

Using Randomized Evaluations to Improve Policy

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Objective

- To separate the impact of the program from other factors—what is the *causal* effect of a program?
- Need to answer the counterfactual: what would have happened without the program
- Comparison group—who, except for the program, are just like those who got the program

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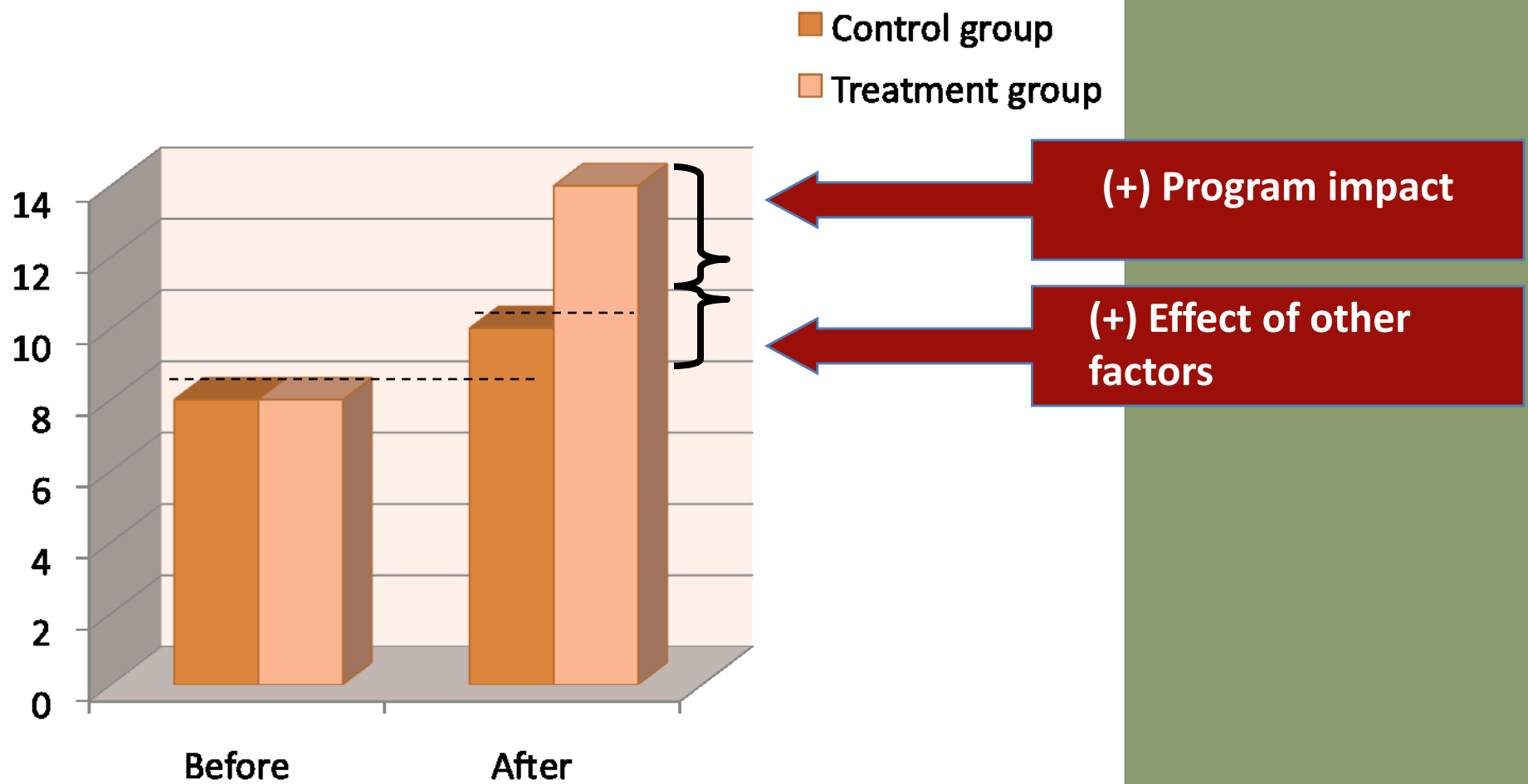
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Illustration: children learning



