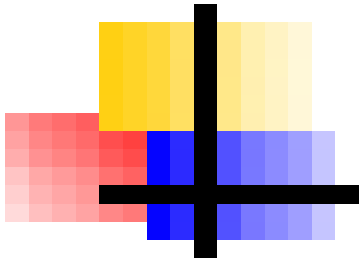


Descriptive Epidemiology

Descriptive Epidemiology

Study of the occurrence and distribution of disease

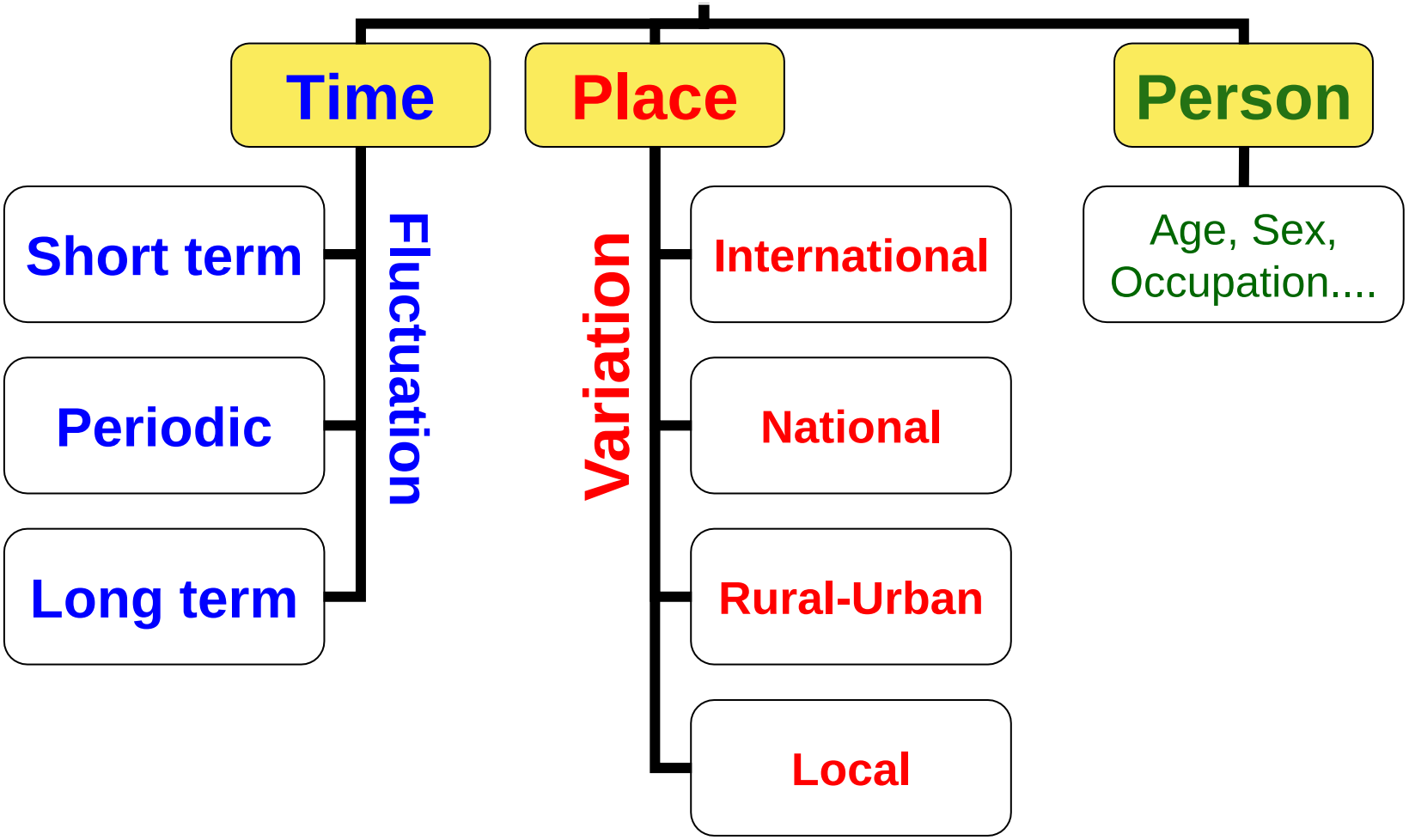
Terms:

Time

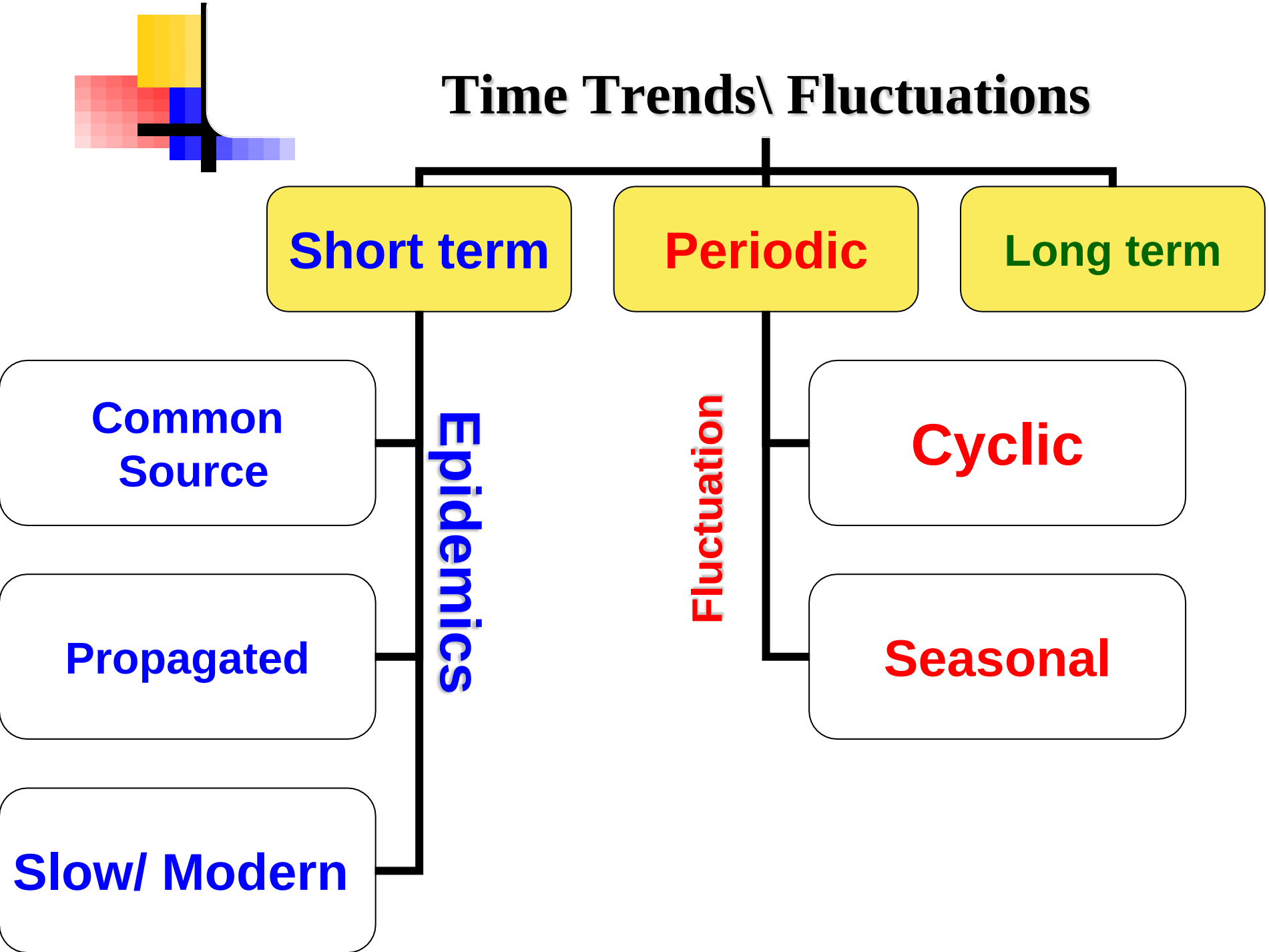
Place

Person

Descriptive Epidemiology

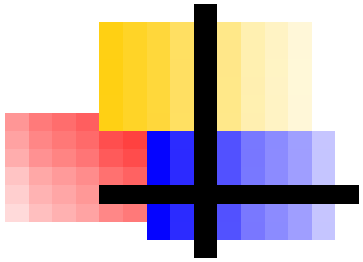


Time Trends\ Fluctuations



(Reservoir) Source of infection

- Contaminated well water
- Bhopal Gas tragedy
- Contamination whole batch of food product
- Minamatta disease in Japan- acute mercury poisoning
- Contaminated food served in the party
- Food handler suffering from typhoid
- Child suffering from measles
- Mosquito borne disease
- Leptospirosis, Plague…..



