Chapter 7

THREATS

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Outline

- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects

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- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects

- **What is?**
- **Why are they threats?**
- **How to limit threats?**

1.1 Partial compliance

- When people in the treatment group are not treated

  ➔do not complete the treatment course

  ➔do not receive the treatment

  ➔comparison group receive the treatment

- When implementation staff depart from the allocation or treatment procedure
- When people (defiers) exhibit the opposite of compliance

- Before the election

Letter treatment

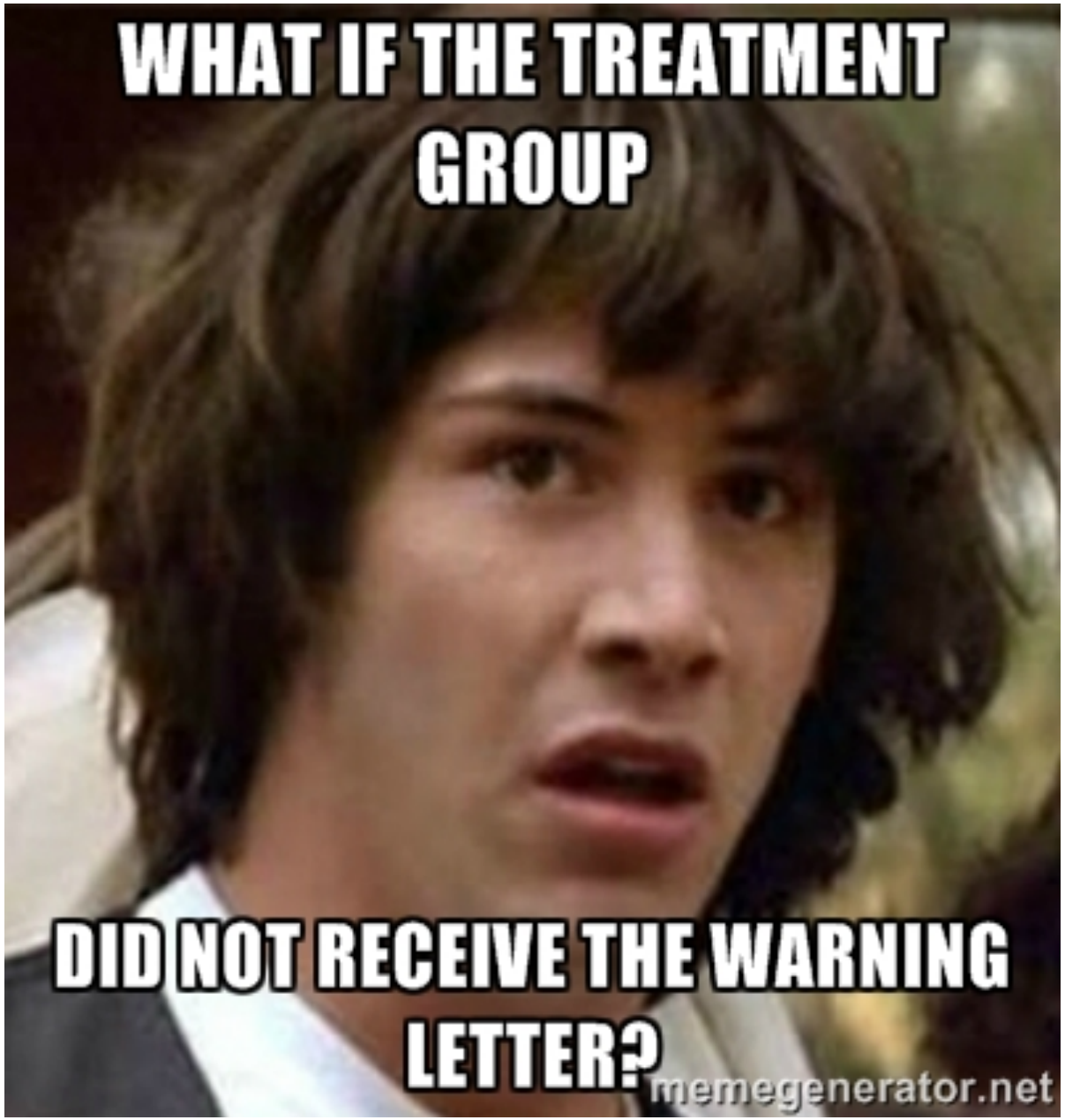
- A letter would be sent to some of the polling station