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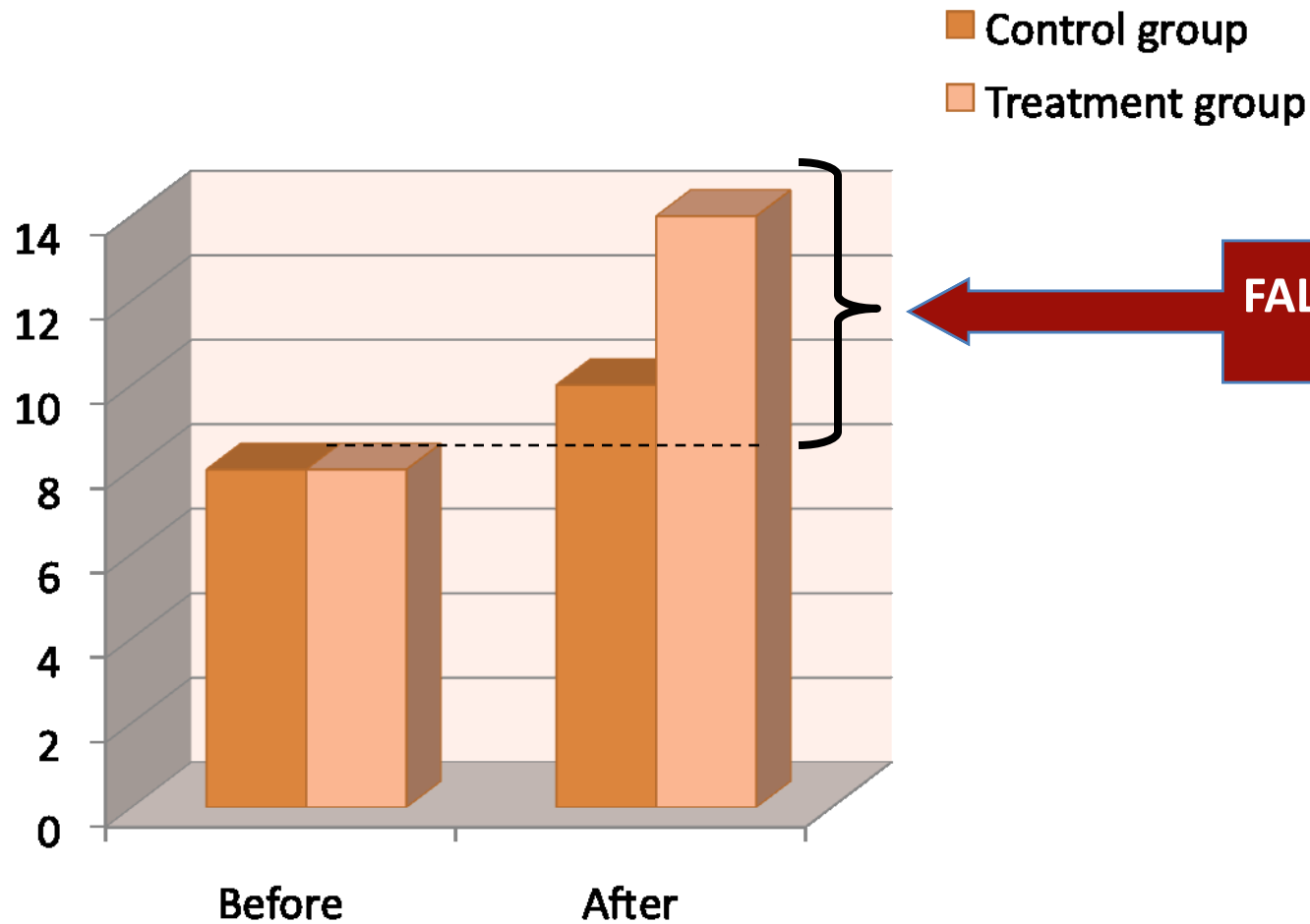


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Illustration: children learning



FALSE (+) Program Impact

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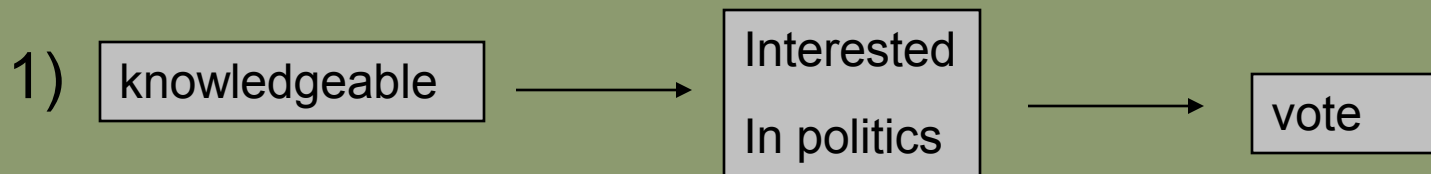


