

# Population Medicine & Changing pattern of disease

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# POPULATION MEDICINE

- Knowledge about human health and disease is sum of the contributions of a large number of disciplines, classified as
  - a) Basic sciences
  - b) Clinical sciences
  - c) Population medicine

- The basic sciences (e.g., biochemistry, physiology, microbiology) are primarily sited in laboratories
- Clinical activities are carried out in hospitals
- Population medicine in the community

- **Population medicine is referred to as**
  - Hygiene
  - Public Health
  - Preventive Medicine
  - Social Medicine
  - Community Medicine
- All these share common ground in their concern for promotion of health and prevention of disease.
- Each has originated at a different time, and each has introduced a new direction or emphasis.

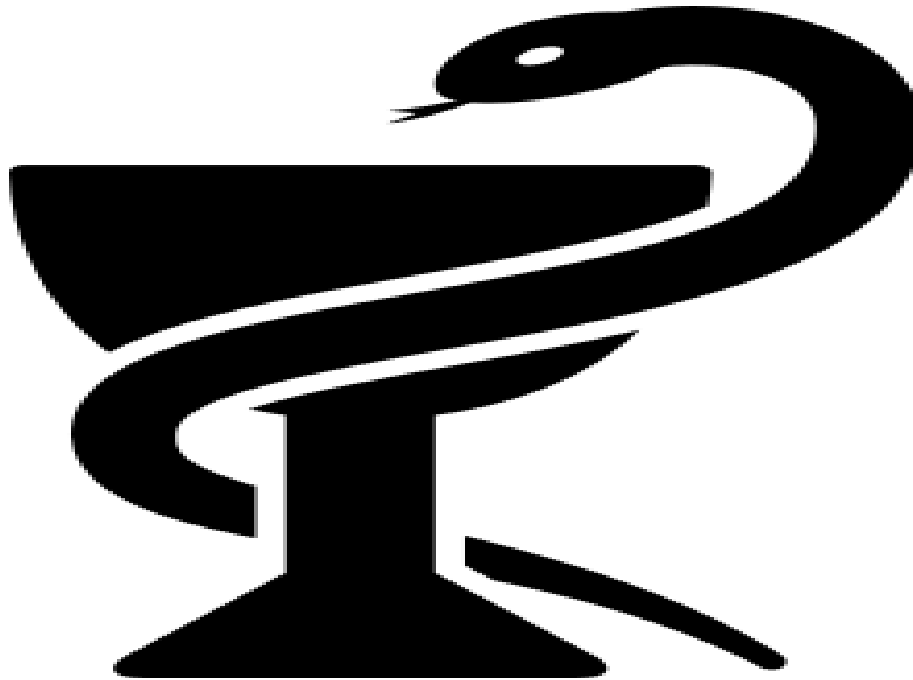
# Hygiene

- The word "hygiene" is derived from **Hygeia**, the goddess of health in Greek mythology.
- She is represented as a beautiful woman holding in her hand a bowl from which a serpent is drinking.

# Goddess of health in Greek



# Bowl of Hygeia



- In Greek mythology, the serpent testifies the art of healing which symbol is retained even today.

# Symbol of Medicine





- Hygiene is defined as "the science of health and embraces all factors which contribute to healthful living".

# Public health

- The term "public health" came into general use around 1840.
- It arose from the need to protect "the public" from the spread of communicable diseases.
- In 1920, Winslow, a former professor of public health at Yale University, gave definition of public health.

- "the science and art of
  - Preventing disease, prolonging life, and promoting health and
  - Efficiency through organized community efforts for the sanitation of the environment
  - The control of communicable infections
  - The education of the individual in personal hygiene
  - The organization of medical and nursing services for early diagnosis and preventive treatment of disease
  - And the development of social machinery to ensure for every individual a standard of living adequate for the maintenance of health
- So, organizing these benefits as to enable every citizen to realize his birthright of health and longevity".

- In developing countries, public health has not made much headway in terms of sanitary reforms and control of communicable diseases
- It has made tremendous strides in the industrialized western countries resulting in longer expectation of life and significant decline in death rates.

- As a result of improvements in public health during the past 50 or 60 years, public health in the developed countries has moved from sanitation and control of communicable diseases to preventive, therapeutic and rehabilitative aspects of chronic diseases and behavioural disorders.

# Preventive medicine

- Preventive medicine developed as a branch of medicine distinct from public health, based on aetiology. It is applied to "healthy" people.
- It scored several successes in the prevention of communicable diseases based on immunization

- Preventive medicine has thus come to include both
  - Specific medical measures (e.g., immunization)
  - General health promotional measures (e.g., health education).
- Preventive medicine involve responsibilities and decisions at many levels - individual, public and private

# Community health

- The term "community health" has replaced in some countries, the terms public health, preventive medicine and social medicine.
- “All the personal health and environmental services in any human community, irrespective of whether such services were public or private ones”.



