THE HEALTH EFFECTS OF PRISON

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Research Question

- Prison is *correlated* with worse health outcomes at both extensive and intensive margin.
  - Depression, fast food, smoking, stress related illnesses, higher mortality.
    - Schnittker and John, 2007; Turney et al, 2012; Porter, 2014; Massoglia, 2008; Salas et al 2005; Haglund et al 2014.
    - NY state parolees: each additional year in prison = 2 year decrease in life expectancy (Patterson, 2013).

- Unsurprising? prisoners negatively selected on many dimensions related to mortality.
  - SES
  - Pre-incarceration health:
    - 50% US prisoners with known mental health problems (vs 5% general population)

➢ **Does prison causally impact – for better or worse – prisoner health?**

Literature: Limited causal evidence on prison-health.

- Norris, Pencenco and Weaver (recent working paper)
  - Event study/diff-diff analysis of extensive margin effect of incarceration on mortality in Ohio.
  - Mortality risk halves while in prison (incapacitation), and no off-setting post effect.

- Large causal literature studying effect of prison on non-health outcomes.
  - Judge leniency instrument: Mixed findings at intensive and extensive margins.
    - Intensive (Kling, 2006; Mueller-Smith, 2015) and extensive (Bhuller et al, 2020; Dobbie et al, 2018; Aizer and Doyle, 2015)
  - Improved outcomes via other designs, taking advantage of discontinuities in parole guidelines (Kuziemko, 2013), sentencing guidelines (Rose and Shem-Tov, 2019)
    - Rose and Shem-Tov (2019): reduces recidivism, smaller effects for longer sentences

Why is identify the health effects of prison important?

1. Prisoners are relatively disadvantaged: **Does prison exacerbate this inequality?**

2. **Does the ability of ex-prisoners to desist from crime depend on the health effects of prison?**
   - Many challenges faced in successfully reintegrating into society (e.g. Doleac, 2019).
   - Increasing evidence that health care access causally reduces crime (Doleac, 2018).

3. **Healthcare is a significant component of prison budgets**.
   - 20% of 2015 U.S. prison expenditures – more than $8 billion (Pew Charitable Trusts, 2017).

4. S**econd-generation impacts?** Substantial share of prisoners have minor children: > 50% in the U.S. (Glaze and Maruschak, 2008).

Specifically, in this paper…

- Does **more time spent in prison** affect post-release mortality?
  - Overall and by cause of death (natural and unnatural)

- **Identification Strategy**: Exogenous variation in time served generated by Sweden's 1993 and 1999 early release reforms
  - Held sentences constant but increased share of time required to serve from 50% to 67%
  - Reduced form and IV analysis, using reform exposure as instrument for prison days served.

- **Swedish register data**.

How can more time in prison affect health?

Contemporaneous effects:

- Potential *negative* channels:
  - Communicable diseases (eg COVID-19), violent and stressful environment, poor nutrition, low (or no) access to proper healthcare.

- Potential *positive* channels:
  - Kept sober/drug free, receive care and treatment could otherwise not afford or did not seek out.
  - Intake health screening: identify illnesses and treatment needs.
    - May be especially important at the intensive margin: treatment (plans) are a function of time served.

Post-release effects:

- *Directly* via the persistence of these contemporaneous effects
- *Indirectly v*ia the impact of prison on recidivism, labor market, and other outcomes.

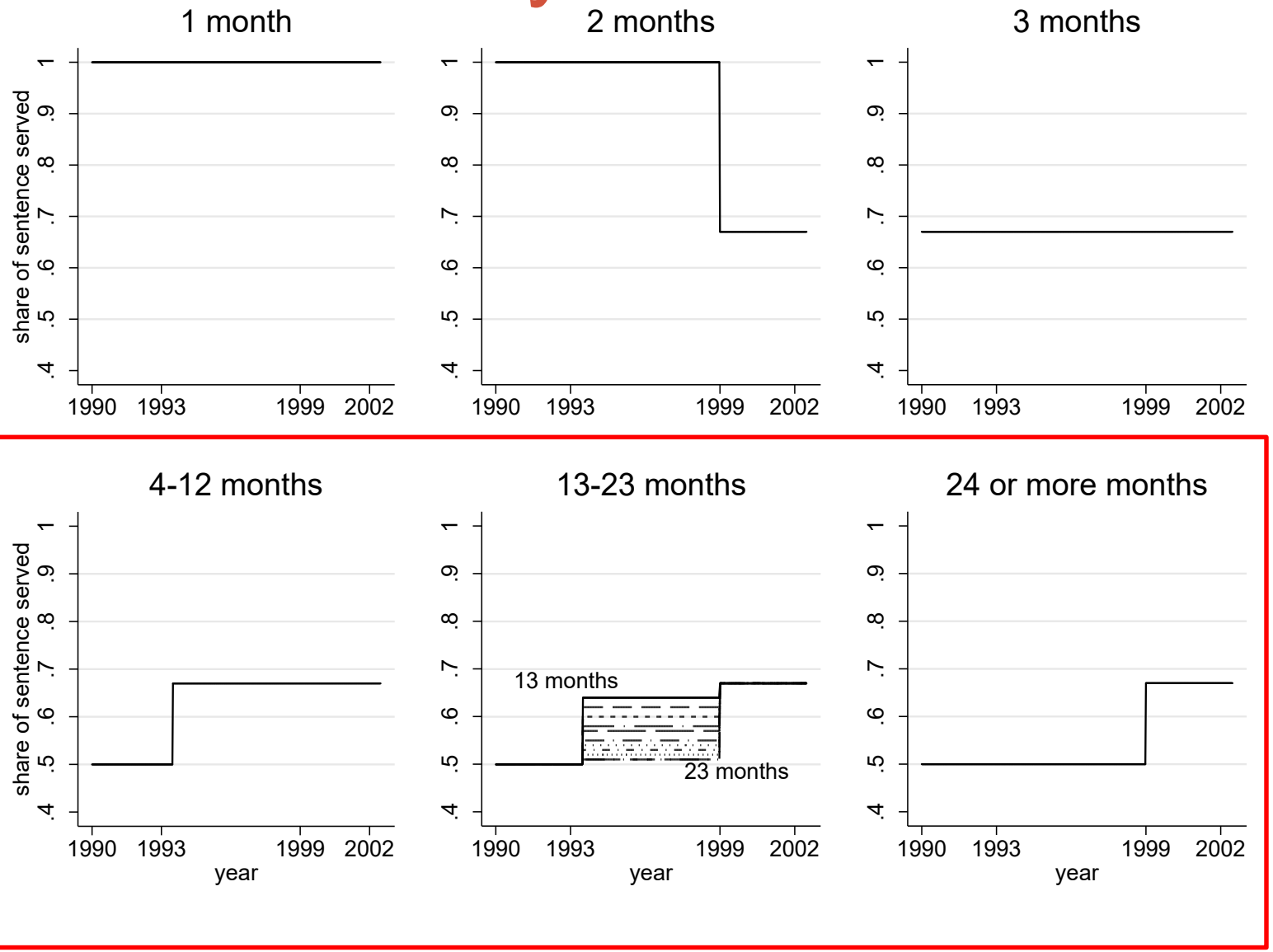
Overview of Findings

1. Contrary to previous correlational evidence, **more prison exposure reduces the overall risk of death**, especially for property and young offenders.

2. **Heterogeneity** in cause of death effects for subsets of vulnerable populations.
   - Significant and persistent reduction in the chance of suicide,
   - Short-term reduction in violent death, and
   - Long-term improvement in general health (circulatory death).
   - Driven by those with pre-prison mental health problems, and violent and older offenders, respectively.

3. **Mechanisms**:
   - Feasibly direct. Demonstrate high quality health care and utilization in Swedish prisons. Increased treatment and utilization for longer sentences.
   - Indirect via recidivism? More prison decreases recidivism, but unlikely to explain whole effect.

Sweden's early release reforms



Treatment: determined by conviction date and sentence length.

Focus on 4-48 month bins.

- Confounding reforms for shorter sentences.

Full exposure to reform: share time served increases from 50% to 67%

- 4-12 month ('93) and > 24 months ('99)
- 13-24 months (graduated scale, '93 and '99)
  8 months + 1/3 of the time > 1 year.

Instrument: Share time served prescribed by the law for sentence month bin *s* at date *t*

Empirical strategy

Identification Challenge: many (un)observables affect both prison days and *Y*.

$$Y_{its}^{m} = \alpha + \beta PrisonDays_i + \alpha_s + ConvMonth_{trend} + ConvYear_{fe} + \boldsymbol{X}_i\boldsymbol{\theta} + \varepsilon_{its}$$

- Y_i^m = outcome Y for agent *i* measured *m* months after leaving prison
- α_s are sentence month bin fixed effects
- Year fixed effects and conviction month trend (crime trends over time)
- X: crim justice controls, pre-incarceration health and ses (income, education, employment, family), and demographics

- Even holding sentences constant and controlling for large *X*, expect biased β:
  - E.g, Time spent in pre-trial detention, Extensions due to misbehavior

Empirical strategy

$$Y_{its}^{m} = \lambda + \delta EarlyReleaseLaw_{ts} + \alpha_s + ConvMonth_{trend} + ConvYear_{fe} + \boldsymbol{X}_i\boldsymbol{\theta} + \varepsilon_{its}$$

Reduced form specification:

- Isolate exogenous variation in days served due to early release law reforms.

- *EarlyReleaseLaw*: share of time served prescribed by law (0-1) if convicted at date *t* and assigned sentence of *s* months
  - Varies across bins and within bins over time.

IV: EarlyReleaseLaw as instrument for days served.

- Focus on reduced form today.

Identifying Assumptions

For Reduced Form:

1. Reform is implemented as it should be, and affects share of time served (**relevance**) but not sentence.

2. **Conditional independence**: exposure is unrelated to individual characteristics.

For Instrumental Variable:

3. **Monotonicity**

4. **Exclusion restriction**: reform only affects outcome through prison days served (and not other prison experiences: facility, overcrowding, peers, treatment plans).
   - Shouldn't change discontinuously, and should be captured by trends in specification.
   - Shouldn't change immediately; results hold when zooming into smaller window.
   - No evidence of discontinuities in average prison size or sentence lengths around the reforms.

