PAMBANSANG PANGASIWAAN SA KABUHAYAN AT PAGPAPAUNLAD
REPUBLIKA NG PILIPINAS

STRATEGIC M&E PROJECT

UNDP

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IMPACT EVALUATION

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CITADINES ORTIGAS

DON'TS IN DIES

WHAT YOU PUT IN YOUR IE PROPOSAL COULD HARM YOU

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Objectives

- To clarify why we want you to conduct impact evaluation
  - Demonstrate capacity to produce policy-relevant, rigorous evaluation results
- To explain preference for quantitative over qualitative evidence
  - And advise to turn qualitative data into quantitative IE results
- To provide tips to make your proposed IE studies simple, coherent and doable

Presentation Outline

Topic 1 Don't get confused about what we're after

Topic 2 Don't ask too many questions

Topic 3 Don't attempt to do many things

DON'T GET CONFUSED ABOUT WHAT WE'RE AFTER IN IE

Effect of CCT on food expenditures

Suppose the total food expenditures (E) (outcome var) of the ith 4Ps-beneficiary household is related to the conditional cash transfer (C) (treatment var) and the household head's wages (W), as follows:

$$E_i = b_0 + b_1 C_i + b_2 W_i + \varepsilon_i \quad (1)$$

where ε is the error term. Suppose W is ignored and instead the following regression equation is estimated

$$Y_i = a_0 + a_1 C_i + \eta_i \quad (1')$$

Suppose W is related to C as follows (where possibly $d_1 < 0$), and μ is an error term

$$W_i = d_0 + d_1 C_i + \mu_i \quad (2)$$

Substitute (2) in (1) and rearrange terms to get

$$E_i = b_0 + b_2 d_0 + (b_1 + b_2 d_1) C_i + \varepsilon_i + b_2 \mu_i \quad (3)$$

Equating the coefficients of C_i in (1') and (3)

$$a_1 = b_1 + b_2 d_1$$

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Equating the coefficients of C_i in (1') and (3)

$$a_1 = b_1 + b_2 d_1$$

Bias in the estimated effect of CCT due to the omitted variable W (the omitted var confounds the effect of the treatment)

Illustration

- Suppose: b_1=0.8, b_2=0.7, d_1= -0.25, CCT is increased by 100 pesos, and everything else is held constant.

- According to equation (1), the increase in food expenditures:

$$\Delta E = b_1 \Delta C = 0.8 \times 100\, pesos = 80\, pesos$$

- According to equations (1') and (3), the increase in food expenditures:

$$\Delta E = a_1 \Delta C = (b_1 + b_2 d_2)\Delta C = (0.8 + (0.7 \times -0.25))100\, pesos = 62.5\, pesos$$

When to worry about the missing W?

- If there's no association between C and the omitted variable (W) (i.e., $d_1 = 0$), then $b_2 d_1 = 0$ and $a_1 = b_1$. DON'T WORRY
- If there is no association between outcome (E) and omitted variable (W) (i.e., $b_2 = 0$), then $b_2 d_1 = 0$ and $a_1 = b_1$. DON'T WORRY
- If $cor(W, C) = 0$, then estimating (1) will not affect the estimate of b_1. DON'T WORRY
- When the treatment and control groups have balanced covariates (characteristics) prior to treatment, the estimate of b_2 (in equation 3) will be statistically insignificant.

Why are there omitted variables?

- The omitted variable is unobserved.
  - In principle the variable can be measured, but was not (i.e., data not available).
  - It can't be measured in principle/practice (technical, ethical or legal reasons).
- When a specific criterion for selection into treatment is not observed (and thus not controlled for), the resulting omitted variable bias is called selection bias.
  - Self-selection = participants self-selected themselves. Usually the case when participation is voluntary among the eligible population.
  - Program placement = when group of eligible participants are purposely selected.

So, what are we after?

- An estimate of the effect/impact of the treatment/intervention on the outcome.
  - We're after an unbiased estimate.
  - While there are many omitted variables, we need to worry ONLY about those that are related to or correlated with the treatment variable.
  - We after the IE method(s) appropriate to address the potential bias due to the important omitted variable(s).
- Qualitative results & communication strategies are important; but without the impact estimate there's no REAL story to qualify or disseminate.