Time Trends\ Fluctuations

- **Short term**
  - **Epidemics**
    - **Common Source**
      - Single exposure / Point source
      -
    - **Propagated**
    - **Slow/ Modern**
- **Periodic**
  - **Fluctuation**
    - **Cyclic**
    - **Seasonal**
- **Long term**

Short Term = “Epidemics”

Occurrence, clearly in excess, normal expectancy

Short Term Epidemics/ Epidemics

A) Common source

1- Single Exposure/ Point source

2- Multiple exposure/ Continuous/ Repeated

B) Propagated

Transmission factor- Person – Person

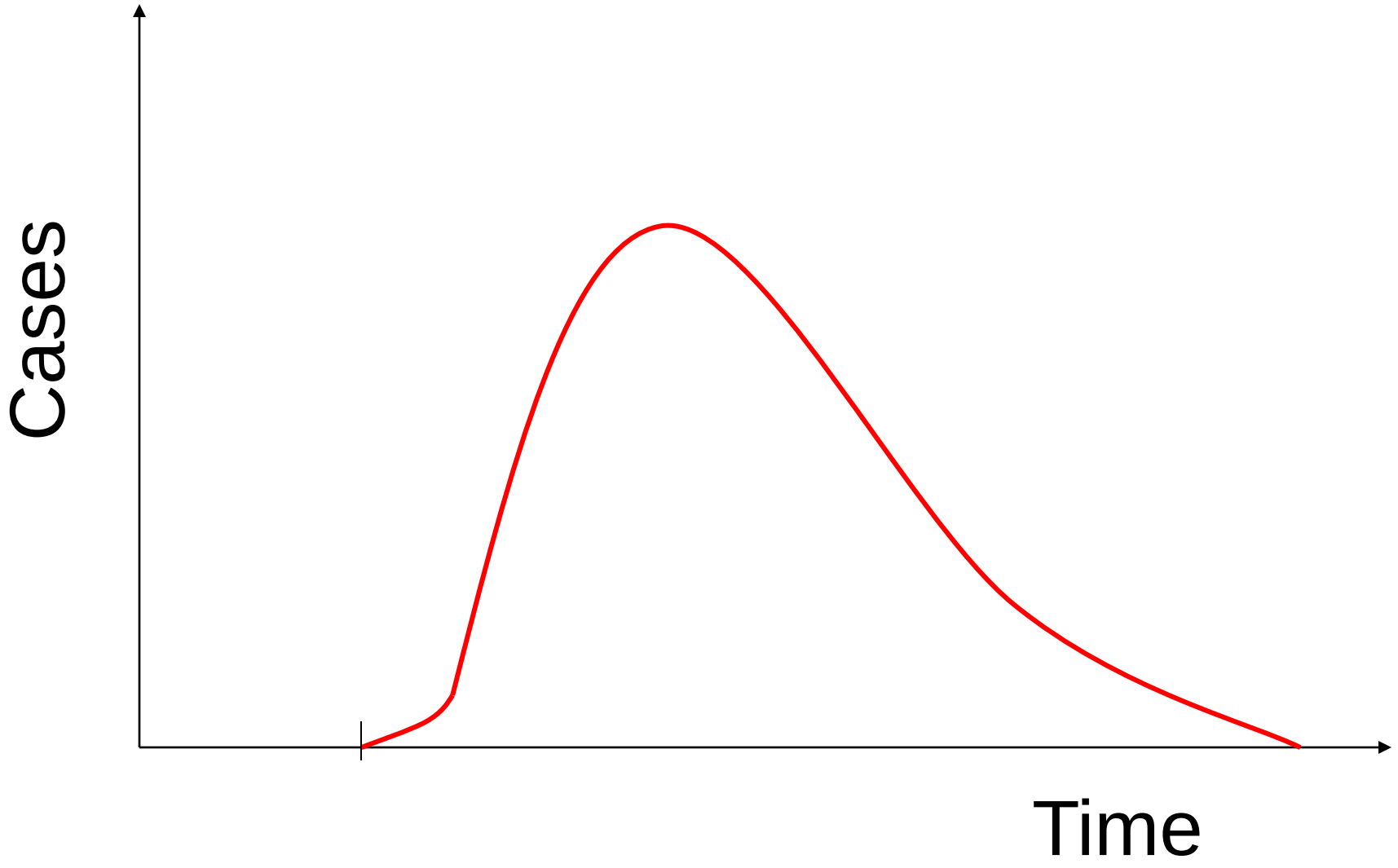
Arthropod vector

Animal reservoir

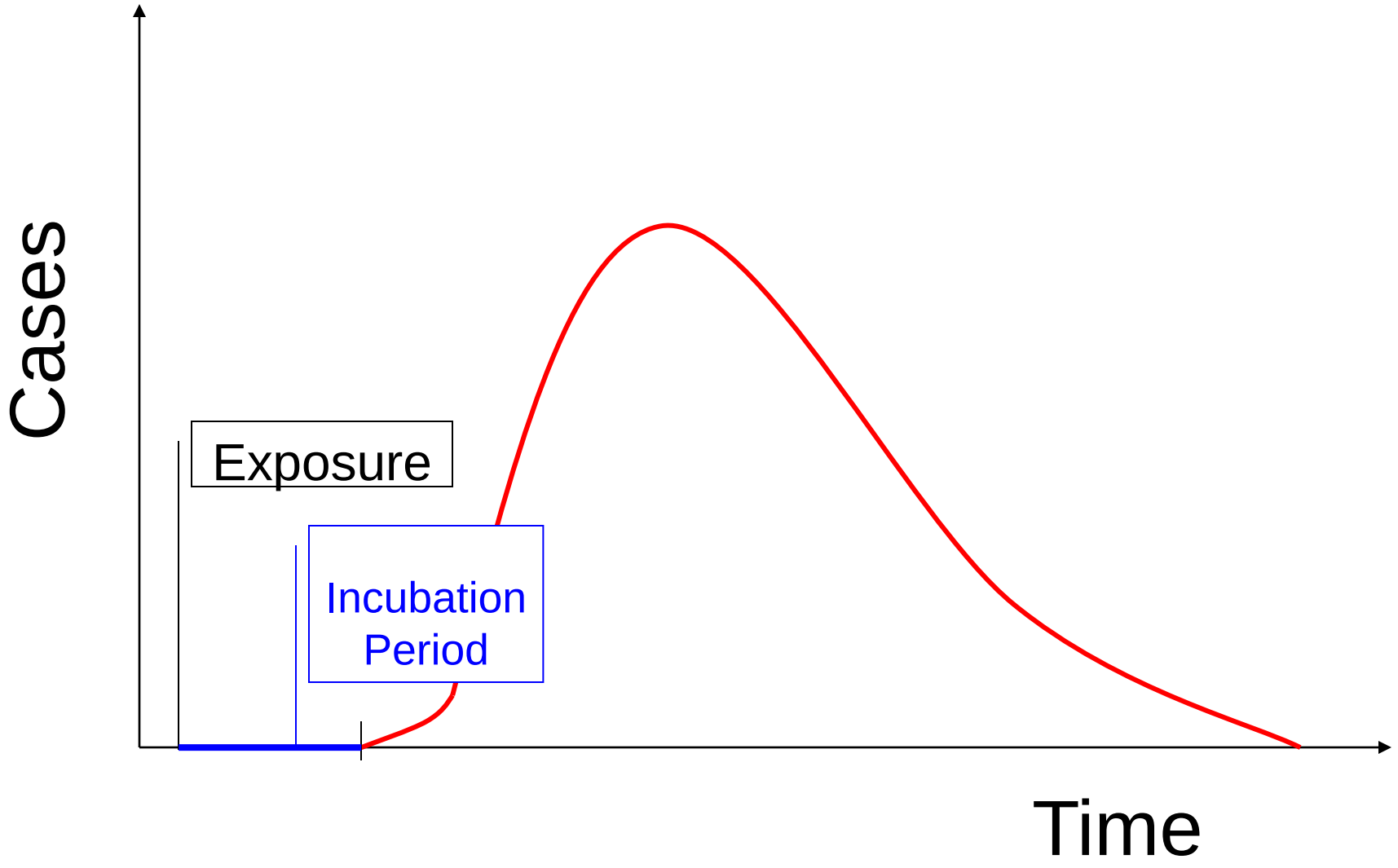
C) Slow (Modern)

Epidemic curve

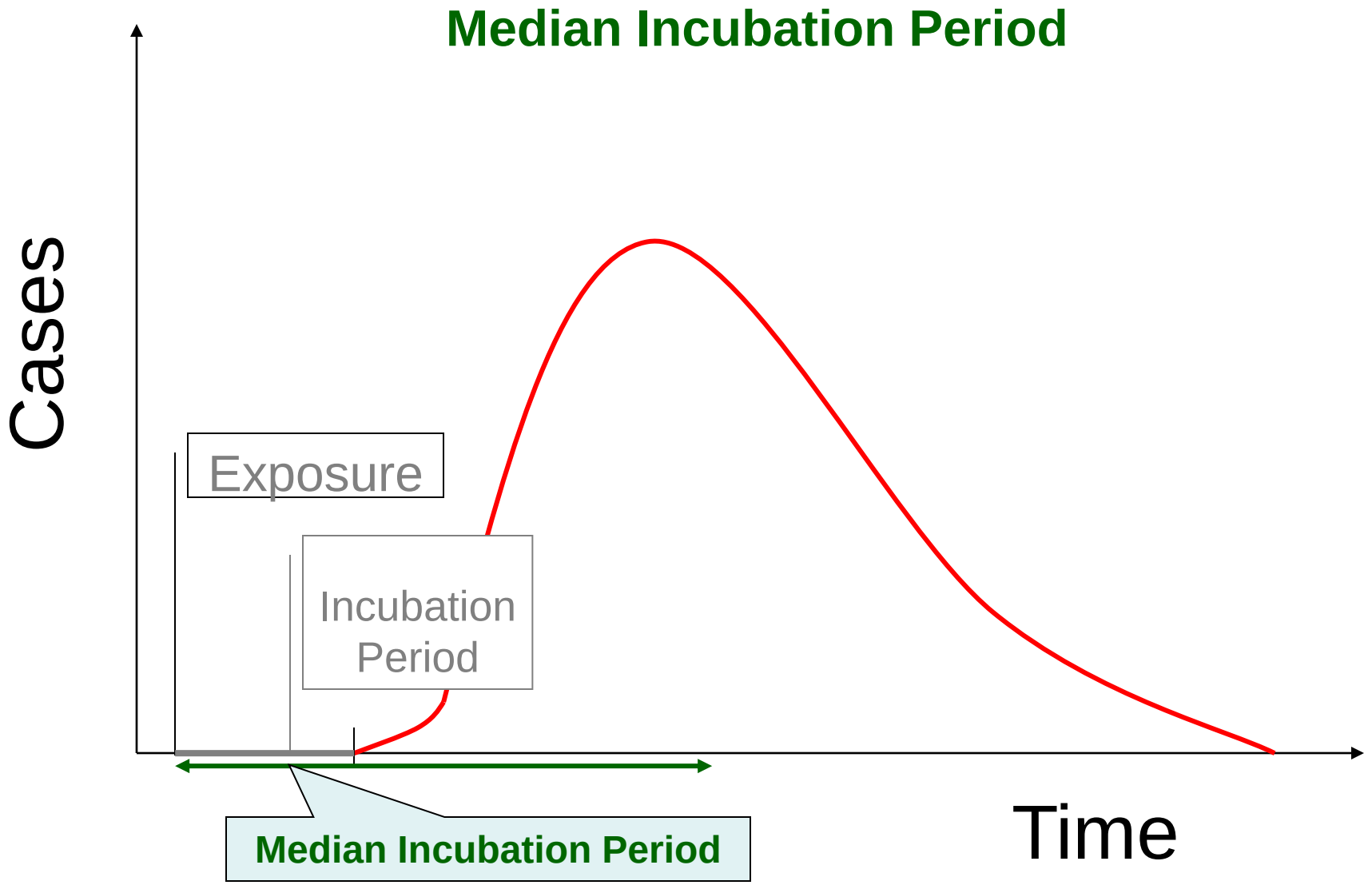
Common Source- Single Exposure



Common Source- Single Exposure



Common Source- Single Exposure



Common Source- Single exposure (Point source)

- Brief essentially simultaneous exposure
- All cases within one incubation period
- Rises & fall rapidly
- No secondary waves
- Explosive with clustering of the cases
- Downward slop- less steep- positively skewed- due to latency/ incubation

  e.g.- Food poisoning, Bhopal Gas tragedy

  “Minamata” disease in Japan.

