المحاضرة الأولى// علم الوبائيات // المرحلة الرابعة

Introduction of Epidemiology

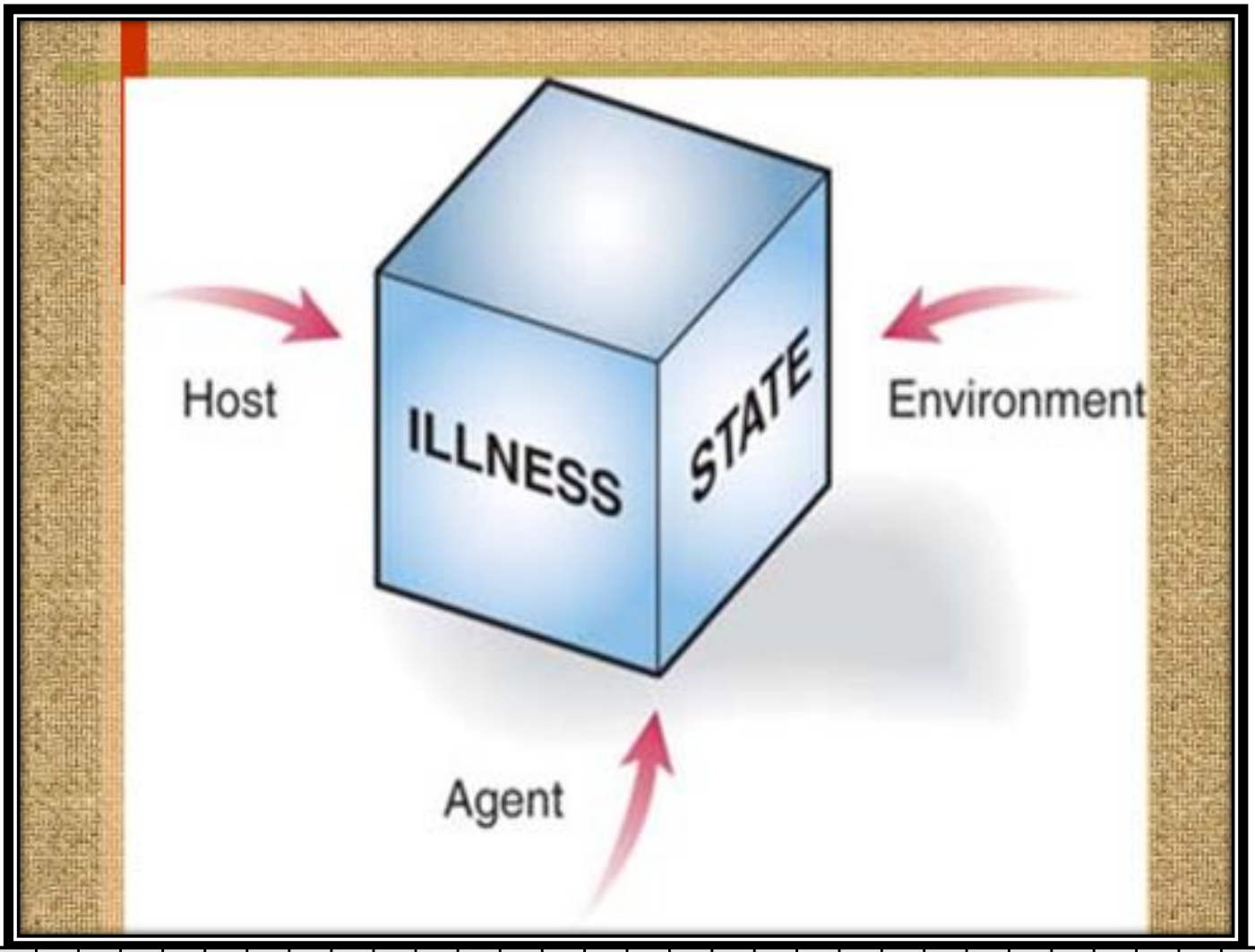
Epidemiology: *The term is derived from Greek words;*
It means the knowledge or study of what happen on people.
Epi*= up on*
Demi*= people*
Ology*= knowledge*

Epidemiology Defined: -

◙ ***It's the study of determinants and distribution of health, disease and injuries in human population, and Application of that Study to Improve the Health of Population.***

