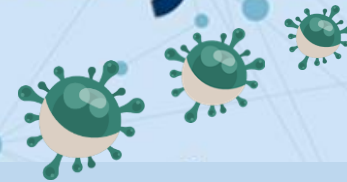


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# CHAPTER 5

## Epidemiology Study Designs



Episode 5.1: Descriptive study

Wanpen Waelveerakup, Dr.P.H.  
Email: [wanpenw@webmail.npru.ac.th](mailto:wanpenw@webmail.npru.ac.th)





## Overview of Epidemiological Study Designs

1

Descriptive Study / Observational Study



## Definition



**Exposure** means any factor that a population has, is exposed to, or is contacted to, which may contribute to both positive and negative effects. (a protective factor) or harmful (a risk factor), or has no effect at all.

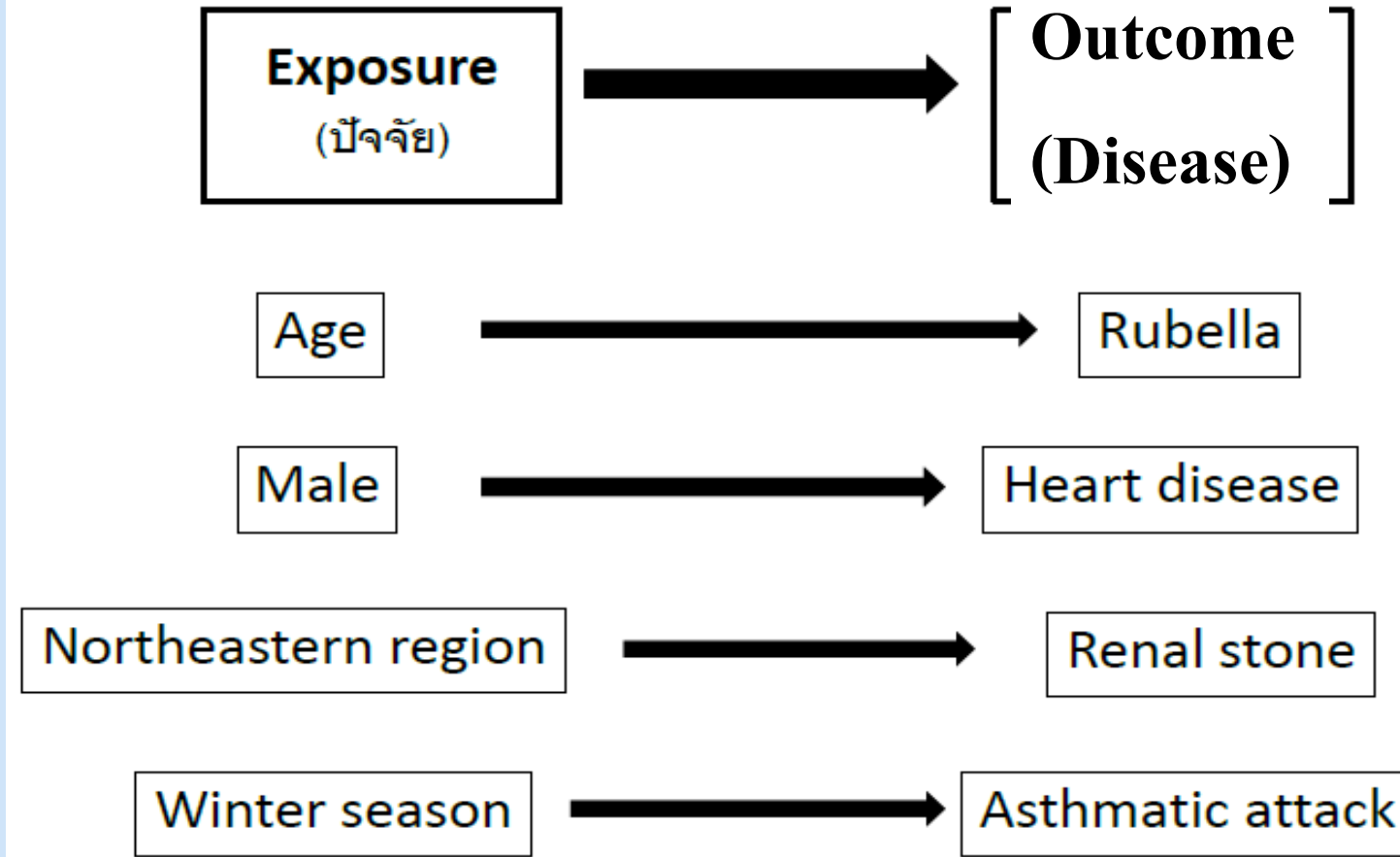
**Outcome** is a condition that is expected to result from exposure.

