- **What is the definition of epidemiology?**
  - It is the study of frequency, distribution (time; place; person) and determinants of health-related states or events in a specified population and the application of this study to control health problems.
- **Morris principles of epidemiology:**
  - Observing health trends in a population (same, better or worse).
  - Community diagnosis (identification of potential health problems).
  - Searching for causes (hypothesis testing).
  - Evaluation of health services (efficacy, effectiveness and efficiency).
  - Calculating individual risks and chances.
  - Completing clinical picture (natural history of the disease).
  - Identification of syndromes.
- **Natural history of a disease and prevention:**
 - **Description:**
    - ✓ It is the course of the disease over time, unaffected by treatment.
    - ✓ Development of a disease is often an irregularly evolving process.
    - ✓ The point at which a person should be labeled 'diseased' may be arbitrary (إعتباطي).
  - **Stages of a disease:**
    - ✓ Susceptibility stage: the disease has not developed yet but risk factors are present.
    - ✓ Pre-symptomatic stage: The disease is not manifested; pathological changes have started to occur.
    - ✓ Stage of clinical disease: sufficient end-organ changes have occurred and there are recognizable signs and symptoms of the disease.
    - ✓ Final stage: represented by recovery, disability or death.
  - **Levels of disease prevention:**
    - ✓ Primary prevention: prevention of a disease by altering susceptibility or reducing exposure through:
      - ❖ Health promotion.
      - ❖ Specific protection.
    - ✓ Secondary prevention: represented by
      - ❖ Screening.
      - ❖ Early diagnosis and treatment.
    - ✓ Tertiary prevention: restoring an affected individual to a useful, satisfying and self-sufficient role in society. This is represented by:
      - ❖ Limitation of disability
   - ❖ Rehabilitation.
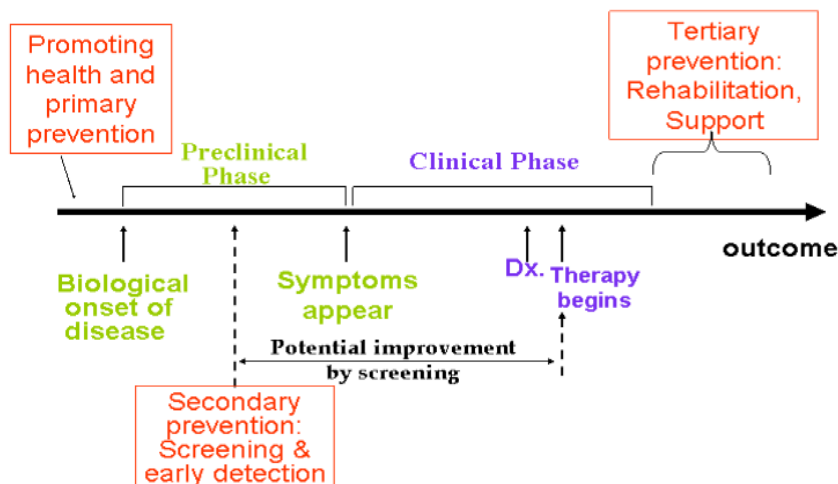
- **Infectious disease:**
  - **Definition**: an illness due to a specific infectious agent or its toxic products that arises through transmission of that agent or its products from an infected person, animal or reservoir to a susceptible host, either directly or indirectly through an intermittent plant or animal host, vector, or the inanimate environment.
  - **Some important terminologies:**
    - ✓ <u>Susceptible</u>: uninfected but able to become infected if exposed.
    - ✓ <u>Infectious</u>: infected and able to transmit the infection to other susceptible individuals.
    - ✓ <u>Immune</u>: possessing cell-mediated or humoral antibody protection against an infection.
    - ✓ <u>Diseased/ clinical infection</u>: implies the presence of clinical signs of pathology (not synonymous with infected).
    - ✓ <u>Latent infection/ subclinical infection</u>: implies the presence of an infectious agent but the absence of a clinical disease.
    - ✓ <u>Carrier</u>: implies a protected infected state with shedding of the infectious agent. Carriers may be diseased, recovering or healthy.
  - **Transmission of the disease:**

Direct transmission	Indirect transmission
Mucous membrane to mucous membrane (HIV)	Water-borne (cholera)
Across placenta (TORCH: Toxoplasmosis, Others, Rubella, Cytomegalovirus, Herpes simplex virus/HIV)	'Proper' air-borne (chicken pox)
Transplants	Food-borne (typhoid)
Skin to skin (scabies: الجرب)	Vectors (malaria and yellow fever)
Sneeze and cough (corona)	Objects/ fomites (scarlet fever)

