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UNIT I
HEALTH

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Unit – I

- Health: Concept of Health, Definition, Dimensions of Health, Determinants of Health, Right to Health, Responsibilities for Health, Indicators of Health. Healthy lifestyle,
- Disease: Definition; Disease Causation; Natural History of Disease; Types of Disease Agents; Host factors; Environmental Factors; Risk Groups. Disease control. Disease Prevention.

Concept of Health

- Health, according to the World Health Organization, is "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity".
- Health is a resource to support an individual’s function in wider society, rather than an end in itself. A healthful lifestyle provides the means to lead a full life with meaning and purpose.

Objectives & Aims of Health

- Physical and Mental development
- Character building
- Development of Organic system
- Healthy and happy life
- Socialisation
- Recreation
- Self expression
- Leadership and skill development
- Development of hidden qualities
- Self confidence
- Sportsman spirit

- **Physical and Mental Development**

  Physical development: the changes in size, shape, and physical maturity of the body, including physical abilities and coordination. Intellectual development: the learning and use of language; the ability to reason, problem-solve, and organize ideas; it is related to the physical growth of the brain.

- **Character Building**

  Building character means **learning how to handle tough or uncomfortable situations**.

- **Socialisation**

  Main biological characteristic of humans are based on socialization: Lack of instincts, social contact requires a longer period of childhood dependency, the ability to learn and language. Those abilities are learn from healthy physical and mental capacity only.

Development of Organic System

Important objective of health is to develop the healthy organic system. There are 11 distinc organ systems in human beings, which form the basis of human anatomy and physiology.

The 11 organ systems include the

- respiratory system,
- digestive and excretory system,
- circulatory system,
- urinary system,
- integumentary system,
- skeletal system,
- muscular system,
- endocrine system,
- lymphatic system,
- nervous system, and reproductive systems.

Recreation

Recreational uses means those activities of a voluntary and leisure time nature that aid in promoting entertainment, pleasure, play, relaxation, or instruction.

- Recreation has many health benefits, and, accordingly, Therapeutic Recreation has been developed to take advantage of this effect.
- psychiatric facilities for youth and adults, and in the care of the elderly
- the disabled, or people with chronic diseases.
- Recreational physical activity is important to reduce obesity,

Self Expression

- Self-expression; in fact, their psychological and physical well-being depend on it. In Imagination and Expressive Arts as Antidotes to Adversity
- Engaging in creative self-expression is a wellness practice, as beneficial as spending time in nature, good nutrition, sleep, and physical exercise.
- Creative self-expression reduces stress and increases a sense of well-being and other positive emotions.
- It helps to heal wounds and bridge differences, supporting health, well-being, resilience, and coping abilities.

Leadership and Skill Development

- Effective leadership is a complex and highly valued component of health
- It is an influential process, through which groups of people work towards the achievement of a common goal
- Effective leadership is a complex and highly valued component of healthcare education, increasingly recognised as essential to the delivery of high standards of education, research and clinical practice
- leaders within healthcare education should not rely on formal positions of authority, but instead, utilise their own appropriate leadership qualities irrespective of their level within the organisation

Development of Hidden Qualities

- Be Empathetic
- Be Intuitive
- Be Creative
- Be Passionate
- Be a healthy Life-long Learner
- Be a healthy Good Listener
- Be Persuasive
- Be Responsible and Kind
- Be Courageous

Self confidence

- Confidence is knowing that you have skills and positive traits, that you are able to face challenges and deal with difficult circumstances;
- Confidence can also give you a positive outlook on life, increasing your mental and emotional wellbeing.
- Confidence levels can change throughout your life and across different areas of your life.
- Many things can influence your confidence levels such as your thoughts, feelings, actions and past experiences.
- It is important to try and understand what affects your confidence because ongoing low confidence can affect your physical and emotional health, your relationships with others

Sportsman Spirit

- **Sportsman spirit** is the act of accepting one's success with humility.
- By engaging in physical activities, you can manage your weight, decrease the chances of any disease, and strengthen your body.
- Sportsmanship is **when competitors or viewers of competitive events treat one another with respect and exhibit appropriate behavior**.
- Good sportsmanship means being fair and ethical, it only happened through good healthy mind and body

Spectrum of health

Spectrum of health

-positive health

-better health

-freedom from sickness

-Unrecognisedsickness

-mild sickness

-severe sickness

-death

Determinants of health

1. Biological Determinants
2. Behavioural and socio cultural conditions
3. Environment
4. Socio economic conditions
5. Health services
6. Aging of the population
7. Gender
8. Other factors

Responsibility for health

I.Individual responsibility

II.Community responsibility

III.State responsibility

IV.International responsibility

Community responsibility

- PHC
- ASHA (Accredited Social Health Activist) under National Health Mission
- Village health guides scheme-1977

International Responsibility

- United nations system
- It covers-exchange of experts
- Provisionof drugs and supplies
- Border meetings
- Regard to control of communicable disesases

Important regional mechanisms for co operation

- (Association of south east Asian nations)
- SAARC (South asia association for regional cooperation)
- WHO acts as –a directing andco ordinating authority on international health workTCDC (Technical cooperation in developing countries)
- ASEAN

Need and Scope of Health

Health

- Common theme in all cultures
- All communities have their own concept relate to the culture
- Oldest concept of health- “ **absence of disease”**
- In some cultures considered health and harmony are equivalent
- Past few decades, reawakening period- “ Considered health is a fundamental human right and a worldwide social goal, social satisfaction of human needs to an improved quality of life, attained by all people.
- In 1977, the 30th World Health Assembly- Goal “ Attainment by all citizens of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life”
- Health for all

Health

- Adoption of health as an integral part of socio-economic development by the United Nations in 1979
- In the year 2000, Millennium Development Goals
- In the year 2015, Sustainable Development Goals
- Goals kept health centrally positioned to ensure healthy lives
- promote well-being for all at all ages

Health

- Health is a state of complete physical, mental and social well-being and not merely an absence of disease or infirmity" – WHO
- The concepts regarding health is changed;

1. Concept:- Health became the ultimate goal of medicine
2. Ecological Concept:- Health implies the relative absence of pain and discomfort and a continuous adaptation and adjustment to the environment to ensure optimal function.Psychosocial Concept:- Health is both biological and social phenomenon
3. Holistic Concept:- All the sectors of society have an effect on health, in particular agriculture, animal husbandry, food, industry, education, housing, public works, food, industry, education, housing and other sectors.

Standard of Living

- Usual scale of our expenditure
- Level of education, Employment status, food, dress, house, amusements and comforts of modern living
- WHO- Income and occupation, standards of housing, sanitation and nutrition, the level of provision of health, educational, recreational and other services may all be used individually as measures of socio-economic status and collectively as an index of the “ standard of living”

Level of living

- Health
- Food consumption
- Education
- occupation and working conditions
- housing, social security, clothing, recreation and leisure and human rights
- These are influenced the human well-being
- Health is the most important component of the level of living

Quality of Life

- “ The condition of life resulting from the combination of the effects of the complete range of factors such as those determining health, happiness”
- Comfort in the Physical environment and a satisfying occupation
- Education, social, intellectual attainments, freedom of action, justice and freedom of expression
- People are now demanding a better quality of life
- Therefore, governments all over the world are increasingly concerned about improving the quality of life of their people by reducing morbidity, mortality
- Providing primary health care and enhancing mental, physical and social well being.

Physical Quality of Life Index

- Physical Quality of Life Index consolidates three indicators:-
- Infant mortality
- Life expectancy at age one
- literacy.

Human Development Index

- A composite index focusing on three basic dimensions of human development:
- To lead a long and healthy life measured by life expectancy at birth
- The ability to acquire knowledge, measured by mean years of schooling and expected years of schooling
- The ability to achieve a decent standard of living

Health & Development

- Health is essential to socio-economic development has gained increasing recognition
- It was a commonly a thought in the 1960s that socio-economic progress was not essential for improving the health status of people in developing countries
- Substantial and rapid progress could be made through introduction of modern public health measures alone
- The role of human beings in the developing process was grossly underestimated
- The period1973-1977 witnessed considerable rethinking on this subject
- Profound modification of the economic theory
- It became increasingly clear that economic development alone cannot solve the major problems of poverty

Health & Development

- Hunger
- Malnutrition
- Disease
- The experiences of few developing countries e.g.:- Sri Lanka, Costa Rica, and the state of Kerala in India illustrates dramatically the way in which health forms part of the development
- The efforts in the health field were simultaneously reinforced by developments in other sectors
- Such as education, social welfare and land reforms
- Health is the integral part of development
- Health services are solely medical measures but a subsystem of an overall socio-economic system
- Human health and Well being are the ultimate goal of development

- Health & Hygiene
- Health of a family, community, or a nation is ultimately determined by the health of individual members
- Physical cleanliness- avoid diseases
- Nutrition and balanced diet
- Nutritious food- good health and high spirit
- Provides energy- constructive activity
- Work for long period
- Ipropsperous country- arrange medical facilities-citizens
- Investment-economic development and progress of the country

Importance

- All round development
- Physical, mental and spiritual features
- Physical development is essential for both mental and spiritual development
- “ A healthy mind is a healthy body”
- Provision of healthful environment
- Promotion of positive health

- Food and Nutrition
- Information about good health habits
- Certain common diseases and their prevention and control
- First aid and safety measures
- Water and Air-Pollution and purification
- Mental health and personal hygiene

Scope

- Health education – individual

  Personal contact- Understand client attitudes

  Clear their doubts

  Correct misconceptions

  Identify and remove barriers in the way of adapting health practices

- Group

  Panel discussions

  Conferences

  Role playing

  Field trip

- Community

  Awareness Programmes

- Health policy

National health policy is an expression of goals for improving the health situation

Each country develop a health policy of its own aimed at defined goals

Improving peoples health

- Sustainable Development Goals
- Millennium Development Goals
- Health services Research

Biomedical research, to elucidate outstanding health problems and develop new or better ways of dealing

- Intersectoral research

Relationships would have to be established with the institutions concerned with the other sectors

- Health services research

1981-1982 developed

Systematic study of the means by which biomedical and other relevant knowledge is brought to bear on the health of individuals and communities under a given set of conditions

Essential for continues evolution and reinforcement of health services.