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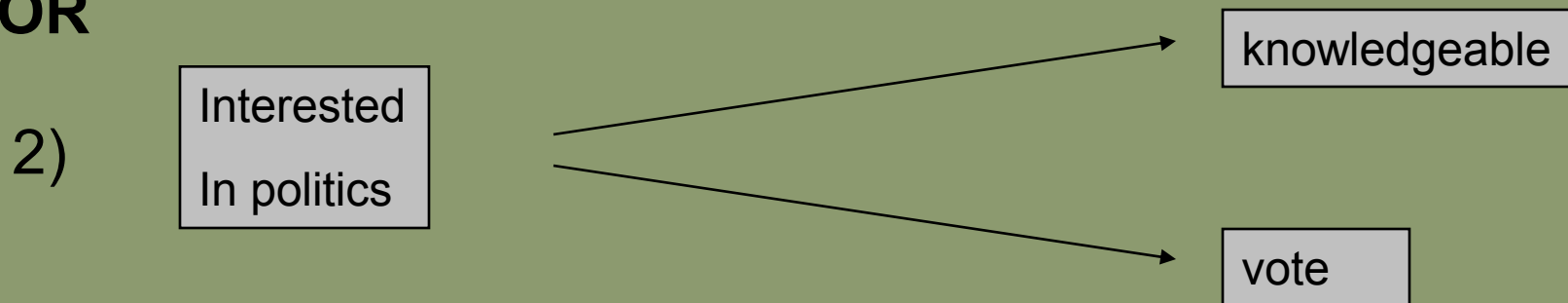
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Correlation is not causation

Knowledgeable about politics = More likely to vote



OR



Motivation

- Hard to distinguish causation from correlation from statistical analysis of existing data
 - However complex the statistics can only see that X goes with Y
 - Difficult to correct for unobserved characteristics, like motivation
 - Motivation may be one of the most important things to correct for
- Selection bias a major issue for impact evaluation
 - Projects started at specific times and places for particular reasons
 - Participants may select into programs
 - First farmers to adopt a new technology are likely to be very different from the average farmer, looking at their yields will give you a misleading impression of the benefits of a new technology

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Motivation

- Retrospective impact evaluation:
 - Collecting data after the event you don't know how participants and nonparticipants compared before the program started
 - Have to try and disentangle why the project was implemented where and when it was, after the event
- Prospective evaluation allows you to design the evaluation to answer the question you need to answer
- Allows you to collect the data you will need

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Experimental design

- All those in the study have the same chance of being in the treatment or comparison group
- By design treatment and comparison have the same characteristics (observed and unobserved), on average
 - Only difference is treatment
- With large sample, all characteristics average out
- Unbiased impact estimates

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Options for randomization

- Lottery (only some get the program)
- Random phase-in
 - (everyone gets it eventually)
- Variation in treatment
 - (full coverage, different options)
- Encouragement design (when partial take up)
 - Everyone can get it, some encouraged to get it

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Examples in agriculture

- Lottery
 - Lottery to receive information of a new ag. technology
- Random phase-in (everyone gets it eventually)
 - Train some farmers groups each year
- Variation in treatment
 - Some get information on new seed, others get credit, others get demonstration plot on their land etc
- Encouragement design
 - One farmers support center per district
 - Some farmers get travel voucher to attend the center

