

**Introduction:**

- Veterinary epidemiology is concerned with disease in animal populations

**History:**

- dog, naturally a hunter, was probably the first animal to be domesticated over 14 000 years ago when it became the companion of early hunters.
- Sheep and goats were domesticated by 9000 BC in the fertile Nile valley and were the basis of early pastoral cultures.
- An Egyptian cattle culture evolved from 4000 BC
- The aurochs was central to the religion of the Sumerians, who migrated throughout Asia, North Africa and Europe in the third millennium BC taking their animals and beliefs with them.
- India is the largest cattle culture that remains.
- The Greek physician [Hippocrates](#) is known as the father of [medicine](#) he is the first person known to have examined the relationships between the occurrence of disease and environmental influences.
- Humoral pathology

		CHARACTERISTIC	
		Moisture	Dryness
CHARACTERISTIC	Heat	Humour = Blood Associated element = Air Source = Heart Excess → Sanguine temperament	Humour = Yellow bile Associated element = Fire Source = Liver Excess → Choleric (bilious) temperament
	Cold	Humour = Phlegm Associated element = Water Source = Pituitary gland Excess → Phlegmatic temperament	Humour = Black bile Associated element = Earth Source = Spleen Excess → Melancholic temperament

- A milestone in this growth was the establishment of the first permanent veterinary school at Lyons, France, in 1762

**The scope of epidemiology**

Epidemiology is derived from [Greek](#), *epi*, meaning 'upon, among', [demos](#), meaning 'people, district' [logos](#), meaning 'study, word, discourse',

**Epidemiology:**

- Is the study of disease in populations and of factors that determine its occurrence
- Is the study and analysis of the [patterns](#), [causes](#), and effects of [health](#) and [disease](#) conditions in defined [populations](#).

## **Epizootiology**1910

- the sum of the factors controlling the occurrence of a disease or pathogen of animals
- Is a science that deals with the character, ecology, and causes of outbreaks of animal diseases

### **Uses of epidemiology:**

- Determination of the origin of the disease whose cause is unknown
- Investigation and control of a disease whose cause initially is unknown
- Acquisition of information on the ecology and natural history of a disease
- Planning and monitoring of a disease control programs
- Assessment of the economic effect of a disease and analysis of the cost and economic benefits of alternatives control programs
- the communication of disease by direct or indirect contact, such as FMD

### **Disease:**

- any impairment of normal physiological function affecting all or part of an organism, eg. a specific pathological change caused by infection, stress, etc, producing characteristic symptoms; illness or sickness.

### **Infectious disease:**

- are illnesses that are caused by organisms, usually microscopic in size, such as bacteria, viruses, fungi, or parasites that are passed, directly or indirectly, from one host to another.

### **Contagion**

- **the spread of disease by direct or indirect contact. Eg FMD**

### **Single infection:**

- A simple agent that predominantly cause a disease

### **Mixed infection:**

- A disease produced by simultaneous infection with more than one agent.

### **Complex infectious disease**

- Diseases of body surfaces – enteric and respiratory diseases are single agents alone cannot be incriminated in the pathogenesis of them

### **Subclinical disease:**

- without clinical manifestations
- As of the early stages or a very mild form of a disease.

### **Diseases of unknown cause:**

- The cause of some diseases has not been fully elucidated, despite intensive experimental and field investigations over many years.
- Examples include the related diseases, eg. equine grass sickness.

**Noninfectious disease:**

- not able to spread disease
- noninfectious, or intrinsic, conditions are neither contagious nor communicable.
- They arise from inside the body as a result of hereditary conditions or other causes such as dietary deficiencies.

**Nosocomial infection:**

- are infection acquired during the process of receiving health care that was not present during the time of admission (infection acquired during hospital).

**Types of epidemiological investigations:**

1. Descriptive epid.
2. Analytic epid.
3. Experimental epid.
4. Theoretical epid.

**Descriptive epid.**

- Its involves observing and recording diseases and possible causal factors.
- It is subjective,
- Eg Darwin's theory of evolution,

**Analytic epid:**

- is the analysis of observations
- using suitable diagnostic and statistical procedures.

**Experimental epid.:**

- Experimental epidemiologists observe and analyze data from groups of animals from which they can select, and in which they can alter, the factors associated with the groups.
- An important component of the experimental approach is the control of the groups.
- utilized laboratory animals whose short lifespans enabled events to be observed more rapidly than in humans

**Theoretical epid.:**

- Theoretical epidemiology consists of the representation of disease using mathematical 'models' that attempt to simulate natural patterns of disease occurrence.

## **Epidemiological sub disciplines**

### 1 Clinical epidemiology

- is the use of epidemiological principles, methods and findings in the care of individuals, with particular reference to diagnosis and prognosis, and therefore brings a numerate approach to traditional clinical medicine, which has tended to be anecdotal and subjective

### 2 Computational epidemiology:

- Computational epidemiology involves the application of computer science to epidemiological studies
- This includes the representation of disease by mathematical models and the use of expert systems.
- examples are identification of the cause of coughing in dogs and the diagnosis of bovine mastitis.

