrhea.
  d) **C. parvum**: watery diarrhea, crampy stomach pain
  e) **Cholera**: About 5 percent of people who come into contact with Cholera may develop severe diarrhea, vomiting and leg cramps.
3.5.2 SEXUALLY TRANSMITTED DISEASES (STDs)

- Infections that are most commonly passed through sexual contact:
  a) Oral
  b) Vaginal
  c) Anal
  d) Skin-to-skin

- In order for transmission to occur, it is necessary to have:
  a) A body fluid with the germ in it
  b) A way of spreading the germ from one person to another

- Body fluid – semen, vaginal fluid, blood, saliva, tears, sweat.

- High risk method of transmission - Sexual Intercourse (vaginal, anal, oral), blood-to-blood contact, sharing needles or other drug-use equipment, tattoo or body piercing and infected mother to her baby.

- Chlamydia is the most STD followed by gonorrhea, syphilis, genital herpes, hepatitis B, human papilloma virus (HPV), HIV, pubic lice ad scabies,

- Contact Diseases are transmitted when an infected person has direct bodily contact with an uninfected person and the microbe is passed from one to the other.

- It can also be spread by indirect contact with an infected person’s environment or personal items.

- The presence of wound drainage or other discharges from the body suggest an increased potential for risk of transmission and environmental contamination.

- The common direct contact diseases include the following; 
  a) Lice
  b) Scabies
  c) Anthrax
  d) Rabies
  e) Hand, foods and mouth diseases

### Sign and symptoms of STDs

<table>
<thead>
<tr>
<th>MEN</th>
<th>WOMEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groin Pain</td>
<td>Milky discharge</td>
</tr>
<tr>
<td>Burning during urination</td>
<td>Burning during urination</td>
</tr>
<tr>
<td>Milky discharge</td>
<td>Lower abdominal/back pains</td>
</tr>
<tr>
<td>Irritation around opening of penis</td>
<td>Nausea and Fever</td>
</tr>
<tr>
<td>Testicular pain/swelling</td>
<td>Painful intercourse</td>
</tr>
<tr>
<td>Sore Throat</td>
<td>Spotting between periods</td>
</tr>
<tr>
<td>Anal Itching</td>
<td>Sore throat/Anal Itch</td>
</tr>
</tbody>
</table>
3.5.4 AIRBORNE DISEASES

- Airborne diseases are those caused by pathogens and transmitted through the air as very small, or aerosolized particles.
- Disease-causing pathogens are organisms that spread from an infected person to another through coughing, talking and sneezing - even breathing and laughing.
- Airborne pathogens or allergens often cause inflammation in the nose, throat, sinuses and the lungs.
- There are three main types of organisms that can cause airborne diseases, including viruses, bacteria, and fungi. Some examples of airborne diseases include the flu, tuberculosis, and valley fever.
- The common airborne diseases are as follows:
  a) Anthrax (inhalational),
  b) Chickenpox,
  c) Influenza,
  d) Smallpox,
  e) Tuberculosis.

3.5.4 VECTOR BORNE DISEASES

- **Vector**: A host that carries a pathogen without injury to itself and spreads the pathogen to susceptible organisms.
- Vectors are insects (mosquitoes, ticks, fleas, black flies and sandflies) that carry infectious agents such as protozoa, bacteria and viruses and transmit numerous diseases to humans.

<table>
<thead>
<tr>
<th>Diseases</th>
<th>Vector</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>Anopheles mosquito.</td>
<td>Bites from infected mosquitoes</td>
</tr>
<tr>
<td>Japanese Encephalitis</td>
<td>Mosquitoes - Culex</td>
<td>Bites from infected mosquitoes</td>
</tr>
<tr>
<td>Plague</td>
<td>Fleas</td>
<td>Bites from infected fleas</td>
</tr>
<tr>
<td>Filariasis</td>
<td>Culex, Mansonia, Anopheles mosquitoes</td>
<td>Bites from infected mosquitoes</td>
</tr>
<tr>
<td>Chikungunya</td>
<td>Aedes mosquitoes</td>
<td>Bites from infected mosquitoes</td>
</tr>
<tr>
<td>Lyme diseases</td>
<td>Ticks</td>
<td>Bites from infected mosquitoes</td>
</tr>
<tr>
<td>Dengue</td>
<td>Aedes mosquitoes</td>
<td>Bites from infected mosquitoes</td>
</tr>
</tbody>
</table>
3.5.5 NOSOCOMIAL INFECTIONS

- Infection acquired by the person in the hospital, manifestation of which may occur during hospitalization or after discharge from hospital.

- Common in high risk patients for example, debilitated patients and patients with devitalized tissues by injuries or operation.
- The incidence can be reduced by antiseptic, prophylactic immunization and use of antibiotics.
- The main mode of transmission is by direct contact and contaminated vehicles, including surgical instruments especially during endoscopic procedures.
### 3.7 HUMAN BODY PROTECTION MECHANISM

#### 3.6.1 HUMAN BODY IMUNE SYSTEM

- The Immune System is a combination of body defenses made up of cells, tissues, and organs that fight pathogens in the body.

- Basic vocabulary:
  a) **Antibody**: a protein produced by the white blood cells in human immune system to tag and destroy invasive microbes.
  b) **Antibiotic**: various chemicals produced by certain soil microbes that are toxic to many bacteria. Some we use as medicines.
  c) **Antigen**: any protein that our immune system uses to recognize “self” vs. “not self.”

- Human has **THREE** lines of defense mechanism;
  d) Skin, mucous, saliva, tears and stomach acid
  e) White blood cells
  f) Antibodies

- **First line defense mechanism**
  a) **Skin** – acts as a protective barrier
  b) **Mucous Membranes** – line the mouth, nose, throat, eyes and other body parts. These trap germs. Coughing and sneezing gets rid of the germs trapped by these mucus membranes.
  c) **Saliva** – contains enzyme that destroy many harmful organisms.
  d) **Tears** – wash away germs. Contains enzymes that kill some harmful organisms.
  e) **Stomach Acid** – acid kills many germs

- **Second line defense mechanism**
  a) When invaders (pathogen) get within the body, then the white blood cells (WBCs) begin their attack
  b) WBCs normally circulate throughout the blood, but will enter the body's tissues if invaders are detected.
  c) These white blood cells are responsible for eating foreign particles (pathogen) by engulfing them.
3.6.2 WHAT IS IMMUNITY?

- **Definition of Immunity**: Resistance to a disease causing organism or harmful substance

- **There are two types of immunity**
  a) Active Immunity - The body produced the antibody.
  b) Passive Immunity - The body do not produce the antibody

- **Active immunity**
  a) **Natural**: The body has been exposed to the pathogen in the past (infection), fought it, produce antibodies, recovered from the illnesses and save into the memory. The next time, the body exposed to the same pathogen, it already has the antibodies to fight the disease. At this stage, the body has become immune to the pathogen.
b) **Artificial**: The best example is vaccine. Vaccine is a killed or weakened pathogen that has been deliberately introduced into the human body. Minimal symptoms of disease will occur because the pathogen is weak or killed. The human body will produce antibodies to fight the pathogen. Next time, when human body exposed to the same pathogen, these antibodies will attack the pathogen and defense the body.

- **Passive immunity**
  
  a) **Natural**: maternal antibodies are transferred to the fetus through the placenta.
  
  b) **Artificial**: antibodies against a particular infectious agent are given directly to a sick human

Sources: https://bigpictureeducation.com/long-term-protection
3.7.1 E-COLI FOOD POISONING

- E. coli is a type of bacteria that normally live in the intestines of people and animals. However, some types of E. coli, particularly E. coli 0157:H7, can cause intestinal infection.

- Symptoms of intestinal infection generally begin between 1-5 days after being infected with E. coli. Symptoms can include:
  a) abdominal cramping
  b) sudden, severe watery diarrhea that may change to bloody stools
  c) gas
  d) loss of appetite/nausea
  e) vomiting (uncommon)
  f) fatigue
  g) fever

- Symptoms can last anywhere from a few days to more than a week.

- Common causes of food poisoning
  a) failing to wash hands completely before preparing or eating food
  b) using utensils, cutting boards, or serving dishes that aren’t clean, causing cross-contamination
  c) consuming dairy products or food containing mayonnaise that have been left out too long
  d) consuming foods that haven’t been stored at the right temperature
  e) consuming foods that aren’t cooked to the right temperature
  f) consuming raw seafood products
  g) drinking unpasteurized milk
  h) consuming raw produce that hasn’t been properly washed
3.7.2 CLAMYDIA

- Chlamydia is a sexually transmitted infection caused by the bacterium Chlamydia trachomatis.
- It is the most common sexually transmitted bacterial infection.
- Usually, chlamydia has no symptoms. Most people are not aware that they have the infection especially women.
- Symptoms may begin in as little as 5 to 10 days after the infection.
- Chlamydia is spread by vaginal and anal intercourse. Rarely, it is spread during oral sex or by touching your eye with your hand. It can also spread from a woman to her fetus during birth. Chlamydia is not passed through casual contact.

When women have chlamydia symptoms, they may experience
  a) abdominal pain
  b) abnormal vaginal discharge
  c) bleeding between menstrual periods
  d) low-grade fever
  e) painful intercourse
  f) pain or a burning feeling while urinating
  g) swelling inside the vagina or around the anus
  h) the urge to urinate more than usual
  i) vaginal bleeding after intercourse
  j) a yellowish discharge from the cervix that may have a strong smell

When men have symptoms, they may experience
  a) pain or a burning feeling while urinating
  b) pus or watery or milky discharge from the penis
  c) swollen or tender testicles
  d) swelling around the anus

In both women and men, chlamydia may cause the anus to itch and bleed. It can also result in a discharge and diarrhea.

If chlamydia infects the eyes, it may cause redness, itching, and a discharge. If chlamydia infects the throat, it may cause soreness.

Chlamydia symptoms may only appear in the morning and may be mild, especially for men. That's why many people do not realize they have an infection.
3.7.3 SCABIES

- Scabies is caused by a mite (like a tiny insect) called *Sarcoptes scabiei*. The mite is a parasite, meaning it lives off the host (a human) with no benefit to the host. The mite lives on the skin and burrows into it.

- Scabies is spread to others through close skin-to-skin contact because the scabies mite cannot jump or fly. Most cases of scabies are probably caught from prolonged hand-holding with an infected person. The hand is the most common site to be first affected.

- Symptoms of scabies includes;
  a) Itching. This is the main symptom of scabies. This is often severe and tends to be in one place at first (often the hands), and then spreads to other areas.
  b) Mite tunnels (burrows). These may be seen on the skin as fine, dark, or silvery lines about 2-10 mm long.
  c) Rash. It is typically a blotchy, lumpy red rash that can appear anywhere on the body.
  d) Scratching. Scratching due to intense itching can cause minor skin damage. In some cases the damaged skin becomes infected by other germs (bacteria).
  e) Aggravation of pre-existing skin conditions. Scabies can worsen the symptoms of other skin conditions, particularly itchy skin problems such as eczema, or problems such as psoriasis.
3.7.4 HIV/AIDS

- HIV stands for human immunodeficiency virus. It kills or damages the body's immune system cells.

- AIDS stands for acquired immunodeficiency syndrome. It is the most advanced stage of infection with HIV.

- Unlike some other viruses, the human body can’t get rid of HIV completely. So once a person has HIV, he has it for life.

- This damage to the immune system makes it harder and harder for the body to fight off infections and some other diseases. Opportunistic infections or cancers take advantage of a very weak immune system.

- Stages of HIV (3 stages)
  a) Acute HIV infection
  b) Clinical latency (HIV inactivity or dormancy)
  c) Acquired immunodeficiency syndrome (AIDS)

- Symptoms:
  a) Some people may experience a flu-like illness within 2 to 4 weeks after infection (Stage 1 HIV infection). But some people may not feel sick during this stage.

  b) Flu-like symptoms include fever, chills, rash, night sweats, muscle aches, sore throat, fatigue, swollen lymph nodes, or mouth ulcers. These symptoms can last anywhere from a few days to several weeks.

- HIV is not spread easily. Only certain body fluids from a person who has HIV can transmit HIV:
  a) Blood
  b) Semen (cum)
  c) Pre-seminal fluid (pre-cum)
  d) Rectal fluids
  e) Vaginal fluids

- These body fluids must come into contact with a mucous membrane or damaged tissue or be directly injected into your bloodstream (by a needle or syringe) for transmission to occur.

- Most commonly, people get or transmit HIV through sexual behaviors and needle or syringe use.
3.7.5 TUBERCULOSIS

- Tuberculosis (TB) is caused by a bacterium called Mycobacterium tuberculosis.

- The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain.

- Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist: latent TB infection (LTBI) and TB disease.

- If not treated properly, TB disease can be fatal.

- **Modes of transmission:**
  TB bacteria are spread through the air from one person to another. The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, speaks, or sings. People nearby may breathe in these bacteria and become infected.

- People cannot get TB from clothes, drinking glass, eating utensils, handshake, toilet and other surfaces.
3.7.6 Dengue

- Dengue is a mosquito-borne viral disease.
- Dengue virus is transmitted by female mosquitoes mainly of the species Aedes aegypti and, to a lesser extent, Ae. albopictus. This mosquito also transmits chikungunya, yellow fever and Zika infection.
- Dengue is widespread throughout the tropics, and influenced by rainfall, temperature and unplanned rapid urbanization. Typically, dengue occurs in areas that have a combination of:
  a) a warm and humid climate
  b) overcrowding and major urban centres
Symptoms typically begin three to fourteen days after infection. This may include a high fever, headache, vomiting, muscle and joint pains, and a characteristic skin rash. Recovery generally takes less than two to seven days.

