Does Adult Redeploy Illinois change the rate of prison use in jurisdictions with ARI programs?

Kathy Saltmarsh, Executive Director
Mark Powers, Senior Policy Analyst
Adult Redeploy Summit
Wednesday, June 17th, 2020

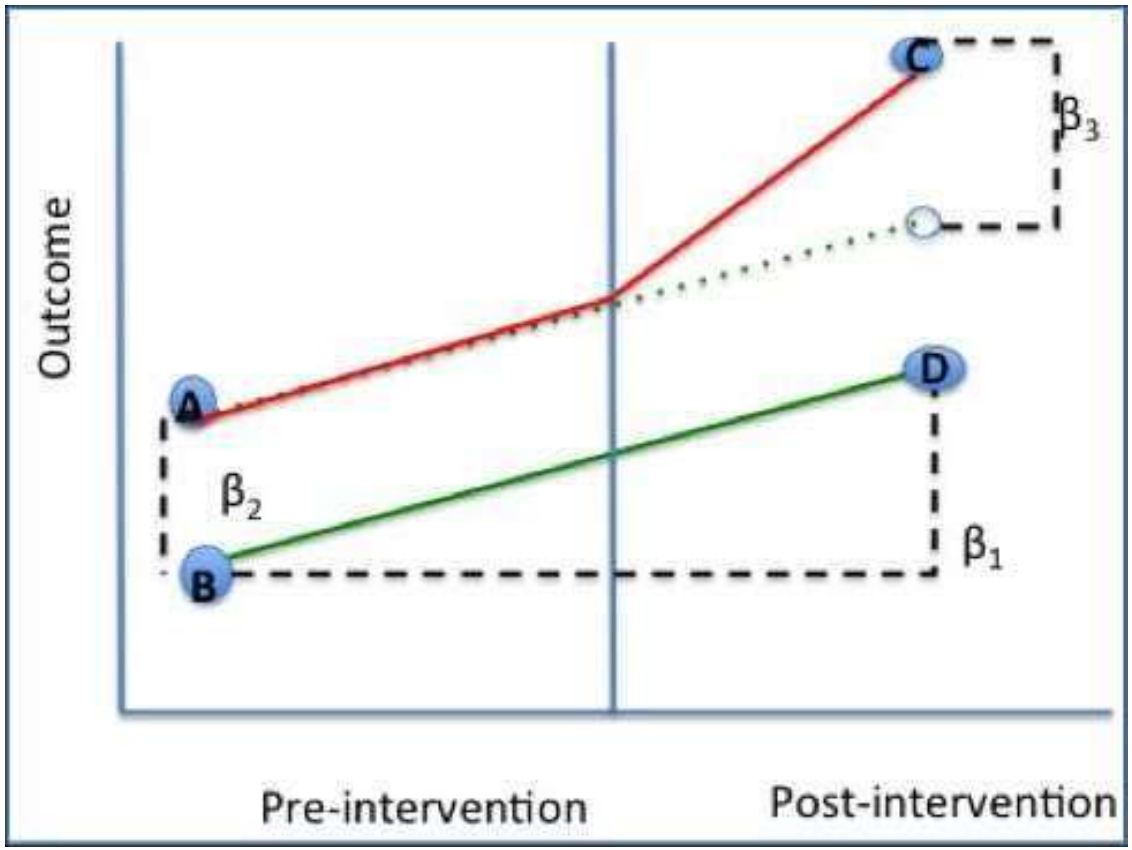
What did we attempt to learn?

- Simple question: Did prison use change for ARI counties?
- What should we see if ARI is changing prison usage?
  - Changes in incarceration rates.
  - Changes in felony sentencing.
- Can we attempt to answer this with available data?
  - To a limited extent…YES!

What data did SPAC have to answer this?

