How to Randomize?

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Overview

1. Opportunities to Randomize
2. Define the target group
3. Select program features to evaluate
4. Level of randomization
5. Should you evaluate?
**Video:** Opportunities to Randomize
Basic setup of a randomized evaluation

- Target Population
- Random Sampling
- Evaluation Sample
- Baseline Survey
- Random Assignment
- Treatment group
- Control group
- Endline Survey

- External Validity
- Internal Validity
- Balance Check
- Measure Impact
Randomly sample from area of interest

Random sampling and random assignment
Randomly sample from area of interest

Randomly assign to treatment and control

Randomly sample from both treatment and control
Random sampling and random assignment

Income per person, per month, shillings

1457  1442

1000

500

0  Treat  Compare
Opportunities to Randomize when Resources are Limited
Lottery when Oversubscription

More are eligible than can be served by the program
Lottery when oversubscription:
Youth Group Support Uganda
Targeted Lottery

Exclude some from the lottery

Include others
Targeted Lottery

Randomize the rest of the eligible population
Randomly vary *when* to receive program

- **Before**
- **During**
- **After**

*Time*

**Evaluation period**
Randomly vary when to receive the program: Preschools in Cambodia
Randomly vary program strength
Summary: opportunities to randomize

Consider

1. **Targeting rules**: Who is eligible for the program? Is program participation restricted, widely open, some combination?

2. **Resources**: Sufficient program resources to reach all eligible beneficiaries?

3. **Timing**: How are potential beneficiaries enrolled in the program – all at once or in phases over time?
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Whom does this program hope to benefit?

Whole Population

Target Population

Not Eligible
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Testing multiple program features

Target Population

Not in evaluation

Evaluation Sample

Random Assignment

Treatment Group 1

Treatment Group 2

Treatment Group 3

Control Group
Cross-cutting program features

- Target Population
- Evaluation Sample
- Not in evaluation

Random Assignment:

T1  C1
T2  T1*T2  T2
C2  T1  C
Learn more with multiple treatments

Scholarship program in Cambodia.
- In 52 schools, well-performing pupils received a merit scholarship
- In 51 schools, poor pupils received a poverty-targeted scholarship
- 105 schools were control
Learn more with multiple treatments

Teacher bonus program in India

• 100 schools – individual bonus
• 100 schools – group bonus
• 100 schools – cash grant
• 100 control
Learn more with multiple treatments

Early Child Nutrition and Development program in Colombia. Villages randomized into 4 groups:

• 24 - stimulation
• 24 - micro-nutrients
• 24 received both.
• 24 in control
Overview

1. Opportunities to Randomize.
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4. Level of randomization.
5. Should you evaluate?
Which level of randomization?

INDIVIDUAL unit:
- e.g. pupil, mother, father, household

CLUSTER unit:
- e.g. class, health clinic, village
Which level of randomization?

Individual or Cluster?
Which level of randomization?

Individual
Which level of randomization?

Cluster (group)
Which level of randomization?

For example, school
Which level of randomization?
Factors that matter

1. Unit of Implementation
2. Spillovers
3. Sampling unit and statistical power
4. Ethics and Fairness
Which level of randomization?

- Community
- School
- Class
- Pupil

Unit of randomization should be at least at the level of the unit of program intervention:

Example:

IF program targets *classes* ->
Randomization may be at class, school, community level.
Which Level of Randomization?

A. Unit of Implementation

B. Spillovers: individual in the control also benefits from the treatment

C. Sampling and Cost

D. Ethics and Fairness
With spillovers over/under-estimate impact

Impact

Treatment

Spillover

Control

Measured Impact

True Impact
Higher unit of randomization reduces risk of spillovers

Example: randomize at school level to reduce interaction between treatment and control pupils
Question: Is there risk of spillovers in the following programs?

• Example 1: Job training program

• Job seekers in the control are less likely to get jobs as a result of the program, if the available jobs are given to those who received training.

• Measured program impact = jobs in treatment – jobs in comparison

• As a result, measured program impact is higher than the real program impact
**Question:** Is there risk of spillovers in the following programs?

- Example 2: **HIV-AIDS education program**

- People who attend education program will tell their friends

- Measured program impact = HIV-aids awareness in treatment – HIV-aids awareness in comparison

- As a result, *measured* impact is lower than the *real impact*
Which Level of Randomization?

A. Unit of Implementation
B. Spillovers
C. Sampling unit and statistical power
D. Ethics and Fairness
Higher unit of randomization requires larger sample

**Same statistical power:**

**School randomization:**
- 800 in treatment and 800 in control ....in
- 40 treatment and 40 control schools, 20 pupils per school

**Pupil randomization:**
- 393 in treatment and 393 in control

Assume intra-cluster correlation of 0.05
Need to increase number of clusters, not number of individuals per cluster

For example, the following two studies have the same power:
• 80 clusters, 20 individuals per cluster
• 40 clusters, 1067 individuals per cluster
That’s 1,600 individuals compared to 42,680!

Assume intra-cluster correlation of 0.05
Which Level of Randomization?

A. Unit of Implementation  
B. Spillovers  
C. Sampling unit and statistical power  
D. Ethics and Fairness
Sometimes perception of unfairness among control if randomizing peers, community members etc. at *individual* level
Less so if all in same group or village are in the control
Which Level of Randomization?

A. Unit of Implementation
B. Spillovers
C. Sampling unit and statistical power
D. Ethics and Fairness

Randomize at the smallest feasible level
Some Examples
At what level should we randomize for a school deworming program?

A. School
B. Teacher
C. Classroom
D. Clinic
E. Community
F. Pupil
At what level should we randomize for a conditional cash transfer program?

A. Individual
B. Household
C. Village/Community
At what level should we randomize for a teacher training program?

A. School
B. Teacher
C. Classroom
D. Pupil
At what level should we randomize for a small-business start-up grant?

A. Individual
B. Household
C. Clinic
D. School
E. Village/Community
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Does this need an Impact Evaluation?

Maximize learning

**Consider**

1. Do we know the answer already?
2. Is it policy relevant?
   a) Is this a program that government could scale up if it is successful?
   b) Is it strategically relevant for reducing poverty?
3. Does it add to knowledge?
4. Is the program ready for an impact evaluation?
5. Are there program design options that need to be compared?
6. Is there an resource constraint that provides an opportunity for randomization?
Now is your chance to integrate an impact evaluation in your own program