In-person session 9

March 9, 2023

PMAP 8521: Program evaluation
Andrew Young School of Policy Studies

Plan for today

General questions

Final project

Simple diff-in-diff

Two-way fixed effects

Markdown fun

General questions

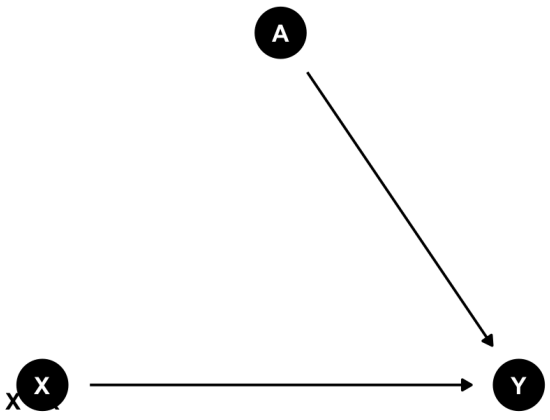
Should we control for variables to close as many backdoors as possible in our diff-in-diff model?

Design-based identification

Use a special situation to isolate arrow

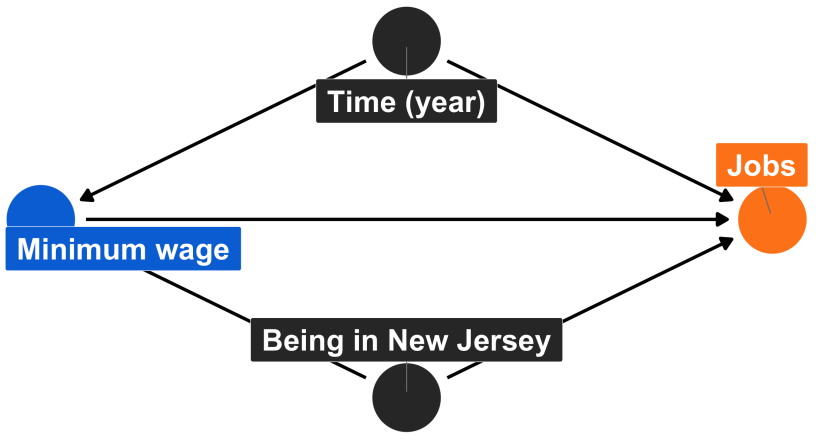
RCTs

Use randomization to remove confounding



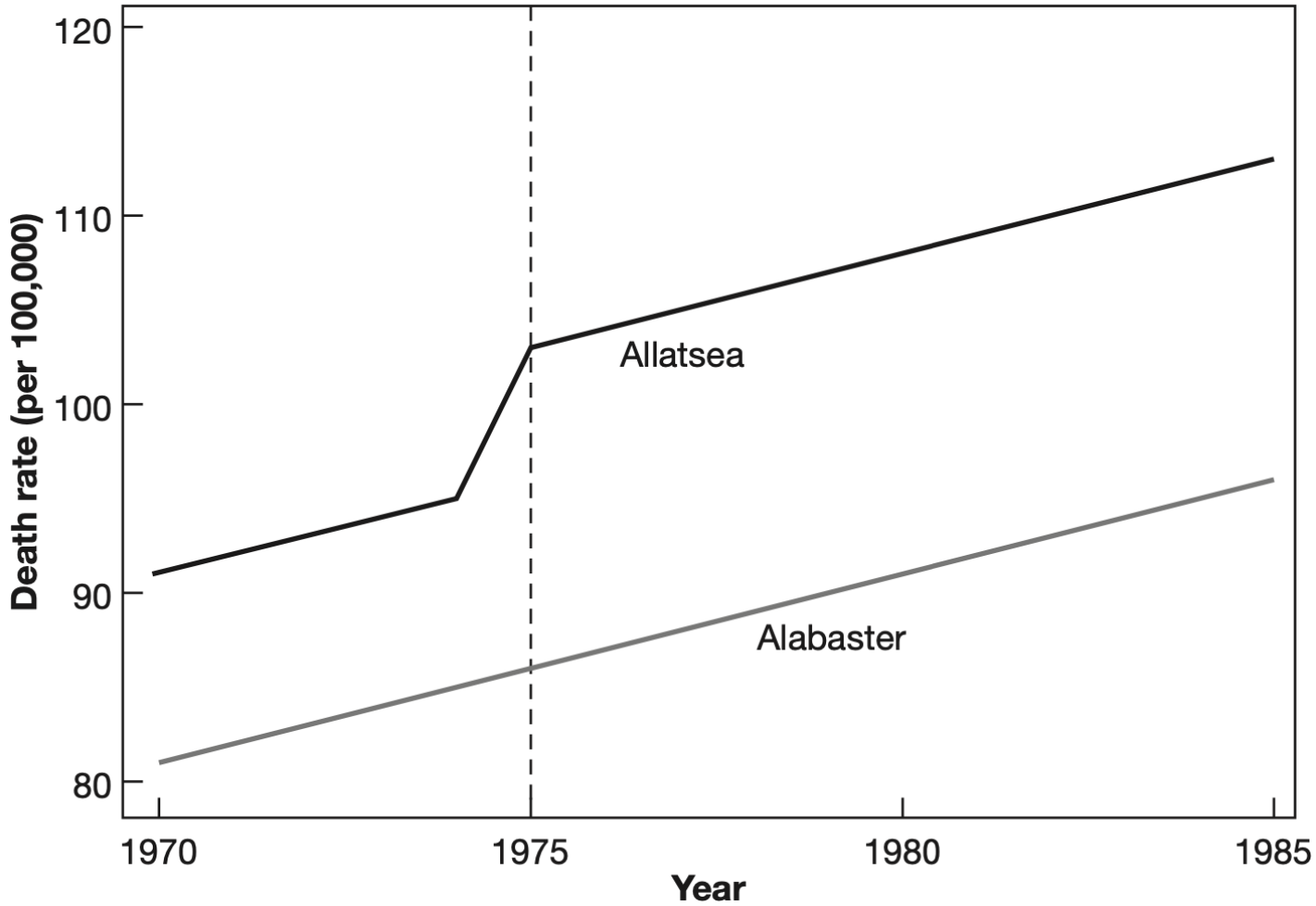
Difference-in-differences

Use before/after & treatment/control differences to remove confounding



How does moving time back let us check for parallel trends?

FIGURE 5.4
An MLDA effect in states with parallel trends



Can you conduct diff-in-diff with a binary outcome?

Final project

Tell us more about the final project!

Simple diff-in-diff

Minimum legal drinking age

MLDA reduction

Two states: Alabama vs. Arkansas

$$\begin{aligned}\text{Mortality} = \beta_0 + \beta_1\ \text{Alabama} + \beta_2\ \text{After 1975} + \\ \beta_3\ (\text{Alabama} \times \text{After 1975})\end{aligned}$$

Two-way fixed effects (TWFE)

Two states: Alabama vs. Arkansas

$$\begin{aligned}\text{Mortality} = \beta_0 + \beta_1\ \text{Alabama} + \beta_2\ \text{After 1975} + \\ \beta_3\ (\text{Alabama} \times \text{After 1975})\end{aligned}$$

All states: `Treatment == 1`
if legal for 18-20-year-olds to drink