Data

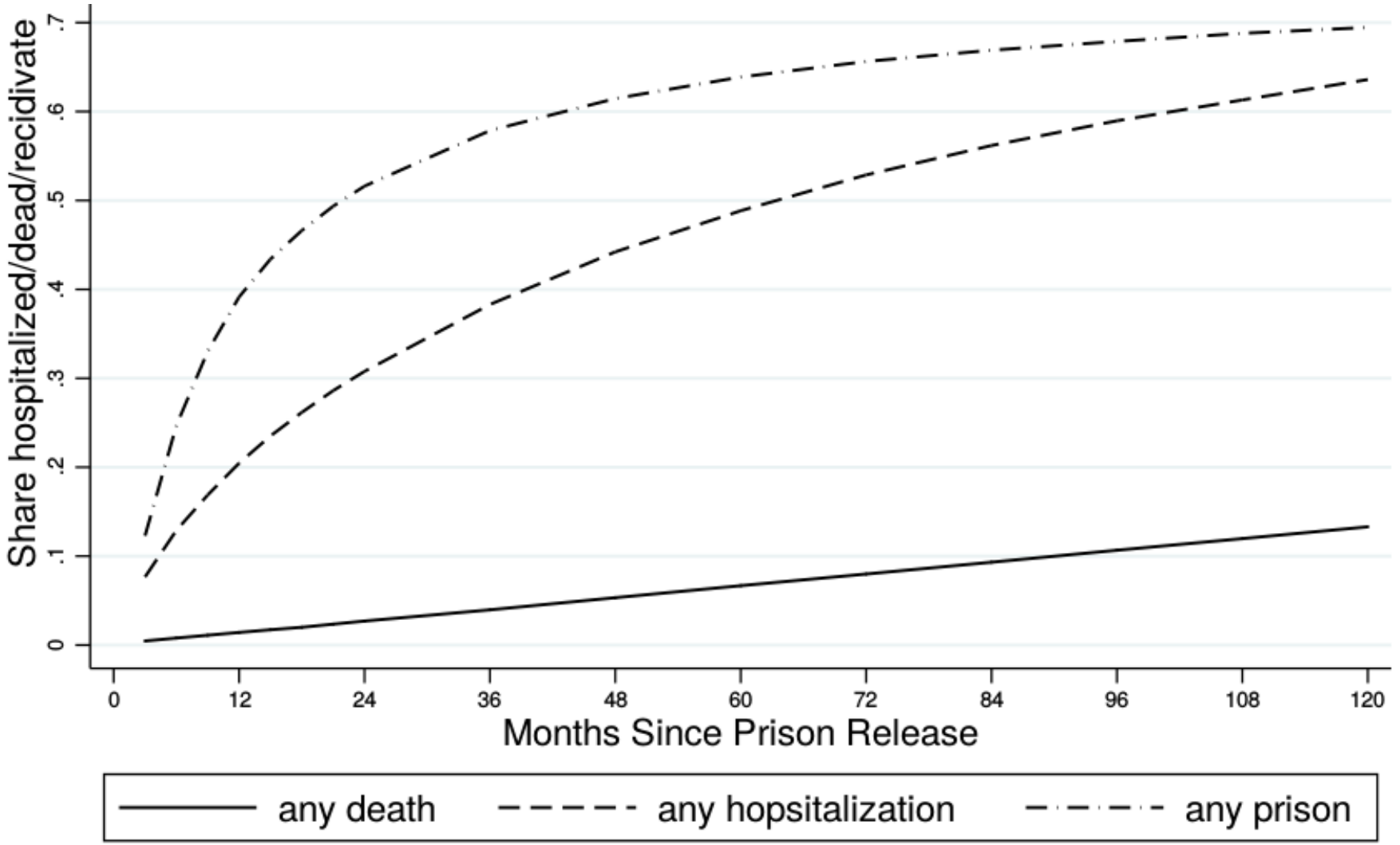
- **Swedish Prison and Probation Service**: Inmates entering prison 1992-2001, convictions from1991.
  - Start date & end date → number of days in prison

- **Convictions register**
  - Conviction date
  - Measure criminal history and recidivism

- **Hospital and cause of death registers**
  - Outcome = Mortality
    - ALL cause and ICD 10 codes for (i) suicide, (ii) intentional violence, (iii) circulatory, (iv) cancer, (v) digestive
    - Coroner note: (i) alcohol, and (ii) narcotics. (not mutually exclusive)
  - Pre-prison hosp. nights by ward : (i) psych, (ii) alcohol, (iii) narcotics, and (iv) “general” (non-maternity)

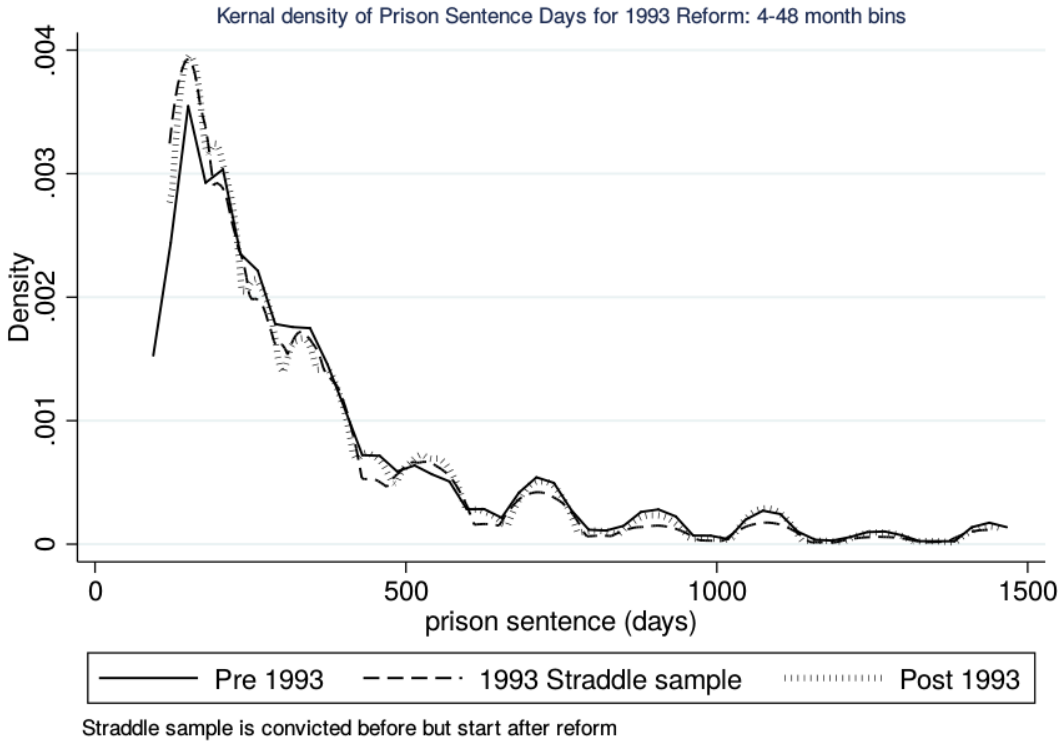
- Sample: 46815 sentences of 4-48 months
  - 95% male, average age 34
  - Crime composition varies across bins: shorter sentences more property, less violent. (vice versa for longer sentences)
  - Poor health: more than 5 nights on average in psych ward in 3 years before prison start

Dynamics of Post Release Outcomes

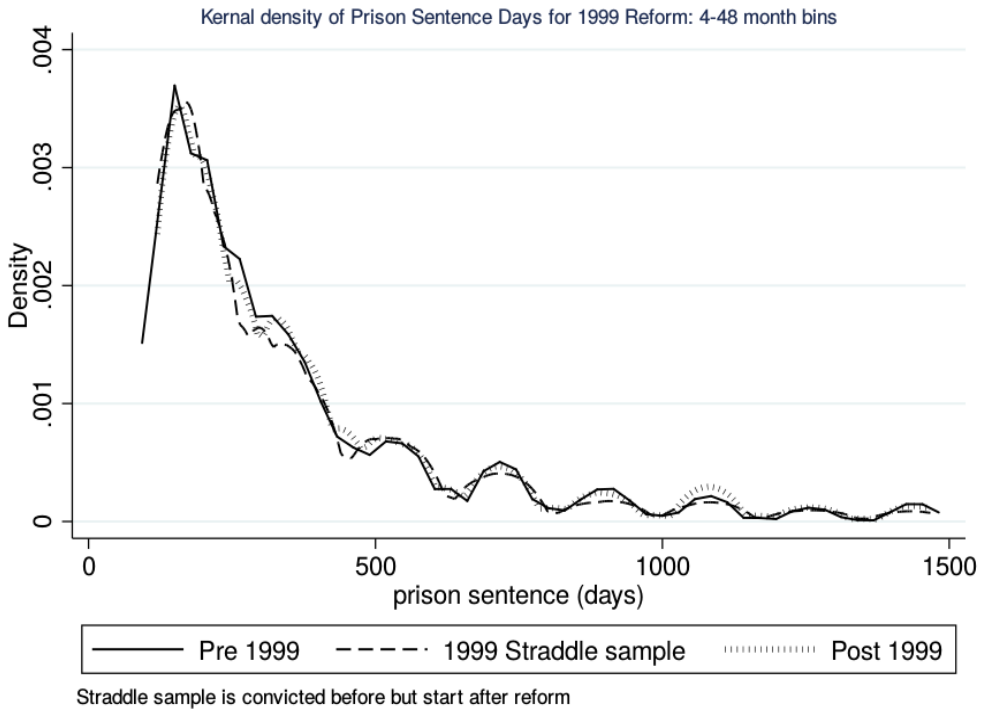


Were the reforms implemented correctly?

No effect on sentence distributions (1993)



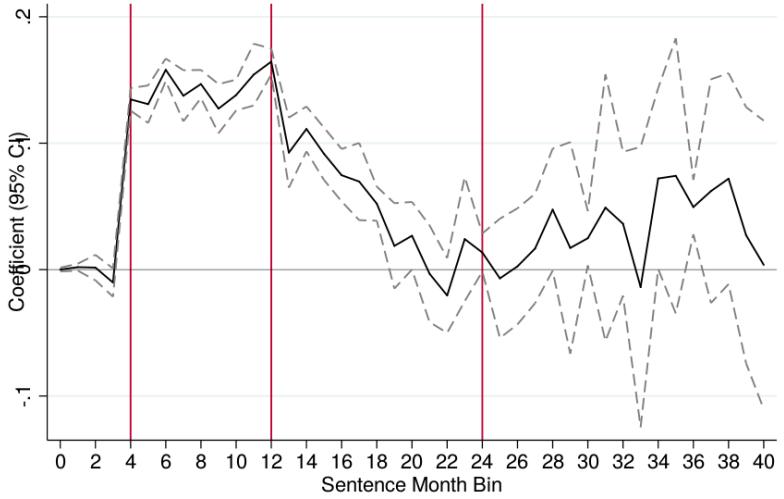
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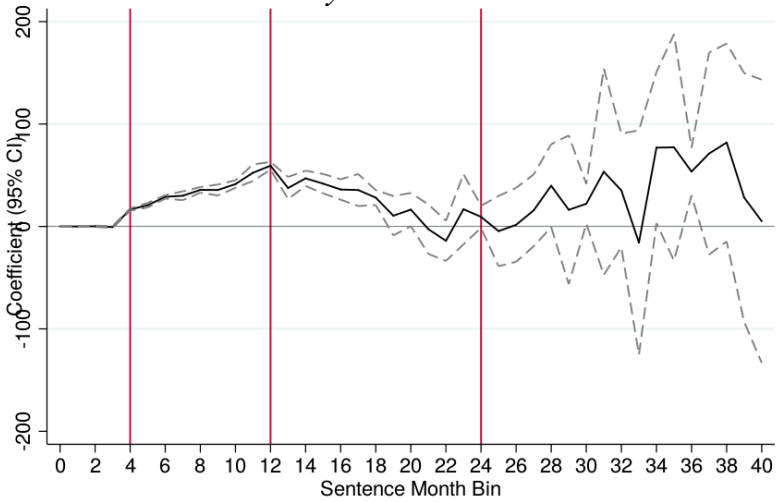
Also see no impact on other judicial (prosecutor and judge) decisions.