- This can be good (positive) or bad (negative).
- Other names include dependent variable or response

# Sample of Exposure & Outcome (Disease)



## Exposure and Outcome (Disease)



## Hierarchy of Evidence

### Epidemiology Study Type and Objective

#### 1. Observational study

#### 2. Experimental design

Case reports or case series

**For situation analysis and to postulate hypothesis:**

- 1.1 Descriptive epidemiologic study
  - > Ecological study (Correlational study)
  - > Cross-sectional study (Prevalence study)

**For identifying the (potential) cause:**

- 1.2 Analytic epidemiologic study
  - > Cross-sectional study
  - > Case control study
  - > Cohort study

**For studying efficacy and effectiveness, evaluation of programs**

- 2.1 Clinical trial
- 2.2 Field trial
- 2.3 Community trial



# Let's think about this!

According to the COVID-19 pandemic in Thailand,



Who  
Where  
When  
How  
Why

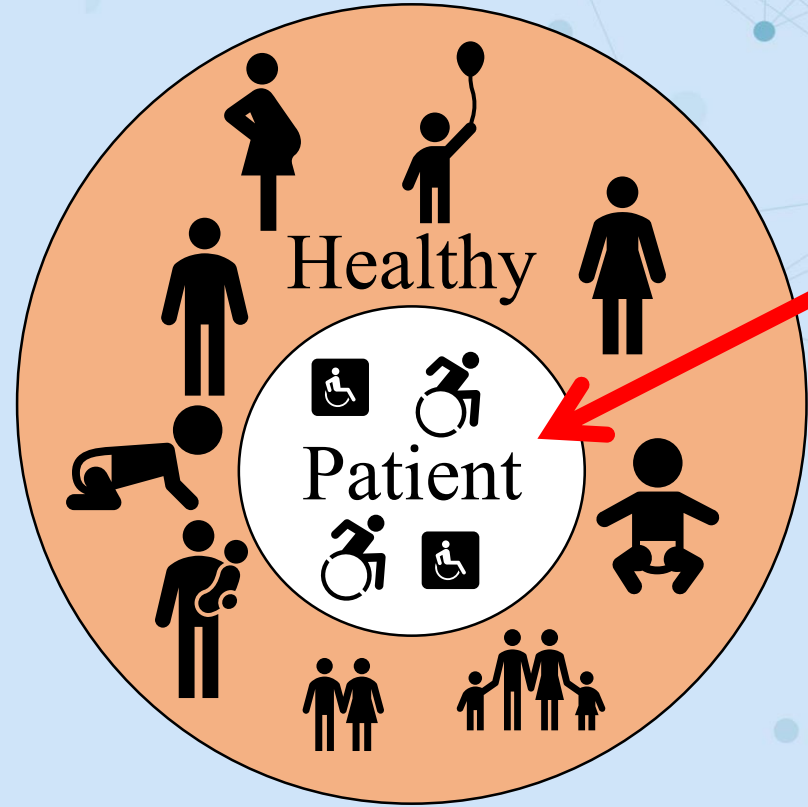
- เกิดกับใคร
- เกิดที่ไหน
- เกิดเมื่อไร
- เกิดอย่างไร
- ทำไมจึงเกิด