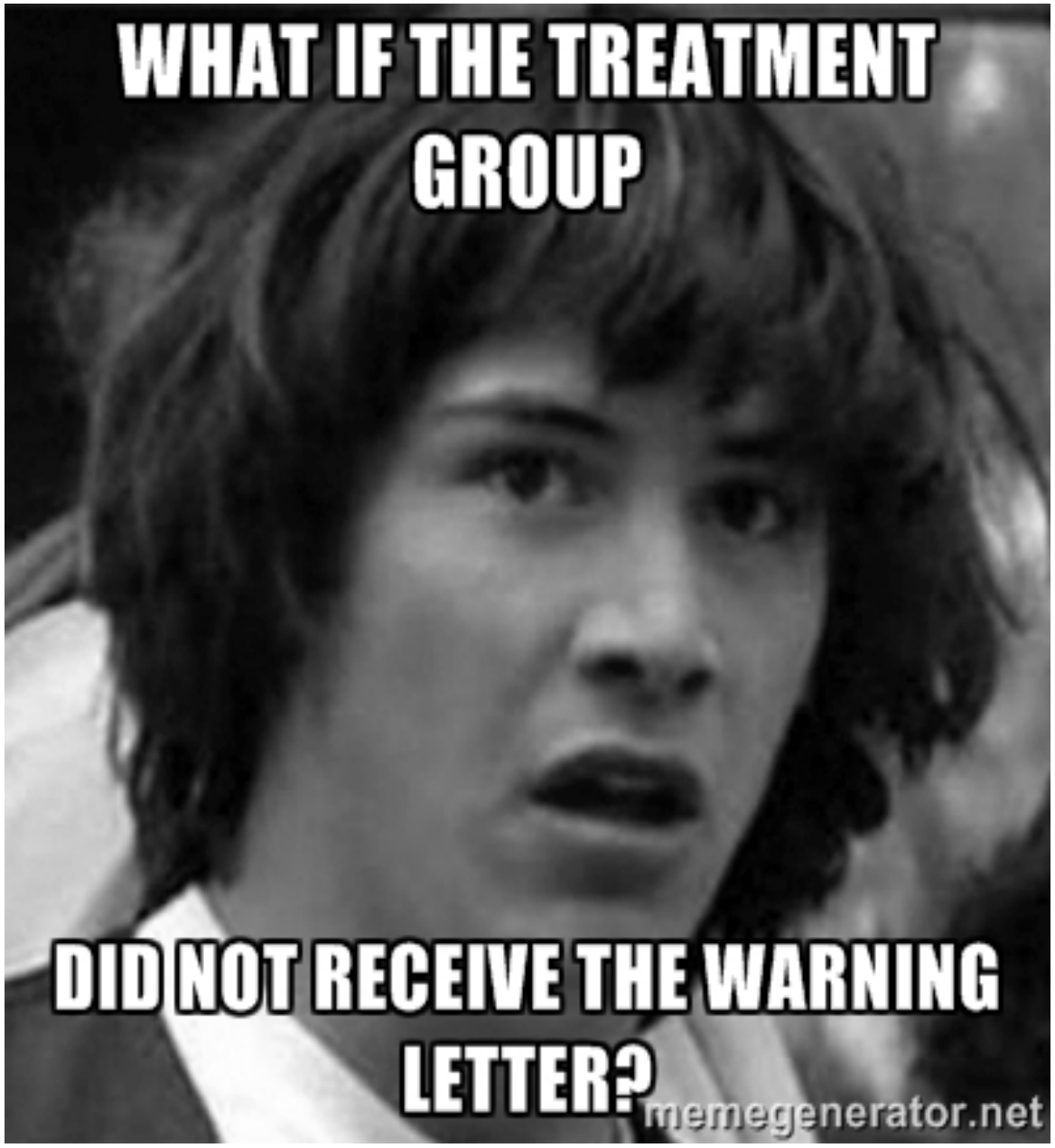
➔treatment group

- Right after the election

- Take photos in every polling station

- Only some of them were warned with the letter


WHAT IF THE TREATMENT GROUP
DID NOT RECEIVE THE WARNING LETTER?
memegenerator.net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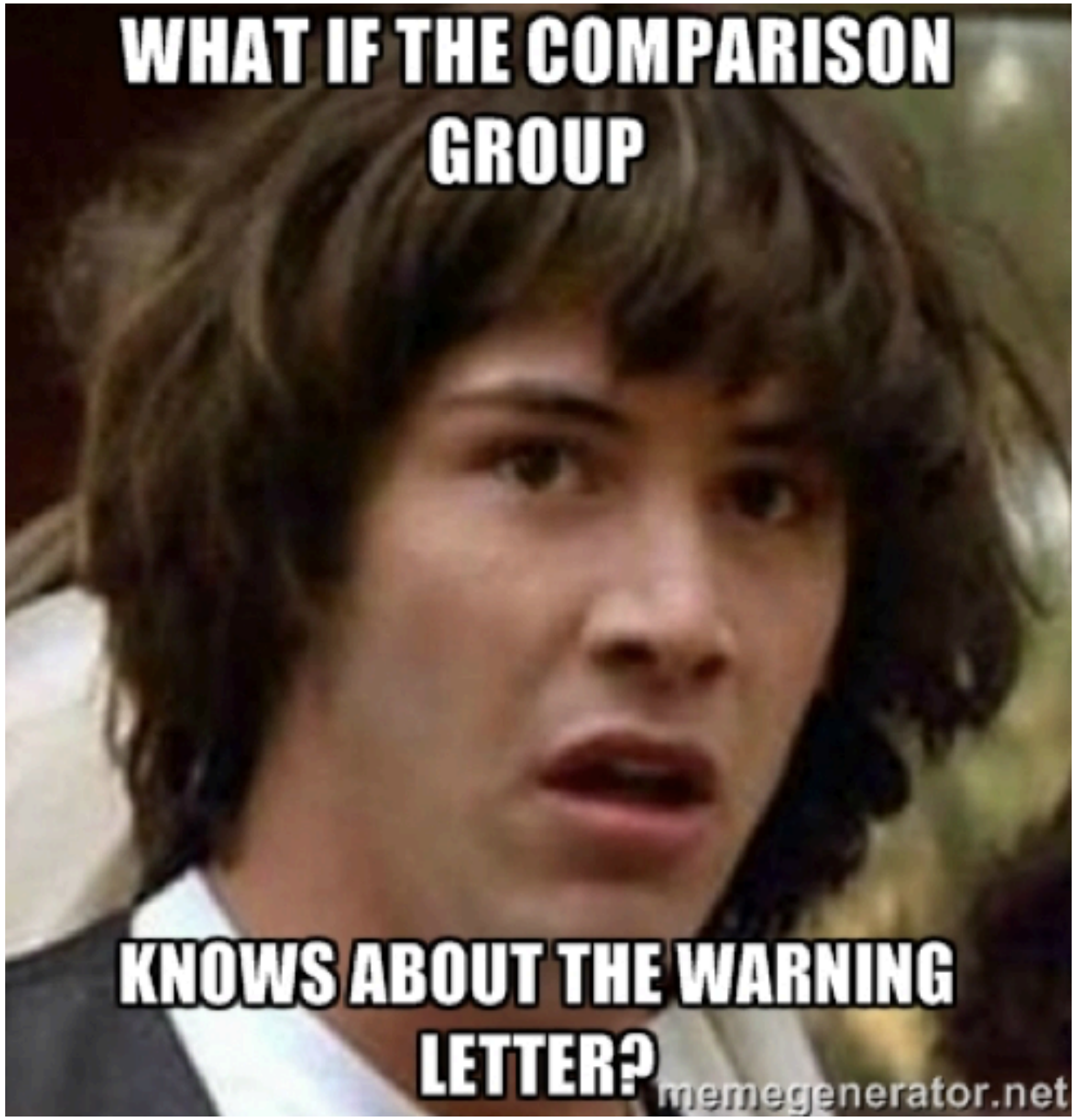
WHAT IF THE COMPARISON GROUP
KNOWS ABOUT THE WARNING LETTER?
memegenerator.net

Partial Compliance

(Noncompliance)

1.2 why are they threats

Noncompliance can

- **reduce the difference** between the treatment and comparison group
- **reduce comparability** between the treatment and comparison groups

➔impossible to estimate the true impact of a program

How to limit

- Make take-up of the program easy
- Incentivize take-up of the program
- Compartmentalize and routinize field tasks
- Randomize at a higher level

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- Compartmentalize and routinize field tasks
- Randomize at a higher level
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- How can we document compliance and identify defiers
  - Document who receives what treatment
  - Identify defiers