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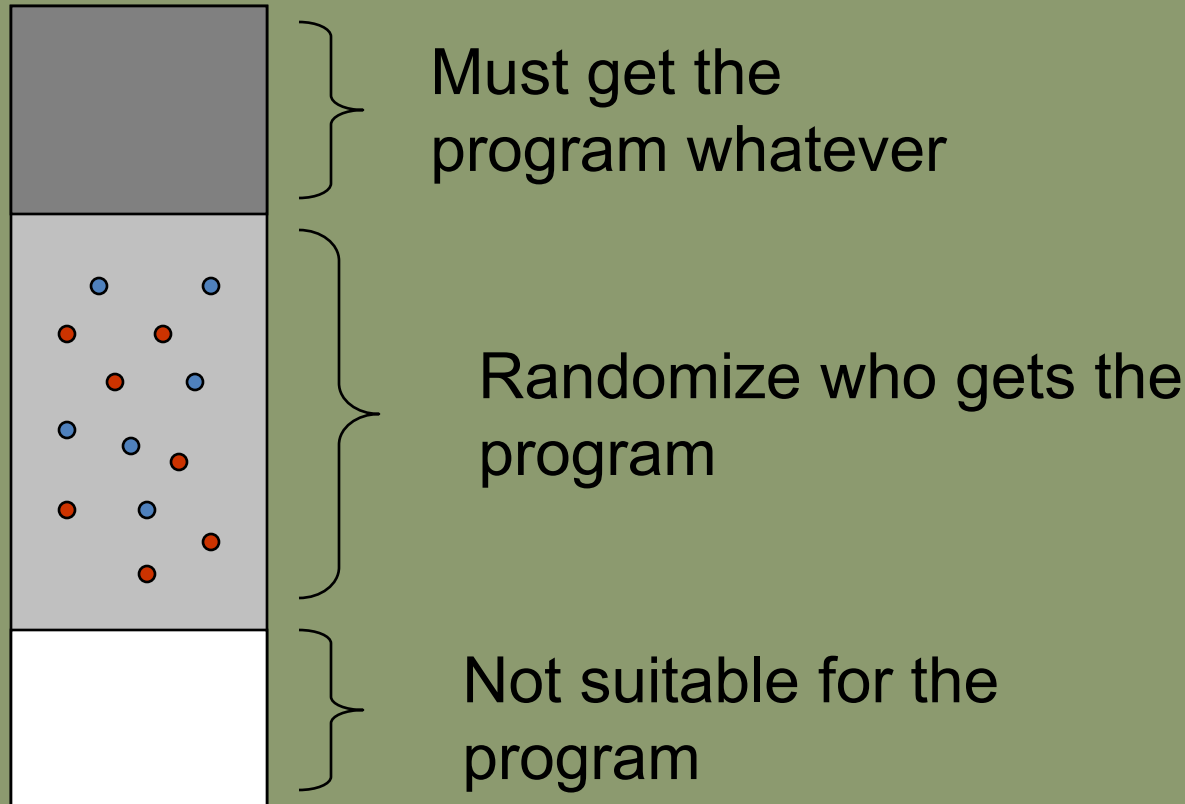
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Lottery among the qualified



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Opportunities for randomization

- Budget constraint prevents full coverage
 - Random assignment (lottery) is fair and transparent
- Limited implementation capacity
 - Phase-in gives all the same chance to go first
- No evidence on which alternative is best
 - Random assignment to alternatives with equal *ex ante* chance of success



Opportunities for randomization, cont.

- Take up of existing program is not complete
 - Provide information or incentive for some to sign up
- Pilot a new program
 - Good opportunity to test design before scaling up
- Operational changes to ongoing programs



Different units you can randomize at

- Individual
- Farm
- Farmers' Association
- Irrigation block
- Village level
- Women's association
- Youth groups
- School level

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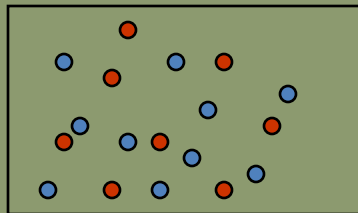
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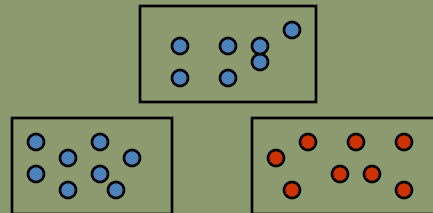
Group or individual randomization?

- If a program impacts a whole group usually randomize whole community to treatment or comparison
- Easier to get big enough sample if randomize individuals

Individual randomization



Group randomization



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Unit of randomization

- Randomizing at higher level sometimes necessary:
 - Political constraints on differential treatment within community
 - Practical constraints—confusing for one person to implement different versions
 - Spillover effects may require higher level randomization
- Randomizing at group level requires many groups because of within community correlation

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Elements of an experimental design

Target population

Commercial Farmers



Potential participants

Maize producers

Rice producers



Evaluation sample



Random assignment

Treatment Group

Control Group



- Participants
- Drop-outs

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External and internal validity

- External validity
 - The sample is representative of the total population
 - The results in the sample represent the results in the population
 - We can apply the lessons to the whole population
- Internal validity
 - The estimated effect of the intervention/program on the evaluated population reflects the *real* impact on that population
 - i.e. the intervention and comparison groups are comparable

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External and internal validity

- An evaluation can have internal validity without external validity
 - Example: a randomized evaluation of encouraging women to stand in elections in urban area may not tell you much about impact of a similar program in rural areas
- An evaluation without internal validity, can't have external validity
 - If you don't know whether a program works in one place, then you have learnt nothing about whether it works elsewhere.

