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The Online R-FETPV 1st Module : Basic Epidemiology and Surveillance Data Analysis

5 April -28 May 2021



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Apply basic epidemiology concepts and essential definitions needed to address animal and human health problems

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Content/Outline

- 2.1. Definition of epidemiology
- 2.2. Descriptive vs analytic
- 2.3. Epidemiological triad
- 2.4. Important concepts: Person/Animal, Place, Time



Lesson 2 part 1

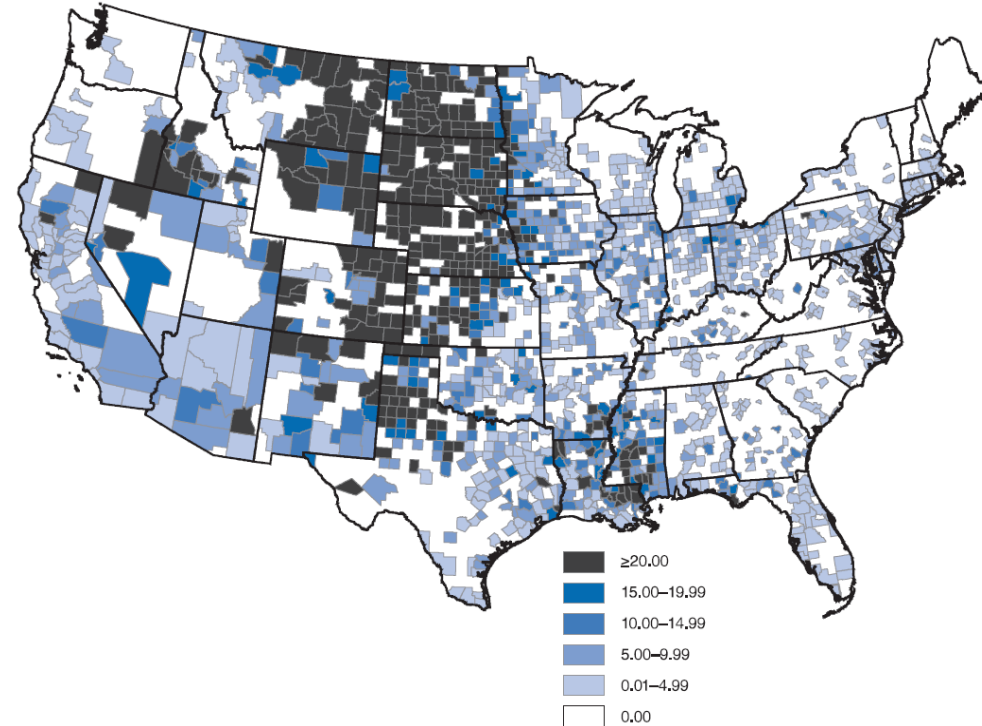
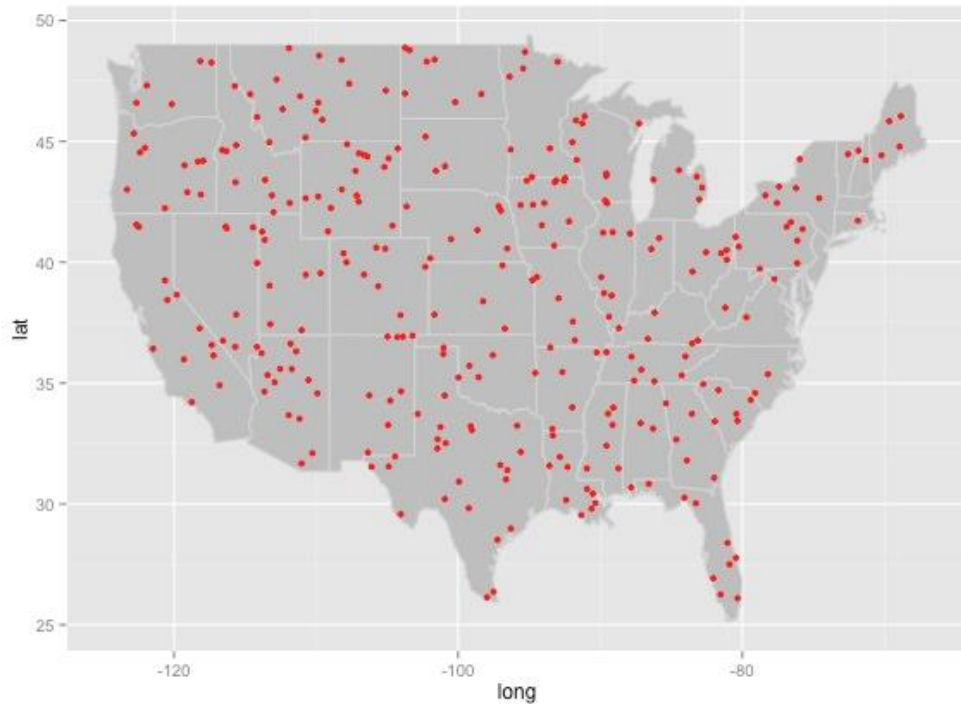


we protect the market.



we are stronger together.

What is Epidemiology?



Disease is NOT randomly distributed

- across places/environments
- between different groups of people or animals
- across time