Dimensions of Health

Determinants of Health

HEALTH INDICATORS

National Health Indicators

Health

- Health is defined as “a state of complete physical, mental & social wellbeing, and not merely an absence of disease or infirmity”
- This statement has been amplified to include the ability to lead a “socially and economically productive life”
- Health cannot be measured in exact measurable forms
- Measurement have been framed in terms of illness (or lack of health), consequences of ill-health (morbidity, mortality) & economic, occupation & domestic factors that promote ill health

National Health Indicators

- **Health indicators** are used to measure health status of the community. They are defined as parameters that can measure changes in the level of health. In fact, they are indirect parameters or variables that assess state of the health of the community. Indicators can be:

1. Rates
2. Ratios
3. Number (in a specific place and time).

Uses of Health Indicators

- Measurement of the health of the community.
- Compare health status of one community with another whether in the same continent or globally.
- Assessment of health care needs.
- Proper allocation of human and non-human resources according to the needs.
- Monitoring and evaluation of health services, activities, and programs.
- Compare health status of different areas or groups of people over time.

Characteristics of Indicators

1. Valid: They should actually measure what they are supposed to measure, e.g. use of case fatality rate to measure severity of a disease.

2. Reliable: give similar results when the measure is used for the same person in different times with similar circumstances.

3. Objective: does not depend on subjective feelings of the persons, but depends on defined standards.

4. Sensitive: they should be sensitive to the changes in the measured condition .

5. Specific: only reflects the changes in the measured condition.

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Characteristics of Indicators (continued)

6. Feasible: they should have the ability to obtain data needed.

7. Relevant: they should contribute to the understanding of the phenomenon of interest.

Indicators

WHO defines Indicators as

“variables which measure change”

Health Indicator

- A health indicator is a variable that provides a single numeric measurement of an aspect of health within a population for a special period of time, normally a year.

Factors influencing health Indicators

- **Health is multidimensional**
- **Each dimension is influenced by numerous factors**
- **Economic, occupational, cultural, educational, social**

Health Indicators

- Mortality indicators
- Morbidity indicators
- Disability rates
- Nutritional status indicators
- Health care delivery indicators
- Utilization rates
- Indicators of social and mental health
- Environmental indicators
- Socio-economic indicators
- Health policy indicators
- Indicators of quality of life
- Other indicators

Mortality Indicators

- Crude Death Rate (CDR)
- Number of death per 1000 population during one year.
- Crude Death rate for Jordan is 5 per 1000
- Many of the former Socialist countries of Eastern Europe and Central Asia, Sweden, Switzerland, Austria, Greece, Italy and Germany had a crude death rate (CDR) higher than crude birth rate (CBR), causing a negative population growth if immigration is insufficient to compensate. All other countries had higher birth rates than death rates.

- In 2022, crude death rate for India was **7.3 deaths per thousand population**.
- Over the last 50 years, crude death rate of India was declining at a moderating rate to shrink from 16.73 deaths per thousand population in 1971 to 7.19 deaths per thousand population in 2020.

- Which state has highest crude death rate in India?
- In 2018, the **state of Kerala**, with 6.7 deaths per 1,000 inhabitants, had the highest urban death rate.
- It was followed by Chhattisgarh and Odisha.
- On the contrary, the region of Delhi had the lowest urban deaths during the same period

Demographics of India

Population	**1.4 billon(2022)**
Density	**500 people per.sq.km (2011 est.)**
Growth rate	**1.1% (2020 est.)**
Birth rate	**18.2 births/1,000 population (2020 est.)**

Population Growth Rate

Population Growth Rate: Growth of the population size in one year expressed in percent.

Total Fertility Rate: The number of children that would be born per women if she were to live to the end of the childbearing years and bear children at each age in accordance with the prevailing age-specific fertility rates.

The current fertility rate for India in 2022 is 2.159 births per woman, a 0.6% decline from 2019. The fertility rate for India in 2019 was 2.220 births per woman, a **0.89%** decline from 2018. The fertility rate for India in 2018 was 2.240 births per woman, a 1.37% decline from 2017.

Life Expectancy at Birth

The numbers of years a newborn baby would live if subjected to present mortality risks prevailing for each age group in the population.

- Estimated for both sexes separately.
- Good indicator of socioeconomic development
- Positive health indicator of long time survival

- How much is the life expectancy at birth in India?
- In India the average life expectancy of a **female is 70.7 years and for male it is 68.2 years**. If a child survives its first one year from his birth in India then the life expectancy increases to 71.1 years from 69.4 years

- Which Indian state has lowest life expectancy?
- The lowest life expectancy has been recorded in the State **of Madhya Pradesh** for rural males and
- Assam for rural females.
- The lowest life expectancy has been recorded in BIHAR both for urban males and females during 2022.

- Which country lives the longest?
- Countries ranked by life expectancy
- Country Life Expectancy (both sexes)
- 1 Hong Kong 85.29
- 2 Japan 85.03
- 3 Macao 84.68
- 4 Switzerland 84.25

- Kerala
- Which Indian state has longest life expectancy?
- List
- Rank State Life expectancy at birth
- (2010–20)
- 1 Kerala 74.9
- 2 Delhi 73.2
- 3 Jammu and Kashmir 72.6

Crude Birth Rate (CBR)

- **CBR is defined as number of births per 1000 population during one year.**
- **Crude Birth Rate in Jordan is 27 per 1000 population.**
- CBR is dependent on the age structure of the population.
- A population with a large proportion in the childbearing age naturally has a higher crude birth rate than a population with predominance of either children or people beyond fertile age.
- The high crude birth rate in Africa arises from the combination of high fertility and a young age structure.
- In 2020, crude birth rate for India was 17.44 births per thousand population. Crude birth rate of India fell gradually from 38.82 births per thousand population in 1971 to 17.44 births per thousand population in 2020.

Infant Mortality Rate (IMR)

- The annual number of children less than one year of age who die per 1000 live birth.

- Indicator of health status of not only infants but also whole population & socioeconomic conditions.

- Sensitive indicator of availability, utilization &effectiveness of health care, particularly perinatal care.

- What is the current infant mortality rate in India?
- The current infant mortality rate for India in 2022 is 27.69 deaths per 1000 live births, a 3.36% decline from 2018.
- The infant mortality rate for India in 2018 was 32 deaths per 1000 live births, a 4.24% decline from 2017.

The Most Common Causes of Infant Mortality Worldwide

1. Pneumonia
2. Diarrhoea (dehydration)

Major Causes of Infant Mortality in developed countries include:

1. Congenital Malformation
2. Infection
3. Short Infant death Syndrome (SIDS)

Definition of Childhood Mortality

- **Infant Mortality: Number of deaths of infants one year of age or younger per 1000 live births.**
- **Perinatal Mortality**: The total number of deaths of the fetus from a gestational age of 22 weeks to the seventh day of life of the newborn.
- **Neonatal Mortality**: Only includes deaths in the first 28 days of life.
- **Post-Neonatal death**: Only includes deaths after 28 days of life but before one year.
- **Child Mortality**: Includes deaths within the first five years after birth.

Child Mortality Rate (Under-Five Mortality Rate)

- The annual number of children dying between birth and exactly five years of age, expressed per 1000 live births.
- Correlates with inadequate MCH services, malnutrition, low immunization coverage and environmental factors
- Current child Mortality rate (Under 5 Mortality Rate) in Jordan is 28 per 1000
- Other indicators are Perinatal mortality rate, Neonatal mortality rate, Stillbirth rate, etc.
- Correlates with inadequate antenatal care and perinatal care.

Causes of Child Mortality

- According to **UNICEF** most child mortality result from one of the following causes or a combination of:

1. Acute Respiratory Infection (ARI)
2. Diarrhoea
3. Malaria
4. Measles
5. Malnutrition
6. Perinatal Disorders

Mortality Indicators

Maternal Mortality Rate

- Number of maternal deaths per year per 100000 women aged 15-49 years. (Reproductive Age of women is 15-49 years).
- Accounts for the greatest number of deaths among women of reproductive age in developing countries.