Impact on share time and days served across sentence bins

Panel A. 1993 Share Time Served

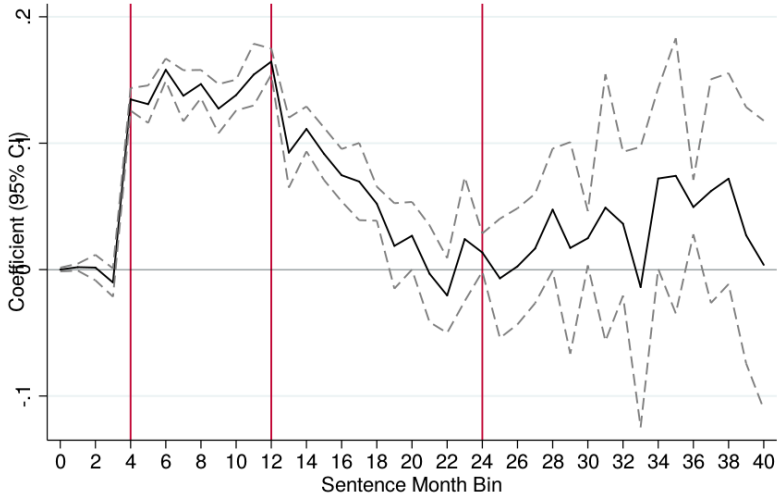


Panel B. 1993: Prison Days

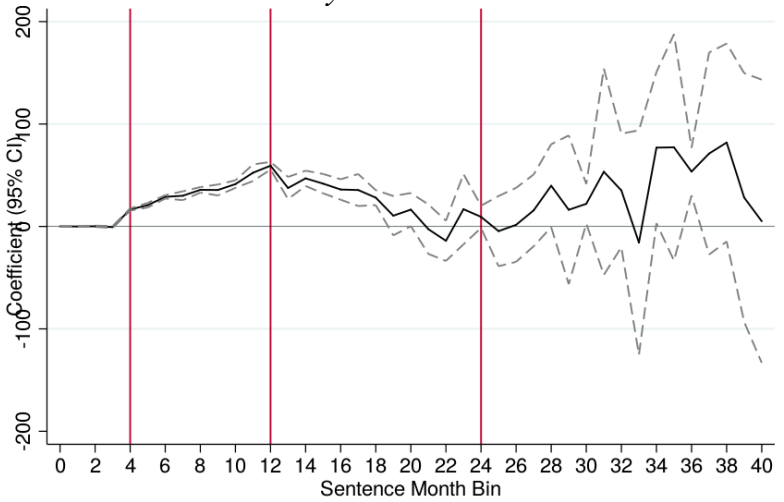


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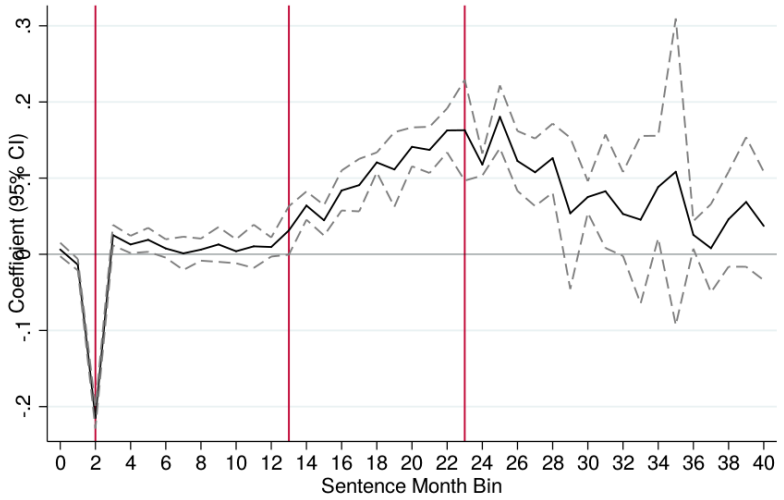
Panel A. 1993 Share Time Served



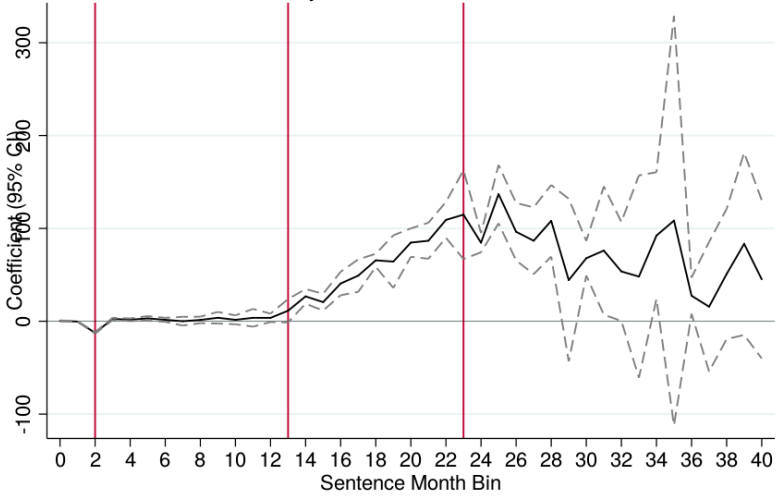
Panel B. 1993: Prison Days



Panel C. 1999 Share Time Served



Panel D.1999 Prison Days



First Stage

Full reform exposure (17 percentage points) increases days served by 46 days (0.17*271)

	(1)	(2)	(3)	(4)	(5)
	Dependent Variable: Prison Sentence Days				
	Drop Individuals Dead or Emigrated by x years after End Date				
	All sample	1 year post	2 years post	3 years post	10 years post
law_share_sent	271.037	274.163	274.163	275.342	274.481
	(25.771)***	(26.102)***	(25.785)***	(25.524)***	(25.462)***
F-stat	111	110	113	116	116
Cumulative # died	0	659	1242	1812	5996
Cumulative # emigrated	0	527	879	1183	2185
Observations	46815	45629	44694	43820	38634

Each column includes sample alive and NEVER Emigrated from Sweden X years since date of release. Panel A (the baseline spec) includes controls fo 60+ crime type dummies, # current offense, # past crimes, # past prison admissions, age <=21, and age at prison, as well as calendar month dummies of conviction and court dummies, and demographics and socioeconomic and health characteristics at time of incarceration. Standard errors clustered on sentence month bin.

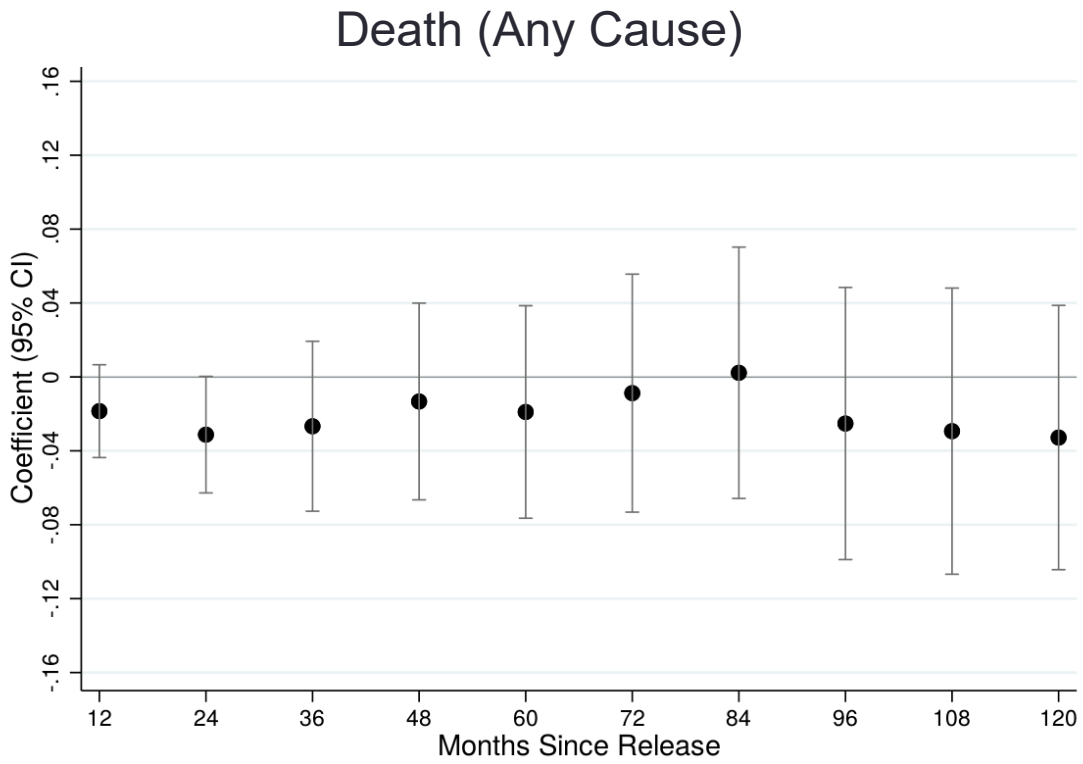
- Insensitive to excluding all observable controls (conditional independence)
- Very similar estimates across many subsamples (monotonicity)

Reduced Form Effect on Overall Mortality

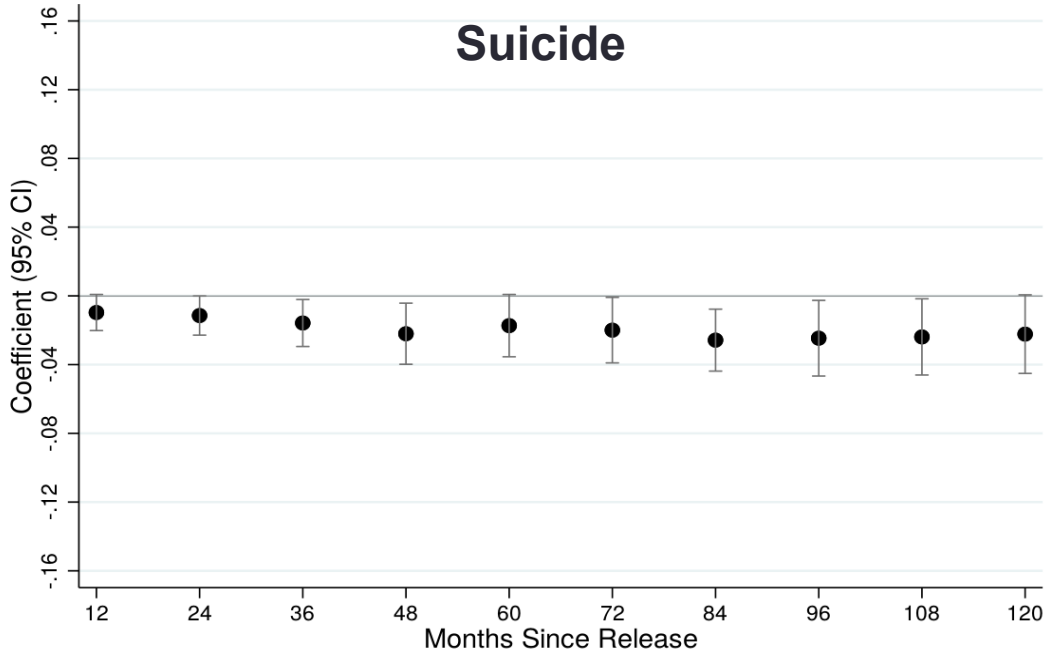
	Reduced Form Estimates at month			
Dep Variable:	12	24	36	120
Death (Any Cause)	-0.019	-0.031*	-0.027	-0.033
	[0.012]	[0.016]	[0.023]	[0.035]
Share dead	0.014	0.027	0.040	0.13
N	46287	45934	45629	44560

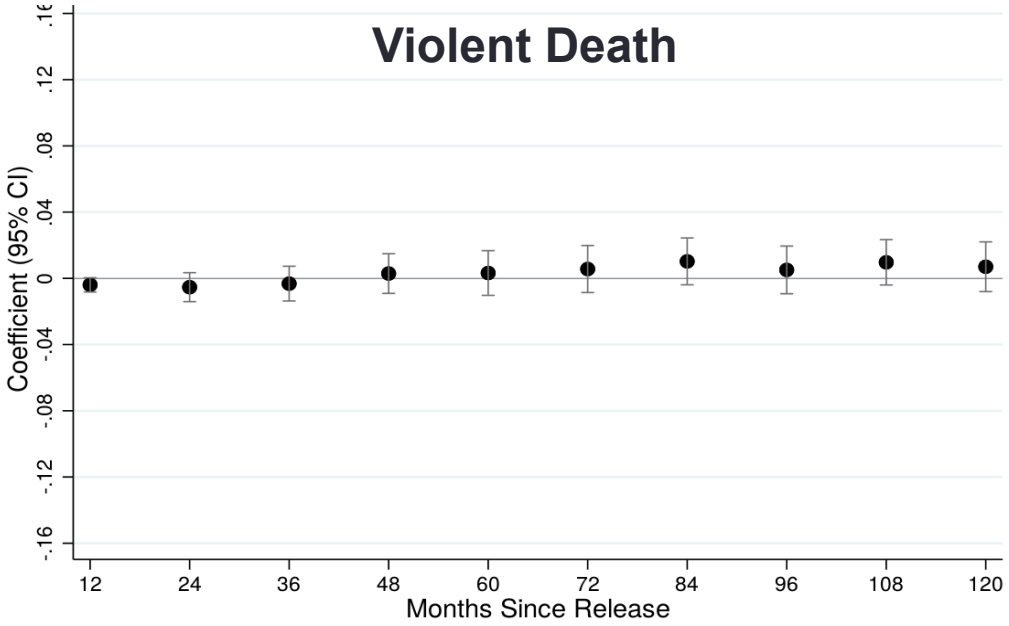
Negative effect on overall mortality, but only (marginally) significant in short run.