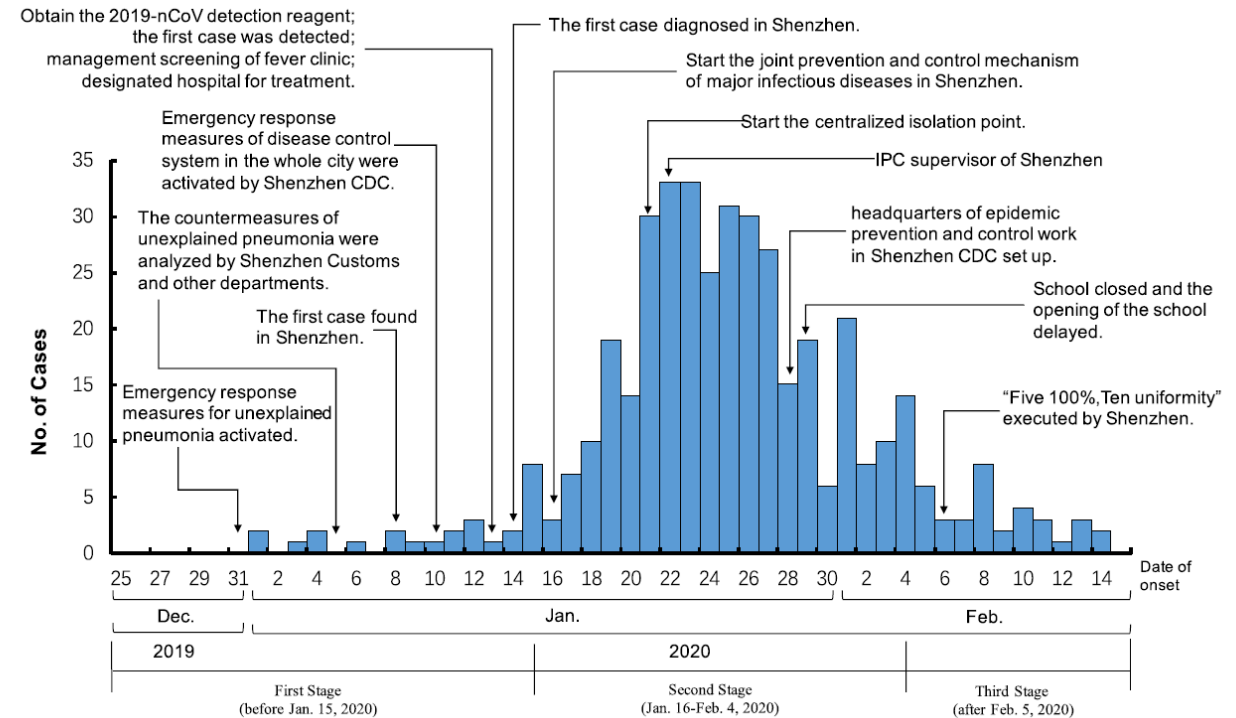
Source of infection

- Animal origin and natural reservoir of the virus
- Human-animal interface of the original event
- Early cases whose exposure could not be identified

Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19)

Modes of Transmission:

- o Role of aerosol transmission in non-health care settings
- o Role of fecal-oral transmission
 - Viral shedding in various periods of the clinical course in different biological samples (i.e. upper and lower respiratory tract, saliva, faeces, urine)
- o Before symptom onset and among asymptomatic cases
- o During the symptomatic period
- o After the symptomatic period / during clinical recovery



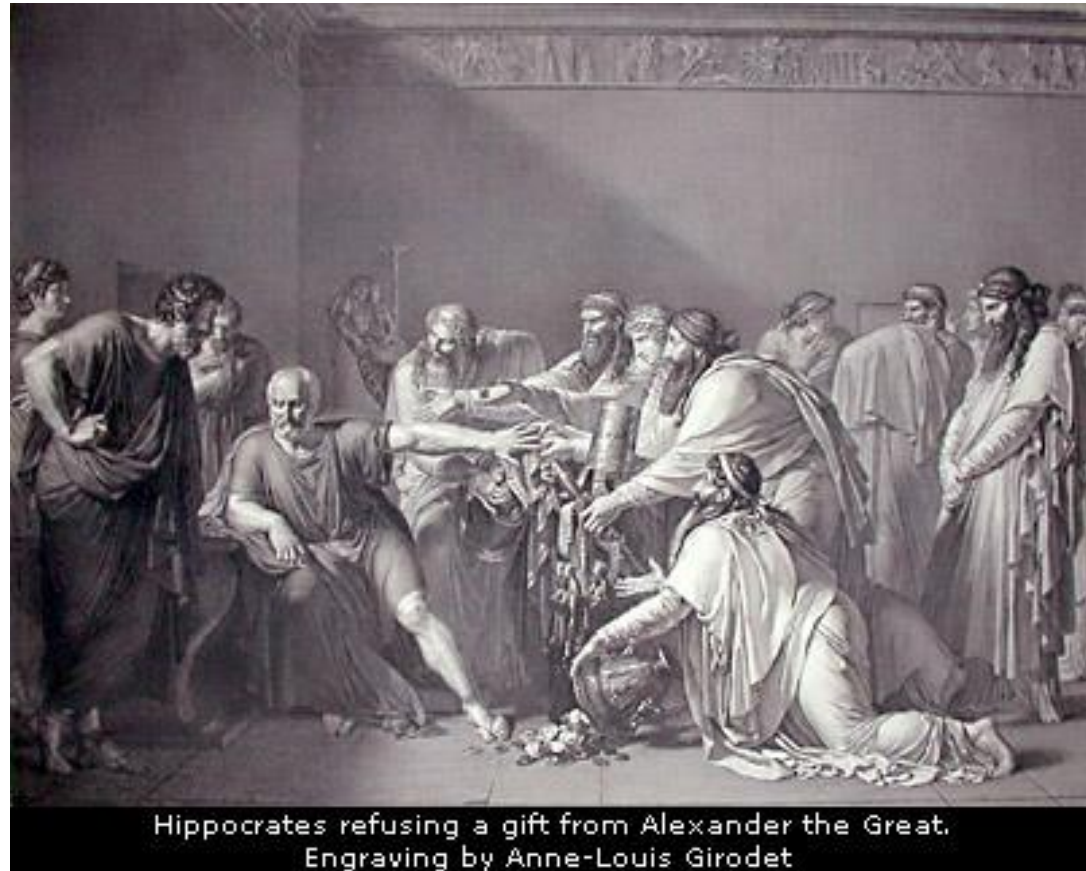


Lesson 2 part 2

Hippocrates

Greece

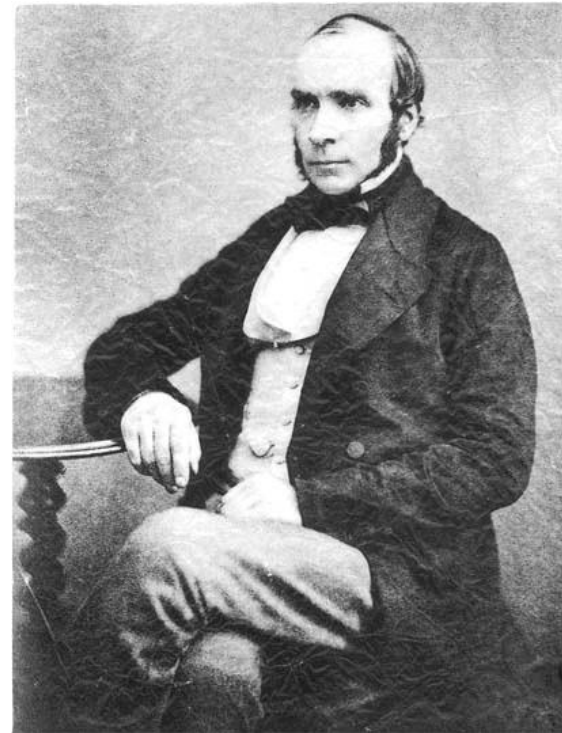
- Hippocrates
- “On Air, Water and Places”