Maternal Mortality (Maternal Death)
Definition

- According to WHO “A maternal death is defined as the death of a women while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes”.

Major Causes of Maternal Death (Maternal Mortality)

According to WHO Report (2005) Major Causes of Maternal Death are:

1. Severe bleeding/hemorrhage (25%)
2. Infections (13%)
3. Unsafe abortions (13%)
4. Eclampsia (12%)-seizure
5. Obstructed labor (8%)-a failure to progress due to mechanical problems
6. Other direct causes (8%)
7. Indirect causes (20%), such as malaria, anemia, HIV/AIDS, CVD (a general term for conditions affecting the heart or blood vessels)- complicate pregnancy or are aggravated by it.

Maternal Mortality Ratio (MMR)

- Number of deaths of women from pregnancy-related causes per 100000 live births.
- The MMR is used as a measure of the quality of a health care system.
- Measures the risk of death among pregnant and recently delivered women.
- Current MMR in Jordan is 38 per 100000 live births.
- WHO, UNICEF,and UNFPA Report:

The Worst Countries (2003): Sierra Leone (2000), Afghanistan (1900), Malawi (1800), Angola (1700), Niger (1600), Tanzania (1500).

Lowest Rates (2005): Iceland (0), Austria (4), USA (11)

Mortality Indicators

Disease Specific Death Rate

Mortality rate which is computed for specific diseases. E.g. TB mortality is 23 per 100000 population per year .

Proportional Mortality Rate

Proportion of all deaths attributed to the specific disease

E.g. Coronary heart disease causes 25 to 30 % of all deaths in developed world.

Morbidity Indicators

Morbidity Indicators reveal the burden of ill health in a community, but do not measure the subclinical or inapparent disease states.

Incidence

The number of new events or new cases of a disease in a defined population, within a specified period of time. E.g. Incidence of TB is 168 per100000 population per year.

Prevalence

The total number of all individuals who have disease at a particular time divided by population at risk of having disease at this point of time

Reflects the chronicity of the disease

E.g. Prevalence of TB (sputum+ve in population) is 249 per 100000 population

Morbidity Indicators

1. Notification rates is calculated from the reporting to public authorities of certain diseases . yellow fever , poliomyelitis, cholera, plague
2. They provide information regarding geographic clustering of infections, quality of reporting system
3. Attendance rates at health centers.
4. Admission, Readmission and discharge rates.
5. Duration of stay in hospital – reflects the virulence and resistance developed by the etiological factor
6. Absence from work or school.
7. Reflects economical loss to the community
8. Hospital data constitute a basic and primary source of information about diseases prevalent in the community.

Disability Rates

- Sullivan’s Index refers to “expectation of life free of disability”.
- Sullivan’s Index = life expectancy of the country -probable duration of bed disability and inability to perform major activities
- It is considered as one of the most advanced indicators currently available.
- HALE - Health Adjusted Life Expectancy.
- It is based on the framework of WHO
- It is based on life expectancy at birth but includes an adjustment for time spent in poor health.
- It is the equivalent number of years in full health that a newborn can expect to live based on current rates of ill-health and mortality.

Disability Rates

- DALYs: Disability-Adjusted Life Years.
- A comprehensive indicator including both losses of healthy years due to disability and premature death.
- DALYs is an indicator that measures the disease burden in a population, taking into account not only premature mortality but also disability caused by disease or injury.
- Two things needed to measure DALYs are
- Life table of that country, to measure the losses from premature deaths
- Loss of healthy life years resulting from disability; the disability may be permanent (polio) or temp (TB, leprosy), physical / mental.

Disability Rates

- **Uses of DALYs**
- To assist in selecting health service priorities
- To identify the disadvantaged groups
- Targeting health interventions
- Measuring the results of health interventions
- Providing comparable measures for planning & evaluating programs
- To compare the health status of different countries
- DALY express years of life lost to premature death and years lived with disability for the severity of the disability
- One DALY is one lost year of healthy life

Disability Rates

❑**Premature death –**

Defined as one that occurs before the age to which a dying person could have expected to survive if he or she was a member of a standardized mode population with a life expectancy at birth equal to that of world longest surviving population e.g. Japan

❑**QALY- Quality Adjusted Life Year.**

- It is the most commonly used to measure the cost effectiveness of health interventions .
- It estimates the number of years of life added by a successful treatment or adjustment for quality of life.

Nutritional Status Indicators

- Nutritional Status is a positive health indicator.
- Newborns are measured for their

  i. Birth–weight ii. Length iii. Head circumference
- They reflect the maternal nutrition status
- Pre-school children Anthropometric measurements

i. Weight – measures acute malnutrition

ii. Height – measures chronic malnutrition

iii. Mid-arm circumference - measures chronic malnutrition

- Growth Monitoring of children
- Measuring weight-for-age, height-for-age, weight-for- height, head & chest circumference and mid-arm circumference.

  Adults Body Mass Index (BMI) is an indicator of Underweight and Obesity. Underweight, Obesity and Anemia are generally considered reliable nutritional indicators.

Low Birth Weight

- **Low Birth Weight**: The proportion of newborns with low birth weight is the % of children born with a weight less than 2500 grams.

Growth Monitoring of children
(Most Commonly Used Anthropometric Indicators for Children)

Weight-for-age (WFA), Underweight in children. The proportion of underweight in children is the % of children in a specific age group with weight –for- age below -2SD (standard deviations) of a reference group.

Combines effects on past and present episodes of disease or malnutrition.

Grading: Normal +2 SD to -2 SD

Moderate < -2 SD

Severe < - 3 SD

Growth Monitoring of children
(Most Commonly Used Anthropometric Indicators for Children)

- Height-for-age (HFA), stunting in children. The proportion of stunting in children is the % of children in a specific age group with height-for-age below -2SD of a reference group.
- Integrates effects over whole of life up to age of measurements. Insensitive to acute episodes.
- Grading: Normal +2 SD to -2SD
  Moderate < -2 SD
  Severe < -3 SD

Growth Monitoring of children
(Most Commonly Used Anthropometric Indicators for Children)

- Weight-for-height (WFH), wasting in children. The proportion of wasting in children is the % of children in a specific age group with weight-for-height below -2SD of a reference group.
- Indicates current or recent episodes, insensitive to small but normal proportioned individuals.
- Grading: Normal +2 SD to -2SD
  Moderate < -2SD
  Severe < -3SD

Growth Monitoring of children
(Most Commonly Used Anthropometric Indicators for Children)

- Mid-upper arm circumference (MUAC): Single figure of 16.5 cm for all children between 1 and 5 years (Reference Standard). It is commonly used as indicator of body shape substituting for BMI in adults and weight –for-Height (WFH) Wasting in children.
- Indicates current or recent episodes. Fast, cheap, reliable (with careful training). Good predictor of mortality risk. Needs only approximate ages.
- MUAC Grading: Normal > 13.5 cm

  Moderate 12.5 cm – 13.5 cm

  Severe <12.5 cm

Health Care Delivery Indicators

These indicators reflect the equity of distribution of health resources in different parts of the country and of the provision of health care

- population per physician 526
- Population – bed ratio 1:1701

Population per dentist 1747

Population per nurse 324

- Population per pharmacist 1164

Health Manpower (Jordan)

Registered Doctors

In 2020, there were over 1.2 million doctors registered with the Indian Medical Council across the south Asian country. This was significant increase from over 827 thousand doctors in the country in 2010.

1164

Registered Dentists

India has the second highest number of dentists in the world: 2.7 lakh are registered with the Dental Council of India (DCI). In 2020, the country achieved more than the ideal dentists-to-population ratio of 1:5,000, as against the 1:7,500 recommended by the WHO.

- Registered Nurses 12.5 L registered nurses, ANM-2020
- Population per doctor The doctor-population ratio in India is 1:1456 against the WHO recommendation of 1:1000.
- Population per bed

Utilization Rates

Utilization Rates is expressed as the proportion of people in need of a service who actually receive it in a given period, usually a year

- It depends on availability & accessibility of health services and the attitude of an individual towards health care system

1. Proportion of infants who are fully immunized
2. Proportion of pregnant women who receive ANC care or have institutional deliveries
3. Percentage of population who adopt family planning
4. Bed occupancy ratio, bed-turn over ratio, etc.

