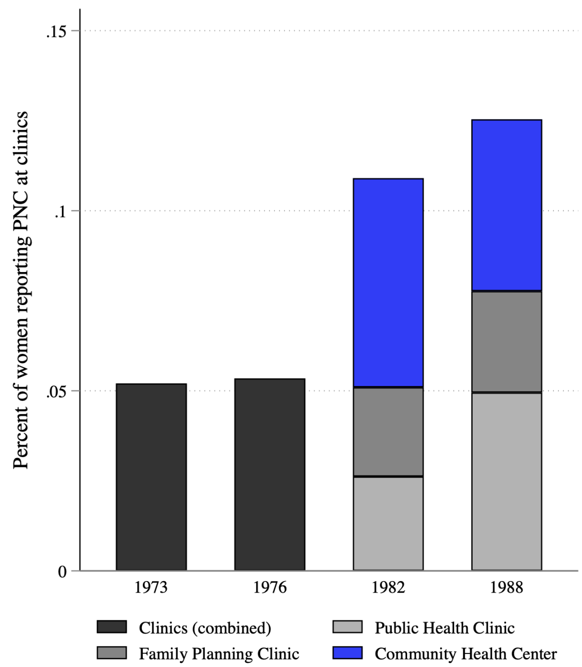
ONLINE APPENDIX

“Does the Delivery of Primary Health Care Improve Birth Outcomes? Evidence from the Rollout of Community Health Centers" by Esra Kose, Siobhan O’Keefe, and Maria Rosales-Rueda

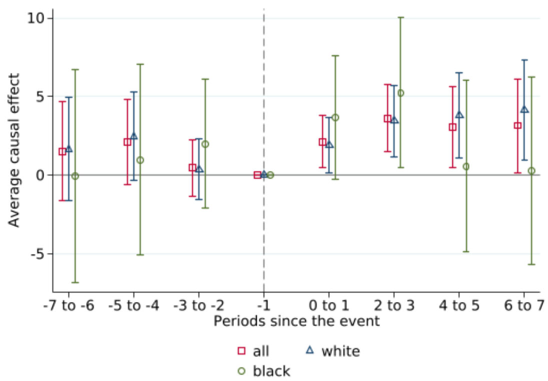
A. Additional Figures and Tables

Figure A.1: Reported use of clinics for prenatal care

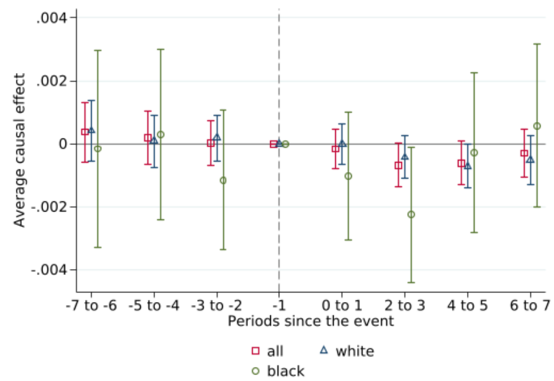


Notes: Authors calculations using cycles 1-4 of the National Survey of Family Growth. Percentages calculated using survey weights.

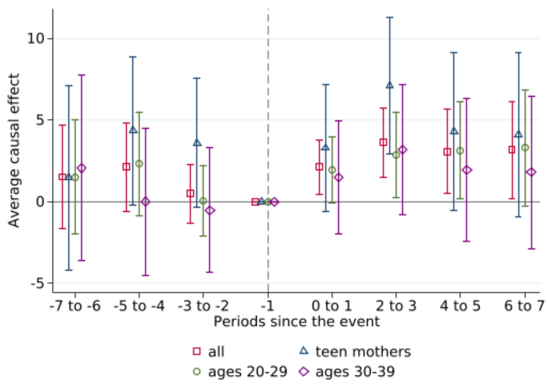
Figure A.2: Heterogeneity: The Effect of CHC on Infant Health - By Maternal Characteristics



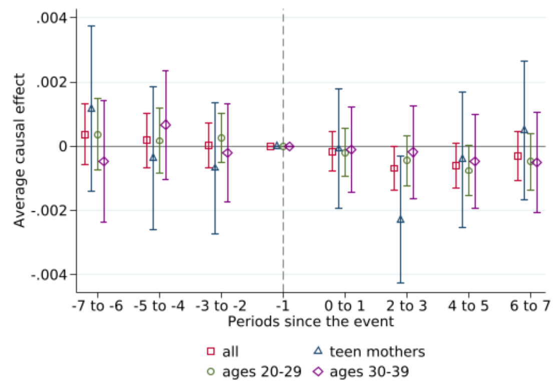
(a) Birth Weight (grams) - By Race



(b) Low Birth Weight - By Race



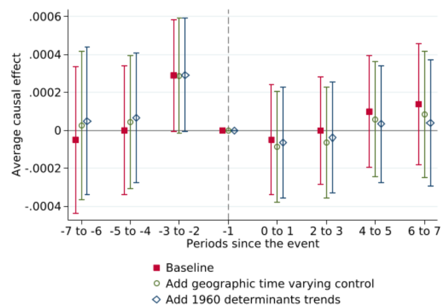
(c) Birth Weight (grams) - By Maternal Age



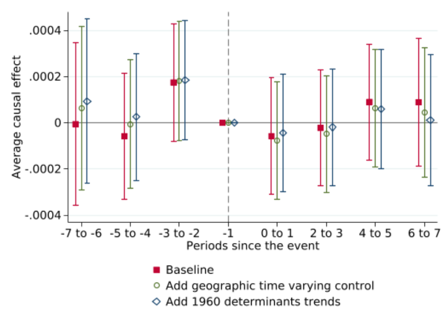
(d) Low Birth Weight - By Maternal Age

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021) with our preferred specification (Spec 3 of Table **??**). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV.

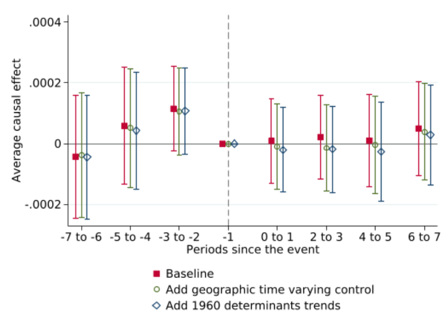
Figure A.3: The Effect of CHC on Infant Mortality Rates



(a) Infant Mortality Rate (combined)