◙ ***The ultimate goal*** *is* ***① To Determine the scale and nature of human health problems, ② Identify solutions to prevent disease and ③ Improve the health of the whole population.***

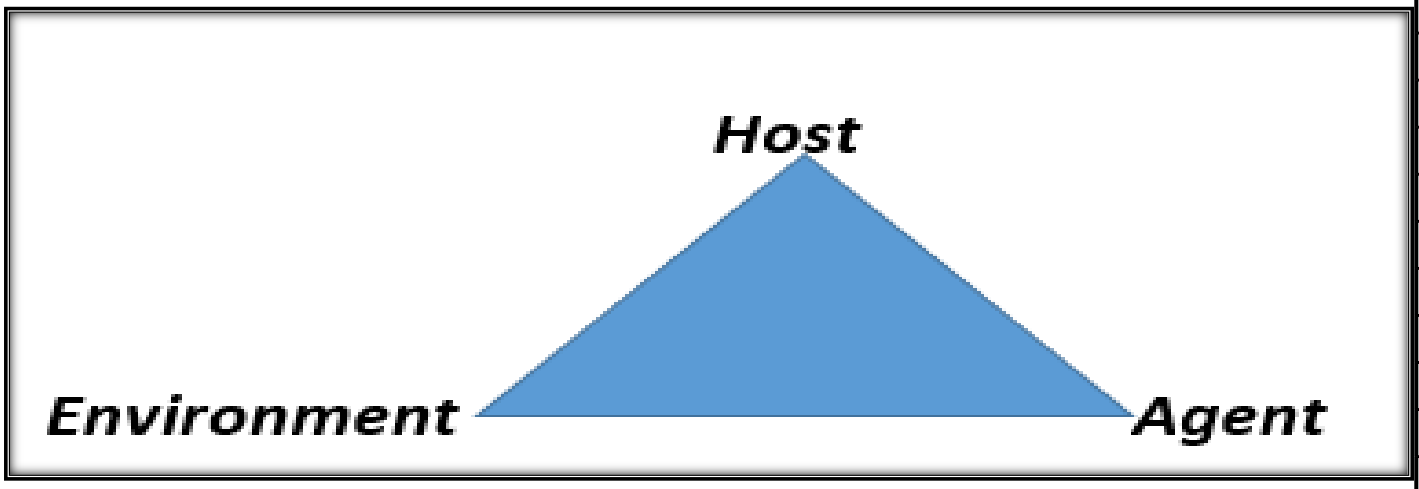
► *Considered both a* ***Methodology*** *and a* ***Body of Knowledge****.*



Host, Agent, and Environment Model

*Through their early study of **infectious diseases, epidemiologists began** to consider **disease states generally** in terms of the **epidemiologic triad**, or **the host, agent, and environment model**.*

Interactions among these Three Elements Explained Infectious and other Disease Patterns.



Epidemiological, Research, and Nursing Process: (Benefit)✓✓

- **Identifying health problems and needs.**
- **Collecting and analyzing data to identify factors that influence health problems and needs.**
- **Planning, implementing, and evaluating methods for prevention and control.**

⟶ ***Host***

- *The **Host** is a susceptible human or animal who nourishes a disease-causing agent. Many physical, psychological, and lifestyle **factors influence the host's susceptibility and response to an agent**.*
- ***Physical factors** include: **Age**, **Gender**, **Race**, and **Genetic** influences on the host's **Weakness** Or **Resistance**.*
- ***Psychological factors**, such as **outlook and response to stress**, can **strongly influence host susceptibility**.*
- ***Lifestyle factors** also play a major role. **Diet, Exercise, Sleep Patterns,** and **Healthy** or **Unhealthy Habits** all contribute to either **Increased** or **Decreased Weakness** to the **Disease-Causing Agent**.*

⟶ ***Agent***

- ***An Agent is a factor that causes or contributes to a health problem or condition.***
- ***Causative agents*** *can be* ***Factors*** *that are* ***Present*** *(e.g., bacteria that cause tuberculosis).*
- ***Factors*** *that are* ***lacking*** *(e.g., a low serum iron level that causes anemia).*
- *Agents vary considerably and include* ***Five Types: Biologic, Chemical, Nutrient, Physical, And Psychological****.*

❖ ***Biologic agents*** *include bacteria, viruses, fungi, protozoa, worms, and insects.*

❖ ***Chemical agents*** *may be in the form of liquids, solids, gases, dusts, or fumes.*