# Social medicine

- The term "social medicine" was first introduced by Jules Guerin, a French physician in 1848.
- In 1911, the concept of social medicine was revived by Alfred Grotjahn of Berlin who stressed the importance of social factors as determinants of health and disease.
- These ideas of social medicine spread throughout Europe and England after the First World War

- "Social medicine stands upon two pillars, medicine and sociology.
  - Social medicine, by derivation is concerned with the health of groups of individuals
  - Individuals within these groups with a view to create, promote, preserve, and maintain optimum health.
- The laboratory to practice social medicine is the whole community

- The tools for diagnosing community ills are epidemiology and biostatistics
- Social therapy does not consist in administration of drugs, but social and political action for the betterment of conditions of life of man."

- In 1968, Todd Report for the first time referred to "community medicine" instead of social medicine
- And defined it in terms which embraced social medicine, but went beyond it, by giving greater emphasis to the organizational and administrative aspects

# Community medicine

- The term "community medicine" is a newcomer.
- It is the successor of what has been previously known as public health, preventive medicine, social medicine and community health.

- The Todd Commission ( 1968) recommended that every medical school in England should have a department of community medicine.
- The combination of community medicine with "primary health care" extends the functioning of both elements

Hygiene

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graph TD; Hygiene[Hygiene] --- PublicHealth[Public Health (1840)]; PublicHealth --- SocialMedicine[Social medicine (1848)]; SocialMedicine --- PreventiveMedicine[Preventive Medicine]; PreventiveMedicine --- CommunityHealth[Community Health]; CommunityHealth --- CommunityMedicine[Community Medicine];
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The diagram illustrates the historical progression of community medicine. It features a series of blue rectangular boxes, each containing a term. The boxes are arranged in a descending staircase pattern from top-left to bottom-right. The terms are: Hygiene, Public Health (1840), Social medicine (1848), Preventive Medicine, Community Health, and Community Medicine. Each box is connected to the next by a blue line that extends horizontally to the right and then turns vertically downwards to the next box.

Public Health (1840)

Social medicine (1848)

Preventive Medicine

Community Health

Community Medicine

# **CHANGING PATTERN OF DISEASE**



- Although diseases have not changed significantly through human history, their patterns have.
- It is said that every decade produces its own pattern of disease or new diseases. Eg. HIV, Swine flu, zika, Ebola
- The truth of this will be obvious when one compares the leading causes of death globally for the year 2000 and 2011

