



CHAPTER 5

Epidemiology Study Designs



Episode 5.3: Experimental Quasi-experimental

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Overview of Experimental Study Design

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Experimental Study Design

Quasi-experimental design

Overview of Experimental Study Design

- An experimental study, commonly known as a trial, involves the use of designed experiments to investigate the role of some agent in the prevention or treatment of a disease.

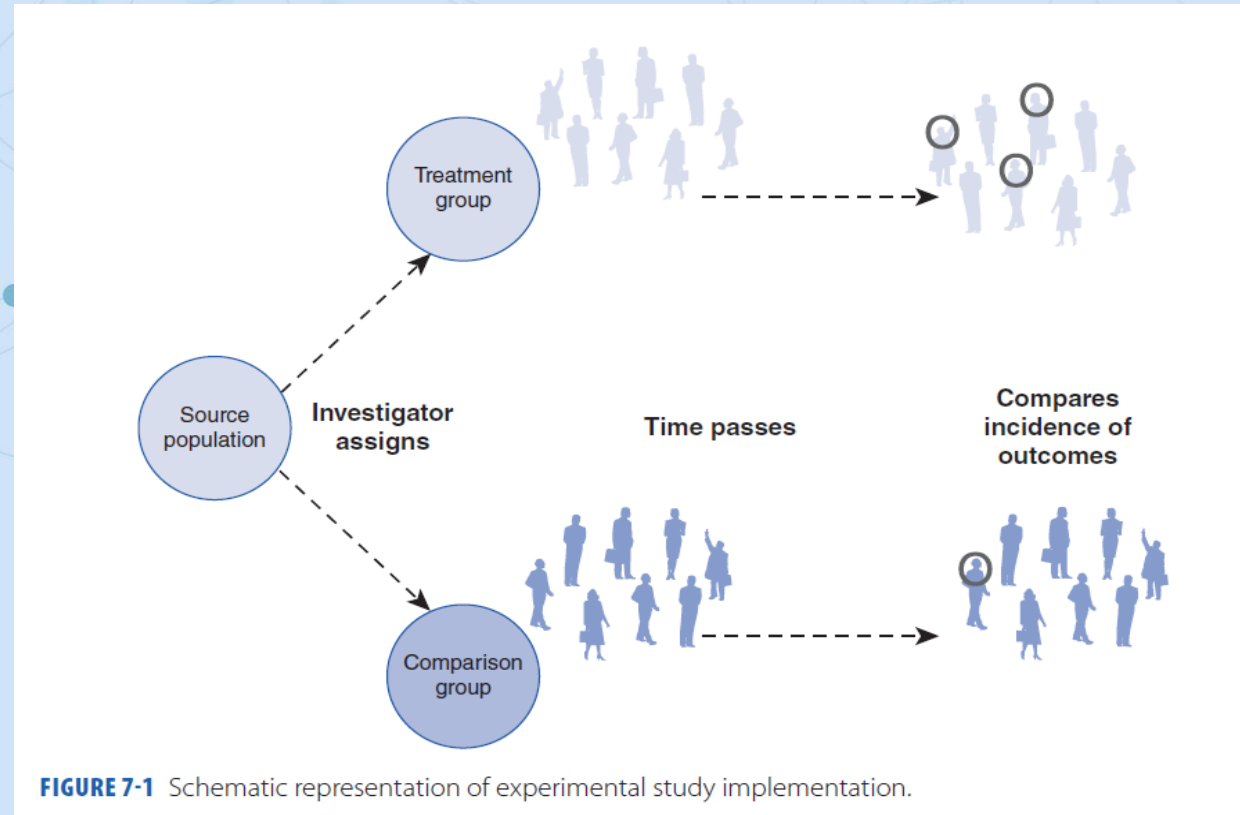


FIGURE 7-1 Schematic representation of experimental study implementation.