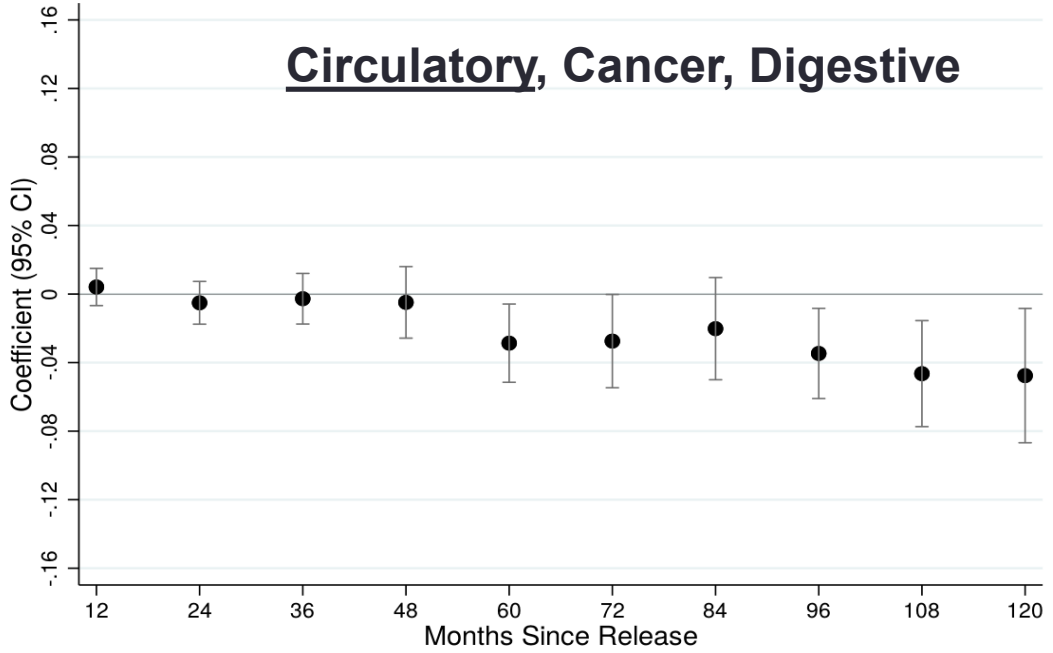
All deaths and entire sample masks heterogeneity.



Reduced Form Results by Cause of Death







	Reduced Form Estimates at month			
Dep Variable	12	24	36	120
Death (Any Cause)	-0.019 [0.012]	-0.031* [0.016]	-0.027 [0.023]	-0.033 [0.035]
Death by Type (ICD Codes):				
Suicide	-0.010* [0.005]	-0.011** [0.006]	-0.016** [0.007]	-0.022* [0.011]
Violent	-0.004* [0.002]	-0.005 [0.004]	-0.003 [0.005]	0.007 [0.007]
Cancer/Circ/Digestive	0.004 [0.005]	-0.005 [0.006]	-0.003 [0.007]	-0.048** [0.019]
Alcohol/Narcotics Exclusive	-0.008 [0.008]	-0.003 [0.011]	0.001 [0.014]	0.025 [0.020]
Share dead	0.014	0.027	0.040	0.13
Share suicide	0.0013	0.0022	0.0034	0.010
Share Violent death	0.00069	0.0011	0.0018	0.0050
Share CCD Death	0.0019	0.0039	0.0061	0.030
Share Alc/Narc Only Death	0.0072	0.0136	0.0200	0.0601

Reform exposure decreases chance of suicide by 75% (m36) and 37% (m120)

-100%

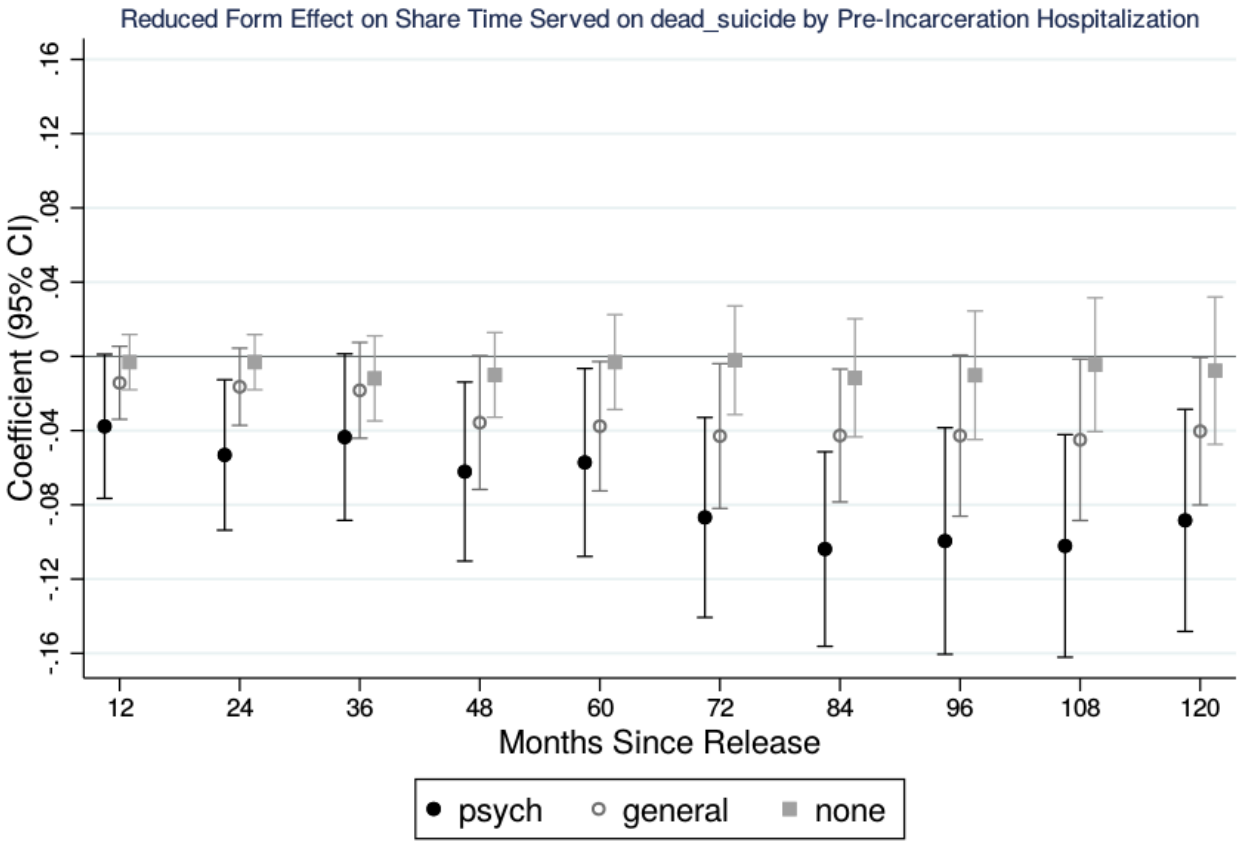
-27%

Heterogeneity: High Risk Subsamples

Three main results and corresponding hypotheses:

1. Large, immediate and persistent reduction in chance of suicide: Driven by those with pre-identified mental health problems?
   - Psych ward admission in 5 years prior to prison vs. general ward vs no ward.
   - 10 year suicide rates: 2%, 1.3%, 0.6%

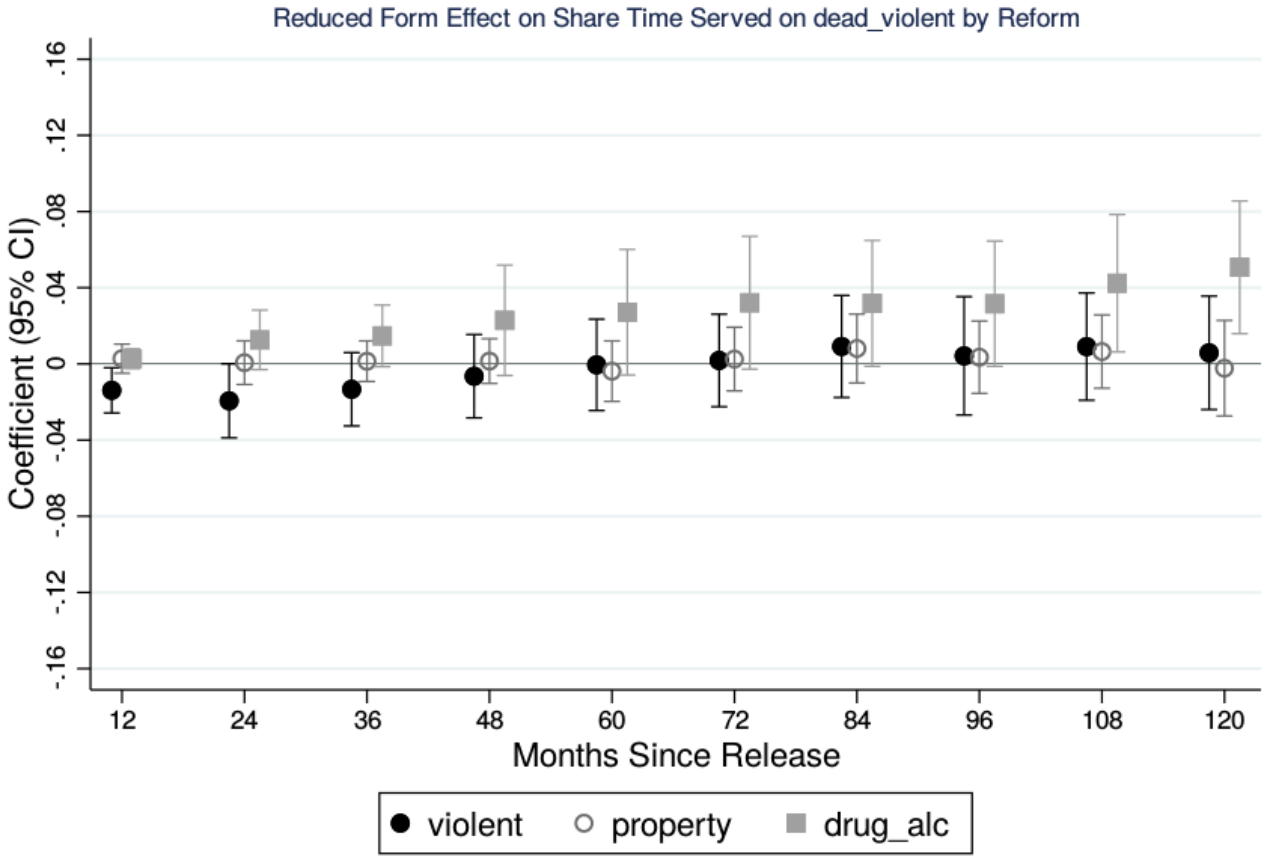
- Typical reform exposure decreases 10 year post-release chance of suicide by:
  - 75% (psych ward)
  - 50% (general ward).



