Primary case, index case

- The first disease case in the population is the **primary case**.
- The first disease case brought to the attention of the epidemiologist is the **index case**.
- The index case is not always the primary case.

Secondary case

Those persons who become infected and ill once a disease has been introduced into a population and who became infected from contact with the primary case

Different levels of diagnosis

- Suspect
- Probable
- Confirmed

Different levels of diagnosis

As more information (such as laboratory results) becomes available to the physician, he or she generally upgrades the diagnosis. When all criteria are met and they meet the case definition, the case is classified as a confirmed case.

Suspect case

- An individual or group of individuals who have all of the signs and symptoms of a disease or condition yet has not been diagnosed as having the disease, nor have the cause of the symptoms connected to a suspected **pathogen** (i.e., any virus, microorganism, or other substance that causes disease)

Triangle is based on the communicable disease mode

- Shows the interaction and interdependence of agent, host, environment, and time as used in the investigation of diseases and epidemics.
- **Agent** is the cause of the disease
- H**ost** is an organism, usually a human or an animal, that harbors a disease
- **Environment** is those surroundings and conditions external to the human or animal that cause or allow disease transmission
- **Time** accounts for incubation periods, life expectancy of the host or the pathogen, and duration of the course of the illness or condition.

Stopping an epidemic

An epidemic can be stopped when one of the elements of the triangle is interfered with, altered, changed, or removed from existence, so that the disease no longer continues along its mode of transmission and routes of infection

Steps for investigations of an epidemic :

First step :

Verify the diagnosis of an epidemic or outbreak

Determine whether there is an outbreak – an excess number of cases from what would be expected

Compare the current rate with the previous rate of the disease .

Second step :Establish a case definition

Non-ambiguous

Clinical / diagnostic verification

Person / place / time descriptions

Identify and count cases of illness

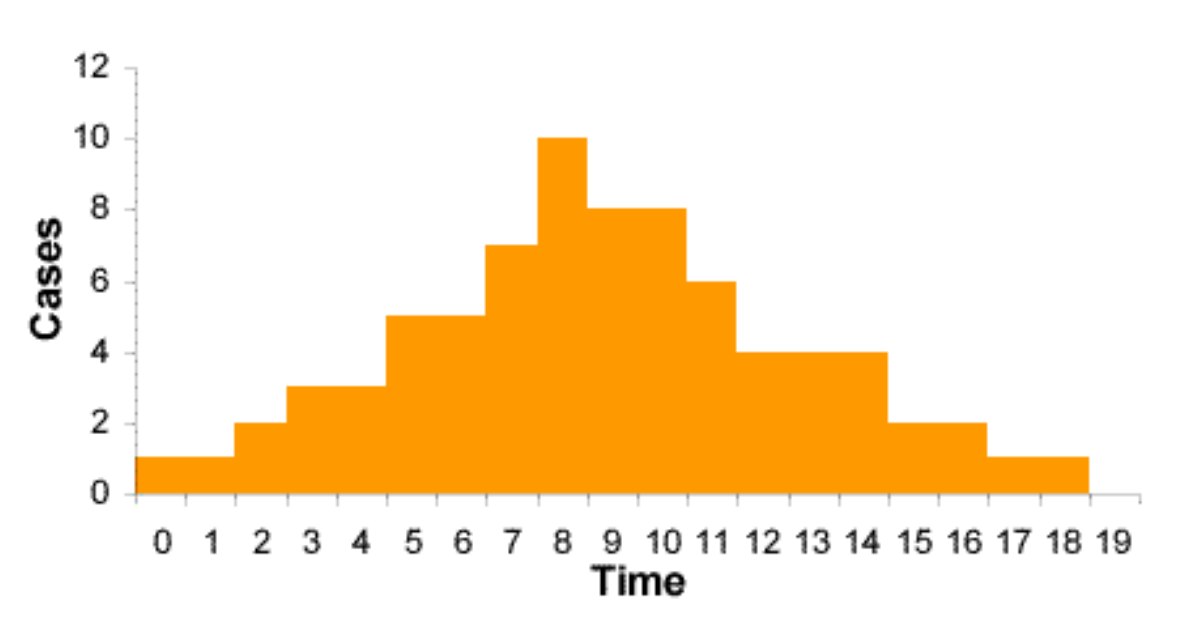
Put criteria for case definition ; a statement about clinical observation , Lab test , x-ray with some restriction to time, person , place.

