

The Economic Costs of Rape

Abi Adams
Kristiina Huttunen
Emily Nix
Ning Zhang

NBER SI Crime
July 2024

Introduction

- ▶ Rape and sexual assault are common worldwide
 - ▶ Across 28 EU countries, 1 in 12 women reported experiencing a rape since the age of 15.
 - ▶ US NCVS: Rape/sexual assault accounted for 12% of violent crime victimization in 2018
 - ▶ AEA 2019 Climate Survey: 1.4% of women in economics experienced an actual/attempted rape
- ▶ Stakeholder evidence & victim testimony highlight the traumatic nature of the crime
 - ▶ 94% of survivors report PTSD symptoms, 33% contemplate suicide, 13% attempt suicide (National Center for Victims of Crime)

Why Estimate the Economic Cost of Rape?

- ▶ No systematic evidence to date on the economic impact of these crimes on victims, their families, & peers
 - ▶ UK Crime Survey 2021: 29% of rape victims since age-16 reported stopping going out as much, 21% reported taking time off work and 5% reported losing their job/giving up work
 - ▶ Survey from Centre for Rape Victims at the University Hospital of Aarhus: 25% of the families and friends suffered from PTSD
- ▶ Small economics literature on the prevalence of sexual assault & its use in conflict settings
 - ▶ Zimmerman & Benson (2007); Bhuller et al (2013); Cunningham & Shah (2018); Lindo et al (2018); Guarnieri & Tur-Prats (2023).
- ▶ Medical article gives a cost of \$122,461 per rape and is used to inform many policy cost-benefit exercises (Petersen et al, 2017)
 - ▶ Unable to fully account for career costs, no accounting for spillovers

Policy & Social Context

- ▶ Commissions across countries on the prevalence and impact of rape note chronic under-funding in policing & victim support
 - ▶ United Nations Office on Drugs and Crime (2015), Lonsway and Archambault (2012), Hunter (2019), Carroll (2022)
- ▶ High attrition rate:
 - ▶ Finland and US: 6% incarcerated
 - ▶ UK admin data: 1.3% of recorded rape offenses assigned an outcome resulted in charge/summons
- ▶ Narrative has often been quick to identify the cost of charging for perpetrators
 - ▶ "His life will never be the one that he dreamed about...That is a steep price to pay for 20 minutes of action out of his 20 plus years of life" - Dan Turner, father of Stanford rapist Brock Turner

This Paper

- ▶ Harness detailed Finnish data to provide new insights into the economic costs of rape to victims
 1. What is the impact of experiencing a rape on a survivor's earnings, employment, and career choices?
 - ▶ **Contribution:** provide new facts on the cost of a prevalent form of violence that are currently missing from the literature
 2. Are there wider spillovers on the survivor's family & peer group?
 - ▶ **Contribution:** demonstrate the indirect costs of sexual assault on mothers, fathers, and peers
 3. Can the criminal justice system do anything to alleviate these costs?
 - ▶ **Contribution:** show that heterogeneity in the effectiveness of the local criminal justice system at responding to these crimes reduces the cost of victimization

Outline

1. Data and Descriptive Facts
2. Impacts on Victims
3. Spillover Effects on Peers, Mothers, and Fathers
4. Interaction with Criminal Justice Treatment

Finland

- ▶ Finland is usually considered a role model for gender equality but has repeatedly been criticized for its poor track record on VAWG
- ▶ 2019 Council of Europe and Amnesty International reports were damning; Amnesty International representative Anna Blus stated:

“In many ways, Finland is a model country for gender equality, but its antiquated rape laws are badly failing women. The definition of rape in Finnish law, which is based on physical violence and incapacity, is outdated and discourages survivors from coming forward. Survivors of sexual violence deserve laws that protect them and avenues to get justice, and to have their human rights respected throughout the process.”