Indicators of Social and Mental Health

- Rates of suicide, homicide, other crime, road traffic accident, juvenile delinquency, alcohol and substance abuse, domestic violence etc.
- These indicators provide a guide to social action for improving the health of people.
- Social and mental health of the children depend on their parents. E.g. Substance abuse in orphan children, smoking

Environmental Indicators

- These reflect the quality of physical and biological environment in which diseases occur and people live.
- The most important are those measuring the proportion of population having access to safe drinking water and sanitation facilities.
- These indicators explains the prevalence of communicable diseases in a community
- The other indicators are those measuring the pollution of air and water, radiation, noise pollution, exposure to toxic substances in food and water

Health Policy Indicators

The single most important indicator of political commitment is allocation of adequate resources

The relevant indicators are

- Proportion of GDP spent on health services- 9%
- Proportion of GDP spent on health related activities like water supply and sanitation & housing and nutrition
- Proportion of total health resources devoted primary health care

Indicators of Quality of Life

- Life expectancy is no longer important
- The Quality Of Life has gained its importance
- Physical Quality of Life Index
- It consolidates Infant mortality, Life expectancy at age of 1yr and Literacy.
- For each component the performance of individual country is placed on a scale of 1- 100.
- The composite index is calculated by averaging the three indicators giving equal weight to each
- The resulting is placed on the 0 to 100 scale.
- The PQLI does not consider the GDP.

Indicators of Quality of Life

Human Development Index

- **Life expectancy at birth**
- **Literacy rate**
- **Income- GDP per capita income**

The result is placed on the 0 to 1 scale

Other indicators

Social indicators

- Population, families, educational, earning

Basic Needs indicators

- Calories consumption, access to water, illiteracy, Dr per population

Health for All Indicators

Indicators of Health

- To measure the health status of a community
- To compare the health status of country with that of another.
- Characteristics of indicators:
  - Should be valid
  - Should be reliable & objective
  - Should be sensitive
  - Should be specific
  - Should be feasible
  - Should be relevant.

Indicators of health

1. Mortality indicators
2. Morbidity indicators
3. Disability rates
4. Nutritional status indicators
5. Healthy care delivery indicators
6. Utilization rates
7. Indicators of social & mental health
8. Environmental indicators
9. Socio-economic indicators
10. Healthy policy indicators
11. Indicators of quality of life.

Mortality Indicators

- Crude Death Rate
- Expectation of Life
- Maternal Mortality Rate
- Infant Mortality Rate
- Child Mortality Rate
- Under 5 proportionate mortality rate
- Disease Specific Mortality
- Proportional Mortality Rate

Morbidity Indicators

- Morbidity rates used for assessing ill health in community are:
  - Incidence
  - Prevalence
  - Notification rate
  - Attendance rate at OPDs, health centres etc.
  - Admission, readmission and discharge rates
  - Spells of sickness.

Disability Rates

- Based on premises or portionthat health implies a full range of daily activities.
- Two groups:

➢ **Event type indicators:**

  – Number of days of restricted activity
  – Bed disability days
  – Work-loss days within a specified period

➢ **Person-type indicators:**

  – Limitation of mobility
  – Limitation of activity (ADL)

- **Sullivan’s Index**
  - Expectation of life free of disability
- **HALE (Health Adjusted Life Expectancy)**
  - The equivalent number of years in full health that a newborn can expect to live based on current rates of ill-health and mortality.
- **DALY (Disability Adjusted Life Year)**
  - Number of years lost due to ill-health, disability or ill-health.
- **QALY (Quality adjusted life year)**
  - Number of years of life that would be added by a medical intervention.

Nutritional Status Indicators

It includes :

- Anthropometric measurement of pre-school children.
- Height of children at school entry.
- Prevalence of low birth weight.

Health Care Delivery Indicators

- Doctor : population ratio
- Doctor : nurse ratio
- Population : bed ratio

Utilization Rate

- Expressed as proportion of people in need of health care services who actually receive it in a given period.
  - Proportion of infants who are fully immunized against the Seven EPI diseases.
  - Percentage of population using the various methods of family planning.

Indicators of Social & Mental Health

- Indirect measures
- It includes indicators of *social pathology*:-
  - Suicide
  - Homicide
  - Other acts of violence
  - Other crime etc.
  - Alcohol and drug abuse, etc.

Environmental Indicators

- Reflects quality of physical &biological environment.
  - Proportion of population having access to safe water
  - Proportion of population having access to sanitation facilities
  - Indicators relating to pollution of air and water, radiation, solid wastes, noise

Socio Economic Indicators

- Rate of population decrease
- Per capita GNP
- Level of unemployment
- Dependency ratio etc.

Other Indicators

- Social Indicators
- Basic Need Indicators
- Health For All Indicators
- Millennium Development Goal Indicators
- SDG

Social and Eeconomic Characteristics

Variable	Developing Countries	Developed Countries
Place of residence	Mostly Rural	Mostly Urban
Major occupation	Agriculture	Industry
Standard of living	Low	High
GNP per capita	200 to 6,000 US $	5,000 to 40,600 US $
Adult literacy	Low	High
Women	Economically dependent	Economically independent

Demographic characteristics

Variable	Developing Countries	Developed Countries
Growth Rate	Above global GR (>1.3%)	Below global GR (<1.3%)
Young population	28% ~~3~~8%	18%
Elder population	6%	21%

Levels of Health Care

- **Primary health care**
- **Secondary health care**
- **Tertiary health care**

Health Team Concept

- Professionals
- Auxiliary worker
- Team comprising of physicians, nurses, social workers, health assistants, trained dais, village health guides etc.

Right to Health, Responsibilities for Health

Healthy life style

Healthy Life Style

- Wake Up Early
- Exercise Regularly
- Eat Healthy
- Drink Plenty of Water
- Reduce Stress

Healthy Life Style

- ***You Also Need to Give and Receive***
- Forgiveness
- Love and Compassion
- You Need to Laugh and Experience Happiness
- You Need Joyful Relationships With Yourself and Others

Healthy Life Style

- WHO 1946 defined health as ‘A complete state of mental, physical and social well-being not merely the absence of disease’.
- **Physical (For The Body)**
- Good Nutrition, Eating Right
- Getting Physically Fit, Beneficial Exercise
- Adequate Rest
- Proper Stress Management

Healthy Life Style

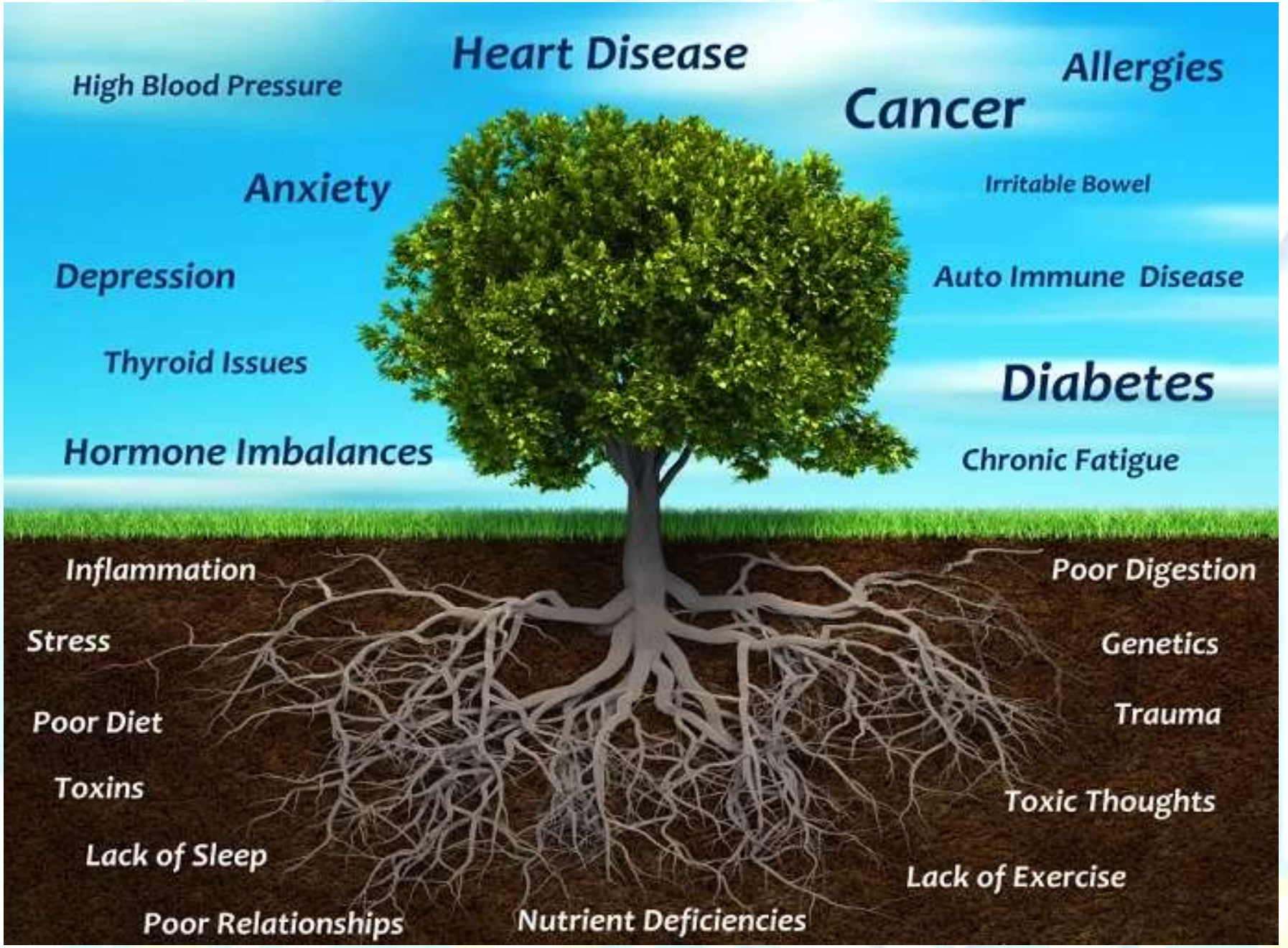
- A healthy lifestyle is a valuable resource for reducing the incidence and impact of health problems, for recovery, for coping with life stressors, and for improving quality of life.
- There is a growing body of scientific evidence that shows our lifestyles play a huge part in how healthy we are.
- From what we eat and drink, to how much exercise we take, and whether we smoke or take drugs, all will affect our health, not only in terms of life expectancy, but how long we can expect to live without experiencing chronic disease.