Classify cases according to degree of severity .(mild , moderate and severe)

Step 3: Plot an Epidemic Curve

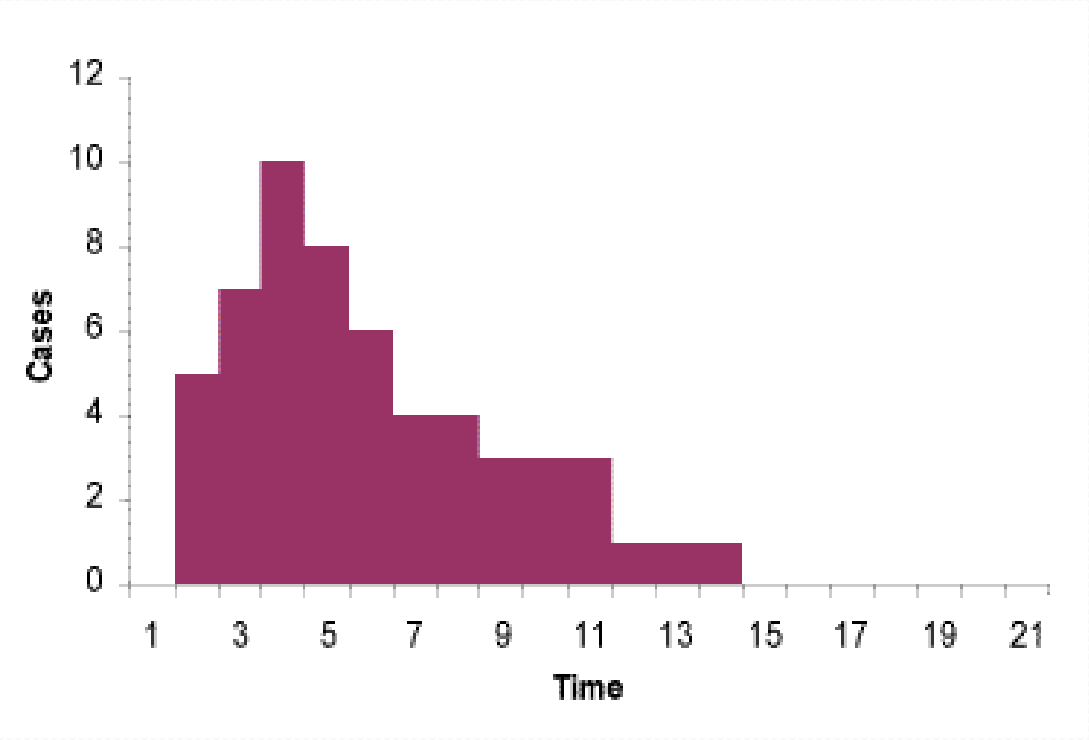
- Graph of the number of cases (y-axis) by their date or time of onset (x-axis)
- Interpreting an epidemic curve
  - **Overall pattern**: increase, peak, decrease
    - Type of epidemic?
    - Incubation period?