Definition

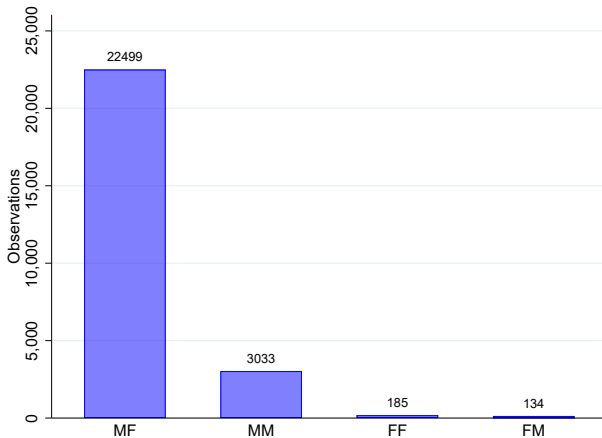
- ▶ Rape defined under Chapter 20 of Finnish Criminal Code
 - ▶ A person who forces another into sexual intercourse by the use or threat of violence directed against a person
 - OR
 - ▶ A person takes advantage of the fact that another person, due to unconsciousness, illness, disability, state of fear or other state of helplessness, is unable to defend themselves or to formulate or express their will, and has sexual intercourse with them
- ▶ In practice, threshold for “helpless state” and “expression of will” set very high over our time period (reformed in 2022)
- ▶ Countries with coercion-based definition of rape: France, Russia, Poland, Phillipines, Thailand, Estonia, ...

Data

- ▶ Universe of police reports filed in Finland from 2006-2019 matched perfectly with administrative data on tax records, employment, demographics, health, and family information
 - ▶ Police data contains personal IDs for perpetrators and victims, here we will focus on victims
- ▶ Police reports: first step in a police investigation before charging
- ▶ Identify a report as rape if an incident is categorized as rape, attempted rape, or other forms of sexual assault

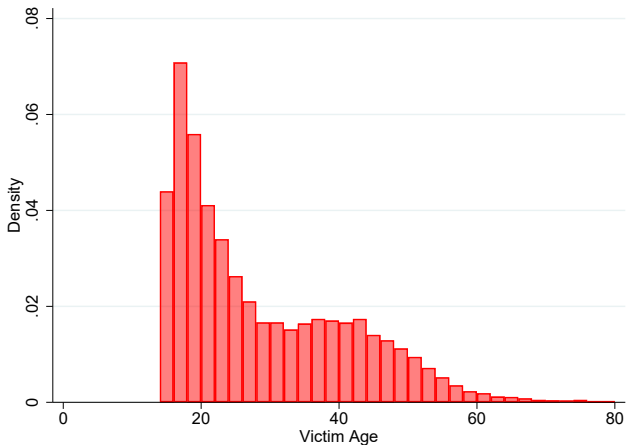
Crime Code

Types of Cases

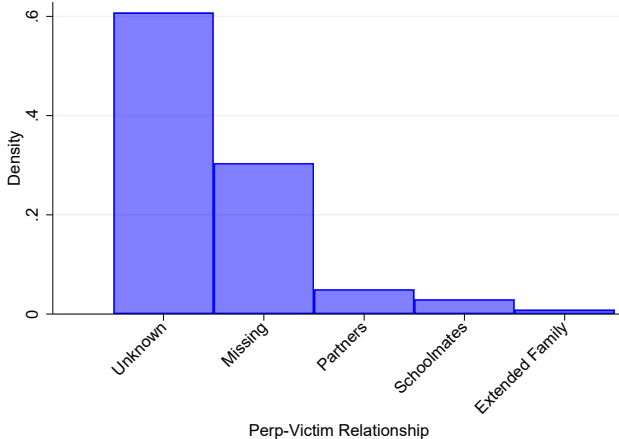


→ restrict to female victims with male perpetrators for rest of the talk

Age Distribution - Victims



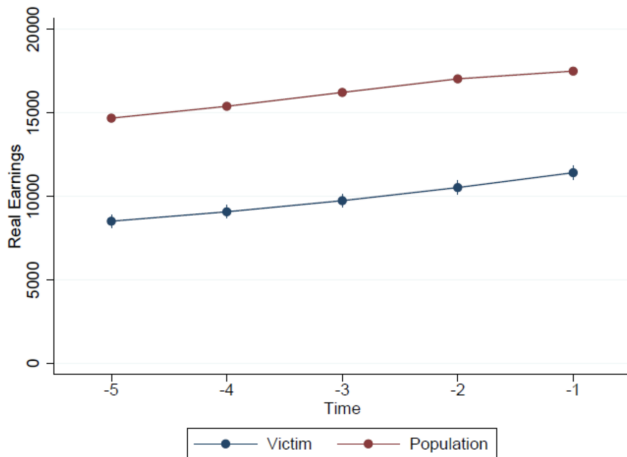
Victim and Perpetrator Relationship



Summary Statistics - Older Victims (≥ 21 yr old)