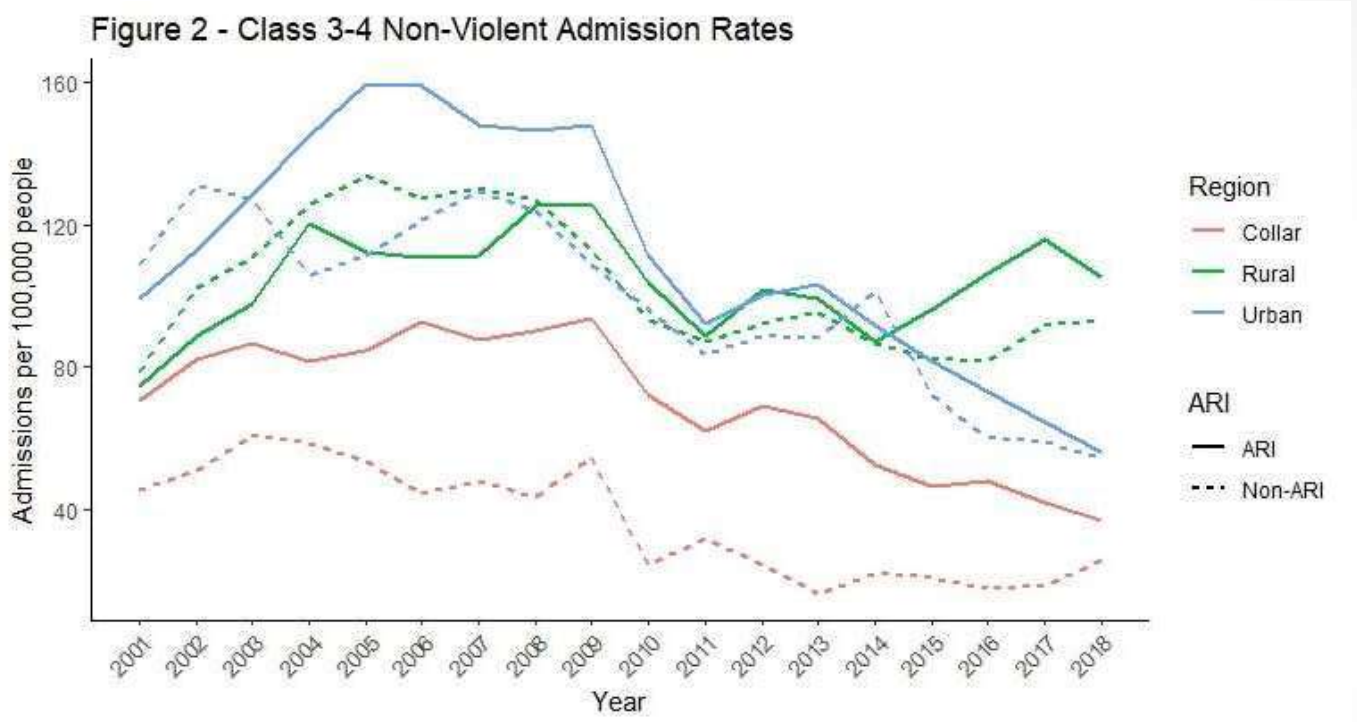
- SPAC did **not** have ARI data on participants.
- SPAC did know when each site started enrolling clients.
- SPAC did have prison and sentence data
  - Detailed IDOC prison admissions data, high quality
  - CHRI conviction and sentence data, quality that varies across counties
- SPAC started with three models in mind:
  - Difference-in-Differences of prison admission rates
  - Synthetic Control method of prison admission rates
  - Multilevel Logistic Regression of presence or absence of a prison sentence for a conviction using CHRI sentence data
    - Less preferred due to data issues