Heterogeneity: High Risk Subsamples

Three main results and corresponding hypotheses:

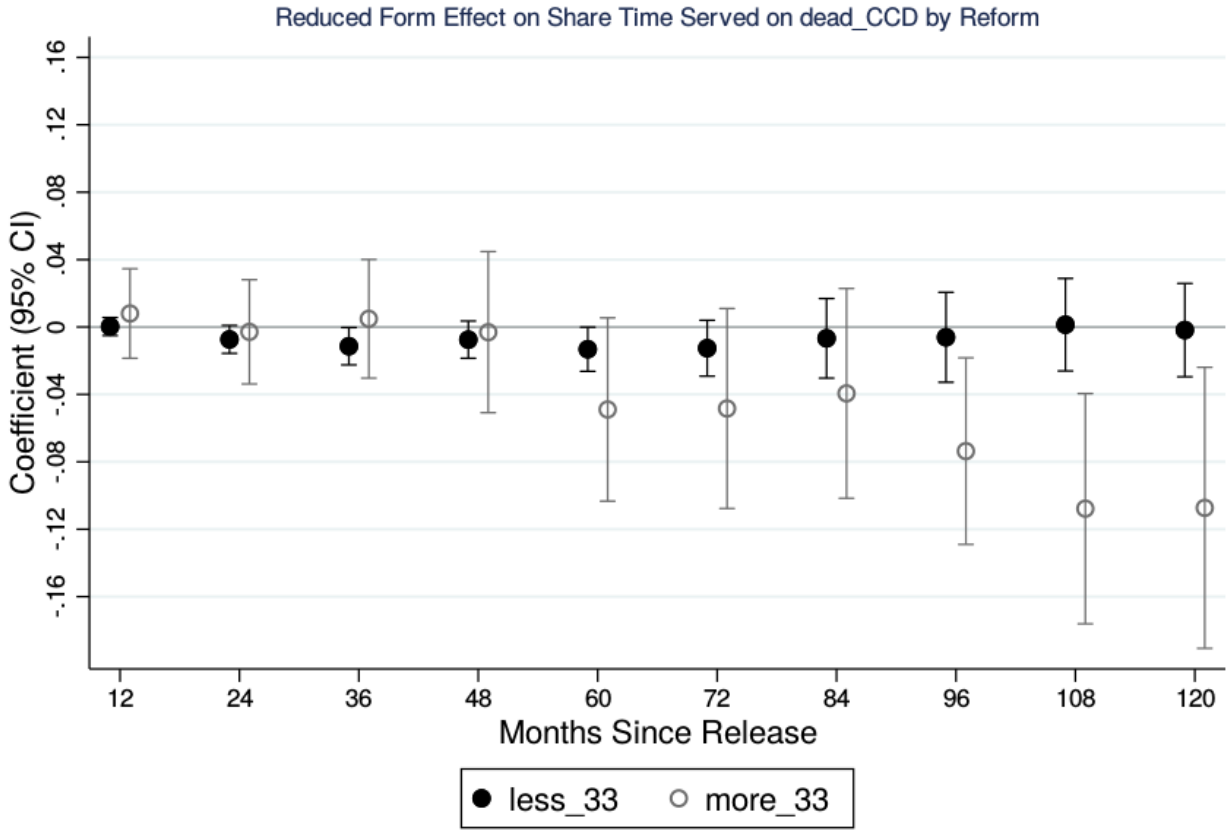
2. Large but termporary reduction in violent death: Driven by those with highest potential exposure to violence?
   - Current off: violent, property, drug/alc.
   - 10 year violent death risk: .7%, .4%, .4%



Heterogeneity: High Risk Subsamples

Three main results and corresponding hypotheses:

3. Long term impact on CCD deaths: Driven by the older population (for whom circulatory disease becomes more common)?
   - Older vs younger than 33 at admission
   - 10 year CCD death rate: 5.7% vs 1%



Mortality By Cause vs. Overall Mortality Effect?

Death (Any Cause)			
12	24	36	120
< 33 years old			
-0.03**	-0.05**	-0.06**	-0.009
[0.014]	[0.021]	[0.025]	[0.047]
>= 33 years old			
0.001	0.001	0.005	-0.07
[0.021]	[0.028]	[0.040]	[0.071]
property offender			
-0.037*	-0.038	-0.07**	-0.067
[0.019]	[0.024]	[0.026]	[0.042]
violent offender			
-0.014	-0.051*	-0.01	-0.019
[0.025]	[0.026]	[0.033]	[0.055]
psychiatric hospitalization in the last five years			
-0.021	-0.065	-0.039	-0.033
[0.045]	[0.057]	[0.071]	[0.086]
no hospitalization in the last five years			
-0.022*	-0.026	-0.029	-0.024
[0.013]	[0.021]	[0.026]	[0.043]

Overall negative effect seen for many subsamples:
Especially large and significant for **young** and **property offenders**.

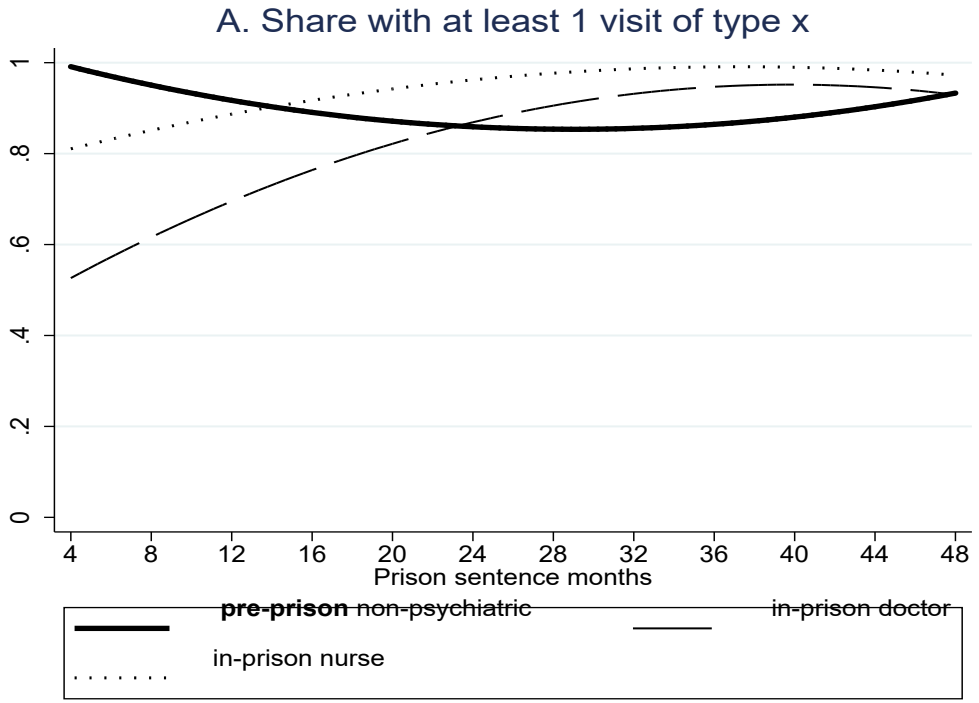
Why does more time in Swedish prisons improve health?

1. **Direct effects**? Due to treatment within Swedish prisons?
   - No in-prison treatment/healthcare data for the 1990s.
   - Out-of-sample analysis: high health care provision and take up in Swedish prisons.
   - Increases with time served in prison.
   - Direct effects are feasible!

2. **Indirect effects** via an effect on other outcomes? We consider the first-order outcome of recidivism.
   - Some evidence of a reduction in recidivism.
     - Not an incapacitation story.
     - Change in lifestyle can't explain all results – inconsistencies in heterogeneity analyses.

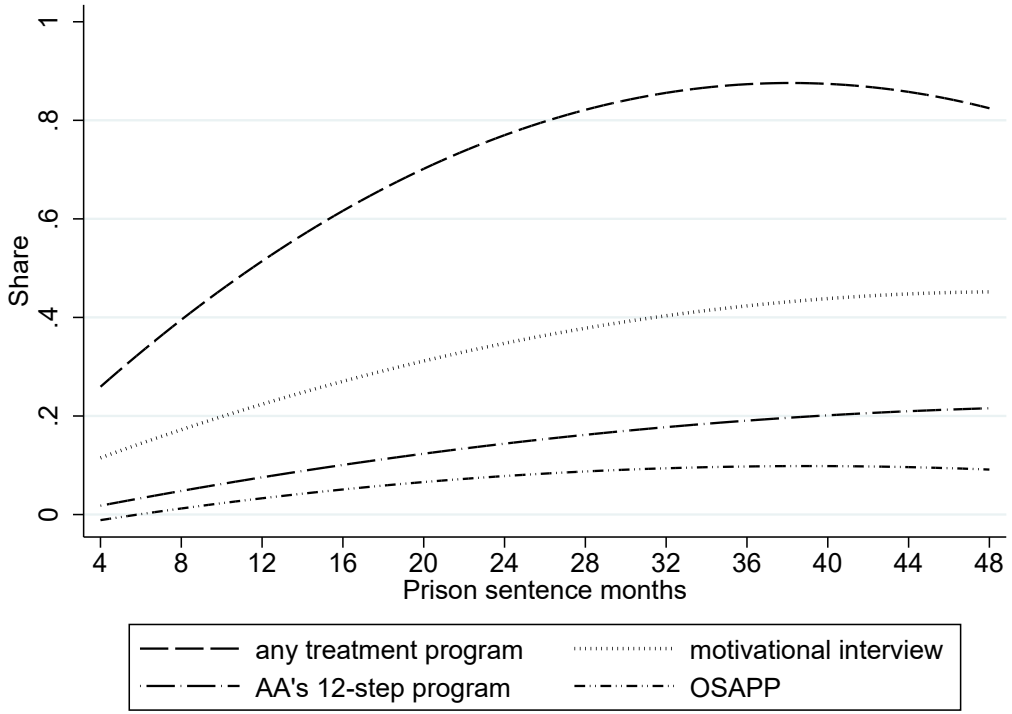
Out-of-Sample Analysis: 4-48 month sentences 2009-2013

Healthcare (doctor, psych visits, medication) takeup is (i) high and (ii) increases with time in prison



Pre-prison includes inpatient/outpatient in 2 years prior to prison spell.

Program completion increases with time in prison.



Recidivism

Reduced Form Estimates		
12	24	36
Dep Var = Any Conviction at Month t		
-0.089*	-0.103	-0.034
[0.046]	[0.074]	[0.062]
0.563	0.700	0.758
Dep Var = > 1 Conviction at Month t		
-0.098**	-0.101*	-0.145**
[0.039]	[0.051]	[0.061]
0.314	0.514	0.607
Dep Var = Any Prison at Month t		
-0.170**	-0.117*	-0.103
[0.068]	[0.065]	[0.070]
0.391	0.516	0.579
45626	44691	43817

Note -- The left hand side presents the reduced form effects of the prescribed share of time served on three measures of recidivism (any conviction, more than 1 conviction, and return to prison) measured at 12, 24, and 36 months post-release. All specifications condition on the sample that is alive and in Sweden at time t. Standard errors, clustered at the prison sentence month bin level, are in brackets. The mean of the dependent variable is in italics. * significant at 10%; ** significant at 5%; *** significant at 1%.

- Typical exposure to reform decreases 2 year recidivism rate (returning to prison) by 4%.
- But heterogeneity analyses for recidivism not completely consistent with mortality:
  - E.g. recidivism not driven by young.

Conclusion

- Spending more time in Swedish prisons does not harm health. If anything, health *improves.*
  - Decreases all cause mortality, especially significant for young and property offenders.
    - Immediate and persistent reduction in suicide, especially for those with mental health problems.
    - Immediate but not persistent reduction in violent death, especially for violent offenders.
    - Long-run reduction in circulatory disease, especially for older offenders.
    - Significant reductions in specific cause don't always translate into overall effect due to off-set in alcohol/narcotics, especially in the long run.