	M-F		Non-Violent	
	Victim	Perp	Women	Men
Age	35.34	35.44	46.28	45.64
College	0.12	0.07	0.26	0.20
High School	0.55	0.40	0.57	0.58
Dropouts	0.33	0.53	0.17	0.22
Anti-Depressant at t-1	0.30	0.10	0.11	0.07
Employed at t-1	0.47	0.40	0.65	0.63
Earnings t-1	11999	13232	20379	26548
+ Earnings t-1	19578	23270	27093	34918
Prior Crimes	0.37	7.83	0.00	0.00
<i>N</i>	9568	9053	1750486	1767479

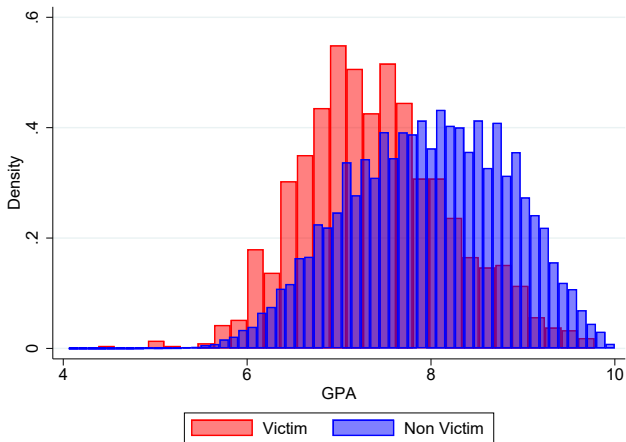
Earnings Trajectories Prior to Rape



Summary Statistics - Younger Victims' Parents

	Mothers		Fathers	
	Victim	No-Victim	Victim	No-Victim
Age	44.71	46.04	47.30	48.35
College	0.13	0.19	0.13	0.19
High School	0.66	0.68	0.66	0.68
Dropouts	0.21	0.13	0.21	0.13
Anti-Depressant	0.17	0.11	0.10	0.07
Employed at t-1	0.75	0.85	0.72	0.83
Earnings at t-1	22547	27991	29477	38856
+ Earnings at t-1	27077	30974	36639	43535
Prior Crimes	0.01	0.01	0.23	0.04
<i>N</i>	2343	1164755	2343	1164755

GPA Distribution - Younger Victims (≤ 20 yr old)



Outline

1. Data and Descriptive Facts
- 2. Impacts on Victims**
3. Spillover Effects on Peers, Mothers, and Fathers
4. Interaction with Criminal Justice Treatment

Empirical Strategy

- ▶ It is challenging to identify the magnitude of the impact of sexual violence on victims' outcomes
- ▶ Many victims are young and still at school
 - pre-event economic outcomes are not observed
- ▶ Victims might be on (permanently) different life trajectories
 - persistent differences in economic trajectories
- ▶ Victimization might not be random but linked to external life-shocks
 - temporary shock around event time

Empirical Strategy: Older Victims

Leverage the rich data available in our context in a series of matched difference-in-differences event study designs:

1. Changes in survivors' outcomes before-after rape relative to observationally equivalent women who do not experience a reported rape
 - ▶ Control for persistent observed differences in pre-assault economic trajectories
2. Focus on sub-sample of victims with stable outcomes prior to assault
 - ▶ Robustness to temporary economic shocks linked to victimization
3. Changes in survivors' outcomes before-after rape compared to the change in outcomes at the same age of future victims
 - ▶ Control for persistent unobserved differences in economic trajectories

Empirical Strategy: Older Victims

Leverage the rich data available in our context in a series of matched difference-in-differences event study designs:

1. Changes in survivors' outcomes before-after rape relative to observationally equivalent women who do not experience a reported rape
 - ▶ Control for persistent observed differences in pre-assault economic trajectories
2. Focus on sub-sample of victims with stable outcomes prior to assault
 - ▶ Robustness to temporary economic shocks linked to victimization
3. Changes in survivors' outcomes before-after rape compared to the change in outcomes at the same age of future victims
 - ▶ Control for persistent unobserved differences in economic trajectories