- If epidemic continuous over *more than one incubation period-*
  a) Multiple exposure/ Continuous/ Repeated

  or

  b) Propagated

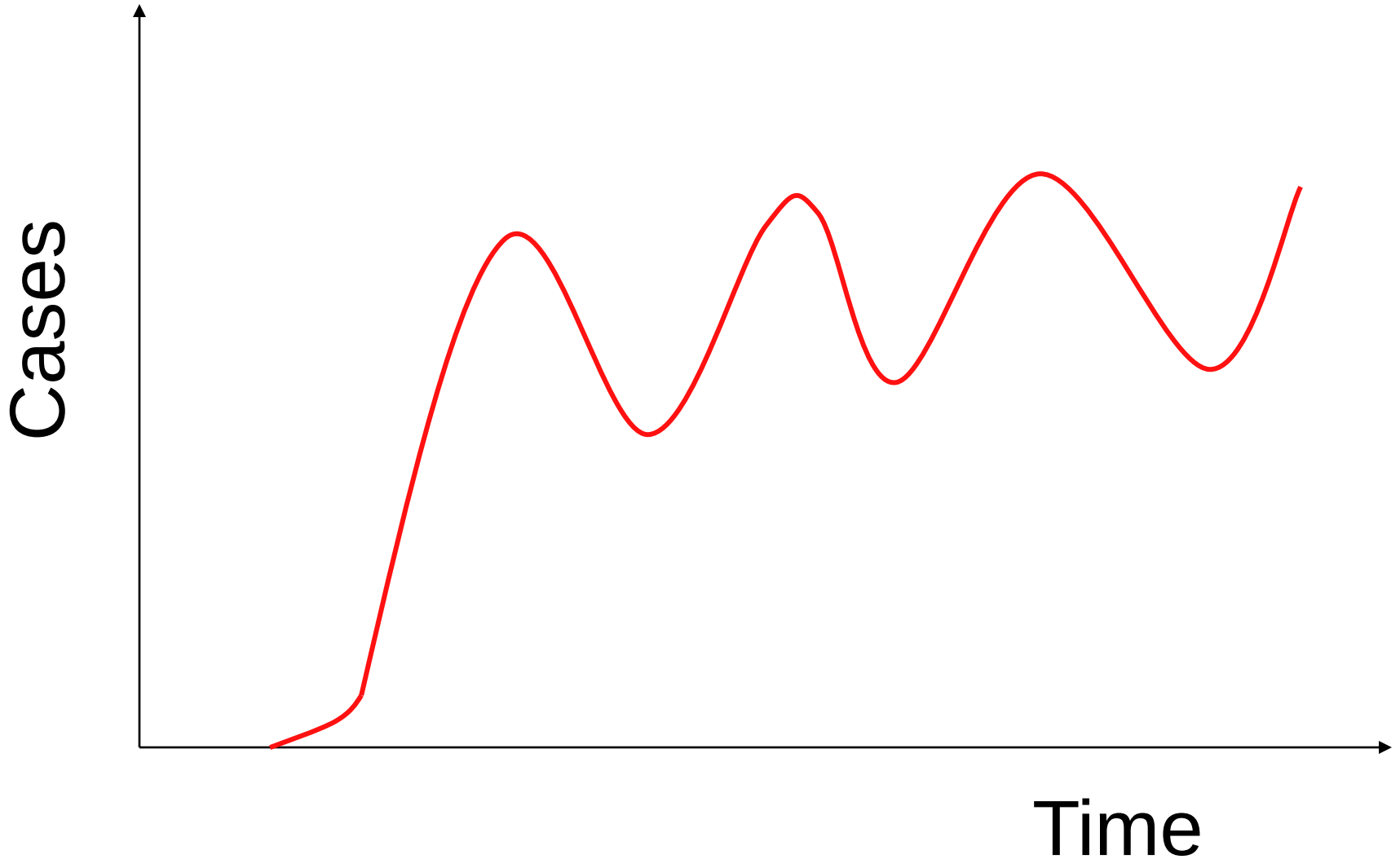
Common Source Continuous/ repeated exposure

- Exposure is prolonged
  - Continuous, repeated or intermittent
- Continue beyond the incubation period
- Not necessarily at same place & time
- Epidemic- extended & irregular
- No evidence of secondary cases