- More time in prison can have causal impact on post-release health. Why?
  - Treatment in Swedish prisons – plausible; increases with time served.
  - Desist from life of crime. Evidence of decrease in recidivism, but can't explain all of the effect given contrasts in heterogeneity analyses.

APPENDIX – EXTRA SLIDES

Sample Creation: 4-48 month analysis sample

Restriction	N
Baseline sample of all prison sentences from 1992-2001	57,310
Matching kriminalvården and brå conviction data: keep those with a conviction date up to 2 years before the start date	54,952
Keep: Sentences 48 months or shorter	52,783
Drop: Start date before age 18	52,697
Drop: Conviction date before age 18	52,675
Drop: Offense date before age 18	52,606
Drop: Start and end sentence in pre-trial detention	51,037
Drop: Uncertain Treatment (conviction pre reform, start is post)	47,446
Drop: life sentences	47,446
Drop: died in prison	47,385
Drop: sent to foreign prison	47,237
Trim: Share Time Served > 1.1	47,008
Trim: Share Time Served < 0.1	**46,815**

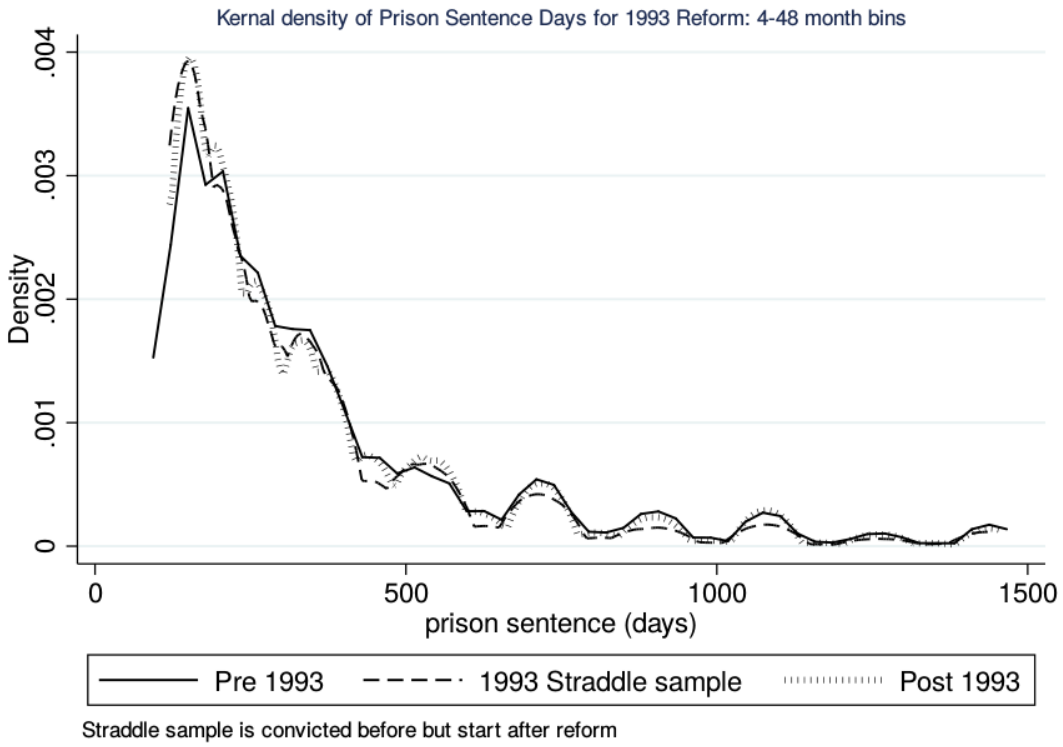
Note – This shows the sample restrictions in creating the baseline analysis sample of 4-48 month sentences.

Summary Statistics

	4-12 Month Bins N=33799		13-24 Month Bins N=8968		25-48 Month Bins N=4048	
variable	mean	sd	mean	sd	mean	sd
male	0.95	0.21	0.95	0.22	0.95	0.22
age_at_prison	33.94	9.44	33.28	9.79	33.82	10.1
prison_sentence_months	7.16	2.65	18.09	3.62	35.59	6.91
prison_sentence_days	217.49	79.58	545.19	107.75	1069.38	206.62
prison_days	114.64	53.17	271.68	76.49	575.23	169.78
dui	0.04	0.2	0.01	0.08	0	0.04
drug_alc	0.13	0.34	0.17	0.37	0.28	0.45
traffic	0.02	0.14	0.01	0.07	0	0.02
property	0.49	0.5	0.35	0.48	0.18	0.38
violent	0.28	0.45	0.43	0.5	0.52	0.5
other	0.04	0.2	0.04	0.19	0.02	0.16
employed_november_lag1to3	0.55	0.94	0.61	0.98	0.78	1.08
income_average_lag1to3	10.42	1.38	10.4	1.44	10.63	1.34
hospital_alcohol_days_lag1to3	0.44	3.7	0.32	2.97	0.21	2.48
hospital_narcotics_days_lag1to3	0.96	8.67	0.53	5.62	0.46	5.33
hospital_psych_days_lag1to3	5.56	38.23	5.34	43.23	3.94	38.5
hospital_other_days_lag1to3	2.68	9.83	2.52	10.56	2.4	16.86

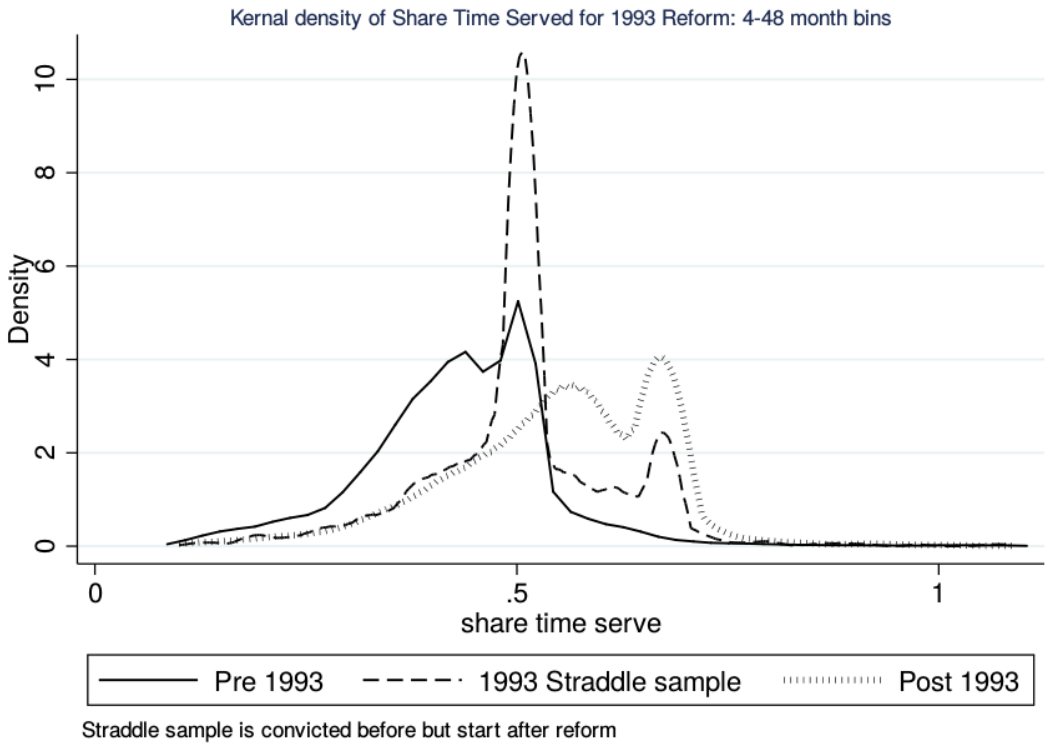
Were the reforms implemented correctly?

No effect on sentence distributions (1993)



Same picture when look at convictions around 1999 reform

Treatment status not always assigned according to **conviction date**



Drop straddle sample: convicted before but start after.

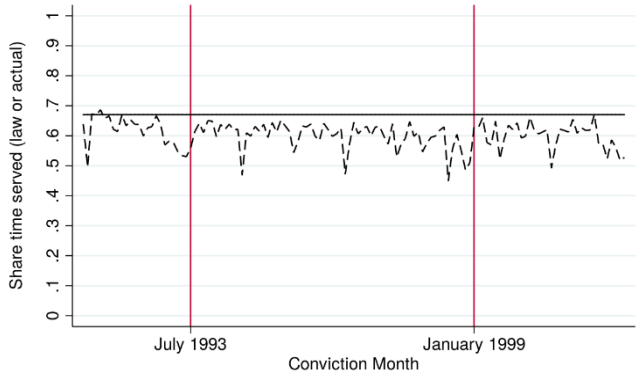
Other *implementation* facts and findings

- Timing of treatment = correct (implemented immediately)

- Additional evidence of conditional independence:
  - No impact other judicial decisions
  - No impact on prisoner characteristics/compositions.
    - Only observable that changes is employment around 1993 reform. Driven by recession. Identification strategy controls for this. (Go to figure)
  - Estimation sample (4-48 months) unaffected by other criminal justice reforms.
    - 1994 and 1999 reforms largely targeted alcohol related offenses in 0-3 month bins.

Timing of treatment (Appendix)

