High-Yield Summary – Epidemiology (Principles + Infectious Process)

1. Definition of Epidemiology

Epidemiology comes from:

- Epi = among

- Demos = people

- Logos = study

Many definitions exist, but all focus on studying disease in populations.

Classic Definitions

1. Study of epidemics. (Parkin, 1873)

2. Science of mass phenomena of infectious diseases. (Frost, 1927)

3. Study of disease as a mass phenomenon. (Greenwood, 1934)

4. Study of distribution and determinants of disease frequency. (MacMahon, 1960)

John M. Last (1988)

“Study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to control health problems.”

Nature of Epidemiology

- Basic science of preventive and social medicine.

- Rapid development in the last century.

- Includes disease distribution, causes, prevention, treatment evaluation, and health services.

Modern epidemiology identifies:

- Risk factors for chronic diseases

- Effectiveness of treatments

- Effectiveness and efficiency of health services

Branches of Modern Epidemiology:

infectious disease epidemiology, chronic disease epidemiology, clinical epidemiology, genetic & molecular epidemiology, serological epidemiology, cancer epidemiology, occupational epidemiology, malaria epidemiology, psychosocial epidemiology, neuro-epidemiology.

Core Components

1. Disease frequency

2. Disease distribution

3. Determinants

Epidemiology vs Clinical Medicine

- Epidemiology studies populations; clinical medicine studies individuals.

- Clinician → diagnosis/treatment; epidemiologist → patterns, causes, control.

- Epidemiology concerns both sick and healthy.

- Clinician receives patients; epidemiologist goes to community.

- Clinical data is concrete; epidemiology is conceptual (tables, graphs).

- Both fields are interdependent.

Infectious Disease Epidemiology

Reasons to study:

- New infections

- Changing patterns

- Some chronic diseases have infectious origins

- Vaccines/antibiotics did not eliminate infectious diseases

Key Definitions

Health: Complete physical, mental, social well-being (WHO).

Disease: Deviation from normal health.

Infection:

Entry/development/multiplication of an agent in the host.

May cause immune response or disease.

Does not always cause illness.

Levels of Infection

- Colonization

- Subclinical (inapparent)

- Latent infection

- Clinical infection

Outcome depends on:

- Host immunity

- Agent factors (virulence, toxicity, invasiveness)

Pathogenesis:

Outcome of host–agent interaction:

- No infection

- Subclinical infection

- Disease

Contamination:

Presence of agents on surfaces or objects.

Infestation:

Arthropods on body surface (lice, mites).

Also invasion of gut by worms.