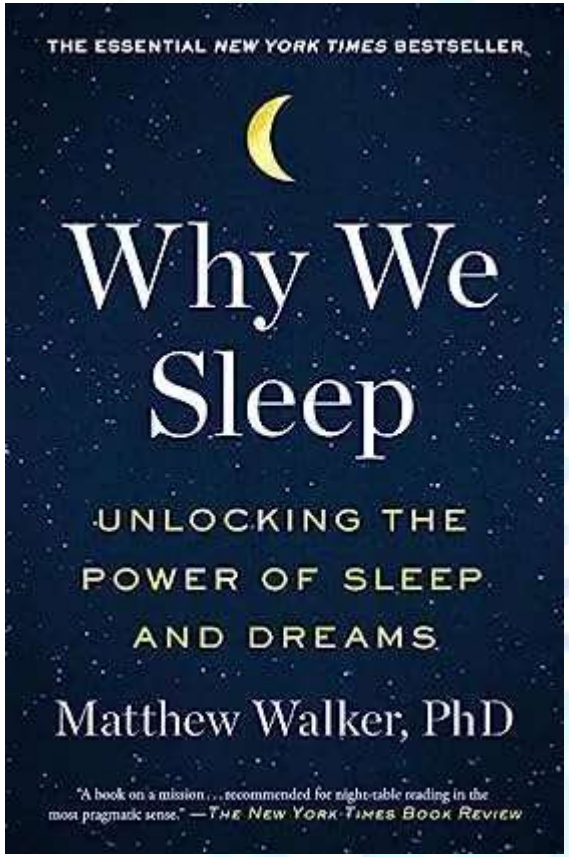
Healthy Life Style

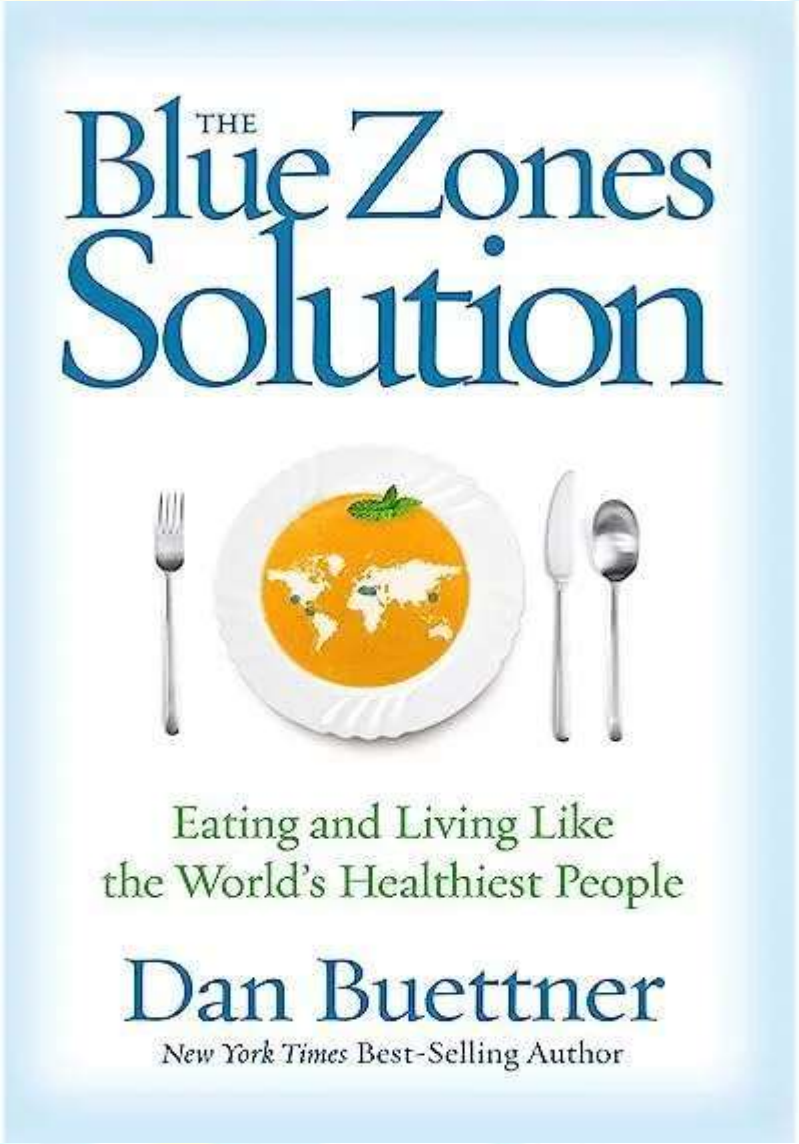
- Conditions such as heart disease, cancer, diabetes, joint disease, and mental illness are responsible for a vast number of deaths and disabilities.
- Currently, we rely almost exclusively on the provision of clinical care by highly trained health professionals as our major strategy to deal with these conditions.
- Many health problems can be prevented or at least their occurrence postponed by having a healthy lifestyle.

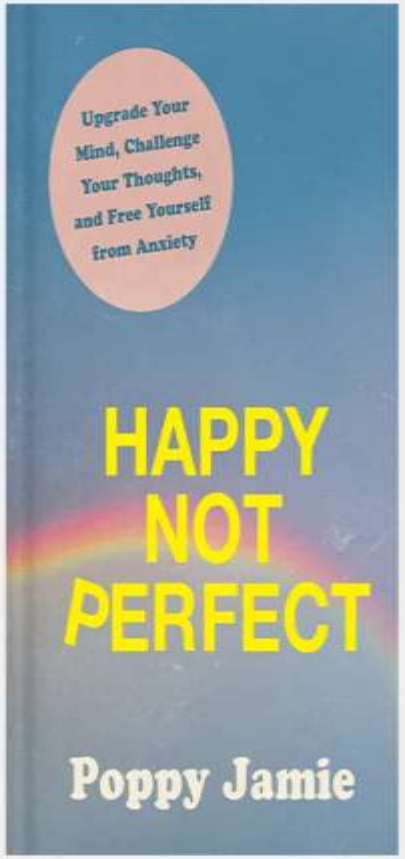
Healthy Life Style

- ***Emotional Wellness (For The Mind)***
- Self-Supportive Attitudes
- Positive Thoughts and Viewpoints
- Positive Self-Image
- ***Spiritual Wellness***
- Inner Calmness
- Openness to Your Creativity
- Trust in Your Inner Knowing
- And all aspects of one’s self, must work in harmony to achieve wellness, so you need to create a balanced life.


Heart Disease
High Blood Pressure
Allergies
Cancer
Anxiety
Irritable Bowel
Depression
Auto Immune Disease
Thyroid Issues
Diabetes
Hormone Imbalances
Chronic Fatigue
Inflammation
Poor Digestion
Stress
Genetics
Poor Diet
Trauma
Toxins
Toxic Thoughts
Lack of Sleep
Lack of Exercise
Poor Relationships
Nutrient Deficiencies


THE ESSENTIAL NEW YORK TIMES BESTSELLER
Why We Sleep
UNLOCKING THE POWER OF SLEEP AND DREAMS
Matthew Walker, PhD
"A book on a mission . . . recommended for night-table reading in the most pragmatic sense." —THE NEW YORK TIMES BOOK REVIEW


THE Blue Zones Solution
Eating and Living Like the World's Healthiest People
Dan Buettner
New York Times Best-Selling Author


Upgrade Your Mind, Challenge Your Thoughts, and Free Yourself from Anxiety
HAPPY NOT PERFECT
Poppy Jamie

Disease: Definition; Disease Causation; Natural History of Disease; Types of Disease Agents; Host factors; Environmental Factors; Risk Groups. Disease control. Disease Prevention.

