

Parenthood in Poverty

Sarah Eichmeyer & Christina Kent

June 28, 2023

Bocconi University & Mathematica Policy Research

Motivation

Parenthood has profound effects on lives of new parents:

- affects ability to work,
- alters housing needs,
- influences mental and physical health,
- probes stability of relationships,
- ...and more.

Motivation

Parenthood has profound effects on lives of new parents:

- affects ability to work,
- alters housing needs,
- influences mental and physical health,
- probes stability of relationships,
- ...and more.

Particularly disrupting for low-income/poor parents: lack resources to insure themselves.

⇒ Depend on sound safety net policies.

Motivation

- Well-functioning safety net: requires comprehensive understanding of parenthood's impact on living conditions.
- But: So far, heavy focus on labor market outcomes.
- **What about other key domains relevant to well-being?**
Housing stability, drug use, criminal behavior, ...

This paper

Paint **comprehensive picture** of how **first-time parenthood** shapes **living conditions** of **women of low SES**.

- Data: *high-frequency administrative data* from large urban US county.
- Sample: \sim poorest 15%.
 - Young (median age at first birth: 21), unmarried (90%), racial disparities (52% are Black)
- Domains: *housing, substance use, use of social assistance programs, crime.*

This paper

Paint **comprehensive picture** of how **first-time parenthood** shapes **living conditions** of **women of low SES**.

- Data: *high-frequency administrative data* from large urban US county.
- Sample: \sim poorest 15%.
 - Young (median age at first birth: 21), unmarried (90%), racial disparities (52% are Black)
- Domains: *housing, substance use, use of social assistance programs, crime*.

Approach: **Event study research design** around precise timing of childbirth.

- Document impacts + identify domains of improvement/deterioration.

This paper

Paint **comprehensive picture** of how **first-time parenthood** shapes **living conditions** of **women of low SES**.

- Data: *high-frequency administrative data* from large urban US county.
- Sample: \sim poorest 15%.
 - Young (median age at first birth: 21), unmarried (90%), racial disparities (52% are Black)
- Domains: *housing, substance use, use of social assistance programs, crime*.

Approach: **Event study research design** around precise timing of childbirth.

- Document impacts + identify domains of improvement/deterioration.
- Investigate mechanisms (*leverages cross-domain nature of data*).
- Draw policy implications.

Overview of results

Nuanced results: Parenthood brings both **challenges** and **opportunities**.

Overview of results

Nuanced results: Parenthood brings both **challenges** and **opportunities**.

Challenges:

- **Housing instability** ↑ (including homeless shelter stays).

Opportunities:

- **SUD treatment** ↑ (likely due to decrease in untreated drug addictions).
- Use of **government benefits** ↑ (healthcare coverage, food assistance, cash assistance); eligibility rules driven.
- **Criminal behavior** ↓ (benefit access unlikely mechanism)

Contribution to literature

a) **Impact of parenthood on life outcomes:** Earnings, employment and wage gap literature (e.g. Adda et al., 2017; Lundborg et al., 2017; Zohar and Brooks, 2022; Gallen et al., 2022; Blau and Kahn, 2017; Kleven et al., 2019a,b; Kuziemko et al., 2022). Teenage parenthood and education (Hotz et al., 1997; Fletcher and Wolfe, 2009; Kearney and Levine, 2012). Curtis et al. (2013); **Miller et al. (2023) on financial distress; Massenkoff and Rose (2023) on crime**, Wolfe et al. (2007) on SUD. Important qualitative studies, e.g. Edin and Kefalas (2005), DeLuca et al. (2019).

- 1) **Broader set of domains;** some not studied before: *homelessness, public housing;*
- 2) **Precise estimates accounting for pre-trends,** due to high freq admin data & sample size: *SUD, gov't benefits;*
- 3) Explore **mechanisms** by leveraging across-domain data.

b) **Causes of permanent/transitory economic hardship:** Health shocks (Dobkin et al., 2018), death of spouse (Fadlon and Nielsen, 2021).

Family formation as event.

c) **Housing and family formation:** home ownership (e.g. Lauster and Fransson, 2006), house price/home ownership(regime) and fertility (e.g. Dettling and Kearney, 2014; Mulder and Billari, 2010)

Focus on relevant outcomes for low-income populations: public housing + homelessness.

d) **Homelessness:** Lucas (2017); Corinth (2017); Curtis et al. (2013); Collinson et al. (2022); Abramson (2022)

Study pregnancy/parenthood as cause of homelessness; use non-survey-based data on housing outcomes.

This Talk

1. Setting & Data
2. Empirical Strategy: Event Study
3. Results
4. Robustness

Setting & Data

Setting

U.S. context: Less generous safety net, eligibility often tied to age/family status.

Focus on **Allegheny County, Pennsylvania.** [▶ Allegheny County characteristics](#)

- Population of 1.2 million.
- Includes the city of Pittsburgh.

Setting

U.S. context: Less generous safety net, eligibility often tied to age/family status.

Focus on **Allegheny County, Pennsylvania.** [▶ Allegheny County characteristics](#)

- Population of 1.2 million.
- Includes the city of Pittsburgh.

Data: From Allegheny County Data Warehouse, Administrative records:

- covering all residents,
- for years 2005-2019.

Includes **court records/crime, medical records/SUD, housing assistance records, benefit records.** Binary indicators at the individual-month level. [▶ Eligibility rules](#)

Sample Selection

1. Focus on **first birth event to female residents** (identified via birth records).
 - (exclude men b/c of important selection concerns - in 38% of low SES births no father is listed on birth record)
 - Birth in 2007-2018; age 16-40 at time of birth.
2. Restrict to **low-SES** individuals.
 - Proxy for low SES: **Enrolled in Medicaid at some point pre-pregnancy.**
 - Why Medicaid? Largest means-tested program in U.S., with highest take-up rate (70-90%); Income threshold is 138% of FPL.

⇒ 12,500 first births (15% of all first births in the county).

Balanced panel in relative even time r_{it} : 12 months before pregnancy to 12 months after birth.

Summary Statistics

	Low SES First Time Mothers	All Other First Time Mothers
Age	21.897	28.436
Age 16-17	0.098	0.012
Black	0.523	0.082
White	0.456	0.846
Dad listed on birth certificate	0.566	0.909
Married at birth	0.099	0.711
SNAP recipient in year before pregnancy	0.378	0.011
Any homeless encounter in year before pregnancy	0.017	0.000
Charged with crime in year before pregnancy	0.108	0.010
Any SUD encounter in year before pregnancy	0.050	0.001
Observations	12928	66529

Notes: Table shows demographic characteristics of all women in Allegheny County who experienced a first live birth in the sample period (2007-2018), and who were age 16-40 at the time. Outcomes are measured as of month of first childbirth, unless otherwise noted. Low SES is defined as being Medicaid-insured in at least one month within the five years preceding the pregnancy leading up to the first birth.

Low SES sample:

- higher markers of economic vulnerability (age, SNAP, etc.);
- ca. 50% births unintended (Finer and Zolna, 2016);
- ca. 50-70% solo parenting (CPS, 2021).
- Lower childbirth penalty: 15% (20%) decline in weekly employment (earnings) for unmarried women (Kleven, 2023)

Empirical Strategy

Setting: High frequency data (monthly), sharpness of event timing.

⇒ Lends itself to **event study** approach.

- Measure individual-level changes in outcomes around childbirth, controlling flexibly for:
 - seasonality/time trends through date FE γ_t ,
 - time-invariant individual characteristics through individual FE μ_i .
- Incorporates **parallel trends assumption**:

Among women with different childbirth dates, evolution of outcomes in absence of pregnancy/childbirth would follow parallel trends.

- Many potential sources of endogeneity: Meeting a new partner, finding/losing employment, ...

Event Study Approach

Do parallel trends hold? 3-pronged approach:

(akin to Dobkin et al., 2018)

1. **Examine raw means** to visually assess pre-trends.
2. Informs **event study specification**: include control for a linear pre-trend in event time.
 - Measure changes in outcomes around pregnancy and childbirth relative to smooth trends leading up to pregnancy.
3. **Robustness**:
 - Miscarriage DiD: Construct counter-factual from women who have a miscarriage.
 - Matched DiD: Construct counter-factual from similar women who don't have a child (yet).

Event study specification

Borusyak, Jaravel, and Spiess's (2021) **Imputation Estimator**. [► Why?](#)

- **Step 1:** Estimate via OLS for all $r_{it} < -9$ (*untreated obs*):

$$y_{it} = \beta_0 + \mu_i + \gamma_t + \delta r_{it} + \epsilon_{it}, \quad (1)$$

- y_{it} is the outcome of interest for individual i in calendar year-month t
- μ_i and γ_t are individual and calendar year-month fixed effects
- **Step 2:** impute potential outcomes for treated periods.
- \Rightarrow Difference between imputed potential outcome and actual outcome is TE estimate.