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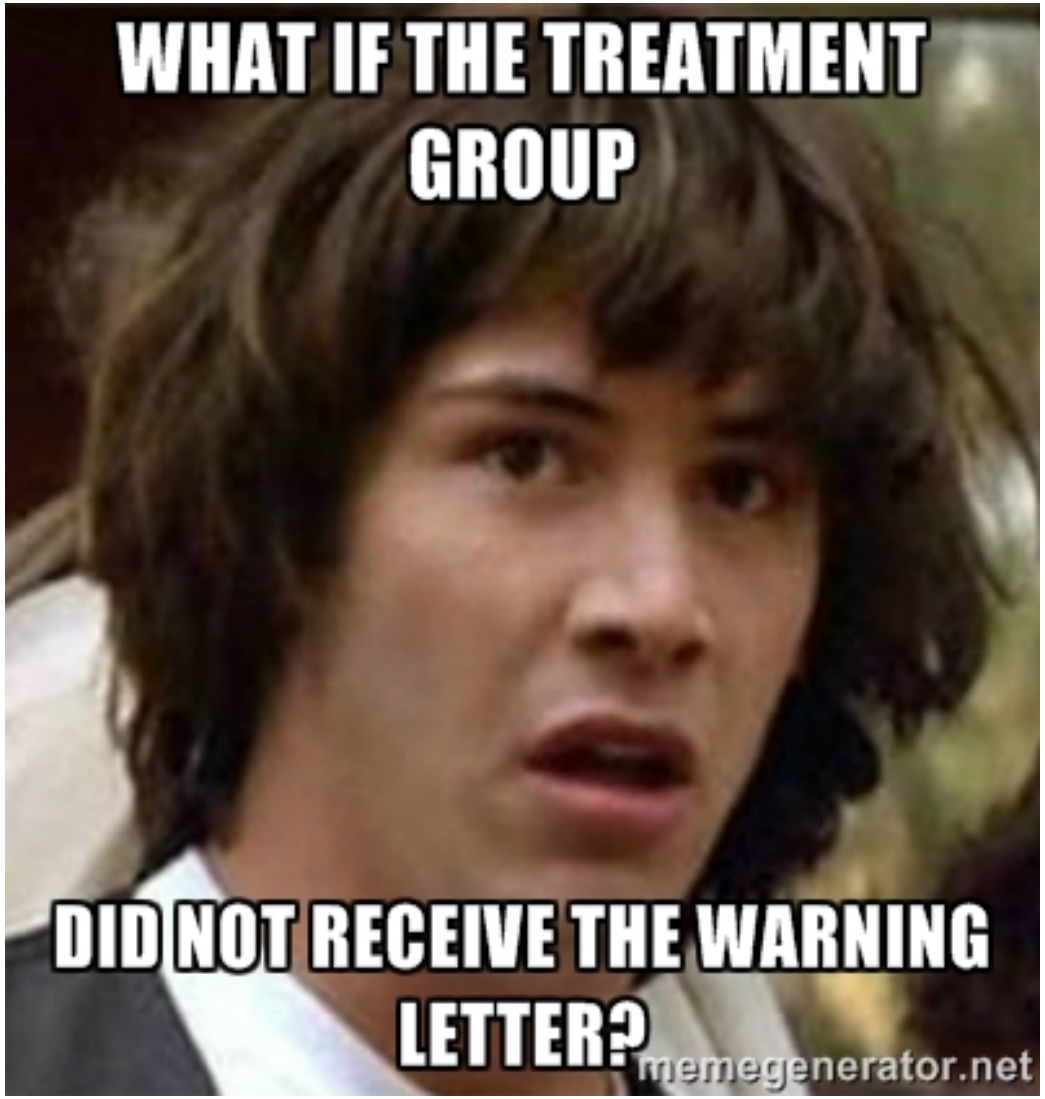