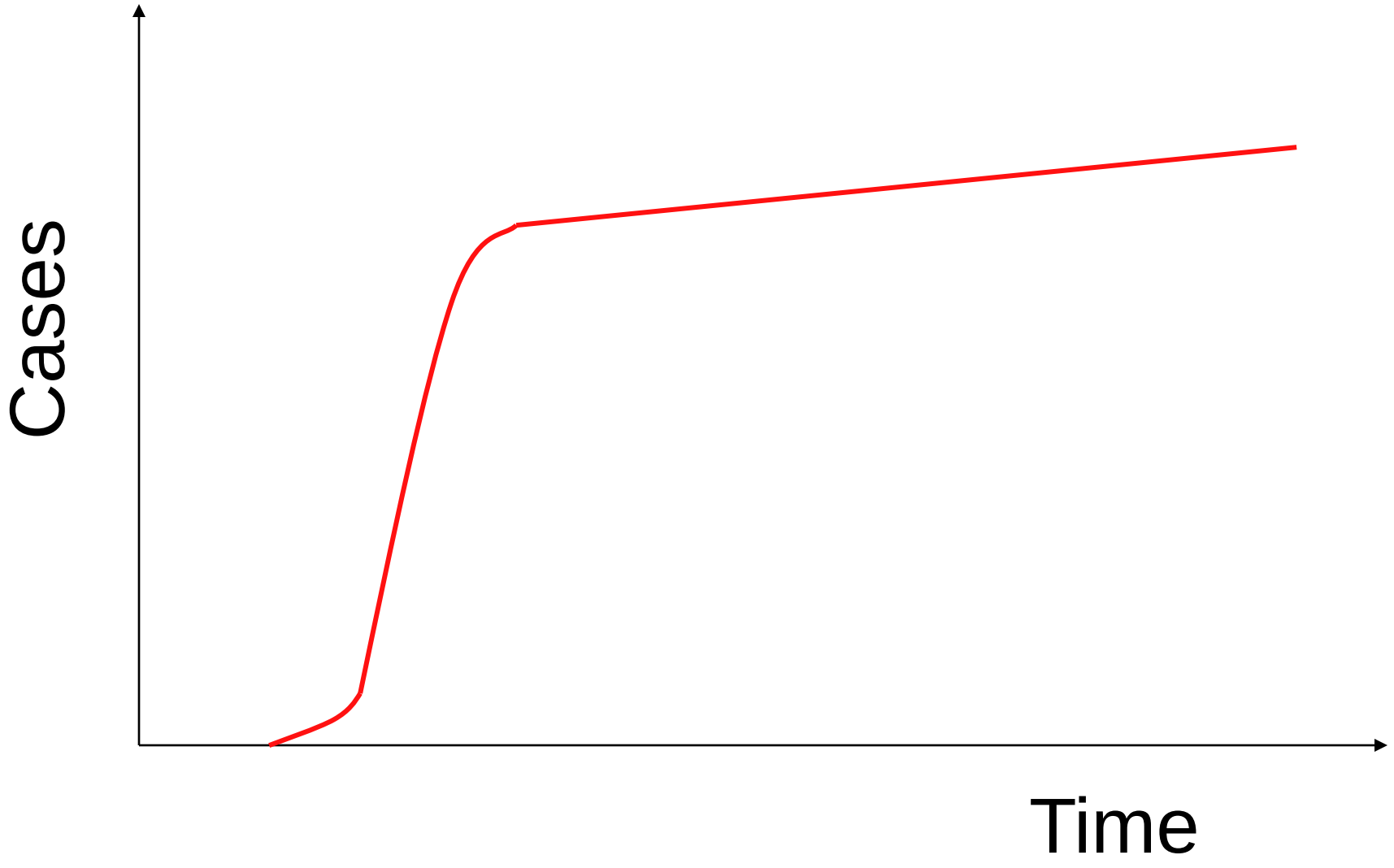
  e.g.- Bad batch drug,

  Contaminated well water- hepatitis A

Common Source- Multiple (Repeated) exposure



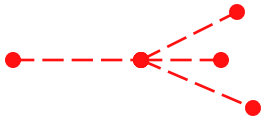
Common Source- Continuous exposure

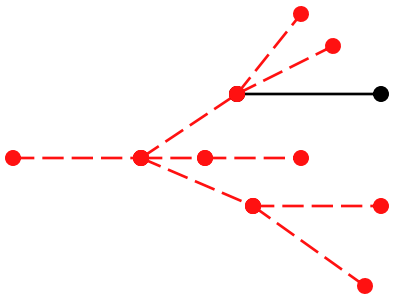


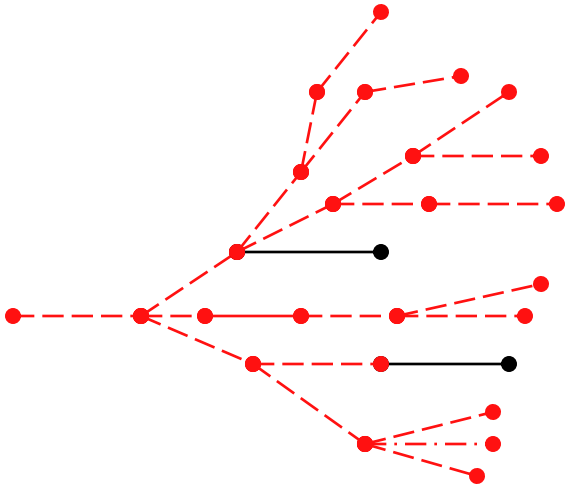
Propagated Epidemic

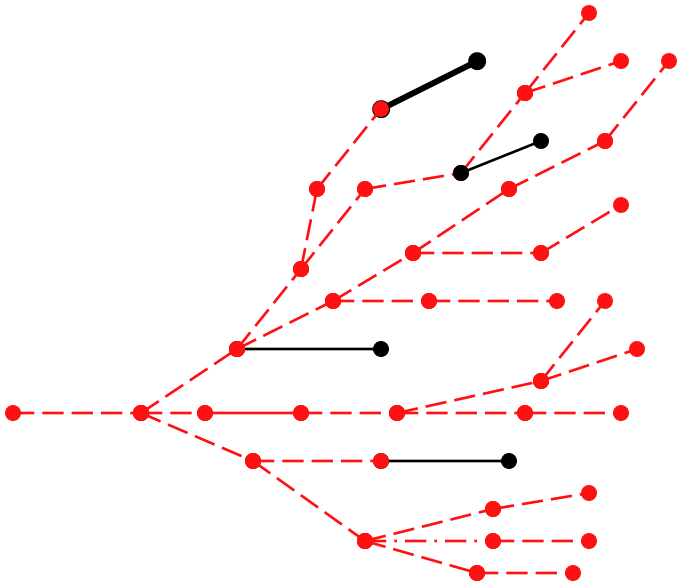
- Infectious origin----Respiratory Infections
- Transmission present
- Gradual rise of cases as disease progress by transmission
- Tails off gradually

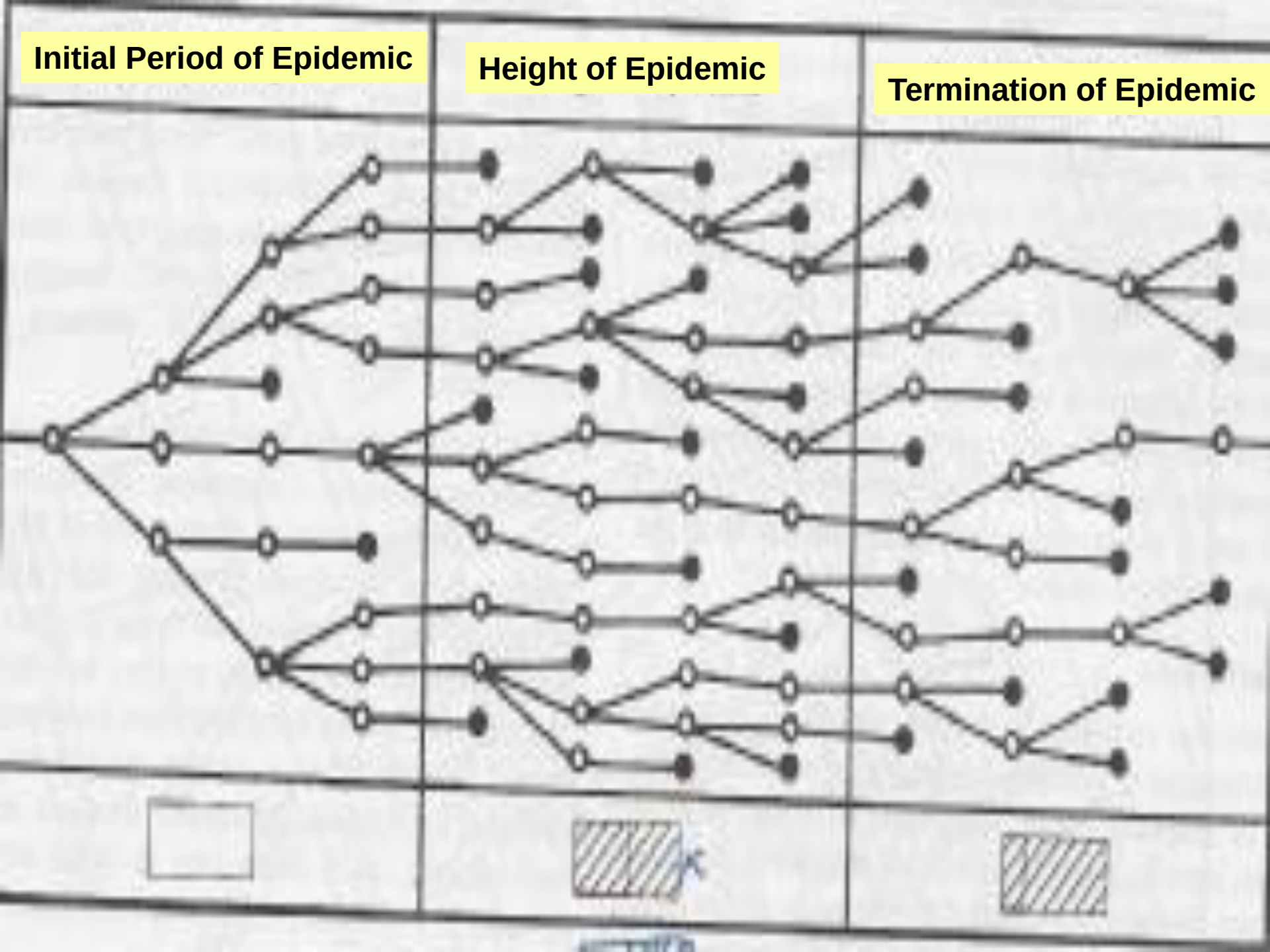
  Susceptibles depleted or no longer exposed
- Speeds depends on immune status & disease factors
- Prone where large no. of susceptibles are aggregated or new susceptibles are regularly supplied