DON'T ASK TO MANY QUESTIONS

Recall, the basic IE question

What is the impact of the program on the target population?

Program (or intervention)	Target population (or program participants)	Outcomes (effects or consequences)
Insurance premium subsidy	Informal-sector workers without insurance coverage	Voluntary enrollment in a social health insurance scheme
School feeding program	School children (7-10 years old) who are malnourished	Nutritional status (weight-for-age z scores, underweight)
Fertilizer subsidy	Farmers in rural villages	Harvest (sacks of rice/hectare) Volume of sales
Piped water connection	Rural households	Incidence of diarrhea in children 0-5 years old

By impact, we mean . . .

What is the impact of P on Y?

Answer:

$$\alpha = (Y|P = 1) - (Y|P = 0)$$

- The impact of the program (α) for the target individual is the difference in the outcomes if she participated ($Y|P{=}1$) and did not participate ($Y|P{=}0$) in the program.
- Or, the impact is the difference in the outcome that can be attributed to the program.

Desiderata in framing the IE question

- Outcome of interest
  - Could be an output, outcome or impact variable (in the theory of change)
- Treatment unit (in the target population)
  - Individual, family/household, community
- Intervention or treatment
  - Uniform/homogenous for the relevant treatment group
- Counterfactual
  - Control unit (same as the treatment unit)

Illustration

Suppose that a year ago Q city government completed a health project comprising three 3 interventions that covered its only 4 barangays as follows;

Barangays	Establish a Rural Health Unit in each barangay (facility, personnel & supplies)	Health promotion for pre-natal care (complete house-to-house campaign)	Free dialysis in accredited clinics (for any poor resident who needs dialysis care)
UP Campos	YES	YES	YES
Bala-balara	YES	NO	YES
Krus na Lugas	YES	YES	YES
Javier Village	YES	NO	YES

Which are proper IE questions? Which can be answered?

- How has the health project of city government impacted the welfare of its constituents? Has it enabled its people live a matatag, maginhawa at panatag na buhay? Is it sustainable? Inclusive?
- What is the impact of the health project on the overall health status of the city's constituents?
- Has the establishment of the Rural Health Unit improved health care utilization (i.e., OP visits/consultations) of barangay residents?
- Has the health promotion campaign saved mothers from pregnancy-related deaths?
- What is the effect of the establishment of the RHU and health promotion on the OP visits of pregnant women and mothers?
- Does free dialysis increase the food consumption of the poor? Has it prolonged their lives?

DON'T ATTEMPT TO DO MANY THINGS

Basically, only two tasks

$$\alpha = (Y|P = 1) - (Y|P = 0)$$

Measure the outcome with treatment (EASY SINCE THIS IS OBSERVED)

Measure the outcome without treatment (DIFFICULT SINCE NOT OBSERVED)

Use comparison or control group with similar baseline characteristics as treatment group KEY TO CREDIBLE COUNTERFACTUAL

Do IE methods achieve covariate balance?