Hippocrates refusing a gift from Alexander the Great.
Engraving by Anne-Louis Girodet



John Snow's Cholera Map



Rate of Cholera cases per 10,000 houses

by pipe water supplied company, London 1854

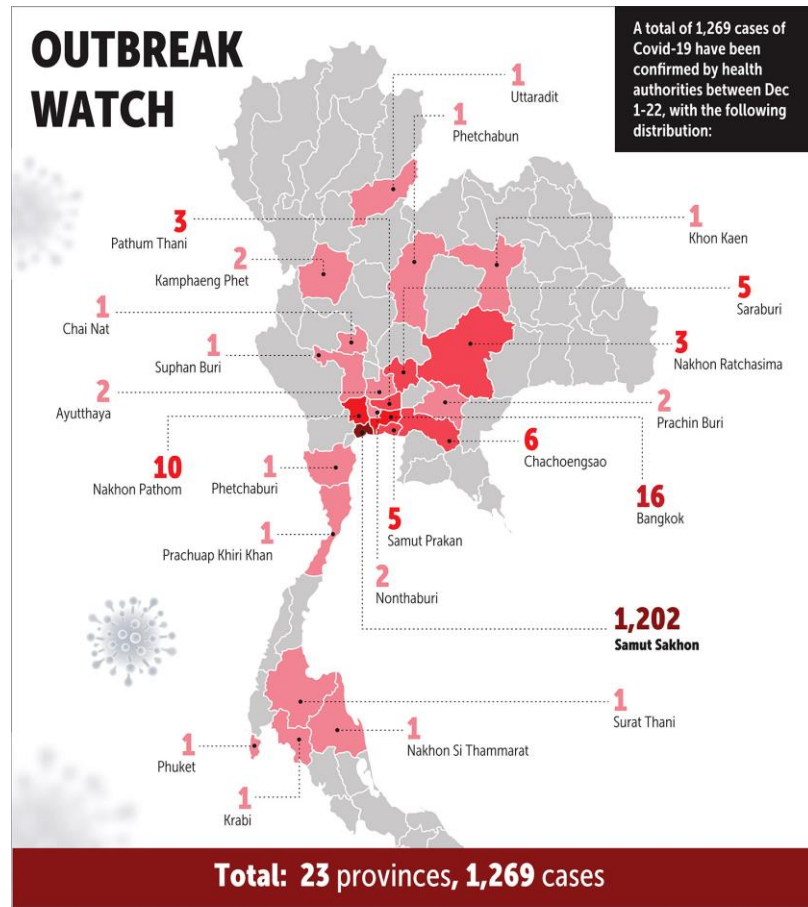
Company	Household	cases	Rate per 10000 houses
Southwark & Vauxhall Company	40,046	1,263	315
Lamberth Company	26,107	98	37
Rest of London	256,423	1,422	59



Describe the disease

Disease Distribution

Person/Animal
Place
Time



Source: The Ministry of Public Health and the Center for Covid-19 Situation Administration

BANGKOK POST GRAPHICS

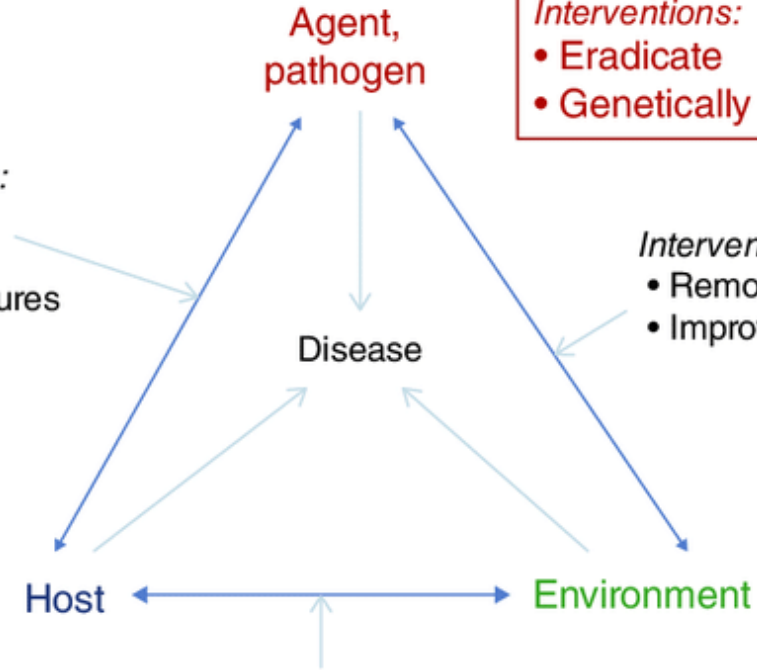


Disease Determinants

Analyze Risk factors

How healthy turn to non-healthy
“Epidemiologic triad”

- Characteristics:*
- Age
 - Prior exposure
 - Susceptibility
 - Co-infection
 - Immune response
- Interventions:*
- Treat, isolate
 - Immunize
 - Nutrition



- Interventions:*
- Protect
 - Educate
 - Alter exposures

- Characteristics:*
- Toxicity, virulence, infectivity
 - Susceptibility to antibiotics
 - Ability to survive outside body
- Interventions:*
- Eradicate
 - Genetically modify