Concept of Experimental Study



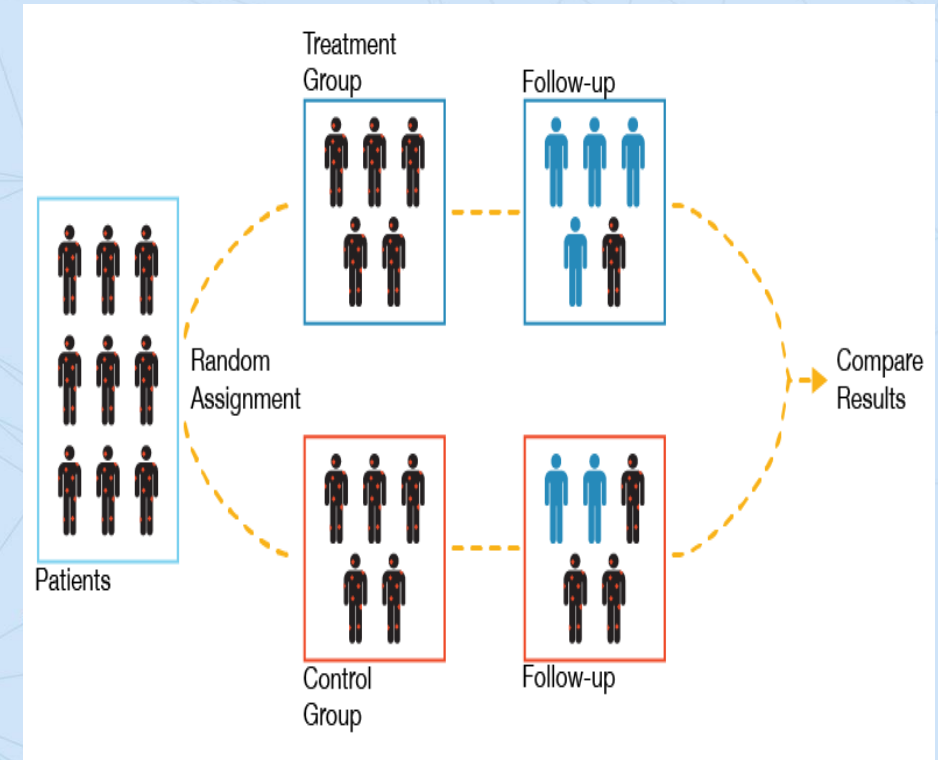
Aschengrau, A. & Seage, G. R. (2020).



Experimental Study

1. The study population consisted of those who received and did not receive the factors studied.
2. Exposure occurs before the expected outcome.
3. Measure the incidence of the condition that is expected to be an outcome.
4. The researcher can directly control the research process.
5. Use a systematic sampling process based on the likelihood of probabilities. (randomization)