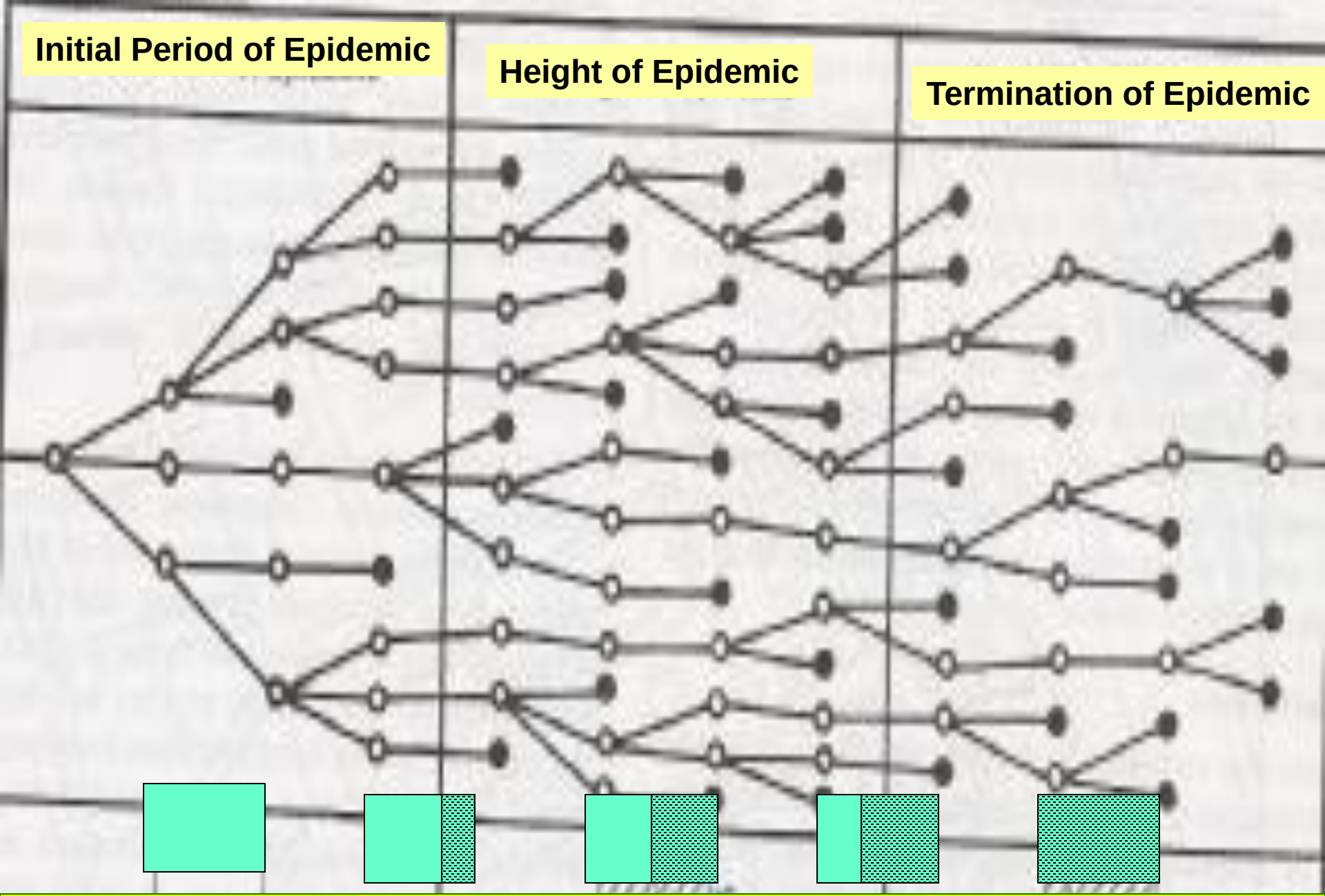








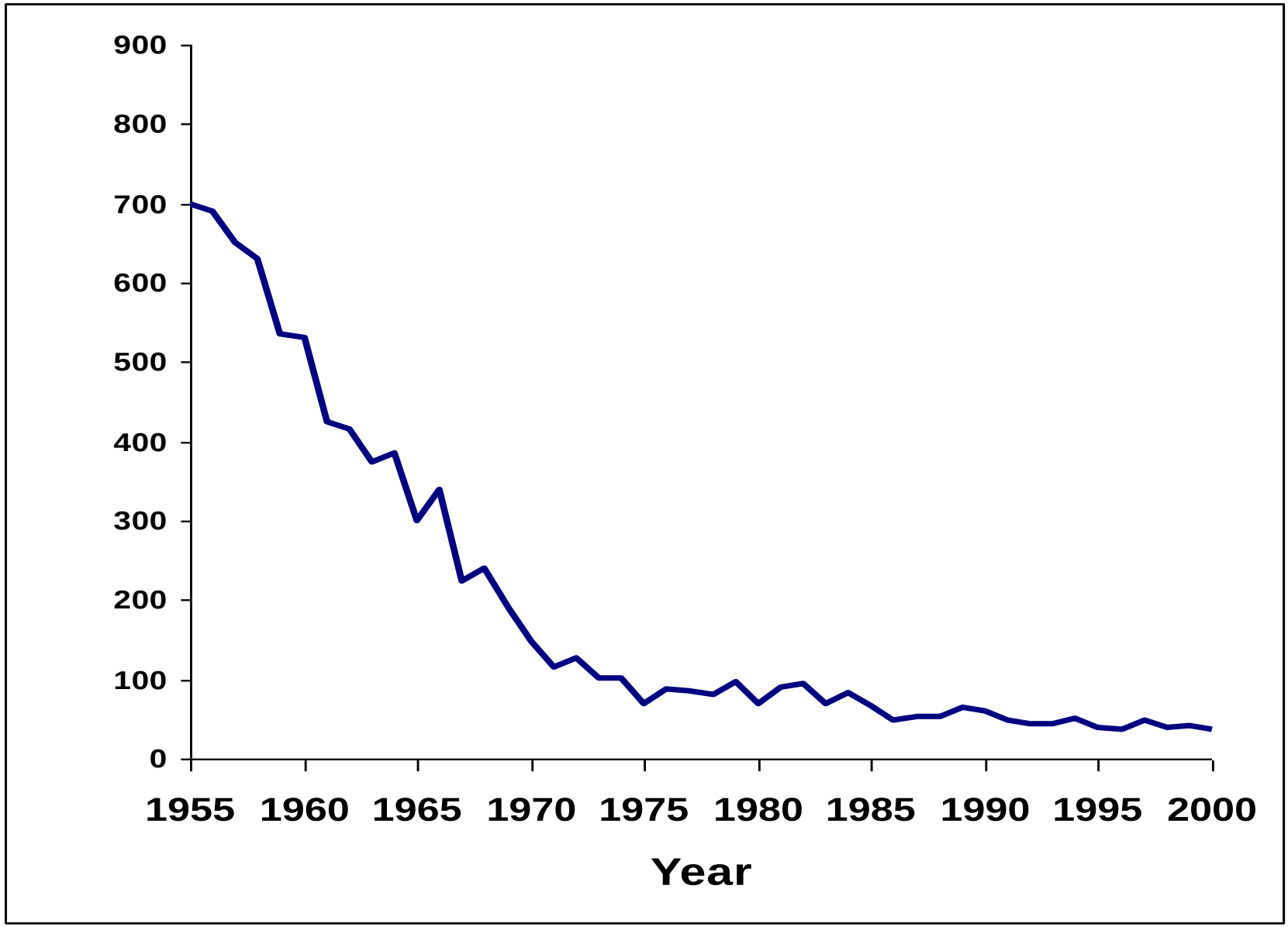

Initial Period of Epidemic
Height of Epidemic
Termination of Epidemic


Initial Period of Epidemic
Height of Epidemic
Termination of Epidemic
-Susceptible Population
-Immune population

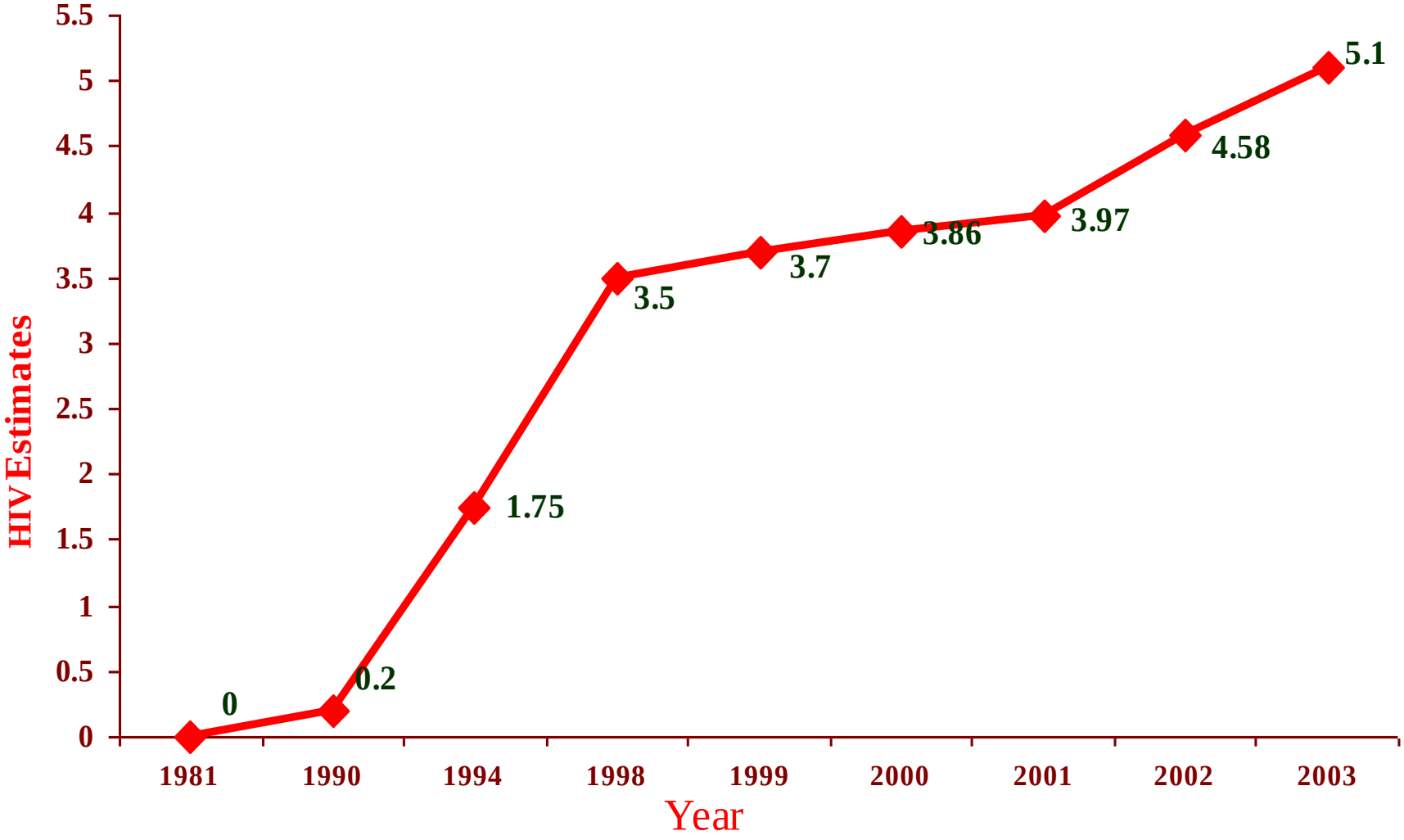
Secular Trend

The long-time trend of disease occurrence

Tetanus – by year, United States



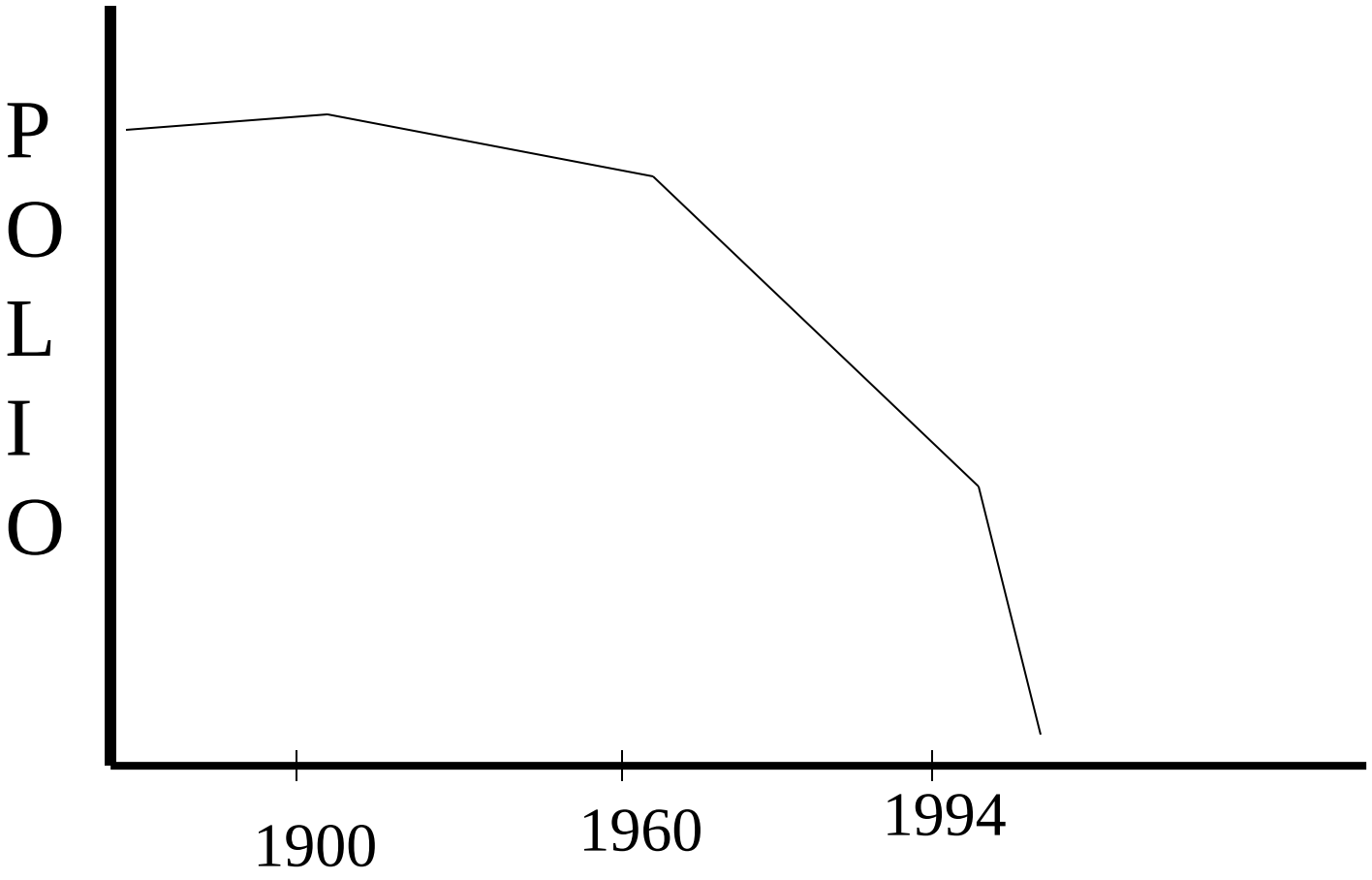
Yearly Trend of Estimates of HIV Infections in India in Millions