### 3 Genetic epidemiology:

- is the study of the cause, distribution and control of disease in related individuals, and of inherited defects in populations
- Many diseases involve both genetic and non-genetic factors, and genes are increasingly incriminated in diseases of all organ systems

### 4 Field epidemiology:

- is the practice of epidemiology in response to problems of a magnitude significant enough to require a rapid or immediate action
- For example, when outbreaks of foot-and-mouth disease occur, field epidemiologists promptly trace potential sources of infection in an attempt to limit spread of the disease

### 5 Participatory epidemiology:

- Awareness, in the 1980s, of the rudimentary development of veterinary services in some parts of the developing world, where animals were economically and socially important, prompted the use of local knowledge to gain information, with the main goal of improving animal health

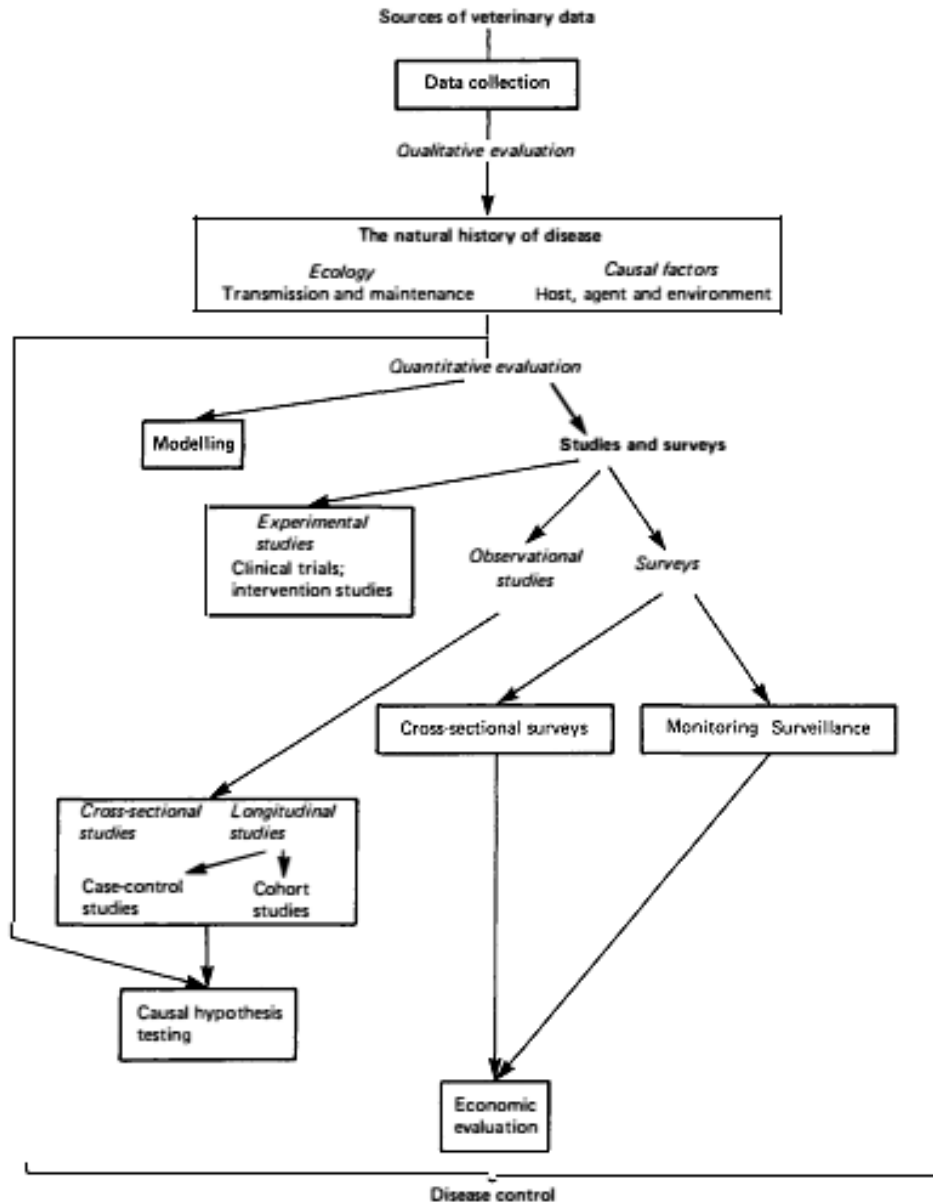
### 6 Molecular epidemiology:

- New biochemical techniques now enable microbiologists and molecular biologists to study small genetic and antigenic differences between viruses and other

microorganisms at a higher level of discrimination than has been possible using conventional serological techniques.

- The methods include peptide mapping, nucleic acid 'fingerprinting' and hybridization, restriction enzyme analysis, monoclonal antibodies and the polymerase chain reaction

**Components of epidemiology:**



**Quantitative investigations:**

- Surveys
- Monitoring and surveillance
- Studies
- Modelling
- Risk assessment
- Disease control