Dengue is spread through the bite of the female mosquito (vector).
Communicable diseases can be spread from one another through different mode of transmission. Each disease has its own timeline of infection which may differ from a few minutes to few weeks.

**KEYWORDS**

- Nature of disease
- Chain of infection
- Immunity

**SELF-CHECK 1.1**

- Do you know the mode of transmission for the common types of infectious diseases?

**EXERCISE 2.1**

1. Describe the 4 main mode of diseases transmission by giving examples (12 marks)
Unit 4 \text{\(\Rightarrow\)} NON-COMMUNICABLE DISEASES

INTRODUCTION

This unit describes the definition, and the main types of non-communicable diseases.

OBJECTIVE

To outline the following areas of concern
1. Introduction
2. Major types of non-communicable diseases
3. Common risk factors for NCDs
4.1 INTRODUCTION

- A non-communicable disease (NCD) is a medical condition or disease that is non-infectious or non-transmissible.
- NCDs can refer to chronic diseases which last for long periods of time and progress slowly.

- Types of NCDs
  a) Cardiovascular disease (e.g., Coronary heart disease, Stroke)
  b) Cancer
  c) Chronic respiratory disease
  d) Diabetes
  e) Chronic neurologic disorders (e.g., Alzheimer's, dementias)
  f) Arthritis/Musculoskeletal diseases
  g) Unintentional injuries (e.g., from traffic crashes)

- The 4 main types of non-communicable diseases are;

  ![The 4 major categories of non-communicable diseases (NCDs)](source)


- Non-communicable diseases, or NCDs, are by far the leading cause of death in the world, representing 63% of all annual deaths.

- Most are not caused by germs but breakdown in body cells and tissues

- Basic characteristics of NCDs are;
  a) Complex etiology (causes) with multiple risk factors
  b) Diseases of long duration and generally slow progression
  c) Rarely resolve spontaneously
  d) Generally not cured by medication or prevented by vaccine but can be controlled.
  e) Some chronic illnesses causes permanent disability but is preventable.
4.2 COMMON RISK FACTORS

- The common risk factors for NCDs are:

  ![Diagram of NCD risk factors]

  Source: [http://wellnesssrilanka.com/ncd.html](http://wellnesssrilanka.com/ncd.html)

- **Modifiable risk factors:**
  - A behavioral risk factor that can be reduced or controlled by intervention, thereby reducing the probability of disease.
  - WHO has prioritized the following four:
    a) Physical inactivity
    b) Tobacco use
    c) Alcohol use, and
    d) Unhealthy diets (increased fat and sodium, with low fruit and vegetable intake).

- **Non-modifiable risk factors:**
  - A risk factor that cannot be reduced or controlled by intervention; for example:
    a) Age,
    b) Gender,
    c) Race, and
    d) Family history (genetics).
4.3 CARDIOVASCULAR DISEASES

- Cardiovascular disease (CVD) is a group of disorders of the heart and blood vessels, and may include:

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary heart disease</td>
<td>Disease of the blood vessels supplying the heart muscle</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>Disease of the blood vessels supplying the brain</td>
</tr>
<tr>
<td>Stroke</td>
<td>Disease of the blood vessels supplying the brain</td>
</tr>
<tr>
<td>Peripheral arterial disease</td>
<td>Disease of blood vessels supplying the arms and legs</td>
</tr>
<tr>
<td>Congenital heart disease</td>
<td>Malformations of heart structure existing at birth</td>
</tr>
</tbody>
</table>
**Symptoms can include:**
- a) Chest pain (angina)
- b) Shortness of breath, Pain, numbness, weakness or coldness in your legs or arms if the blood vessels in those parts of your body are narrowed
- c) Pain in the neck, jaw, throat, upper abdomen or back.

**Other symptoms include sudden onset of:**
- a) numbness of the face, arm, or leg, especially on one side of the body;
- b) confusion, difficulty speaking or understanding speech;
- c) difficulty seeing with one or both eyes;
- d) difficulty walking, dizziness, loss of balance or coordination;
- e) severe headache with no known cause; and
- f) fainting or unconsciousness.

<table>
<thead>
<tr>
<th>Heart diseases</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart attack</td>
<td>A heart attack occurs when the blood flow to a part of the heart is blocked by a blood clot. If this clot cuts off the blood flow completely, the part of the heart muscle supplied by that artery begins to die.</td>
</tr>
<tr>
<td>Ischemic stroke</td>
<td>The most common type happens when a blood vessel that feeds the brain gets blocked, usually from a blood clot. When the blood supply to a part of the brain is shut off, brain cells will die. The result will be the inability to carry out some of the previous functions as before like walking or talking.</td>
</tr>
<tr>
<td>Heart failure</td>
<td>This doesn't mean that the heart stops beating. The heart isn't pumping blood as well as it should. The heart keeps working, but the body's need for blood and oxygen isn't being met.</td>
</tr>
<tr>
<td>Arrhythmia:</td>
<td>This is an abnormal rhythm of the heart. There are various types of arrhythmias. The heart can beat too slow, too fast or irregularly.</td>
</tr>
</tbody>
</table>

**Risk factors for CVD**
- a) high blood pressure (hypertension)
- b) smoking
- c) high blood cholesterol
- d) diabetes
- e) lack of exercise
- f) being overweight or obese
- g) a family history of heart disease
- h) ethnic background
4.4 CANCER/TUMOR

- **DEFINITION:**
  a) Cancer is the uncontrolled growth and spread of cells that arises from a change in one single cell.
  
b) The change may be started by external agents and inherited genetic factors and can affect almost any part of the body.
  
c) 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.

**TWO TYPES OF TUMOR**

<table>
<thead>
<tr>
<th>Benign Tumours (necancerous)</th>
<th>Malignant Tumours (cancerous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enclosed in a fibrous shell or capsule.</td>
<td>Not usually contained – metastasis</td>
</tr>
<tr>
<td>Take up space</td>
<td>Invade and emit claw-like protrusions that disrupt the RNA and DNA of normal cells (these cancerous cells act like a virus).</td>
</tr>
<tr>
<td>Concerned if they interfere with surrounding tissues or vessels or impede the function of the body.</td>
<td></td>
</tr>
</tbody>
</table>

**Malignant versus Benign Tumors**

- Benign (not cancer) tumor cells grow only locally and cannot spread by invasion or metastasis.
- Malignant (cancer) cells invade neighboring tissues, enter blood vessels, and metastasize to different sites.
TYPES OF CANCER

<table>
<thead>
<tr>
<th>Types</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lymphomas</td>
<td>Cancers of the immune system</td>
</tr>
<tr>
<td>Leukemia</td>
<td>Cancers of the blood forming organs</td>
</tr>
<tr>
<td>Carcinomas</td>
<td>Cancers of the glands and body linings, including the skin and the linings of the digestive tract and lungs</td>
</tr>
<tr>
<td>Sarcomas</td>
<td>Cancers of connective tissue, including bones, ligaments and muscle</td>
</tr>
</tbody>
</table>

- **CAUSES:** Interaction between a person’s genetic factors and any of three categories of external agents.
  
  a) **Physical carcinogens;** such as ultraviolet and ionizing radiation or asbestos;
  
  b) **Chemical carcinogens;** components of tobacco smoke, aflatoxin (a food contaminant) and arsenic (a drinking-water contaminant);
  
  c) **Biological carcinogens;** such as infections from certain viruses, bacteria or parasites

- **Factors Believed to Contribute to Global Causes of Cancer**
The vast majority of cancers are non-hereditary

Researchers have estimated that as many as 2 in 3 cases of cancer (67 percent) are linked to some type of environmental factor, including use or abuse of tobacco, alcohol, and food, as well as exposures to radiation, viruses, and substances in the air, water and soil.

### Carcinogenic risks of chemicals to man

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Group 1** | Established human carcinogen  
 Evidenced derived from epidemiological studies is sufficient |
| **Group 2A** | Probable human carcinogen  
 Evidence in human is limited and the agent is an experimental carcinogen |
| **Group 2B** | Possible human carcinogen  
 Include experimental carcinogens for which human evidence is inadequate or non-existent |
| **Group 3** | Not classified as carcinogenic to humans                                      |
Risk assessment involves three factors:

a) Potency:
The potential of a given amount of a substance to cause cancer e.g. benzene, chloroform.

b) Type of exposure:
Exposure is one-time (acute) or long-term (chronic), and whether it is unavoidable (in the workplace, for example, or in the air we breathe).

c) Dose response:
A range of doses over which response occurs

Occupational Cancer Risks (example)
a) painters;
b) furniture makers;
c) workers in the iron, steel, coal,
d) rubber industries;
e) workers involved in shoe manufacturing and repair.
4.4.1 LUNG CANCER

- The uncontrolled growth of abnormal cells that start off in one or both lungs; usually in the cells that line the air passages.
- The abnormal cells do not develop into healthy lung tissue, they divide rapidly and form tumors.
- As tumors become larger and more numerous, they undermine the lung’s ability to provide the bloodstream with oxygen.

**Risk factors of lung cancers**

a) Carcinogen - Tobacco, asbestos, arsenic, radiation such as gamma and x-rays, the sun, and compounds in car exhaust fumes

b) Genes

![Lung Cancer Diagram]

**Symptoms of lung cancer**

a) Persistent or intense coughing

b) Pain in the chest shoulder, or back from coughing

c) Changes in color of the mucus that is coughed up from the lower airways (sputum)

d) Difficulty breathing and swallowing

e) Hoarseness of the voice

f) Harsh sounds while breathing (stridor)

g) Chronic bronchitis or pneumonia

h) Coughing up blood, or blood in the sputum
4.4.2 COLORECTAL CANCER

- Also known as bowel cancer, colon cancer or rectal cancer,
- Any cancer (a growth, lump, tumor) of the colon and the rectum.
- The second most common cancer worldwide, after lung cancer.
- The colon and rectum belong to our body's digestive system - together they are also known as the large bowel.
- The colon reabsorbs large quantities of water and nutrients from undigested food products as they pass along it.
- The rectum is at the end of the colon and stores feces (stools, waste material) before being expelled from the body.

**ANATOMY OF THE LARGE INTESTINE**

- **Symptoms of Colorectal cancer**
  a) Going to the toilet more often.
  b) Diarrhea or Constipation.
  c) A feeling that the bowel does not empty properly after a bowel movement.
  d) Blood in feces (stools).
  e) Pains in the abdomen.
  f) Bloating in the abdomen.
  g) A feeling of fullness in the abdomen (maybe even after not eating for a while).
  h) Vomiting.
  i) Fatigue (tiredness).
  j) Inexplicable weight loss.
  k) A lump in the tummy or a lump in the back passage felt by your doctor.
  l) Unexplained iron deficiency in men, or in women after the menopause.
- **Risk factors of colon cancer**
  
i) Being elderly - the older you are the higher the risk is.
  
j) A diet that is very high in animal protein.
  
k) A diet that is very high in saturated fats.
  
l) A diet that is very low in dietary fiber.
  
m) A diet that is very high in calories.
  
n) A diet that is very high in alcohol consumption.
  
o) Women who have had breast, ovary and uterus cancers.
  
p) Being elderly - the older you are the higher the risk is.
  
q) A diet that is very high in animal protein.
  
r) A diet that is very high in saturated fats.
  
s) A diet that is very low in dietary fiber.
  
t) A diet that is very high in calories.
  
u) A diet that is very high in alcohol consumption.
  
v) Women who have had breast, ovary and uterus cancers.


4.4.3 BREAST CANCER

- Breast cancer is a kind of cancer that develops from breast cells.
- Usually starts off in the inner lining of milk ducts or the lobules that supply them with milk.
- 18.2% of all cancer deaths worldwide, including both males and females, are from breast cancer.

- **Symptoms of breast cancer**
  a) A lump in a breast
  b) A pain in the armpits or breast that does not seem to be related to the woman's menstrual period
  c) Pitting or redness of the skin of the breast; like the skin of an orange
  d) A rash around (or on) one of the nipples
  e) A swelling (lump) in one of the armpits
  f) An area of thickened tissue in a breast
  g) One of the nipples has a discharge; sometimes it may contain blood
  h) The nipple changes in appearance; it may become sunken or inverted
  i) The size or the shape of the breast changes
  j) The nipple-skin or breast-skin may have started to peel, scale or flake.
Diabetes mellitus (commonly referred to as diabetes) is a disease of the pancreas, an organ behind the stomach that produces the hormone insulin. Insulin helps the body use food for energy. When a person has diabetes, the pancreas either cannot produce enough insulin, uses the insulin incorrectly, or both.

Insulin works together with glucose (sugar) in the bloodstream to help it enter the body's cells to be burned for energy. If the insulin isn't functioning properly, glucose cannot enter the cells. This causes glucose levels in the blood to rise, creating a condition of high blood sugar or diabetes, and leaving the cells without fuel.

The first symptoms of diabetes are related to the direct effects of high blood glucose levels and include:
- Increased thirst (polydipsia).
- Increased urination (polyuria).
- Increased hunger.

Other symptoms of diabetes include:
- Blurred vision.
- Drowsiness.
- Nausea.
- Decreased endurance during exercise.

Risk factors for breast cancers:
- Getting older.
- Genetics.
- A history of breast cancer.
- Having had certain types of breast lumps.
- Dense breast tissue.
- Estrogen exposure - women who started having periods earlier or entered menopause later.
- Obesity.
- Radiation exposure.
- HRT (hormone replacement therapy).
- Certain jobs.
- Cosmetic implants may undermine breast cancer survival.
**Type 1 Diabetes**

Typically occurs before the age of 40 and is caused by an insulin deficiency. Type 1 diabetes cannot be reversed and the affected individuals rely on an external source of insulin.