❖ ***Nutrient agents*** *include essential dietary components that can produce illness conditions if they are* ***Deficient or are Taken in Excess****.*

⟶ Environment

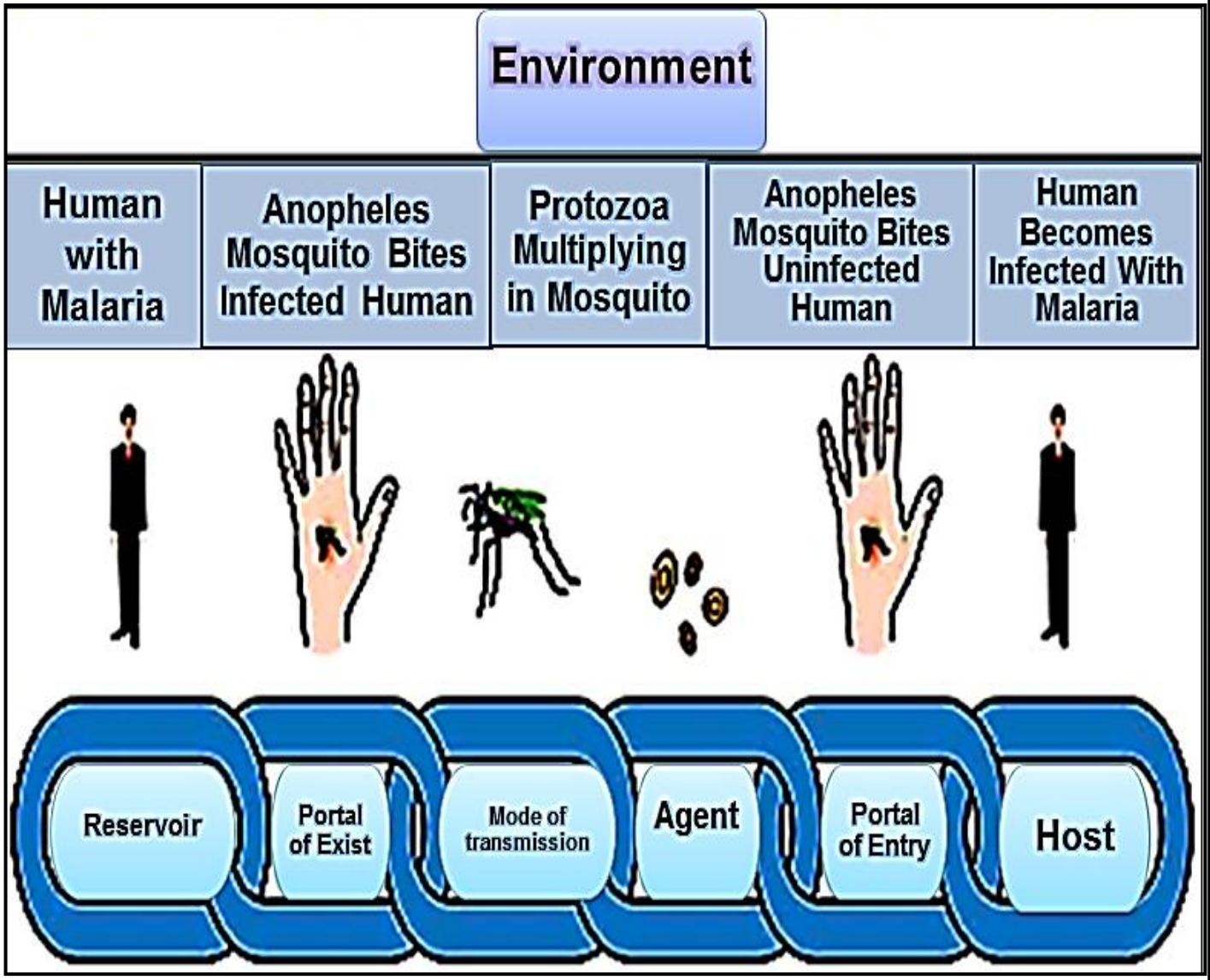
- *The* ***Environment*** *refers to all the external factors surrounding the host that might influence vulnerability or resistance.*
- ***The Physical Environment*** *includes factors such as* ***geography, climate*** *and* ***weather, safety*** *of* ***buildings, water*** *and* ***food supply, animals, plants, insects,*** *for* ***transmitting disease****.*
- ***The Psychosocial Environment*** *refers to* ***Social, Cultural, Economic****, and* ***Psychological*** *Influences and conditions that* ***Affect Health****, such as* ***access to health care****,* ***cultural health practices****,* ***poverty****, and* ***work stressors****, which can all contribute to* ***Disease*** *or* ***Health****.*

