Online Appendix for:

Inside the War on Poverty: The Impact of Food Stamps on Birth Outcomes

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Appendix Tables 8 and 9 were inadvertently omitted from the original online appendix and Appendix Table 10 was labeled Appendix Table 8. These omissions and mislabeling have been corrected in this version.

In addition, Appendix Table 4 used the white FSP participation rate to inflate the black point estimates (white inflated numbers are correct). Thus the rows in that table labeled "Estimate inflated" and "% impact inflated" are incorrect. Throughout the appendix and paper all of the point estimates and point estimates divided by the mean are correct. Further, all white inflated numbers are also correct. This mistake has been corrected in this *erratum*.

On-line Appendix

In our paper, we examine the impact of the food stamp program on infant health. In this Appendix, we provide supplemental estimates to those provided in the published paper.

Appendix Table 1 provides documentation of the nature of the missing data in the national natality files. We report the share of observations by year with non-missing data for birth outcomes and mother's demographics. Appendix Table 2 gives information on causes of death in the national mortality file. We identify the mapping between detailed causes of death and our definition for "deaths possible affected by nutritional deprivation."

In the main paper, we discuss county regressions of FSP implementation dates on county pre-treatment characteristics. Appendix Figure 1 provides scatter plots of each of six county characteristics (x-axis) against the county FSP implementation date (y-axis). For guidance, we also provided the univariate linear regression line (weighted by the county population) for each panel. These figures show that the magnitude of the association between the county characteristics and the food stamp start date is weak and there is an enormous amount of variation that is not explained by the characteristics.

In Appendix Table 3 we test the correspondence between our USDA-measured county FSP start dates and the annual county food stamp payments that are measured in the REIS data. We tabulate mean per capita REIS food stamp expenditures by number of years relative to the county FSP implementation date. In years -3, -2, and -1 it's $12, $11 and $10, respectively, then jumps to $993 in year 0 and upwards of $2,000 for every subsequent year. The table also shows that almost 99 percent of counties report no FSP payments in years -3, -2 and -1 and then it drops to 1.3% in year 0 and less than 0.5 percent in all subsequent years. Clearly the correspondence between the REIS measurement of food stamp payments and our USDA measured implantation dates is excellent.

Appendix Table 4 is a companion table to the main results in the paper on the effect of FSP on birth outcomes (Table 1). Here we provide similar specifications for additional outcome variables:

low birth weight, gestation less than 37 weeks and fraction female. Appendix Table 5 presents results for the impact of the FSP on birth outcomes using a longer time period (1959-1977, necessitating aggregating the data to the state-year level). Appendix Figure 2 is a companion figure to the main results in the paper on event study estimates of the effect of FSP on birth outcomes (Figure 5). Here we provide similar specifications for average birth weight.

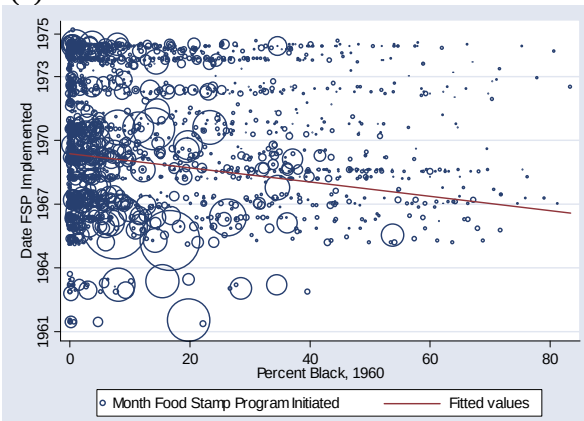
Robustness results for the birth outcomes results are provided in Appendix Tables 6 and 7. In Appendix Table 6 we control for a one-year lead of the policy variable. In Appendix Table 7 we examine impacts on location of birth (in hospital, attended by physician).

Appendix Table 8 and 9 present results by quartiles of the county poverty rate for fertility (Appendix Table 8) and neonatal infant mortality (Appendix Table 9).

Appendix Table 10 presents results for the impact of the FSP on neonatal infant mortality using a longer time period (1959-1977, necessitating aggregating the data to county-time level).

