

Notes for long version

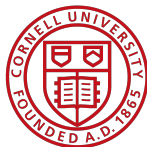
- ① Translate the wording for everyone (mechanism, quasi-random), and be clearer about suggestive. Use words like necessary but not sufficient.
- ② Needs a clearer introduction, which accurately overviews and previews the approach findings
- ③ Novelty needs to be loud, so put it first, Write $ATE = ADE + AIE$ for Levon, and enumerates folks theorems for why CM did not take off in econ but did in medicine epi psych)
- ④ Evan Riehl recommends a slide with quotes from top 5s that investigates mechanisms (note the approach is necessary but not sufficient for mechanism analysis)
- ⑤ Mention Kwon Roth result on my data, reject null then move on....
- ⑥ Longer presentation needs clear reasoning on the IV.

Notes for long version: empirical IV

- ① Longer explanation of the IV in Oregon for applied audience
- ② Options for the included IV, mainly to consider as illustrative (and do not want people to expect a super clean IV, but then get an illustrative one).
- ③ Talk through the quasi-experimental concerns (why is D_i endogenous?)
- ④ Show the IV set-up (clean pre- Z_i first-stage, but exclusion restriction maybe lacking). Can it be made binary to simplify the interpretation (and linearise the estimation?).
- ⑤ Develop at least one slide that talks through the controlling for *already diagnosed* illnesses
- ⑥ See what the CM estimates look like without controlling for them already.

Causal Mediation in Natural Experiments

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Presentation Plan

Introduction

First ten minutes: introduction, road-map, and preview of findings.

- Mechanism are important (show top 5 quotes), and we do not know much about them and given (at best) suggestive evidence.
- CM is a framework from elsewhere which gives sufficient evidence, though has not taken off in economics
- I give explicit reasoning for why conventional CM methods are unlikely to work in applied econ settings, then develop a structural approach to get back to what you want.
- Apply these methods to Oregon, showing how these methods work in practice (suggestive, conventional CM, then my MTE approach).

For this part, no model and no maths notation, just vibes.

Presentation Plan

1. Oregon

Second ten-minutes, the model and suggestive evidence in the OHIE.

- Introduce the OHIE, and say why the mechanisms are important and unknown
- Show suggestive evidence
- Question whether suggestive evidence is enough, when $D_i \rightarrow Y_i$ correlation is zero.

Presentation Plan

2. Causal Mediation

15-minutes, the CM framework.

- Model: Define the ADE and AIE, identifying assumption, and thus sufficient evidence on this mechanism.
- Explain why this does not hold (e.g., Roy model), and get selection bias (figure of simulation)
- Show the figure of conventional CM (i.e., assume the mechanism) estimate for OHIE. Explain why MI would not hold for Oregon

Presentation Plan

3. CM with Selection 15-minutes, My approach to CM.

- Write the two-stage equation, giving intuition on where non-identification comes from (second-stage).
- Use my 3 assumption approach to identify the mediator mechanism MTE, then ADE + AIE (write equations, and short guide, but be careful)
- Explain estimation with my simulation figures.

Presentation Plan

4. Return to Oregon 10-minutes, my application of CM.

- Re-introduce the setting (good lottery first-stage, but hospital visits are free choice).
- Walk through my MTE model, with monotonicity + relevance, then walk through the IV (if illustrative)
- Show my estimates of CM effects, then give discussion of findings. Include an adjusted slide of not controlling for pre-diagnosed illnesses, alluding to Oster (2019) reasoning on controlling for more ailments to get a sharper answer.

Finding notes: very different CM effects from conventional, noting direct (psychological) effects of socialised healthcare access. Agreed with suggestive evidence, giving clear uncertainty on the proportion of the mechanism. Note → apply the Kitagawa (2015) Kwon Roth (2024) test to these data rejects null (there are direct effects).

Presentation Plan

Conclusion Bullet-point overview of everything that has happened..

