



“One of the great mistakes is to judge policies and programs by their intentions rather than their results”

Milton Friedman



SDPI

Sustainable Development Policy Institute

Impact Evaluation: The Experimental Design

Sajid Amin Javed
Research Fellow
SDPI

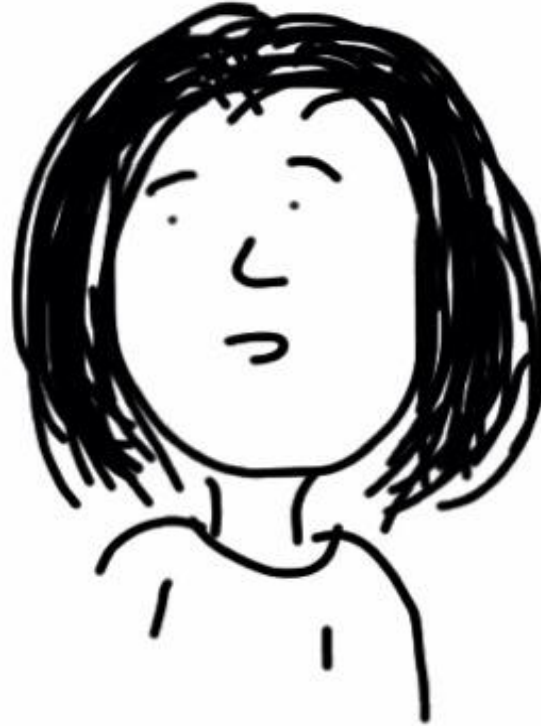
At the beginning of every evaluation



I know our
project works



No,
you don't



THEORIES OF IMPACT



Buy mine It's up-to-date, and it's full of equations



Mine is far better—more complex, yet simple,



Mine is whatever you want it to be—and it's guaranteed.



Experimental Design: The Basic Principle

- ▶ The **intervention** is the *only difference* between two groups
- ▶ This is achieved by random assignment
 - ▶ Treatment
 - ▶ **Control**
 - ▶ Factual vs. **Counterfactual**
 - ▶ What if intervention does not take place
- ▶ **Impact** = Factual - Counterfactual



We can't give your child the vaccine, she's in the control group.





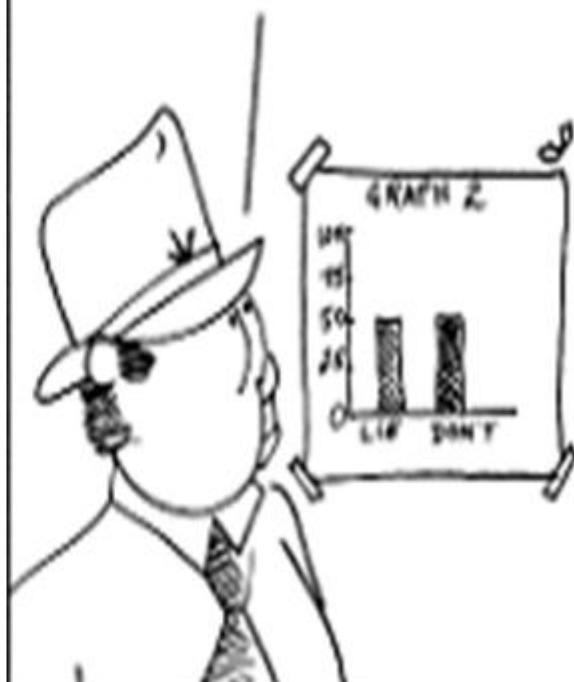
Experimental Design- Beating the Competitors

The Cox-Box

You're saying 50% of the people admit they lie on surveys?



Let me consider the impact of that for a second...

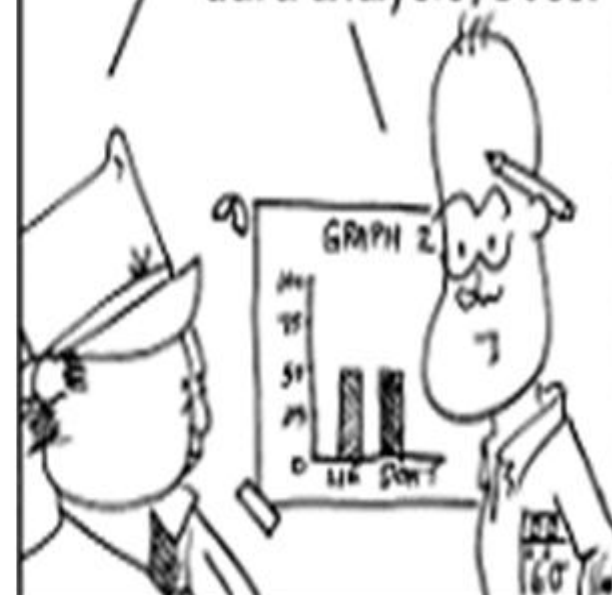


That means those who lie would say they were truthful, and those who are truthful would say they are truthful too...