- Interventions:*
- Remove breeding grounds
 - Improve sanitation

- Characteristics:*
- Climate
 - Physical structures
 - Population density
 - Social structure
- Interventions:*
- Housing quality
 - Sanitation, water
 - Preventive services

Epidemiology

Surveillance System

Outbreak Investigation

Distribution
Person/Animal
Place
Time

Describe the disease
Analyze Risk factors

Determinants
Host
Agent
Environment

Policy & Implementation to Control and Prevention

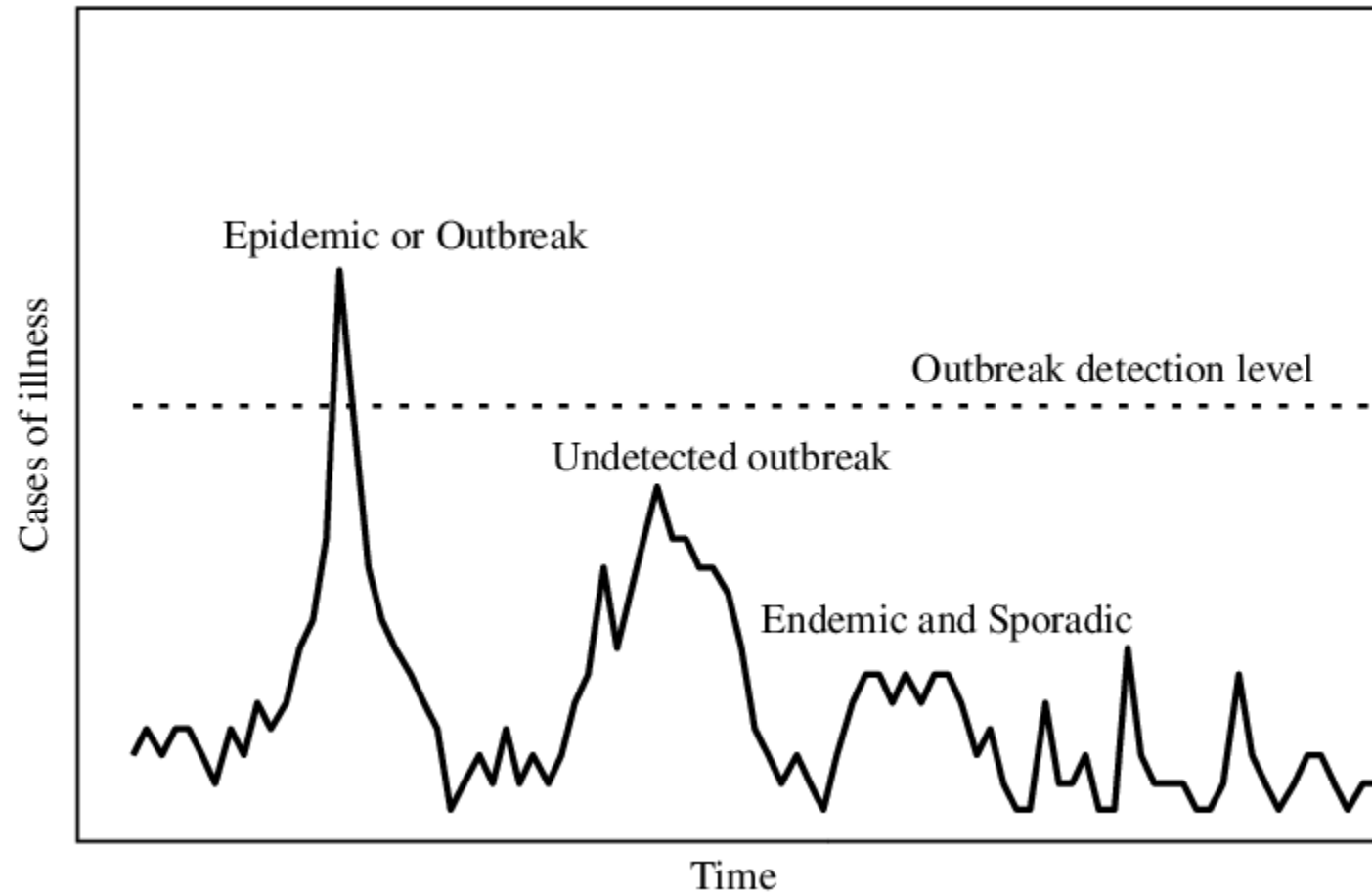


Disease Distribution

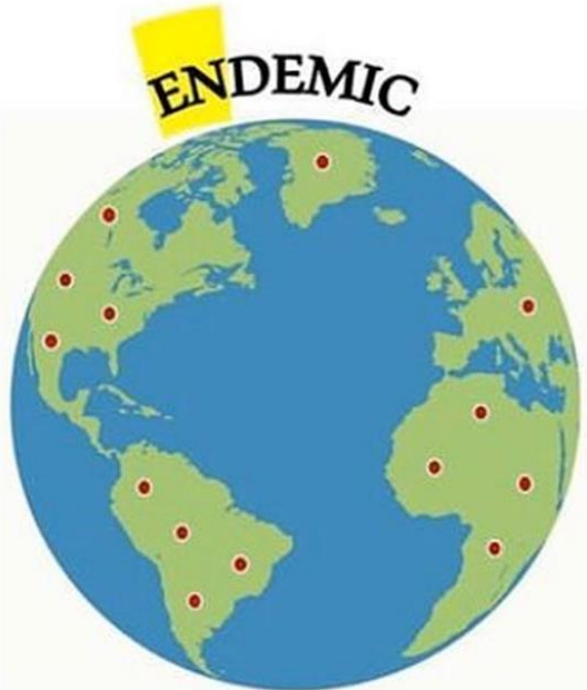
Epidemic VS Outbreak

- Over a particular period of time
- Two or more linked cases of the same illness
- Excess of normal expectancy
- A single case of an EID/re-EID