$$\text{Mortality} = \beta_0 + \beta_1 \text{ Treatment} + \beta_2 \text{ State} + \beta_3 \text{ Year}$$

$$\text{Mortality} = \beta_0 + \beta_1 \text{ Alabama} + \beta_2 \text{ After 1975} + \beta_3 \left(\text{Alabama} \times \text{After 1975}\right)$$

vs.

$$\text{Mortality} = \beta_0 + \beta_1 \text{ Treatment} + \beta_2 \text{ State} + \beta_3 \text{ Year}$$

TABLE 5.2
Regression DD estimates of MLDA effects on death rates

Dependent variable	(1)	(2)	(3)	(4)
All deaths	10.80	8.47	12.41	9.65
	(4.59)	(5.10)	(4.60)	(4.64)
Motor vehicle accidents	7.59	6.64	7.50	6.46
	(2.50)	(2.66)	(2.27)	(2.24)
Suicide	.59	.47	1.49	1.26
	(.59)	(.79)	(.88)	(.89)
All internal causes	1.33	.08	1.89	1.28
	(1.59)	(1.93)	(1.78)	(1.45)
State trends	No	Yes	No	Yes
Weights	No	No	Yes	Yes

Notes: This table reports regression DD estimates of minimum legal drinking age (MLDA) effects on the death rates (per 100,000) of 18–20-year-olds. The table shows coefficients on the proportion of legal drinkers by state and year from models controlling for state and year effects. The models used to construct the estimates in columns (2) and (4) include state-specific linear time trends. Columns (3) and (4) show weighted least squares estimates, weighting by state population. The sample size is 714. Standard errors are reported in parentheses.

What about this staggered treatment stuff?

See this

What are random effects?

See this

Bonus fun with R Markdown and Quarto

Documents

Websites