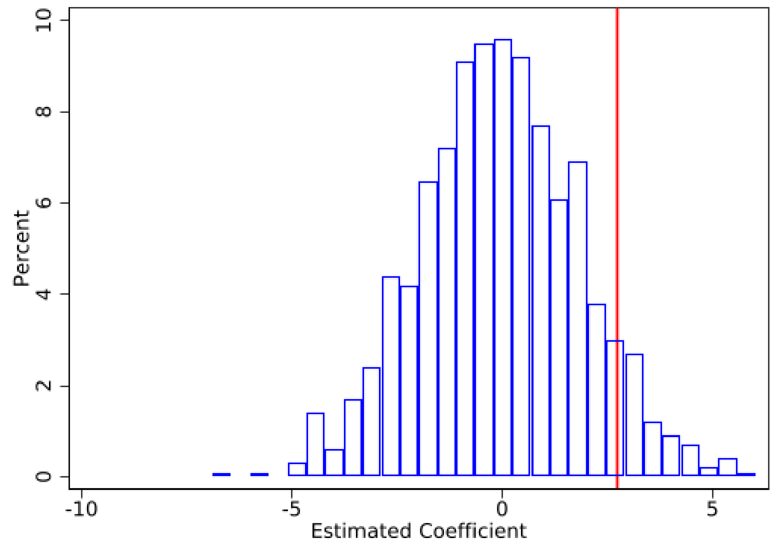
(b) Infant Mortality Rate (Neonatal)



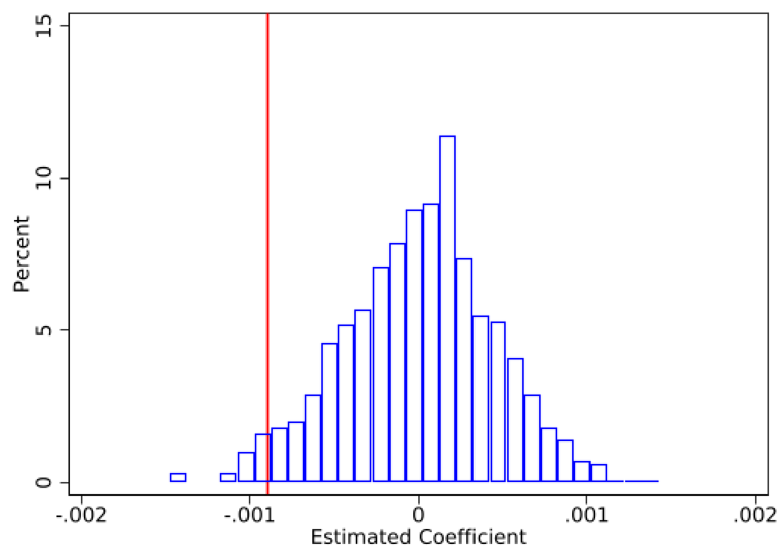
(c) Infant Mortality Rate (Post-neonatal)

Notes: Infant mortality rate is the number of deaths of infants less than one year old over the number of live births. Neonatal refers to deaths in the first 27 days after birth; post-neonatal refers to deaths between 28 days and one year after birth. This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Compressed Mortality File that covers the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, and individual demographic controls. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV.

Figure A.4: The Effect of CHC on Infant Health, Randomized Treatment Timing



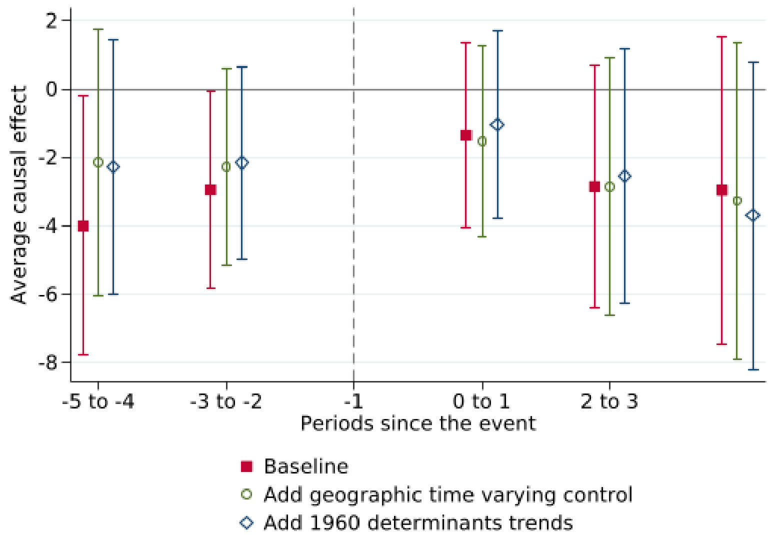
(a) Birth Weight (grams)



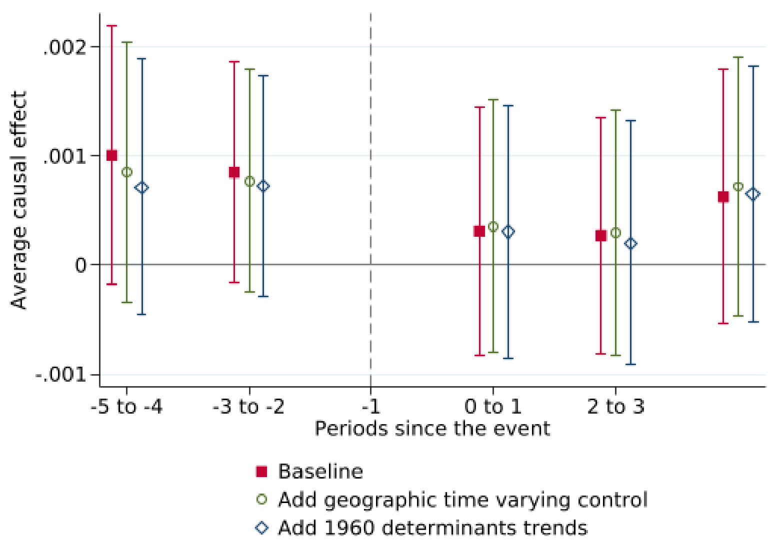
(b) Low Birth Weight

Notes: This figure plots the estimated coefficients from 1000 permutations of our preferred specification. The red line represents the true estimated effect. The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. For these figures, CHC timing has been randomized. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.5: The Effect of CHC on Infant Health, Placebo Treatment Timing



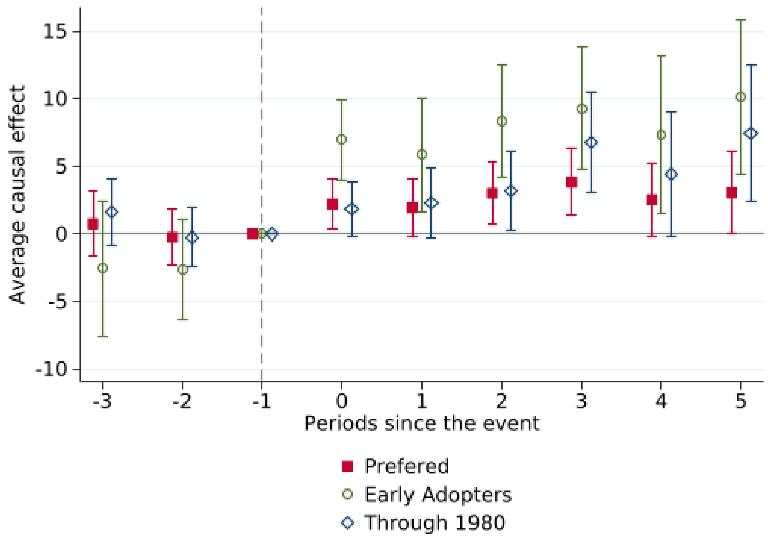
(a) Birth Weight (grams)