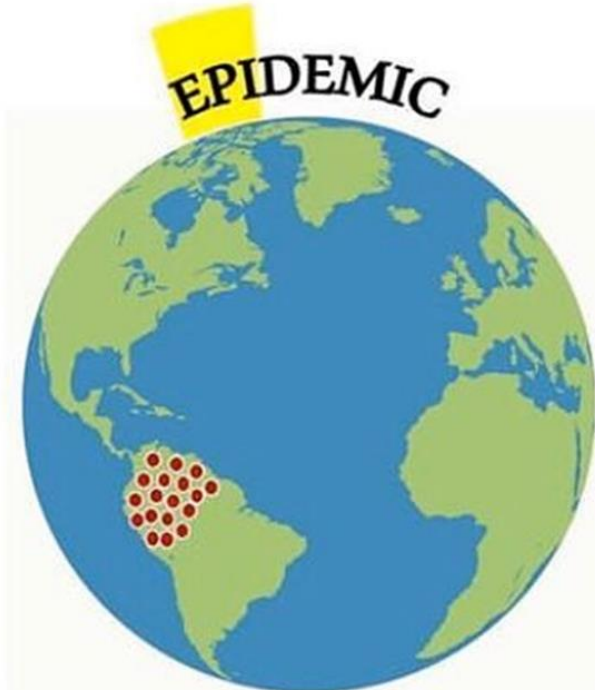
Epidemic, endemic, and sporadic illness



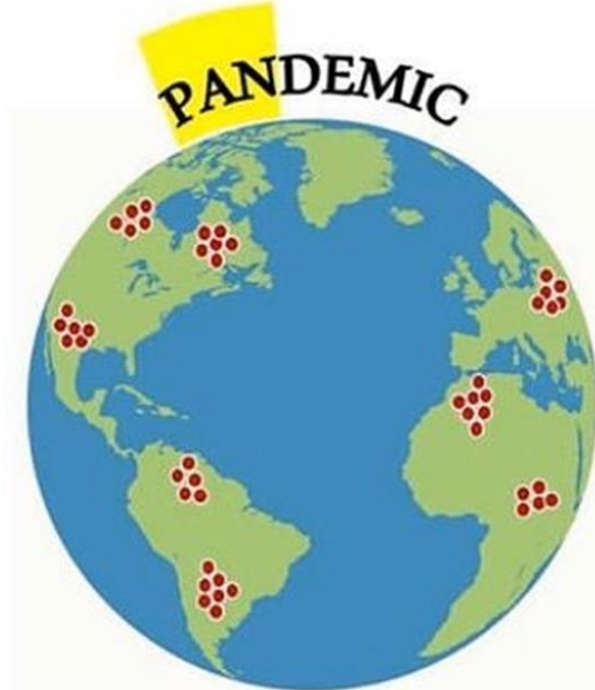
.....What is the differences between



Transmission occur, but
the number of cases
remains constant

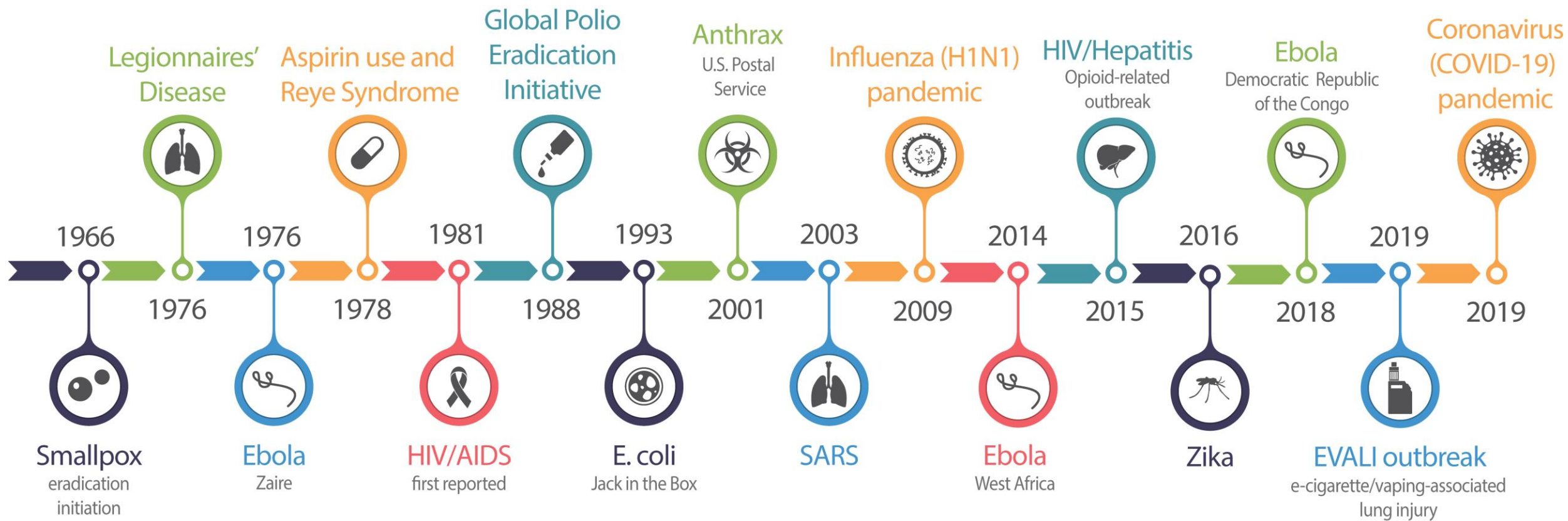


The number of cases
increases



When epidemics occur at
several continents
-global epidemic-

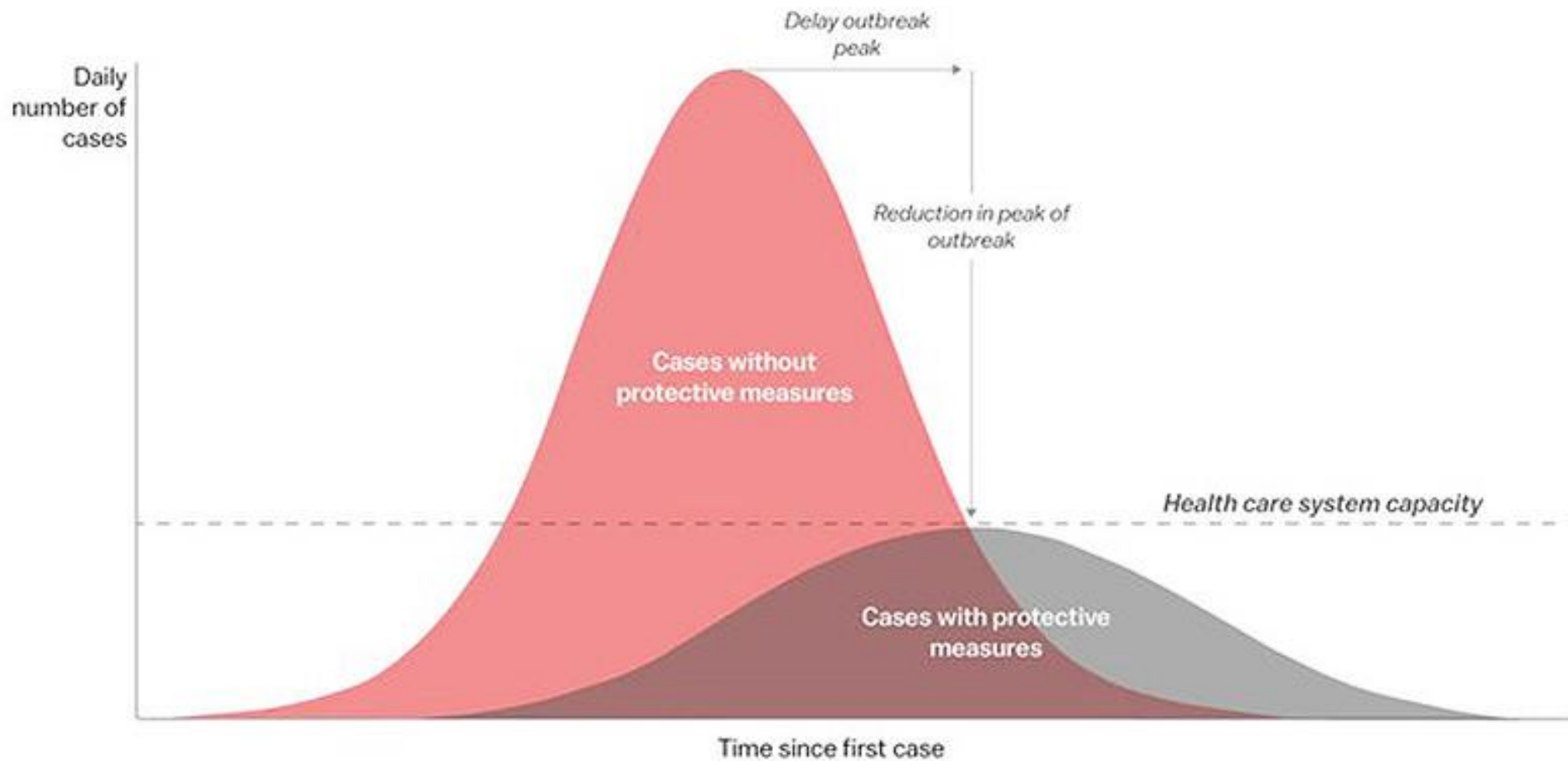




<https://www.cdc.gov/eis/about/history.html>