[► Pre-trend test specification](#)

Results 1/4: Housing

Housing Outcomes

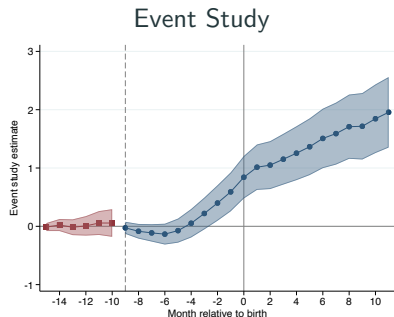
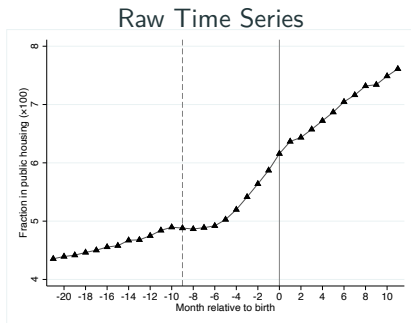
Outcomes:

1. Public Housing residence,
 - Upside: Rent is capped at 30% of income.
 - (Downside): In areas of concentrated poverty.
 - Relatively common: 8% ever lived in PH pre-pregnancy, w/ median of 2.5 years
2. Homeless shelter stays (rarer: 2% w/ at least 1 visit pre-pregnancy),
3. Stays in medium-/long-term homelessness housing programs.

Eligibility:

- Unchanged for 1.
- Supply & quality of 2. and 3 may change: separate facilities for families.

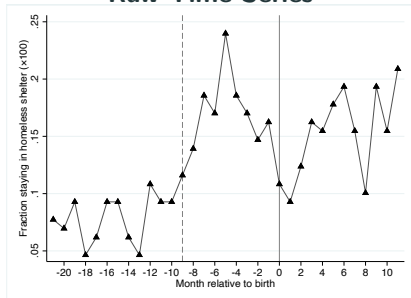
Public Housing: Trend-break & increase



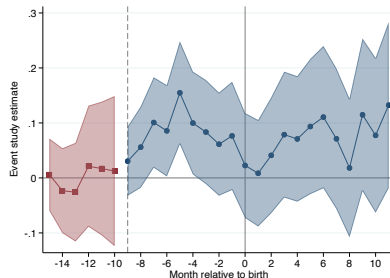
- Effect size: on average 1.4pp (or 30%) increase in year post-birth.
- Path-dependence w.r.t. age at first birth: Driven by younger women who move straight out of parents' household into PH.
- (Average time on wait list: 9 months.)

Homeless shelter stays increase

Raw Time Series



Event Study



► Table

► Robustness

► Heterogeneity

- Shelter visits increase by 0.08pp (77%) during pregnancy; coeff is 0.07 in year post birth (not stat. sig.)
- Large CIs on stays in long-term homeless housing programs, positive trend post-birth. ► medium/long term homeless

Homeless shelter results: Demand- or supply-driven?

Consistent w/ several potential mechanisms.

1. Demand: Real increase in homelessness.
2. Demand (preference): Switch from unsheltered to sheltered homelessness.
3. Supply: Change in supply of homeless services.

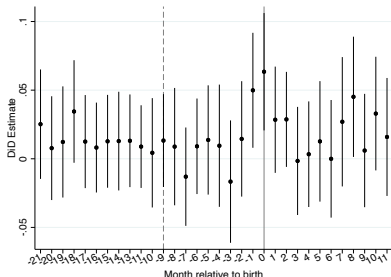
⇒ Investigate by **comparing effects across 1st and 2nd births.**

- Supply-side changes & preference change likely small for second pregnancy (since already has dependent child).

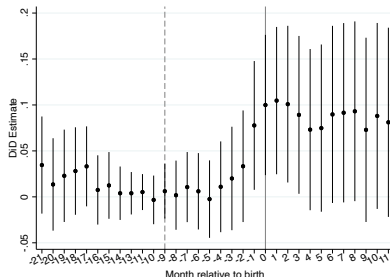
Finding: Even larger effects of second birth. Suggests real increase in homelessness due to pregnancy/additional child.

Compare first to second birth

Homelessness Shelter Stay



Medium-Term Homeless Program Participation



Notes: Figures show DiD interaction coeffs β_r (difference at $r = -12$ is left-out category) from following specification:


$y_{ijr} = \alpha + \sum_{r \neq -12} (\gamma_r \tau_r + \beta_r \tau_r T_{ij}) + \nu T_{ij} + \eta X_{ijr} + \epsilon_{ijt}$; where r is month relative to the month of childbirth, i is individual, and j denotes the series (either first or second birth). τ_r denotes relative event time dummies, T_{ij} is second birth indicator, and X_{ijr} includes individual FE, age FE, and calendar year FE. For sample of women with two live births in the sample period ($N = 22,890$).

Take-aways

New parenthood brings big shifts to housing environment.

- Induces moves into public housing.
 - Is this good or bad? Depends on counterfactual. According to Chyn (2018) it's worse than providing rental assistance for private market housing (Section 8).
- Increases homelessness service use; likely due to real increase in homelessness.

Substantial heterogeneity (age, race, pre-existing SUD).

- Public Housing: young (↑), Black (↑).
- Homeless Shelter: age (∼), Black (↑).
- Long-term Homeless Assistance: pre-ex SUD (↑) 

Results 2/4: Substance Use Disorder Treatment

Substance Use Disorder (SUD)

Background:

- SUDs impose heavy burden on individuals, their children, and society.
- Not a fringe issue: 11% ever treated for any SUD (half of them for opioid UD).
- Highly effective treatments exist (e.g. for OUD), but are under-utilized.
- Little evidence on demand-side determinants of take-up.

Substance Use Disorder (SUD)

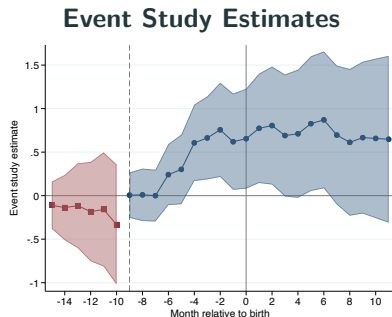
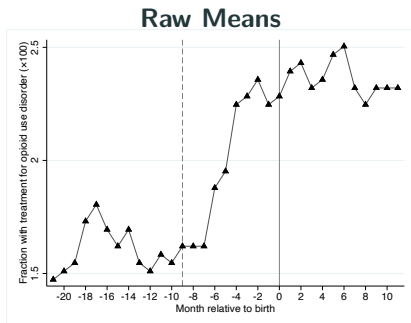
Background:

- SUDs impose heavy burden on individuals, their children, and society.
- Not a fringe issue: 11% ever treated for any SUD (half of them for opioid UD).
- Highly effective treatments exist (e.g. for OUD), but are under-utilized.
- Little evidence on demand-side determinants of take-up.

Implementation:

- Only observe treatment for Medicaid insured. So, restrict sample to: Continuously Medicaid insured (21% of sample).
- Outcomes: Any SUD treatment and **Opioid Use Disorder treatment**.
 - Observe: Psychotherapy, Medication-based addiction treatment, Inpatient rehab stays, Other treatment services (peer programs, detox, telephone crisis line, ...)

Big effect on Opioid Use Disorder Treatment



Treatment for OUD increase by 48% ($+0.72pp$ in yr post childbirth).

► Table

► Types

► Robustness

► Heterogeneity

Timing suggests it's coming from **people with pre-existing disorders**.

⇒ Suggests new parenthood is important push-factor out of un(der)treated drug addiction.

Results 3/4: Government Assistance

Government benefit outcomes

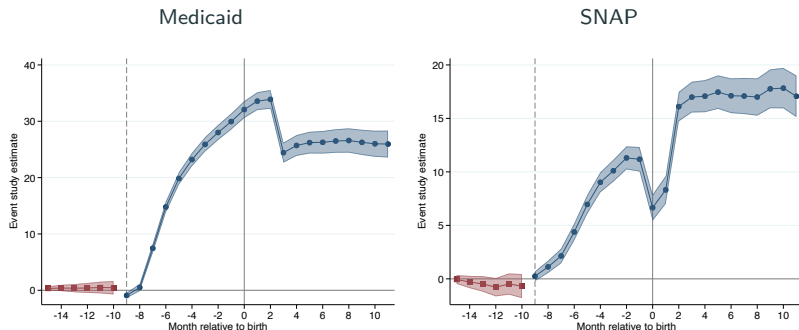
Observe:

- Healthcare: Medicaid
- Food assistance: SNAP (ca. \$400 for single parent household)
- Cash assistance: TANF (ca. \$280 for single parent household)

All programs feature large eligibility changes upon pregnancy/parenthood.

► Eligibility rules

Very Large Increases in Benefit Enrollment



- Huge effect sizes: 28pp \uparrow Medicaid, 16pp \uparrow SNAP in year post-birth.

► raw means ► Table ► TANF ► Heterogeneity

- > twice as large as ACA expansion effect. [► click](#)
- Elig rule changes + timing of increase suggests: Likely largely eligibility-driven; likely also: increase in take-up cond. on eligible.

Results 4/4: Criminal Behavior

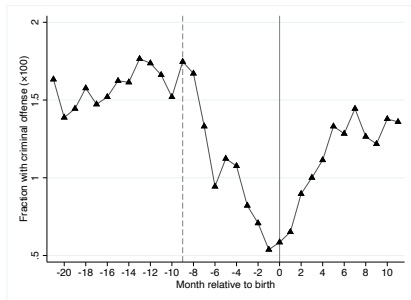
Criminal Behavior: Outcome Construction

Dummy variable that equals 1 if criminal offense charge filed in Allegheny courts in a given person-month.