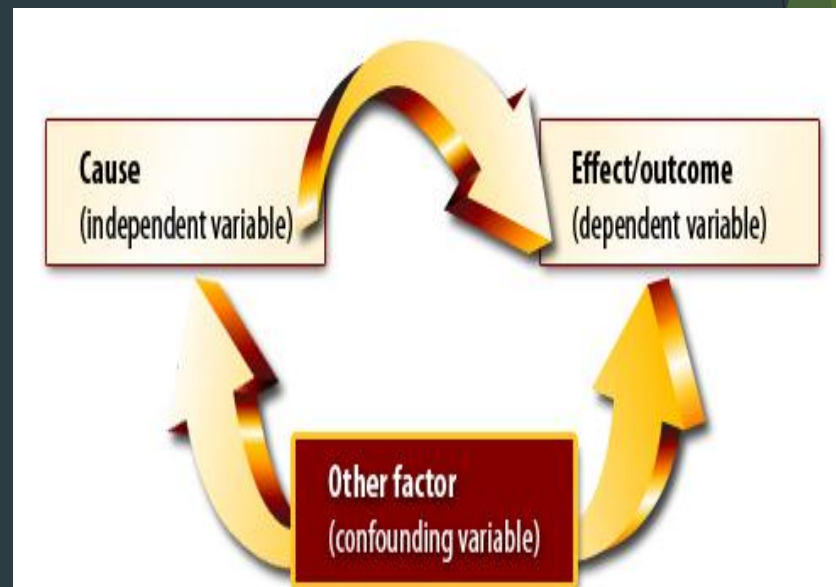
Then who do we believe?

Welcome to the world of data analysis, Boss.



Why Employ Experimental Design?

- ▶ Good way to understand the impact of an intervention because it allows us to
 - ▶ Eliminate *selection bias* (self selection)
 - ▶ (serious problem, not fully addressed in *quasi-experimental evaluations*)
 - ▶ *Control vs. Comparison Group*
 - ▶ Be sure we are comparing groups on all significant characteristics (can't always be sure with quasi-experimental designs)
 - ▶ Rules out alternative explanation(s) of the outcome(s).
 - ▶ *Confounding variables*
 - ▶ Third variables- not in the picture
 - ▶ Heavy drinkers die at young age
 - ▶ Cause: Drinking
 - ▶ Outcome: Death at young age
- ▶ The confounder? Smoking, Eat junk