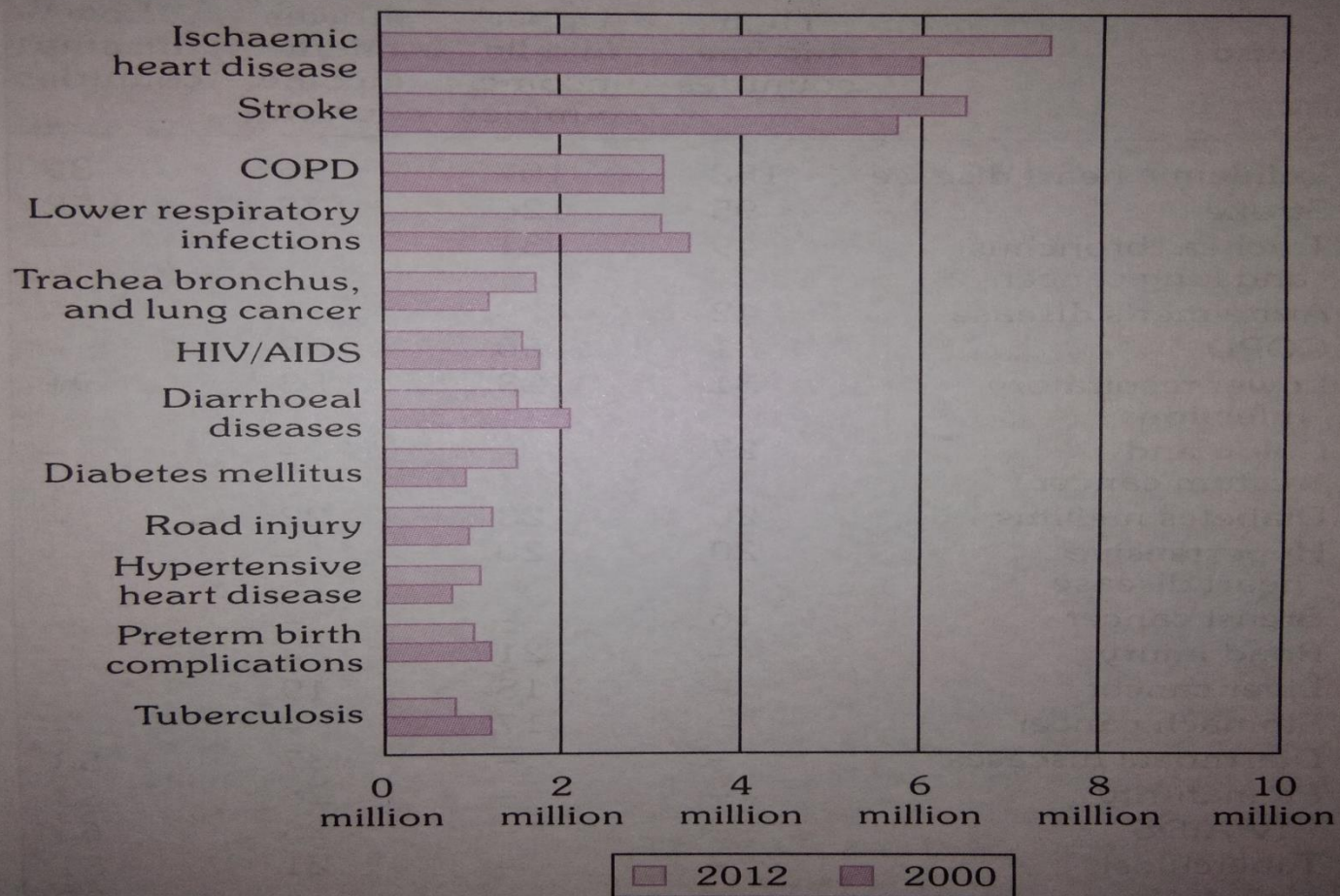
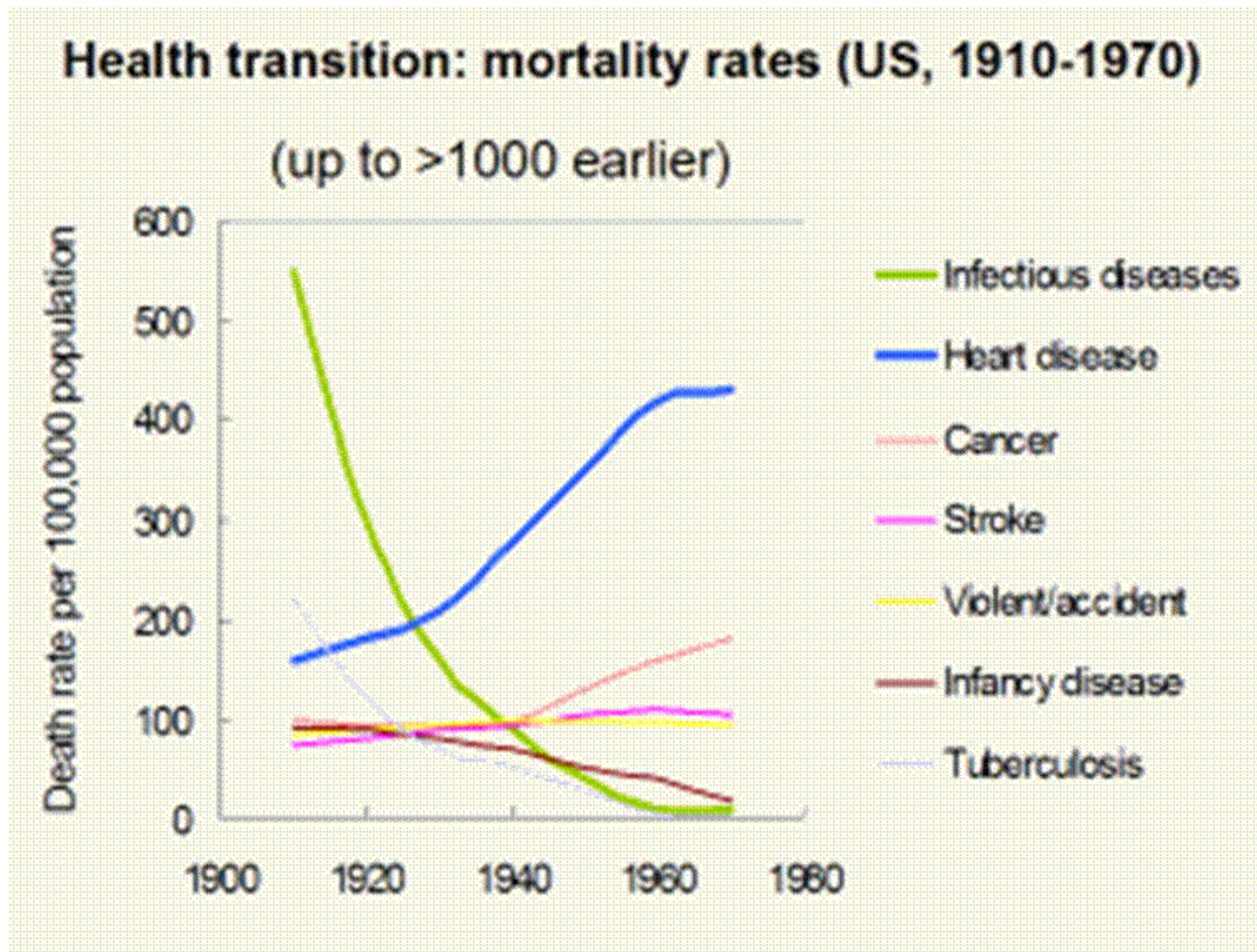