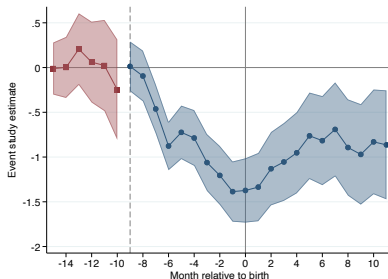
- Common: 25% w/ at least 1 charge ever before pregnancy.
- Can distinguish felonies & misdemeanors
- Within felonies: distinguish 5 categories
 - violent assault,
 - theft,
 - drug possession,
 - DUI,
 - Other (e.g. terroristic threats, criminal trespassing)

Large decrease in Crime

Raw Time Series



Event Study



Very large reductions.

- 0.73pp (40%) reduction during pregnancy and 0.97pp (56%) reduction in year post-birth; [▶ Table](#) [▶ Robustness](#) [▶ Heterogeneity](#)
- Similar effect size as Massenkoff and Rose (2020) for WA.
- Largest reduction coming from [▶ theft and drug offenses](#).

What explains the decrease in crime?

At least 4 plausible mechanisms:

1. Eligibility for benefits (Medicaid/food/cash)?
2. SUD treatment?
3. Incapacitation?
4. “Turning point hypothesis”?

What explains the decrease in crime?

At least 4 potential mechanisms:

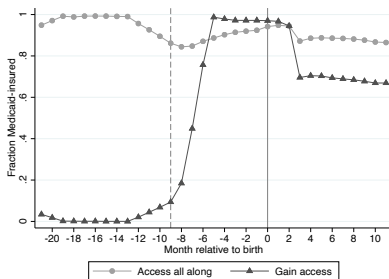
1. Eligibility for benefits (Medicaid/food/cash)?
2. SUD treatment?
3. Incapacitation?
4. “Turning point hypothesis”?

⇒ **Investigate channel 1.:**

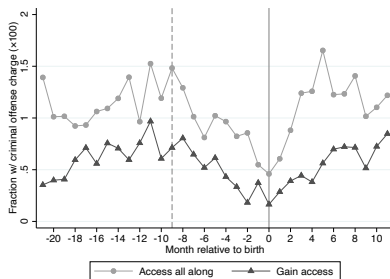
- compare crime-trajectory of observably similar women with vs. without prior benefit enrollment.

Comparing criminal behavior of the newly vs. already enrolled

Medicaid



Criminal Offense Charges



Notes: “Access all along” is defined as having been enrolled in Medicaid for at least 80% of the 12 months before pregnancy. “Gained access” is defined as having been enrolled at most 20% of the 12 months before pregnancy, and having been enrolled at least one out of the first five months of pregnancy. Total sample size includes 8,000 women, of whom 47% fall into the access all along group. We present means adjusted for cohort, year of childbirth, and race (only demographic cells with at least 2 individuals per gain access and per access all along group are kept), as follows: means for each relative time period are computed for each demographic cell-by-access group separately, and then averaged across demographic cells within an access group and relative time period by using weights equal to the total number of individuals in a demographic cell.

⇒ Access to Medicaid unlikely to be key driver behind decrease in criminal behavior.

What explains the decrease in crime?

Key mechanism?

- Eligibility for benefits (Medicaid/food/cash)? *Unlikely*
- SUD treatment? *Unlikely*
 - \Rightarrow Group that does not initiate OUD is much larger (97% of sample), and has sizeable decrease in crime, too.
- Incapacitation? (✓)
 - Consistent with re-bound after birth.
- “Turning point hypothesis”? (✓)
 - (Temporary) motivation to turn life around.

Robustness & Extensions

Robustness & Extensions

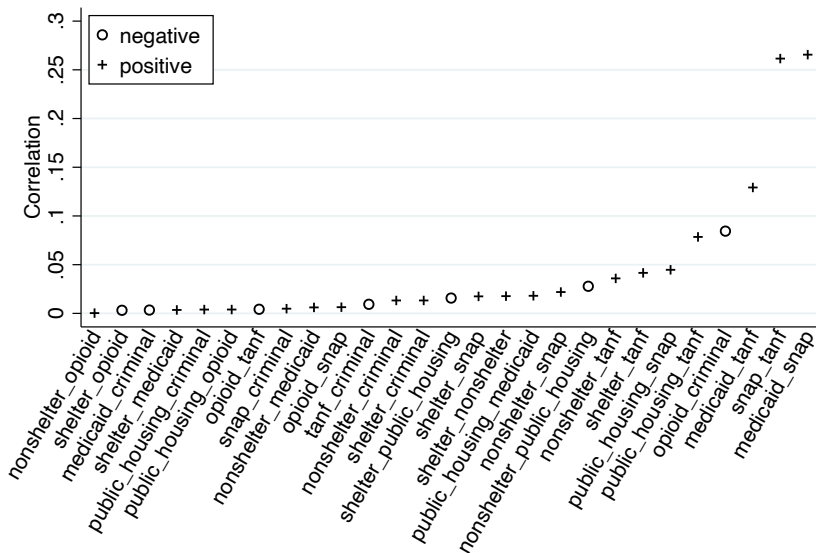
Robustness:

- Sample selection:
 - All first time mothers. ▶ click
 - Alternative low SES criteria ▶ click
- Event study specification:
 - Drop control for linear pre-trend. ▶ click
 - Drop three pre-conception months to rule out bias from anticipation effects. ▶ click
 - Standard TWFE specification. ▶ click
- Use matched DiD estimator. ▶ click
- Miscarriage vs. live birth DiD. ▶ click
- In-/out-migration ▶ click

Extensions:

- Correlation across domains.
- Results for men.

Correlation of treatment effects across domains



Differences by Gender

- Well-known fact: Male-female labor supply diverges at parenthood.
- What about living conditions more broadly, among low SES populations?

⇒ Compare trajectories of moms and dads.

- Focus on mom-dad-dyads in which mom is identified as low SES.
- Beware selection concern: 49% have no father listed on birth certificate.
- Plausibly *positive selection* of dads:
 - those on better recent trajectory (economic, crime, drug use) more likely to be listed. ⇒ “upward bias”?

Differences by gender

Findings:

- Vastly different: No or much smaller effects for men, on average.
- Subset who are married (20%): similar “effects” on moms and dads.

⇒ Consistent with **parents living separately and mother parenting alone, among unmarried parents.**

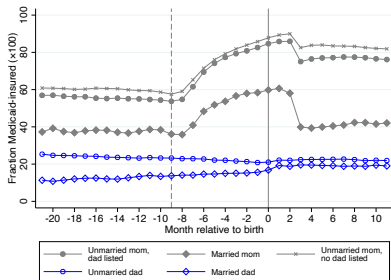
Differences by gender

Findings:

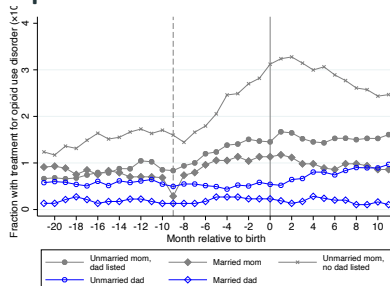
- Vastly different: No or much smaller effects for men, on average.
- Subset who are married (20%): similar “effects” on moms and dads.

⇒ Consistent with **parents living separately and mother parenting alone, among unmarried parents.**

Medicaid Enrollment



Opioid Use Disorder Treatment



No dad listed: 49%; unmarried mom, dad listed: 42%; married mom: 9%.

Sarah Eichmeyer & Christina Kent

Bocconi University & Mathematica Policy Research

32 / 33

Concluding remarks

Among women of low SES, parenthood causes **challenges** in the housing domain, and brings **improvements** in the domain of criminal desistance and SUD treatment.

Some tentative policy implications

1. Suitable, important time for moving to opportunity interventions.
 - Counterfactual (of no MTO intervention) is increased housing instability during sensitive time for child development.
 - Likely lower barriers to moving nbhds & accepting gov't assistance.
2. Importance of social factors for criminal desistance and engagement with SUD treatment.
 - In environments with **low economic opportunity** and **high social isolation**: programs that foster a strong sense of purpose and meaning could improve individual welfare tremendously, and create positive externalities.
 - By returning social capital, economic opportunities, or both?

Thank you!

References i

- Abramson, Boaz (2022), "The welfare effects of eviction and homelessness policies." Working Paper.
- Adda, Jérôme, Christian Dustmann, and Katrien Stevens (2017), "The Career Costs of Children." *Journal of Political Economy*, 125, 293–337.
- Blau, Francine D. and Lawrence M. Kahn (2017), "The Gender Wage Gap: Extent, Trends, and Explanations." *Journal of Economic Literature*, 55, 789–865.
- Chyn, Eric (2018), "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children." *American Economic Review*, 108, 3028–56.
- Collinson, Rob, John Eric Humphries, Nick Mader, Davin Reed, Daniel Tannenbaum, and Winnie van Dijk (2022), "Eviction and poverty in american cities." NBER Working Paper No. 30382.
- Corinth, Kevin (2017), "The Impact of Permanent Supportive Housing on Homeless Populations." *Journal of Housing Economics*, 35, 69–84.
- Curtis, Marah A., Hope Corman, Kelly Noonan, and Nancy E. Reichman (2013), "Life Shocks and Homelessness." *Demography*, 50, 2227–2253.
- DeLuca, Stefanie, Holly Wood, and Peter Rosenblatt (2019), "Why Poor Families Move (And Where They Go): Reactive Mobility and Residential Decisions." *City & Community*, 18, 556–593.
- Dettling, Lisa J. and Melissa S. Kearney (2014), "House prices and birth rates: The impact of the real estate market on the decision to have a baby." *Journal of Public Economics*, 110, 82–100.
- Dobkin, Carlos, Amy Finkelstein, Raymond Kluender, and Matthew J. Notowidigdo (2018), "The Economic Consequences of Hospital Admissions." *American Economic Review*, 108, 308–352.
- Edin, Kathryn and Maria Kefalas (2005), *Promises I Can Keep: Why Poor Women Put Motherhood Before Marriage*. University of California Press, Berkeley.
- Fadlon, Itzik and Torben Heien Nielsen (2021), "Family Labor Supply Responses to Severe Health Shocks: Evidence from Danish Administrative Records." *American Economic Journal: Applied Economics*, 13, 1–30.
- Finer, Lawrence B. and Mia R. Zolna (2016), "Declines in Unintended Pregnancy in the United States, 2008–2011." *The New England Journal of Medicine*, 374, 843–852.
- Fletcher, Jason M. and Barbara L. Wolfe (2009), "Education and labor market consequences of teenage childbearing: Evidence using the timing of pregnancy outcomes and community fixed effects." *Journal of Human Resources*, 44, 303–325.