FACTORS INVOLVED IN THE PROCESS OF DISEASE TRANSMISSION

Disease Transmission

- Transmission is a process in which several events happen one after the other in the form of a chain. Hence, this process is known as a **chain of transmission**
- Six major factors can be identified
- The infectious agent, The reservoir, The route of exit, The mode of transmission, The route of entry and The susceptible host

Infectious Agents

- **Protozoa**

  are micro-organisms made up of one cell

- **Bacteria**

  are also micro-organisms made up of one cell, but they are much smaller than protozoa and have a different structure

- **Viruses**

  are infectious agents that do not have the structure of a cell. They are more like tiny boxes or particles and are much smaller than bacteria

- **Helminths**

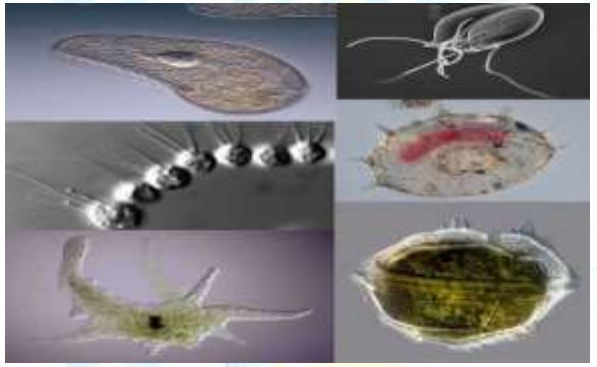
  are worms made up of many cells

Protozoa

- Protozoa are one-celled animals found worldwide in most habitats. Most species are free living, but all higher animals are infected with one or more species of protozoa. Infections range from asymptomatic to life threatening, depending on the species and strain of the parasite and the resistance of the host.
- On the basis of light and electron microscopic morphology, the protozoa are currently classified into six phyla. Most species causing human disease are members of the phyla Sacromastigophora and Apicomplexa.

Common infectious diseases caused by protozoans include:

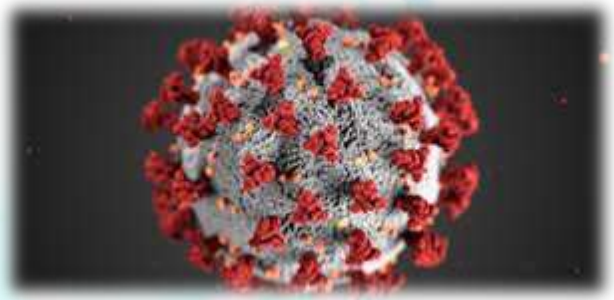
- **Malaria**
- **Giardia**
- **ToxoplasmosiI**



Bacteria

- Bacteria are single-cell organisms that are neither plants nor animals.
- They usually measure a few micrometers in length and exist together in communities of millions.
- There are many different types of bacteria. One way of classifying them is by shape. There are three basic shapes.
- **Spherical**: Bacteria shaped like a ball are called cocci, and a single bacterium is a coccus. Examples include the streptococcus group, responsible for "strep throat."
- **Rod-shaped**: These are known as bacilli (singular bacillus). Some rod-shaped bacteria are curved. These are known as vibrio. Examples of rod-shaped bacteria include *Bacillus anthracis* (*B. anthracis*), or anthrax.
- **Spiral**: These are known as spirilla (singular spirillus). If their coil is very tight they are known as spirochetes. Leptospirosis, Lyme disease, and syphilis are caused by bacteria of this shape.

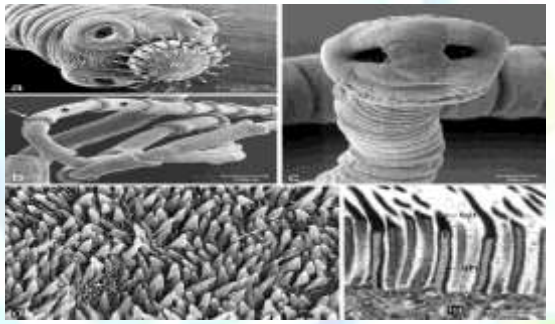
Virus



- A virus is an infectious agent of small size and simple composition that can multiply only in living cells of animals, plants, or bacteria.
- Viruses can infect a variety of living organisms, including bacteria, plants, and animals.
- Virus affect an living organism through four method

  Direct contact transmission, Indirect transmission, Common vehicle transmission, Airborne transmission

Helminths



- The helminths are worm-like parasites. The clinically relevant groups are separated according to their general external shape and the host organ they inhabit. There are both hermaphroditic and bisexual species. The definitive classification is based on the external and internal morphology of egg, larval, and adult stages.
- Infection can cause **physical, nutritional and cognitive impairment in young, developing children**.

Reservoirs of infectious agents

- Many infectious agents can survive in different organisms, or on non-living objects, or in the environment
- Some can only persist and multiply inside human beings, whereas others can survive in other animals, or for example in soil or water.
- The place where the infectious agent is normally present before infecting a new human is called a reservoir
- Humans and animals which serve as reservoirs for infectious agents are known as infected hosts.

Route of exit

- Before an infectious agent can be transmitted to other people, it must first get out of the infected host. The site on the infected host through which the infectious agent gets out is called the **route of exit**.

Respiratory tract

- The routes of exit from the respiratory tract are the nose and the mouth. Some infectious agents get out of the infected host in droplets expelled during coughing, sneezing, spitting or talking, and then get transmitted to others

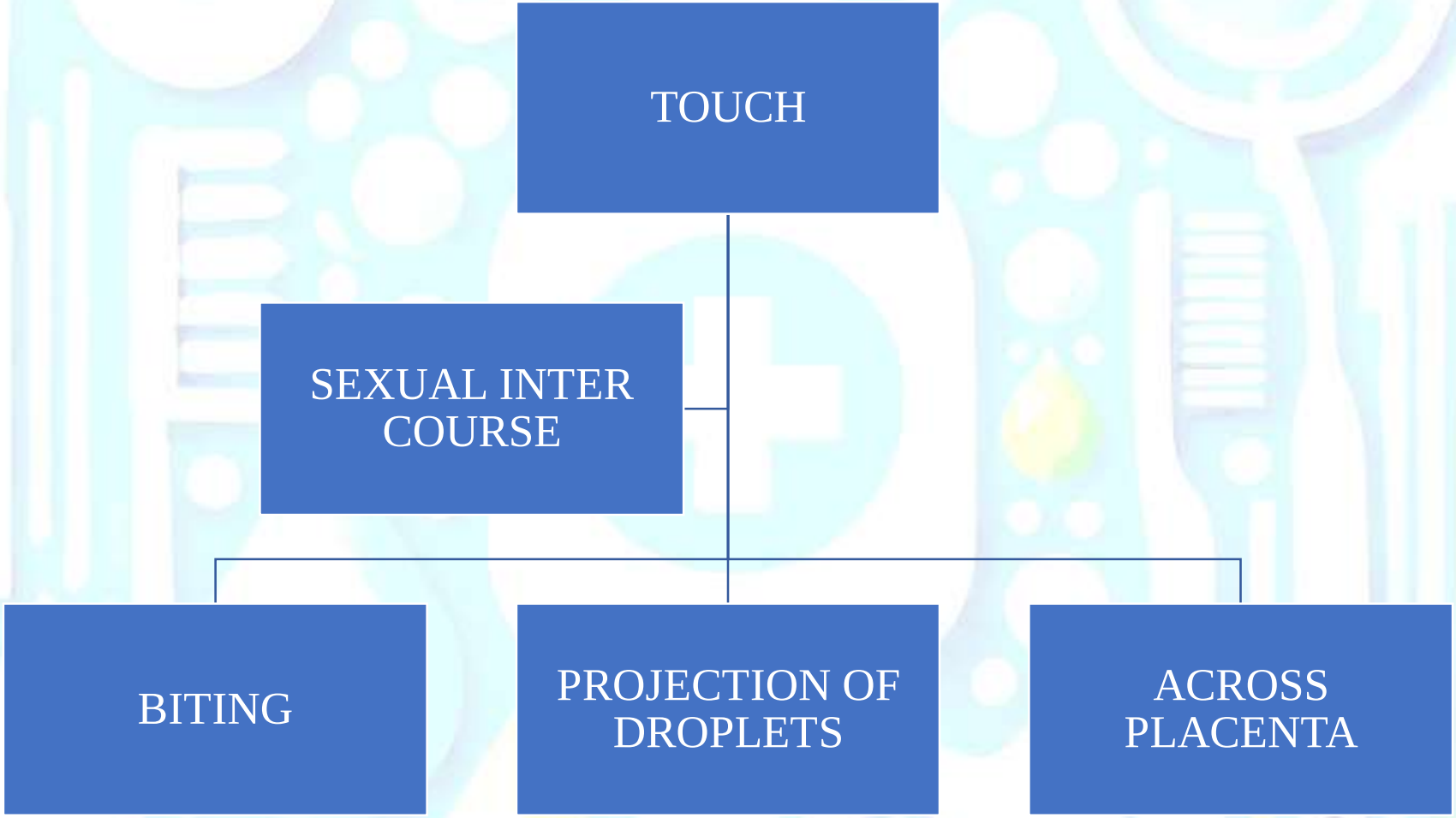
Gastrointestinal tract

- The anus is the route of exit from the gastrointestinal tract (or gut). Some infectious agents leave the human body in the stool or faces
- Some types of infectious agents can exit the body through breaks in the skinwhich are present in the blood and get out of the human body when a mosquito bites through the skin to suck blood.