- Muscle unable to use glucose due to low insulin
- Glycogen and protein breakdown, causing keto-acidosis
- Increased glucose due to low insulin
- Decreased insulin in the blood vessels

**Type 2 Diabetes**

Typically occurs after the age of 40 and is caused by insulin resistance. Type 2 diabetes can potentially be reversed through change of diet and lifestyle.

- Muscle unable to use glucose due to insulin resistance
- Obesity, inheritance & other factors leading to insulin resistance
- Increased glucose in the blood stream
- Sufficient insulin secreted in the blood stream

4.5.1 TYPES OF DIABETES

<table>
<thead>
<tr>
<th>TYPES OF DIABETES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type I</strong></td>
</tr>
<tr>
<td>Insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>Usually strikes children and young adults, although disease onset can occur at any age.</td>
</tr>
<tr>
<td>May account for 5% to 10% of all diagnosed cases of diabetes.</td>
</tr>
<tr>
<td>Risk factors for type 1 diabetes may include autoimmune, genetic, and environmental factors.</td>
</tr>
<tr>
<td><strong>Type II</strong></td>
</tr>
<tr>
<td>Non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes.</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>May account for about 90% to 95% of all diagnosed cases of diabetes.</td>
</tr>
<tr>
<td>Risk factors include older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity.</td>
</tr>
<tr>
<td><strong>Gestational diabetes</strong></td>
</tr>
<tr>
<td>A form of glucose intolerance that is diagnosed in some women during pregnancy</td>
</tr>
<tr>
<td>More common among obese women and women with a family history of diabetes</td>
</tr>
<tr>
<td>After pregnancy, 5% to 10% of women with gestational diabetes are found to have type 2 diabetes.</td>
</tr>
<tr>
<td>Women who have had gestational diabetes have a 20% to 50% chance of developing diabetes in the next 5-10 years.</td>
</tr>
<tr>
<td><strong>Others</strong></td>
</tr>
<tr>
<td>Result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses.</td>
</tr>
<tr>
<td>May account for 1% to 5% of all diagnosed cases of diabetes.</td>
</tr>
</tbody>
</table>
4.5.2 COMPLICATION OF DIABETES

- Diabetes damages blood vessels, causing them to narrow and therefore restricting blood flow. Because blood vessels throughout the body are affected, people may have many complications of diabetes. Many organs can be affected, particularly the following:
  a) Brain, causing stroke
  b) Eyes (diabetic retinopathy), causing blindness
  c) Heart, causing heart attack
  d) Kidneys (diabetic nephropathy), causing kidney failure
  e) Nerves (diabetic neuropathy), causing decreased sensation in feet
4.6 CHRONIC RESPIRATORY DISEASES

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

4.6.1 CHRONIC OBSTRUCTIVE PULMONARY DISEASE

- (COPD) is an umbrella term used to describe progressive lung diseases including
  a) emphysema,
  b) chronic bronchitis
  This disease is characterized by increasing breathlessness.
- In COPD, the airways become inflamed and the air sacs in the lungs are damaged and cause the airways to become narrower, which makes it harder to breathe in and out.
- People with COPD have breathing difficulties, and this can affect many aspects of day-to-day life.
- There is no cure for COPD, but there are lots of treatments available to help in managing the condition.
What are the signs and symptoms of COPD?

a) Increased breathlessness
b) Frequent coughing (with and without sputum)
c) Wheezing
d) Tightness in the chest

Risk factors

a) Most cases of COPD are caused by inhaling pollutants; that includes smoking (cigarettes, pipes, cigars, etc.), and second-hand smoke.

b) Fumes, chemicals and dust found in many work environments are contributing factors for many individuals who develop COPD.

c) Genetics can also play a role in an individual’s development of COPD even if the person has never smoked or has ever been exposed to strong lung irritants in the workplace.
4.6.2 ASTHMA

- Asthma is a chronic (long-term) lung disease that inflames and narrows the airways.

- Symptoms of asthma include recurring periods of;
  a) wheezing (a whistling sound when you breathe),
  b) chest tightness,
  c) shortness of breath, and
  d) coughing (often occurs at night or early in the morning).

- People who have asthma have inflamed airways. The inflammation makes the airways swollen and very sensitive. The airways tend to react strongly to certain inhaled substances.

- When symptoms get more intense and/or more symptoms occur, then asthma attack will happen which can be fatal.

- Asthma has no cure.

- **Causes of asthma**
  a) The causes of asthma are not fully understood, although people with asthma often have a family history of asthma, eczema and hayfever.
  b) Research has shown that exposure to tobacco smoke (especially as a baby or young child), obesity and some workplace chemicals can increase the risk of developing asthma.
Non-communicable diseases cannot be spread from one person to the others. They are mostly related to the lifestyle of people on top of the genetic factors.

ACTIVITY 1.1
(a) Understand Chapter 2 and Chapter 3 and find the difference between CDC and NCDs.

KEYWORDS
- Cardiovascular diseases
- Chronic respiratory diseases
- Diabetes
- Cancer

SELF-CHECK 1.1
- Do you know the definition of each of the four main type of NCDs? Do you know the main risk factors of each of the disease?

EXERCISE 2.1
1. What are cardiovascular disease? (3 marks)
2. List down four types of cardiovascular diseases (4 marks)
4. Explain the four main risk factors of cardiovascular diseases (12 marks)
Unit 5 ➔ GLOBAL TRENDS IN HEALTH AND DISEASES

INTRODUCTION

This unit describe the current status of global health and diseases

OBJECTIVE

To outline the following areas of concern
1. Introduction
2. Differences of the diseases pattern between poor and rich countries
3. Changes of the disease trends for the past decades
4. Trends of diseases in Malaysia
5.1 INTRODUCTION

- Non-communicable diseases are the leading killer today and are on the increase.
- Nearly 80% of these deaths occurred in low- and middle-income countries.
- More than nine million of all deaths attributed to non-communicable diseases (NCDs) occur before the age of 60.
- Around the world, NCDs affect women and men almost equally.
- 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, that is 3 in every 10 deaths. Of these, 7.4 million people died of ischaemic heart disease and 6.7 million from stroke.
- Ischaemic heart disease, stroke, lower respiratory infections and chronic obstructive lung disease have remained the top major killers during the past decade.

![The 10 leading causes of death in the world 2012](image)
5.2 RICH AND POOR COUNTRIES

- In high-income 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.
- In low-income countries, nearly 4 in every 10 deaths are among children under 15 years, and only 2 in every 10 deaths are among people aged 70 years and older.
- People predominantly die of infectious diseases: lower respiratory infections, HIV/AIDS, diarrhoeal 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.
5.3 CHANGES IN THE PAST DECADE

- Ischaemic heart disease, stroke, lower respiratory infections and chronic obstructive lung disease - top major killers during the past decade.
- NCDs were responsible for 68% (38 million) of all deaths globally in 2012, up from 60% (31 million) in 2000.
- Cardiovascular diseases alone killed 2.6 million more people in 2012 than in the year 2000.
- HIV deaths decreased slightly from 1.7 million (3.2%) deaths in 2000 to 1.5 million (2.7%) deaths in 2012.
- Diarrhoea is no longer among the 5 leading causes of death, but is still among the top 10, killing 1.5 million people in 2012.
- Tuberculosis, while no longer among the 10 leading causes of death in 2012, was still among the 15 leading causes, killing over 900 000 people in 2012.
- Maternal deaths have dropped from 427 000 in the year 2000 to 289 000 in 2013, but are still unacceptably high: nearly 800 women die due to complications of pregnancy and childbirth every day.
- Injuries continue to kill 5 million people each year. Road traffic injuries claimed nearly 3500 lives each day in 2012 – more than 600 more than in the year 2000 – making it among the 10 leading causes in 2012.
5.4 TRENDS OF DISEASES IN MALAYSIA

- The trends of diseases in Malaysia is similar with those of midle income countries.
- The leading causes of death is the non-communicable diseases

<table>
<thead>
<tr>
<th>Ten Principal Causes of Hospitalisation in MoH Hospital, 2013</th>
<th>Ten Principal Causes of Death in MoH Hospitals, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pregnancy, childbirth and the puerperium 25.43%</td>
<td>1. Diseases of the circulatory system 24.38%</td>
</tr>
<tr>
<td>2. Diseases of the respiratory system 11.50%</td>
<td>2. Diseases of the respiratory system 22.73%</td>
</tr>
<tr>
<td>3. Injury, poisoning and certain other consequences of external causes 8.77%</td>
<td>3. Certain infectious and parasitic diseases 13.96%</td>
</tr>
<tr>
<td>5. Diseases of the circulatory system 7.65%</td>
<td>5. Injury, poisoning and certain other consequences of external causes 5.05%</td>
</tr>
<tr>
<td>6. Certain conditions originating in the perinatal period 7.12%</td>
<td>6. Diseases of the digestive system 5.00%</td>
</tr>
<tr>
<td>7. Diseases of the digestive system 4.73%</td>
<td>7. Diseases of the genitourinary system 4.05%</td>
</tr>
<tr>
<td>8. Diseases of the genitourinary system 4.33%</td>
<td>8. Certain conditions originating in the perinatal period 2.60%</td>
</tr>
<tr>
<td>9. Neoplasms 3.93%</td>
<td>9. Endocrine, nutritional &amp; metabolic diseases 2.11%</td>
</tr>
<tr>
<td>10. Endocrine, nutritional &amp; metabolic diseases 3.44%</td>
<td>10. Diseases of the nervous system 1.86%</td>
</tr>
</tbody>
</table>
The highest prevalence of communicable diseases is dengue, hand food and mouth diseases, tuberculosis and food poisoning.
• The trend of diseases in Malaysia is similar with those of middle income countries. The leading causes of death is the non-communicable diseases.

Malaysia is the most obese country in Asia. Almost 18 percent of the country, or more than five million people, can be classed as obese. A further 30 percent are overweight. The obesity prevalence have increased drastically from 4.4 per cent in 1996 to 14 per cent in 2006.

• Diabetes increase from 11.6 per cent of the population affected in 1996 to 17.5 per cent in 2015.

• 47.7 per cent of adults in the country has high cholesterol.

• However, the prevalence for hypertension saw a decrease from 32.7 per cent in 2006 to 30.3 per cent in 2015.
The leading causes of death is non-communicable disease. Cases of non-communicable diseases is increasing and cases of communicable diseases is decreasing.

**ACTIVITY 1.1**

(a) Look close the statistics shown throughout this chapter and interpret them.

**KEYWORDS**

- Disease trends

**SELF-CHECK 1.1**

- What is the difference of diseases pattern between rich and poor countries?

**EXERCISE 2.1**

1. Describe the changes of diseases pattern for the past decade (15 marks)
Unit 6  ➔
PRINCIPLES OF PREVENTION AND CONTROL

[Introduction]

This unit describe the definition, and the three main stage of disease prevention

[Objective]

To outline the following areas of concern
1. Introduction
2. Primary Prevention
3. Secondary Prevention
4. Tertiary Prevention
5. Disease control
6.1 INTRODUCTION

The goals of medicine are to promote health, to preserve health, to restore health when it is impaired, and to minimize suffering and distress. These goals are embodied in the word "prevention"

- **Definition:** Actions aimed at eradicating, eliminating or minimizing the impact of disease and disability, or if none of these are feasible, retarding the progress of the disease and disability.

- The concept of prevention is best defined in the context of levels, traditionally called
  a) primary,
  b) secondary and
  c) tertiary prevention.

- **Preventive Medicine**
  a) Preventive medicine or preventive care refers to measures taken to prevent illness or injury, rather than curing them.
  b) It is designed to avert and avoid disease. Screening for hypertension and treating it before it causes disease is good preventive medicine.
  c) Preventive medicine is a proactive approach.
  d) It can be contrasted with curative medicine

<table>
<thead>
<tr>
<th></th>
<th>PRIMARY Prevention</th>
<th>SECONDARY Prevention</th>
<th>TERTIARY Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>An intervention implemented before there is evidence of a disease or injury</td>
<td>An intervention implemented after a disease has begun, but before it is symptomatic.</td>
<td>An intervention implemented after a disease or injury is established</td>
</tr>
<tr>
<td><strong>Intent</strong></td>
<td>Reduce or eliminate causative risk factors (risk reduction)</td>
<td>Early identification (through screening) and treatment</td>
<td>Prevent sequelae (stop bad things from getting worse)</td>
</tr>
<tr>
<td><strong>NAS Example</strong></td>
<td>Prevent addiction from occurring</td>
<td>Screen pregnant women for substance use during prenatal visits and refer for treatment</td>
<td>Treat addicted women</td>
</tr>
<tr>
<td></td>
<td>Prevent pregnancy</td>
<td>Treat babies with NAS</td>
<td></td>
</tr>
</tbody>
</table>
6.2 PRIMARY PREVENTION

6.2.1 INTRODUCTION

- Primary prevention can be defined as the action taken prior to the onset of disease, which removes the possibility that the disease will ever occur.
- It signifies intervention in the pre-pathogenesis phase of a disease or health problem.
- Primary prevention may be accomplished by measures of “Health promotion” and “specific protection”
- It includes the concept of “positive health”, a concept that encourages achievement and maintenance of "an acceptable level of health that will enable every individual to lead a socially and economically productive life".

![Diagram: Primary prevention, achieved by Health promotion and Specific protection, with subcategories such as Health education, Environmental modifications, Nutritional interventions, Life style and behavioral changes, Immunization and seroprophylaxis, chemoprophylaxis, Use of specific nutrients or supplementations, Protection against occupational hazards, Safety of drugs and foods, Control of environmental hazards, e.g. air pollution.]
6.2.2 HEALTH PROMOTION

- Health promotion concerns helping people to increase control over, and to improve, their health (Ottawa Charter for Health Promotion, 1986).