- Receiving letter = take-up
  = treatment
- Not receiving letter

➔underestimation of treatment

How to limit

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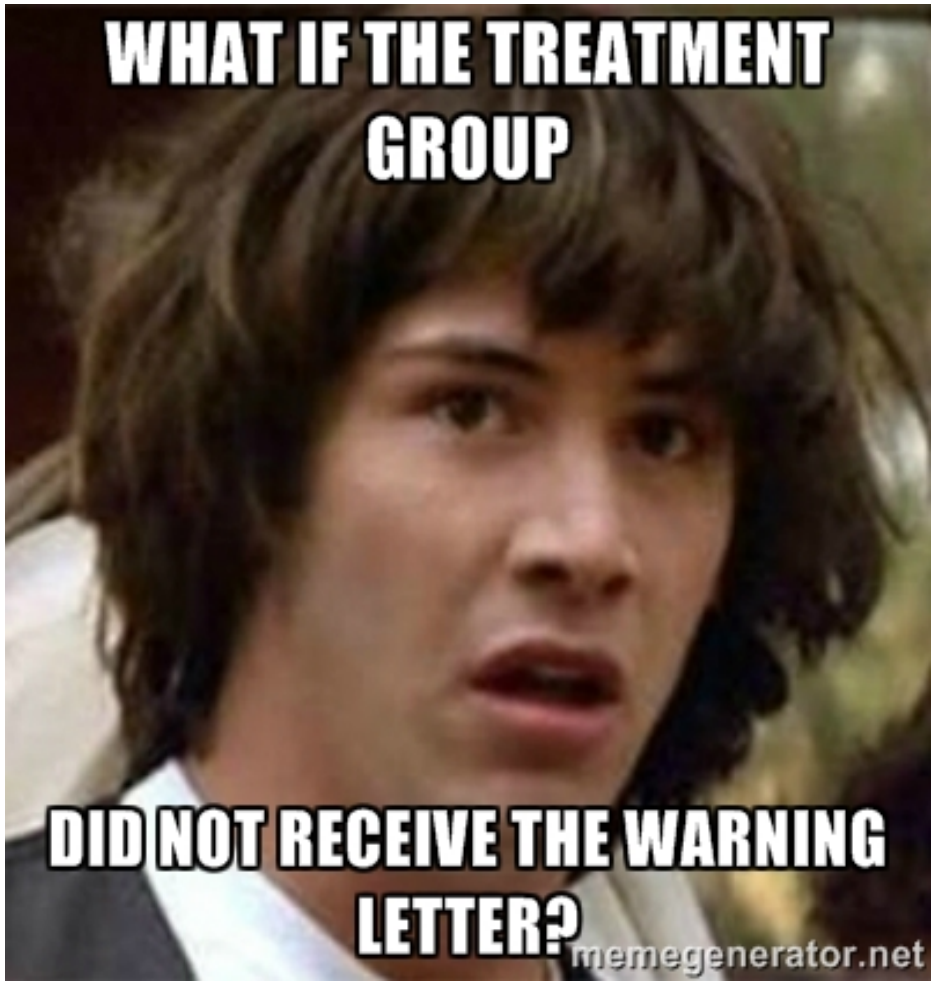
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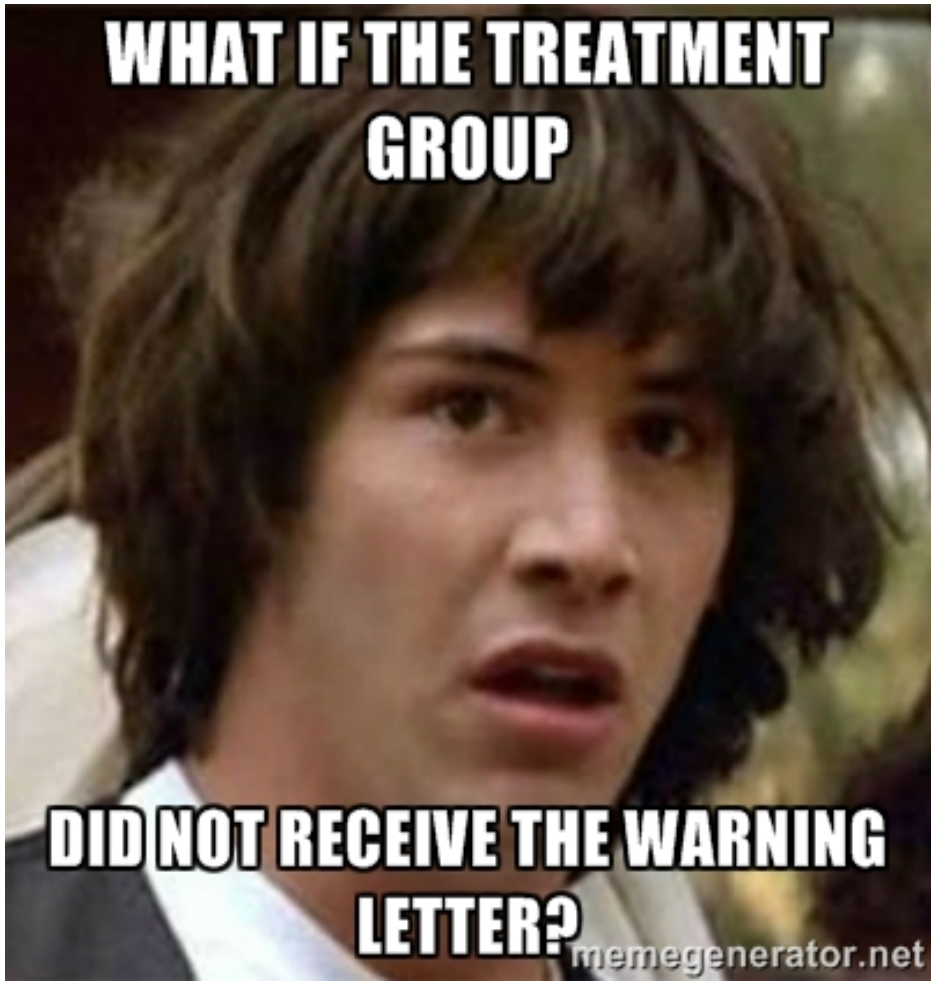