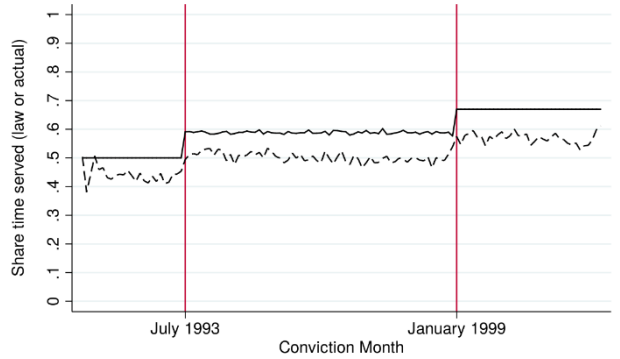
Prison Sentence = 3 months



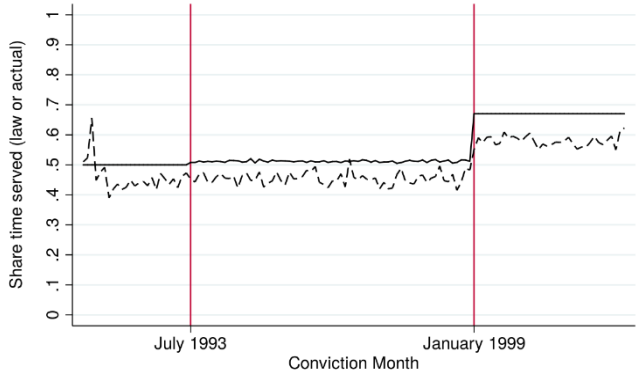
Prison Sentence = 4-12 months



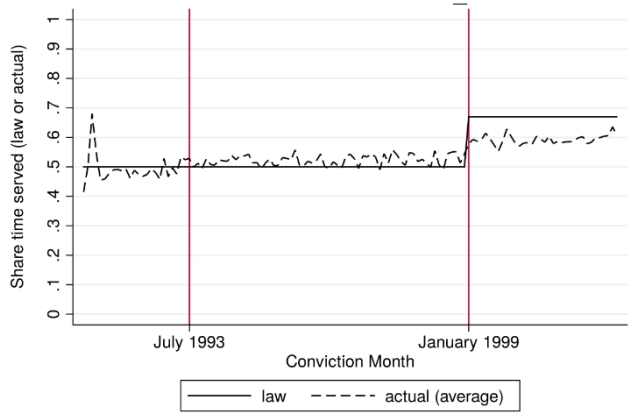
Prison Sentence = 13-18 months



Prison Sentence = 19-24months



Prison Sentence ≥ 25months



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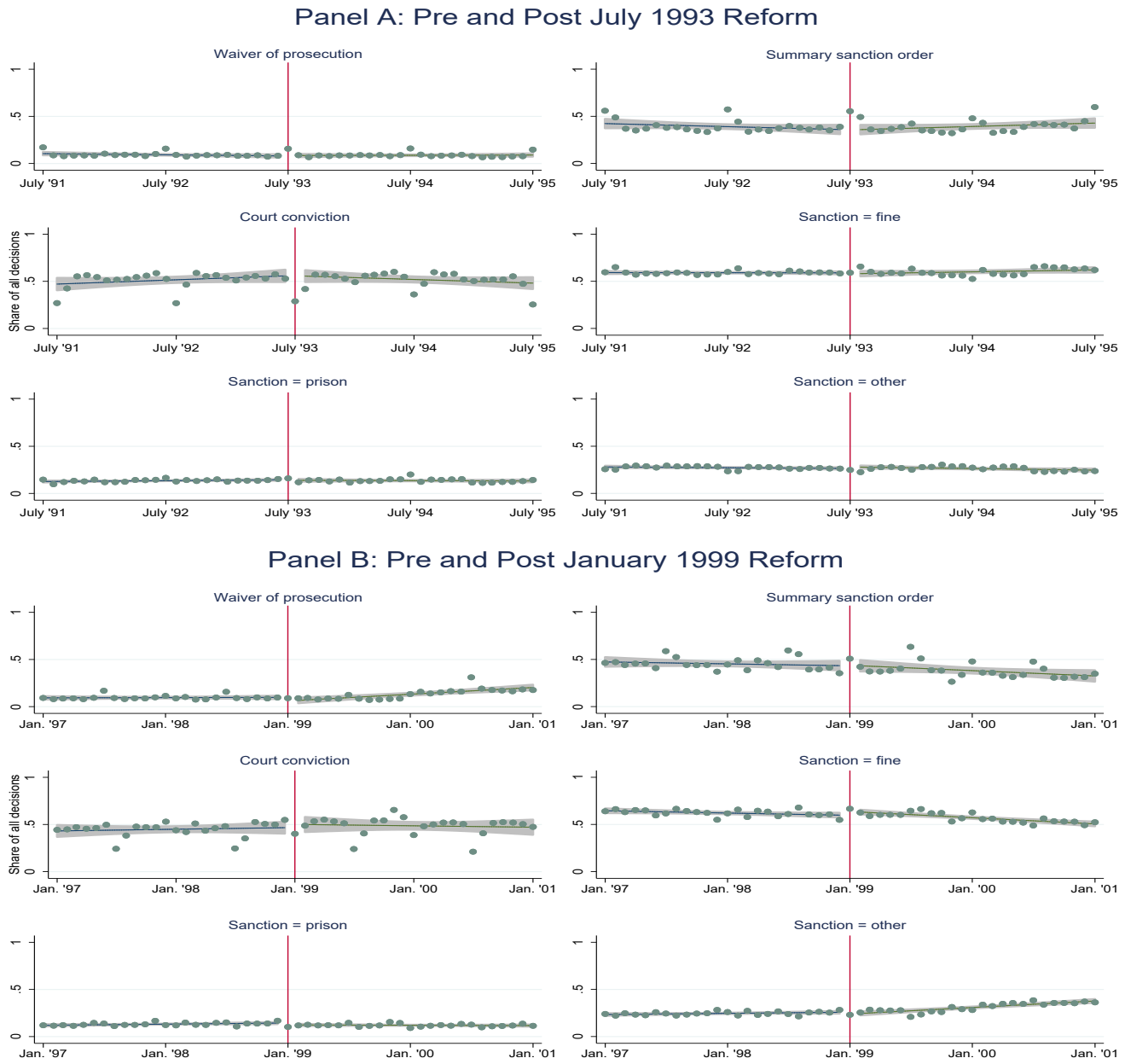
Monotonicity/ Heterogeneity

	Coefficient	Std Error	F	N
Baseline Sample	271.037	(25.771)***	111	46815
4 or less curent crimes	271.56	(27.722)***	96	21146
more than 4 current crimes	267.803	(26.476)***	102	25669
no past prison	266.822	(33.781)***	62	8073
1 past prison	328.963	(34.303)***	92	9014
past prison more than 1	252.472	(26.174)***	93	29728
drugs alcohol	316.011	(23.274)***	184	7065
Property	248.162	(24.693)***	101	20245
Violent	282.147	(31.696)***	79	15484
not born in sweden	273.588	(28.496)***	92	11069
born in sweden	272.062	(27.044)***	101	35746
younger 33	270.025	(30.007)***	81	22929
older 33	271.488	(24.590)***	122	23886
unemployed last 3 years	309.5	(25.307)***	150	31584
employed last 3 years	222.301	(31.043)***	51	15231
>= 1 psych 5 years prior	284.216	(29.729)***	91	9995
>= 1 general 5 years prior	271.701	(24.672)***	121	19348
no hospitalization 5 years prior	265.555	(29.674)***	80	22375
+/- 2 years of 1993 reform	134.006	(37.527)***	13	19130
+/- 2 years of 1999reform	428.866	(38.701)***	123	16930

Each row presents first stage estimates for different subsample; i.e. regressions of prison days served on share time that should be served according to the law. The baseline specification, with the full set of controls, is used. Fstatistics on the instrument (share of time served law) are reported in the third columns. Standard errors clustered on sentence month bin.

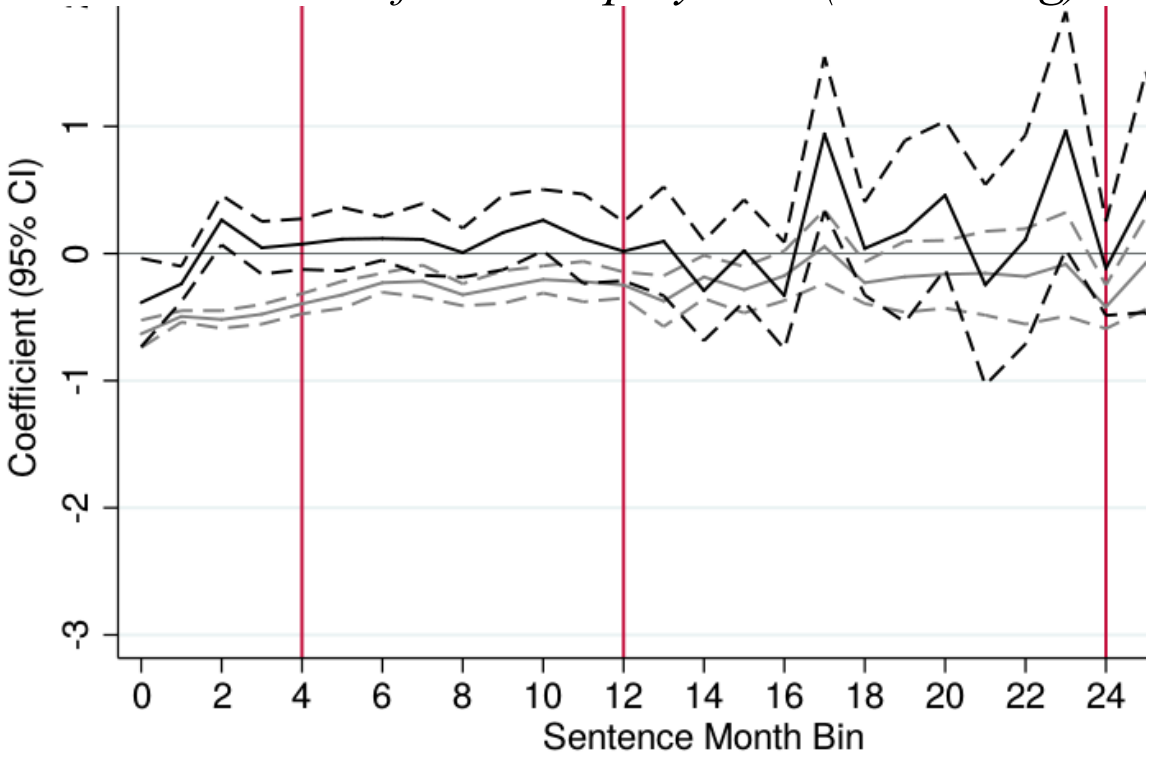
No manipulation of prosecutor and judge decisions

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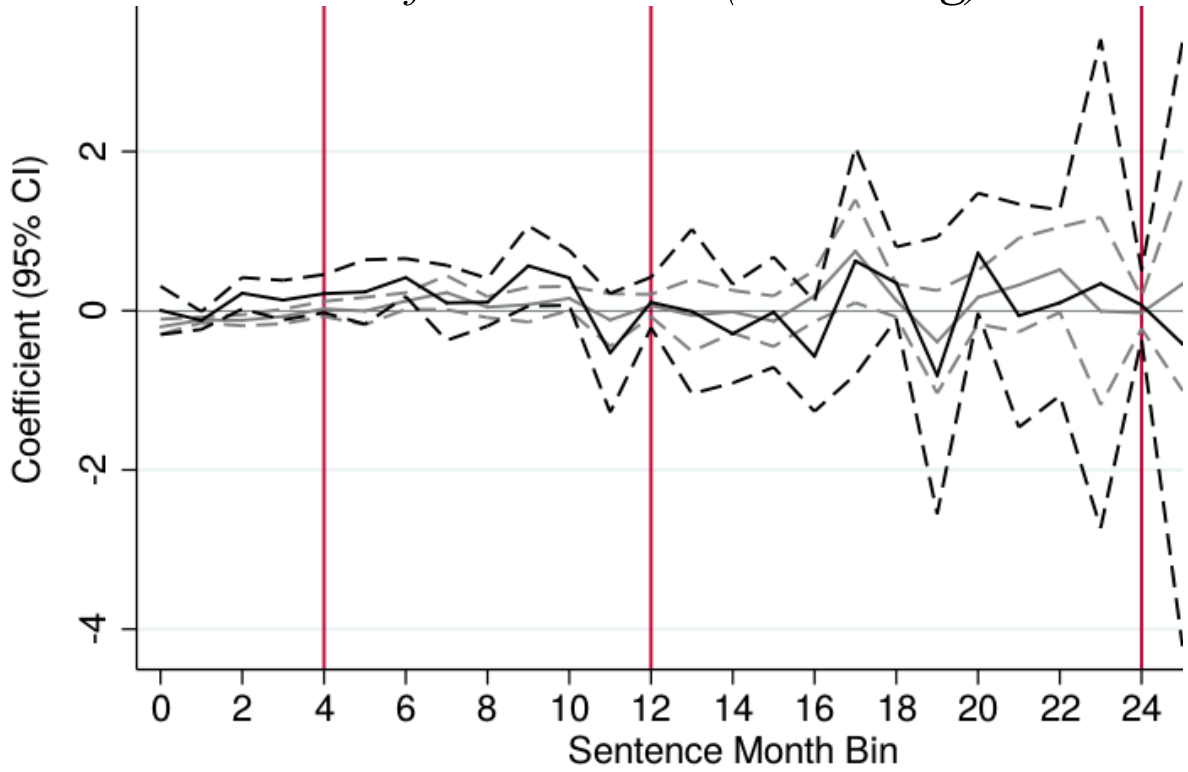


Employment/income around 1993 reform

Panel A1. 1993 Reform: Employment (3 Year lag)



Panel A2. 1993 Reform: Income (3 Year lag)



Gray: raw difference

Black: control for baseline trends

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Robustness and sensitivity checks

- Excluding/including controls
- Using first offense or last offense of offenders only
- Sentence day versus sentence month fixed effects.
- Bin specific trends
- Dropping donuts around reform dates
- Including samples dropped in sample creation