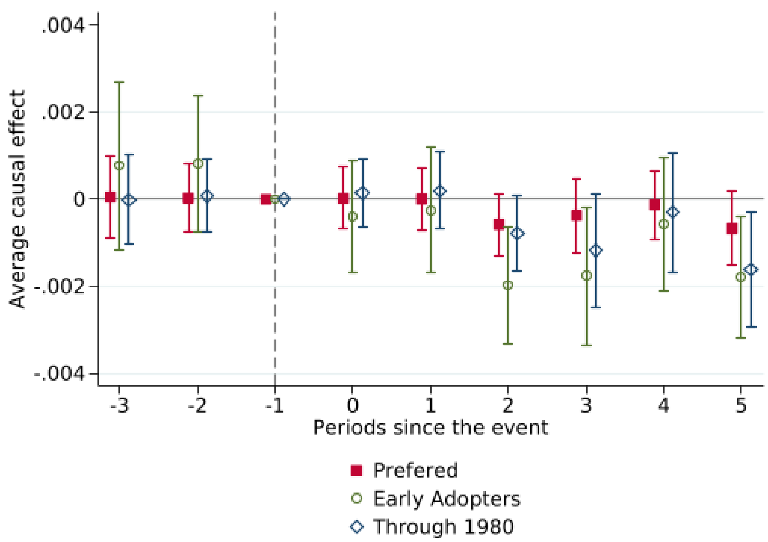
(b) Low Birth Weight

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. For these figures, CHC timing has been artificially applied four years before actual treatment. All regressions include county, year fixed effects, and individual demographic controls. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.6: The Effect of CHC on Infant Health - Alternative Time Periods



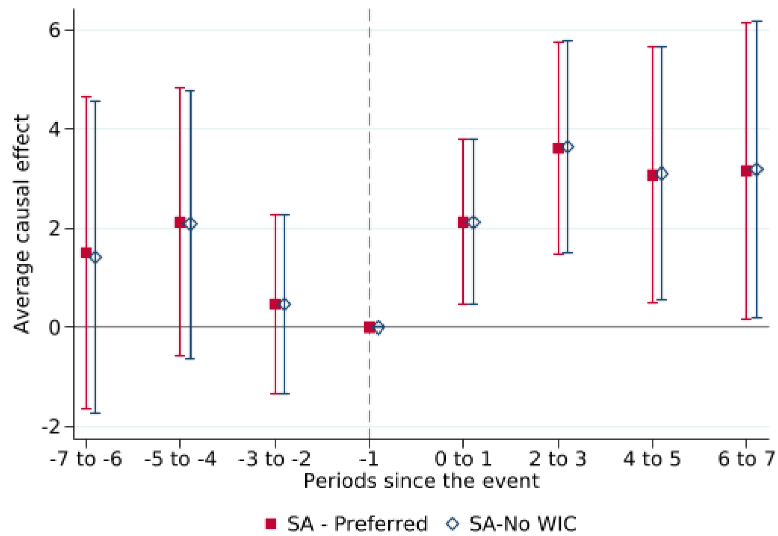
(a) Birth Weight (grams)



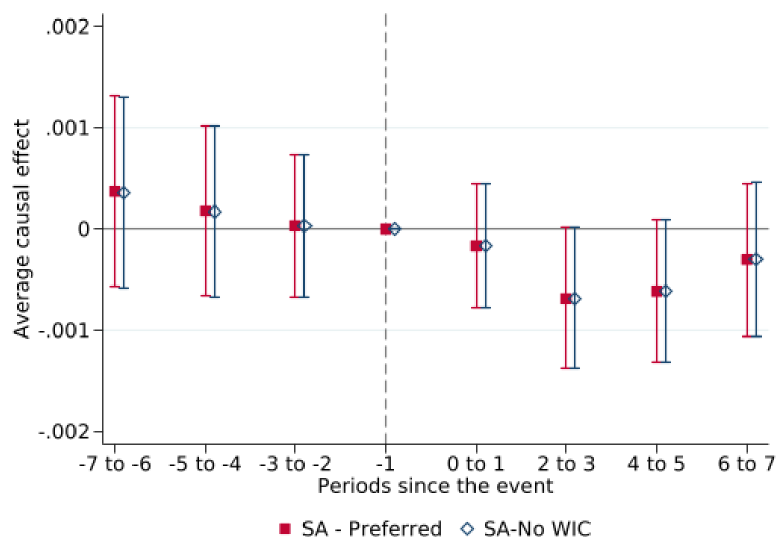
(b) Low Birth Weight

Notes: Our preferred estimation uses CHC implementation between 1969 and 1988. Early adopters include counties that received a CHC grant before 1975. The last group includes counties that adopted CHC by 1980. This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. Because the Natality data is only available beginning in 1968, in order to maximize the pre-period years we can estimate using the early adopters we only estimate three years of pre-treatment coefficients and unlike our preferred specification in Figure 2, we do not bin these coefficients into two year groups. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county and year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.7: The Effect of CHC on Infant Health - with and without Controlling for WIC Exposure
Full Sample



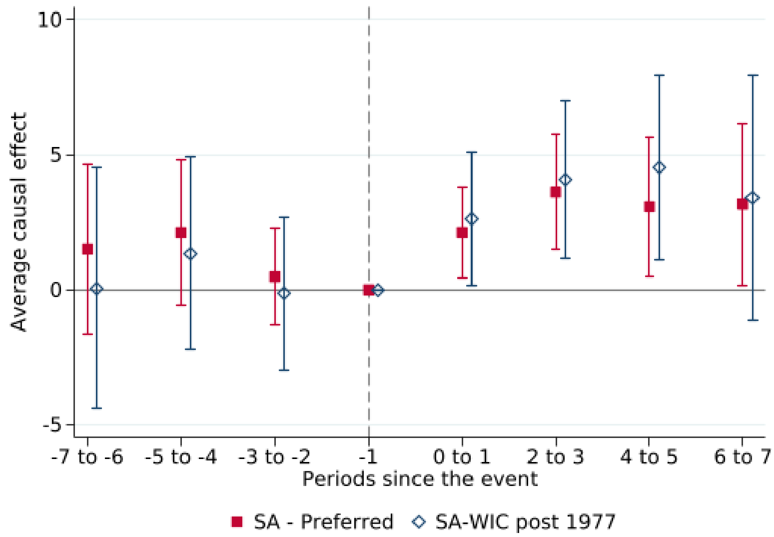
(a) Birth Weight (grams)