- 5 key actions areas for health promotion:
  a) Building healthy public policy
  b) Create supportive environment
  c) Strengthen community action
  d) Develop personal skills
  e) Reorient health services

- Health promotion activities seek to empower individuals and their social environments to organize, prioritize, and act on health issues according to local needs (Whitehead, 2004).

- Health promotion usually includes the following activities
  a) Lifestyle modification – healthy lifestyle
     - Personal hygiene/washing hands
     - Balanced diet / proper nutrition
     - Regular exercise
     - Stop smoking
  b) Environmental
     - Safe workplace
     - Safe environment
     - Vector control
  c) Healthy lifestyle campaigns

6.2.3 SPECIFIC PROTECTION

- Any planned intervention or services designed to provide individuals and communities with resistance to health threats, often by modifying policy or the environment to decrease potentially harmful interactions.

- Targeted to at risk population, against specific health threats
- Examples are;
  a) Vaccination – e.g. Tuberculosis, Hepatitis B, Polio, Diphteria, Tetanus
  b) Chemoprophylaxis – e.g. protection for non-immune travelers to Malaria endemic region (Mefloquine 2 weeks before and 4 weeks after), mass treatment of Diethylcarbamazine (DEC) against Filariasis, Tetracycline/Doxycycline for household members of Cholera cases, insect repellant
  c) Occupational safety
  d) Automobile safety, safe driving habits
Specific protection by enforcement of legislation

<table>
<thead>
<tr>
<th>Environmental Control</th>
<th>Relevant legislation / Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control of mosquito breeding sites</td>
<td>Destruction of Disease Bearing Insects Act</td>
</tr>
<tr>
<td>Pollution control</td>
<td>Environment Quality Act</td>
</tr>
<tr>
<td>Tobacco-smoke free air</td>
<td>Tobacco Control Regulations</td>
</tr>
<tr>
<td>Food safety</td>
<td>Food Act</td>
</tr>
</tbody>
</table>

- Malaysia gazette Malaysia Health Promotion Board Act (Act 651) and established Malaysian Health Promotion Board (MySihat) to set and develop the health promotion agenda across different sectors and settings particularly with the active participation of the Non-Governmental Organisations (NGOs).
6.3 SECONDARY PREVENTION

6.3.1 INTRODUCTION

- Secondary prevention are activities that aimed at screening for early disease detection, thereby increasing opportunities for interventions to prevent progression of the disease and emergence of symptoms.

- It is defined as “action which halts the progress of a disease at its incipient stage and prevents complications.”

- Secondary prevention is needed because early treatment can cure, prevent or slows progression of disease into an impairment or disability or spreading within a population.

- The earlier the disease is diagnosed, and treated the better it is for prognosis of the case and in the prevention of the occurrence of other secondary cases.

- The specific interventions are:
  a) early diagnosis (e.g. screening tests, proactive monitoring and case finding programs, periodic health examination)
  b) adequate treatment.
6.3.2 SCREENING

- Screening is a process used to detect the possibility of disease state so that the person can be referred for diagnosis.

- It is conducted by medical technician / allied health personals (under supervision of Physician)

- Applied rapidly to sort out apparently well people who have disease from those who probably do not.

- Not intended to be diagnostic

- Persons with suspicious or positive findings are referred to physicians for diagnosis and treatment

- Examples:
  a) Body Mass Index - obesity
  b) Breast Self-examination – breast cancer
  c) Blood Pressure, Lipid Profile – hypertension and risk factor
  d) Urine sugar – Diabetes Mellitus
  e) PAP smear – Cervical cancer
  f) Chest x-ray – pulmonary infection, occupational lung disease
  g) G6PD - G6PD deficiency

- Screening is different from diagnosis, where diagnosis involves evaluation of signs and symptoms and diagnostic tests and applied to patient-physician.
6.4 TERTIARY PREVENTION

- Tertiary prevention reduces the negative impact of an already established disease by restoring function and reducing disease related complications. It is used when the disease process has advanced beyond its early stages.
- It is defined as “all the measures available to reduce or limit impairments and disabilities, and to promote the patients’ adjustment to irremediable conditions.”
- Activities may include limiting disability and rehabilitation.

- **Limiting disability by:**
  h) medical or surgical treatment to limit damage from the disease E.g. surgical removal of tumor,
  i) Stop smoking after Myocardial Infarct
  j) Foot-care of Diabetics to prevent ulcer

- **Impairment** is “any loss or abnormality of psychological, physiological or anatomical structure or function.”
- **Disability** is “any restriction or lack of ability to perform an activity in the manner or within the range considered normal for the human being.”
- **Handicap** is “a disadvantage for a given individual, resulting from an impairment or disability, that limits or prevents the fulfillment of a role in the community that is normal (depending on age, sex, and social and cultural factors) for that individual.”
- **Rehabilitation** activities that will help the patient lead a normal life once the disease has already caused illness or injury. It involves any attempt to restore a person to a useful, satisfying and self-sufficient role in society or provide the highest quality of life possible. For example:
  a) Physical therapy after an accident
  b) Oxygen for those with breathing problems
  c) Asthma treatments

- The rehabilitation activities are facilitated by:
  a) Physiotherapist
  b) Occupational therapist
  c) Speech therapist
  d) Rehabilitation counselor

---

6.5 **APPLICATION**

**Strategy for Prevention**

- Assess Exposure
- Identify Populations at High Disease Risk
  (based on demography, family history, host factors..)
- Conduct Research on Mechanisms
  (including the study of genetic susceptibility)
- Apply Population-Based Intervention Programs
- Evaluate Intervention Programs
- Modify Existing Intervention Programs
### Examples of prevention levels for selected diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Intervention level</th>
<th>Primary</th>
<th>Secondary</th>
<th>Tertiary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colorectal cancer</strong></td>
<td>Individual</td>
<td>Counselling on healthy lifestyles: dietary counselling for people at risk of colorectal cancer, etc.</td>
<td>Hemoccult stool testing to detect colorectal cancer early</td>
<td>Follow-up exams to identify recurrence or metastatic disease: physical examination, liver enzyme tests, chest x-rays, etc.</td>
</tr>
<tr>
<td></td>
<td>Population</td>
<td>Publicity campaigns alerting the public to the benefits of lifestyle changes in preventing colorectal cancers; promotion of high fibre diets; subsidies to help people access exercise programmes; anti-smoking campaigns</td>
<td>Organized colonoscopy screening programs</td>
<td>Implementation of health services organizational models that improve access to high-quality care</td>
</tr>
<tr>
<td><strong>Infectious diseases:</strong></td>
<td>Individual</td>
<td>Counselling on safe drug use to prevent hepatitis C virus (HCV) transmission; counselling on safer sex</td>
<td>Screening for HCV infection of patients with a history of injection drug use</td>
<td>HCV therapy to cure infection and prevent transmission</td>
</tr>
<tr>
<td>hepatitis C</td>
<td>Population</td>
<td>HCV prevention includes safer sex practices, programmes to discourage needle sharing among intravenous drug users, etc.</td>
<td>Establish a universal testing system for HCV in high risk groups</td>
<td>(Similar to primary prevention): ensuring close control of high risk sites such as tattoo parlours that have been associated with outbreaks</td>
</tr>
<tr>
<td></td>
<td>Individual</td>
<td>Nutrition and exercise counselling</td>
<td>Screening for diabetes</td>
<td>Referral to cardiac rehabilitation clinics</td>
</tr>
<tr>
<td><strong>Metabolic syndrome</strong></td>
<td>Population</td>
<td>Built environment favourable for active transport (walking, bicycling rather than using a car)</td>
<td>Community level weight loss and exercise programs to control metabolic syndrome</td>
<td>Implementation of multidisciplinary clinics</td>
</tr>
</tbody>
</table>
6.6 CONTROL

- In 1998, Dowdle proposed a definition of control as a reduction in the incidence, prevalence, morbidity or mortality of an infectious disease to a locally acceptable level; elimination as reduction to zero of the incidence of disease or infection in a defined geographical area; and eradication as permanent reduction to zero of the worldwide incidence of infection.

- **Concept of control**

  The term disease control describes ongoing operations aimed at reducing:
  a) The incidence of disease
  b) The duration of disease and consequently the risk of transmission
  c) The effects of infection, including both the physical and psychosocial complications
  d) The financial burden to the community.

- Control activities focus on primary prevention or secondary prevention, but most programs combine both.

- The term "elimination" is used to describe interruption of transmission of disease, as for example, elimination of measles, polio and diphtheria from large geographic regions or areas.

- **Eradication** is an absolute process, an "all or none" phenomenon, restricted to termination of an infection from the whole world. It implies that disease will no longer occur in a population.

- To-date, only one disease has been eradicated, that is smallpox. In 1980, after the certification of smallpox eradication, routine smallpox vaccination was discontinued in all countries.

- Some of the activities include surveillance and monitoring.
- **Monitoring** is "the performance and analysis of routine measurements aimed at detecting changes in the environment or health status of population" (Thus we have monitoring of air pollution, water quality, growth and nutritional status, etc).

- It also refers to on-going measurement of performance of a health service or a health professional, or of the extent to which patients comply with or adhere to advice from health professionals.

- **Surveillance** means to watch over with great attention, authority and often with suspicion

- According to another, surveillance is defined as "the continuous scrutiny (inspection) of the factors that determine the occurrence and distribution of disease and other conditions of ill-health"

Surveillance and continuation of control interventions are necessary to maintain achievements in infectious disease control unless transmission has been interrupted and the microbe destroyed worldwide.
Both CDC and NCD can be prevented at different stages. Control mechanism is needed to ensure that the number of diseases and illnesses is not increasing.

**ACTIVITY 1.1**
(a) Search the strategy used by the Malaysian government to promote healthy lifestyle in preventing diseases.

**KEYWORDS**
- Primary prevention
- Secondary prevention
- Tertiary prevention

**SELF-CHECK 1.1**
- Can you differentiate the different stages of disease prevention mechanism?

**RUMUSAN**

**EXERCISE 2.1**
1. Discuss the best primary prevention mechanism for diabetes (20 marks)
INTRODUCTION

This unit describe some of the important health indicators used in public health.

OBJECTIVE

To outline the following areas of concern
1. Ratio, proportion and rate
2. Measures of morbidity
3. Measures of mortality
7.1 INTRODUCTION

- Health indicators are individual measures of health that must be assessed individually, and then combined collectively to measure health accurately. Individual measures should be evaluated for reliability, validity and practically of administration and analysis.
- The efficient system of recording the mortality and morbidity is a fundamental requirement for defining the principal current problems in the fields of public health, preventive medicine, social medicine and epidemiology.
- The first requirement is definition of what to be measured and establishment of criteria or standard by which it can be measured.
- The basic tools of measurement are:
  a) A ratio
  b) A proportion
  c) A rate

7.2 RATIO

- Simply one number divided by another.
- It expresses a relation in size between two quantities.
- Division of two unrelated numbers.
- The individuals in the numerator can be different from those in the denominator.
- A ratio can be expressed by:
  a) separating its numerator with a colon (a:b);
  b) representing the relation as a fraction (a/b);
  c) completing the division and expressing in decimal form (x.xxx)

For example, of 1,000 motorcycle fatalities, 950 victims are men and 50 are women.

The sex ratio motorcycle fatalities = no of male victims/no of female victims
= 950/50
= 19:1
7.3 PROPORTION

- Special type of ratio.
- Division of two related numbers; the numerator is always included in the denominator.
- Proportion are often expressed as percentage.
- Range from:
  a) 0 – 1; or
  b) 0% - 100%

7.4 RATE

- Also one number divided by another, but a rate differ from a proportion because the denominator involve a measure of time.
- A rate measures the occurrence of disease or death in a population during a given time period.
- It is a statement of the risk of developing a condition.
- It indicates a change in some event that takes place in a population over a period of time.
- A rate comprises the following elements:
  a) Numerator – consists of the frequency of disease/death
  b) Denominator – is a unit size of population
  c) Time specification - is usually a calendar year
  d) Multiplier – 1,000 or 10,000 or 100,000
- The rate is expressed per 1,000 or 10,000 or 100,000 according to convenience or convention to avoid fractions.
- The various categories of rates are:
  - **Crude rates** - the actual observed rate (e.g: crude death rate).
  - **Specific rates** - actual observed rates due to specific causes (e.g: AIDS) or occurring in a specific group (e.g: age specific mortality rate).
  - **Standardized rates /adjusted rates** - These are obtained by direct or indirect methods of standardization or adjustment (e.g: age-standardized mortality rate).
7.5 MEASURES OF MORBIDITY

- Morbidity is any departure from health.
- This results in or has potential to result in at least some restriction on performing the normal activities of life.
- Morbidity could be in terms of:
  a) Disease
  b) Injury
  c) Disability
  d) Mental depression
  e) Pain
- The two basic measures of morbidity are:
  a) Prevalence
  b) Incidence
- Other morbidity measures is attack rate

7.5.1 ATTACK RATE

- Attack rate – incidence rate used in such a population is observed for a short time period such as epidemics or outbreak of disease.

\[
\text{Attack rate} = \frac{\text{no. of cases during the epidemic}}{\text{Total no. of exposed or at risk during the same period}} \times 100
\]

- Secondary attack rate- defined as the number of exposed person developing the disease within the range of the incubation period following exposure to primary case.
7.5.2 PREVALENCE

- It refers to all current cases (old and new) existing at a given point in time or over a period of time in a given population.

- A prevalence rate is the total number of cases of a disease existing in a population divided by the total population. So, if a measurement of cancer is taken in a population of 40,000 people and 1,200 were recently diagnosed with cancer and 3,500 are living with cancer, then the prevalence of cancer is 0.118. (or 11,750 per 100,000 persons).