References ii

- Gallen, Yana, Juanna Schroter Joensen, Eva Rye Johansen, and Gregory F. Veramendi (2022), "The Labor Market Returns to Delaying Pregnancy." Working paper.
- Hotz, V. Joseph, Charles H. Mullin, and Seth G. Sanders (1997), "Bounding causal effects using data from a contaminated natural experiment: Analysing the effects of teenage childbearing." *The Review of Economic Studies*, 64, 575–603.
- Kearney, Melissa S. and Phillip B. Levine (2012), "Why is the teen birth rate in the United States so high and why does it matter?" *Journal of Economic Perspectives*, 26, 141–163.
- Kleven, Henrik (2023), "The Geography of Child Penalties and Gender Norms: Evidence from the United States." Nber working paper no. 30176.
- Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimueller (2019a), "Child Penalties Across Countries: Evidence and Explanations." *American Economic Review P&P*, 109, 122–126.
- Kleven, Henrik, Camille Landais, and Jakob Egholt Sogaard (2019b), "Children and Gender Inequality: Evidence from Denmark." *American Economic Journal: Applied Economics*, 11, 181–209.
- Kuziemko, Ilyana, Jessica Pan, Jenny Shen, and Ebonya Washington (2022), "The mommy effect: Do women anticipate the employment effects of motherhood?" NBER Working Paper No. 24740.
- Lauster, N. T. and U. Fransson (2006), "Of marriages and mortgages: the second demographic transition and the relationship between marriage and homeownership in Sweden." *Housing Studies*, 21, 909–927.
- Lucas, David S. (2017), "The Impact of Federal Homelessness Funding on Homelessness." *Southern Economic Journal*, 84, 548–576.
- Lundborg, Peter, Erik Plug, and Astrid Würtz Rasmussen (2017), "Can Women Have Children and a Career? IV Evidence from IVF Treatments." *American Economic Review*, 107, 1611–1637.
- Massenkoff, Maxim and Evan K. Rose (2023), "Family Formation and Crime." Nber working paper no. 30385.
- Miller, Sarah, Laura R. Wherry, and Diana Greene Foster (2023), "The Economic Consequences of Being Denied an Abortion." *American Economic Journal: Economic Policy*, 15, 394–437.
- Mulder, Clara H. and Francesco C. Billari (2010), "Homeownership Regimes and Low Fertility." *Housing Studies*, 25, 527–541.
- Wolfe, Ellen L., Joseph R. Goydish, Ann Santos, Kevin L. Delucchi, and Alice Gleghorn (2007), "Drug treatment utilization before, during and after pregnancy." *Journal of Substance Use*, 12, 27–38.
- Zohar, Tom and Nina Brooks (2022), "Out of Labor and Into the Labor Force? The Role of Abortion Access, Social Stigma, and Financial Constraints." Working paper.

Allegheny County

Table 1: Allegheny County Characteristics

	Allegheny County mean	Rest of US mean
College plus	0.35	0.28
Foreign born	0.05	0.13
Median hshld income	60,055.76	61,287.21
Poor	0.13	0.14
White	0.81	0.64
Black	0.14	0.13
Hispanic	0.02	0.16
Asian	0.02	0.04
Single parent	0.33	0.32
Rent 2-bedroom	890.77	982.46
Population	1,223,348.00	1,094,111.02

Allegheny County is similar across many characteristics to the average US county (weighted by population)

Eligibility changes by family status

Program	Eligibility Before first pregnancy	Eligibility During first pregnancy	Eligibility with one child in household
Medicaid	non-disabled adult age 21 or over: ineligible before 2015 and <\$1,400 since 2015	<\$3,100	non-disabled adult age 21 or over: <\$580 before 2015 and <\$2,000 since 2015
SNAP	<\$1,400, must participate in work program at least 20 hours per week in order to receive benefits for more than 3 months (waived 2009-2015)	<\$1,400, no work requirement	<\$2,250, no work requirement
TANF	ineligible	<\$205	<\$316
Homeless Services	12 shelters and 47 permanent/transitional housing programs for singles	Can access single shelters, plus 3 extra shelters for pregnant women	7 shelters and 55 permanent/transitional housing programs for families with children
Public Housing & Section 8 [†]	<\$3,875, min. 18 year old household head	unchanged	<\$4,429, min. 18 years old household head

Notes: All eligibility thresholds listed in US\$ refer to gross monthly household income for a household with one adult (and one child, for the last column) unless otherwise noted, and correspond to 2020 eligibility thresholds for adult household members. The only program with a major change to eligibility thresholds over the sample period is Medicaid, which was expanded in 2015 to include households without children and to increase income thresholds for parents. "Unchanged" means no change relative to eligibility before first pregnancy. Under Medicaid Pennsylvania, for individuals age 6-20 a household income threshold of 138% of FPL applies since 2014, corresponding to about \$2,000 in a household of size two. Before 2014, the threshold was 100% of FPL.

[▶ back to setting](#)[▶ back to benefit overview](#)

Interest in correlation or causation?

Correlation suffices for “**tagging**”:

- Using pregnancy/new parenthood as a predictor (“tag”) of outcomes when deciding how to allocate services.

Isolating **causality** allows for making **counter-factual** claims:

1. Elucidates causes of (adverse) outcomes — helps us understand these phenomena better, and how elastic they are to (potentially “insurable”) life events.
2. Necessary for making evaluations such as “does this event stabilize or destabilize a person’s living conditions”.
3. Relevant for fertility-related policies.

Event study specification

Well-known issues with standard TWFE estimators under heterogenous treatment effects.

Several solutions exists. We use Borusyak, Jaravel, and Spiess's (2021) **Imputation Estimator**.

- Upsides: Is transparent, has known efficiency properties, & conservative SE, computed analytically, are available.

(Results unchanged when we use old-school flawed TWFE estimator.)

▶ back

Pre-trend test

Step 3: Test for pre-trends:

Estimate via OLS for all $r < -9$ (*untreated obs*):

$$y_{it} = \alpha + \mu_i + \gamma_t + \delta r_{it} + \sum_{s=-15}^{-10} \gamma_s 1[r_{it} = s] + \epsilon_{it}, \quad (2)$$

\Rightarrow Joint significance test of $\gamma_s = 0$.

► back

Housing Results

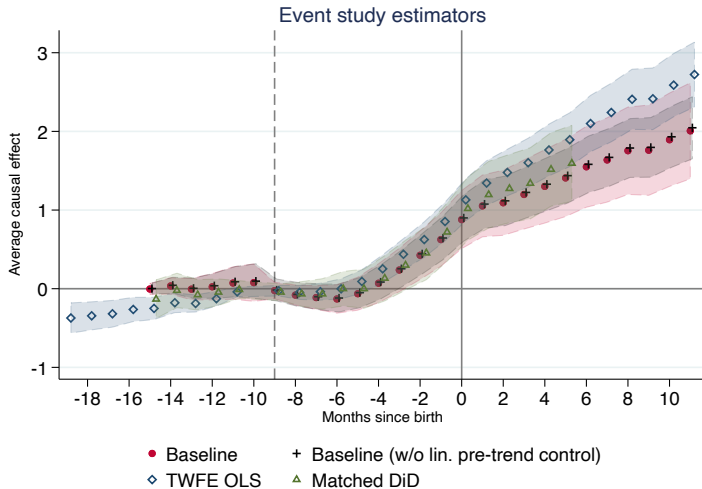
	(1)	(2)	(3)	(4)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8
Pregnancy effect	0.083*** (0.031)	0.001 (0.053)	0.092 (0.099)	-0.042 (0.114)
Post-birth effect	0.070 (0.056)	0.157 (0.129)	1.416*** (0.244)	0.407 (0.256)
Year-month FE	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes
Mean of dep. var	0.108	0.580	4.749	11.850
Obs	457309	457309	457309	457309
N individuals	12928	12928	12928	12928
Wald-statistic pre-trend p-value	0.597	0.235	0.439	0.263

Notes: Observations are at the individual-month level. "Pregnancy effect" ("Post-birth effect") is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. "Mean of dep. var" gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**) [*].