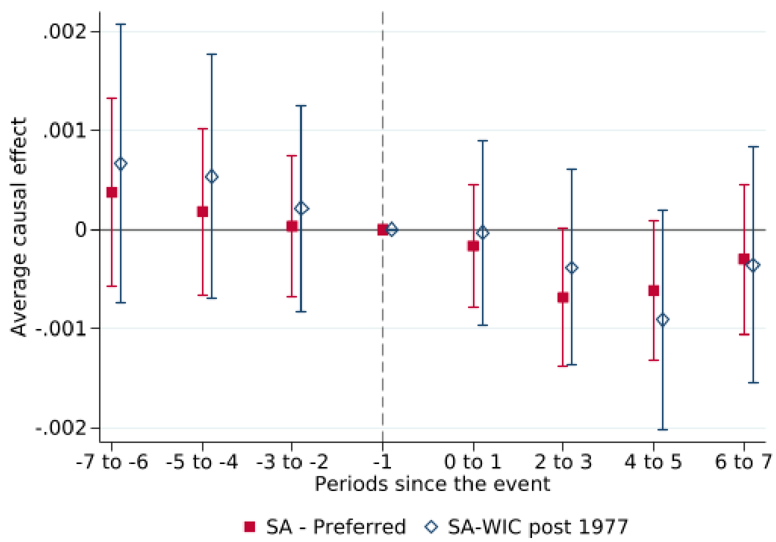
(b) Low Birth Weight

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.8: The Effect of CHC on Infant Health - Robustness - Drop early WIC adopters
Full Sample



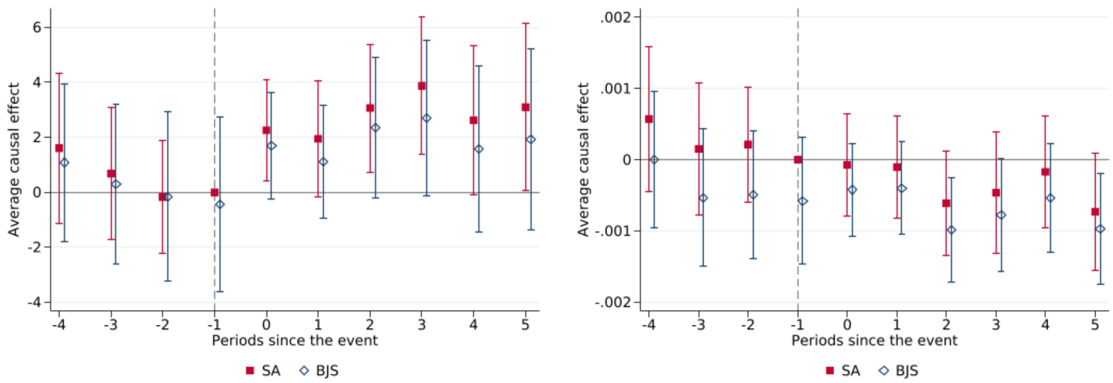
(a) Birth Weight (grams)



(b) Low Birth Weight

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county and year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.9: Alternative Estimation Procedure: Borusyak Jaravel and Spiess (2023)

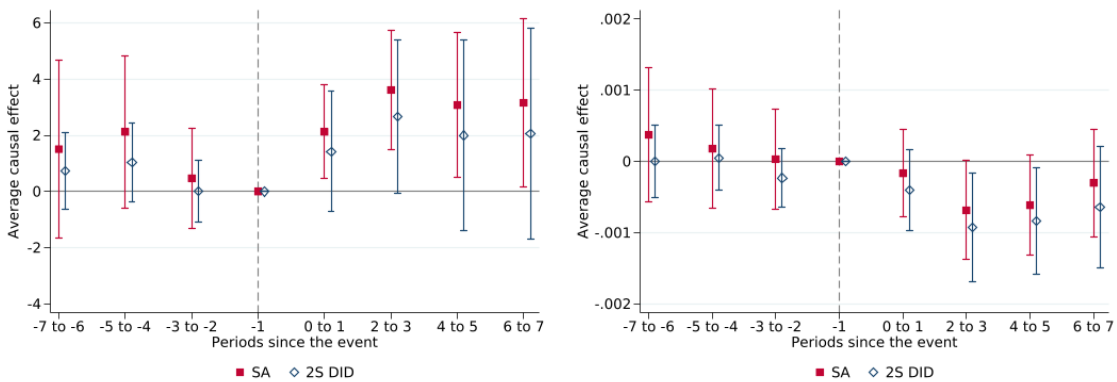


(a) Birth Weight, BJS

(b) Low Birth Weight, BJS

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Borusyak, Jaravel and Spiess (2023). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Figure A.10: Alternative Estimation Procedures: Gardner (2021)



(a) Birth Weight, Gardner

(b) Low Birth Weight, Gardner

Notes: This figure plots the estimated coefficients and 95% confidence intervals obtained from event study specification using the methods introduced in Gardner (2021). Confidence intervals were derived from a bootstrap procedure with 1000 iterations. The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 and Section VII.

Table A.1: 1960 characteristics of counties with CHCs between 1965 and 1988, Full Sample

	CHC established in					Rest of counties
	(1) 1965-1968 (N=39)	(2) 1969-1970 (N=22)	(3) 1971-1974 (N=56)	(4) 1975-1980 (N=505)	(5) 1981-1988 (N=111)	(6) (N=2332)
Total population - 1960	1058587.4	411549.7	249451.7	76222.2	55731.7	29637.9
Median family income- 1959	5430.2	5577.7	4866.8	4112.0	4136.8	4134.8
% w/ family income < $3000 - 1959	24.84	20.92	29.66	37.02	36.85	35.92
% w/ family income $10000+ - 1959	15.04	14.04	12.15	7.982	8.021	7.626
% population aged 0-4 -1960	11.24	11.55	12.26	11.50	11.46	11.01
% population aged 65+ - 1960	9.458	8.345	8.412	9.647	9.861	10.99
% persons 25+ w/ <4 yrs sch. - 1960	10.64	8.823	13.22	13.54	13.21	10.51
% persons 25+ w/ 12+ yrs sch. - 1960	39.47	43.07	38.13	33.28	33.51	37.23
% nonwhite - 1960	18.40	12.39	18.28	15.99	14.35	9.001
% urban - 1960	76.02	75.68	57.82	36.12	37.38	28.75
% rural farm - 1960	4.718	2.782	10.29	18.93	18.37	24.63
Total Active MDs (per pop) - 1960	1.613	1.736	0.964	0.666	0.738	0.617
AMR - All Ages - 1960	1002.7	971.1	984.1	976.4	951.5	919.6

Notes: Source of county characteristics is the 1960 County and City Databooks (Haines and ICPSR 2005).