Vector-borne Disease



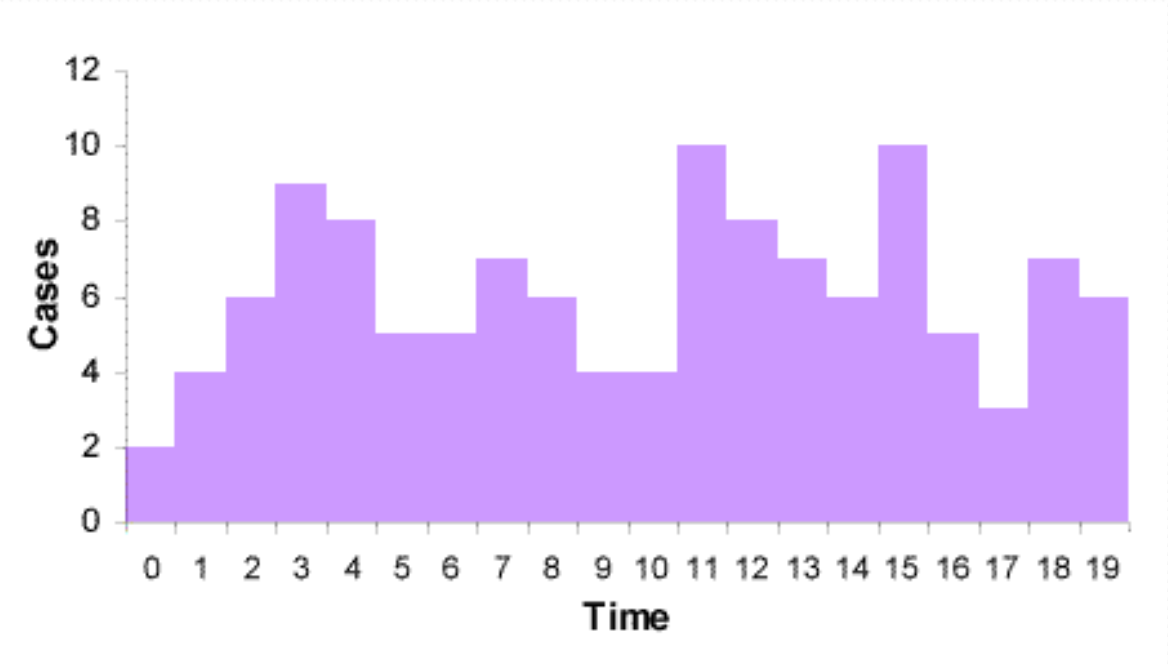
- Starts slowly
- Time between the first case and the peak is comparable to the incubation period.
- Slow tail

Point Source Transmission



- This is the most common form of transmission in food-borne disease, in which a large population is exposed for a short period of time.

Continuing Common Source or Intermittent Exposure



- In this case, there are several peaks, and the incubation period cannot be identified.

Step 4 :

Calculate the attack rate :

Which is a special form of incidence rate where the duration is the period of the epidemic.

Step 5:

Test hypothesis , is the difference between the risk association due to chance factor or not .

Asses the attributable risk AR among exposed and non exposed persons and the relative risk RR .

Step 6:

1- taking sample from source (water, food soil ,blood , stool ,)

2- contact tracing which help in identifying additional cases by asking the diseased person , mothers of diseased children or relatives

Step 7 :

Control measures to stop the epidemic.

1-attack the source and the mode of transmissions.

2-treat and isolate all cases .

3-increase resistance of local population.

4-continue surveillance to ensure that control measures have been effective .

Step 8: Report what have been done (results and conclusion)

Step 9: recommendations to prevent and control further spread and to prevent recurrence.

Objectives of investigation of an epidemic :

1- to know the source of the epidemic.

2-to satisfy the people(the politics and the community leaders) inorder to calm them.

3-to train the juniors .

4- scientific values (scientific researches) to discover new findings regarding the etiology or the control measures .

Three levels of prevention used in public health and epidemiology

- Primary prevention (occurs prior to exposure)
  - Immunization
  - Sanitation
  - Education
  - Media campaigns
  - Warning labels

Active primary prevention

- Requires behavior change on part of subject
- Wearing protective devises
- Obtaining vaccinations

- Passive primary prevention
  - Require behavior change
  - Vitamin fortified foods
  - Fluoridation of public water supplies

Secondary prevention

- Occurs to reduce the progress of disease
- The disease already exists in the person
- Cancer screening – cancer already present. The goal is to detect the cancer before clinical symptoms arise in order to improve prognosis

Tertiary prevention

- To reduce the limitation of disability from disease
- The disease has already occurred
- Physical therapy for stroke victims
- Halfway houses for recovering alcoholics
- Shelter homes for the developmentally disabled
- Fitness programs for heart attack patients

THANKS