► back to shelter

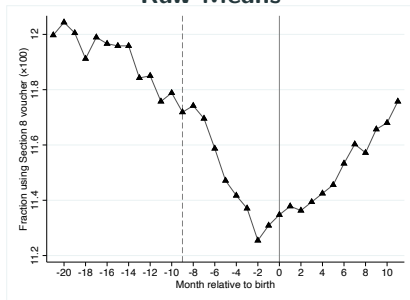
► back to public housing

Public Housing: Robustness

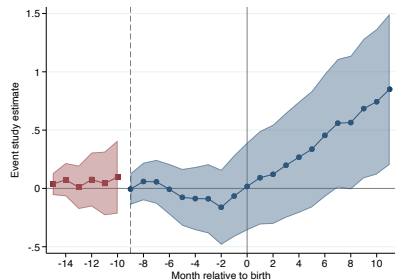


Section8

Raw Means



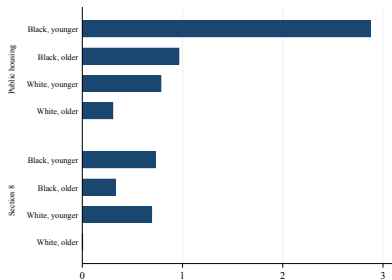
Event study estimates



► back

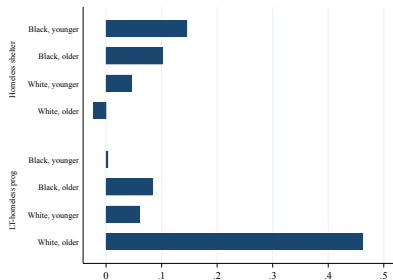
Heterogeneity in Impacts on Housing

Public Housing



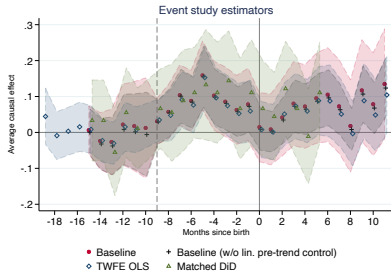
▶ back

Homelessness

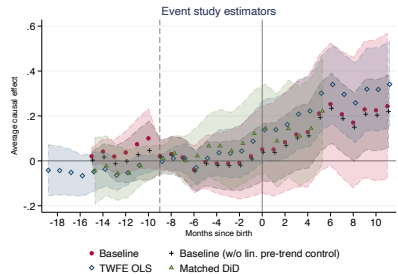


Homelessness: Robustness

Shelter stays



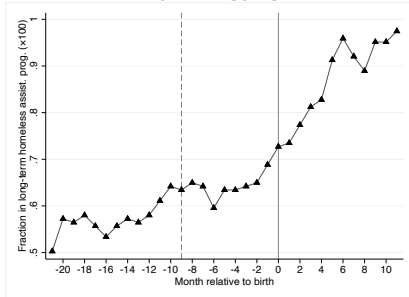
Medium/long-term programs



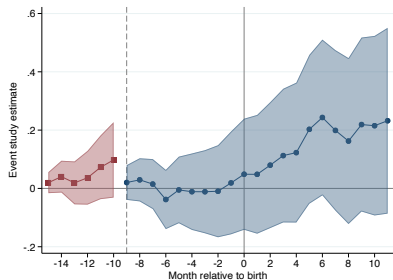
▶ back

Housing: Medium/Long-term homelessness programs

Raw Means



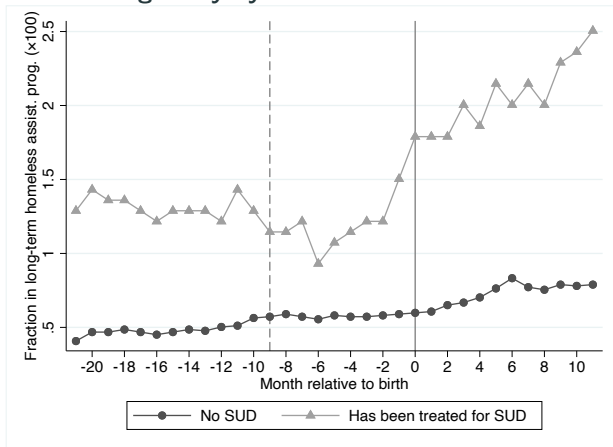
Event study estimates



► Back

Heterogeneity

Medium/Long-Term Homelessness Assistance: Heterogeneity by Substance Use Disorder



Long-term homelessness assistance driven by those with SUD.

[▶ Back](#)

SUD Results

	(1)	(2)
	Any SUD treatment	Opioid UD treatment
Pregnancy effect	0.067 (0.305)	0.356** (0.172)
Post-birth effect	1.151* (0.677)	0.718* (0.387)
Year-month FE	Yes	Yes
Individual FE	Yes	Yes
Lin. event time control	Yes	Yes
Mean of dep. var	2.578	1.510
Obs	97823	97823
N individuals	2715	2715
Wald-statistic pre-trend p-value	0.101	0.875

Notes: Table shows treatment effect estimates obtained from the “imputation estimator” for the main analysis sample of low SES first time mothers detailed. Observations are at the individual-month level. “Pregnancy effect” (“Post-birth effect”) is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. “Mean of dep. var” gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses.

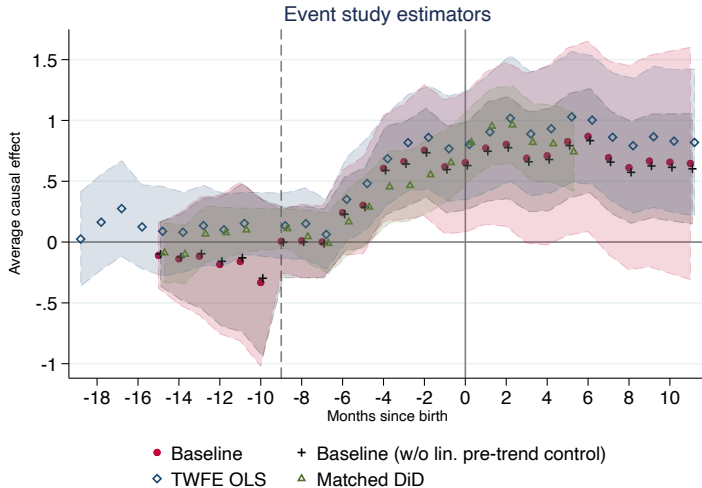
Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**) [*].

Type of SUD treatment

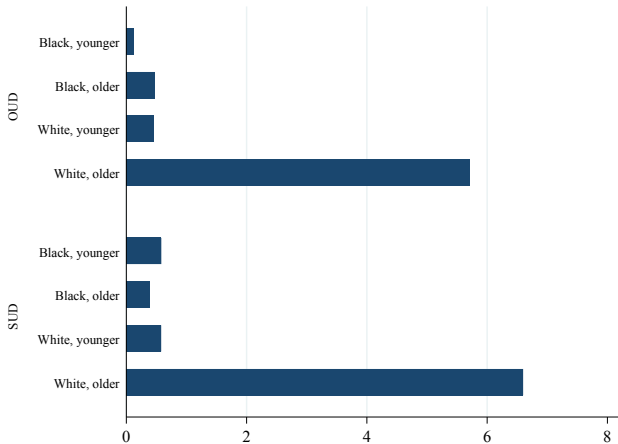
	(1) Opioid UD Medication	(2) Opioid UD Rehab	(3) Opioid UD Psychoth.	(4) Opioid UD Unspec: PsyTh/Medic	(5) Cannabis UD any treatment	(6) Alcohol UD any treatment	(7) Cocaine UD any treatment
Pregnancy effect	0.425*** (0.149)	-0.381** (0.179)	0.407*** (0.138)	-0.095 (0.108)	-0.193 (0.231)	-0.132 (0.093)	0.016 (0.067)
Post-birth effect	0.653* (0.336)	-0.577 (0.353)	0.816*** (0.249)	-0.165 (0.204)	0.350 (0.487)	-0.065 (0.214)	0.088 (0.134)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	1.142	0.331	0.368	0.295	0.663	0.184	0.110
Obs	97823	97823	97823	97823	97823	97823	97823
N individuals	2715	2715	2715	2715	2715	2715	2715
Wald-statistic pre-trend p-value	0.262	0.947	0.378	0.502	0.048	0.097	0.539

Notes: Table shows treatment effect estimates obtained from the "imputation estimator" for the main analysis sample of low SES first time mothers who were continuously Medicaid-insured. Observations are at the individual-month level. "Pregnancy effect" ("Post-birth effect") is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. "Mean of dep. var" gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

Opioid Use Disorder Treatment: Robustness



Heterogeneity in Impacts on SUD/OD



▶ back

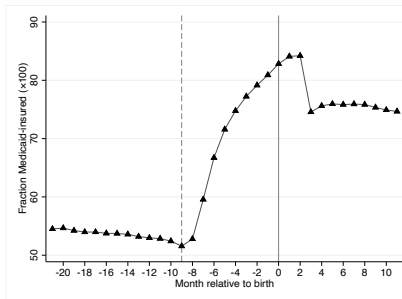
Government Benefits Results

	(1)	(2)	(3)
	Medicaid	SNAP	TANF
Pregnancy effect	16.525*** (0.483)	6.275*** (0.376)	4.197*** (0.195)
Post-birth effect	27.786*** (0.989)	15.540*** (0.783)	15.040*** (0.428)
Year-month FE	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes
Mean of dep. var	52.978	26.717	5.376
Obs	456756	457309	457309
N individuals	12928	12928	12928
Wald-statistic pre-trend p-value	0.742	0.304	0.145