## How do we find the answer?





# Descriptive Study



focus on patient

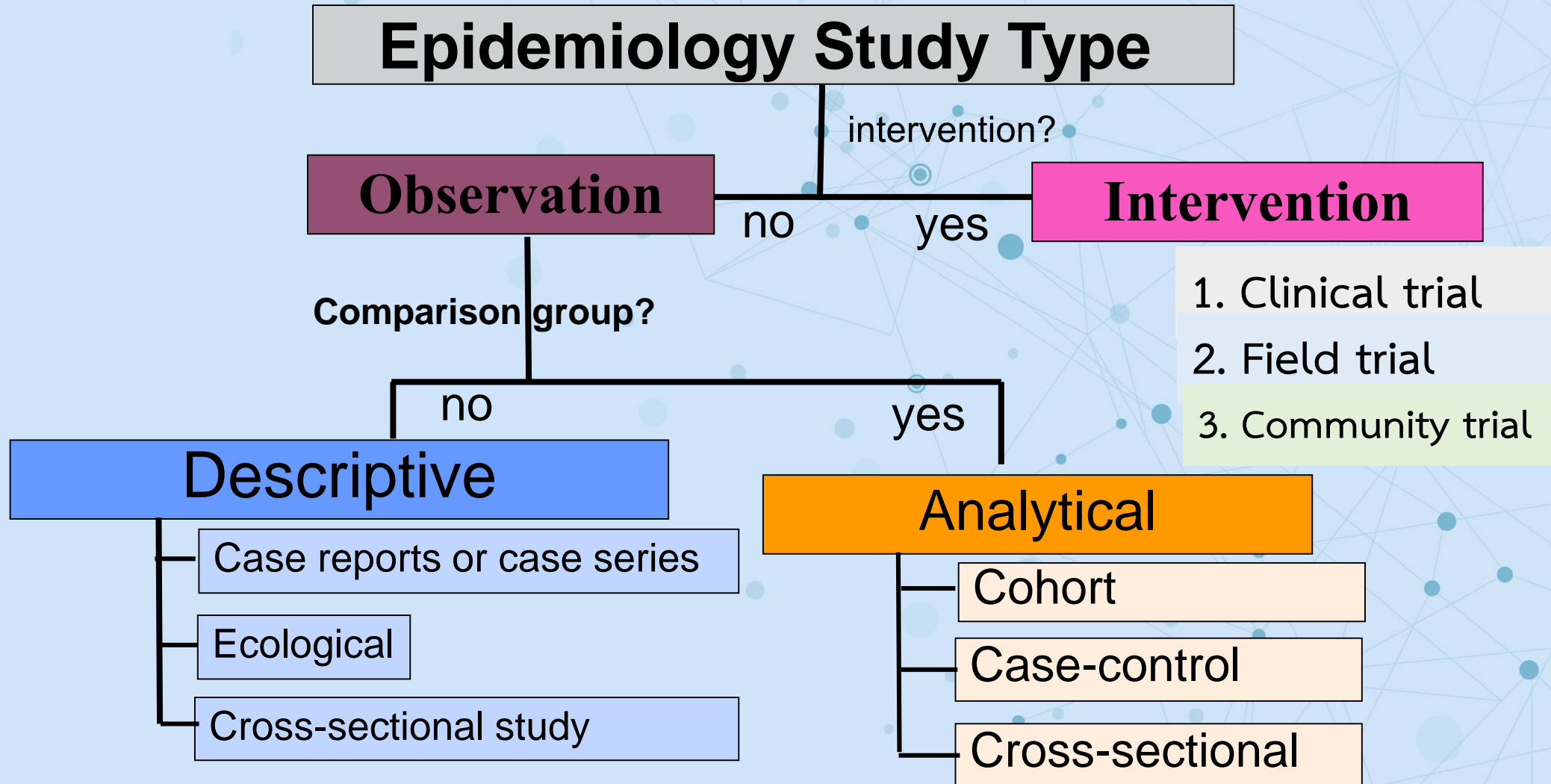
Aims

Magnitude and Severity

Distribution: Time, Place, Person

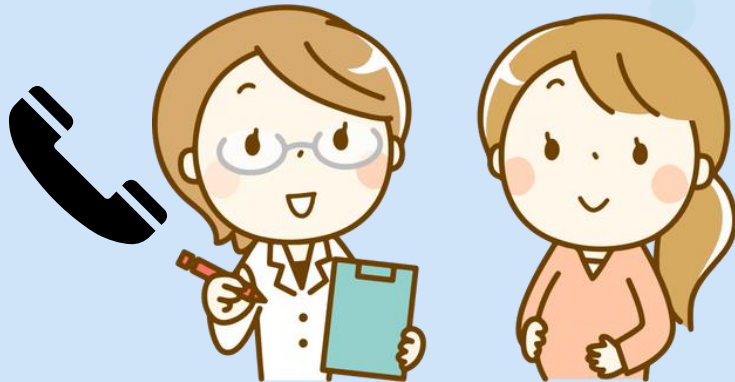
Hypothesis Formulation

# OVERVIEW STUDY DESIGN IN EPIDEMIOLOGY





- Descriptive studies are observational studies that describe the patterns of **disease occurrence** in relation to variables such as place, time, and person.



- A descriptive study is one in which information is collected without changing the environment (i.e., nothing is manipulated).

# Descriptive study: WH questions

✓ WHAT

✓ HOW

: HOW much of the problem  Incident rate, Attack rate, Prevalence rate

✓ WHO

: Characteristics of the patients

✓ WHEN

: Time line, Epidemic curve

✓ WHERE

: Place of incidence/prevalence or linking people together

# Distribution characteristics of diseases or health problems

## PERSON

Personal characteristics that are usually available for descriptive epidemiology include age, gender, race and ethnic group, socioeconomic status, occupation, religion, and marital status and lifestyle.

## TIME

The distribution of a disease or health problem accordingly hour, day, month or year such as

- / date and time of exposure to risk factors
- / Date of onset of illness
- / Incubation period of the disease
- / Duration of illness
- / Disease-free period

## PLACE

Geographic location or place of residence, work, school such as

- / Elephant filariasis is most common in the southern part of the country,
- / Allergic dermatitis is found more in people who work in factories with chemicals.





# Distribution of disease or health problems in a person

- ❑ Age: Hand, foot, and mouth disease has a high mortality rate in the age group less than 1 year and older person.
- ❑ Gender: Males are more likely to suffer from coronary heart disease than females.
- ❑ Race: Sickle cell anemia is most common in Africans.
- ❑ **Socio-economic conditions:** The morbidity rate of malnutrition tends to occur in children from difficult families rather than in well-being.
- ❑ **Marital status:** Breast cancer is rare in women who are breastfeeding.
- ❑ **Occupation:** Farmer suffers from leptospirosis more than any other occupation.
- ❑ **Lifestyle:** Smokers are more likely to suffer from lung disease than non-smokers,  
: Persons who do not practice exercise regularly are more likely to suffer from cardiovascular disease than those who exercise regularly.



# Types of descriptive study

## Cross-sectional descriptive study

- Survey method
- Prevalence Rate
- Examples :
- 1) Survey the prevalence of any new disease in the specific community
- 2) Survey the prevalence of all existing asthma in areas with excess PM 2.5.