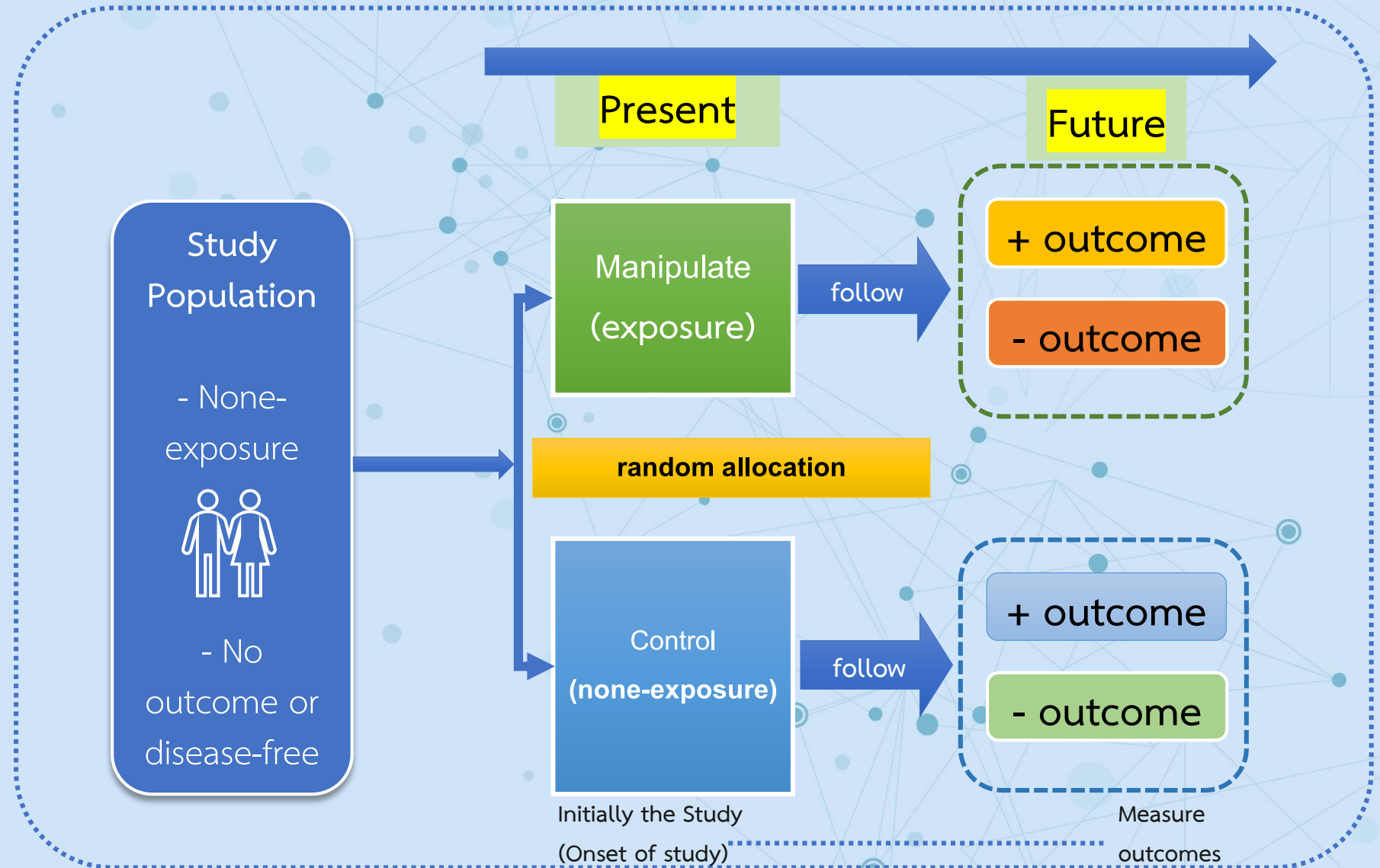
Basic structures of
experimental study



Source: <https://betterthesis.dk/research-methods/empirical-studies/1121-2>

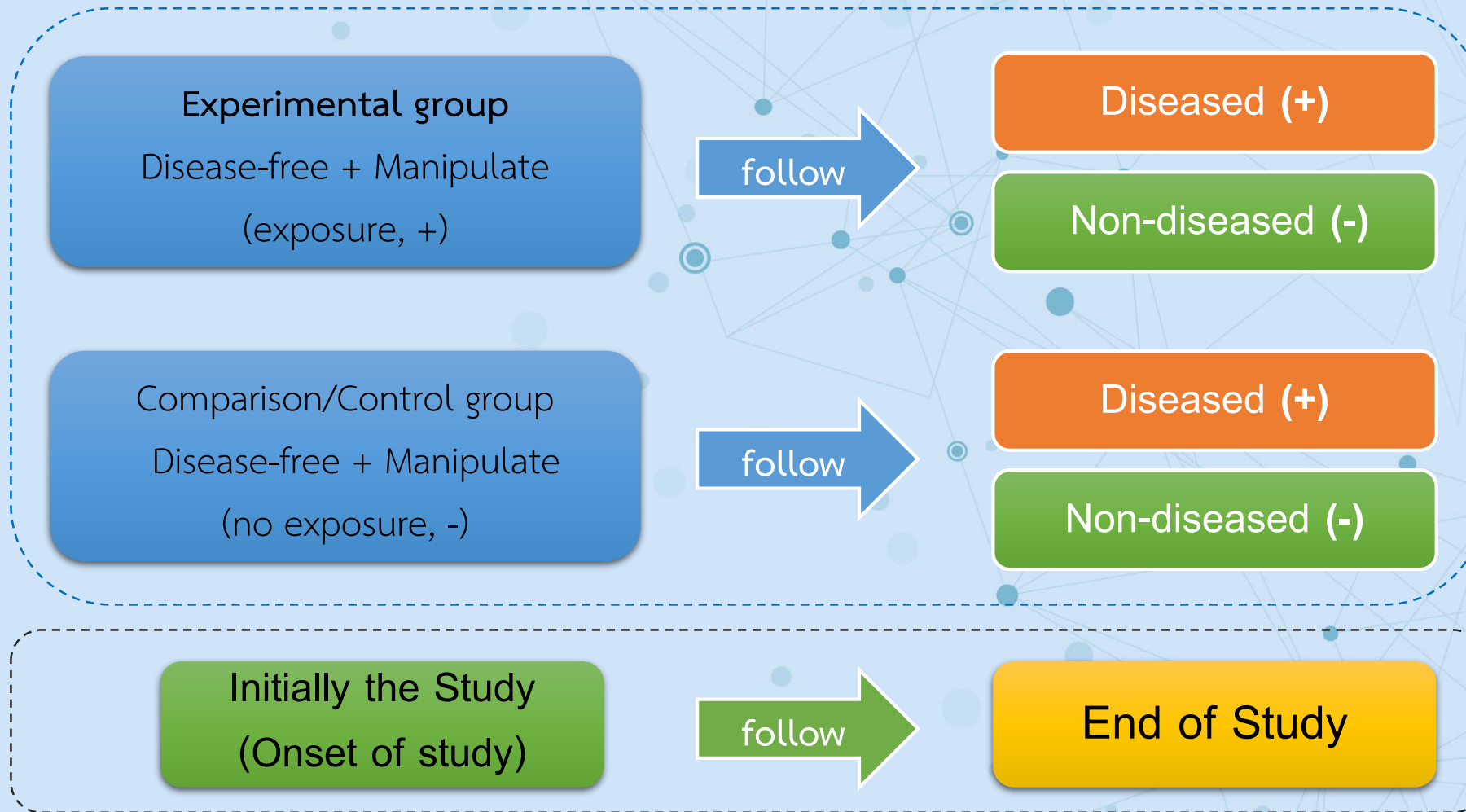
Characteristics of an experimental study

- Prospective / Cohort study
- Outcome and Exposure





Characteristics of an experimental study



What are the characteristics of a true experimental design?



True experiments have four elements:

- manipulation
- control
- random assignment
- random selection

The most important of these elements are manipulation and control.

The independent (predictor) variable is manipulated by the researcher

Quasi-experimental Design



- "Quasi-experimental research is similar to experimental research in that there is the manipulation of an independent variable.
- It differs from experimental research because

 - ✓ no control group
 - ✓ no random selection
 - ✓ no random assignment
 - ✓ no active manipulation

Quasi-experimental Design



- ✓ Quasi-experiments design can be perfect to determine what is best for the population.
- ✓ Involves real-world problems and solutions and not any artificial ones.
- ✓ Offers better control over the third variable known as the confounding variable which influences the cause and effect.

The disadvantages of a quasi-experimental design



- It serves less internal validity than true experiments.
- Due to no randomization, the confounding or third variable does not eradicate.
- It has scope for human errors.
- It can allow the researcher's personal bias to get involved.
- Human responses are difficult to measure.

Differences between quasi-experiments and true experiments

True experimental design

Assignment to treatment

- ✓ The researcher randomly assigns subjects to control and treatment groups.

Control over treatment

- ✓ The researcher usually designs the treatment.

Use of control groups

- ✓ Requires the use of **control and treatment groups**.

Quasi-experimental design

Assignment to treatment

- ✓ Some other, non-random method is used to assign subjects to groups.

Control over treatment

- ✓ Does not have control over the treatment

Use of control groups

- ✓ Control groups are not required (although they are commonly used)

Type of Epidemiology Experimental Design

1

Clinical trial (การทดลองทางคลินิก)

2

Field trial (การทดลองสนาม)

3

Community trial/Community intervention study
(การทดลองในชุมชน)

The main strengths and weaknesses of experimental design

Strengths:

The experimental method makes it possible to determine whether changes in the independent variable cause subsequent changes in the dependent variable.