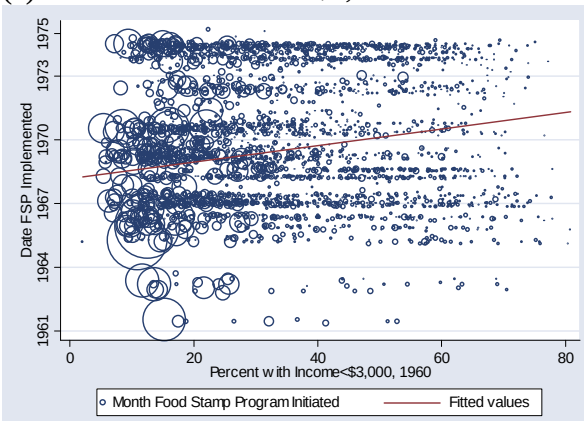
Appendix Figure 1: 1960 County Characteristics and County Food Stamp Start Date

(a) Percent Black

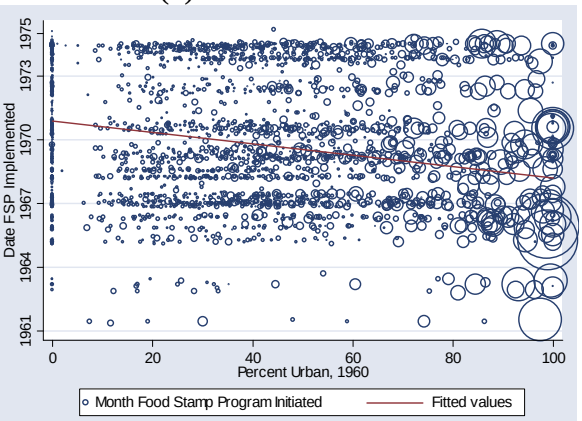


(b) Log of Population

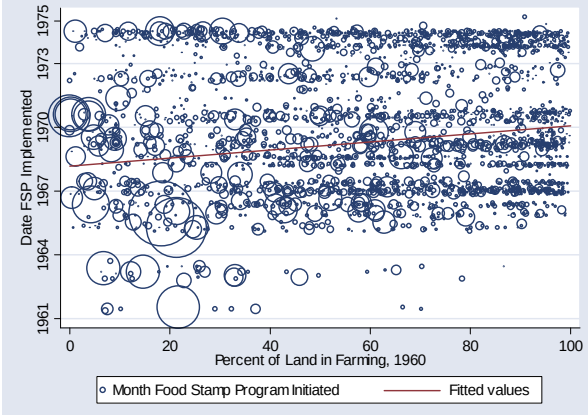
(c) Percent with Income<$3,000



(d) Percent Urban



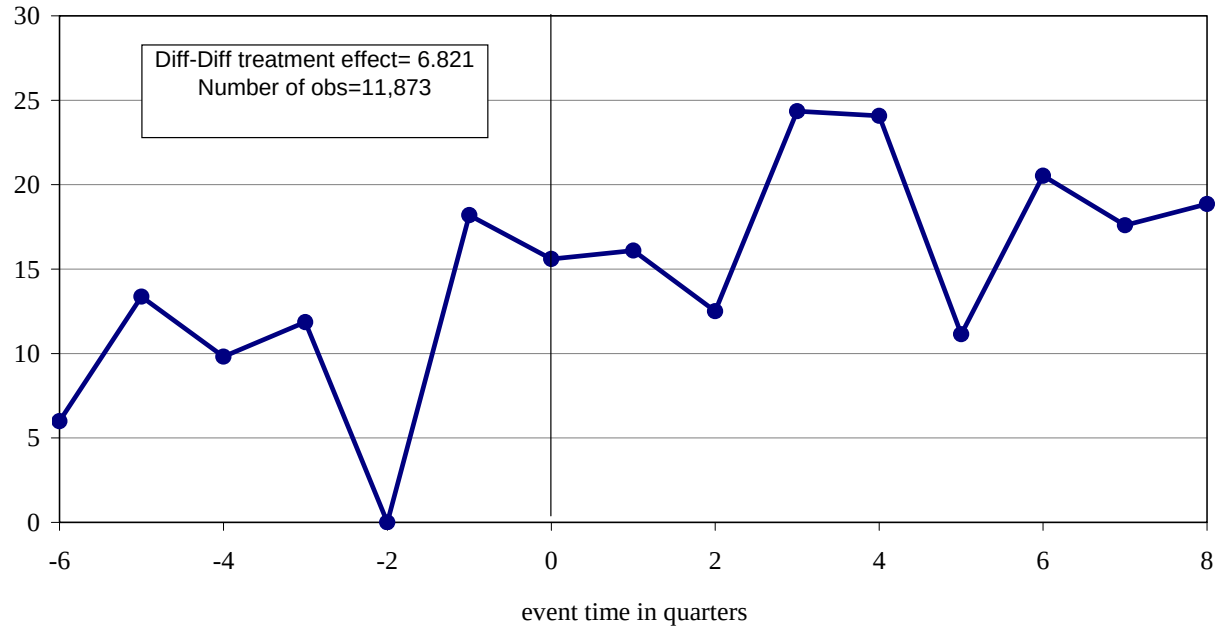
(e) Percent of Land in Farming



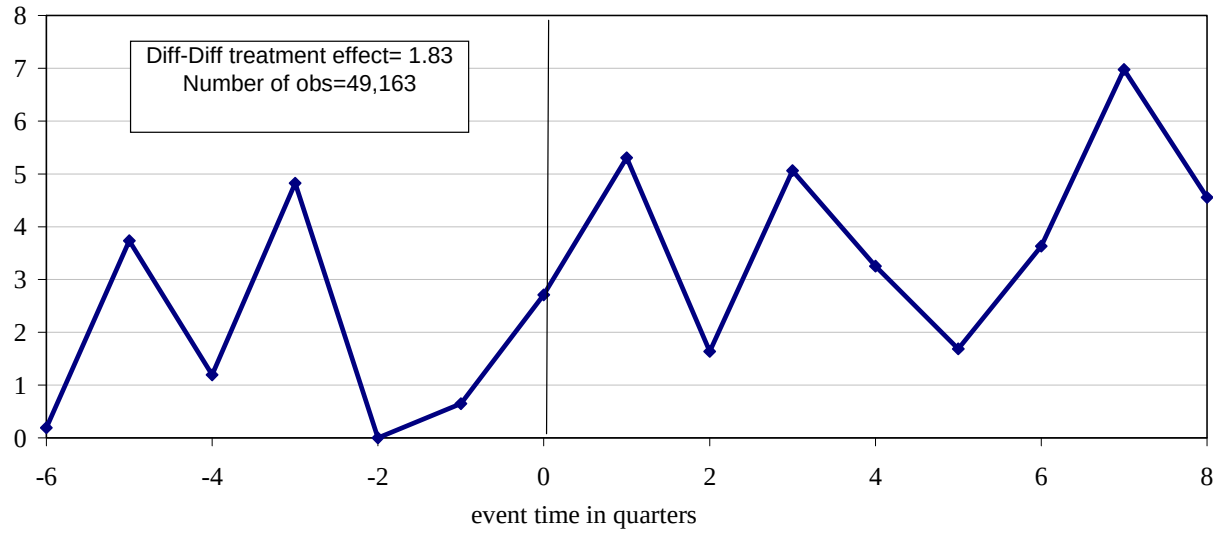
(f) Percent Age >65

Note: Each graph provides a scatter plot of a 1960 county characteristic (x-axis) against the food stamp start date (y-axis) where the points are weighted by the 1960 county population. The graphs also contain the linear fit where the regression is weighted by 1960 county population. 1960 County characteristics are from the 1960 Census of Population and Agriculture. The FSP implementation dates are from U.S. Department of Agriculture (various years).

Appendix Figure 2: Effects of FSP Implementation on Mean Birth Weight
Results for Event Study Analysis
(a) Blacks



(b) Whites



Notes: Each figure plots coefficients from an event-study analysis. Coefficients are defined as quarters relative to the quarter the Food Stamp Program is implemented in the county. The sample is a balanced county sample, where a county is included only if there are 6 quarters of pre- and 8 quarters of post- implementation data. The specification includes controls for county, county * linear time, quarter, 1960 county controls interacted with time, county per capita transfers and county real per capita income. The "diff-in-diff treatment effect" is comparable to the results presented in Table 1. We present them here because the samples used for the event study differ from the main results.