## Prospective descriptive study

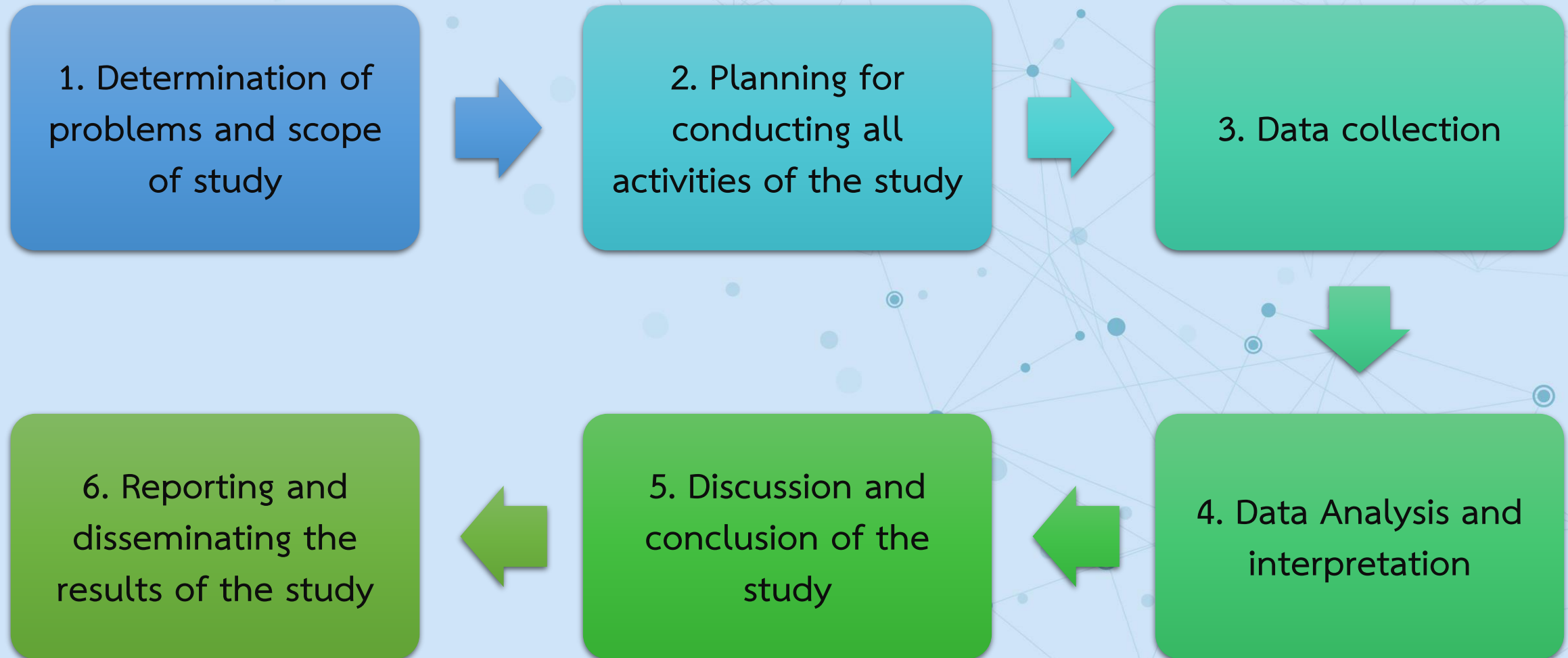
- longitudinal study
- Incidence Rate
- Examples
- 1) Study on blood pressure levels of people aged 35 years and over every year, twice a year to monitor the incidence of hypertension in Thai people.
- 2) Study of residual abnormalities or symptoms of long COVID-19 after being diagnosed COVID-19 among the Thai people by following up for a period of 5 years.

## Retrospective descriptive study

- Retrospective
- Examples
- **1) Case report:** It is a report of 1 patient in detail about the signs, symptoms, diagnosis, and medical treatment.
- Often studying a new disease that has never been seen before
- **2) Case series:** It is the report of two or more patients with the same disease over a period of time.

Ecologic studies assess the overall frequency of disease in a series of populations