Table A.2: The Dynamic Effect of CHCs on Infant Health, Main Outcomes, Full Sample

	Birth Weight			Low Birth Weight			Number of Treated
	(1)	(2)	(3)	(4)	(5)	(6)	Counties
Years -7 to -6	0.3836	1.4201	1.5082	0.0005	0.0004	0.0004	610
	(1.5657)	(1.6111)	(1.6087)	(0.0005)	(0.0005)	(0.0005)	
Years -5 to -4	1.3877	1.6603	2.1240	0.0003	0.0003	0.0002	645
	(1.3526)	(1.3856)	(1.3811)	(0.0004)	(0.0004)	(0.0004)	
Years -3 to -2	0.1847	0.0024	0.4729	0.0001	0.0001	0.0000	671
	(0.8879)	(0.9243)	(0.9137)	(0.0004)	(0.0004)	(0.0004)	
Years 0 to 1	2.2830***	2.4288***	2.1258**	-0.0002	-0.0002	-0.0002	680
	(0.8170)	(0.8371)	(0.8520)	(0.0003)	(0.0003)	(0.0003)	
Years 2 to 3	4.5189***	4.1528***	3.6142***	-0.0008**	-0.0008**	-0.0007*	669
	(1.0821)	(1.0546)	(1.0915)	(0.0004)	(0.0003)	(0.0004)	
Years 4 to 5	4.6288***	3.9445***	3.0741**	-0.0008**	-0.0008**	-0.0006*	653
	(1.2712)	(1.2948)	(1.3160)	(0.0004)	(0.0003)	(0.0004)	
Years 6 to 7	5.5788***	4.3221***	3.1588**	-0.0006	-0.0004	-0.0003	605
	(1.5010)	(1.5090)	(1.5201)	(0.0004)	(0.0004)	(0.0004)	
N	4242779	4236199	4235220	4242779	4236199	4235220	
Mean Y	3298.3084	3298.4409	3298.4195	0.0859	0.0859	0.0859	
Number of Never Treated (Control) Counties							2332
Baseline	Y	Y	Y	Y	Y	Y	
Geographic Time Varying Controls	N	Y	Y	N	Y	Y	
1960 Determinants Trends	N	N	Y	N	N	Y	

Notes: This table reports the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). The last column reports the number of treated counties that are used in the estimation of each binned event time. The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. All regressions include county, year fixed effects, and individual demographic controls. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV. * p<0.10, ** p<0.05, *** p<0.01.

Table A.3: The Effect of CHCs on Infant Health, Main Outcomes, Full Sample using Individual-level data

	Birth Weight			Low Birth Weight		
	(1)	(2)	(3)	(4)	(5)	(6)
A: Static Policy Effect						
CHC	5.7796***	4.7295***	2.5963*	-0.0014***	-0.0013***	-0.0008**
	(1.2792)	(1.3292)	(1.3764)	(0.0003)	(0.0003)	(0.0003)
B: Dynamic Policy Effect						
Years -7 to -6	0.3810	1.4172	1.4416	0.0005	0.0004	0.0003
	(1.5639)	(1.6084)	(1.6129)	(0.0005)	(0.0005)	(0.0005)
Years -5 to -4	1.3864	1.6591	1.9524	0.0003	0.0003	0.0002
	(1.3505)	(1.3835)	(1.4262)	(0.0004)	(0.0004)	(0.0004)
Years -3 to -2	0.1840	0.0019	0.2603	0.0001	0.0001	0.0000
	(0.8871)	(0.9237)	(0.9266)	(0.0004)	(0.0004)	(0.0004)
Years 0 to 1	2.2842***	2.4300***	2.2361***	-0.0002	-0.0002	-0.0002
	(0.8145)	(0.8349)	(0.8605)	(0.0003)	(0.0003)	(0.0003)
Years 2 to 3	4.5200***	4.1541***	3.6114***	-0.0008**	-0.0008**	-0.0006*
	(1.0790)	(1.0516)	(1.1292)	(0.0004)	(0.0003)	(0.0004)
Years 4 to 5	4.6312***	3.9475***	3.1311**	-0.0008**	-0.0008**	-0.0006
	(1.2650)	(1.2889)	(1.3754)	(0.0004)	(0.0003)	(0.0004)
Years 6 to 7	5.5809***	4.3247***	3.1725**	-0.0006	-0.0004	-0.0002
	(1.4950)	(1.5034)	(1.5471)	(0.0004)	(0.0004)	(0.0004)
N	55418316	55318497	55315853	55418316	55318497	55315853
Mean Y	3334.6386	3334.6386	3334.6386	0.0686	0.0686	0.0686

Notes: This table reports the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the individual level. All regressions include county, year fixed effects, individual demographic controls, time varying county controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV. * p<0.10, ** p<0.05, *** p<0.01.

Table A.4: Comparison of Effect Sizes from Static DD

	Birth weight	Low birth weight
CHCs	2.7 - 5.7 gm (TOT: 25-42gm)	1% (TOT: 9%-16%)
Food Stamps	2 - 3 gm (TOT: 16-23gm)	1% and 1.1% (TOT: 7%-8.3%)
WIC	2.3 - 2.7 gm (TOT: 20gm)	1%* (TOT: 6%)
Medicaid**		1.9%

Notes: This table compares the point estimates that we find in our paper to the effect sizes reported following the introduction of Food Stamps and WIC. Almond et al. (2011) find that the Food Stamp program's introduction increased birth weight by around 2 grams for White infants and 4.3 grams for Black infants while reducing the likelihood of low birth weight by 1% and 1.3% for White infants and Black infants, respectively. Similar to our effect sizes, Hoynes et al. (2011) estimate that the rollout of WIC increased birth weight between 2.3 and 2.7 grams with no significant impacts on the incidence of low birth weight.*Preliminary finding reported by Bitler, Horn, Kose, Rosales-Rueda and Seifoddini (2023).** The empirical strategy to identify the impacts of Medicaid expansions is a simulated IV strategy (rather than a difference-in-differences strategy, which is used in the rest of the studies summarized in this table).