Appendix Table 1: Share of Observations with Non-Missing Data, by Year and Race

A. WHITE

year	birthweight	parity	gestation	mother's education	legitimacy	physician attended birth
1968	1.00	1.00	0.83	0.00	0.71	1.00
1969	1.00	0.99	0.60	0.62	0.66	1.00
1970	0.99	0.99	0.60	0.66	0.66	1.00
1971	1.00	0.99	0.60	0.66	0.67	1.00
1972	1.00	0.98	0.60	0.66	0.67	1.00
1973	1.00	0.96	0.61	0.69	0.67	1.00
1974	1.00	0.99	0.61	0.70	0.67	1.00
1975	1.00	0.99	0.61	0.70	0.67	1.00
1976	1.00	0.99	0.64	0.76	0.67	1.00
1977	1.00	0.99	0.65	0.76	0.60	1.00

B. BLACK

year	birthweight	parity	gestation	mother's education	legitimacy	physician attended birth
1968	1.00	1.00	0.82	0.00	0.75	1.00
1969	0.99	0.99	0.52	0.59	0.70	1.00
1970	0.99	0.99	0.54	0.65	0.70	1.00
1971	1.00	0.98	0.54	0.65	0.71	1.00
1972	1.00	0.95	0.53	0.66	0.72	1.00
1973	1.00	0.92	0.57	0.74	0.72	1.00
1974	1.00	0.98	0.57	0.76	0.71	1.00
1975	1.00	0.98	0.57	0.76	0.71	1.00
1976	1.00	0.98	0.60	0.82	0.71	1.00
1977	1.00	0.98	0.60	0.83	0.64	1.00

Notes: Authors' tabulations of 1968-1977 Natality detail files.

Appendix Table 2: Causes of Death based on ICD-7 and ICD-8 codes

	Cause of Death	ICD-7 Code (1959-1967)	ICD-8 Code (1968-1978)
1	Congenital Anomalies	750-759	740-759
2	Respiratory Distress	773	776.1,776.2
3	Disorders of short gestation and unspecified low birthweight	776	777
4	Infections specific to the perinatal period	53	038
5	Pneumonia and influenza	480-483, 490-493, 763	470-474,480-486
6	Newborn affected by maternal complications of pregnancy	n/a	769.0-769.2,769.4,769.5,769.9
7	Intrauterine hypoxia and birth asphyxia	762	776.9
8	Newborn affected by complications of placenta, cord, and membranes	761	770,771
9	Certain gastrointestinal diseases	045-048,543,571,572,764	004,006-009,535,561,563
10	Diseases of the heart	400-402,410-443	390-398,402,404,410-429
11	SIDS	NA	795.0
12	Accidents and adverse events	E800-E962	E800-E949
13	Birth trauma	760	764-768(.0-.3), 772
14	Hemolytic disease of newborn, due to isoimmunization and other perinatal jaundice*	770	774,775
15	All Other	all other codes	all other codes

Deaths possi
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Other Deat
(not likely
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nutrition)

Appendix Table 3: REIS Food Stamp Expenditures by USDA FSP start date

Year relative to FSP start year	Mean of REIS per capita FSP expenditures	Fraction with REIS per capita FSP =0
-3	$12	98.7%
-2	$11	98.7%
-1	$10	98.7%
0	$933	1.3%
1	$2,266	0.2%
2	$2,442	0.2%
3	$2,562	0.2%
4	$2,875	0.2%
5	$3,492	0.1%
6	$4,232	0.0%
7	$4,558	0.1%
8	$4,665	0.1%

Appendix Table 4: Impacts of Food Stamp Introduction on Birth Outcomes, by Race

	Fraction < 1,500 grams	Fraction Gestation < 37 weeks	Fraction Female
A. WHITES			
Ave FSP (0/1)	-0.0002	-0.001	-0.0004
	(0.0001)	(0.001)	(0.0006)
% Impact (coef/mean)	-2.30%	-1.13%	-0.09%
Estimate inflated	-0.0018	-0.0069	-0.0032
% Impact inflated	-17.69%	-8.65%	-0.66%
Observations	97785	69535	97785
R-squared	0.06	0.24	0.04
mean of dependent variable	0.01	0.08	0.49
B. BLACKS			
Ave FSP (0/1)	-0.0013	-0.0038	-0.0016
	(0.0006)*	(0.0024)	(0.0016)
% Impact (coef/mean)	-6.60%	-2.12%	-0.32%
Estimate inflated	-0.0029	-0.0083	-0.0035
% Impact inflated	-14.35%	-4.60%	-0.71%
Observations	27374	16580	27374
R-squared	0.13	0.37	0.05
mean of dependent variable	0.02	0.18	0.49
1960 CCDB * linear time	x	x	x
REIS controls	x	x	x
cty per cap real income	x	x	x
yr x qtr fixed effects	x	x	x
county fixed effects	x	x	x
state * year fixed effects	x	x	x

Notes: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy. The treatment is assigned as of 3 months prior to birth (proxy for beginning of the 3rd trimester). The estimation sample includes means by race-county-quarter for years including 1968-1977 where cells with less than 25 births are dropped. In addition to the fixed effects, controls include 1960 county variables (log of population, percent of land in farming, percent of population black, urban, age<5, age>65 and with income less than $3,000) each interacted with a linear time trend, per capita county transfer income (public assistance, medical care, and retirement and disability benefits), and county real per capita income. Estimates are weighted using the number of births in the cell and are clustered on county. Standard errors are in parentheses. Inflated impacts divide the parameter estimate by an estimate of the food stamp participation rate for the regression sample.