- There are two types of prevalence:

  a) **Point prevalence** – disease is defined as the number of all current cases of a disease at one/single point in time in a defined population.

     \[
     \text{Point prevalence} = \frac{\text{no. of person ill at a time point}}{\text{Total no in the group at a time point}} \times 100
     \]

  b) **Period prevalence** - disease is defined as the number of all current cases of a disease existing during a defined period of time in a defined population (eg: annual prevalence)

     \[
     \text{Point prevalence} = \frac{\text{no. of person ill during a time period}}{\text{Average population during a time period}} \times 100
     \]

7.5.3 INCIDENCE

- It is defined as the number of new cases of a disease in a defined population during a specified period of time. This means that individual who have a history of the disease are not included.

- An incidence rate is the number of new cases of a disease divided by the number of persons at risk for the disease.

- For example, if over the course of one year, five women are diagnosed with breast cancer, out of a total female study population of 200 (who do not have breast cancer at the beginning of the study period), then we would say the incidence of breast cancer in this population was 0.025 (or 2,500 per 100,000 women-years of study).

- An incidence rate includes three important elements:
  a) a numerator- the number of new cases
  b) a denominator- the population at risk which may represent special risk categories.
  c) time- the period during which the cases occur
There are two types of incidence:

a) **Cumulative incidence** – number of new cases of a specific disease in a specific period of time divided by total population at risk during the same time period whereas time is not an integral part but just expressed by the word only.

b) **Incidence rate** - occurrence of disease that arises during person-time observation. The numerator is identical to that cumulative incidence but the different is in incidence’s rate denominator which it integrates time (t) that makes it a true rate.

### 7.6 MEASURES OF MORTALITY

- Mortality is the incidence of death from a disease.
- Mortality rates includes
  - a) Crude death rate (CDR)
  - b) Cause/Disease specific death rate
  - c) Case fatality rate
  - d) Stillbirth rate
  - e) Perinatal mortality rate (PMR)
  - f) Neonatal mortality rate (NMR)
  - g) Post-neonatal mortality rate (PNMR)
  - h) Infant mortality rate (IMR)
  - i) Toddler mortality rate (TMR)
  - j) Maternal mortality rate (MMR)
7.6.1 CRUDE DEATH RATE

- Crude rates are summary rates based on the actual number of events in a population over a given time period. It does not account for differences of age, sex, or any other aspects of death. Examples of crude rates are:

  a) **Crude death rate (CDR)**

  \[
  CDR = \frac{\text{Total deaths per year}}{\text{Average total population of that year}} \times 1000
  \]

  b) **Infant mortality rate (IMR)**

  It can be used for international comparisons, a high rate indicates unmet health needs and poor environmental conditions.

  \[
  IMR = \frac{\text{no. of child death less than 1 year old}}{\text{no. of live births in the same year}} \times 1000
  \]

  c) **Neonatal mortality (NMR):**

  It measures risk of dying among newborn infants who are under the age of 28 days for a given year. The formula is as follow:

  \[
  NMR = \frac{\text{no. of infant deaths <28 days old}}{\text{no. of live births in the same year}} \times 1000
  \]

  It can reflect event happening after birth, primarily the congenital malformations, prematurity and low birth weight.

  d) **Maternal mortality rates (MMR):**

  Maternal death is death of a woman while pregnant or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management but not from accidental causes.

  \[
  MMR = \frac{\text{no. of deaths from puerperal/year/population}}{\text{total no. of births in the same period and population}} \times 100,000
  \]
### 7.6.2 SPECIFIC RATE

- Although the crude rates describe so far are important and useful summary measures of the occurrence of disease, they still have limitation as it cannot making comparative statements about diseases frequencies in populations.

- Specific rates refer to a particular subgroup of the population defined, for example, in terms of race, age or sex, or they may refer to the entire population but be specific for some single cause of death or illness.

#### a) Cause specific mortality rate (CSMR):

\[
CSMR = \frac{\text{no. of death by certain disease/group/year}}{\text{Total mortality cause population in the same period}} \times 100,000
\]

#### b) Case fatality rate (CFR):

\[
CFR = \frac{\text{no. of death by a certain disease in given time}}{\text{no. of diagnosed cases in the same period}} \times 100
\]

#### c) Age-specific rates:

This can be calculate by divide the age in defined group for example 5 to 10 years old and then one divide the frequency of a disease in a particular age stratum to find the age specific rates.

\[
\text{Age-specific rates} = \frac{\text{no. of death among those aged 10-15 years}}{\text{no. of person aged 10-15 years (during time period)}} \times 100,000
\]
Health indicators are important to analyze the pattern of diseases and health. Findings from these indicators help in disease prevention and control programmes.

**ACTIVITY 1.1**

(a) Search online about The National Health and Morbidity Survey (NHMS). Look at how the statistics of diseases are represented.

**KEYWORDS**

- Morbidity rate
- Measure of Mortality
- Tertiary prevention

**SELF-CHECK 1.1**

- Can you differentiate the difference between prevalence and accidents?

Health indicators are important to analyze the pattern of diseases and health. Findings from these indicators help in disease prevention and control programmes.

**EXERCISE 2.1**

1. In a district, the number of registered people having HIV in 2016 was 200. The new cases registered in 2016 is 46. The number of total population is 20,000. What is the prevalence of HIV in the district?
Unit 8  → SOCIAL DETERMINANTS OF HEALTH

INTRODUCTION

This chapter focuses on how some important social determinants influence the health status of population.

OBJECTIVE

To outline the following areas of concern
1. Healthy people 2020
2. Approach in Malaysia
3. Explain Natural History of Disease
4. Education and Health
5. Economic and Health
6. Health Inequalities
7. The Commission on SODH
INTRODUCTION

- Getting and sustaining optimal health and wellness requires an understanding of the many different aspects that affect our health and well-being including social, psychology, and culture.

- Conditions in the places where people live, learn, work, and play affect a wide range of health risks and outcomes. These conditions are known as social determinants of health (SDOH).

- Understanding the relationship between how population groups experience “place” and the impact of “place” on health is fundamental to the social determinants of health including both social and physical determinants.

- Examples of social determinants of health are
  a) Availability of resources to meet daily needs (e.g., safe housing and local food markets)
  b) Access to educational, economic, and job opportunities
  c) Access to health care services
  d) Quality of education and job training
  e) Availability of community-based resources in support of community living and opportunities for recreational and leisure-time activities
  f) Transportation options
  g) Public safety
  h) Social support
  i) Social norms and attitudes (e.g., discrimination, racism, and distrust of government)
  j) Exposure to crime, violence, and social disorder (e.g., presence of trash and lack of cooperation in a community)
  k) Socioeconomic conditions (e.g., concentrated poverty and the stressful conditions that accompany it)
  l) Residential segregation
  m) Language/Literacy
  n) Access to mass media and emerging technologies (e.g., cell phones, the Internet, and social media)
  o) Culture

- Differences in health are striking in communities with poor SDOH such as unstable housing, low income, unsafe neighborhoods, or substandard education.

- Improving the conditions in which we live, learn, work, and play and the quality of our relationships will create a healthier population, society, and workforce.
8.2 HEALTHY PEOPLE 2020

- Healthy People 2020 highlights the importance of addressing the social determinants of health by including “Create social and physical environments that promote good health for all” as one of the four overarching goals for the decade.

- This emphasis is shared by the World Health Organization, whose Commission on Social Determinants of Health in 2008 published the report, Closing the gap in a generation: Health equity through action on the social determinants of health.

- A “place-based” organizing framework, reflecting five (5) key areas of social determinants of health (SDOH), was developed by Healthy People 2020.

- Each of these five determinant areas reflects a number of critical components/key issues that make up the underlying factors in the arena of SDOH.
• **Economic Stability**
  a) Poverty  
  b) Employment  
  c) Food Security  
  d) Housing Stability  

• **Education**
  a) High School Graduation  
  b) Enrollment in Higher Education  
  c) Language and Literacy  
  d) Early Childhood Education and Development  

• **Social and Community Context**
  a) Social Cohesion  
  b) Civic Participation  
  c) Discrimination  
  d) Incarceration  

• **Health and Health Care**
  a) Access to Health Care  
  b) Access to Primary Care  
  c) Health Literacy  

• **Neighbourhood and Built Environment**
  e) Access to Healthy Foods  
  f) Quality of Housing  
  g) Crime and Violence  
  h) Environmental Conditions  

**Healthy People 2020 strives to:**
  a) Identify nationwide health improvement priorities.  
  b) Increase public awareness and understanding of the determinants of health, disease, and disability and the opportunities for progress.  
  c) Provide measurable objectives and goals that are applicable at the national, State, and local levels.  
  d) Engage multiple sectors to take actions to strengthen policies and improve practices that are driven by the best available evidence and knowledge.  
  e) Identify critical research, evaluation, and data collection needs.  

The Healthy People 2020 is initiated in the USA. Different countries have different approaches in addressing social determinants to improve their people’s health.
8.3 APPROACH IN MALAYSIA

- Malaysia has 50 years of experience in addressing social determinants of health through inter-sectoral action for health.
- At Independence in 1957, Malaysia inherited a rural urban divide and racial identification of specific economic functions. At Independence almost 90% of the population were poor.
- This entailed the formulation of national social policies to reduce poverty and at the same time to restructure society by addressing economic imbalances and eventually eliminating racial identification of specific economic functions.
- The poverty reduction approaches placed a strong emphasis on rural socio-economic development addressing the social determinants of health.
- This approach has served Malaysia well over the decades but since the 1990s Malaysia has been caught in a middle income trap.
- Many of the essential elements of Social Determinants for Health are highly correlated with poverty eradication programmes. Poverty has reduced from 50% in 1970 to 3.6% in 2007. The gap between rural and urban poverty has reduced and in 2009 rural poverty was 8.4% as compared to 1.7% urban poverty.
- The poverty reducing approaches emphasised agricultural and rural development to raise income of poor farmers; labour-intensive export industrialization to absorb workers; and public investment in education, health and infrastructure especially in rural areas to raise levels of poor.
- Realising that achieving a high income nation status by 2020 is not possible at the present economic trajectory, Malaysia has now embarked on a national transformation agenda based on the four pillars of inculcating the cultural and societal values under the;
  a) 1Malaysia Concept and the twin commitments of people first in all policies and projects and performance
  b) A government transformation programme (GTP);
  c) Macroeconomic policies under the economic transformation programme (ETP); and
  d) The operationalisation of these policies through the 10th Malaysia Plan
• The highest political commitment is given to the implementation of these national policies by the various agencies, orchestrated and coordinated by a central planning process which cascades down to the state and district administrative levels of the government machinery.

• The health policies follow these national policies and the thrust of the Malaysian health care system is primary health care, supported by an inclusive referral system to decentralized secondary care and regionalized tertiary care.

• The primary health care approach has delivered increased access to health care at a relatively low-cost.

• This has translated into health gains for the Malaysian population comparable with countries of similar economic development.

• The policies are usually developed through participation of the staff from the implementation level initially through conducting the situational analyses to prioritise health problems at a district or local level.

• The magnitude of the problem, its distribution of the problem, its causes and contributing factors as well as the identification of potential resources, including community capacities and strengths, which can be mobilised and actions which can be undertaken to address the problem, are identified.

• Proposals are then formulated for example, Safe Motherhood Initiative, the Integrated Management of Childhood Illness, DOTS, Harm Reduction, National Strategic Plans and technical guidelines for the management of non-communicable and communicable diseases after a process of meetings and feedback across all levels through the District Health Officer, the State Health Directors and the Health Ministry.

• Facilitating organisational change and encouraging (particularly government) staff to be more flexible, innovative and responsive to local communities are key actions in achieving success.

• In the past, many of the initiatives to promote community participation in health have concentrated on inviting members of the community to participate in activities established (and largely controlled) by the health services.

• However, over the last three decades, a wide range of community groups or organisations play substantial roles in promoting health.

• They include, in addition to representative health councils, women's groups, youth groups, social clubs, cooperative societies, mutual aid societies and sporting clubs.

• Settings-based health promotion initiatives offer a mechanism of extending health services towards a more inter-sectoral and developmental role.
8.4 EDUCATION AND HEALTH

- Education will influence people’s lifestyle, health care seeking behaviour and health care access
- More educated people usually have better health than less educated people

This information taken from Robert Wood Johnson Foundation. 2008. All RWJF rights reserved.
8.5 ECONOMIC, SOCIAL ADVANTAGE & HEALTH

- Higher income people have better health care access, good housing and more nutritious food, a safe neighbourhood.
- They are able to get high quality health services including prevention and curative services.
- They will have better resources to cope with stress such as taking long vacation, hire professionals to solve their difficulties etc.

![Diagram showing the relationship between higher income, education, and health outcomes.](image-url)
8.6 HEALTH INEQUALITIES

- Health inequalities refer to differences in the extent to which groups of people experience health problems, access health services and how long they live.
- Social and economic conditions and their effects on people’s lives determine their risk of illness and the actions taken to prevent them becoming ill or treat illness when it occurs.
- Health inequalities are preventable and unjust differences in health status experienced by certain population groups.
- People in lower socio-economic groups are more likely to experience chronic ill-health and die earlier than those who are more advantaged.
- Health inequalities are not only apparent between people of different socio-economic groups – they exist between different genders and different ethnic groups.
- Health inequalities are often observed along a social gradient. This means that the more favourable the social circumstances such as income or education, the better a person’s chance of enjoying good health and a longer life. While there is a significant gap between the wealthy and the poor, the relationship between social circumstances in health is in fact a graded one.

Examples of health inequities between countries:

a) The infant mortality rate (the risk of a baby dying between birth and one year of age) is 2 per 1000 live births in Iceland and over 120 per 1000 live births in Mozambique;

b) The lifetime risk of maternal death during or shortly after pregnancy is only 1 in 17 400 in Sweden but it is 1 in 8 in Afghanistan.