Empirical Strategy: Older Victims

Leverage the rich data available in our context in a series of matched difference-in-differences event study designs:

1. Changes in survivors' outcomes before-after rape relative to observationally equivalent women who do not experience a reported rape
 - ▶ Control for persistent observed differences in pre-assault economic trajectories
2. Focus on sub-sample of victims with stable outcomes prior to assault
 - ▶ Robustness to temporary economic shocks linked to victimization
3. Changes in survivors' outcomes before-after rape compared to the change in outcomes at the same age of future victims
 - ▶ Control for persistent unobserved differences in economic trajectories

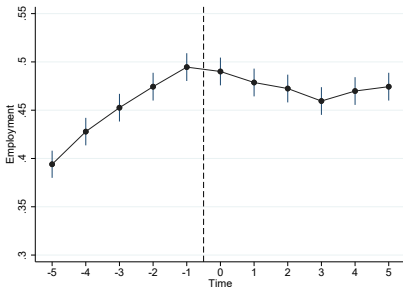
Empirical Strategy 1: Older Victims

- ▶ “Observationally equivalent”:
 - ▶ Exact match on following $t - 1$ characteristics: (i) women’s employment; (ii) women’s age group; (iii) any anti-depressant prescriptions; (iv) college
 - ▶ Five nearest-neighbour propensity score matches on these characteristics: age, high school + anti-depressant, substance abuse, earnings, fertility, cohabitation, and employment status in the four years prior
- ▶ DiD specification including match \times years from event fixed effects

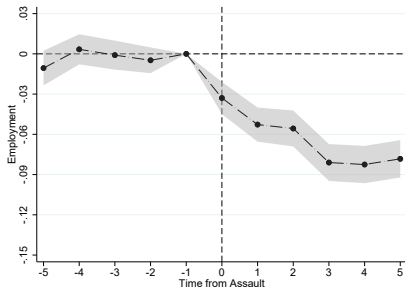
$$Y_{it} = \sum_{j=-5}^5 (\delta_j D_{i,j} + \alpha_{m(i),j}) + \gamma_t + \epsilon_{it} \quad (1)$$

Impact of Rape on Employment

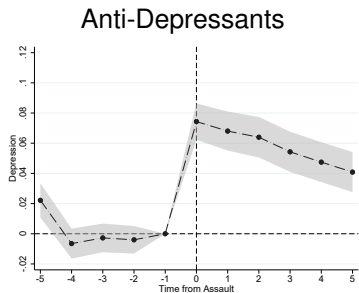
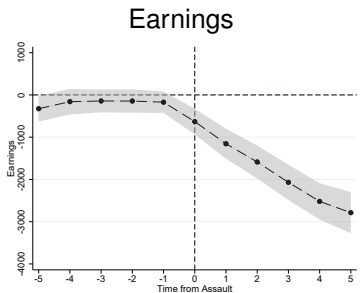
Raw Means