Difference-in-Differences Design



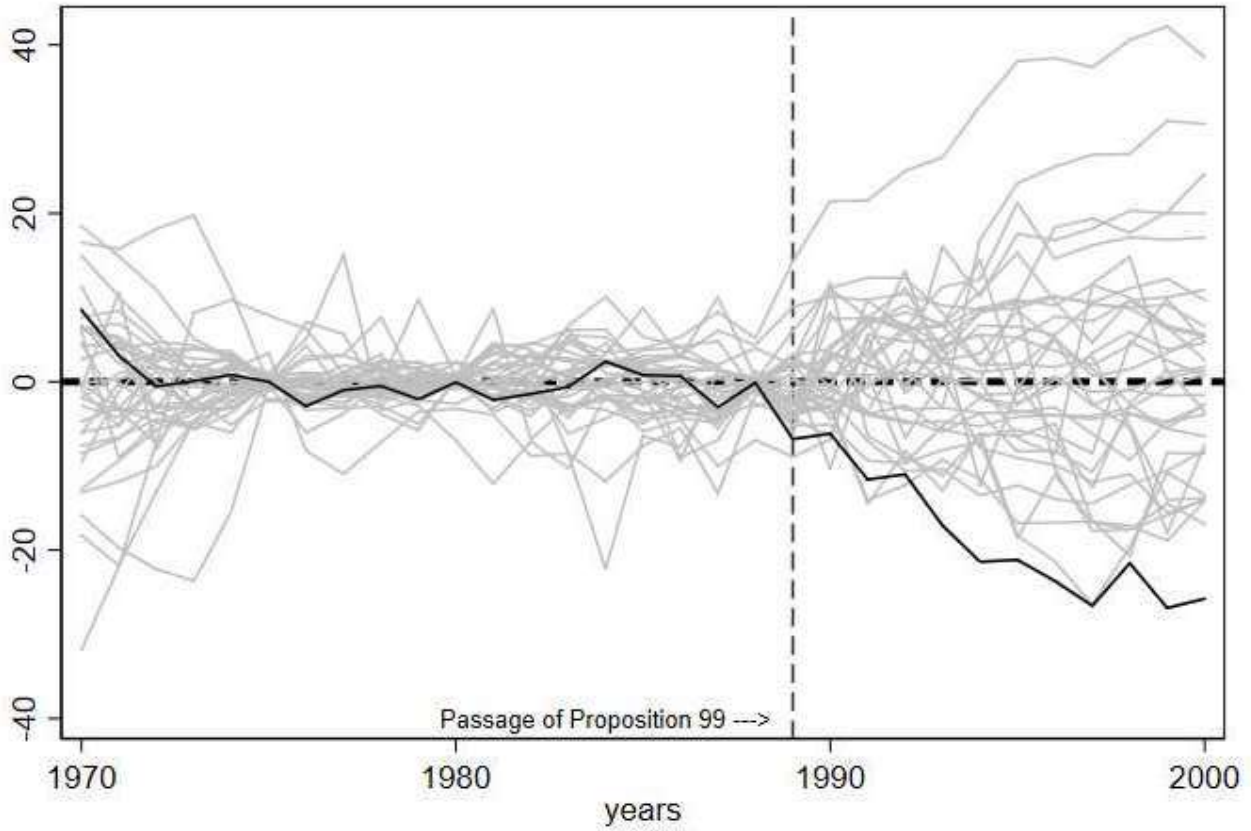
https://www.publichealth.columbia.edu/research/population-health-methods/difference-difference-estimation

Challenge - trend data for IDOC admission rates



Difference-in-differences assumes that the average