Appendix Table 5: Effect of FSP Implementation on Birth Outcomes using Expanded Sample 1959-1977, State-year data

Fraction of births less than:	Original period 1968+		Full Period 1959+		Post-Pilot county period 1964+	
	< 2,500 gms	< 1,500 gms	< 2,500 gms	< 1,500 gms	< 2,500 gms	< 1,500 gms
	(1)	(2)	(3)	(4)	(5)	(6)
A. WHITES						
FSP (1 qtr before birth quarter)	-0.0003	-0.0002	-0.0009	0.0003	-0.0003	0.0003
	(0.0007)	(0.0003)	(0.0005)	(0.0002)	(0.0006)	(0.0002)
Observations	500	500	947	947	700	700
R-squared	0.96	0.57	0.95	0.58	0.96	0.56
mean of dependent variable	0.065	0.009	0.068	0.010	0.067	0.010
% impact (coef/mean)	-0.441%	-2.571%	-1.280%	2.795%	-0.516%	2.869%
B. NONWHITES						
FSP (1 qtr before birth quarter)	-0.0021	-0.0002	-0.0019	-0.0003	-0.0014	-0.0002
	(0.0019)	(0.0013)	(0.0016)	(0.0008)	(0.0018)	(0.0009)
Observations	500	500	946	946	699	699
R-squared	0.94	0.79	0.93	0.81	0.93	0.79
mean of dependent variable	0.128	0.022	0.131	0.022	0.131	0.023
% impact (coef/mean)	-1.621%	-0.963%	-1.486%	-1.509%	-1.093%	-0.801%
state & year fixed effects	x	x	x	x	x	x
REIS controls, per cap income	x	x	x	x	x	x
state linear time trends	x	x	x	x	x	x

Note: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy. The estimation sample includes the observations by race-state-year. In addition to the fixed effects, controls include, per capita state transfer income (public assistance, medical care, and retirement and disability benefits), and state real per capita income. The treatment is assigned as of one quarter before the birth and is a weighted average of the county FSP implementation using county births by month from 1968. Estimates are weighted using the number of births in the cell and are clustered on state. Standard errors are in parentheses.

Appendix Table 6: Sensitivity of Estimates to Including One Year Lead of Policy Variable

	Birthweight (1)	LBW (2)	VLBW (3)	GEST<37 (4)	%Female (5)
A. WHITES					
Ave FSP (0/1)	2.161	-0.0005	-0.0002	-0.0019	-0.0003
	(1.038)**	(0.0004)	(0.0002)	(0.0007)**	(0.0007)
One Year Lead of Ave FSP (0/1)	-0.159	-0.0002	0.0000	0.0015	-0.0002
	(1.226)	(0.0004)	(0.0002)	(0.0008)*	(0.0008)
Observations	97785	97785	97785	66888	97785
R-squared	0.55	0.18	0.06	0.15	0.04
mean of dependent variable	3350	0.06	0.01	0.08	0.49
B. BLACKS					
Ave FSP (0/1)	6.369	-0.0026	-0.0011	-0.0003	-0.0001
	(2.681)**	(0.001)*	(0.0007)	(0.0027)	(0.0019)
One Year Lead of Ave FSP (0/1)	-1.980	0.0015	-0.0005	-0.0023	-0.0033
	(3.356)	(0.0014)	(0.0007)	(0.0033)	(0.0022)
Observations	27374	27374	27374	15777	27374
R-squared	0.34	0.17	0.13	0.24	0.05
mean of dependent variable	3097	0.13	0.02	0.18	0.49
1960 CCDB * linear time	x	x	x	x	x
REIS controls	x	x	x	x	x
cty per cap real income	x	x	x	x	x
yr x qtr fixed effects	x	x	x	x	x
county fixed effects	x	x	x	x	x
state * year fixed effects	x	x	x	x	x