Estimates

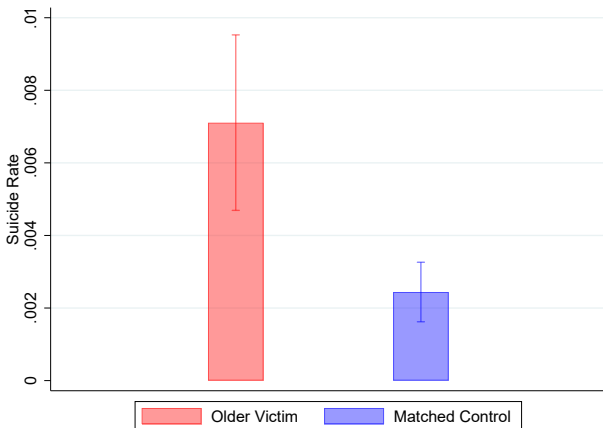


Impact of Rape on Earnings & Mental Health



Impact of Rape on Suicide Rate

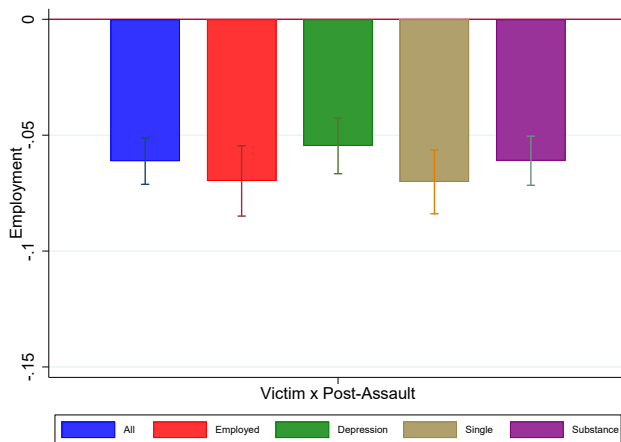
Suicide Rate within 5 years after Rape



Empirical Strategy 2: External Negative Shocks

- ▶ Survivors might experience other life shocks that reduce economic outcomes and also make them more vulnerable to rape
- ▶ This would cause us to overestimate the effect of rape on outcomes
- ▶ We focus on three possible life shocks occurring between $t = -2$ and $t = -1$:
 - ▶ Job-loss
 - ▶ Break-up
 - ▶ Mental-health deterioration
 - ▶ Substance abuse
- ▶ Analyze heterogeneity by whether changes (+ve / -ve / none) in these factors

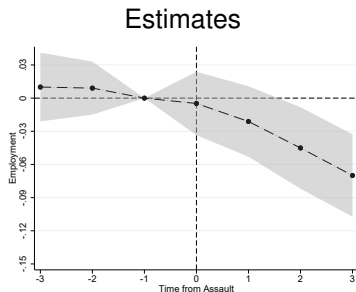
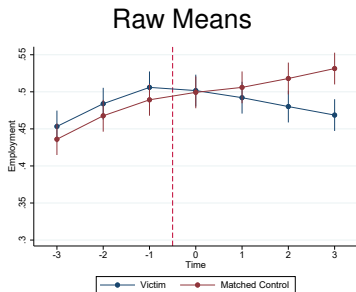
Empirical Strategy 2: External Negative Shocks



Empirical Strategy 3: Future Victims

- ▶ Leverage variations in the timing of victimization (Fadlon and Nielsen, 2019)
- ▶ Compare outcomes at ages $t + 1$, $t + 2$, $t + 3$ for those who were victimized at age t (treatment) to those who are victimized at age $t + 4$ (counterfactual)
 - ▶ Match on age, education level, employment status, and anti-depressant prescriptions before victimization

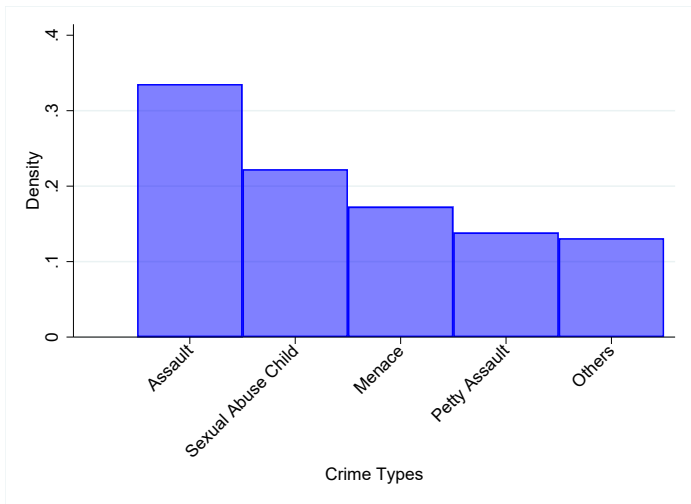
Empirical Strategy 3: Future Victims



Rape Definition and External Validity

- ▶ The cases we identified in the police data using the official definition of rape in Finland tend to be the most serious ones
- ▶ To further check external validity of our results
 - ▶ Identify other female victims of perpetrators: 40% of the perpetrators had been violent against other women before
 - ▶ These female victims share similar characteristics of our rape victims
 - ▶ Find significant negative impact on these female victims using the same matching method

