

### 1. Definition and Main Objectives of Epidemiology

Epidemiology is like detective work for health issues - it's the study of how diseases and health-related events spread among populations, aiming to understand causes and control health problems. The main objectives are:

- Describing Disease Patterns: Understanding trends and distributions.
- Identifying Risk Factors: Figuring out what causes diseases.
- Evaluating Interventions: Checking if control measures work.
- Informing Public Health Policy: Guiding decisions with evidence.

### 2. Descriptive vs Analytical Epidemiology

- Descriptive Epidemiology: Paints a picture of disease patterns (time, place, person). Example: Tracking age-specific COVID-19 cases in Nigeria.
- Analytical Epidemiology: Digs deeper to test hypotheses about causes and risk factors. Example: Linking smoking to lung cancer risk.

### 3. Epidemiologic Triangle

The triangle has three key players in infectious disease spread:

- Agent: The pathogen (like a virus or bacteria).
- Host: The susceptible human or animal.
- Environment: External factors influencing transmission.

Think malaria: Plasmodium parasite (agent), human (host), mosquito habitat (environment).

### 4. Determinants in Epidemiology

Determinants are factors shaping health outcomes.

- Biological Examples: Genetics linked to hypertension; age affecting susceptibility.
- Environmental Examples: Air pollution and respiratory diseases; climate influencing vector-borne diseases.

## 5. Three Levels of Prevention

Level	Description	Example
Primary	Stop disease before it starts	Vaccination against measles
Secondary	Catch it early	Mammography for breast cancer
Tertiary	Manage disease, reduce impact	Rehabilitation post-stroke

## 6. John Snow's Contribution

John Snow was a pioneer! During London's 1854 cholera outbreak, he mapped cases, pinpointed a contaminated Broad Street pump, and showed removing the pump handle helped curb the outbreak.

## 7. Incidence vs Prevalence

- Incidence: Counts new cases over time (useful for risk and causes).

- Prevalence: Total existing cases (shows disease burden).

For diabetes, incidence helps understand risk factors; prevalence guides healthcare planning.

## 8. Epidemiological Study Designs

Common designs include cohort, case-control, cross-sectional, ecological.

- Cohort Studies: Follow exposed/unexposed groups prospectively.

- Case-Control Studies: Retrospective look comparing diseased vs healthy folks.

## 9. Relative Risk (RR) vs Odds Ratio (OR)

- Relative Risk (RR): Used in cohort studies to compare risks.

- Odds Ratio (OR): Often used in case-control studies to estimate associations.

## 10. Epidemiological Surveillance

It's like having eyes on the ground for public health - involves collecting and analyzing data for timely action.

- Role: Ongoing data collection for public health decisions.

- In Emerging Epidemics: Helps with early detection, tracking spread, guiding interventions (like with COVID-19).