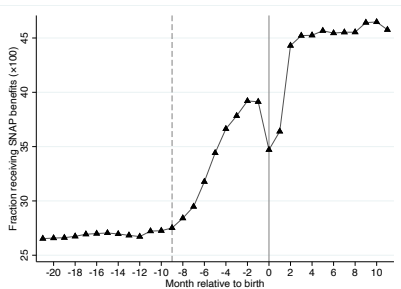
Notes: Table shows treatment effect estimates obtained from the “imputation estimator” for the main analysis sample of low SES first time mothers. Observations are at the individual-month level. “Pregnancy effect” (“Post-birth effect”) is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. “Mean of dep. var” gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

Raw means of Medicaid and SNAP

Raw Means: Medicaid



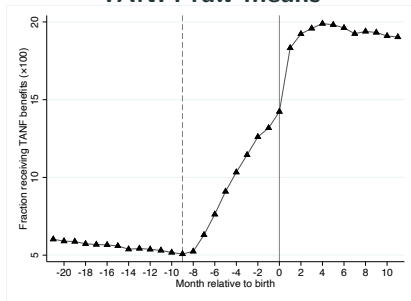
Raw Means: SNAP



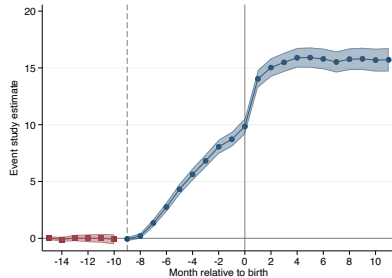
Results: TANF

[▶ back](#)

TANF: raw means

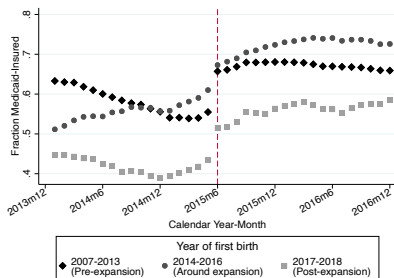


TANF: event study

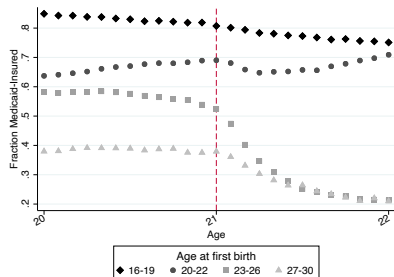


Benchmarking the Medicaid results [▶ back](#)

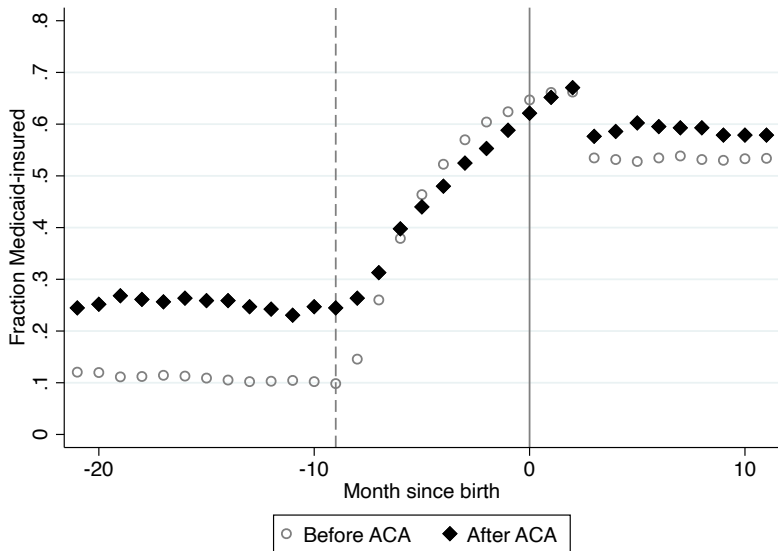
ACA Expansion Effects: Low SES Sample



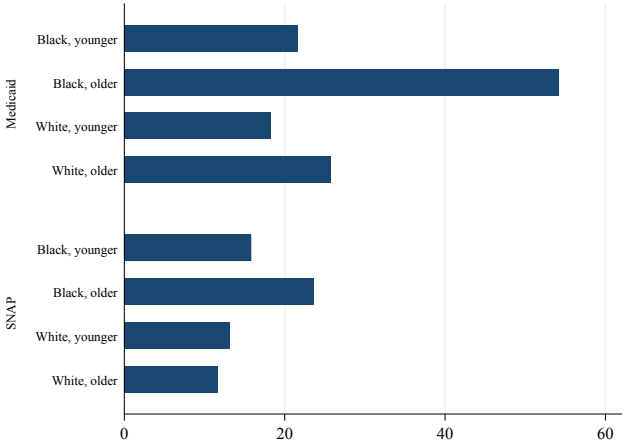
Aging Out Effects



Treatment Effect Heterogeneity by ACA Expansion Status



Heterogeneity in Impacts on Benefit Enrollment



Criminal Behavior Results

	(1) Criminal offense
Pregnancy effect	-0.732*** (0.123)
Post-birth effect	-0.973*** (0.236)
Year-month FE	Yes
Individual FE	Yes
Lin. event time control	Yes
Mean of dep. var	1.737
Obs	380254
N individuals	10593
Wald-statistic pre-trend p-value	0.167

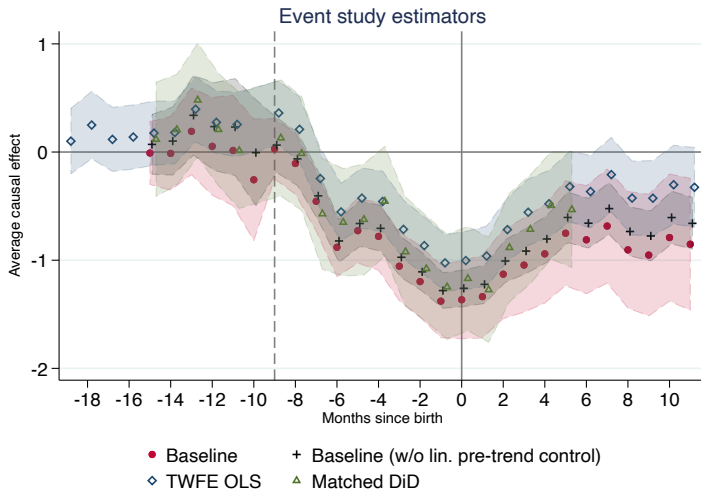
Notes: Table shows treatment effect estimates obtained from the “imputation estimator” for the main analysis sample of low SES first time mothers. Observations are at the individual-month level. “Pregnancy effect” (“Post-birth effect”) is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. “Mean of dep. var” gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

Type of Crimes

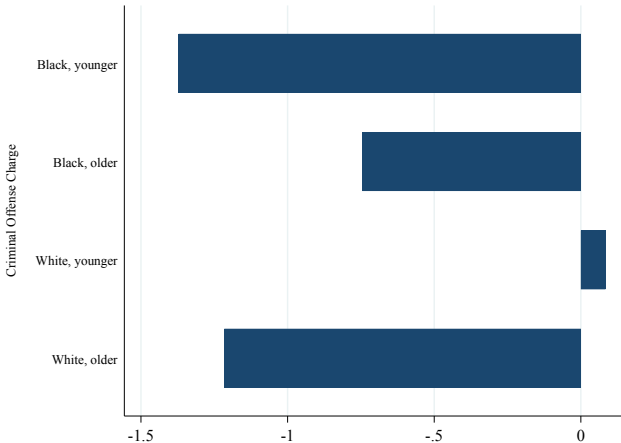
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Felony	Misde- meanor	Felony: Assault	Felony: Theft	Felony: Drug poss.	Felony: DUI	Felony: Other
Pregnancy effect	-0.445*** (0.095)	-0.442*** (0.116)	-0.048 (0.042)	-0.167*** (0.050)	-0.087** (0.044)	-0.063** (0.025)	-0.100* (0.051)
Post-birth effect	-0.627*** (0.184)	-0.418** (0.208)	-0.008 (0.082)	-0.275*** (0.095)	-0.180** (0.084)	-0.097* (0.050)	-0.101 (0.097)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	1.076	1.066	0.217	0.236	0.255	0.085	0.283
Obs	380254	269110	380254	380254	380254	380254	380254
N individuals	10593	7225	10593	10593	10593	10593	10593
Wald-statistic pre-trend p-value	0.193	0.425	0.356	0.550	0.330	0.565	0.778

Notes: Table shows treatment effect estimates obtained from the “imputation estimator” for the main analysis sample of low SES first time mothers. Observations are at the individual-month level. “Pregnancy effect” (“Post-birth effect”) is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. “Mean of dep. var” gives the mean of the dependent variable twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**) [*].

Criminal Offense Charges: Robustness



Heterogeneity in Impacts on Criminal Behavior



All first births

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.020*** (0.006)	0.000 (0.009)	0.028 (0.018)	-0.021 (0.021)	0.068*** (0.024)	0.084*** (0.017)	7.607*** (0.100)	1.654*** (0.070)	0.855*** (0.035)	-0.182*** (0.025)
Post-birth effect	0.015 (0.010)	0.042* (0.023)	0.321*** (0.046)	0.084* (0.047)	0.250*** (0.048)	0.182*** (0.034)	13.195*** (0.189)	4.720*** (0.147)	3.185*** (0.079)	-0.247*** (0.047)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.018	0.106	0.928	2.268	0.334	0.204	8.620	4.944	0.985	0.416
Obs	2813499	2813499	2813499	2813499	2813499	2813499	2810029	2813499	2813499	2308764
N individuals	79457	79457	79457	79457	79457	79457	79457	79457	79457	64162
Wald-statistic pre-trend p-value	0.729	0.208	0.357	0.273	0.737	0.654	0.777	0.483	0.297	0.186

Notes: Table shows treatment effect estimates obtained from the "imputation estimator" for the full sample of all first live births to women (i.e. without restriction to low SES individuals). Observations are at the individual-month level. "Pregnancy effect" ("Post-birth effect") is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. "Mean of dep. var" gives the mean of the dependent variable ($\times 100$) twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates and standard errors are multiplied by 100 for better readability. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**) [*].