External Validity: Other Victims of Rape Perpetrators

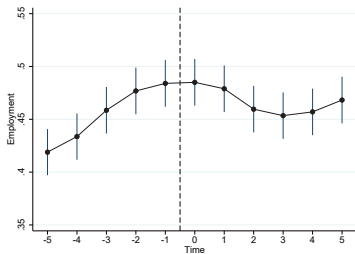


External Validity: Other Victims of Rape Perpetrators

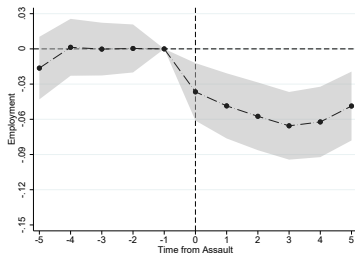
	Rape Victims	Rapist Other Female Victims
Age	34.53	38.91
College	0.07	0.05
High School	0.59	0.59
Dropouts	0.35	0.35
Anti-Depressant	0.29	0.20
Employed at t-1	0.49	0.53
Earnings at t-1	11805	13948
Prior Crimes	0.16	0.31
<i>N</i>	4642	2166

External Validity: Other Victims of Rape Perpetrators

Raw Means



Estimates

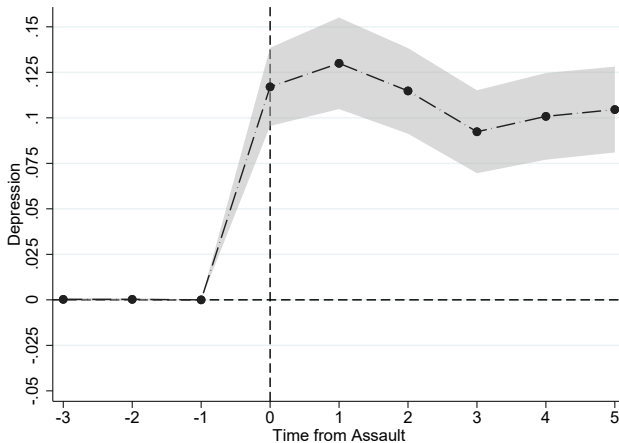


Empirical Strategy - Younger Victims

- ▶ Do not observe many pre-event outcomes for young victims
- ▶ For anti-depressants, use a matched event-study design
 - ▶ **Exact match** on anti-depressant prescriptions in the three years before an assault
- ▶ For education/labor outcomes, we provide descriptive impacts
 - ▶ Compare outcomes at age-25 for girls who are observationally equivalent except for victimization status on: anti-depressant prescription at $t - 1$; 1-digit GPA (if taken pre-assault); Mother's & father's within-gender income decile & education at $t - 1$; Father's criminal history
- ▶ Estimating equation simply:

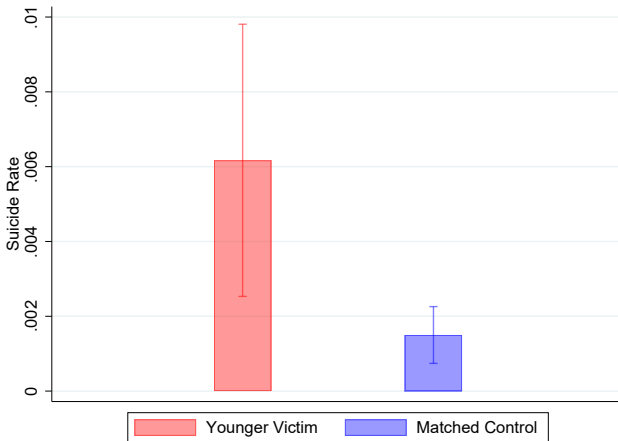
$$y_i = \beta \text{Assault}_i + \gamma_{g(i)} + \delta_{t(i)} + \epsilon_i \quad (2)$$