outcomes of treated and control counties would have followed parallel paths if there were no intervention….
These appear problematic!

Synthetic Control Design



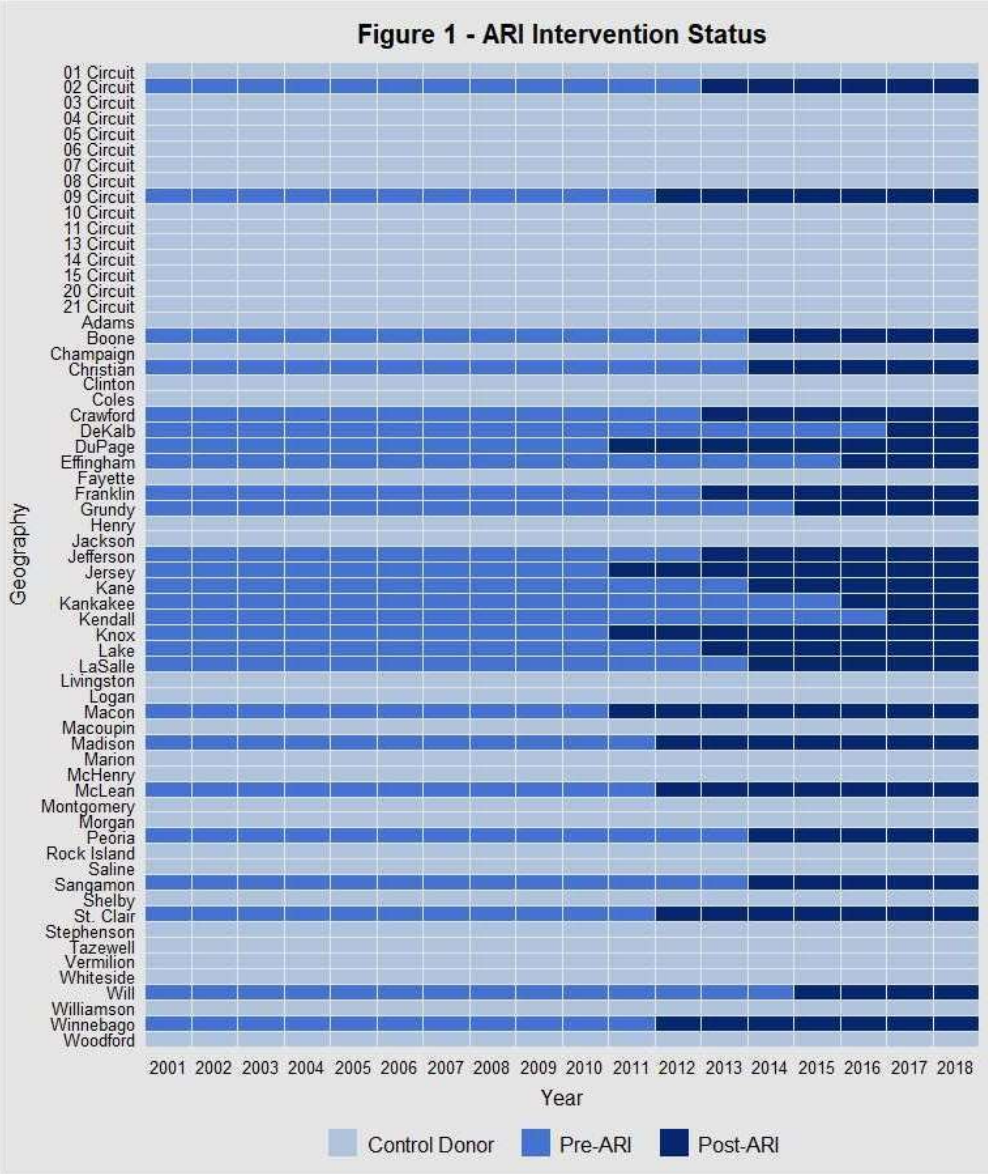
Re: Figure 5. Per-cap cig sales gaps in California & placebo gaps in 34 control states