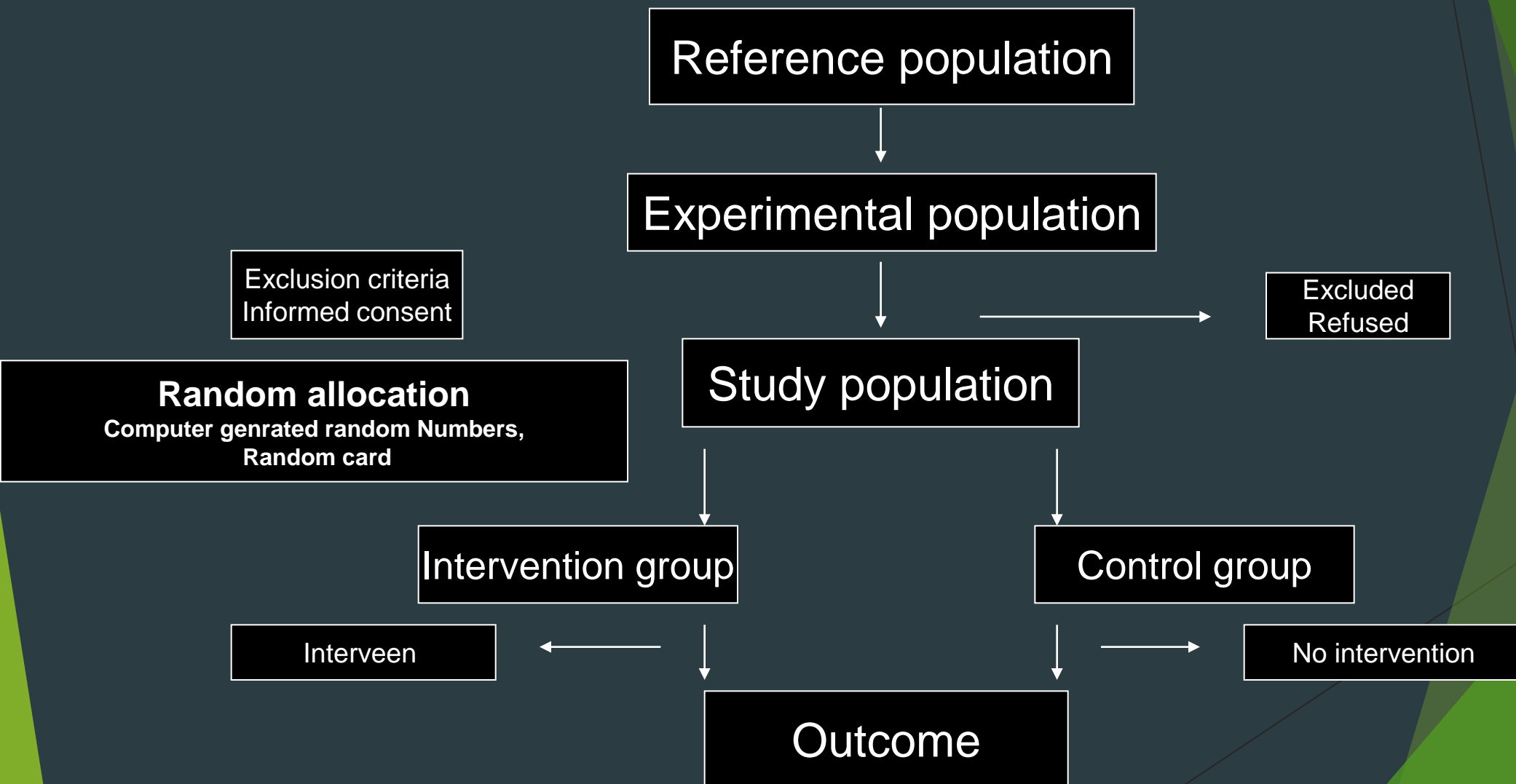


Treatment Vs. Control Group- The base, The Bad

- Select the potential target population
 - Reference population
- Identify the eligible(s)
 - Experimental Population (EP)
- **Randomly** Split the EP in to two groups
- Treatment and **Control Groups**
 - **In the Pipe line Method**
- Apply the treat on “treatment group”
- Read the impact after due time
 - What time is due in the “due time”
 - Depends
 - The nature of treatment
- Poverty reduction vs. **school enrollment**
 - **Enrollment season(s) (one or two)**
- During the project implementation



