5 Types of Epidemiology

During the COVID-19 outbreak, epidemiologists worked hard to identify the novel disease, determine how it spread and research ways to mitigate the harsh impacts of a pandemic. Infectious diseases aren't the only health conditions that these professionals study. Others include chronic, environmental and mental health conditions.

What Is Epidemiology?

Epidemiology is the science of investigating the causes and transmission of diseases. By studying diseases, epidemiologists can help prevent illness and improve the public's health.

Epidemiologists study:

- What causes diseases
- How diseases spread

PUBLIC HEALTH SURVEILLANCE

Epidemiologists collect, analyze and interpret public health data to understand the spread of diseases, including infectious diseases and chronic diseases.

JOHN SNOW, FATHER OF MODERN EPIDEMIOLOGY

- John Snow investigated London's 1854 cholera outbreak.
- By mapping cases and tracking its spread, Snow concluded that cholera was a waterborne disease.
- Snow's groundbreaking and lifesaving research changed public health knowledge before the germ theory of disease had been established.

Types of Epidemiology

As public health experts, epidemiologists specialize in infectious diseases and chronic diseases. But these are only two of several specializations in epidemiology.

INFECTIOUS DISEASE EPIDEMIOLOGY

Infectious disease epidemiology is the study of illnesses caused by germs, including bacteria and viruses

Americans make about **23 million** doctor's visits annually because of infections.

GOALS of infectious disease epidemiology	METHODS used in infectious disease epidemiology
• Prevent and control infections • Prevent diseases through public education	• Public health surveillance • Infectious disease reporting • Immunizations and vaccines

CHRONIC DISEASE EPIDEMIOLOGY

Chronic disease epidemiology is the study of chronic illnesses, which are those that continue or occur repeatedly.

Heart disease, cancer, diabetes and hypertension are chronic diseases.

In 2018, it was estimated that around **129 million** Americans have at least one major chronic disease.

GOALS of chronic disease epidemiology	METHODS used in chronic disease epidemiology
• Identify social determinants of chronic diseases • Reduce health disparities • Improve health outcomes	• Public health surveillance • Observational data analysis • Public health education

ENVIRONMENTAL EPIDEMIOLOGY

Environmental epidemiology is the study of how the environment impacts people's health and the spread of diseases.

Roughly **24 percent** of global deaths are estimated to be linked to the environment.

GOALS of environmental epidemiology	METHODS used in environmental epidemiology
• Identify environmental risk factors • Limit the harm of environmental contaminants	• Public health surveillance • Environmental exposure data analysis • Cluster outbreak investigations

PSYCHIATRIC EPIDEMIOLOGY

Psychiatric epidemiology is the study of the distribution and determinants of mental disorders.

Half of the people around the world will experience a mental health disorder in their lifetime.

GOALS of psychiatric epidemiology	METHODS used in psychiatric epidemiology
• Prevent mental health conditions • Improve people's health and well-being	• Clinical psychological research • Mental health data analysis

NEUROEPIDEMIOLOGY

Neuroepidemiology is the study of diseases that impact the central nervous system.

Over **3 billion** people globally had a neurological condition in 2021.

GOALS of neuroepidemiology	METHODS used in neuroepidemiology
• Identify causes of nervous system disorders • Prevent and find treatments for neurological diseases	• Observational studies of neurologic disorders • Experimental research on medications and interventions • Diagnostic prediction research

Types of Epidemiology Studies

Epidemiology studies fall into two broad categories: descriptive studies and analytic studies.

Descriptive Epidemiology Studies

- Examine disease patterns
- Investigate locations and populations impacted
- Used to allocate public health resources
- Generate hypotheses that analytic studies evaluate

Example

Descriptive studies of HIV in the 1980s identified high risk groups, creating a hypothesis about the cause of AIDS.

Types of Descriptive Epidemiology Studies

- Case Reports
- Case Series
- Incident Studies

Analytic Epidemiology Studies

- Identify the causes and effects of diseases
- Analyze the distribution of diseases
- Determine the links between exposures and outcomes

Example

After a descriptive study identified an outbreak of a foodborne illness, an analytic study compared an exposed and a nonexposed group to identify the source.

Types of Analytic Epidemiology Studies

Experimental Studies

Researchers conduct trials to gain clinical insights.

Experiments can determine the most effective public health responses.

Example

Public health researchers studied the impact of a public health education campaign on a community's health and wellness.

Types of experimental studies

- Clinical Trials
- Community Trials

Observational Studies

Researchers observe patterns of exposure to understand diseases.

Long-term observational studies can take decades to complete.

Example

Researchers compared influenza rates in populations with different immunization levels.

Types of observational studies

- Cohort
- Case Control
- Cross-Sectional
- Ecological

Conclusion

Epidemiologists specialize in many areas, such as chronic diseases, environmental risk factors and mental health. By using descriptive and analytic approaches, these epidemiologists help improve people's health and wellness.

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Sources:

https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Publications/DVS/mb/mb1-1209.pdf
https://www.cdc.gov/nchs/nvss/mortality-public.htm
https://www.cdc.gov/nchs/data/nvsr/nvsr70-02.pdf
https://www.ncsl.org/research/health/opioid-2017.pdf
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