  - **Disease causation models:**
    - ✓ <u>Epidemiological triad:</u>
      - ❖ Suitable for communicable diseases.
      - ❖ Each component must be analyzed.
      - ❖ Change in any of the components will alter an existing equilibrium.
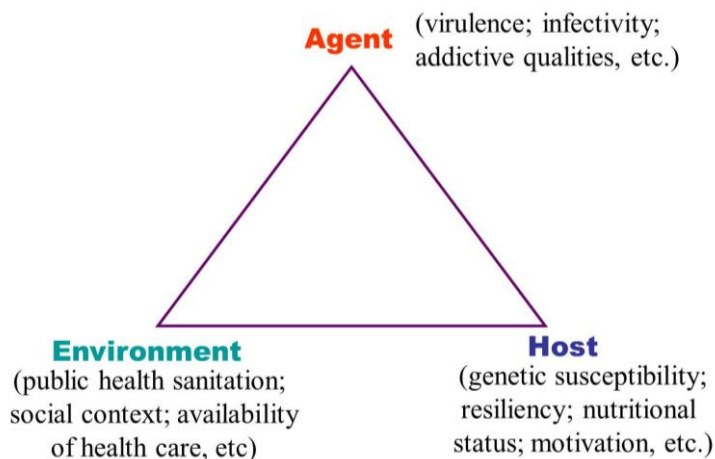

    - ✓ <u>Web of causation:</u>
      - ❖ Suitable for Non-Communicable Disease (NCDs) and multi-factorial Communicable Diseases (CDs) such as tuberculosis.
      - ❖ Effects never depend on single isolated cause.
      - ❖ Develop as the result of chain of causation.
      - ❖ Large number of antecedents (أسلاف-أجداد) create a condition conceptualized as 'web'.

- ✓ Wheel model:
  - ❖ It is a multi-causation model with a genetic core.
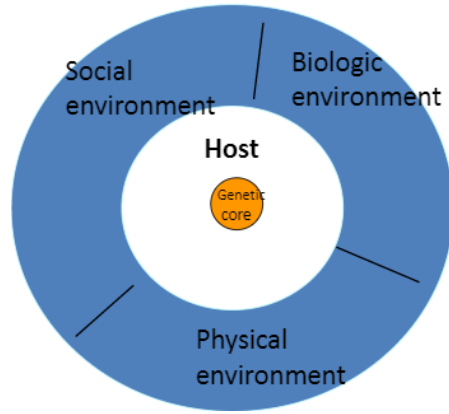
- **Iceberg phenomenon:**
  - ✓ That portion of a disease which remains unrecorded or undetected despite physicians' diagnostic endeavors (مساعيهم لتشخيص المرض) and community disease surveillance procedures is referred to as the "submerged portion of the iceberg".
  - ✓ Detected or diagnosed disease is the "tip of the iceberg".
  - ✓ The submerged portion comprises diseases not medically attended, medically attended but not accurately diagnosed, and diagnosed but not reported.
  - ✓ Other terms have been proposed to describe this concept in parts of the world where icebergs are unknown.

THE ICEBERG
A Tool for Guiding Systemic Thinking
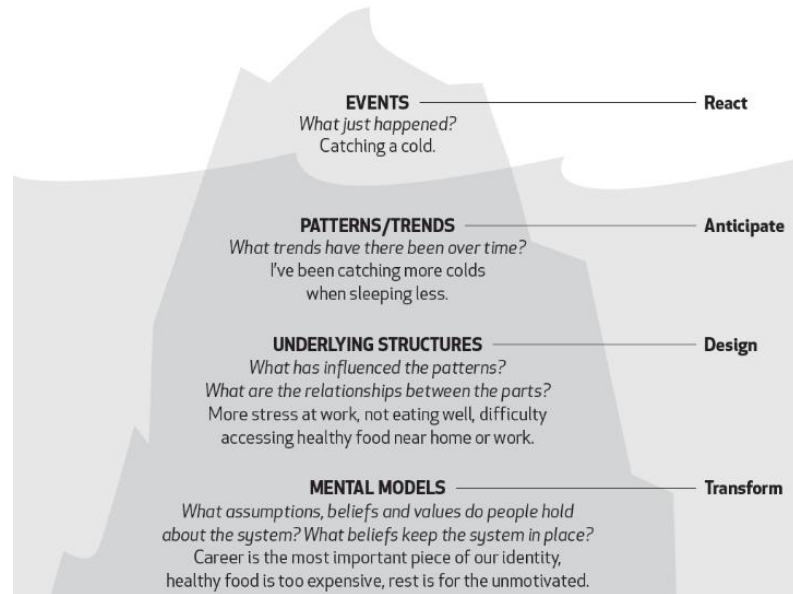
- **The graph below shows the relation between seasons and infections in Tanzania between 1980-1983:**