Hierarchy for Intervention- Designing the Experimental

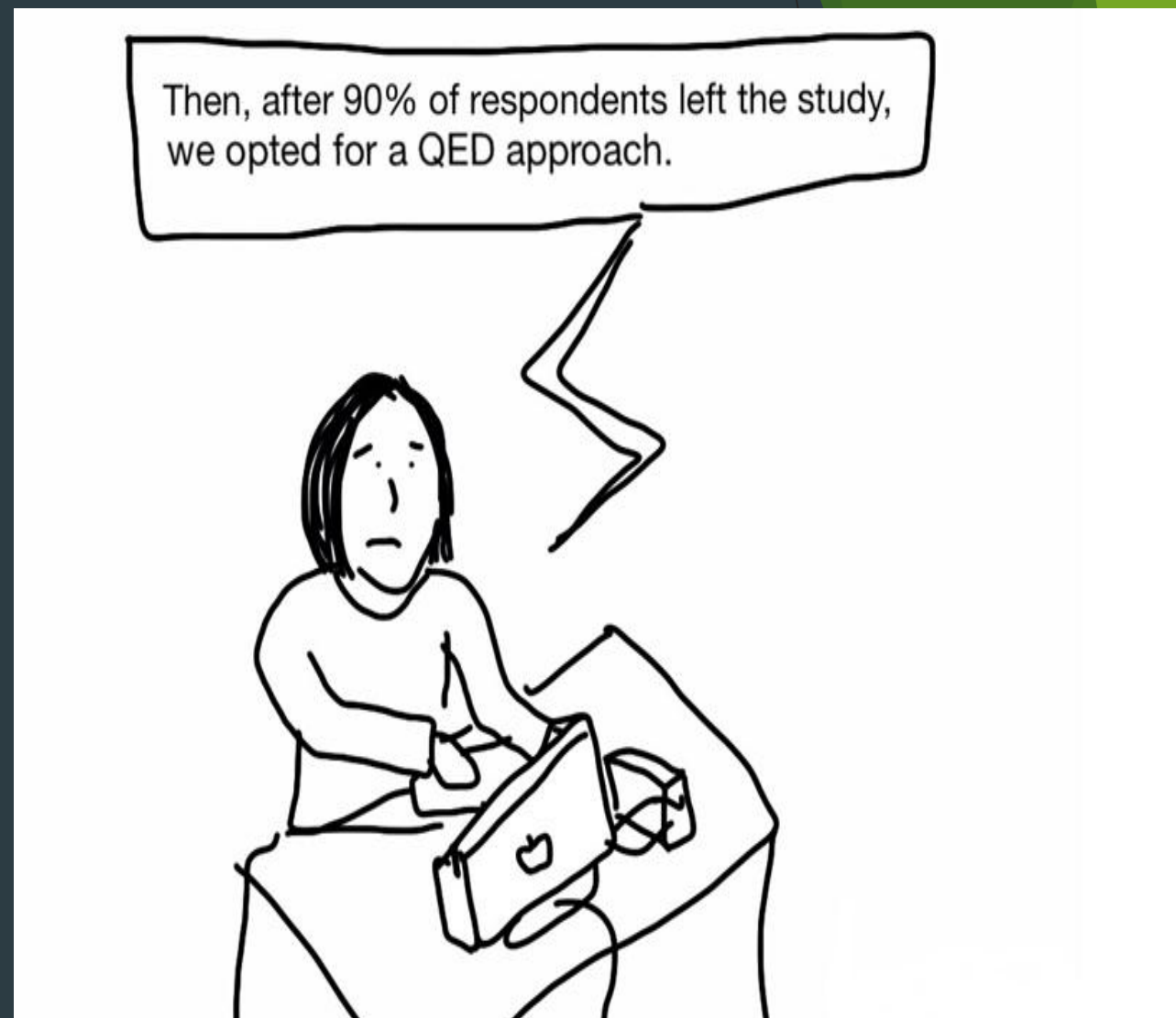


Experimental Design-The Attrition problem

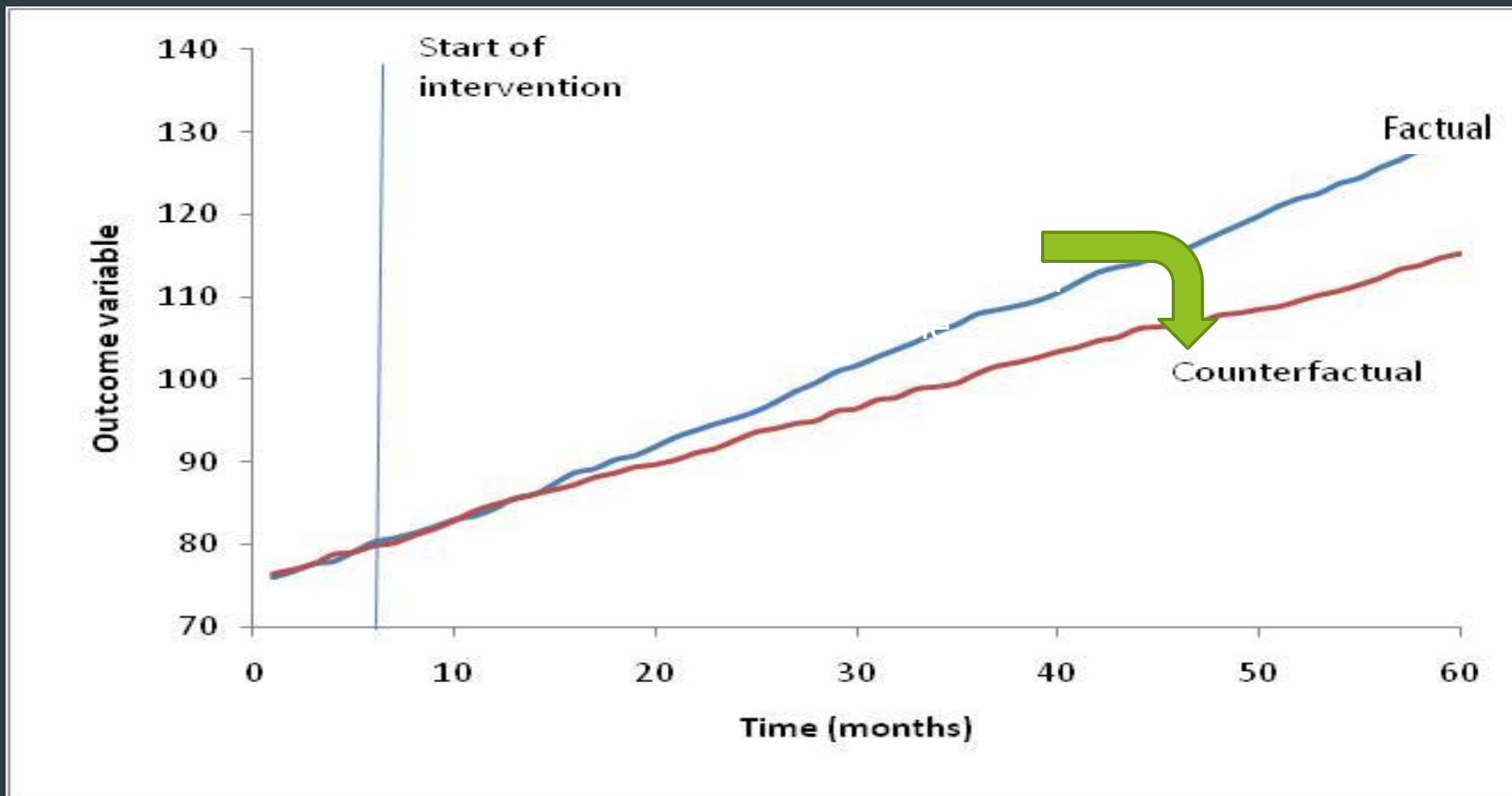
Even with kids randomly assigned into groups, if your attrition (esp. differential attrition) is high, you just lost the benefits of random assignment.

Buh.

*The sample has changed too much – now you have dropped down to a Quasi Experimental Design from the “**Gold standard**” RCT.*



RCT Ready-The Attribution Problem Trade Off





Study Designs-Summary Features

True experiment	Quasi-experiment	Non-experimental
Partial coverage/ new programs	Partial coverage/ new programs	Full coverage programs
Control group	Comparison group	--
Strongest design	Weaker than experimental design	Weakest design
Most expensive	Moderately expensive	Least expensive

Choosing a study Design



Assessment	Objective	What it says	Data needs
Adequacy: (assessment of change in outcome)	Assess whether impact was reached	Indicates whether resources were well spent or not	Outcome data collected among beneficiaries
Plausibility: (before/after comparison controlling for confounding factors)	Understand what affects the outcomes	Helps understand the determinants of success/failure of program	Outcome data plus confounders collected among beneficiaries and controls
Probability: (Causal analysis of before/after differences)	Determine the causal effect of one intervention on the outcome	Establishes precise causation between action and effect	Outcome data collected among beneficiaries and control



“How do you want it—the crystal mumbo-jumbo or statistical probability?”

Experimental Design- Gains and Pains

Advantages	Data requirements	Limitations
<ul style="list-style-type: none">• If implemented correctly, estimates of impact are 'unbiased'• Results are transparent and easily understood• Findings less subject to qualification and doubt• Variety of design variants available to cope with a range of policy contexts and intervention circumstances	<ul style="list-style-type: none">• Basic requirement to control selection into the intervention via randomisation• Recording of who has been allocated to which groups• Advisable to collect baseline data• Result measures need to be recorded for both treatment and control groups	<ul style="list-style-type: none">• Often explicit denial of the intervention for control group• Consent from participants is often required• Randomisation can influence the composition of those who participate/apply to an intervention• If participants are aware of their assignment status this can alter their behaviour and influence results• Ethical concerns• Considerable planning and design requirements• Can be costly (though not necessarily so)