♣♣***Causality***

- ***Causality Refers to the Relationship Between a Cause and Its Effect. At purpose of epidemiologic study has been to discover causal relationships to understand why conditions develop and offer effective prevention and protection.***

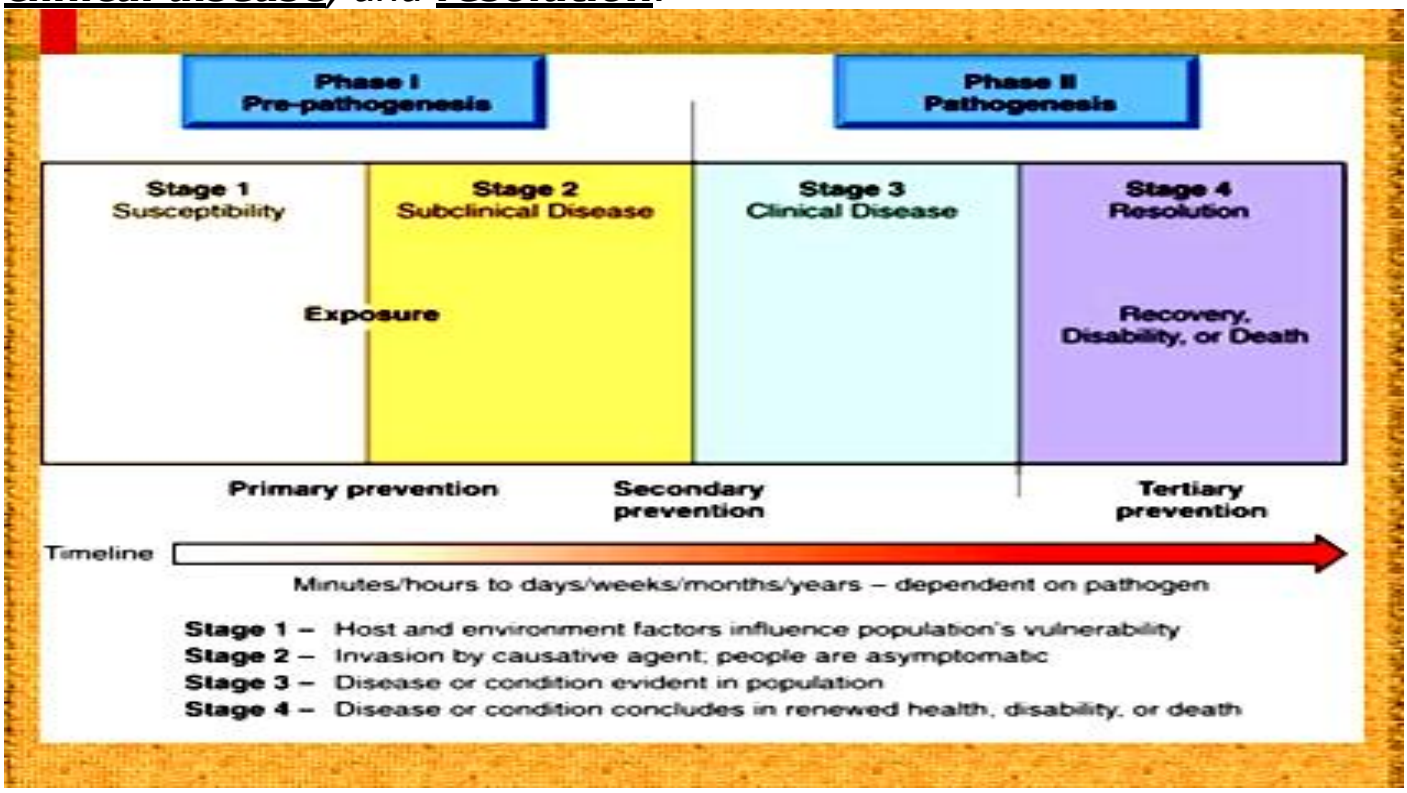
♣♣***Chain of Causation***

- *The chain begins by identifying the reservoir (where the causal agent can live and multiply). With plague, that reservoir may be other humans, rats, squirrels, and a few other animals. With malaria, infected humans are the major reservoir for the parasitic.*