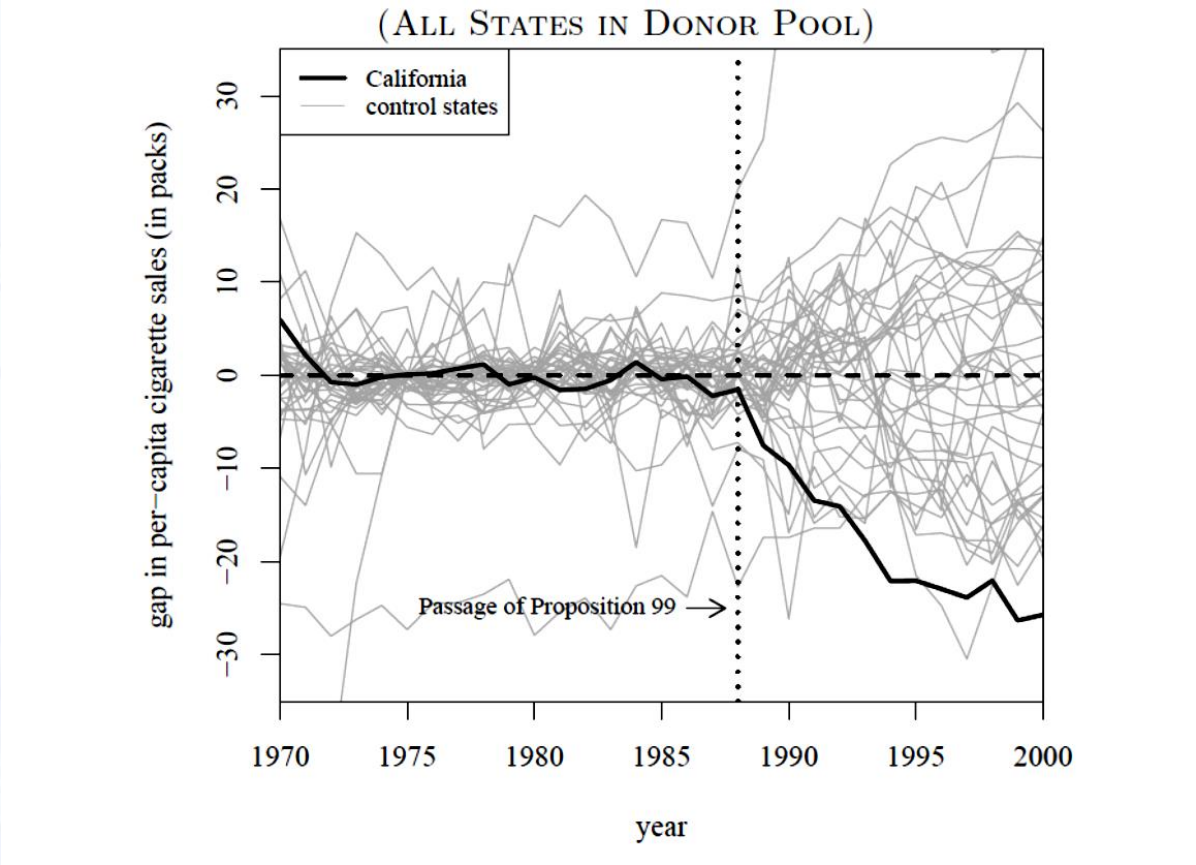
Methods	OBSERVED Characteristics	UNOBSERVED Characteristics	Remarks
RCT	YES	YES	As random samples from the same population, both the treatment and control groups share average characteristics of the population.
RDD	YES	YES	But only for the subset of treatment and control units around the threshold.
DID	YES	NO	But eliminate the bias due to the unobserved time-invariant, unit-specific characteristic.

Do IE methods achieve covariate balance?