Table A.5: The Effect of CHCs on Infant Health, Main Outcomes

Mothers with Less than High School Degree

	Birth Weight			Low Birth Weight		
	(1)	(2)	(3)	(4)	(5)	(6)
A: Static Policy Effect						
CHC	9.6162***	8.9934***	6.7582***	-0.0026***	-0.0025***	-0.0018**
	(1.9768)	(1.9241)	(1.9360)	(0.0009)	(0.0008)	(0.0009)
B: Dynamic Policy Effect						
Years -7 to -6	0.0710	-0.2057	-0.0073	-0.0002	-0.0001	-0.0005
	(2.8191)	(2.8101)	(2.8146)	(0.0013)	(0.0013)	(0.0013)
Years -5 to -4	0.0972	-0.2757	-0.2409	0.0001	0.0002	0.0001
	(2.3096)	(2.3150)	(2.3739)	(0.0012)	(0.0012)	(0.0013)
Years -3 to -2	0.2497	-0.1087	0.4116	-0.0014	-0.0013	-0.0014
	(2.0801)	(2.0489)	(2.0666)	(0.0011)	(0.0011)	(0.0011)
Years 0 to 1	6.1171***	6.2051***	6.2380***	-0.0023**	-0.0024**	-0.0024**
	(1.9445)	(1.9192)	(1.8843)	(0.0010)	(0.0010)	(0.0010)
Years 2 to 3	8.7758***	7.9332***	7.8228***	-0.0035***	-0.0033***	-0.0031***
	(2.2073)	(2.2175)	(2.1386)	(0.0012)	(0.0012)	(0.0012)
Years 4 to 5	8.3657***	7.7164***	6.9869***	-0.0028**	-0.0026**	-0.0023**
	(2.4933)	(2.5202)	(2.5506)	(0.0011)	(0.0011)	(0.0010)
Years 6 to 7	11.0896***	9.9640***	9.1464***	-0.0027**	-0.0025**	-0.0022**
	(2.4885)	(2.3983)	(2.4432)	(0.0011)	(0.0011)	(0.0011)
N	981343	979326	979114	981343	979326	979114
	3233	3233	3233	0.1027	0.1027	0.1027
Baseline	Y	Y	Y	Y	Y	Y
Geographic Time Varying Controls	N	Y	Y	N	Y	Y
1960 Determinants Trends	N	N	Y	N	N	Y

Notes: This table reports the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. For this analysis, we restrict our sample to 36 states that include complete information about maternal education following Kearney and Levine (2007). All regressions include county, year fixed effects, and individual demographic controls. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV. * p<0.10, ** p<0.05, *** p<0.01.

Table A.6: The Effect of CHCs on Infant Health, Other Outcomes and Mechanisms

	VLBW (1)	Gestational Age (2)	Small for Gestation (3)	Preterm (4)	Any Prenatal Care (5)	First Trimester (6)
A: Static Policy Effect						
CHC	-0.0002**	0.0022	-0.0014**	0.0005	0.0026*	0.0085**
	(0.0001)	(0.0067)	(0.0006)	(0.0009)	(0.0015)	(0.0038)
B: Dynamic Policy Effect						
Years -7 to -6	0.0004**	0.0057	-0.0010	0.0003	-0.0018*	-0.0049
	(0.0002)	(0.0086)	(0.0007)	(0.0008)	(0.0009)	(0.0040)
Years -5 to -4	0.0002	0.0056	-0.0013	-0.0010	-0.0013*	-0.0016
	(0.0002)	(0.0074)	(0.0008)	(0.0009)	(0.0007)	(0.0029)
Years -3 to -2	0.0002	0.0065	0.0004	-0.0012	-0.0010**	-0.0016
	(0.0002)	(0.0071)	(0.0007)	(0.0010)	(0.0005)	(0.0017)
Years 0 to 1	-0.0000	0.0138**	-0.0004	-0.0016***	0.0016**	0.0051***
	(0.0002)	(0.0059)	(0.0006)	(0.0006)	(0.0007)	(0.0019)
Years 2 to 3	-0.0001	0.0091	-0.0010*	-0.0011*	0.0018*	0.0068**
	(0.0002)	(0.0064)	(0.0006)	(0.0007)	(0.0010)	(0.0028)
Years 4 to 5	0.0001	0.0095	-0.0009	-0.0014*	0.0012	0.0075**
	(0.0002)	(0.0075)	(0.0006)	(0.0008)	(0.0011)	(0.0035)
Years 6 to 7	0.0000	0.0010	-0.0012*	-0.0005	0.0018	0.0093**
	(0.0002)	(0.0084)	(0.0007)	(0.0008)	(0.0012)	(0.0038)
N	4235220	3701912	3701912	3701912	3917747	3917747
Mean Y	0.0147	39.3207	0.1058	0.1116	0.9796	0.6667

Notes: This table reports the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. The high impact sample corresponds to infants whose mothers had less than a high school education. These regressions correspond to our preferred specification, which include county, year fixed effects, individual demographic controls, geographic time varying controls, and 1960 determinants trends. Standard errors are clustered at the county level. For more details about the estimation, see Equation 2 in Section IV. * p<0.10, ** p<0.05, *** p<0.01.

Table A.7: The Effect of CHCs on Birth Weight, Alternative Specifications

	Main	TWFE	StYrFx	Conception	BGB Urban Def	Drop WIC
	(1)	(2)	(3)	(4)	(5)	(6)
A: Static Policy Effect						
CHC	2.7322**	0.4666	1.5305	3.1380**	2.5134*	2.7868**
	(1.3622)	(1.2267)	(1.1080)	(1.5791)	(1.3753)	(1.3643)
B: Dynamic Policy Effect						
Years -7 to -6	1.5082	3.9516**	1.1984	3.8673*	1.5592	1.4072
	(1.6087)	(1.7528)	(1.5035)	(2.2180)	(1.6289)	(1.6070)
Years -5 to -4	2.1240	4.0435***	1.2023	2.2103	2.1564	2.0787
	(1.3811)	(1.5640)	(1.2411)	(1.9548)	(1.3757)	(1.3798)
Years -3 to -2	0.4729	1.8562*	0.6192	-1.6747	0.4733	0.4722
	(0.9137)	(1.0788)	(0.9038)	(1.2086)	(0.9093)	(0.9147)
Years 0 to 1	2.1258**	2.0897**	2.1644**	1.4503	2.1045**	2.1271**
	(0.8520)	(0.9576)	(0.8547)	(1.0894)	(0.8574)	(0.8507)
Years 2 to 3	3.6142***	3.4046***	2.9756***	2.6608*	3.4268***	3.6358***
	(1.0915)	(1.1775)	(1.0705)	(1.4095)	(1.1118)	(1.0875)
Years 4 to 5	3.0741**	2.5899*	1.7368	1.8529	2.9292**	3.1103**
	(1.3160)	(1.4940)	(1.1728)	(1.6012)	(1.3343)	(1.3071)
Years 6 to 7	3.1588**	2.8976*	1.1780	1.2486	3.1913**	3.1875**
	(1.5201)	(1.6704)	(1.3165)	(1.7772)	(1.5448)	(1.5204)
N	4235220	4235220	4235220	3773748	4235220	4235220

Notes: All columns except 2 in this table report the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). Column 2 uses a two-way fixed effects specification. The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. Column 1 reproduces our preferred specification, which includes county, year fixed effects, individual demographic controls, geographic time varying controls and 1960 determinants trends, detailed in Equation 2. Column 3 adds state-by-year fixed effects. Column 4 redefines the treatment timing based on estimated time of conception. Column 5 uses an alternative urbanicity control defined by Bailey and Goodman-Bacon (2015). Column 6 drops WIC exposure as a control variable. Standard errors are clustered at the county level. For more details about the estimation, see Sections IV and VII. * p<0.10, ** p<0.05, *** p<0.01.