Alternative low SES criteria

► back

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.088*** (0.031)	-0.029 (0.054)	0.086 (0.096)	-0.102 (0.111)	16.815*** (0.462)	6.077*** (0.383)	4.168*** (0.193)	-0.746*** (0.121)
Post-birth effect	0.072 (0.056)	0.120 (0.128)	1.340*** (0.235)	0.345 (0.249)	28.079*** (0.934)	14.677*** (0.789)	14.953*** (0.418)	-0.962*** (0.229)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.102	0.584	4.780	11.940	50.139	28.726	5.627	1.733
Obs	485886	485886	485886	485886	485886	485886	485886	412560
N individuals	13702	13702	13702	13702	13702	13702	13702	11480
Wald-statistic pre-trend p-value	0.762	0.269	0.446	0.251	0.760	0.371	0.275	0.287

Notes: Uses low SES criterion defined as observing at least one month of **Medicaid or SNAP** enrollment in the 5 years preceding conception

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.115** (0.051)	-0.052 (0.095)	0.088 (0.142)	-0.299* (0.175)	0.242 (0.393)	0.254 (0.230)	16.441*** (0.593)	3.597*** (0.649)	5.451*** (0.324)	-0.954*** (0.179)
Post-birth effect	0.085 (0.094)	0.159 (0.225)	1.314*** (0.348)	-0.076 (0.387)	1.576* (0.858)	0.712 (0.520)	27.252*** (1.177)	6.361*** (1.347)	19.072*** (0.684)	-1.184*** (0.340)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.150	0.954	6.392	16.492	2.921	1.798	54.586	53.537	9.963	2.180
Obs	263672	263672	263672	263672	64954	64954	263290	263672	263672	234962

No linear event time control

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.079*** (0.023)	-0.007 (0.038)	0.105 (0.080)	-0.034 (0.091)	0.092 (0.193)	0.341*** (0.121)	16.496*** (0.349)	6.299*** (0.268)	4.204*** (0.158)	-0.667*** (0.088)
Post-birth effect	0.062 (0.043)	0.140 (0.101)	1.444*** (0.207)	0.426** (0.206)	1.206** (0.495)	0.685** (0.288)	27.721*** (0.774)	15.593*** (0.614)	15.056*** (0.367)	-0.827*** (0.190)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	No	No	No	No	No	No	No	No	No	No
Mean of dep. var	0.108	0.580	4.749	11.850	2.578	1.510	52.978	26.717	5.376	1.737
Obs	457309	457309	457309	457309	97823	97823	456756	457309	457309	380254
N individuals	12928	12928	12928	12928	2715	2715	12928	12928	12928	10593
Wald-statistic pre-trend p-value	0.611	0.382	0.435	0.262	0.105	0.897	0.885	0.371	0.147	0.162

Notes: Table shows treatment effect estimates obtained from the “imputation estimator” but omitting the control for the pre-trend in event time. Columns (5)-(6) restrict to subsample of first-time mothers who were Medicaid-insured throughout the event time window. Observations are at the individual-month level. “Pregnancy effect” (“Post-birth effect”) is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. “Mean of dep. var” gives the mean of the dependent variable ($\times 100$) twelve months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates and standard errors are multiplied by 100 for better readability. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

Robustness to anticipation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.148*** (0.046)	0.064 (0.077)	0.169 (0.144)	-0.004 (0.175)	-0.116 (0.468)	0.046 (0.256)	16.373*** (0.687)	6.017*** (0.554)	4.241*** (0.259)	-0.962*** (0.210)
Post-birth effect	0.181** (0.082)	0.274* (0.158)	1.568*** (0.303)	0.493 (0.332)	0.920 (0.900)	0.157 (0.479)	27.582*** (1.282)	15.003*** (1.062)	15.085*** (0.525)	-1.405*** (0.388)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.093	0.557	4.579	11.959	2.799	1.621	53.728	27.050	5.593	1.624
Obs	411587	411587	411587	411587	87872	87872	411339	411587	411587	341537
N individuals	12928	12928	12928	12928	2715	2715	12928	12928	12928	10593
Wald-statistic pre-trend p-value	0.489	0.506	0.638	0.142	0.094	0.805	0.461	0.776	0.209	0.704

Notes: Table shows treatment effect estimates obtained from the "imputation estimator", but omitting the three months immediately preceding conception. Columns (5)-(6) restrict to subsample of first-time mothers who were Medicaid-insured at least 90% of the months spanning 12 months before conception to 12 months post-birth. Observations are at the individual-month level. "Pregnancy effect" ("Post-birth effect") is the average treatment effect across months -9 to -1 (0 to 11) relative to month of childbirth. "Mean of dep. var" gives the mean of the dependent variable ($\times 100$) 15 months before childbirth. The p-value of a Wald test statistic for a joint test of all six pre-conception month dummies being jointly equal to zero is reported in the last row. Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates and standard errors are multiplied by 100 for better readability. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

TWFE Estimator

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	0.070*** (0.023)	0.003 (0.043)	0.079 (0.085)	-0.379*** (0.096)	-0.240 (0.179)	0.292** (0.117)	13.089*** (0.319)	5.060*** (0.264)	2.455*** (0.167)	-0.590*** (0.071)
Post-birth effect	0.027 (0.030)	0.164*** (0.060)	1.388*** (0.138)	-0.268** (0.135)	0.620** (0.290)	0.580*** (0.189)	21.022*** (0.405)	12.599*** (0.371)	11.272*** (0.289)	-0.670*** (0.097)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calendar year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.108	0.580	4.749	11.850	2.578	1.510	52.978	26.717	5.376	1.737
Obs	426624	426624	426624	426624	89595	89595	426624	426624	426624	349569
N individuals	12928	12928	12928	12928	2715	2715	12928	12928	12928	10593

Notes: Table shows treatment effect estimates obtained from a standard two-way fixed effect estimator obtained from the following OLS model: $Y_{it} = \beta_0 + \beta_1 \times Preg_{it} + \beta_2 \times Post_{it} + \mu_i + \gamma_{y(it)} + \epsilon_{it}$, where i denotes individual and t denotes calendar year-month.

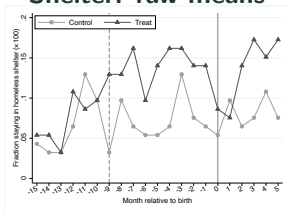
The regression includes controls for individual fixed effects (μ_i) and calendar year fixed effects ($\gamma_{y(it)}$). Columns (5)-(6) restrict to subsample of first-time mothers who were Medicaid-insured at least 90% of the months spanning 12 months before conception to 12 months post-birth. "Pregnancy effect" ("Post-birth effect") is the coefficient on a dummy that equals one in months -9 to -1 (0 to 11) relative to month of childbirth. "Mean of dep. var" gives the mean of the dependent variable ($\times 100$) twelve months before childbirth.

Cluster-robust standard errors clustered at the individual level are shown in parentheses. Coefficient estimates and standard errors are multiplied by 100 for better readability. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

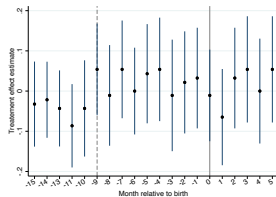
Matched DiD: Housing

[▶ back](#)

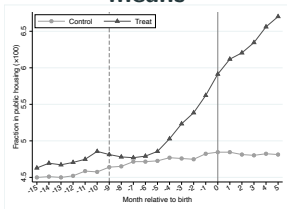
Shelter: raw means



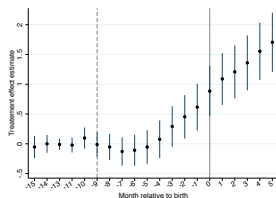
Shelter: matched DiD



Public Housing: raw means



Public Housing: event study

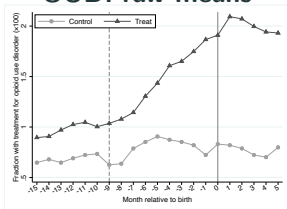


Notes: Figures show raw means of outcomes for treated and control group by month relative to first live birth event of treated individuals (left) and event study estimates from matched DiD regression (right). All estimates are based on outcome dummy multiplied by 100 for better readability. Right figures report treatment effect estimates on interaction coefficients of treatment and relative event time dummies. Regression includes controls for treatment, relative event time dummies, and their interaction. Month -12 relative to childbirth is the omitted category. Sample is restricted to treated-control dyads in which the treated peer satisfies the low SES criterion (that is, is observed as Medicaid-insured in at least one month of the five years preceding pregnancy). 95% confidence bars based on cluster-robust standard errors clustered at the individual-by-treatment level are also shown.