# Descriptive study process

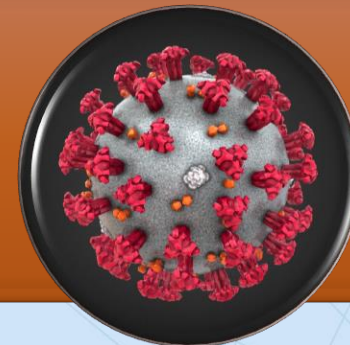


# Questions of descriptive study

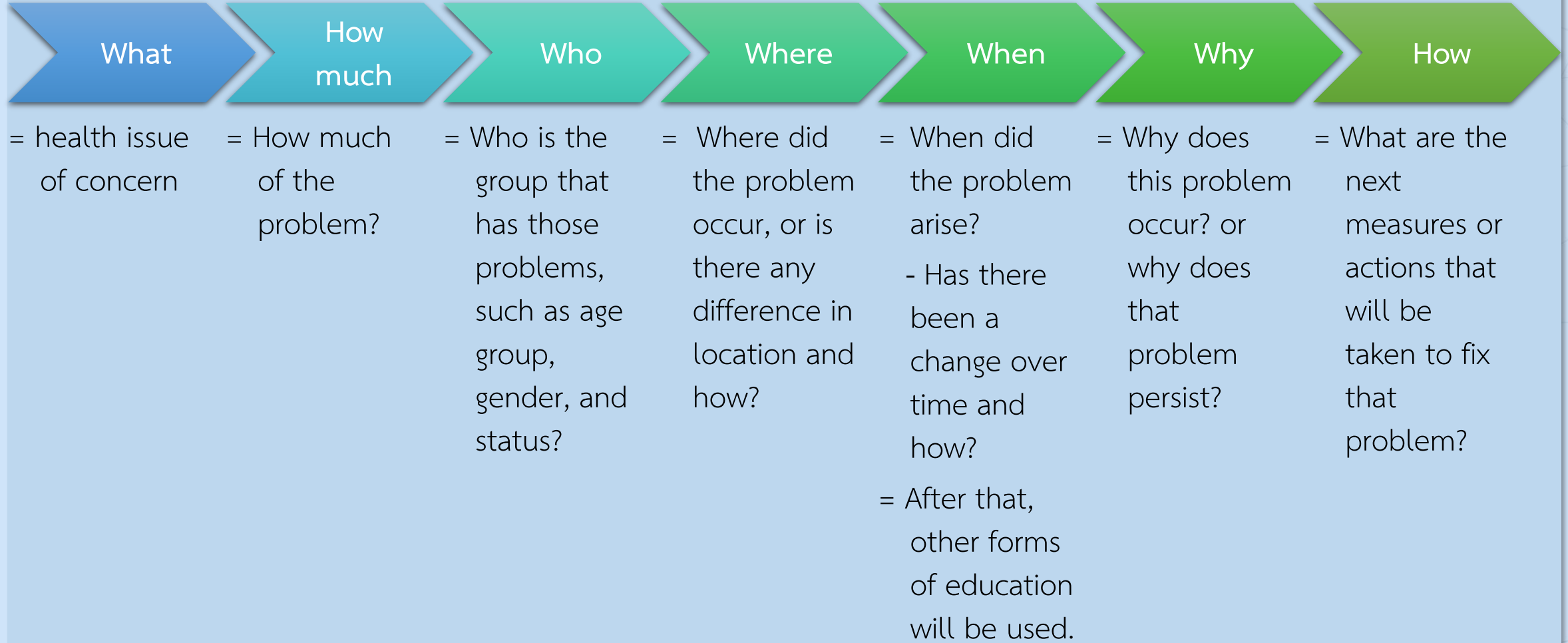
1. What diseases do you have in the population/who has those diseases?
2. How important is the disease/problem in the population?
3. Where does the disease occur?
4. What is the trend of the disease?
5. What is the effect of the disease on the population?
6. In the case of public health services, which affects the measure/service?
7. What factors are related to the occurrence of the disease?

**Formulating assumptions**

Difference/Similarity/Correlation



# Formulating assumptions from descriptive study







# Benefits of Descriptive Study



1. To discover new diseases or health problems and create new knowledge.



2. To provide information about the health status of the population, disease prevalence, disease incidence, and public health necessity.



3. To discover risk factors that may be caused disease or health problems



4. To formulate the basic assumptions related to the risk factors or probable factors.

# Summary



- Observation of the occurrence and distribution of disease,
- No comparison group

Past

Present

Future

Retrospective  
descriptive study

Cross-sectional  
descriptive study

Prospective  
descriptive study

- 1) Case report: individual
- 2) Case series : individual

3) Ecologic studies: a series of populations

Magnitude and Severity  
Distribution: Time, Place, Person  
<<Hypothesis Formulation>>



# Thank You for Your Attention



Email: [wanpenw@webmail.npru.ac.th](mailto:wanpenw@webmail.npru.ac.th)

to be continued