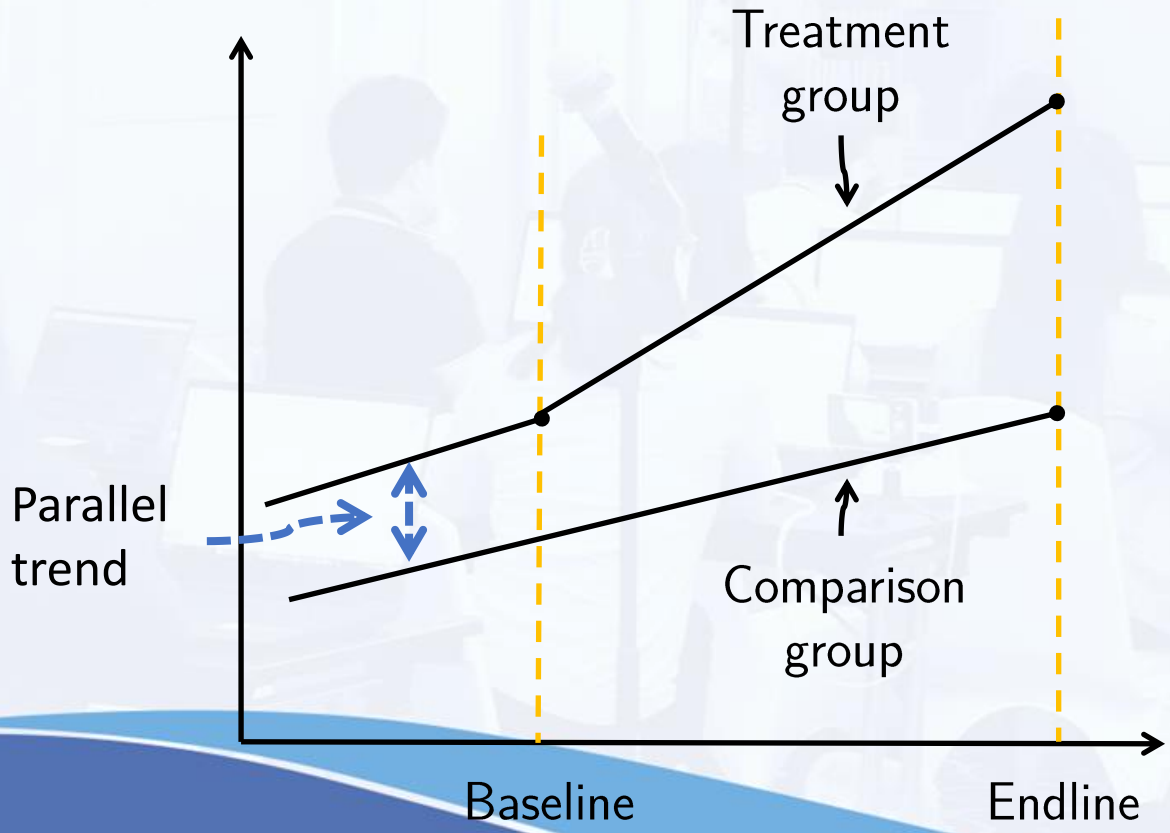
Methods	OBSERVED Characteristics	UNOBSERVED Characteristics	Remarks
IV	YES	YES	But only for treatment and control units whose treatment status is responsive to the IV.
SCM	YES	?	However, the idea is that if the synthetic control mimics the treatment unit closely prior to intervention, then two are assumed to have similar unobserved characteristics.
Matching	YES	NO	Exact matching or propensity score matching rely on observed covariates.