to avoid letter delivery failure

➔assign treatment to more convenient locations

2.1 attrition

- When people

➔drop out of the study and can no longer be measured

➔still participating but can not be measured

➔refuse to answer some questions

2.1 attrition

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Missing Data Problem

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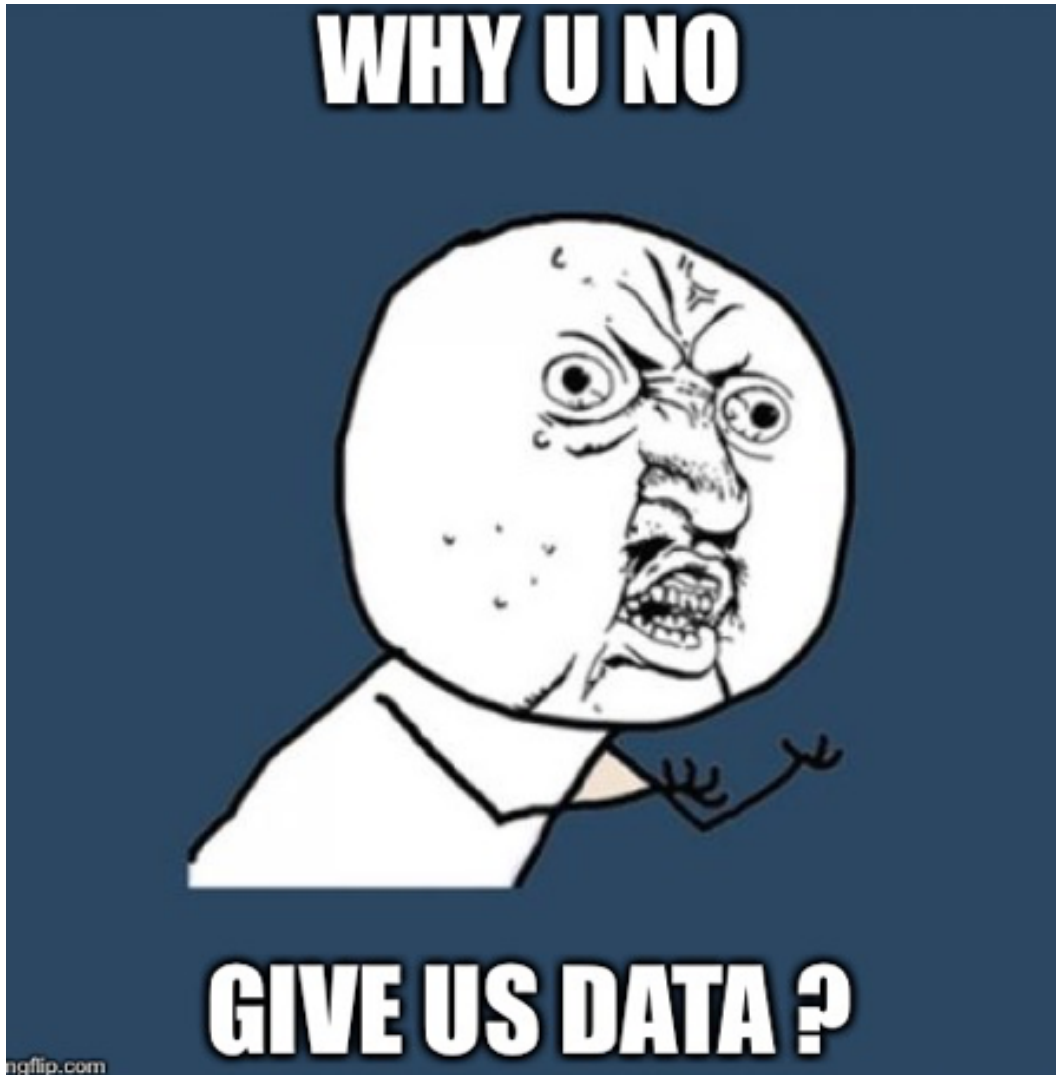