Causal Mediation in Natural Experiments

Natural experiments gives credible estimates of causal effects

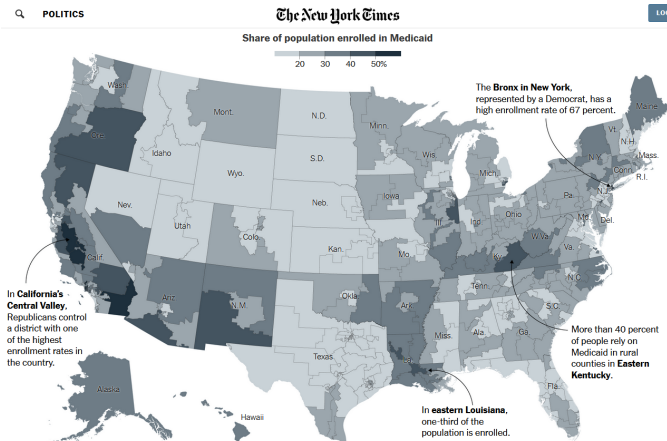
- Little information on the **mechanisms** through which they operate
- Limits understanding of the decisions and underlying economic system
-

School meals → adult income, because increased education (Lundborg Rooth Alex-Petersen 2022).

Senan note: unsure how to start the presentation with 5 minutes that grab attention. Just start section 1, introducing the data succinctly.

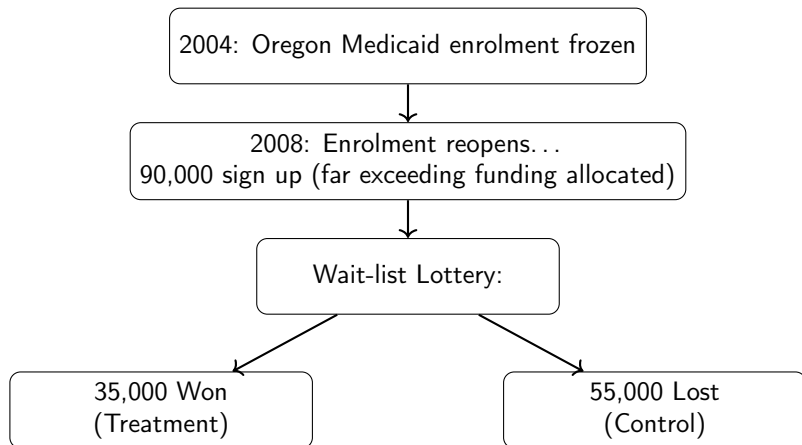
Oregon Health Insurance Experiment

In the USA, healthcare is only provided by the government in special cases
→ Medicaid is the government programme which provides health insurance for those close to the poverty line.



Oregon Health Insurance Experiment

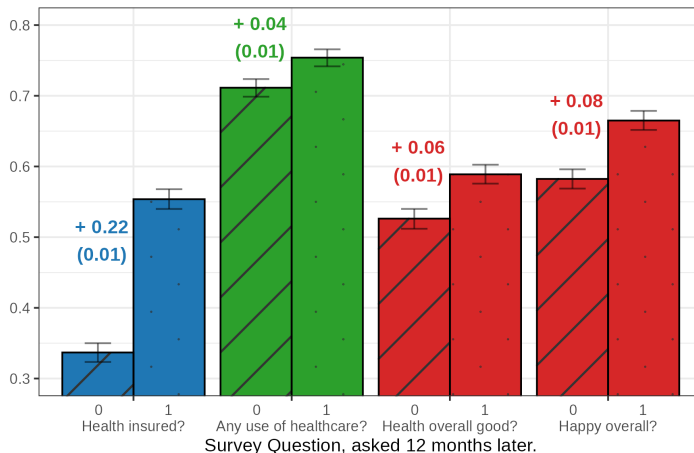
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Oregon Health Insurance Experiment

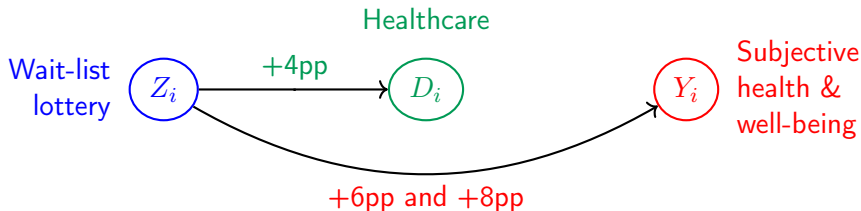
Winning this wait-list lottery significantly increased healthcare usage, plus subjective health and well-being (Finkelstein et al, 2012).