FIG. 12  
Comparison of leading causes of death worldwide  
over the past decade, 2000 and 2012

Source : (119)

# Epidemiologic Transition



# Developed countries

- During the past decades, the developed world has experienced a dramatic change in the pattern of disease.
- By far the greatest part of this development has been the decline of many of the infectious diseases (e.g., tuberculosis, typhoid fever, Polio, diphtheria).
- However problems of a different nature have achieved ascendancy, e.g., coronary heart disease, cancer, accident, dementia, COPD and diabetes.

- Lower respiratory infection remains the leading infectious cause of death.
- Only one in every 100 deaths is among children under 15 years.

- Below table shows the top 10 causes of death in high income, upper middle income and other countries.



**TABLE 9**  
**Top 10 causes of death in developed and  
developing countries, 2012**

Deaths per lac population

Cause	High income countries	Upper middle income countries	Lower middle income countries	Low income countries
Ischaemic heart disease	158	107	95	39
Stroke	95	126	78	52
Trachea, bronchus and lung cancer	49	31	—	—
Alzheimer's disease	42	—	—	—
COPD	31	50	52	—
Lower respiratory infections	31	23	53	91
Colon and rectum cancer	27	—	—	—
Diabetes mellitus	20	23	22	—
Hypertensive heart disease	20	20	—	—
Breast cancer	16	—	—	—
Road injury	—	21	—	—
Liver cancer	—	18	19	—
Stomach cancer	—	17	—	—
Diarrhoeal diseases	—	—	37	53
Prematurity	—	—	28	33
HIV/AIDS	—	—	23	65
Tuberculosis	—	—	21	31
Malaria	—	—	—	35
Protein energy malnutrition	—	—	—	27
Birth asphyxia and birth trauma	—	—	—	29

- **The morbidity pattern** has also changed. In recent years, there has been a steady increase in mental disorders.
- Alzheimer's disease described as the "silent epidemic" of the century, is an important cause of morbidity and mortality.





- There has been a steady increase in social pathology due to alcohol and drug abuse.
- **Lung cancer** as well as other chronic lung diseases due to smoking, and **obesity** due to overeating have become common.
- Environmental health problems connected with toxic, carcinogenic and mutagenic material in the external environment due to industrialization and growing urbanization are assuming growing importance.

- The microbial diseases that are now becoming prominent are often caused by organisms previously regarded as being innocuous such as
  - The coliforms and the other gram-negative bacilli
  - the non-haemolytic streptococci
  - Campylobacters
  - Legionella
  - Chlamydia
  - Rotaviruses
  - AIDS virus.

# Developing countries

- About 40 per cent of deaths are among children under 15 years of age
- People predominantly die of infectious diseases like lower respiratory infections, HIV/AIDS, diarrhoeal diseases, malaria and tuberculosis.
- These diseases collectively account for almost one-third of all deaths in these countries.

- Complications of childbirth due to prematurity, birth asphyxia and birth trauma are among leading causes of death as shown in Table.

# INDIA

- Most deaths result from infectious and parasitic diseases, abetted by malnutrition
- Diarrhoeal diseases are widespread & Cholera has shown a declining trend.
- Malaria which showed a decline in the 1960s have staged a comeback.

- Japanese encephalitis, dengue and meningococcal meningitis have shown an increasing trend.
- There is appreciable change in the prevalence of tuberculosis, filariasis, but little change in the prevalence of viral hepatitis, diarrhoea and dysentery and disorders of malnutrition and undernutrition.

- New health problems such as coronary heart disease, hypertension, cancer, diabetes and accidents has increased
- Along with the development of industries, various occupational diseases, e.g., pneumoconiosis are on the increase
- The emerging picture is a mixture of the old and "modern" diseases.

**Thank you**