Examples of health inequities within countries:

a) in Bolivia, babies born to women with no education have infant mortality greater than 100 per 1000 live births, while the infant mortality rate of babies born to mothers with at least secondary education is under 40 per 1000;

b) life expectancy at birth among indigenous Australians is substantially lower (59.4 for males and 64.8 for females) than that of non-indigenous Australians (76.6 and 82.0, respectively);
8.6.1 SOCIAL GRADIENT

- The social gradient in health refers to the fact that inequalities in population health status are related to inequalities in social status.
- The poorest of the poor, around the world, have the worst health. Within countries, the evidence shows that in general the lower an individual's socioeconomic position the worse their health. This is a global phenomenon, seen in low, middle and high income countries. The social gradient in health means that health inequities affect everyone.
- For example, within countries the relation between socioeconomic level and health is graded. The poorest have the highest under-5 mortality rates, and people in the second highest quintile of household wealth have higher mortality in their offspring than those in the highest quintile. This is the social gradient in health.

Under-5 mortality rate per 1000 live births by level of household wealth.

The WHO Commission on Social Determinants of Health (“the Commission”) was set up in 2005

- The mission is to collect and synthesize global evidence on the social determinants of health, assess their impact on health inequity, and make recommendations for action to address that inequity.

- Based on the collected evidence, the Commission made its recommendations across three overarching areas for action:
  a) To improve the conditions of daily life, the conditions in which people are born, grow, live, work and age.
  b) To tackle the “structural drivers of those conditions,” that is, the inequitable distribution of power, money, and resources.
  c) To measure the problem, evaluate action, expand the knowledge base, develop a workforce that is trained in the social determinants of health, and raise public awareness about the social determinants of health.”

Within these areas of action the Commission made further recommendations in twelve areas:

a) early child development and education,
b) healthy places — the living environment,
c) fair employment and decent work,
d) social protection across the life course,
e) universal health care,
f) health equity in all policies,
g) fair financing,
h) market responsibility,
i) gender equity,
j) political empowerment,
k) good global governance, and
l) knowledge, monitoring, and skills.

8.8 HEALTH EQUITY IN ALL POLICIES

- Every aspect of government and the economy has the potential to affect health and health equity — finance, education, housing, employment, transport, and health, to name just six.

- Policy coherence is crucial — different government departments’ policies must complement rather than contradict each other in relation to health equity.

- Example;

  Obesity prevention requires approaches that ensure a sustainable, adequate, and nutritious food supply; a habitat that lends itself to easy uptake of healthier food; participation in physical activity; and a family, educational, and work environment that positively reinforces healthy living. Very little of this action sits within the capabilities or responsibilities of the health sector. Positive advances have been made, for example, bans on advertisements for foods high in fats, sugars, and salt during television programmes aimed at children. However, a significant challenge remains: to engage with the multiple sectors outside health in areas such as trade, agriculture, employment, and education.
Improving the main social determinants of health will improve the health status of a population.

**ACTIVITY 1.1**
(a) Find the strategy used in poor countries to improve the social determinants of health.

**KEYWORDS**
- SDOH
- Social gradient
- Health inequalities

**SELF-CHECK 1.1**
- Can you describe how education and economic affect population health?

**RUMUSAN**

**EXERCISE 2.1**
1. Discuss the FIVE major SODH in Malaysian context (20 marks)
INTRODUCTION

This chapter define mental health and some common type of mental illnesses.

OBJECTIVE

To outline the following areas of concern
1. Definition of mental health
2. Description on mental illnesses
9.1 INTRODUCTION

- Mental health refers to the maintenance of successful mental activity.
- This includes maintaining productive daily activities and maintaining fulfilling relationships with others. It also includes maintaining the abilities to adapt to change and to cope with stresses.
- The World Health Organization defines mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community".
- Evidence from the World Health Organization suggests that nearly half the worlds population are affected by mental illness with an impact on their self-esteem, relationships and ability to function in everyday life.
- An individuals emotional health can also impact physical health and poor mental health can lead to problems such as substance abuse.
- The importance of maintaining good mental health is crucial to living a long and healthy life. Good mental health can enhance one's life, while poor mental health can prevent someone from living a normal life.

- **World Statistics**
  
a) Over 800 000 people die due to suicide every year and suicide is the second leading cause of death in 15-29-year-olds
b) Around 20% of the world's children and adolescents have mental disorders or problems
c) 75% of suicides occur in low- and middle-income countries

- **Statistics in Malaysia**
  
d) 12% of Malaysians aged between 18 and 60 have mental health issues.
 e) At least 1 in 10 Malaysians will face some kind of mental ailment in their lifetime.
  
f) Those Malaysian aged above 50 are more prone to mental illness and depression, second only ischemic heart disease.
  
g) One in five Malaysian children between the ages of five to 16 in the country has mental health problem.
9.2 MENTAL ILLNESS

9.2.1 WHAT IS MENTAL ILLNESS

- Mental illness is often misunderstood. For centuries, it has been seen as either possession by evil spirits, a moral weakness or punishment from a higher being.
- Those suffering from mental illness are commonly perceived to be restless, violent and unpredictable.
- Mental illness can occur when the brain (or part of the brain) is not working well or is working in the wrong way.
- Six main functions of the brain:
  a) Thinking
  b) Perception
  c) Emotion
  d) Signaling
  e) Physical
  f) Behaviour
- There are many forms of mental illness that differ in severity, duration and degree.
- Symptoms can include:

  - Mental illness is identified by symptoms. These include anxiety, depression, intense fear, thought disturbances, paranoia, delusions (false beliefs), hallucinations and unusual elation.
  - When these symptoms significantly disrupt a person’s life, the person has a mental disorder or a mental illness.
  - Most mental illness can be treated so that a reasonable state of health can be enjoyed.
9.2.2 STAGES OF MENTAL ILLNESS

- Basically mental illnesses can be divided into four stages. The earlier it is detected, the higher chances of a person to be recovered fully and live a normal life.

- Most people with mental disorders live productive and positive lives while receiving treatments for their mental illness.

- Some people have severe and persistent mental disorders which respond poorly to current treatments (as in all other illnesses)
### 9.2.3 CAUSES OF MENTAL ILLNESS

- No single factor is known to cause a specific mental disorder, rather, multiple factors, including:
  a) biological or genetic factors,
  b) psychosocial factors and
  c) environmental factors,
- Other factors are biochemical imbalance, deterioration of brain cells (especially in elderly people) and alcohol or drug abuse.
- It is unclear what causes mental disturbances.
- It is often preceded by emotional stress and difficulty coping with conflict or adjusting to adverse events.

### 9.2.4 TYPES OF MENTAL ILLNESS

- There are 2 main types of mental illnesses
  a) Minor mental illness (neurosis)
     Best understood as exaggerated emotional responses that the sufferer is aware of, yet unable to control. Very often related to stress.
  b) Major mental illness (psychoses)
     I. Organic Psychoses
        In the organic psychoses, there is a demonstrable physical or structural injury to the brain or central nervous system such as head injury, brain tumor, syphilis and brain hemorrhage due to strokes and alcoholism.
     II. Functional Psychoses
        In the functional psychoses, doctors do not know yet the exact cause. The cause may be in the patient's early emotional experiences, his physical make-up or his environment. Most likely, it is a combination of all these factors that is responsible
- Several Types of Mental Illness includes:
  a) Anxiety Disorder
  b) Bipolar Disorder
  c) Depression
  d) Schizophrenia
### 9.2.5 ANXIETY DISORDER

- Anxiety is a normal reaction to stressful situations. However, people with anxiety disorder respond to such situations or even seemingly normal situations in an excessive manner.
- Anxiety disorder is among the commonest mental disorders experienced by many people.
- It is not one condition but a group of conditions, each with its unique presentation.
- However, all anxiety disorders are characterized by persistent and excessive fear or worry that is distressing and interferes with daily living.

#### Generalized Anxiety Disorder (GAD)

Excessive worry about a variety of everyday problems that causes them to feel tense and distressed. They worry about health issues, finance, family member’s wellbeing or safety issues or something negative will happen even though the situation does not warrant such worries. Often they have trouble falling asleep or staying asleep. Physical symptoms include fatigue, headaches, light-headedness, chest or stomach discomfort, shortness of breath, nausea or having to go to the toilet frequently. GAD develops slowly. It often starts during the teen years or young adulthood. Symptoms may get better or worse at different times and often are worse during times of stress.

#### Phobia

Intense, irrational fears triggered by things that pose little or no real danger such as heights, flying or spiders. Most people with specific phobias have several triggers. To avoid panicking, someone with specific phobias will work hard to avoid their triggers. Depending on the type and number of triggers, this fear and the attempt to control it can seem to take over a person’s life.

#### Obsessive-Compulsive Disorder (OCD)

This is a very distressing condition characterized by Obsessions and Compulsive behaviours. Obsessions are recurring, persisting unwarranted thoughts, impulse or images which cause marked distress or anxiety. Compulsions are repetitive behaviours aimed at relieving anxiety caused by obsessions. Failure to do so would result in stress and anxiety.
9.2.6 BIPOLAR DISORDER

- Bipolar Disorder, also known as manic-depressive illness is a brain disorder characterized by episodes of emotional highs (mania or hypomania) and lows (depression) which are different from the normal ups and downs that people go through.

- Unusual intense emotional states occur in distinct periods called “mood episodes”. Each mood episode represents a drastic change from a person’s usual mood and behaviour.

- An overly joyful or overexcited state is called a manic episode, and an extremely sad or hopeless state is called a depressive episode.

- Sometimes a mood episode includes symptoms of both manic and depression. This is called a mixed state.

- People with bipolar disorder also may be explosive and irritable during a mood episode. Extreme changes in energy, activity, sleep and behaviour go along with these changes in mood.

- Signs and Symptoms
  
  a) Manic Episode
  - Feeling “high” or an overly happy or outgoing mood
  - High energy level, engaging in increasing activities
  - Needing little sleep and yet is still very energetic
  - Talking very fast, jumping from one idea to another, having racing thoughts
  - Having an unrealistic belief in one’s abilities (grandiosity)

  b) Depressive Episode
  - Feeling sad or hopeless
  - Loss of interest in activities once enjoyed, including sex
  - Feeling tired or “slowed down”
  - Having problems concentrating, remembering and making decisions
  - Being restless or irritable

- In extreme moods of mania or depression, symptoms may become psychotic with delusions, totally out of contact with reality. It requires admission for safety reason.

- Hypomania

Mania in Bipolar Disorder can also present in a milder form called Hypomania. During a hypomanic episode, the affected person feel very good, is highly productive and functions well. You may not feel that anything is wrong but family and friends may recognize the mood swings as possible Bipolar disorder. Without proper treatment, people with hypomania may develop severe mania or depression.
9.2.7 DEPRESSION

- Depression is an illness due to chemical imbalance in the brain.
- It is common and a treatable condition. Undiagnosed and untreated, depression can ruin your life and your future. Many suicide cases are committed by people who were depressed and untreated.

- Recognizing Depression
  Depression is more than feeling depressed. If a person has 5 or more of the following symptoms for more than 2 weeks, that person may be suffering from Depression.

  a) Extreme sadness*
b) Loss of interest in usual activities*
c) Feeling of hopelessness, worthlessness and guilt
d) Poor concentration
e) Fatigue
f) Mentally or physically slow or agitation
g) Appetite – decrease/increase
h) Sleep changes – decrease/increase
i) Suicidal thoughts

- Post-Partum Depression is depression after childbirth due to the sudden drop in hormones (Estrogen and Progesterone) in the body. It affects the ability of the mother to care and bond with the new born baby and caring for other children.

- Depression can also be part of Bipolar Disorder which is a mood disorder characterized by episodes of emotional highs (mania or hypomania) and lows (depression) which are different from the normal ups and downs that people go through.

- Risk factors include:
  a) Personal or family history of depression
  b) Major life changes, trauma, or stress
  c) Certain physical illnesses and medications
9.2.8 SCHIZOPHRENIA

- Schizophrenia is an illness with severe disturbance in the brain’s functioning, resulting in disturbed thoughts and bizarre behaviours.
- It usually appears during late adolescence and early adulthood.
- The cause is still unknown but is believed to be contributed by predispositions, abnormalities in brain chemistry and stresses faced by the affected person.
- Schizophrenia is treatable. It is important to detect and treat early to minimize functional impairment caused by the illness.

- Recognizing Schizophrenia Symptoms
  a) Delusions (Believing in things that are not true like people reading their minds, controlling their thoughts or plotting to harm them)
  b) Hallucinations (Typically hearing voices that are not there, like people talking bad about them and condemning them)
  c) Disorganized Thoughts and Speech (Incoherent speech, swearing and strange mannerisms)
  d) Negative symptoms (Lack of emotions and expression, lack of motivation, social withdrawal and personal neglect on appearance and hygiene)

- Phases of Illness
  a) Prodromal Phase (Early Stage) – Affected person becomes quieter, and gradually withdraws from usual activities and other people. Person has difficulty in concentration with drop in academic or work performance. The individual may become preoccupied with certain topics or become overly religious.
  b) Active Phase – Affected person becomes very disturbed with hallucinations, delusions, bizarre behaviours, incoherent speech and not in contact with reality. Person needs to be admitted immediately for treatment.
  c) Residual Stage – With proper medications, symptoms of acute phase are controlled. Some may be well enough to resume their activities. Others may remain subdued and have difficulties in engaging with their usual social activities. The symptoms in this phase are similar to the prodromal phase.
9.2.9 MYTHS AND FACTS ON MENTAL ILLNESSES

**Myth**: A person who has been mentally ill can never be normal.

**Fact**: There are many people who have experienced a psychiatric illness and living successful, rewarding lives. Others may have to take medications at times or permanently, but cope well with support.