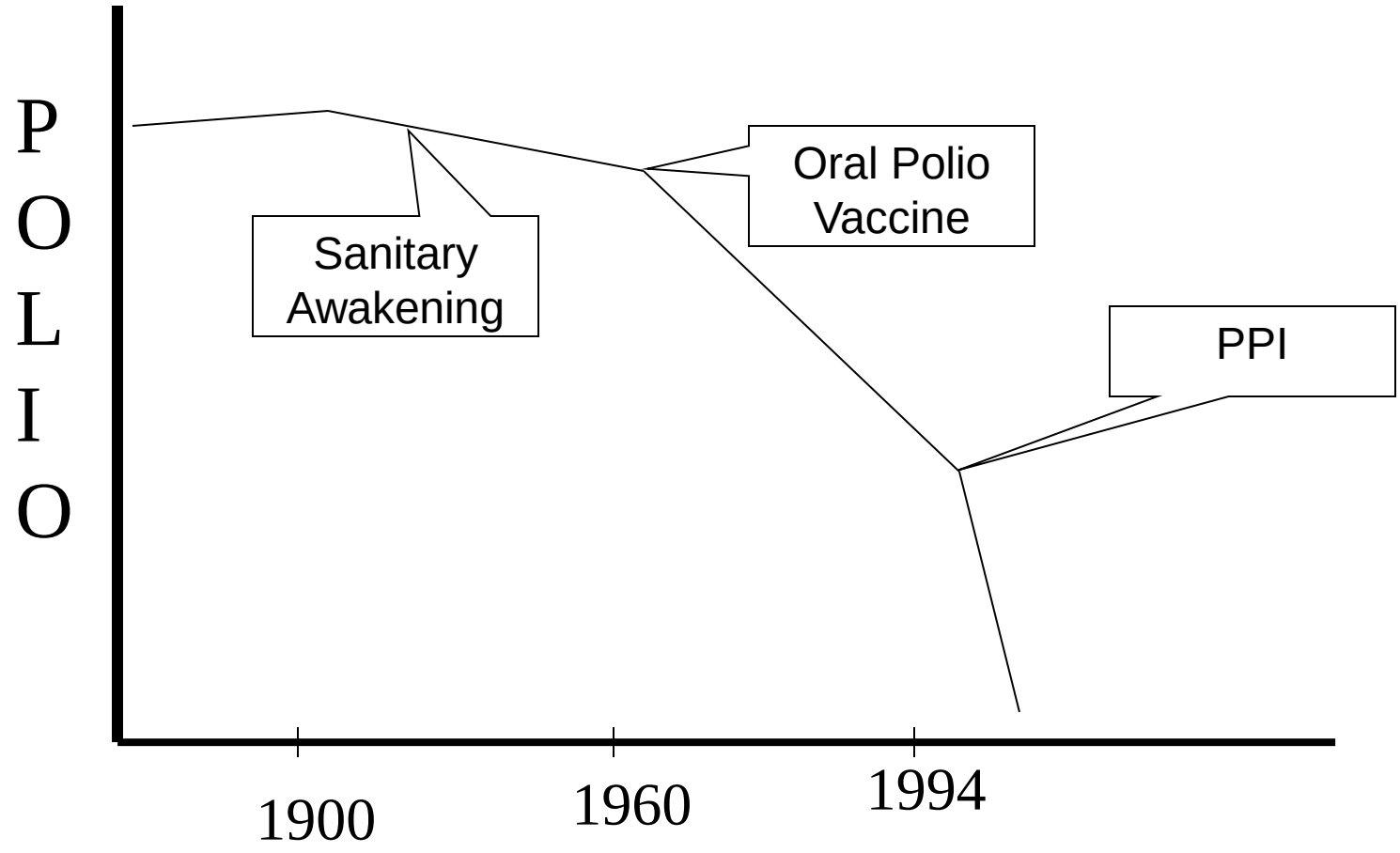


Long Term
(Secular changes)

- Change in disease pattern over a long period of time (years/ decades)
- Show consistent tendency to change in a particular direction
- Not necessarily repetitive e.g.- CHD
- Related to environment/ behavior/ socio-cultural factors etc.

Secular Trend

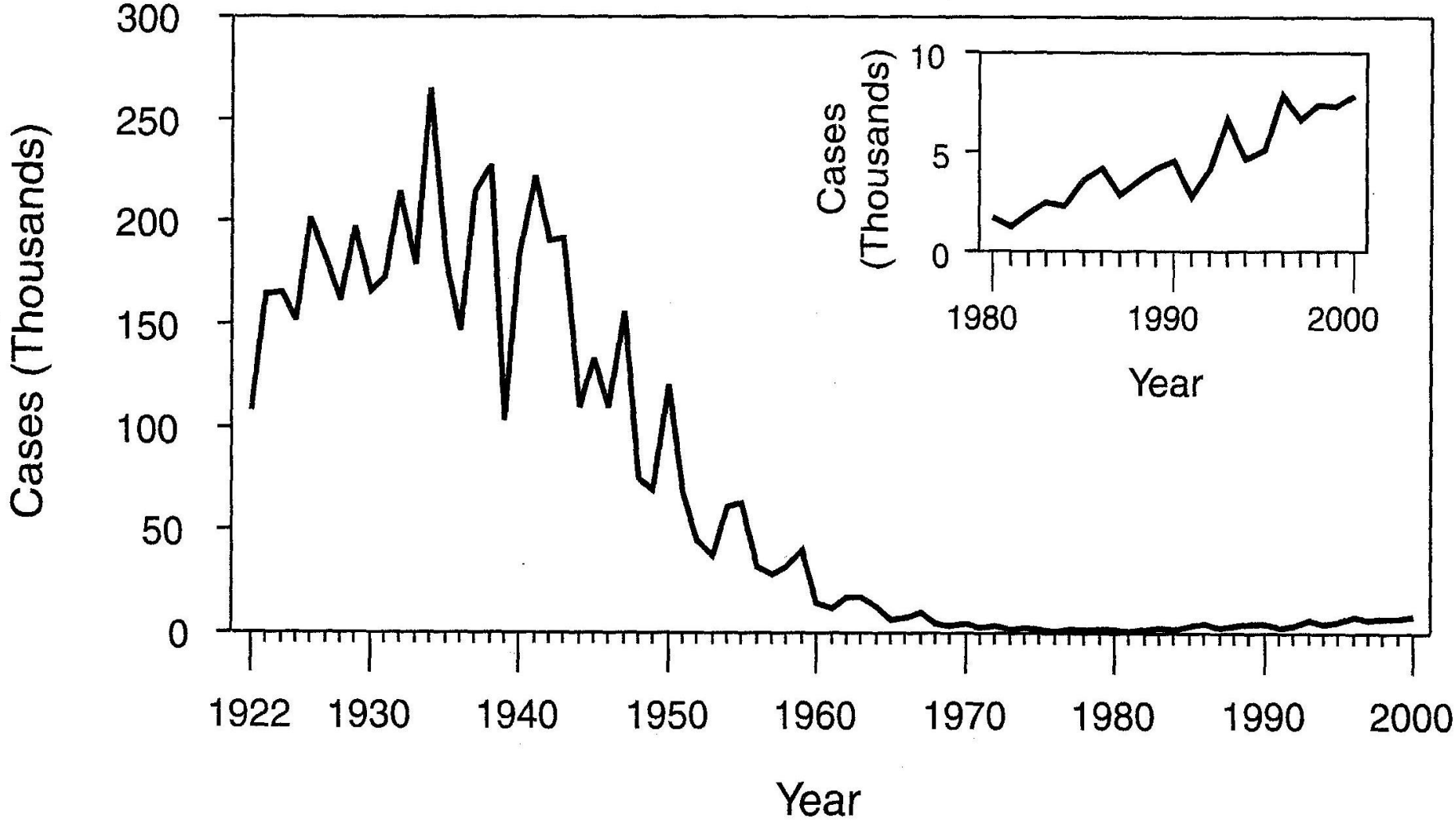



POLIO
Sanitary Awakening
Oral Polio Vaccine
PPI
1900
1960
1994

Periodic Trend

Temporal interruption of the general trend of secular variation

Number of reported pertussis cases, by year, United States, 1922-2000



Periodic Fluctuations
Seasonal Trend

- Respiratory Infection- Winter
- G.I. Infections – Summer & Monsoon
- Heat Stroke- Summer
- Directly or in Directly related to environment