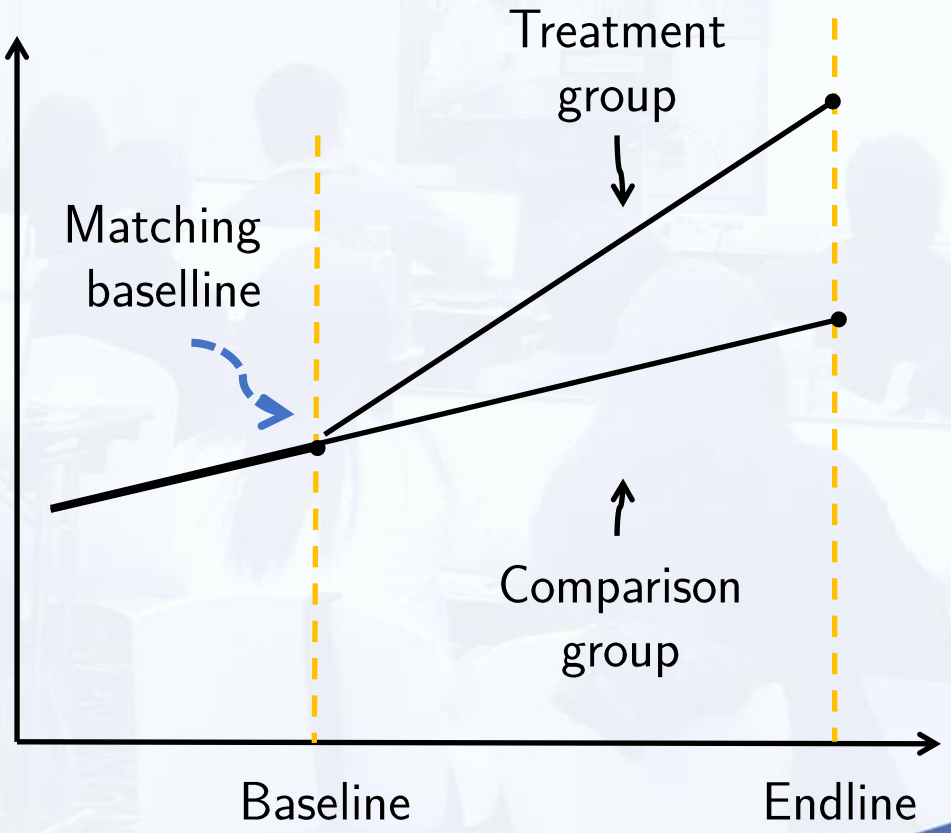
So you're excited to use SCM

- Need a donor pool comprising units that do better and do worse than the treatment unit in the outcome of interest.
  - Since the SC is a "weighted average" of the those in the donor pool.
- Need a fairly long time series to establish the SCM tracks the treatment unit very well prior to intervention.