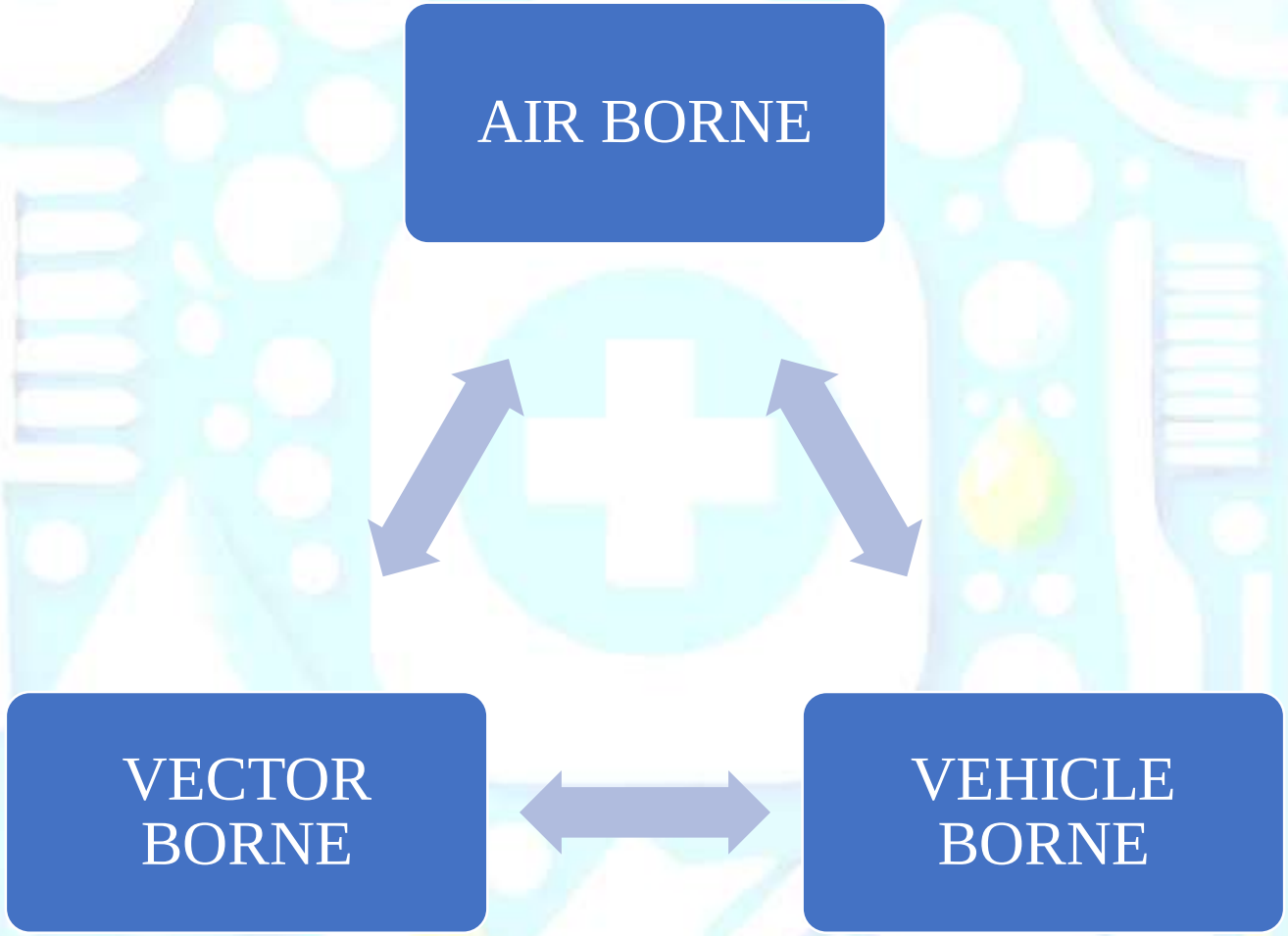
Modes of transmission

- Once an infectious agent leaves a reservoir, it must get transmitted to a new host if it is to multiply and cause disease. The route by which an infectious agent is transmitted from a reservoir to another host is called the **mode of transmission**.

Direct Mode of Transmission



Indirect Mode of Transmission



- **Direct transmission** refers to the transfer of an infectious agent from an infected host to a new host, without the need for intermediates such as air, food, water or other animals. Direct modes of transmission can occur in two main ways:
- **Person to person**: The infectious agent is spread by direct contact between people through touching, biting, kissing, sexual intercourse or direct projection of respiratory droplets into another person’s nose or mouth during coughing, sneezing or talking. A familiar example is the transmission of HIV from an infected person to others through sexual intercourse.
- **Transplacental transmission**: This refers to the transmission of an infectious agent from a pregnant woman to her fetus through the placenta. An example is mother-to-child transmission (MTCT) of HIV.

- **Indirect transmission** is when infectious agents are transmitted to new hosts through intermediates such as air, food, water, objects or substances in the environment, or other animals. Indirect transmission has three subtypes:
- **Airborne transmission**: The infectious agent may be transmitted in dried secretions from the respiratory tract, which can remain suspended in the air for some time. For example, the infectious agent causing tuberculosis can enter a new host through airborne transmission.
- **Vehicle-borne transmission**: A **vehicle** is any non-living substance or object that can be contaminated by an infectious agent, which then transmits it to a new host. **Contamination** refers to the presence of an infectious agent in or on the vehicle.
- **Vector-borne transmission**: A **vector** is an organism, usually an *arthropod*, which transmits an infectious agent to a new host. Arthropods which act as vectors include houseflies, mosquitoes, lice and ticks.

Route of entry

- Successful transmission of the infectious agent requires it to enter the host through a specific part of the body before it can cause disease. The site through which an infectious agent enters the host is called the **route of entry**.
- Some infectious agents get into the body with contaminated food, water or on hands.

Susceptible hosts

- After an infectious agent gets inside the body it has to multiply in order to cause the disease.
- In some hosts, infection leads to the disease developing,
- Individuals who are likely to develop a communicable disease after exposure to the infectious agents are called **susceptible hosts**

Multiple Causation of Disease

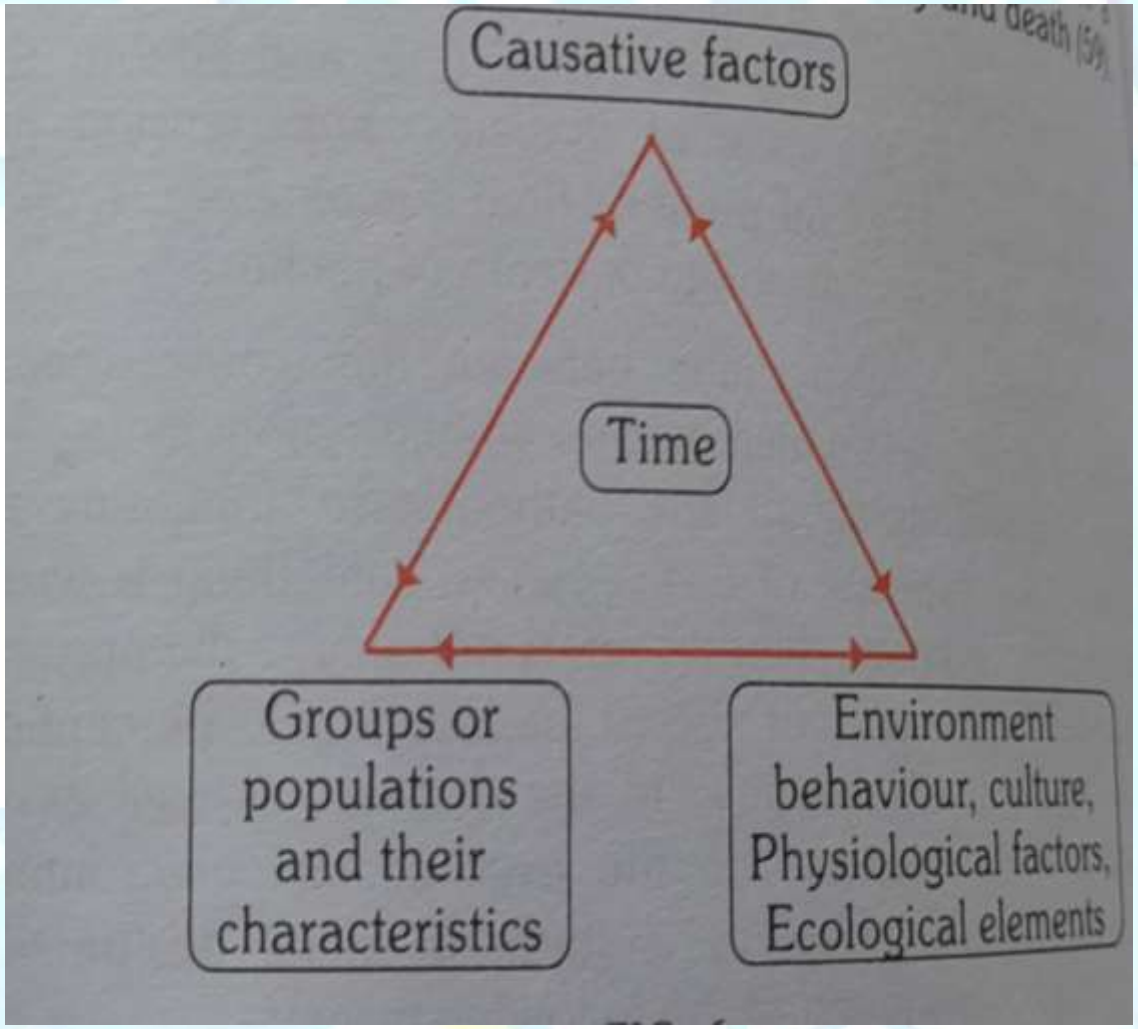
- “ a Condition in which body health is impaired, a departure from a state of health, an alteration of the human body interrupting the performance of vital functions”- Webster
- “ a condition of the body or some part or organ of the body in which its functions are disrupted or deranged”.-Oxford English Dictionary
- “ a maladjustment of the human organism to the environment” – Ecological perspective