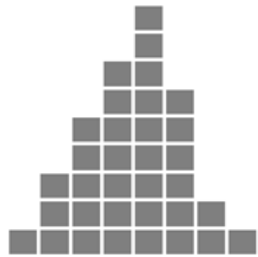
Lesson 2 part 3



<https://internews.org/covid-19/glossary/epidemic-curve>

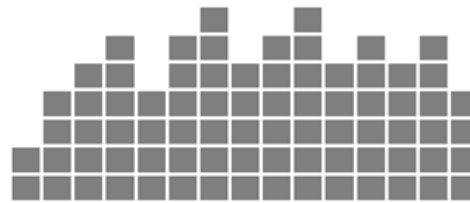
Epidemic curve

Food contamination



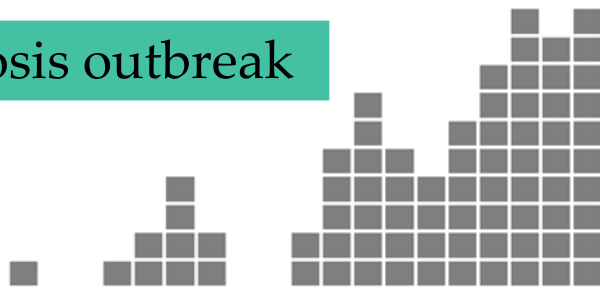
Point source

Insecticide contamination



Continuous source

Brucellosis outbreak



Propagated source

Series of outbreaks of food poisoning occurring at different summer camps for children