Table A.8: The Effect of CHCs on Low Birth Weight, Alternative Specifications

	Main	TWFE	StYrFx	Conception	BGB Urban Def	Drop WIC
	(1)	(2)	(3)	(4)	(5)	(6)
A: Static Policy Effect						
CHC	-0.0009***	-0.0003	-0.0007**	-0.0012**	-0.0009***	-0.0009***
	(0.0003)	(0.0003)	(0.0003)	(0.0005)	(0.0003)	(0.0003)
B: Dynamic Policy Effect						
Years -7 to -6	0.0004	-0.0002	0.0005	0.0003	0.0003	0.0004
	(0.0005)	(0.0005)	(0.0005)	(0.0007)	(0.0005)	(0.0005)
Years -5 to -4	0.0002	-0.0000	0.0004	0.0006	0.0001	0.0002
	(0.0004)	(0.0004)	(0.0005)	(0.0006)	(0.0004)	(0.0004)
Years -3 to -2	0.0000	-0.0001	-0.0001	0.0009*	0.0000	0.0000
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0004)
Years 0 to 1	-0.0002	-0.0001	-0.0002	-0.0001	-0.0002	-0.0002
	(0.0003)	(0.0003)	(0.0003)	(0.0004)	(0.0003)	(0.0003)
Years 2 to 3	-0.0007*	-0.0006	-0.0005	-0.0001	-0.0006*	-0.0007*
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0004)
Years 4 to 5	-0.0006*	-0.0004	-0.0004	-0.0004	-0.0006	-0.0006*
	(0.0004)	(0.0004)	(0.0004)	(0.0005)	(0.0004)	(0.0004)
Years 6 to 7	-0.0003	-0.0002	-0.0001	0.0000	-0.0003	-0.0003
	(0.0004)	(0.0004)	(0.0004)	(0.0006)	(0.0004)	(0.0004)
N	4235220	4235220	4235220	3773748	4235220	4235220

Notes: Low birth weight defined as less than 2500 grams. All columns except 2 in this table report the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). Column 2 uses a two-way fixed effects specification. The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. The analysis is run using data at the cell level. Column 1 reproduces our preferred specification, which includes county, year fixed effects, individual demographic controls, geographic time varying controls and 1960 determinants trends, detailed in Equation 2. Column 3 adds state-by-year fixed effects. Column 4 redefines the treatment timing based on estimated time of conception. Column 5 uses an alternative urbanicity control defined by Bailey and Goodman-Bacon (2015). Column 6 drops WIC exposure as a control variable. Standard errors are clustered at the county level. For more details about the estimation, see Section IV and VII. * p<0.10, ** p<0.05, *** p<0.01.

Table A.9: The Effect of CHCs on Infant Health, Main Outcomes

Event-time Balanced Panel (1970-1981 CHC cohorts)

	Birth Weight			Low Birth Weight		
	(1)	(2)	(3)	(4)	(5)	(6)
A: Static Policy Effect						
CHC	4.6217***	3.3998**	1.4318	-0.0013***	-0.0011***	-0.0008***
	(1.4633)	(1.4631)	(1.4969)	(0.0003)	(0.0003)	(0.0003)
B: Dynamic Policy Effect						
Year -2	0.1259	-0.0970	0.3096	0.0000	0.0001	0.0000
	(1.0832)	(1.1221)	(1.0963)	(0.0004)	(0.0004)	(0.0004)
Year 1	1.9650**	2.1290**	1.7210*	-0.0001	-0.0002	-0.0001
	(0.9991)	(0.9923)	(1.0194)	(0.0004)	(0.0004)	(0.0004)
Year 2	1.6607	1.4725	1.0147	-0.0002	-0.0002	-0.0000
	(1.0862)	(1.1394)	(1.1678)	(0.0004)	(0.0004)	(0.0004)
Year 3	3.7258***	3.2990***	2.5764**	-0.0011***	-0.0011***	-0.0008**
	(1.2338)	(1.2321)	(1.2741)	(0.0004)	(0.0004)	(0.0004)
Year 4	4.6470***	3.9657***	3.2719**	-0.0009*	-0.0008*	-0.0006
	(1.3059)	(1.2893)	(1.3259)	(0.0004)	(0.0004)	(0.0005)
Year 5	3.9681***	3.2433**	2.3003	-0.0005	-0.0005	-0.0002
	(1.4750)	(1.4323)	(1.4683)	(0.0004)	(0.0004)	(0.0004)
Year 6	4.0266**	3.1648*	2.0770	-0.0010**	-0.0009**	-0.0007
	(1.5678)	(1.6382)	(1.6546)	(0.0004)	(0.0004)	(0.0005)
Year 7	5.2706***	4.1109**	2.8259	-0.0006	-0.0005	-0.0003
	(1.6741)	(1.6964)	(1.7187)	(0.0005)	(0.0005)	(0.0005)
N	4053378	4048603	4047624	4053378	4048603	4047624
Mean Y	3299.4438	3299.5676	3299.5457	0.0857	0.0856	0.0856
Baseline	Y	Y	Y	Y	Y	Y
Geographic Time Varying Controls	N	Y	Y	N	Y	Y
1960 Determinants Trends	N	N	Y	N	N	Y

Notes: This table reports the estimated coefficients and standard errors using the methods introduced in Sun and Abraham (2021). The outcome data is from the Vital Statistical Natality Files that cover the years between 1968 and 1988. We compile data on CHC timing from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. Counties that recieved a CHC before 1970 or after 1981 are excluded from this analysis. The analysis is run using data at the cell level. All regressions include county, year fixed effects, and individual demographic controls (see Equation 2). Standard errors are clustered at the county level. For more details about the estimation, see Sections IV and VII. * p<0.10, ** p<0.05, *** p<0.01.

B. Evidence of Treatment Effect Heterogeneity

The TWFE estimator is a weighted average of several different types of comparisons: treated versus never treated as the control group, early treated versus later treated as the control group, and later treated versus already treated as the control group. The last comparison is particularly worrisome, and if the treatment effect is heterogeneous over time and/or across treatment cohorts, this can lead to a biased estimate (Goodman-Bacon 2021a). In response, econometricians have developed multiple ways to test for treatment effect heterogeneity and several estimators that are robust in these cases.