Mean Outcome, winning or losing the wait-list lottery.



Oregon — Suggestive Evidence

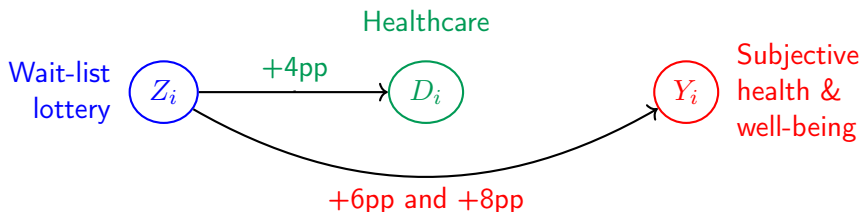
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- If first-stage $\neq 0$, then **healthcare** may be a mediating mechanism
- This gives **suggestive evidence for healthcare as mediating mechanism**.

Oregon — Suggestive Evidence

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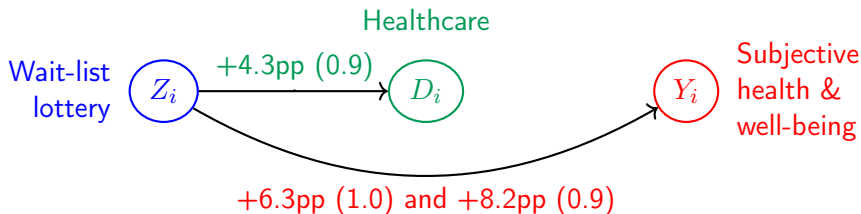


Explain direct EFFECTS HERE. STRESS. PSYCH GAINS.
 HOW LARGE THESE DIRECT EFFECTS ARE (AND SMALL/LARGE
 ETC) AFFECT HOW MUCH HEALTHCARE OPERATES THIS EFFECT.

Oregon: Suggestive Evidence

Two average causal effects are identified:

- ① Average first-stage $\mathbb{E}[D_i | Z_i = 1] - \mathbb{E}[D_i | Z_i = 0]$.
- ② Average Treatment Effect (ATE) $\mathbb{E}[Y_i | Z_i = 1] - \mathbb{E}[Y_i | Z_i = 0]$.



- If the first-stage $\neq 0$, then **healthcare** may be a mediating mechanism
- This gives **suggestive evidence for healthcare as mediating mechanism**.

Oregon: Suggestive Evidence

Suggestive evidence is primarily how economists investigate mechanisms.

Abstract — Lundborg Rooth Alex-Petersen (2022, ReStud).

“... Exposure to the [free school meals] programme also had substantial effects on educational attainment and health, which can explain a large part of the effect of the programme on lifetime income.”

Abstract — Bloom Mahajan McKenzie Roberts (2013, QJE).

“... We find that adopting these management practices had three main effects. First, it raised average productivity by 11% through improved quality and efficiency and reduced inventory [...]”

Abstract — Carvalho (2025, JPE Micro).

“... Evidence suggests fluid intelligence and self-control partly mediate the relationship between the [education polygenic index] and education.”

Oregon: Suggestive Evidence

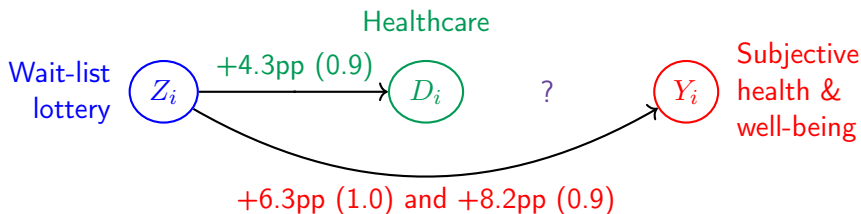
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② Average Treatment Effect (ATE)

$$\mathbb{E}[Y_i | Z_i = 1] - \mathbb{E}[Y_i | Z_i = 0].$$



There is one missing piece to make a **definitive conclusion**:

Size of causal effect $D_i \rightarrow Y_i \dots$

- If large, then **healthcare** explains all the lottery effects
- If small/zero then, then all **direct** (e.g., psychological) effects.

Causal Mediation (CM)

CM with Selection

Oregon Health Insurance Experiment

Conclusion