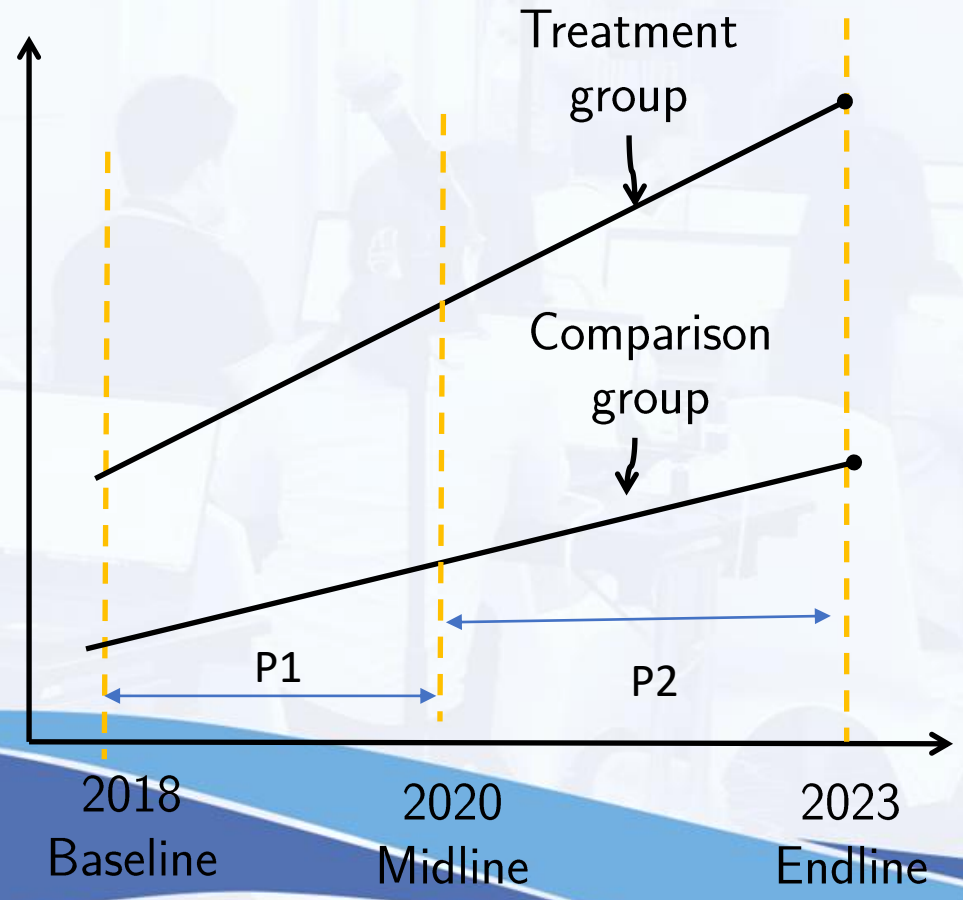


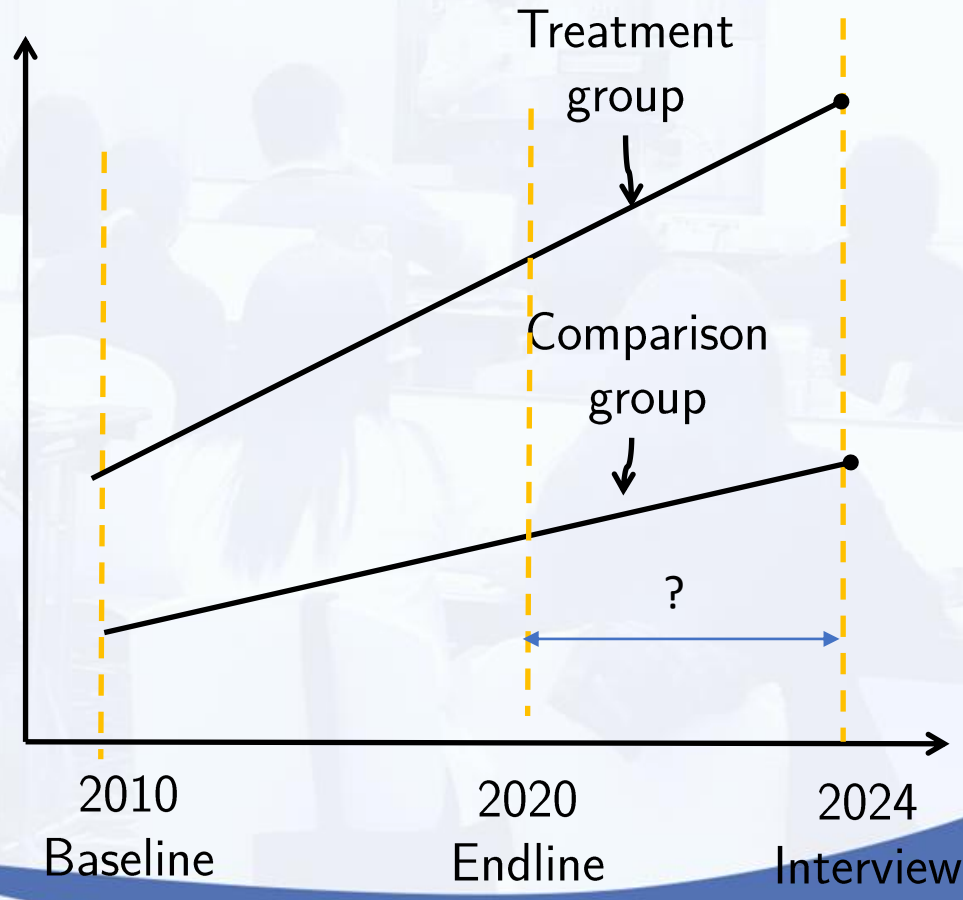
DiD with Matching





DiD WITH MANY OR LONG-PAST INTERVENTIONS





DiD with panel data

Panel data: $Y_{ij} = \alpha + \beta T_i + \delta t + \gamma(T_i \times t) + \varepsilon_i + \boldsymbol{\mu_{ij}}$			
	Pre-treatment outcome (t=0)	Post-treatment outcome (t=1)	Difference (also eliminates fixed effects ε)
Treatment units (T=1)	$\alpha + \beta + \varepsilon_i$	$\alpha + \beta + \delta + \gamma + \varepsilon_i$	$\delta + \gamma$
Control units (T=0)	$\alpha + \varepsilon_k$	$\alpha + \delta + \varepsilon_k$	δ
Difference-in-Difference			γ (estimate of the average impact)