One way the literature tests for this involves demonstrating that the weights used in the TWFE regression may be negative. When combined with treatment effect heterogeneity, negative weights can create a situation where the reported regression coefficient may be opposite signed if, for example, a negative weight was placed on a group ATE that was particularly large in magnitude. To examine if this is a concern in our setting, we use the test developed by de Chaisemartin and D'Haultfœuille (2020). This test calculates the weights from the TWFE specification, identifies how many are negative, and then tests if those weights are correlated with observables. If they are, this demonstrates the existence of treatment effect heterogeneity that could lead to bias. In Appendix Table B.1, we show that there are negative weights in our settings and that the TWFE weights are significantly correlated with the year, maternal education, county hospital beds per capita, and the state share of non-White women on Medicaid. For example, the correlation between the weights on the TWFE estimator and the share of hospitals per capita in the county is 0.168 (t-statistics = 6.779). This implies that the effect of a CHC may be different in areas with more or fewer previously existing hospitals. For instance, the availability of hospital care before a CHC opens likely influences the overall population health and helps determines the health care choice set of pregnant women in the area. This heterogeneity, when combined with the negative weights discussed above, can lead to bias in the TWFE coefficient.

As additional evidence of potential bias from treatment effect heterogeneity, we present the test for treatment effect heterogeneity from Sun and Abraham (2021) as we use their estimation method. Appendix Figure B.1 presents the results for our second lead coefficient (that combines 2 and 3 years before CHC arrival). Sun and Abraham show that the event study coefficient for each relative period can be decomposed into a weighted linear combination of the cohort average treatment effects for that relative period and the cohort average treatment effects for all the other relative periods. The weights on the other relative time periods will sum to zero, but similar to the issue with negative weights described above, if the cohort average treatment effects are not equal (which will be true in a setting with treatment effect heterogeneity), these effects will not sum to zero, and the event study coefficient will be contaminated.

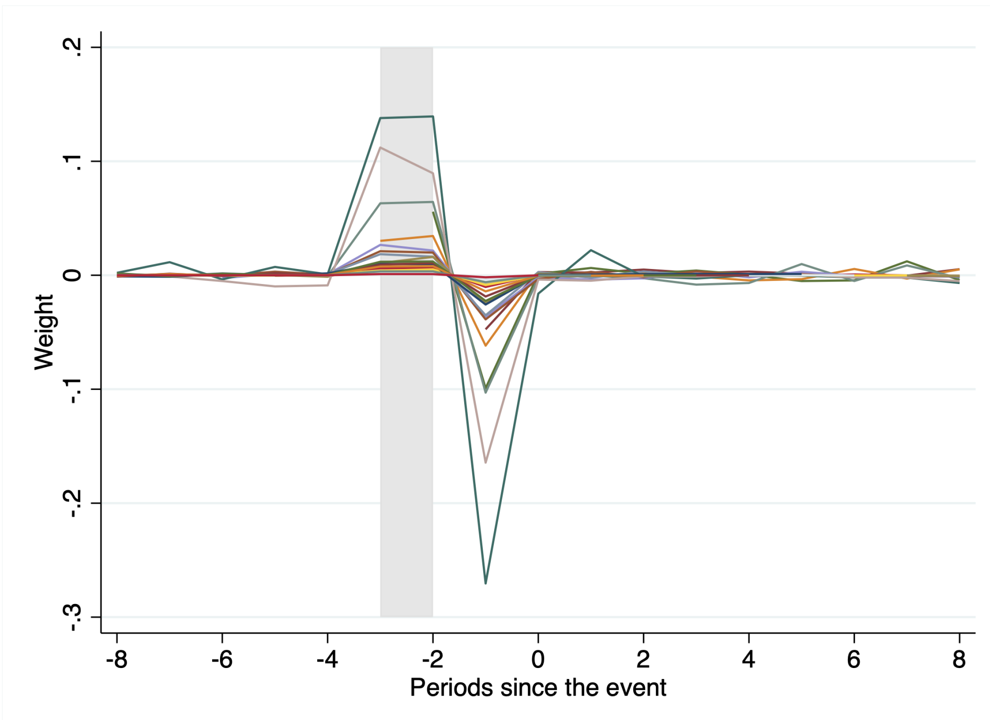
To test for this contamination, the procedure from Sun and Abraham (2021) also begins by calculating the TWFE weights for each cohort of treated units for each relative time period. Figure B.1 plots these weights for the second lead coefficient (that combines 2 and 3 years before CHC arrival). Each colored line represents the weights for a different treatment cohort. Note that this figure can be created for any of the leads or lags, but we only present one coefficient for readability. By construction, the weights for the relative time periods being estimated (shaded in gray) should sum to one, and the weights for the excluded time period (-1, the year before a CHC opens) should sum to -1, and the weights on all the other relative time periods will sum to zero. Considering the treatment heterogeneity in our setting, the positive weights for some cohorts outside of the estimated relative time period imply that information from other relative time periods will contaminate an event study coefficient estimated using TWFE. This provides additional evidence of bias and supports our decision to use a robust method to treatment effect heterogeneity in our setting.

Table B.1: Diagnostic Test for Treatment Effect Heterogeneity from de Chaisemartin and D'Haultfœuille (2020)

	# ATTs		Σ of weights	
Positive weights	6162		1.0379	
Negative weights	293		-0.0379	
	Correlation	Coef	S.E	T-stat
Year	-0.272	-1.572	0.200	-7.860
Mother's education LTHS	0.061	0.034	0.020	1.671
Hospitals per capita	0.168	0.003	0.000	6.779
Share of non-White women on AFDC	0.263	2.326	0.581	4.005

Notes: This table reports a subset of results from a diagnostic test introduced by de Chaisemartin and D'Haultfœuille (2020). The traditional two-way fixed effect (TWFE) coefficient is a weighted average of many difference-in-differences estimators across cohorts and periods. This test calculates the weights from the TWFE estimator of our preferred specification. First, the test checks to see if any of these weights are negative. After, calculating the weights, the next step tests to see if these weights are correlated with observables. If the weights are correlated with these characteristics, this implies that there is treatment effect heterogeneity which may bias the results. Outcome data for this regression is from the Vital Statistical Natality Files that cover the years between 1968 and 1988 and data on CHC timing are from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988.

Figure B.1: Estimated weights underlying the coefficient for the second lead (2 and 3 years before CHC arrival)



This figure presents results from the test for event study coefficient bias from Sun and Abraham (2021). The test begins by calculating the weights from the TWFE estimator of the event study coefficients of our preferred specification. Each colored line represents the weights for a different treatment cohort. Outcome data for this regression is from the Vital Statistical Natality Files that cover the years between 1968 and 1988 and data on CHC timing are from (1) Bailey and Goodman-Bacon (2015) for years 1965-1980 and (2) FAADS for years 1981-1988. This figure plots these estimated weights that would be used to calculate the TWFE estimation of each average treatment effect. The relative time periods that correspond to the event study coefficient are shaded in gray. The weights from the relative wave being estimated sum to one, the weights from the excluded relative wave (-1) sum to negative 1, and the weights from the included relative waves not part of the coefficient sum to zero. The presence of positive weights in the non-excluded relative time periods is evidence of treatment heterogeneity biasing the event study coefficients. This implies that variation from other periods is contaminating the TWFE event study coefficients.