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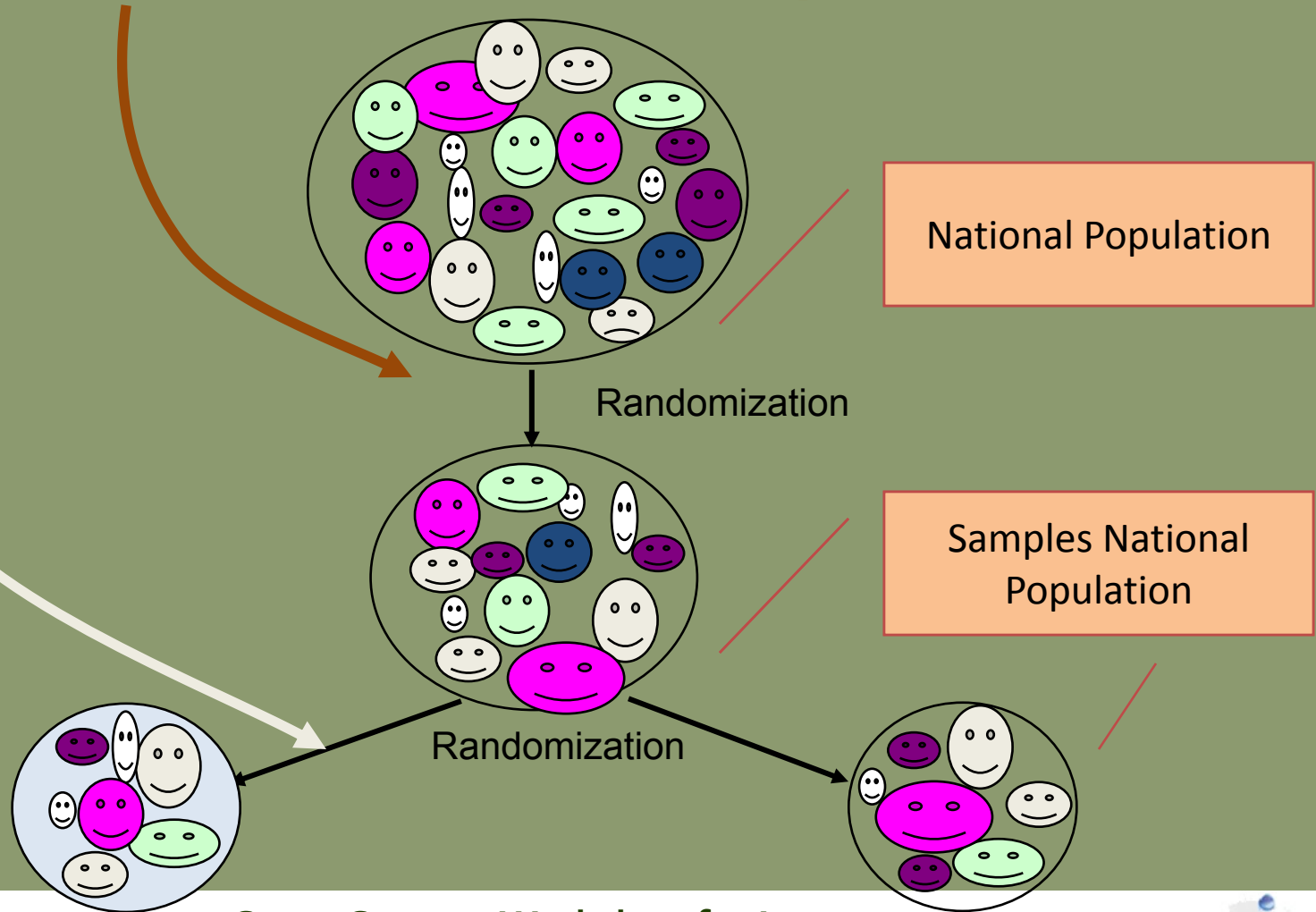


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Internal & external validity