**Myth**: People with mental illness are unpredictable.

**Fact**: When their illness is in an active phase, they can be impulsive and not their usual self; but once recovered, their behavior becomes more consistent.

**Myth**: Mentally ill people are dangerous and violent.

**Fact**: Most of them are not dangerous or violent. Many lack concentration, motivation and the ability to organize. Rare cases of violent occur only when they are seriously ill. When stable, they are no more violent than the average person.

**Myth**: A hospitalized mentally ill person mixing with others is more likely to get worse than better.

**Fact**: Mental illness is not contagious, nor can it be transmitted through social contact.

**Myth**: Psychiatric treatment is likely to cause brain damage as evidenced by the patient’s robotic-like expression.

**Fact**: Robotic-like expression is more a sign of illness than an effect of treatment.

**Myth**: If a person can talk sensibly and has an intact memory, then the person is not mentally ill.

**Fact**: There are numerous types of mental illness and many forms do not affect one’s memory or ability to speak appropriately.
9.3 MENTAL HEALTH APPROACH IN MALAYSIA

9.2.1 WHAT IS MENTAL ILLNESS

- Four decades after the British settled in Penang, which constituted a part of the Straits Settlements, a "lunatic system" was set up in the 1830s and the British regime established asylums in three of the Federated Malay States during the late 18th century.
- Later the Federal Lunatic Asylum near Tanjong Rambutan, Perak, was established in 1911 with 280 beds and was renamed Central Mental Hospital (CMH) in 1928.
- In August 1957, Malaya gained independence and health services became a federal responsibility.
- The first psychiatric outpatient clinic in a general hospital was opened in Ipoh in 1958.
- Mental institution was decentralized from the federal health service from 1970s.
- In 1970 the Minister of Health renamed the two mental hospitals as Hospital Bahagia from CMH and Hospital Permai from Tampoi Mental Hospital (TMH) to minimize the stigma attached to these institutions.
- The Neuropsychiatric Society was also founded in 1971 and at about the same time the Malaysian Mental Health Association (MMHA) was established.
- The mental health acts here have existed since 1953, but were meant for a local or regional population and remained outdated.
- The Ministry of Health here developed the National Mental Health Policy (1997) that is quite comprehensive and provides policy guidelines in mental health issues.
- Introduction of New Mental Health Act 2001 and Mental Health Regulations 2010 to provide better care for the mentally ill.
- Mental Health Promotion Advisory Council was set up and chaired by Hon. Minister of Health in January 2010.
There are 250 psychiatrists for a population of 28 million people, ratio of 0.9 psychiatrist per 100,000 population.

There are 82 clinical psychologists in the country and only 3 in MOH (1 hospital).

Positive development in the area of mental health in Malaysia is the significant increase in the number of day-care centers for psychosocial rehabilitation, of which half are run by non-government organizations (NGOs).

A recent major development in the area of mental health in Malaysia is the launching of the Healthy Lifestyle Campaign by the Ministry of Health starting in 1991. Promotion of Mental Health 2000 was the fourth theme of the second phase (1997–2002).

Manual of Prime and Supportive Messages on mental health was formulated by the MOH with the help from UKM and UM.

This manual serves as a basic reference material on matters of mental health and covers aspects for the Promotion of Mental Health targeted toward the general population and specific groups such as children, adolescents, parents, working adults and the elderly.

Regular mental health seminars and awareness programs are also held in Malaysia.
Cases of mental illnesses are increasing around the world. Mental Illnesses stop a person from reaching their most potential in life.

EXERCISE 2.1

1. Describe the FOUR main stages of mental illnesses (20 marks)
Unit 10 ➔ HEALTH CARE SYSTEM IN MALAYSIA

INTRODUCTION

This chapter is aims to create an understanding of social, cultural and psychological factors affecting DISEASE, HEALTH and WELLNESS of individuals and groups and to assess how and in what ways these can be learnt and applied in practice and research.

OBJECTIVE

To outline the following areas of concern

3. Understand the concept of Prevention
4. Explain Levels of Prevention of diseases
5. Explain Natural History of Disease
6. Apply Principles of prevention of diseases
10.1 INTRODUCTION

- Health care is defined as the maintenance and improvement of physical and mental health, especially through the provision of medical services.
- The National Health Delivery System in Malaysia is predominantly western, frequently referred to as modern scientific medicine. Western trained health personnel provide health and medical care.
- Malaysian’s health care system is recognised by the World Health Organization as among the best in developing countries.
- The Ministry of Health is the main government agency to provide health care services.
- Health care providers can be divided into three;
  a) Public Sector – government sector
  b) Private Sector - non government sector
  c) Complementary Medicine – alternative medicine

- Ministry of Health (MOH) is a major provider.
- Other agencies:
  a) Ministry of Education
  b) Ministry of Defence
  c) Ministry of Finance
  d) Ministry of Home Affairs
  e) Ministry of Social Services
  f) Local Authority

- The health services of MOH is highly centralized where most planning and organization of health services being carried out centrally.
- MOH provides comprehensive services, encompass of:
  a) Medical services: curative and rehabilitative
  b) Public health services: preventive and promotive
  c) Support services
Organization structure: Federal, State and District.

- The level of care are divided into three;
  a) Primary
  b) Secondary
  c) Tertiary
10.2 PRIMARY HEALTH CARE

- Primary Health Care (PHC) is defined as ‘Health for all’ (Declaration of Alma-Ata)
- It is proposed by the World Health Organization (WHO) in 1978.
- Primary Health Care should have the following characteristics;
  a) Accessible – near to patient home
  b) Integrals part of the national health system
  c) Integrated with other services: agriculture, education etc
  d) Community participation
  e) Using local resources
  f) Integrated and comprehensive approach of health care
  g) Affordable
- PHC is the essential equally to everyone in a community.
- It is a basic level of health care provided which addresses the most common problems in the community and to maximize health, wellness and well-being.
- PHC adopt strong and broad-based of PHC and incorporated the following strategies:
  a) Wellness focus: this will involve creating & providing services that will promote individual wellness through life
  b) Personalized information: providing accurate and timely information and promoting knowledge through personalized education services to enable a person to make informed health decision.
  c) Person focus: focusing services on the individual and making available services when & where required.
  d) Self-care: increasing the ability of individuals and families to manage health through knowledge transfer and intensive network based health management tools
  e) Seamless care: integration of health services and information across settings and episodes of care to provide continuity of care.
  f) Customized care: services modified to the needs of individual & group in special circumstances
  g) High quality of care: improving the quality, access and delivery of care at a reasonable cost
Most primary health care is offered in the private sector in urban areas, while the public primary health care facilities are mainly located in rural areas.

Primary care is very well developed in Malaysia as it was the focus of health development in the country after Malaya (then) gained independence from the British in 1957.

The Ministry of Health health clinics provide four components of primary health care:

- **Curative services** in the Ministry of Health clinics include: basic medical care, minor surgery, circumcision, care of chronic conditions, detection of malaria and tuberculosis, detection and early intervention of diabetes, cancer, sexually transmitted diseases and HIV. They also include rest beds in the centre for observation before referral to the next level of care, as well as referral to specialists.

- **Preventive programmes** encompass all ages: screening for child development, for women’s health concerns (such as pap smears and breast screening), screening those above 40 years old for cardiovascular risk factors and offer thalassaemia screening, tobacco cessation programmes, blindness prevention, mental health services, elderly and adolescent health programmes, premarital screening for HIV and school health services among others. District health offices also are responsible for community-level preventive programmes, such as communicable and vector-borne disease control, as well as environmental sanitation.

- **Health promotion programmes** include health education and nutrition.

- **Rehabilitative programmes** include community-based rehabilitation for children with special needs.
Primary care is very well developed in Malaysia as it was the focus of health development in the country after Malaya (then) gained Independence from the British in 1957.

In the public sector, primary care is provided mainly by the Ministry of Health under a two tier system:

- Rural clinics manned by one or two community nurses; and
- Health Clinics (or called Community Polyclinic for newer clinics) and Maternal Child health Clinics in bigger rural towns and in urban areas, providing a comprehensive range of services.

Health clinic coverage is for 20,000 population

Rural clinics are between 2000 to 4000 population

Health Clinic services includes:

- Maternal and Child Health; Outpatient and home visit
- Outpatient clinic & emergency care
- Laboratory services
- Pharmacy
- Diagnostic imaging
- Expanded program; screening clinic for Diabetes Mellitus and quit smoking clinic
- Care for elderly
- Special need children clinic
- Mental health
In the clinics there are minor surgery, dressing, immunization etc.

Type of health clinics:
- Type I: 800 –1000 patient per day
- Type II: 500 – 800 patient per day
- Type III: 300 – 500 patient per day
- Type IV: Less than 300 patient per day

The following table is primary health services in Malaysia and its scope of services:

<table>
<thead>
<tr>
<th>Level</th>
<th>Staffing</th>
<th>Scope of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Clinic</td>
<td>1-2 community nurse (2 1/2 year training programme)</td>
<td>Maternal and child health, Family planning, Simple ailments and first aids</td>
</tr>
<tr>
<td>Maternal Childcare Clinic</td>
<td>Staff nurses (several) Community nurses (several)</td>
<td>Maternal Health - antenatal, post-natal care, home visiting, domiciliary service, and family planning, Child health – immunization, developmental monitoring, home visiting</td>
</tr>
<tr>
<td>Community Polyclinic</td>
<td>Family physician (in larger clinics) Medical officers (1 to several) Medical assistants (several) Staff nurses (several) Community nurses (several)</td>
<td>Initial (traditional) services Maternal and child health Family planning Nutrition promotion and education Medical care for acute and chronic diseases School health service Dental service Expanded scope Mental health Rehabilitation for children with special needs Elderly care Adolescence Health Health and Wellness Accident and Emergency service</td>
</tr>
</tbody>
</table>

Access to the MOH primary care service is direct, as walk-in patients, while access to specialist service in primary care centres or hospitals is through referral to ensure appropriate use of scarce resources.

Primary care service (public sector) in the rural areas are free, while a nominal fee of RM1.00 (US 27 cents) is charged for each visit in the urban clinics. This covers consultation, laboratory and x-ray investigations, as well as medications which could be up to 1-3 months supply for chronic diseases.
Example of Malaysian Primary Health Care system

- The Ministry of Health provides a comprehensive range of maternal and child health service in its primary care facilities.

**Maternal healthcare service**

a) Ante-natal care comprising of pregnancy monitoring and treatment of conditions arising from pregnancy; VDRL and HIV testing (voluntary); health and nutrition education; dental care during pregnancy;
b) Home delivery for low risk pregnancies;
c) Post-natal care which include home visit for complicated deliveries;
d) Family planning.
e) Nutrition promotion and education, breast feeding in particular.

Expectant mothers with complications during pregnancy are referred to either the family health physician in the health clinic or relevant specialist in the hospital for further management.

**Child-health service**

a) G6PD screening at birth;
b) Home visit for high risk babies (complications during delivery, or complicated pregnancies). However, such home visits occur mainly in the rural clinics as the huge workload in urban clinics make it difficult to carry out such visits at times.
c) Immunisation which covers BCG; oral polio; triple antigen (DPT); mumps, measles and rubella (MMR), Hepatitis B and Haemophilus influenza;
d) Child development monitoring, up to 4 years of age;
e) Nutrition assessment and food supplement for under-weight and malnutrition children.
### 10.3 SECONDARY AND TERTIARY HEALTH CARE

- **Summary of types of services provided by the Malaysian public facilities**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary Health Care</strong></td>
<td>Comprise of outpatient department as the first point of contact, including maternal child healthcare, dental services, school health services and support services such as clinical and imaging facilities, pharmacy and registration.</td>
</tr>
<tr>
<td><strong>Basic secondary care services</strong></td>
<td>Comprise of General Medicine, General Surgery, Obstetrics and Gynecology, and Pediatrics. The services are run by resident medical officers and visiting specialties.</td>
</tr>
<tr>
<td><strong>Full secondary care services</strong></td>
<td>Comprise of General Medicine, General Surgery, Obstetrics and Gynecology, Pediatrics, Orthopedics, Anesthesiology, Psychiatry, Dermatology, Medical Rehabilitation, Pathology, Imaging, Dental, Ear, Nose and Throat (ENT), Ophthalmology and Geriatrics. The services are run by medical officers and resident specialists</td>
</tr>
<tr>
<td><strong>Tertiary care services</strong></td>
<td>Comprise of highly specialised care in areas such as Cardiology, Cardiothoracic Surgery, Geriatrics, Pediatric Surgery, Neurology, Neurosurgery, Respiratory Medicine, Urology and Nephrology, Plastics Surgery and Burns, Maxillofacial, Radiotherapy and Oncology, and Endocrinology</td>
</tr>
</tbody>
</table>

![Diagram of health care services categorization]
• There are four types of hospitals
  a) District hospitals
  b) State General Hospitals
  c) National Referral Centre and Special Institution
  d) Non-MOH Hospitals

• The District Hospital have 100-200 beds run by 6-10 medical officers

• State General Hospitals have 500-1500 beds

• Each State has one General Hospitals but Sabah has two

• The Ministry of Health hospitals are classified in five levels:
  a) Small district hospitals (visiting specialists only);
  b) Larger district hospitals with resident specialists;
  c) State-level general hospitals with resident specialists;
  d) Hospitals with multiple specialties including regional hospitals (that cover several states) and national hospitals;
  e) Specialist hospitals or institutions (e.g. for cancer or leprosy).

• Large district hospitals have at least 6 specialties (general medicine, general surgery, paediatrics, orthopaedics, obstetrics & gynaecology and anaesthesiology).