Intermittent source

Epidemiology

Surveillance System

Outbreak Investigation

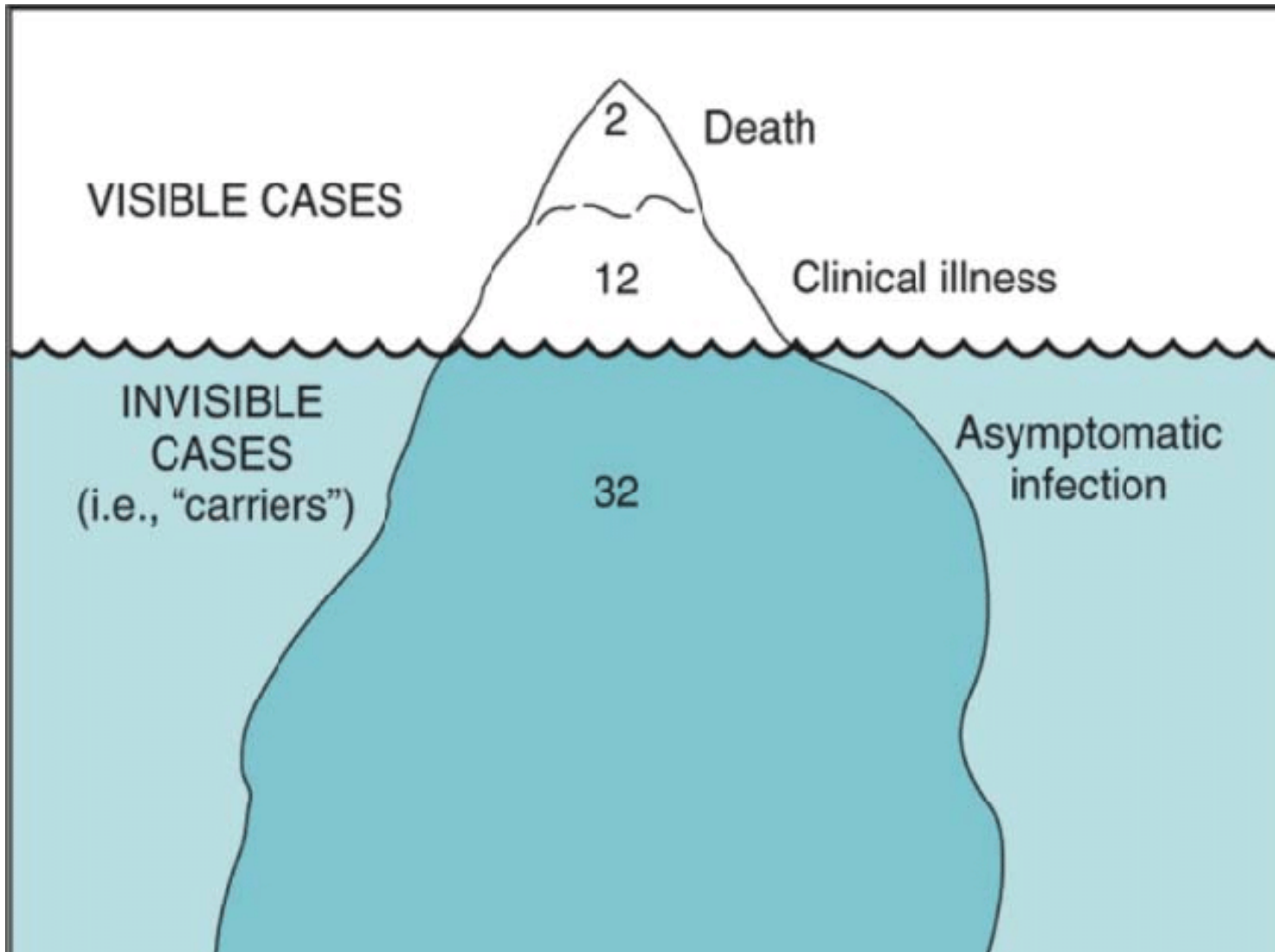
Distribution
Person/Animal
Place
Time

Describe the disease
Analyze Risk factors

Determinants
Host
Agent
Environment

Policy & Implementation to Control and Prevention

Tip of Iceberg Phenomenon





Descriptive study

Identify &
count cases



Obtain information



Perform descriptive
epidemiology

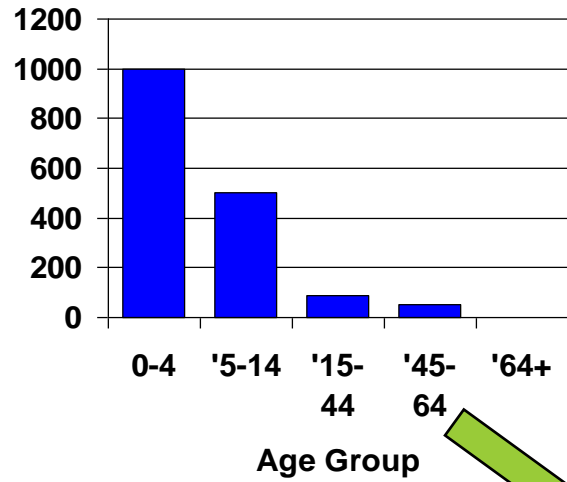
Orient cases in

- time
- place
- person (animal)

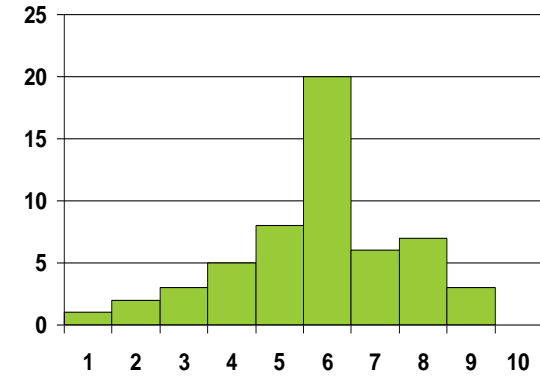


Cases

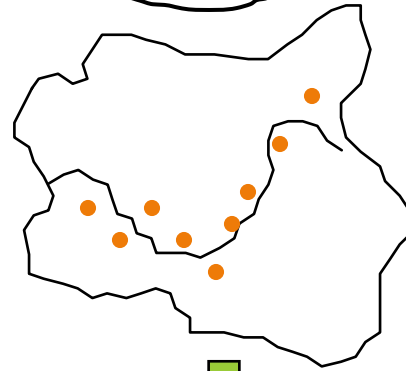
Animal



Time



Place



Evaluate information

Pathogen?

Source?

Transmission?