IF I LET THE CAMERA GUY IN
I WILL GET CAUGHT SOMEDAY

IF I LET THE CAMERA GUY IN
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LOCK
ALL THE DOORS

No data

➔Attrition Problem

2.2 why are they threats

Attrition can

- reduce the comparability of treatment and comparison groups
- lower the statistical power

2.3 how to limit

- Use a research design that promise access to the program to all over time
- Change the level of randomization
- Improve data collection

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- Change the level of randomization
- Improve data collection
  - Pilot the data collection instrument and procedures
  - Follow up on everyone originally randomized
  - Do not wait too long to follow up
  - Improve follow-up by collecting tracking data routinely
  - Reduce attrition through survey timing
  - Subsample
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e.g. Announced to come over at 10, arriving at 8 o'clock

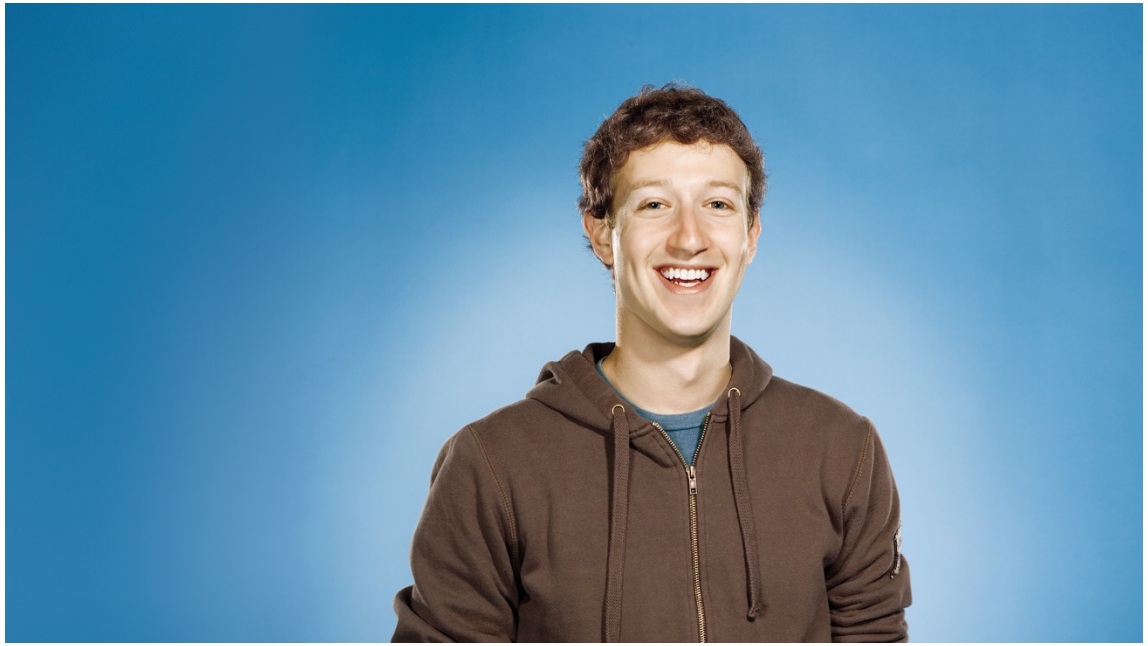
Spillovers effect,

or Externalities

3.1 Spillovers effect

- Facebook
- Data Scientist & News Feeds Algorithm Engineer& Experiment Economist

3.1 Spillovers effect



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- He wants to enhance page reach rate to earn more money

3.1 Spillovers effect

- Facebook
- Data Scientist & News Feeds Algorithm Engineer& Experiment Economist
- Zuckerberg need data to analyze and make decisions
- He wants to enhance page reach rate to earn more money
- Run a Experiment

3.1 Spillovers effect

- Target: Enhance page reach
- Control Group: some fans
  - News Feeds Algorithm A
- Treatment Group: the other fans
  - News Feeds Algorithm B
- Now You Know A or B, Which One is Better

3.1 Spillovers effect

- A lot of share!
- Treatment group and control group interact with each other
- The control group see this post is not because the News Feeds Algorithm A, but because Treatment group's share