DiD WITH POOLED CROSS-SECTION DATA

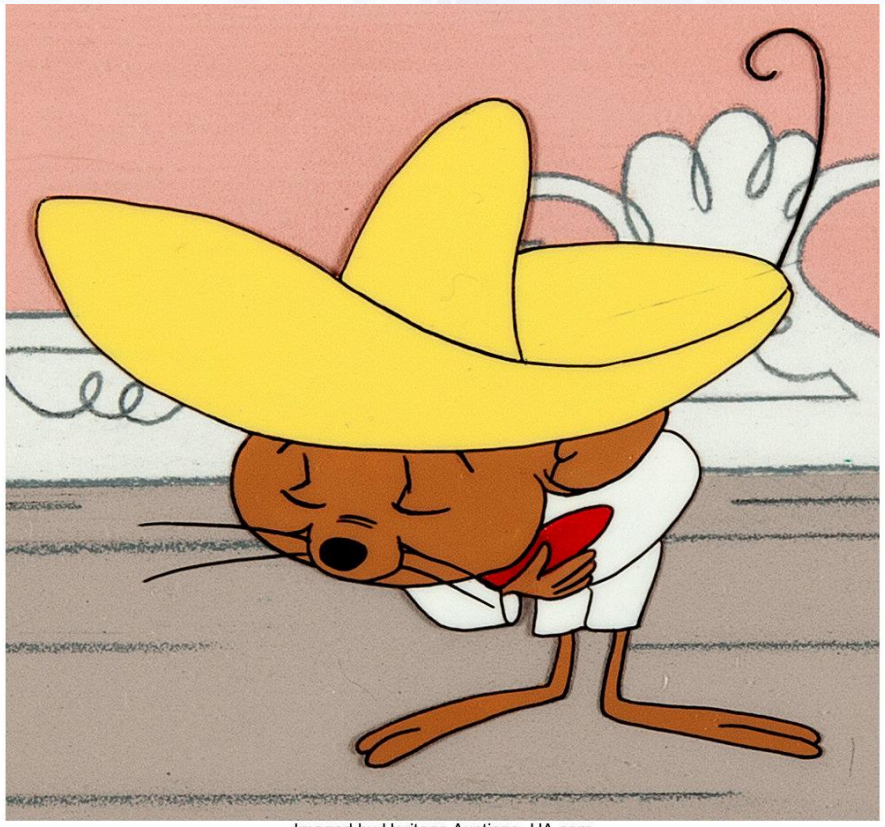
Baseline data: $Y_{ij} = \alpha + \beta T_i + \delta t + \gamma(T_i \times t) + \varepsilon_i + \boldsymbol{\mu_{ij}}$ Baseline data: $Y_{il} = \alpha + \beta T_l + \delta t + \gamma(T_l \times t) + \boldsymbol{l_i} + \boldsymbol{\mu_{ij}}$			
	Pre-treatment outcome (t=0)	Post-treatment outcome (t=1)	Difference (does not eliminate fixed effects ε, could lead to omitted variable bias unless included as controlled for)
Treatment units (T=1)	$\alpha + \beta + \varepsilon_i$	$\alpha + \beta + \delta + \gamma + \varepsilon_l$	$\delta + \gamma + (\varepsilon_l - \varepsilon_i)$
Control units (T=0)	$\alpha + \varepsilon_k$	$\alpha + \delta + \varepsilon_m$	$\delta + (\varepsilon_m - \varepsilon_k)$
Difference-in-Difference			$\gamma + (\varepsilon_l - \varepsilon_i) - (\varepsilon_m - \varepsilon_k)$ (estimate of the average impact)

Other potential pitfalls

- Sampling at endline to establish baseline conditions
  - Allow for attrition or compositional changes in the population (due to migration, deaths since baseline)
  - Recall bias – the more distant the event/information, the bigger the bias
  - Establish eligibility at baseline. (A 60-year old now enjoys the SC discount, but not when the privileges were first introduced).
- Be selective and clear with the questions. Focus on outcomes of interest and that covariates that are related/correlated with treatment status.
- Map out the treatment and control units. Be careful when your unit of analysis is of different level from the treatment and control units. Also, be mindful of spillover effects.

Qualitative methods & data

- Don't use qualitative methods to estimate impact (as defined here).
- FGDs/KIIs and other similar methods are useful in the
  - Beginning: to understand context of the intervention, construct/verify theory of change, identify outcome variables, identify/approach the treatment and control units & other stakeholders
  - Ending: to validate/understand the impact estimates (whether magnitude or direction are credible), how best to disseminate/communicate results to stakeholders
  - Feedback/inputs complement but not substitute for impact estimates
- Survey questions that be answered using categorical responses or Likert scale can be transformed for quantitative analysis including regression methods.



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That's All, Folks!