Younger Victims - Mental Health

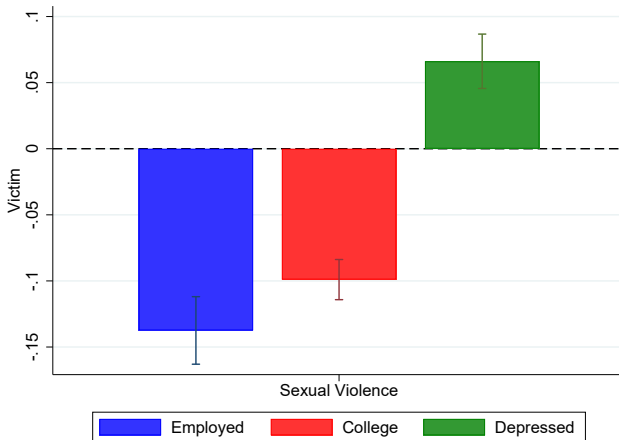


Younger Victims - Suicide Rate

Suicide Rate within 5 years after Rape



Younger Victims - Outcomes at Age 25



Outline

1. Data and Descriptive Facts
2. Impacts on Victims
3. **Spillover Effects on Peers, Mothers, and Fathers**
4. Interaction with Criminal Justice Treatment

Spillover Effects

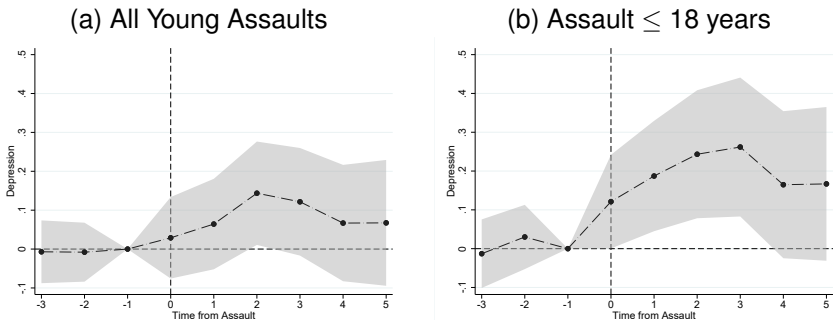
- ▶ Violent crimes can have traumatic consequences not just for victims but also those in their wider social network
 - ▶ Direct caring & support responsibilities
 - ▶ Indirect shift in beliefs & preferences
- ▶ **Today**: impact on outcomes of (all) victims' parents and depression of younger victims' classmates
- ▶ **Future**: impact on major choice of victims' classmates
- ▶ For parents, take the same matched event-study approach as for older victims but consider mothers' and fathers' outcomes

Empirical Strategy - Classmates

- ▶ We observe the school that a victim was enrolled in at age 15
- ▶ Construct a victim's female peer group at age 15 as those in the same school who were born in the same year
- ▶ Compare the anti-depressant outcomes of the peer group to others in which no assault occurred and:
 - ▶ Same quintile of class-size
 - ▶ Any anti-depressant prescriptions in the 3 years before an assault
 - ▶ In a different school
 - ▶ Also matching on characteristics of parents produces very similar effects

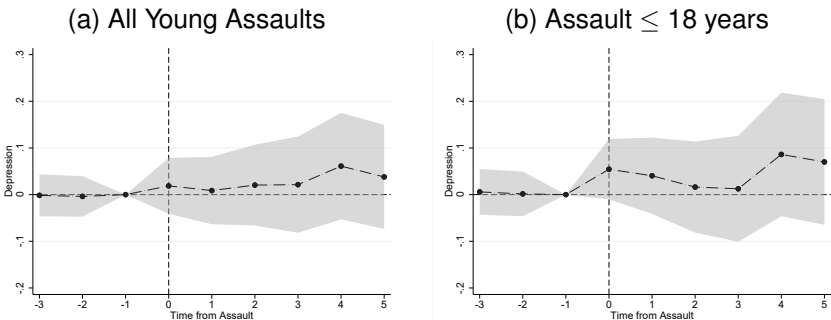
Impacts on Female Peers

Figure: No. of Anti-Depression Prescriptions

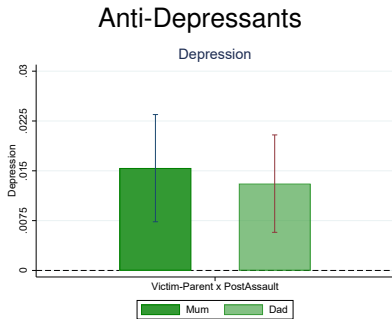
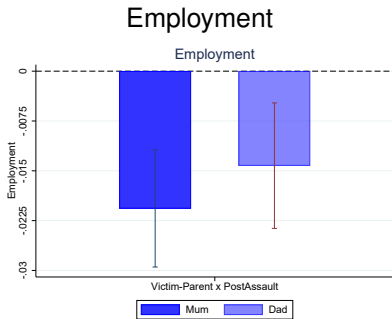