National Population

Randomization

Samples National Population

Randomization

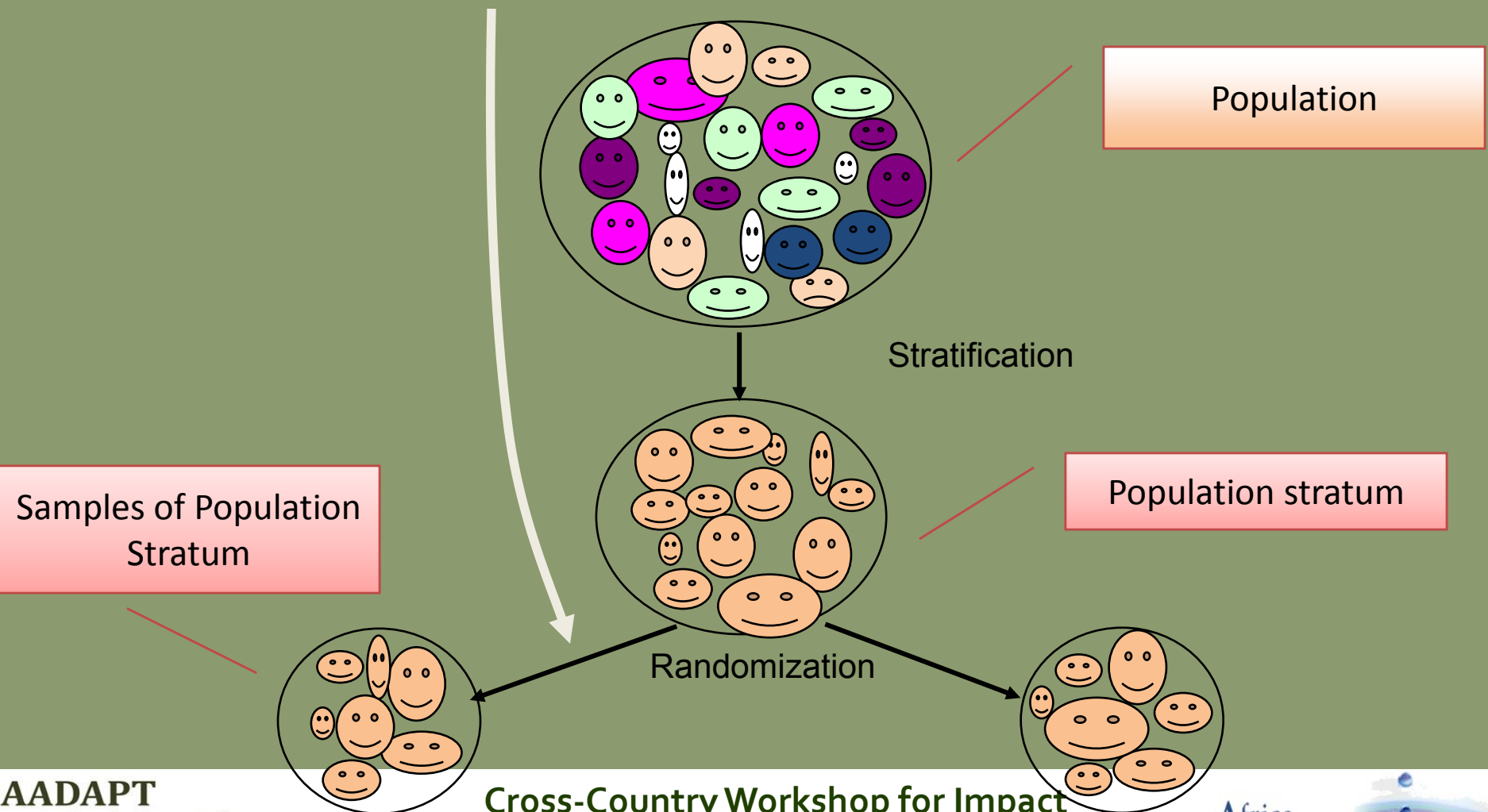
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Internal validity