Heterogeneity by Reform: 1993 vs 1999

	1993 Reform Sample at Month:				1999 Reform Sample at Month:			
Dep Variable	12	24	36	120	12	24	36	120
Death (Any Cause)	-0.015	-0.008	-0.017	-0.006	-0.032	-0.079**	-0.057	-0.071
	[0.014]	[0.019]	[0.022]	[0.046]	[0.024]	[0.034]	[0.043]	[0.089]
Suicide	-0.014**	-0.011*	-0.019**	-0.026*	0.004	-0.007	-0.009	-0.018
	[0.006]	[0.006]	[0.008]	[0.016]	[0.010]	[0.010]	[0.011]	[0.023]
Violent	-0.006*	-0.006	-0.007	0.015	-0.005	-0.005	-0.002	-0.003
	[0.003]	[0.006]	[0.007]	[0.011]	[0.007]	[0.008]	[0.009]	[0.017]
Cancer/Circ/Digestive	0.006	-0.004	-0.001	-0.029	-0.003	-0.015	-0.012	-0.068
	[0.010]	[0.014]	[0.016]	[0.035]	[0.013]	[0.018]	[0.017]	[0.051]
Alcohol/Narc Exclusive	0.005	0.023	0.031	0.058	-0.025	-0.04	-0.041	0
	[0.009]	[0.015]	[0.022]	[0.043]	[0.019]	[0.034]	[0.039]	[0.059]
N	18891	18731	18596	17927	16768	16660	16559	16369

- Less precision, but same general story across reforms.
- Differential Effects (if any): mental health for 1993 and alc/narc for 1999?
  - Non-linear effects? Vs **Different marginal offenders**?
    - (sig suicide effect of 1999 psych histories)

Mortality By Cause vs. Overall Mortality Effect?

	Death (Any Cause)				Suicide				Violent Death				CCD	Alc/Narc Related (exclusive)			
	12	24	36	120	12	24	36	120	12	24	36	120	120	12	24	36	120
< 33 years old	-0.03**	-0.05**	-0.06**	-0.009	-0.005	-0.005	-0.005	-0.011	-0.003	-0.001	-0.002	0.01	-0.002	-0.011	-0.005	-0.002	0.011
	[0.014]	[0.021]	[0.025]	[0.047]	[0.007]	[0.007]	[0.009]	[0.016]	[0.003]	[0.005]	[0.005]	[0.011]	[0.014]	[0.010]	[0.015]	[0.015]	[0.027]
>= 33 years old	0.001	0.001	0.005	-0.07	-0.02**	-0.02*	-0.03**	-0.03*	-0.005	-0.01	-0.005	0.002	-0.107**	-0.002	0.007	0.01	0.04
	[0.021]	[0.028]	[0.040]	[0.071]	[0.007]	[0.010]	[0.014]	[0.017]	[0.005]	[0.010]	[0.010]	[0.013]	[0.041]	[0.010]	[0.016]	[0.025]	[0.037]
property offender	-0.037*	-0.038	-0.07**	-0.067	-0.006	-0.003	-0.006	-0.009	0.003	0.001	0.001	-0.002	-0.043	-0.006	0.001	-0.015	-0.001
	[0.019]	[0.024]	[0.026]	[0.042]	[0.004]	[0.005]	[0.007]	[0.012]	[0.004]	[0.006]	[0.005]	[0.012]	[0.031]	[0.013]	[0.020]	[0.026]	[0.031]
violent offender	-0.014	-0.051*	-0.01	-0.019	-0.014	-0.019	-0.03**	-0.03*	-0.01**	-0.019*	-0.013	0.006	-0.108***	0.009	0.016	0.045*	0.11***
	[0.025]	[0.026]	[0.033]	[0.055]	[0.013]	[0.013]	[0.011]	[0.019]	[0.006]	[0.010]	[0.010]	[0.015]	[0.033]	[0.014]	[0.020]	[0.025]	[0.041]
psychiatric hospitalization in the last five years	-0.021	-0.065	-0.039	-0.033	-0.038*	-0.05**	-0.044*	-0.09***	-0.010*	-0.02**	-0.03**	-0.021	-0.061	0.02	0.037	0.043	0.13**
	[0.045]	[0.057]	[0.071]	[0.086]	[0.019]	[0.020]	[0.022]	[0.030]	[0.005]	[0.011]	[0.011]	[0.020]	[0.056]	[0.032]	[0.050]	[0.061]	[0.057]
no hospitalization in the last five years	-0.022*	-0.026	-0.029	-0.024	-0.003	-0.003	-0.012	-0.008	-0.005	-0.003	0.001	0.021*	-0.026	-0.03***	-0.03*	-0.03*	-0.02
	[0.013]	[0.021]	[0.026]	[0.043]	[0.007]	[0.007]	[0.011]	[0.020]	[0.003]	[0.005]	[0.008]	[0.011]	[0.025]	[0.009]	[0.013]	[0.014]	[0.027]

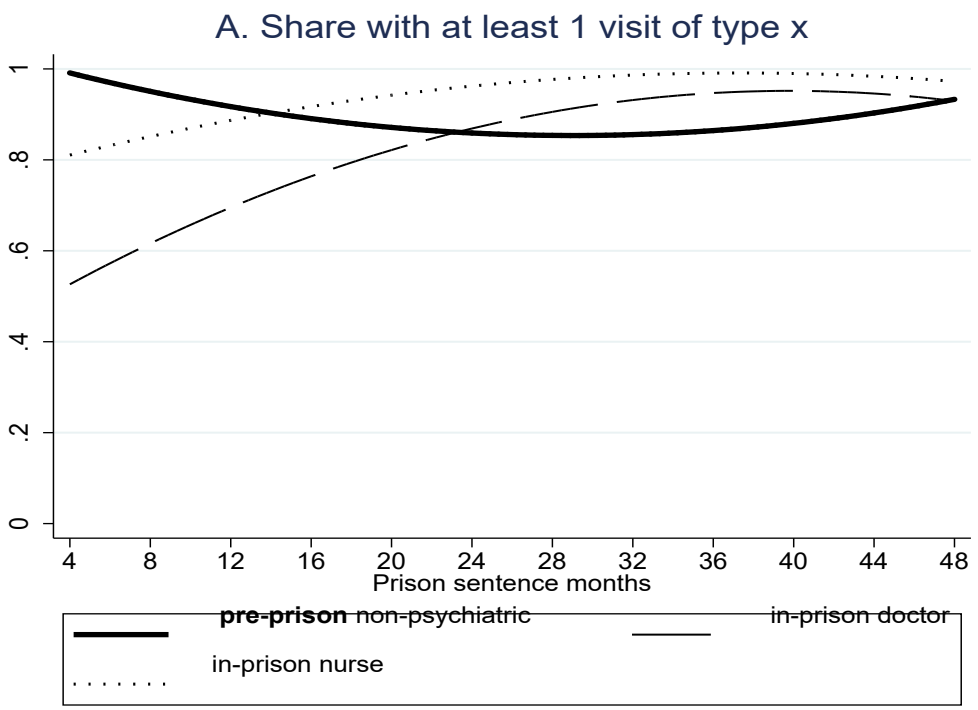
Overall negative effect seen for many subsamples: especially large and significant for young and property offenders.

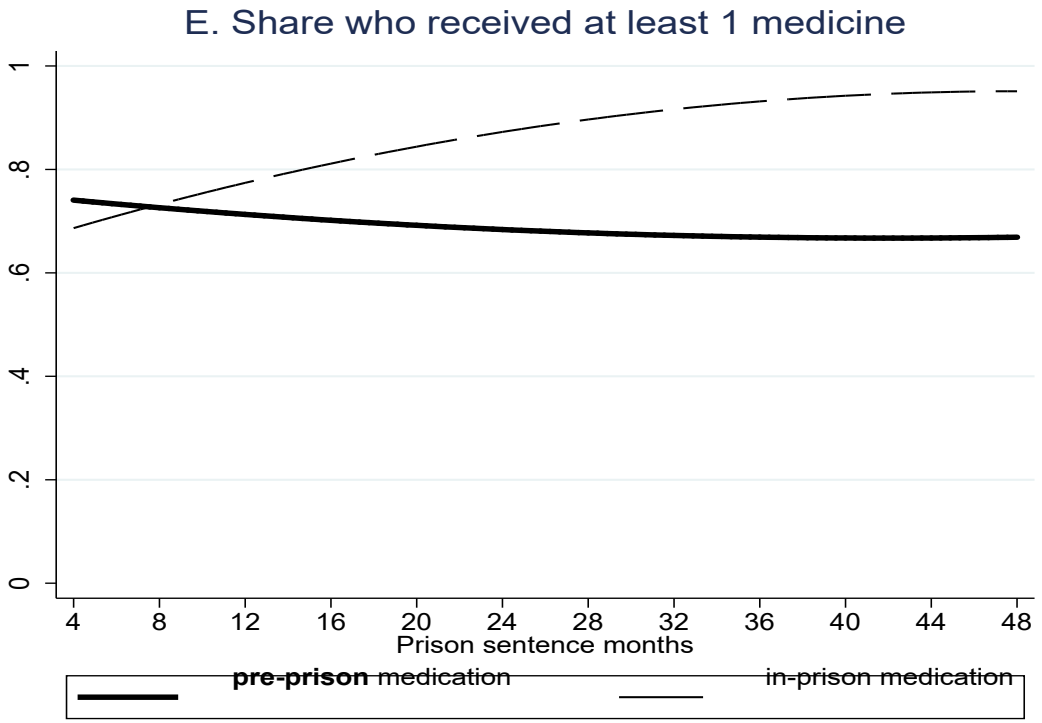
Overall effect muted of suicide and violent deaths (for psych and violent offenders) by substitute, especially in long run, to alc/narc deaths.

Direct effect: prison health services

Out of sample: 2009-2013 sentences of 4-48 months

Take-aways:
- **High** take up (both in prison and out) – also see this when look at psych visits and the intensive margin.
- Take up somewhat higher in prison than out.
- Take up increases with time in prison.





Pre-prison includes inpatient/outpatient in 2 years prior to prison spell.

Heterogeneity in Recidivism Results

Full Sample: at month			1993 Sample at month			1999 Reform at month		
12	24	36	12	24	36	12	24	36
Full Sample (Baseline)								
-0.170**	-0.117*	-0.103	-0.208**	-0.179**	-0.18***	0.059	0.161	0.199
[0.068]	[0.065]	[0.070]	[0.080]	[0.074]	[0.058]	[0.100]	[0.125]	[0.137]
Current Offense = Property								
-0.33***	-0.32***	-0.27***	-0.196	-0.176	-0.159*	-0.174	-0.153	-0.166
[0.088]	[0.078]	[0.065]	[0.118]	[0.115]	[0.091]	[0.204]	[0.183]	[0.152]
Current Offense = Violent								
-0.088	-0.005	0.007	-0.12	-0.08	-0.055	0.01	0.253	0.3
[0.071]	[0.090]	[0.096]	[0.118]	[0.135]	[0.116]	[0.105]	[0.186]	[0.216]
Young (Age <= 33)								
-0.113	-0.055	-0.078	-0.057	-0.044	-0.066	0.077	0.263	0.239
[0.079]	[0.077]	[0.080]	[0.087]	[0.085]	[0.075]	[0.136]	[0.178]	[0.210]
Old (Age > 33)								
-0.23***	-0.20**	-0.15	-0.41***	-0.35***	-0.32***	0.031	0.025	0.108
[0.086]	[0.089]	[0.098]	[0.109]	[0.099]	[0.116]	[0.127]	[0.143]	[0.123]

Driven by 1993: non-linearities or different marginal offender?

Differences matter but not the only story

New life with less crime does not explain all mortality results (strongest/weakest for young/old)