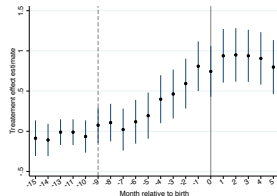
Matched DiD: OUD & Crime

[▶ back](#)

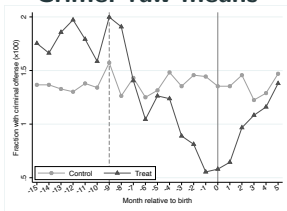
OUD: raw means



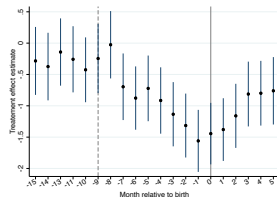
OUD: matched DiD



Crime: raw means



Crime: event study



Notes: Figures show raw means of outcomes for treated and control group by month relative to first live birth event of treated individuals (left) and event study estimates from matched DiD regression (right). All estimates are based on outcome dummy multiplied by 100 for better readability. Right figures report treatment effect estimates on interaction coefficients of treatment and relative event time dummies. Regression includes controls for treatment, relative event time dummies, and their interaction. Month -12 relative to childbirth is the omitted category. Sample is restricted to treated-control dyads in which the treated peer satisfies the low SES criterion (that is, is observed as Medicaid-insured in at least one month of the five years preceding pregnancy). 95% confidence bars based on cluster-robust standard errors clustered at the individual-by-treatment level are also shown.

Matched DiD Estimator

	(1) Homeless shelter	(2) Long-term homeless	(3) Public Housing	(4) Sec. 8	(5) Any SUD treatment	(6) Opioid UD treatment	(7) Medicaid	(8) SNAP	(9) TANF	(10) Criminal offense
Pregnancy (5th month)	0.043 (0.063)	0.119 (0.077)	-0.054 (0.144)	0.054 (0.174)	-0.054 (0.198)	0.194 (0.146)	21.614*** (0.648)	7.511*** (0.596)	3.572*** (0.303)	-0.722*** (0.267)
Post-birth (3rd month)	0.054 (0.067)	0.205* (0.117)	1.360*** (0.235)	0.367 (0.255)	0.971*** (0.223)	0.939*** (0.165)	29.244*** (0.763)	18.528*** (0.711)	14.266*** (0.449)	-0.812*** (0.264)
Mean of dep. var	0.086	0.610	4.613	12.491	1.538	0.858	54.003	25.353	5.331	1.637
Obs	389214	389214	389214	389214	389214	389214	389214	389214	389214	325794
N treated individuals	9267	9267	9267	9267	9267	9267	9267	9267	9267	7757
N control individuals	9267	9267	9267	9267	9267	9267	9267	9267	9267	7757

Notes: Table reports treatment effect estimates on interaction coefficients of treatment and relative event time dummies at -4 and 3 relative to month of childbirth obtained from a matched DiD regression. Includes controls for treatment, relative event time dummies, and their interaction. Sample is restricted to treated-control dyads in which the treated peer satisfies the low SES criterion (that is, is observed as Medicaid-insured in at least one month of the five years preceding pregnancy). "Mean of dep. var" gives the mean of the dependent variable ($\times 100$) 12 months before treated peer's childbirth. Coefficient estimates and standard errors are multiplied by 100 for better readability. Cluster-robust standard errors clustered at the individual-by-treatment level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

Live birth vs. miscarriage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy \times Live birth	0.066*** (0.015)	-0.013 (0.108)	0.223 (0.148)	0.042 (0.200)	-0.080 (0.170)	0.186 (0.119)	9.825*** (0.772)	3.110*** (0.691)	1.482*** (0.299)	-0.444 (0.276)
Post-Pregn. \times Live Birth	0.036 (0.023)	0.155 (0.192)	1.291*** (0.236)	0.579 (0.378)	0.113 (0.227)	0.429*** (0.153)	16.999*** (1.050)	9.676*** (0.768)	7.452*** (0.388)	-0.155 (0.198)
Pregnancy	-0.019 (0.012)	0.030 (0.105)	-0.165 (0.141)	-0.256 (0.193)	0.225 (0.165)	0.046 (0.115)	1.933*** (0.749)	-0.442 (0.680)	-0.261 (0.290)	0.105 (0.275)
Post-Pregnancy	-0.004 (0.023)	-0.085 (0.188)	-0.472** (0.222)	-0.725** (0.369)	0.428* (0.224)	0.027 (0.148)	4.840*** (1.022)	-1.655** (0.749)	-1.557*** (0.364)	-0.231 (0.199)
Individual-Event FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.042	0.261	2.381	5.715	0.554	0.282	21.102	11.849	2.723	1.008
Obs	929370	929370	929370	929370	929370	929370	929177	929370	929370	718218
N indiv.-event tuples	28348	28348	28348	28348	28348	28348	28348	28348	28348	21922

Notes: Table shows treatment effect estimates obtained from DiD estimation of

$Y_{ijt} = \alpha + \beta_1 \text{Pregnancy}_{ijt} \times \text{LB}_{ij} + \beta_2 \text{Post}_{ijt} \times \text{LB}_{ij} + \gamma X_{ijt} + \epsilon_{ijt}$. The vector X_{ijt} includes controls for individual-by-event fixed effects, calendar year fixed effects, and the Post and Pregnancy dummies; estimated among women younger than 26 with miscarriage or live birth event who do not have a child yet. "Mean of dep. var" gives the mean of the dependent variable ($\times 100$) two months before the approximate month of conception. Coefficient estimates and standard errors are multiplied by 100 for better readability. Cluster-robust standard errors clustered at the individual-event level are shown in parentheses. Coefficient estimates with associated p-values < 0.01 (< 0.05) [< 0.1] are denoted by *** (**)[*].

In-/out-migration

Show robustness to using 3 different sub-samples of individuals less likely to move in/out of the county:

1. With encounter in year before and after event time window (77%);
2. In Allegheny at 16 or younger (80%);
3. Born in Pennsylvania (87%).

► back

Results for men

► back

	(1) Low SES first-time fathers						(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	-0.040 (0.043)	0.024 (0.066)	-0.038 (0.118)	-0.111 (0.151)	-1.035 (0.887)	-0.493 (0.408)	-2.374*** (0.655)	0.408 (0.534)	0.066 (0.206)	0.151 (0.278)
Post-birth effect	-0.045 (0.082)	0.025 (0.134)	-0.101 (0.289)	0.039 (0.338)	-1.232 (1.808)	-0.367 (0.823)	-2.450* (1.445)	0.164 (1.141)	0.806* (0.435)	0.897* (0.531)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.079	0.416	2.874	8.482	4.936	2.377	41.062	20.115	2.735	3.096
Obs	179494	179494	179494	179494	20546	20546	179312	179494	179494	149398
N individuals	5046	5046	5046	5046	547	547	5046	5046	5046	4134
Wald-statistic pre-trend p-value	0.203	0.202	0.354	0.089	0.617	0.442	0.018	0.368	0.137	0.456

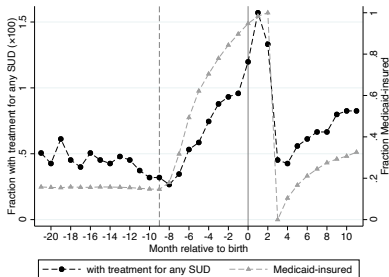
	(1) All first-time fathers:						(7)	(8)	(9)	(10)
	Homeless shelter	Long-term homeless	Public Housing	Sec. 8	Any SUD treatment	Opioid UD treatment	Medicaid	SNAP	TANF	Criminal offense
Pregnancy effect	-0.002 (0.005)	0.004 (0.006)	-0.004 (0.011)	0.000 (0.014)	-0.049** (0.024)	0.002 (0.014)	0.171*** (0.058)	0.130** (0.052)	0.014 (0.018)	-0.048 (0.032)
Post-birth effect	-0.000 (0.009)	0.006 (0.013)	-0.001 (0.026)	0.021 (0.032)	-0.000 (0.047)	0.066** (0.029)	1.216*** (0.130)	0.561*** (0.111)	0.118*** (0.039)	0.010 (0.060)
Year-month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lin. event time control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dep. var	0.008	0.039	0.306	0.840	0.245	0.118	3.405	2.039	0.250	0.516
Obs	2160832	2160832	2160832	2160832	2160832	2160832	2158200	2160832	2160832	1775458
N individuals	60857	60857	60857	60857	60857	60857	60857	60857	60857	49179
Wald-statistic pre-trend p-value	0.282	0.293	0.781	0.281	0.713	0.817	0.021	0.399	0.326	0.143

Notes: Tables shows treatment effect estimates obtained from the "imputation estimator" for first-time fathers.

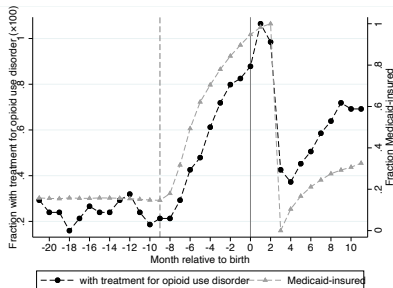
Program Rules and Substance Use Disorder Treatment

What about women who lose Medicaid at 60 days postpartum?

Any SUD Treatment



Opioid Use Dis. Treatment



Notes: Figures show raw means of outcomes by month relative to first live birth event. Sample is restricted to first life birth event to mothers who are Medicaid-insured at 2 months postpartum, but not at 3 months postpartum (with a sample size of 3,793 individuals, 12.6% of whom are in our low SES sample).