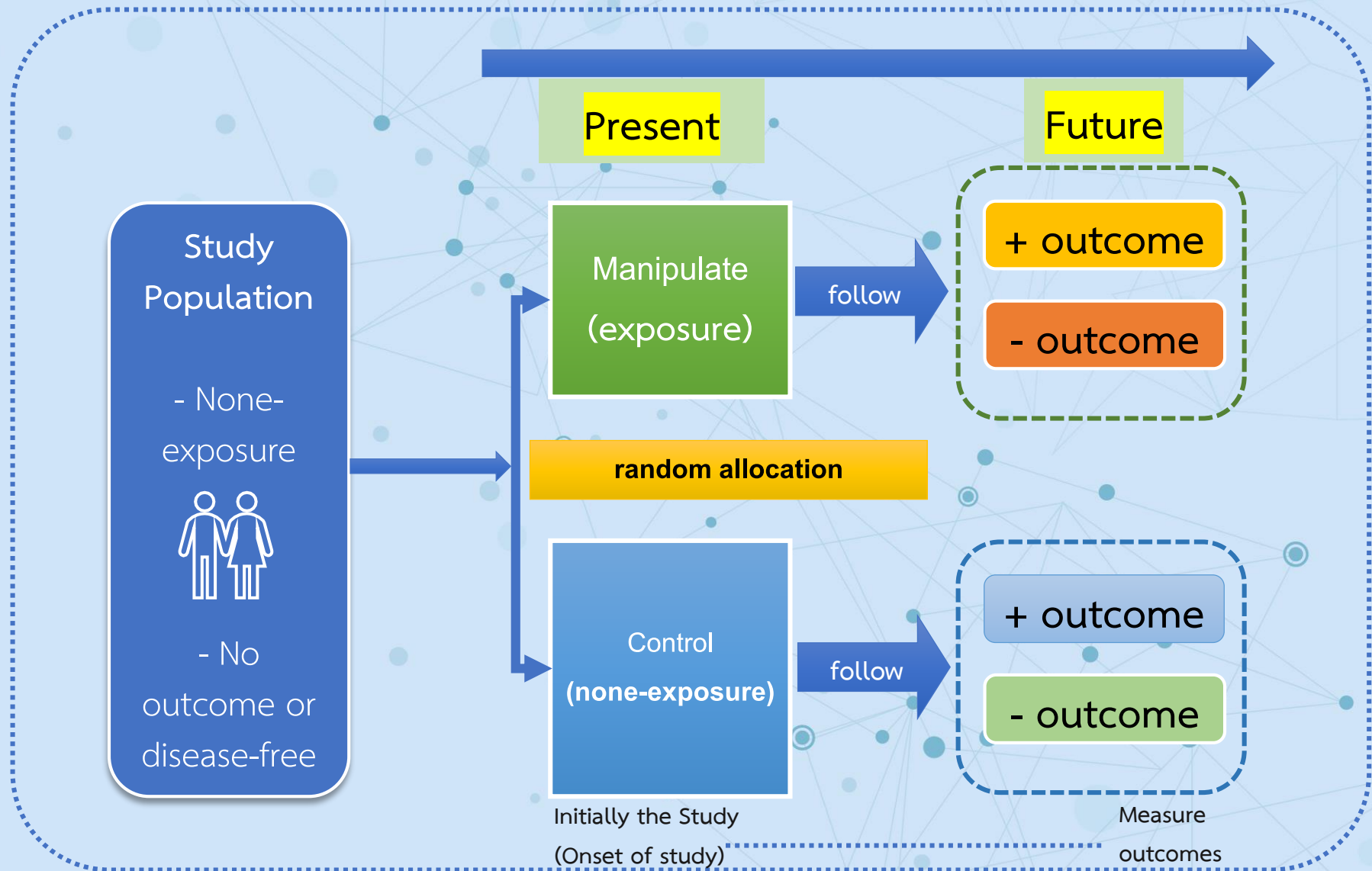
Weaknesses:

The main weakness of the experimental method is that subjects may behave differently in the experimental setting than they would under more ordinary conditions.

Summary

- True Experimental
- Quasi-Experimental

- ✓ Assignment to treatment
- ✓ Control over treatment
- ✓ Use of control groups





Thank you

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