➡ ***Natural History of a Disease or Health Condition***

- *This process involves the interactions among a susceptible host, the causative agent, and the environment.*
- *The natural progression of a disease occurs in four stages as they affect a population—**susceptibility**, **preclinical (subclinical) disease**, **clinical disease**, and **resolution**.*



Sources of Information for Epidemiologic Study:

1- Existing Data:

a-Vital statistics: **(**is statistics relating to births, deaths, marriages, health, and disease. How to use vital statistics in a sentence**)**.

b- Census Data:

c- Reportable Diseases:

d. Disease Registries

e. Environmental Monitoring

2. Informal investigations: (The three major epidemiologic techniques are **Descriptive, Analytic, and Experimental**. Although all three can be used in investigating the occurrence of disease, the method used most is ***descriptive epidemiology).***

3. Scientific studies.

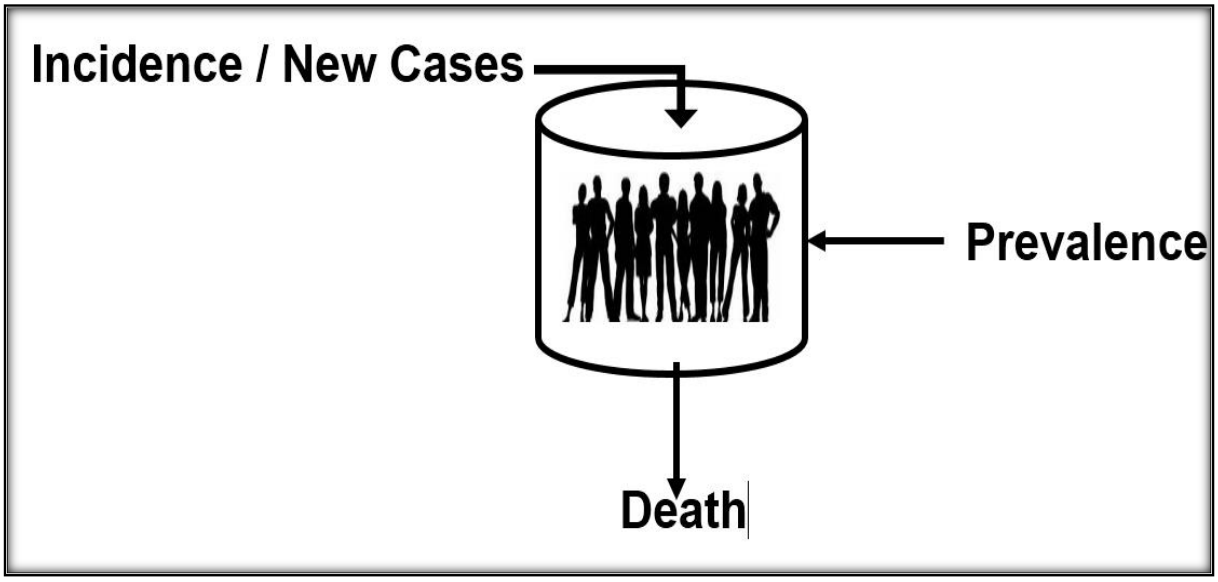
◙***Prevalence:***

- *Refers to all of the people with a particular health condition existing in a given population at a given point in time. The prevalence rate describes a situation at a specific point in time.*
- *A nurse discovers 50 cases of measles in an elementary school, If that number is divided by the number of students in the school the result is the prevalence of measles. For instance, if the school has 500 students, the prevalence of measles on that day would be 10% (50 measles/500 population).*

◙***Incidence:***

- *Refers to all new cases of a disease or health condition appearing during a given time.*
- *Incidence rate describes a proportion in which the numerator is all new cases appearing during a given period of time and the denominator is the population at risk during the same period.*

Diagram Explain Prevalence & Incidence



$$\text{Incidence} = \frac{\textit{Number of New Cases}}{\textit{Population at Risk}} = \frac{15}{50} * 100000 = 30000/100000 \text{(Comparison)}$$

$$\text{Prevalence} = \frac{\textit{Total Number of Cases}}{\textit{Total Population}} * 100\% = \frac{50}{500} * 100\% = 10\%$$