- The capacity of one variable to influence another. The first variable may bring the second into existence or may cause the incidence of the second variable to fluctuate.
- The act of or process of causing
- The act or agent which produces an effect

Multiple Causation of Disease

- Pettenkofer of Munich (1819-1901) - Early proponent of Multiple Causation of Disease
- Lung cancer, Coronary heart disease, Mental illness- These diseases could not be explained by one cause factor.
- There are social, economic, cultural, genetic and psychological factors
- For example:- Tuberculosis is not merely due to tubercle bacilli
- Factors – Poverty, overcrowding, malnutrition also plays a role.
- The term agent is replaced by causative factors
- Need to identify multiple causes of disease
- The purpose of knowing the multiple factors of disease is to quantify and arrange them in priority sequence for modification to prevent or control disease.

Triangle of epidemiology

- 

Triangle of Epidemiology

- It presents an adapted and advanced model of the triangle of epidemiology
- This new model includes all facets of the communicable disease model
- Make it more relevant and useful with regard to the today’s diseases
- Conditions, disorders, defects, injuries and deaths
- It also reflects the cause of current illness and conditions
- Behaviour, lifestyle factors, environmental causes, ecologic elements
- Physical factors and chronic diseases
- The term agent replaced by Causative factors – Identify the multiple causes

Web of Causation

- This model of disease causation was suggested by MacMahon and Pugh
- In their book “Epidemiologic Principles and methods”
- This model ideally suited in the study of chronic disease
- Disease agent is not known, But is the outcome of interaction of multiple factors
- The web of causation – all predisposing factors of any type and their complex interrelationship with each other.

Web of causation for myocardial infarction

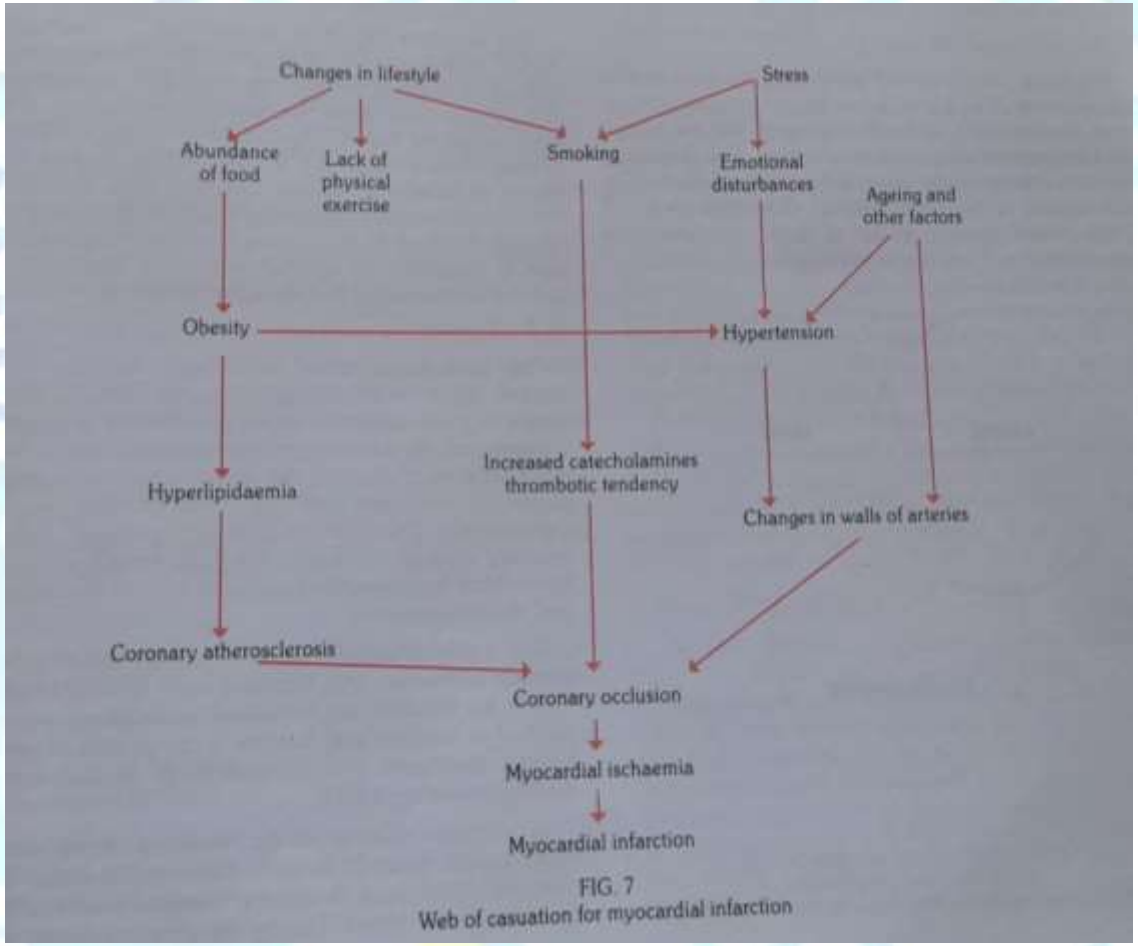


FIG. 7
Web of casuation for myocardial infarction

- Obesity is a complex disease involving an excessive amount of body fat. Obesity isn't just a cosmetic concern. It's a medical problem that increases the risk of other diseases and health problems, such as heart disease, diabetes, high blood pressure and certain cancers.
- Hyperlipidemia (high cholesterol) means your blood has too many lipids (fats) in it. These can add up and lead to blockages in your blood vessels. This is why high cholesterol can put you at risk for a stroke or heart attack.
- Coronary atherosclerosis- Atherosclerosis is thickening or hardening of the arteries caused by a buildup of plaque in the inner lining of an artery. Risk factors may include high cholesterol and triglyceride levels, high blood pressure, smoking, diabetes, obesity, physical activity, and eating saturated fats.). If the plaques rupture, you can have a heart attack
- Catecholamines generate moderately elevated levels of platelet count which enhances the risk of thrombosis.
- Hypertension is when blood pressure is too high. Blood pressure is written as two numbers. The first (systolic) number represents the pressure in blood vessels when the heart contracts or beats. The second (diastolic) number represents the pressure in the vessels when the heart rests between beats

- **Arteries**, a critical part of your cardiovascular system, are blood vessels that distribute oxygen-rich blood to your entire body. These tube-like vessels and the muscles inside them ensure your organs and tissues have the oxygen and nutrients they need to function.
- **Coronary occlusion:** When one or more of the coronary arteries suddenly becomes completely blocked, a heart attack (injury to the heart muscle) may occur.
- **Myocardial ischemia occurs when blood flow to the heart muscle (myocardium) is obstructed by a partial or complete blockage of a coronary artery by a buildup of plaques***(In medicine, a small, abnormal patch of tissue on a body part or an organ. Plaques may also be a build-up of substances from a fluid, such as cholesterol in the blood vessels*.**)**
- A heart attack (medically known as a myocardial infarction) is a deadly medical emergency where your heart muscle begins to die because it isn't getting enough blood flow. This is usually caused by a blockage in the arteries that supply blood to your heart.

- The web of causation does not imply that the disease cannot be controlled unless all the multiple causes or
- Chains of causation or at least a number of them are appropriately controlled or removed
- Removal or elimination of just only one link or chain may be sufficient to control disease
- Provided that link is sufficiently important in the pathogenetic process (Pathogenetic: Pertaining to genetic cause of a disease or an abnormal condition. For example, BRCA 1 and BRCA2 are genes that, when mutated, are responsible for many cases of cancer of the breast. Therefore, these genes are pathogenetic.

(BReast CAncer gene 1) and BRCA2 (BReast CAncer gene 2) are genes that produce proteins that help repair damaged DNA. Everyone has two copies of each of these genes—one copy inherited from each parent.

Both mutations increase the risk of ovarian cancer, as well as pancreatic cancer. A BRCA1 mutation can also increase the risk of cervical, uterine, and colon cancer, while BRCA2 can increase the likelihood of stomach, gallbladder, and bile duct cancer, plus melanoma.