https://www.solomonegash.com/wp-content/uploads/myreplications/synth/synthdid.html

Challenge – site variation

- Multiple ARI sites
- Different start years
- Different treatment modalities
- Different target populations

- A challenge with synthetic control would be constructing separate models for each site

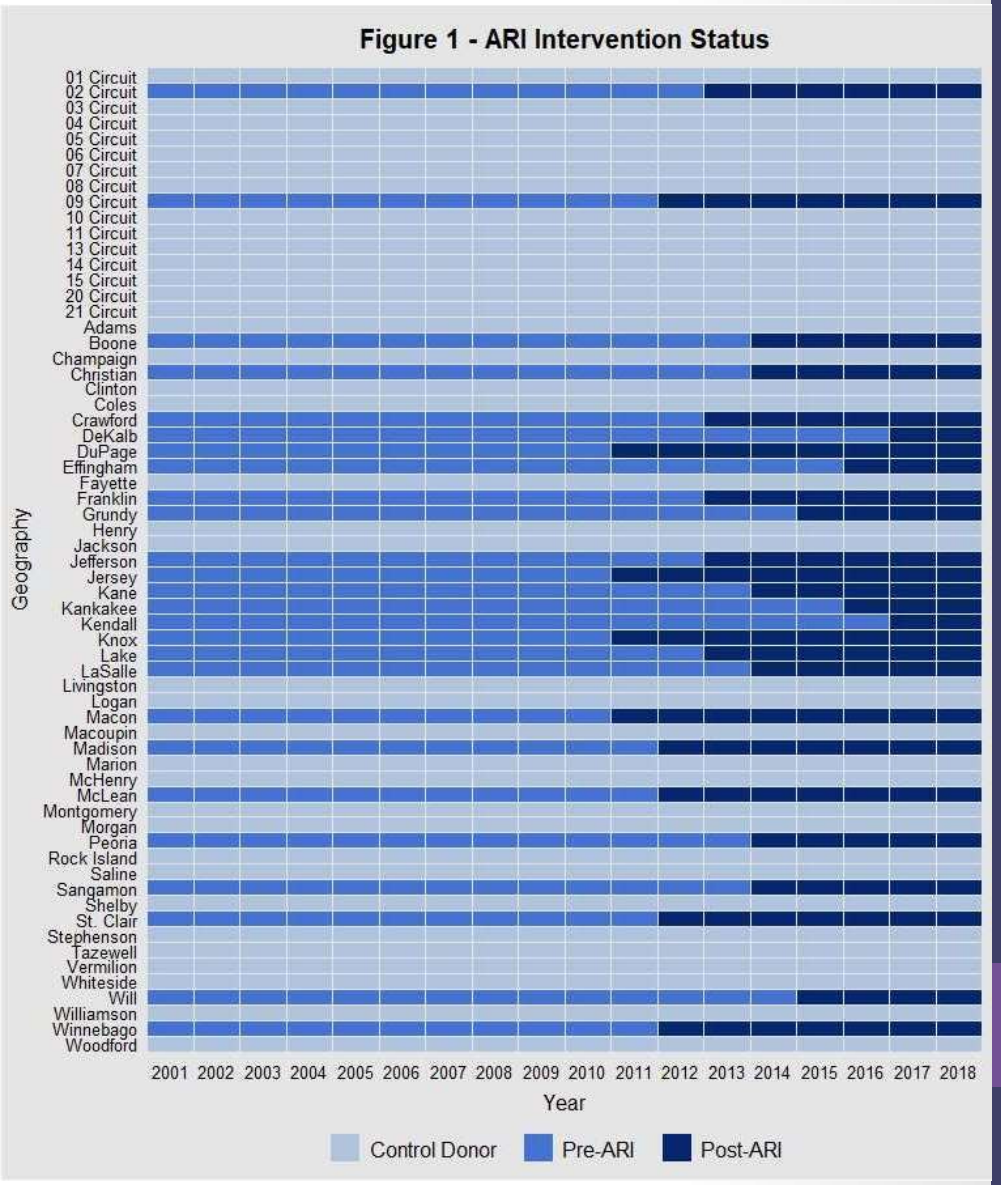


Solution – Generalized Synthetic Control (GSC)

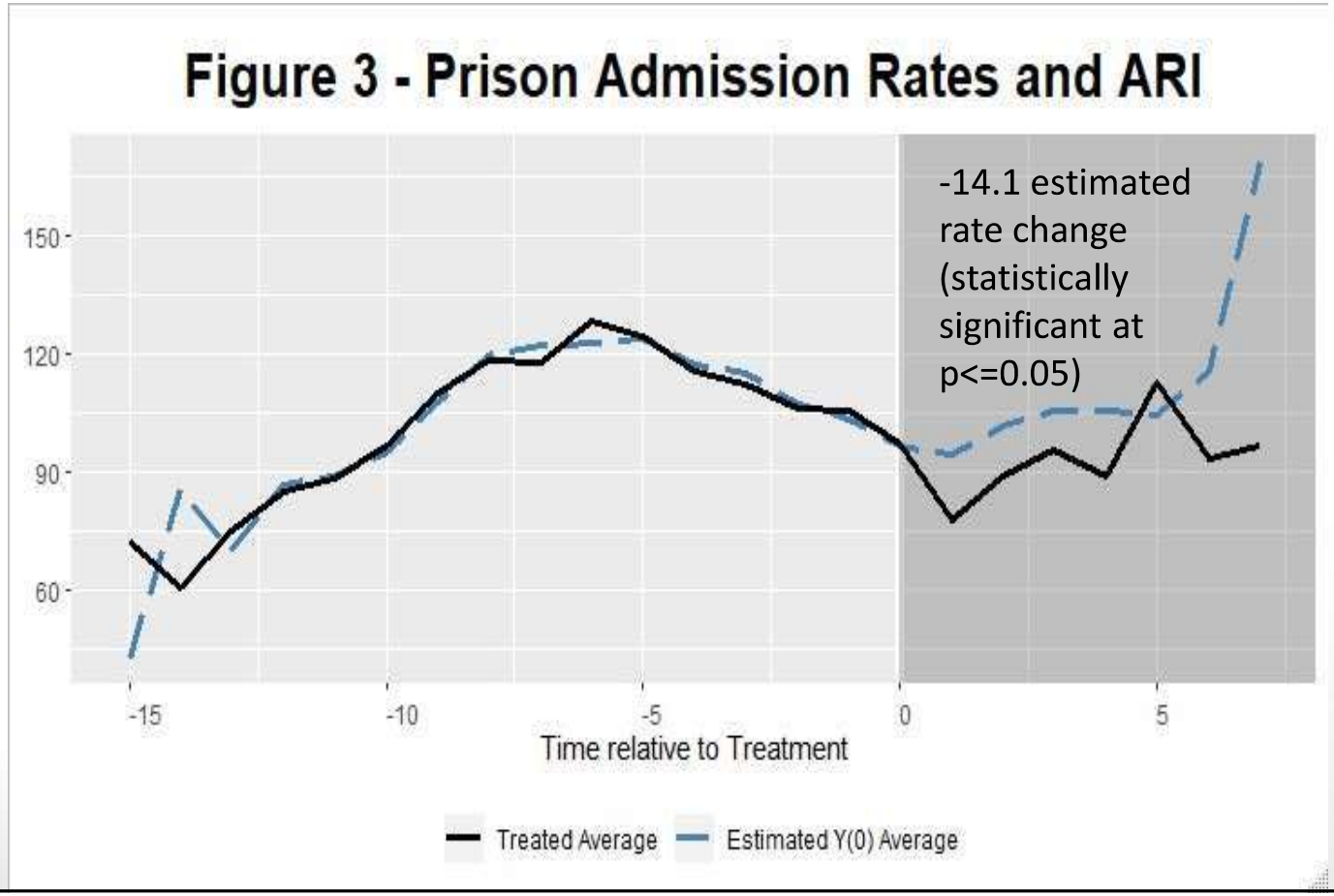
- Xu, Y. (2017). Generalized Synthetic Control Method: Causal Inference with Interactive Fixed Effects Models. *Political Analysis, 25*(1), 57-76. doi:10.1017/pan.2016.2
- Recent development of generalization of synthetic control method.
- Allows multiple treated units in one model even with varying start times.
- Creates weighted counterfactuals from comparison counties to relax the difference-in-difference assumption of parallel trends.
- Allows SPAC to use the higher quality IDOC data as a primary model, with the logistic regression model as a check to see how sensitive the results are to modeling decisions.