Disease Determinants

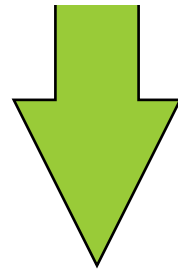


Analytical study

Develop hypotheses

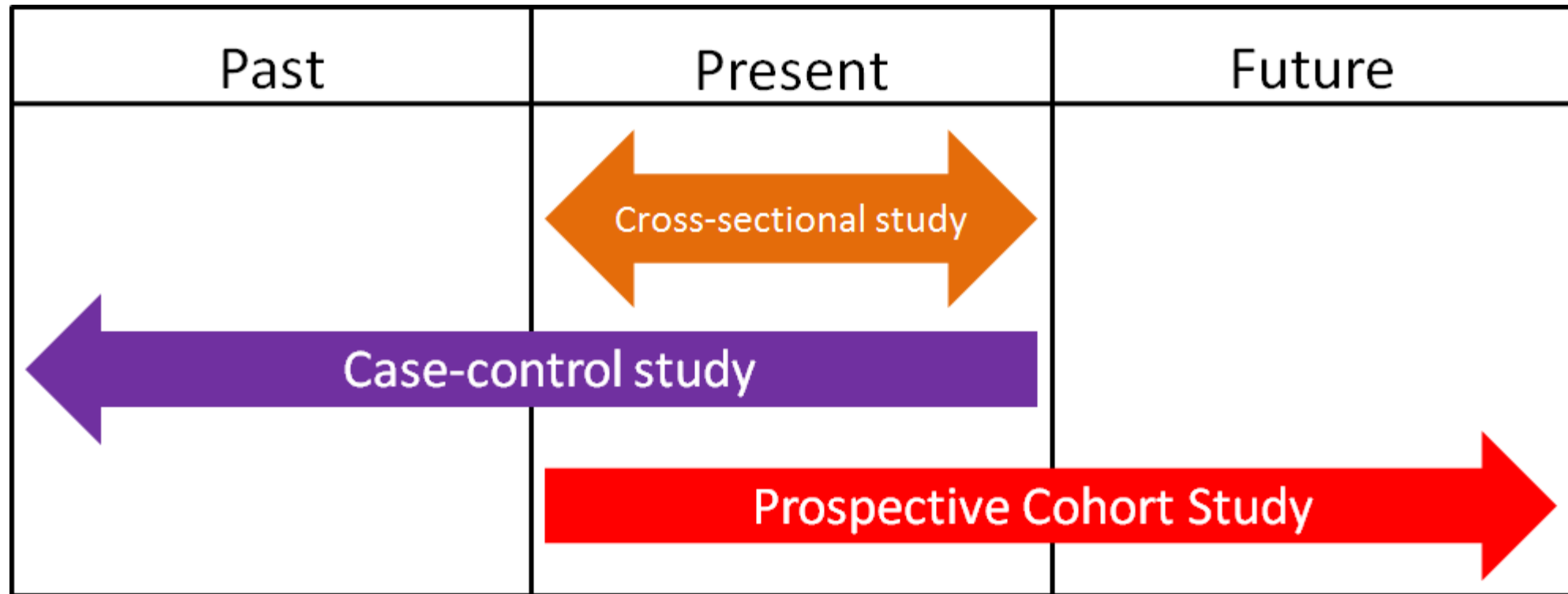


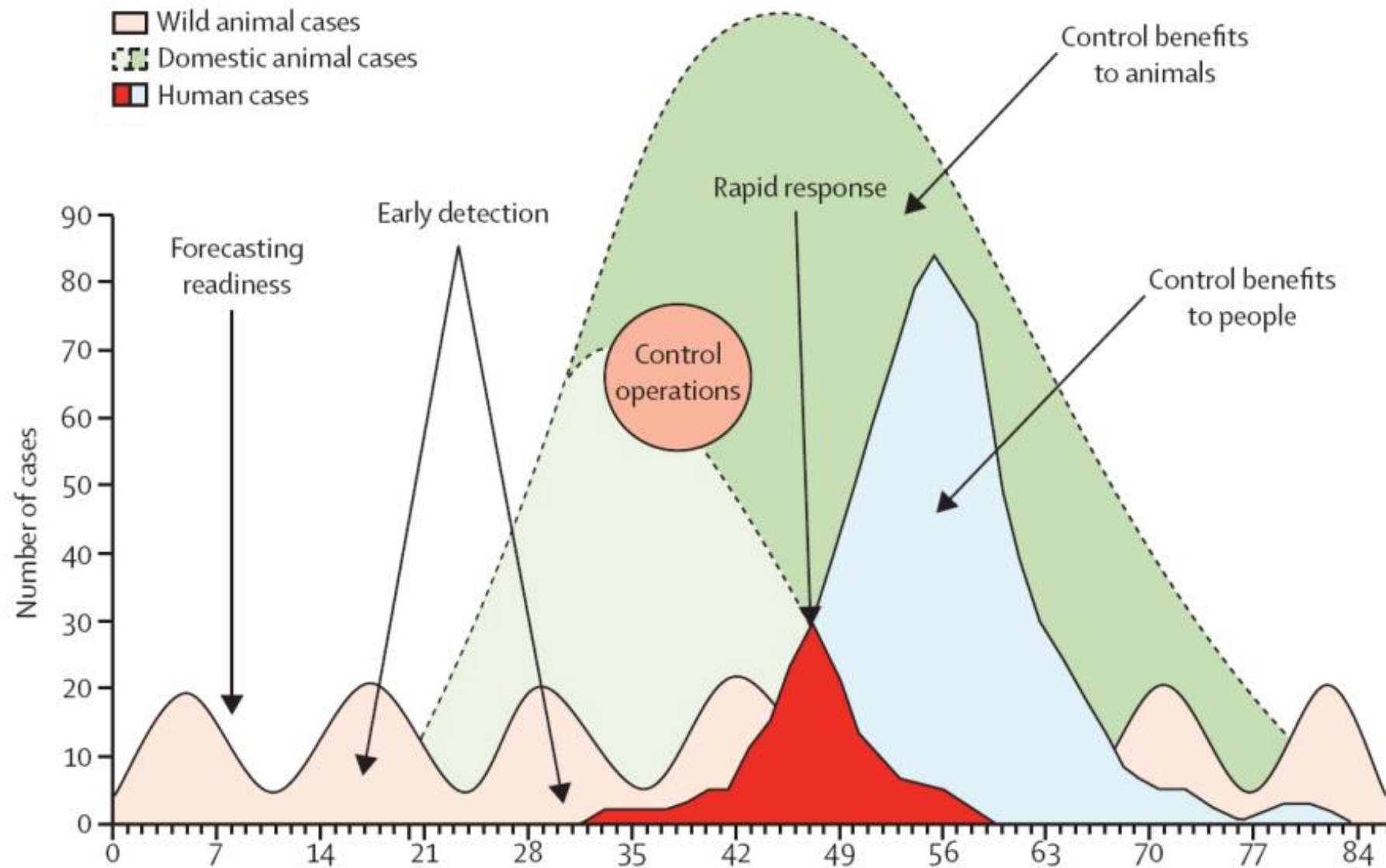
- What is the disease causing the outbreak?
- What is the source of outbreak?
- What is the mode of transmission?



Compare hypotheses with facts

Test specific hypotheses





Source: Karesh, 2012, Lancet 380 p 1936



THANK YOU

Any questions, please email to Tosapol.Dejyong@fao.org