  Rain fall

  Overcrowding

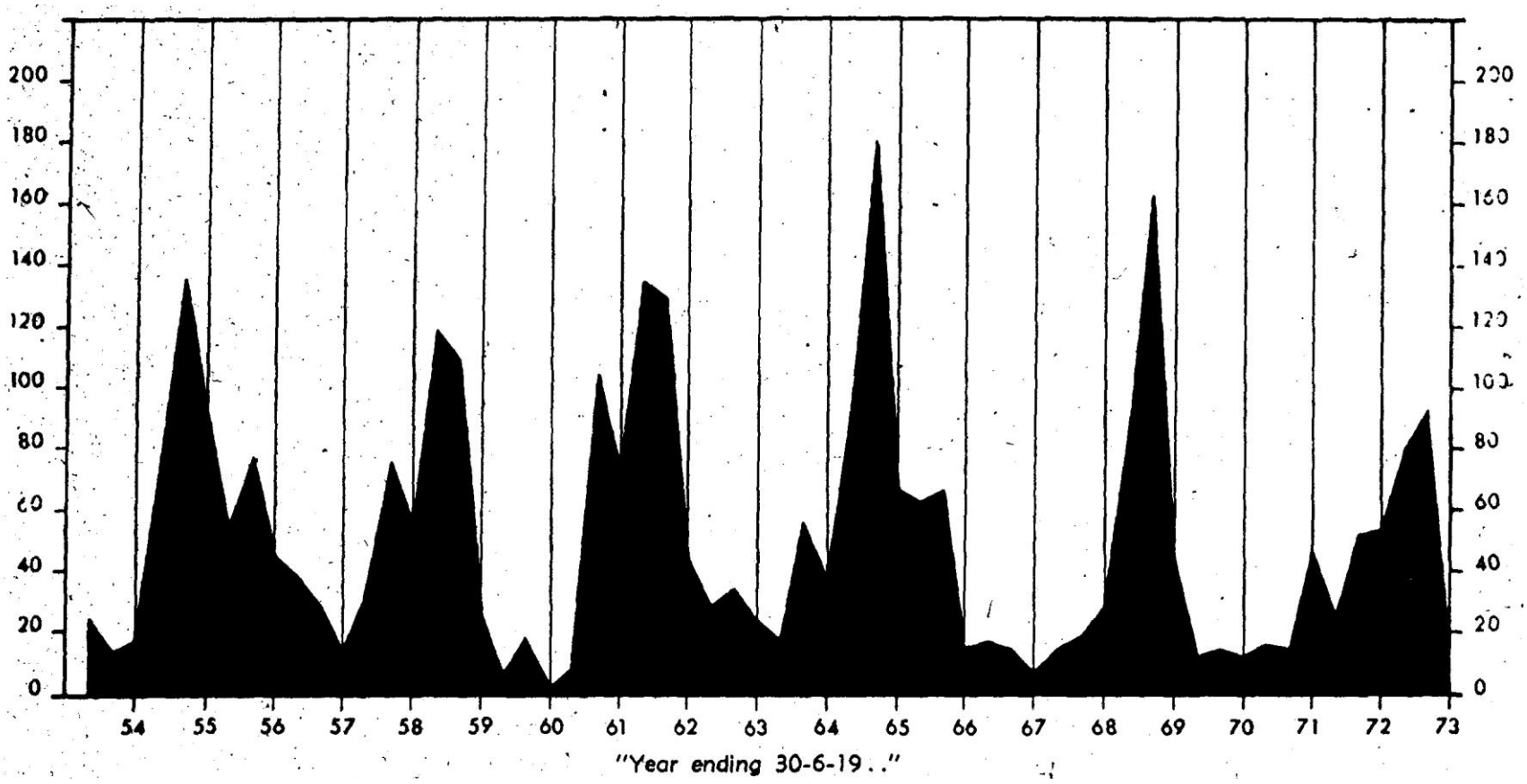
  Vector/ Agent factors

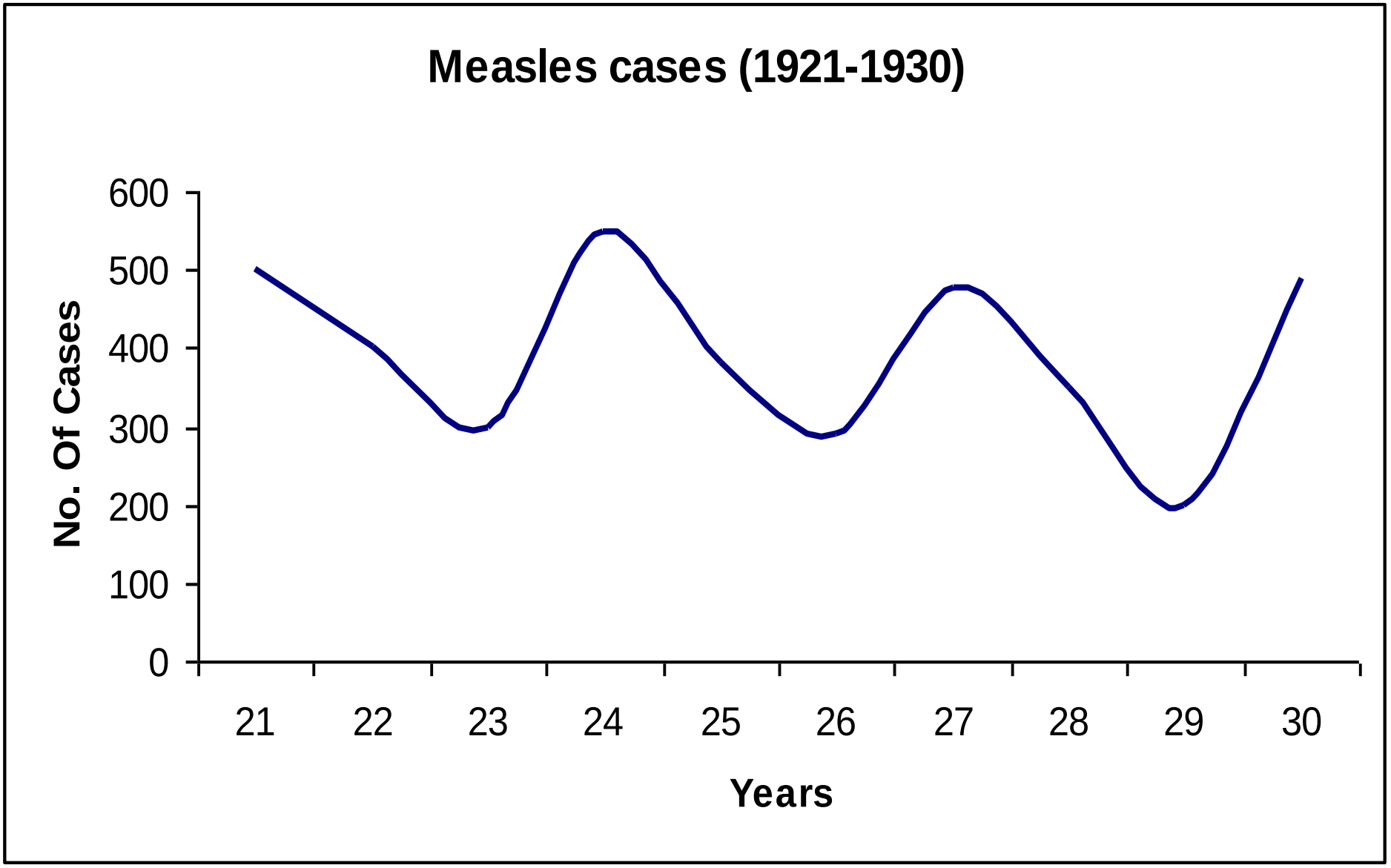
Periodic Fluctuations
Cyclic Trend

- Appx. < 10 years
- Time required for building up the herd of susceptibles

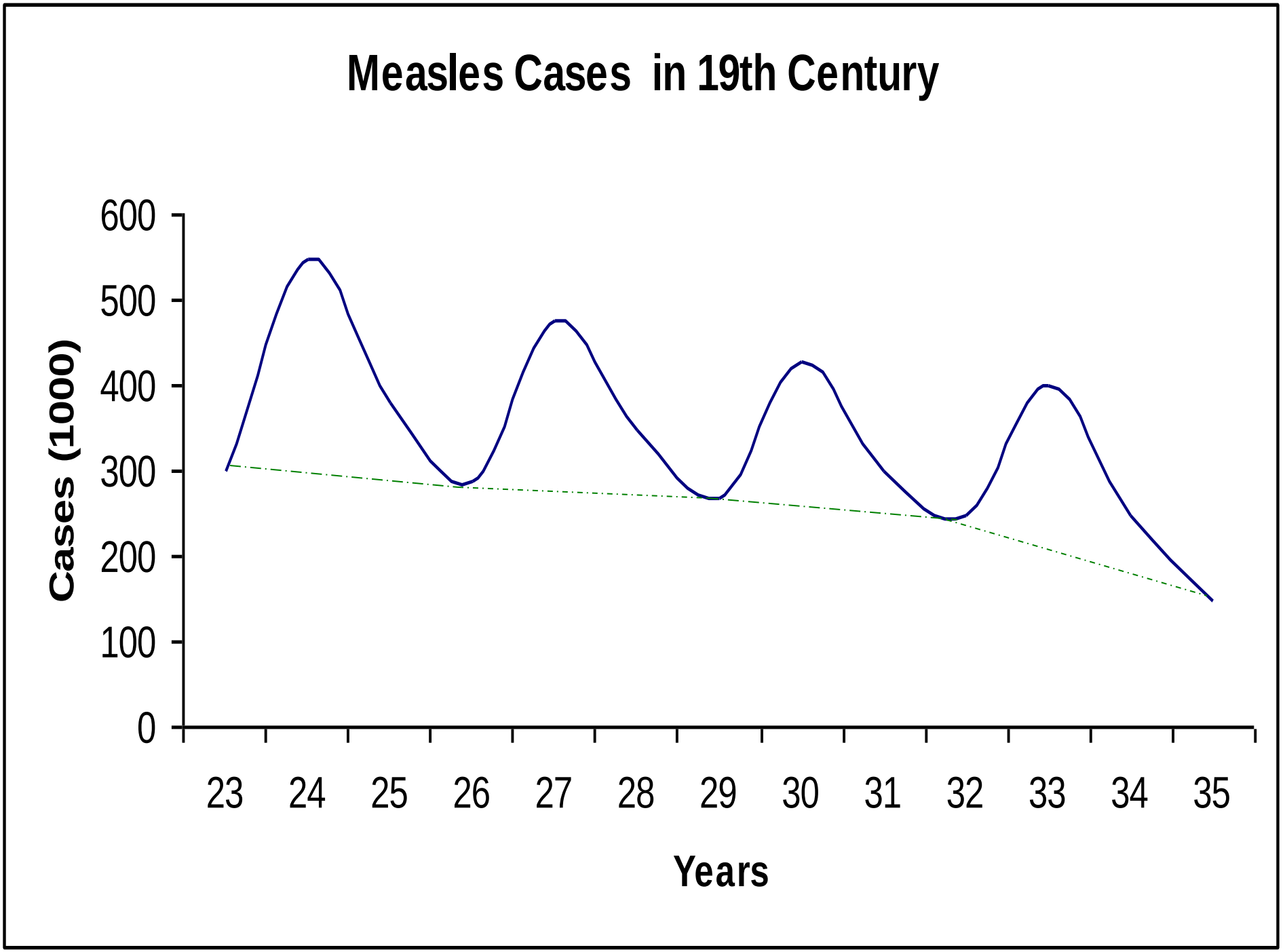
  e.g.- Measles epidemic every 3 years in pre-vaccination era (Naturally occuring variation in herd immunity)