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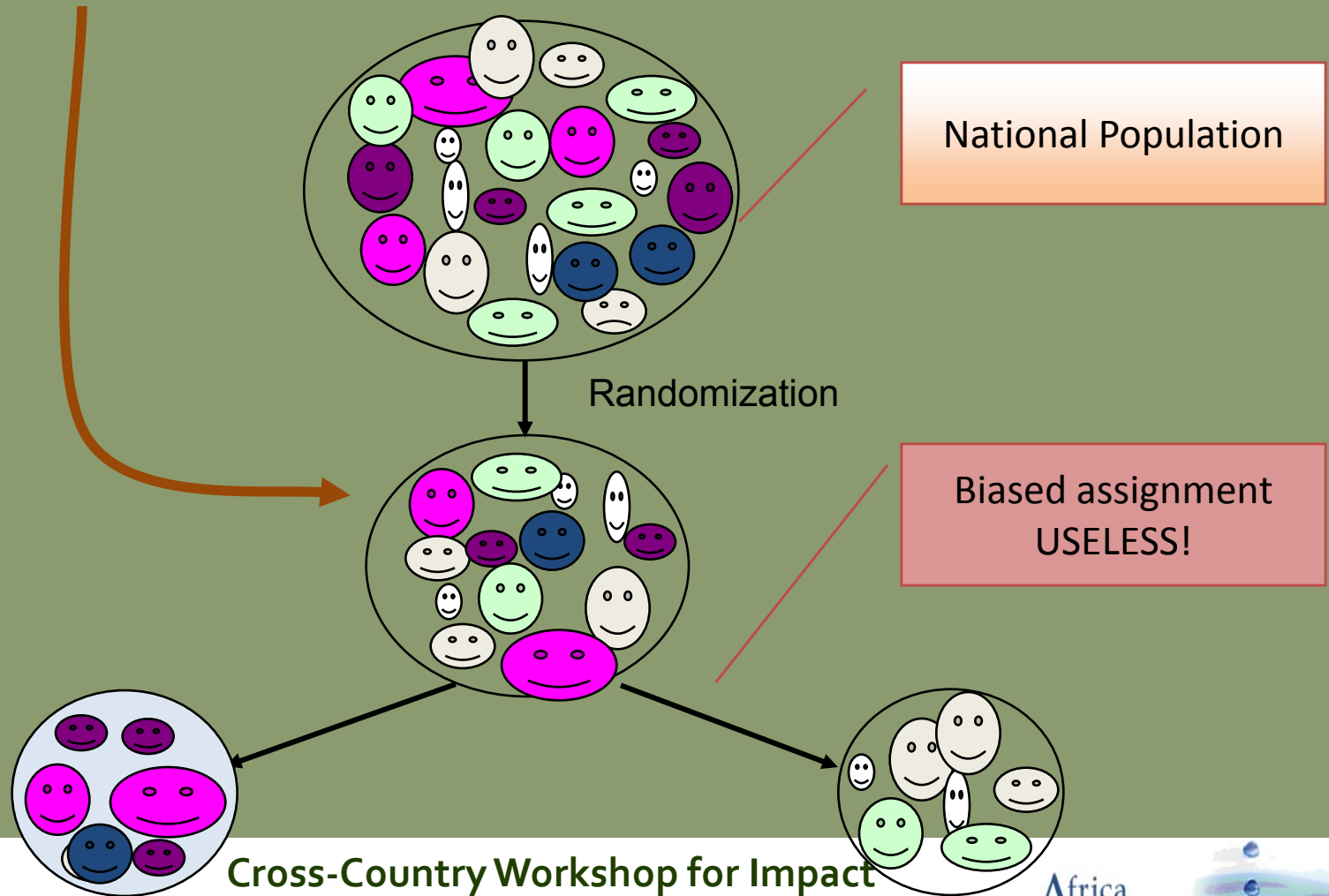
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Representative but biased: useless