• State-level hospitals have up to 15 specialty and subspecialty services

• More complex care, such as cardiothoracic, neurosurgery and vascular surgery are provided in regional hospitals in north, central, east and south Peninsular Malaysia and in Sabah and Sarawak.

• Designated specialty national and regional hospitals take referrals from around the country. For example, Hospital Selayang specializes in microsurgery and in kidney and liver conditions; and Hospital Sungai Buluh provides trauma care and care for infectious diseases.

• Kuala Lumpur Hospital, the oldest and biggest hospital in Malaysia, has over 2000 beds and is a national referral centre for advanced tertiary care. It is the highest level of hospital in the hierarchy.

• There are nine Special Medical Institutions (9)
  a) One Rehabilitation Hospital,
  b) One Women & Children Hospital,
  c) One Leprosy Hospital,
  d) One Respiratory/Tuberculosis Hospital,
  e) One Cancer Hospital
  f) Four Psychiatric Institutions
## 10.4 OTHER MEDICAL SERVICES

### 10.4.1 EMERGENCY CARE

- The Ministry of Health clinics provide basic emergency services managed by paramedics (i.e. assistant medical officers) and 90% of clinics are equipped with ambulances.
- The main function is to respond to accidents and emergencies which requires clinical treatment and referral protocols and specific tools (ambulances, equipment and drugs).
- Facilities involved
  - a) the national emergency call centre network,
  - b) coordinates ambulance services (Ministry of Health, Red Crescent, St Johns’ Ambulance, Civil Defence Department, JPA 3),
  - c) arranges communications between hospital emergency departments,
  - d) organizes telemedicine activities and
  - e) provide mobile medical teams.
- Larger hospitals have emergency departments
- Emergency medicine specialists have been trained in Malaysia since 2003.

### 10.4.2 EMERGENCY CARE

- Malaysia has over 1760 private retail pharmacies mainly in urban areas
- Pharmacists also work in government hospitals and the larger government health clinics.
- Assistant pharmacists or dispensers work in the smaller health clinics, while dispensing in rural clinics is done mainly by paramedics, assistant medical officers and community nurses.
- Pharmacy practice in the government has evolved from a product-oriented to a more patient-oriented service. Patients are counselled to ensure medication understanding; pharmacists are part of health care teams and are experts in drug safety.
- Pharmacists in the major hospitals offer drugs and poison information as do the National Poisons Centre at the University of Science Malaysia and the National Drug Information Centre at Hospital Kuala Lumpur.
10.4.2 REHABILITATION/INTERMEDIATE CARE

- Rehabilitation services are provided in most government health clinics and hospitals, such as assistance with sight and hearing disabilities, screening for autism and counselling on the management of children with special needs.
- Staff do outreach sessions at smaller clinics and visit parents and caregivers at home. Far fewer people are registered.
- The National Anti-Drug Agency under the Ministry of Home Affairs runs 20 drug rehabilitation centres that receive inmates through the legal system and provide ‘cold turkey’ detoxification and 2 centers that provide methadone maintenance therapy.
- In addition, 5 cure & care clinics take patients who voluntarily seek treatment.

10.4.3 LONG-TERM CARE

- Few hospitals have engaged geriatricians and have set up geriatric services.
- The government promotes an intersectoral and community-based approach to help the elderly to remain living at home; for example, district and clinic-level committees plan activities and encourage healthy older people to assist the less healthy, such as through the 225 Clubs for Elders ‘Kelab Warga Emas’ based in government health clinics.
- The Department of Social Welfare provides long-term care homes for dependent people who have no family support with outreach medical services from nearby Ministry of Health facilities.
- Nongovernment organizations also run long term care homes supported by government grants and community donations.
10.4.4 PALLIATIVE CARE

- Palliative care is specialized medical care for people with serious illness. It focuses on providing relief from the symptoms and stress of a serious illness such as cancer, congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), kidney disease, Alzheimer’s, and Parkinson’s.
- The goal is to improve quality of life for both the patient and the family.
- The first palliative care unit was established in 1995 in the Queen Elizabeth Hospital in Kota Kinabalu and palliative medicine was further developed at the Selayang Hospital. So far only 13 units and 48 teams have been established.
- Community-based palliative care is provided mainly by NGOs, such as Hospice Malaysia and the National Cancer Society of Malaysia (Penang & Sabah branches).

10.4.5 MENTAL HEALTH CARE

- Mental health care is integrated into all the primary health care clinics, administratively under the public health division of the Ministry of Health.
- The scope focus on mental health promotion, early detection and treatment, follow up of stable mentally ill, psychosocial rehabilitation, and family intervention.
- Facilities provided are mainly Psychiatry Hospitals, Psychiatry Nursing Homes and Community Mental Health Centres.
- To date, there are 680 health centers providing a stable follow up and early detection and treatment and 27 health centers with psychosocial rehabilitation programmes.
- Resident psychiatrists were posted to all state hospitals and large district hospitals.
10.4.6 ORAL HEALTH CARE

- Oral healthcare in Malaysia is provided both by public and private sectors. Dental care is provided through 1707 public clinics and 1435 private clinics.
- Services are delivered in dental clinics, school clinics and by mobile teams.
- Some larger centres provide specialist care in orthodontics, periodontology and restorative dentistry.
- In the public sector, the Oral Health Division is the lead agency for the dental profession.
- The MOH is also the lead agency in the provision of oral healthcare to the nation. A substantial contribution to care is provided by the Dental Corps of the Ministry of Defence, and the Department of Orang Asli Affairs within the Ministry of Rural and Regional Development.
- Dental Faculties also provide services and these include the dental faculties of Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM) and Universiti Sains Malaysia (USM) which lie under the purview of the Ministry of Higher Education.
- Government clinics give priority to groups, such as preschoolers, schoolchildren, antenatal mothers, the elderly and disadvantaged groups (mental, physical and economic).
- Public care is heavily subsidized and most target groups are entitled to basic care at no charge.

<table>
<thead>
<tr>
<th>Healthcare Facilities, 2013 (as of 31 December)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government (contd.)</strong></td>
</tr>
<tr>
<td>• 1Malaysia Clinics</td>
</tr>
<tr>
<td>- 1Malaysia Clinics</td>
</tr>
<tr>
<td>- 1Malaysia Mobile Clinics (Bus)</td>
</tr>
<tr>
<td>- 1Malaysia Mobile Clinics (Boat)</td>
</tr>
<tr>
<td>- 1Malaysia Dental Clinics (UTC)</td>
</tr>
<tr>
<td>- 1Malaysia Mobile Dental Clinics (Bus)</td>
</tr>
<tr>
<td>- 1Malaysia Mobile Dental Clinics (Boat)</td>
</tr>
<tr>
<td><strong>Non Ministry of Health</strong></td>
</tr>
<tr>
<td>Hospitals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Healthcare Facilities, 2013 (as of 31 December)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private</strong></td>
</tr>
<tr>
<td>• Licensed/Operational</td>
</tr>
<tr>
<td>- Hospitals</td>
</tr>
<tr>
<td>- Maternity Homes</td>
</tr>
<tr>
<td>- Nursing Homes</td>
</tr>
<tr>
<td>- Hospice</td>
</tr>
<tr>
<td>- Ambulatory Care Centre</td>
</tr>
<tr>
<td>- Blood Bank</td>
</tr>
<tr>
<td>- Haemodialysis Centre</td>
</tr>
<tr>
<td>- Community Mental Health Center</td>
</tr>
<tr>
<td>- Combined Facilities</td>
</tr>
<tr>
<td>• Registered</td>
</tr>
<tr>
<td>- Medical Clinics</td>
</tr>
<tr>
<td>- Dental Clinics</td>
</tr>
</tbody>
</table>

*Refers to A Cord Blood Stem Cells Banks and 1 Stem Cell and Regenerative Medicine Research Lab and Services.*
### 10.4.7 COMPLEMENTARY AND ALTERNATIVE MEDICINE

- Malay, Chinese and Indian medicine, homeopathy and complementary medicines are widely used in Malaysia.
- There are several associations of practitioners, such as the 2000-member Chinese Physicians Association of Malaysia (Pillay, 2006).
- Government of Malaysia approved a limited introduction of proven safe and effective T/CM practices.
- Pilot T/CM units set up in three government hospitals that offer acupuncture, reflexology, naturopathy and post-natal massage, with plans for two others in Kota Kinabalu and Kuching.
- Products are offered through a herbal medicine service in one hospital, mainly as an adjunct therapy in treating cancer, with a herbal medicine oncologist from China providing consultation and training.
- Training for T/CM practitioners is undertaken in accredited institutions and practitioners must be registered to practise legally.

### 10.4.8 HEALTH SERVICES FOR SPECIFIC POPULATIONS

- Specific populations refers to those with difficulties of access include the Orang Asli and Penans, the poor in urban and rural areas, estate workers and populations on small islands.
- The Department of Aboriginal (Orang Asli) Affairs provides health services in special hospitals (Hospital Orang Asli) and health posts.
- The flying doctor service (FDS) began in 1973 in Sarawak as a combined effort by the Sarawak state government, the Royal Air Force and the Sarawak health department.
- Malaysia had 193 mobile health teams providing outreach services to remote populations in 2008, such as the Penan people in Sarawak, where about 10,000 formerly nomadic people now are permanently settled or semi-settled in remote locations.
- Services include curative care, preventive care such as immunization, antenatal care, nutritional assessments of toddlers, health screening, health education, dental services and environmental sanitation.
Malaysia has a systematic and excellent health care services. It comprises almost all types of health services needed for all Malaysian population.

**ACTIVITY 1.1**

(a) Search the main services provided by the government in 1 Malaysia Clinics.

**KEYWORDS**

- Primary Health Care
- Secondary Health Care
- Tertiary Health Care

**SELF-CHECK 1.1**

- Can you describe the health care systems available in Malaysia?

**EXERCISE 2.1**

1. Describe the Primary Health Care available in Malaysia (20 marks)
TEST AND EXAM SIMULATION

Mid-Term Examination
Mid-term exam should be sit by students. Exam questions will be based on the module. Questions are a combination of objective and subjective/essay. This examination includes units 1 to 5, however latest information about the exam as a form of questions, number of questions and topics involved will be informed to the students during face to face meetings. The total value of this exam scores are dependent on the current lecturer/course instructor.

Final Exam
The exam questions will cover all topics in the modules, however, the emphasis is on a topic that has not yet been graded. Tutor in the learning center will be informed about these topics or students can connect directly with the lecturers of the course to get the latest information. Final examination questions must be a combination of objective and subjective / essay.

(Attention! Structure of exam questions may change, students can communicate directly with the lecturer / instructor on the latest information about the exam during face to face meetings)
Examples of exam questions are as follows:

**MULTIPLE CHOICES QUESTIONS**

1. What is nosocomial infections? / Apakah jangkitan nosokomial?
   A. Hospital – acquired infections / Jangkitan berpunca daripada hospital
   B. Infection related to nose and throat / Jangkitan berkaitan hidung dan tekak
   C. Infectious Respiratory diseases / Penyakit berjangkit berkaitan pernafasan
   D. Air-borne infection / Jangkitan bawaan udara
   (Answer: A)

2. Which of the following defines prevalence of a disease? / Yang manakah antara mendefinisikan prevalen sesuatu penyakit?
   A. New cases / Kes baru
   B. New cases occurring in a defined time period / Kes baru berlaku dalam tempoh masa yang ditetapkan
   C. Existing cases present at a single time point / Kes sedia ada sekarang pada satu masa
   D. New cases, plus existing cases plus deaths / Kes baru, ditambah dengan kes-kes yang sedia ada ditambah dengan kematian
   (ANSWER C)
Lung cancer is among the commonest cancer among Malaysian. Answer the following questions (20 marks). / Kanser paru-paru adalah salah satu daripada kanser yang kerap terjadi di kalangan masyarakat Malaysia. Jawab soalan-soalan berikut (15 markah)

a. What is lung cancer? (4 marks) / Apakah kanser paru-paru? (2 markah)
   (Answer: Uncontrolled cell growth in tissues of the lung. Uncontrolled division of abnormal cells within the lung)

b. What are the 3 main risk factors of lung cancer? Explain briefly (6 marks) / Apakah tiga faktor risiko utama bagi kanser paru-paru? Terangkan secara ringkas (3 markah)
   (Answer: Tobacco smoke (active and passive), genetic, air pollution (radon, asbestos)

c. Explain why the number of smokers is increasing among Malaysian despite of the various campaigns made by the government? (10 marks) / Terangkan mengapa jumlah perokok meningkat di Malaysia walaupun setelah kerajaan membuat kempen besar-besaran? (10 markah)
   (Answer: Nicotine, KAP, Culture, Awareness, Enforcement, Support system, addiction)


Crowther, Thwaites and Zhou. 2004. Interdisciplinary Team Research (ITR), (ENV403C) Monash University


Mary-Jane S. (2011) Introduction to Public Health, Jones and Bartlett, Boston


Ministry of Health Malaysia (1999) Health in Malaysia: Achievement and Challenges

Ministry of Health Malaysia (2005), Annual Report 1999 / 2005

Ministry of Health Malaysia (2009). TELEPRIMAY HEALTH, Family Development Health Services, KKM


Neil Schneiderman, Psychosocial, Behavioral, and Biological Aspects of Chronic Diseases; Department of Psychology and Behavioral Medicine Research Center, University of Miami


Resource Centre Malaysian AIDS Council (2007) AIDS in Malaysia


Sirajoon N.G., Hematram Y. (2008), Health Care in Malaysia, University Malaya Press


Unnikrishnan Payyappallimana, Role of Traditional Medicine in Primary Health Care: An Overview of Perspectives and Challenges. Yokohama Journal of Social Sciences, 14: 6


WHO (2009). Age-standardized DALYs per 100,000 by cause, and Member State, 2004