3.1 Spillovers effect

Treatment Group

Control Group

It is Indirect effect of a program on those who are not been treated

3.1 Spillovers effect

- Physical
  - contagious disease
- Behavioral
  - imitate
- Informational (social learning)
  - Post share on Facebook
- General equilibrium effect
  - Policy encourage hire younger worker, then the firm fire older worker

3.2Why are they threats

- It reduce the quality of the counterfactual
  - Comparison outcome reflect the indirect program effect
  - Control group outcome is not absence of the program

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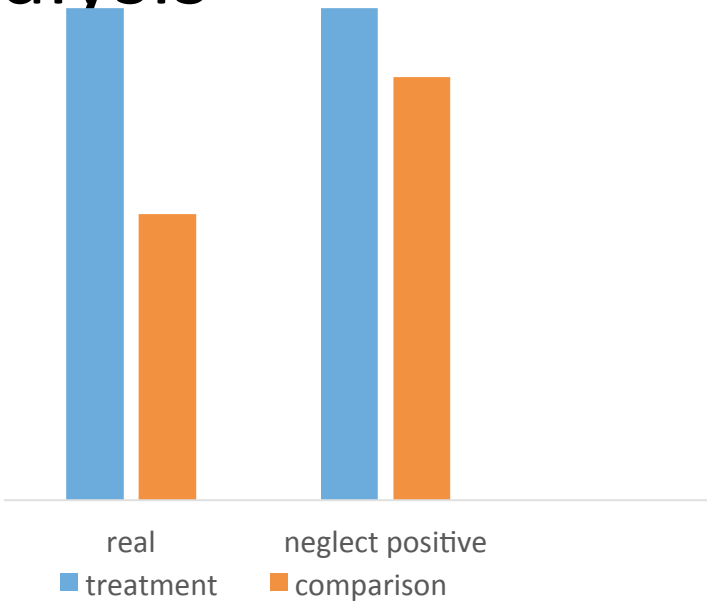
- It reduce the quality of the counterfactual
  - Comparison outcome reflect the indirect program effect
  - Control group outcome is not absence of the program
- If we do not take them into account in analysis
  - Neglect positive spillover effect:
    - underestimate
  - Vise versa



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  - Who? How? What?
  - Previous studies, theories, common sense etc.

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- Estimate by measuring outcomes of the untreated in or near the treated units
  - Afghanistan Election Fraud case: Test Spatial Externalities and chilling effect
  - Facebook : computer (numerical) simulation, cluster

4.1Evaluation-driven effect

- Hawthorne effect
- John Henry effect
- Resentful demoralization effect
- Demand effect
- Anticipation effect
- Survey effect

Hawthorne effect

- When the treatment group works harder
- They feel lucky, don’t want to waste this rare opportunity
- they think that they are “chosen”
- They are thankful and don’t want to fail the program
- Hawthorne Works(霍桑工廠)

John Henry effect

- When the comparison group compete with the treatment group
- John Henry worry that after steam drill were introduced, he would become redundant, so he work harder.
- He challenge steam engine and win the competition but died from overexertion

Resentful demoralization effect

- When the comparison group resents not being given the treatment, they behave worsen
- The treatment is desirable

Demand effect

- Stanford prison experiment
- Some play guards, some play prisoner
- Demand effect critics

- When the participant change their behavior in response to their perception of what the evaluator is trying to test

Anticipation effect

- When the comparison group change their behavior because they think they will receive the program in the future
- Phase-in design
- Micro-finance program

Survey effect

- When being surveyed can change the future behavior
- Frequent test change students test skill especially in multiple choice question

Evaluation-driven effect	Treatment group	Comparison group
Do better	Hawthorne effect	

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Survey affect what they do	Survey effect	Survey effect

4.2Why they are threats

- Undermine power and generalizability
  - Afghanistan Election Fraud case: does it still work in other country?
- Undermine comparability
  - Program effect instead of treatment effect
- Bias impact estimate
  - Inflate the difference : Hawthorne effect and Resentful demoralization effect
  - Deflate the difference : John Henry effect

4.3How to limit

- Use a different level of randomization (Module 4.2)
- Do not announce the phase-in
- Make sure the staff is impartial
- Make sure the treatment and comparison groups get equivalent interaction with evaluation staff
- Measure the evaluation-driven effects on a subset of the evaluation sample

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Conclusion

- Partial compliance
- Attrition
- Spillovers
- Evaluation-Driven Effects
- Identify them , know why they are threats and try to fix them