GSC modeling decisions

- Excluded Cook County
- Outcome was Class 3 and 4 non-violent prison admission rate per 100,000 people
- Combined low-frequency admissions counties within circuits where needed to create treatment and control donor geographies
- Calculated rates for each geography using adult population census data
- Adjusted for unemployment, arrest, conviction, and probation sentence rates

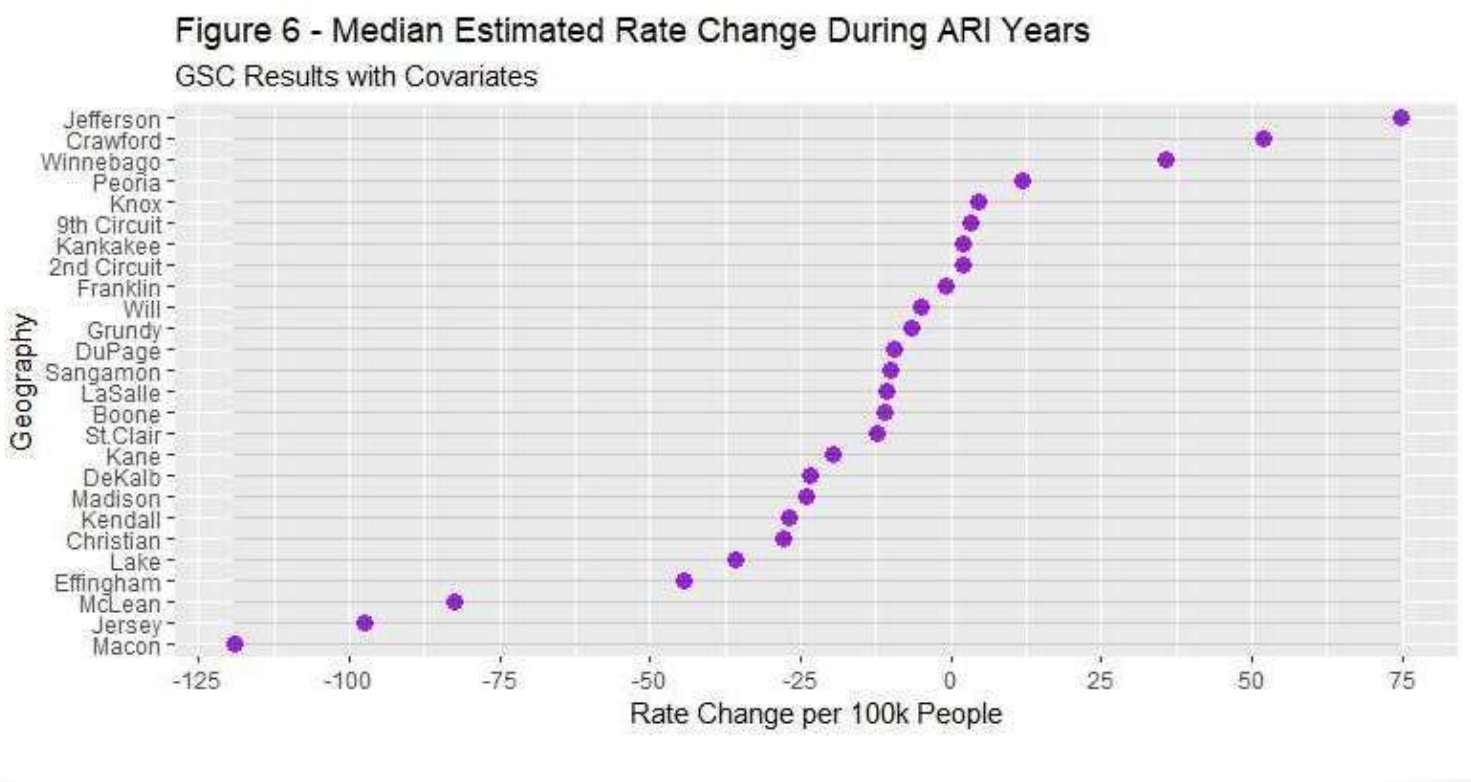


GSC results for class 3-4 non-violent prison admission rates



		GSC Prison Admissions Rate, with covariates	
		ATT	s.e.
Overall Average		**-14.1**	**6.5**
Year	ARI Sites		
-9	-	2.2	4.5
-8	-	-1.0	4.5
-7	-	-4.4	4.6
-6	-	5.7	4.7
-5	-	0.7	4.7
-4	-	-1.4	4.5
-3	-	-2.3	4.3
-2	-	-1.0	3.8
-1	-	1.9	4.0
0	-	0.1	4.1
1	26	-17.8	5.9
2	26	-14.4	6.5
3	24	-10.1	7.3
4	22	-18.0	8.5
5	20	-3.3	9.9
6	14	-3.2	12.3
7	9	-40.9	16.7
8	4	-66.9	25.2

Effect varies by geography



Although there are some outliers in both direction that largely cancel each other out, most counties have estimated changes between -50 and 15, with most showing reductions in the prison admission rate.

Model Two: Multilevel Logistic Regression

SPAC used a multilevel model with a random intercept at the county level and for the conviction year as well as a random slope for the ARI effect on counties. The unit of analysis was a non-violent class 3 or 4 conviction. Individual-level variables are:

- Prison admission (presence or absence, **outcome variable**)
- ARI active at the time of conviction (yes or no)
- Offense Class (3 vs. 4)
- Black (black vs. non-black)
- Male (male vs. female)
- Arrest age mean-centered
- Years between the arrest and conviction mean-centered
- Weapons conviction indicator (any weapons conviction on the DCN)
- Any prior prison sentence indicator (yes or no)
- Prior arrests
- Prior convictions
- Juvenile arrest indicator (first arrest was prior to 18th birthday)

Model Two: Multilevel Logistic Regression results

- Convictions in counties with ARI had a 19% reduction in the odds of receiving a prison sentence for Class 3 or 4 non-violent convictions compared to when ARI was not active.
- The marginal effect over the entire data set was also calculated from the model, predicting the outcome for each observation and finding the change in probability. This arrives at a statistically significant 3.3 percentage point reduction.
- For context, the baseline probability of a prison sentence for Class 3 or 4 non-violent convictions is around 35%—thus a 3.3 percentage point reduction appears reasonable.

Summarizing what we learned

- Both models produce similar results with different but closely related outcomes
  - GSC estimated a reduction of 14 admissions per 100,000 people from about 105 baseline…roughly a 13% decline
  - Regression estimated a reduction of 3.3% chance of receiving a prison sentence, from a 35% baseline...roughly a 10% decline
- The overall estimated effect from ARI intervention is not trivially small or excessively large
  - ARI sites did not always target all class 3 and 4 non-violent offenders and instead tailored target populations based on capacity and programming
- Although the analysis is positive for ARI, it has limitations.
  - Limited to class 3-4 non-violent
  - Hard to derive cost savings without more data
  - Not a replacement for an impact evaluation

Analysis will soon be available!

https://spac.illinois.gov/

SPAC
Illinois Sentencing Policy Advisory Council