Placebo: Impacts on Male Peers

Figure: No. of Anti-Depression Prescriptions



Impacts on Parents



Outline

1. Data and Descriptive Facts
2. Impacts on Victims' Earnings and Employment
3. Spillover Effects on Peers, Mothers, and Fathers
4. **Interaction with Criminal Justice Treatment**

Criminal Justice System

Rape victims are continually and systematically failed by the criminal justice system... The number of cases which result in a charge and proceed to court represents only a small proportion of the total cases reported to the police.

Her Majesty's Inspector of Constabulary Wendy Williams and Her Majesty's Chief Inspector of the Crown Prosecution Inspectorate Andrew Cayley

“Those who do find the strength to carry on are rare... as going through the criminal justice system felt like being raped again, raped of justice, raped of acknowledgement, raped of a day in court to hold them accountable.”

Evidence to UK Parliament Home Affairs Select Committee

Criminal Justice System

- ▶ Large criminology literature on the challenges of effective policing & prosecution in this area
 - ▶ Police officers said to be wedded to stereotypes about “real rapes” and “real victims” (Edwards et al, 2011)
- ▶ Out of 100 rapes reported in Finland, six perpetrators are incarcerated
- ▶ Ex-ante unclear whether pursuing a case through the criminal justice system is ex-ante better for the victims themselves (even if a public good component)
 - ▶ Time & emotional costs could be high

Impact on Victim Outcomes

- ▶ Heterogeneous effects by cases proceeding to courts or not?
- ▶ **Key issue:** cases that proceed to court may be selected on how traumatic an incident was
- ▶ Leverage variation across districts (d) and over time in lagged clearance rates (b-1 refers to year before incidence year)

$$C_{d,b-1} = \frac{RapeCourtCases_{d,b-1}}{RapePoliceReports_{d,b-1}} \quad (3)$$

- ▶ Interact “treatment” with lagged clearance measure
 - ▶ Include interactions with other municipality level factors that might also be associated with clearance rates and victim outcomes
 - ▶ No important district-level characteristic associated with clearance rates that also leads labor market effects of sexual assault to differ

Victim Outcomes and Clearance Rates

Dependant Variable:	Victim Employment	
	(1)	(2)
Victim × Post-Assault	-0.0963*** (0.0108)	-0.0861* (0.0350)
Victim × Post-Assault × CR	0.0558 (0.0362)	0.0751* (0.0382)
Full interactions	No	Yes
Mean	0.592	0.592
Observations	86,983	86,983

Deterrence

Summary

- ▶ Document 3 new facts:
 1. Large & significant impacts on earnings, employment, and mental health for survivors
 2. Smaller but significant impacts on earnings/employment of mothers and fathers; negative mental health effects on school peers
 3. More effective criminal justice approach could mediate some of the impacts on victims
- ▶ Next steps: peer effects on college major choice of being exposed to these crimes

Reformed Rape Definition 2022

- ▶ A person who has sexual intercourse with a person who does not participate in it voluntarily shall be sentenced for rape to imprisonment for at least one year and at most six years.
- ▶ The participation of a person in sexual intercourse shall not be considered voluntary if:
 1. the person has not verbally, through his or her behaviour or in any other way expressed that he or she is participating in it voluntarily,
 2. the person has been coerced into sexual intercourse by using violence against a person or by making a threat, or
 3. the person has not been able to formulate or express his or her will due to unconsciousness, illness, disability, state of fear, state of intense intoxication, reduced consciousness, sudden nature of the situation, serious abuse of a special position of power or another comparable reason.

Crime Codes

1. Primary: "Rape", "Attempted Rape", "Aggravated Rape", and "Aggravated Attempted Rape"
2. Supplementary: "Coercion into a Sexual Act", "Attempted Coercion into a Sexual Act", "Sexual Abuse", "Attempted Sexual Abuse", "Sexual Harassment", "Trafficking", and "Attempted Trafficking"

Back

Correlation Between Clearance Rate and Crime Types