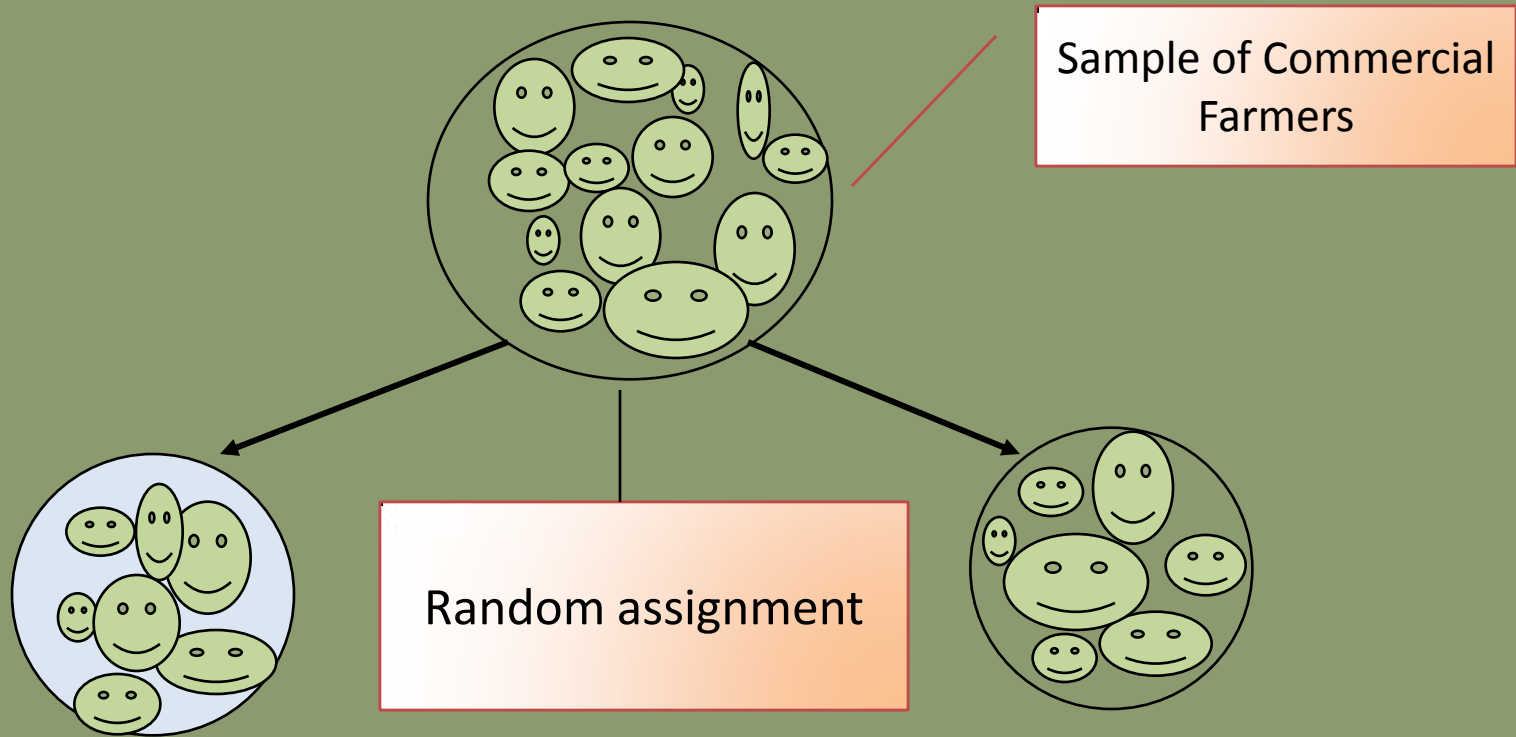
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Example: Fertilizer Vouchers Distribution, internal validity



Example: CDD in Sierra Leone

Basic sequence of tasks for the evaluation

- Listing eligible communities in target areas
 - Communities not already served by other programs and of manageable size
- Baseline data of communities
- Random assignment to GoBifo, some public draws
- GoBifo project implemented
- Follow-up survey and participatory exercise

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Efficacy & Effectiveness

- Efficacy
 - Proof of concept
 - Smaller scale
 - Pilot in ideal conditions
- Effectiveness
 - At scale
 - Prevailing implementation arrangements -- “real life”
- Higher or lower impact?
- Higher or lower costs?

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Advantages of “experiments”

- Clear and precise causal impact
- Relative to other methods
 - Much easier to analyze
 - Cheaper (smaller sample sizes)
 - Easier to explain
 - More convincing to policymakers
 - Methodologically uncontroversial

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What if there are constraints on randomization?

- Budget constraints: randomize among the most in need
- Roll-out capacity constraints: randomize who receives *first* (or *next*, if you have already started)
- Randomly promote the program to some



When is it *really* not possible?

- The treatment already assigned and announced
 - and* no possibility for expansion of treatment
- The program is over (retrospective)
- Universal take up already
- Program is national and non excludable
 - Freedom of the press, exchange rate policy(sometimes some components can be randomized)



Common pitfalls to avoid

- Calculating sample size incorrectly
 - Randomizing one district to treatment and one district to control and calculating sample size on number of people you interview
- Collecting data in treatment and control differently
- Counting those assigned to treatment who do not take up program as control—don't undo your randomization!!

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Thank You

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