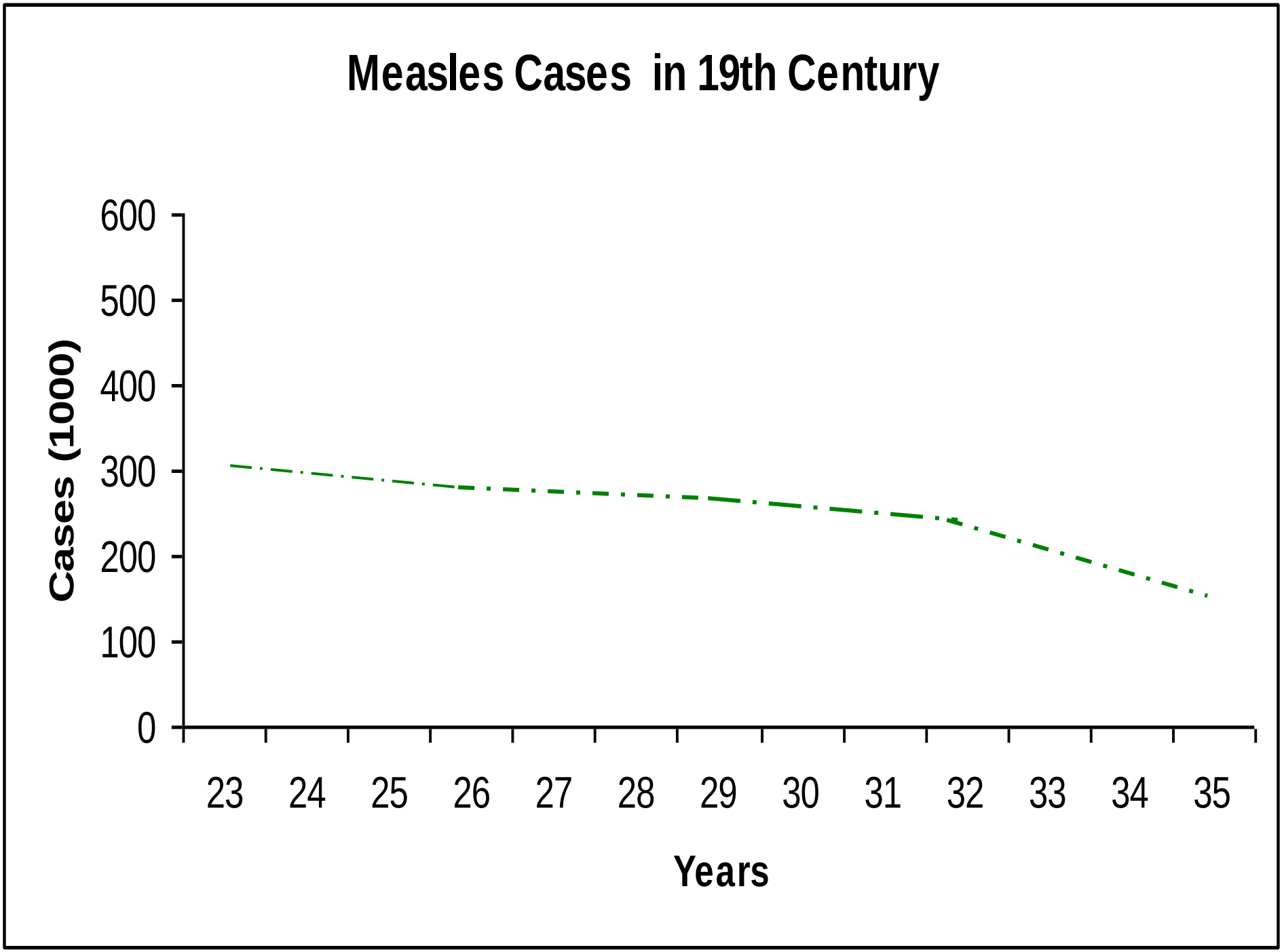
Whooping Cough - Four-monthly admissions, 1954-1973





Pre vaccination era every 2-3 years


Measles Cases in 19th Century
Cases (1000)
600
500
400
300
200
100
0
23
24
25
26
27
28
29
30
31
32
33
34
35
Years


Measles Cases in 19th Century
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600
500
400
300
200
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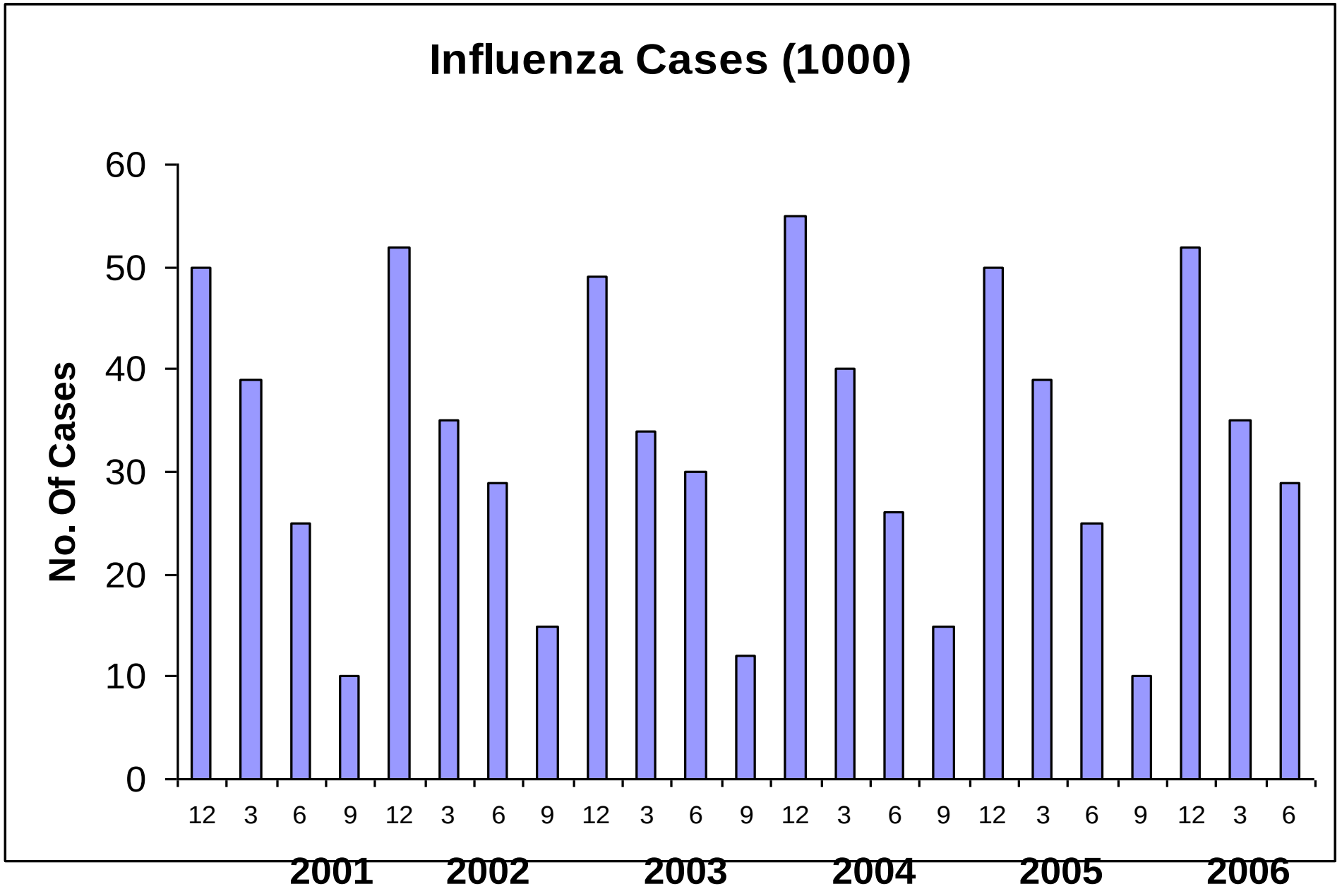
23
24
25
26
27
28
29
30
31
32
33
34
35
Years

Seasonal Trend


Influenza Cases (1000)
No. Of Cases
60
50
40
30
20
10
0
12 3 6 9 12 3 6 9 12 3 6 9 12 3 6 9 12 3 6 9 12 3 6
2001
2002
2003
2004
2005
2006

Uses of time trend study

- To know effectiveness of measures to control e.g. vaccination
- To formulate aetiological hypothesis