Notes: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy. There are two treatment variables: the baseline treatment is assigned as of the month of birth and a one year lead of that policy variable. The estimation sample includes means by race-county-quarter for years including 1968-1977 where cells with less than 25 births are dropped. Controls include county, year * quarter and state * year fixed effects, 1960 county variables (log of population, percent of land in farming, percent of population black, urban, age<5, age>65 and with income less than $3,000) each interacted with a linear time trend, per capita county transfer income (public assistance, medical care, and retirement and disability benefits), and county real per capita income. Estimates are weighted using the number of births in the cell and are clustered on county. Standard errors are in parentheses. Inflated impacts divide the parameter estimate by an estimate of the food stamp participation rate for the regression sample.

Appendix Table 7: Impact of FSP Introduction on Birth Location

	Fraction births in hospital (1)	Fraction births in hospital or physicial attending (2)
A. WHITES		
Ave FSP (0/1)	0.0012	0.0010
	(0.0009)	(0.0009)
Observations	97785	97785
R-squared	0.73	0.80
mean of dependent variable	0.99	1.00
B. BLACKS		
Ave FSP (0/1)	-0.0018	0.0000
	(0.0030)	(0.0030)
Observations	27374	27374
R-squared	0.77	0.79
mean of dependent variable	0.94	0.95
1960 CCDB * linear time	x	x
REIS controls	x	x
cty per cap real income	x	x
yr x qtr fixed effects	x	x
county fixed effects	x	x
state * year fixed effects	x	x

Notes: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy. The treatment is assigned as of three months prior to birth. The estimation sample includes means by county-quarter for years including 1968-1977 where cells with less than 25 births are dropped. Controls include county, year * quarter and state * year fixed effects, 1960 county variables (log of population, percent of land in farming, percent of population black, urban, age<5, age>65 and with income less than $3,000) each interacted with a linear time trend, per capita county transfer income (public assistance, medical care, and retirement and disability benefits), and county real per capita income. Estimates are weighted using the number of births in the cell and are clustered on county. Standard errors are in parentheses.

Appendix Table 8: Impact of FSP Introduction on Fertility Rate (Births per 1000 women 15-44), By Poverty Quartile

	FSP implemented as of 3 quarters prior to birth	
	Lowest quartile by 1970 poverty rate	Highest quartile by 1970 poverty rate
	(1)	(1)
A. WHITES		
Ave FSP (0/1)	0.113	0.047
	(0.127)	(0.132)
% Impact (coef/mean)	0.64%	0.24%
Observations	8650	68917
R-squared (white)	0.93	0.70
mean of dependant variable	17.72	19.67
B. BLACKS		
Ave FSP (0/1)	1.133	-0.035
	(0.483)	(0.260)
% Impact (coef/mean)	5.27%	-0.12%
Observations	4535	29153
R-squared (white)	0.85	0.67
mean of dependant variable	21.51	27.78
1960 CCDB * linear time	x	x
REIS controls	x	x
cty per cap real income	x	x
yr x qtr fixed effects	x	x
county fixed effects	x	x
state * year fixed effects	x	x

Notes: Each parameter is from a separate regression of the outcome variable on the Food Stamp implementation dummy. The treatment is assigned as of 9 months prior to birth. The estimation sample includes means by race-county-quarter for years including 1968-1977. Controls include county, year * quarter and state * year fixed effects, 1960 county variables (log of population, percent of land in farming, percent of population black, urban, age<5, age>65 and with income less than $3,000) each interacted with a linear time trend, per capita county transfer income (public assistance, medical care, and retirement and disability benefits), and county real per capita income. Estimates are weighted using the population in the cell and are clustered on county. Standard errors are in parentheses. Quartiles are assigned using 1970 county poverty rates (weighted using county population).

Appendix Table 9: Impact of FSP on neonatal Infant Mortality Rate (Deaths per 1000 live births), by Poverty Quartile

	All Deaths	
	Lowest quartile by 1970 Poverty Rate	Highest quartile by 1970 Poverty Rate
	(1)	(1)
A. WHITES		
Ave FSP (0/1)	0.223	-0.221
	(0.196)	(0.231)
% Impact (coef/mean)	1.96%	-1.67%
Observations	7980	32783
R-squared (white)	0.25	0.11
mean of dependant variable	11.40	13.25
B. BLACKS		
Ave FSP (0/1)	1.161	-0.707
	(1.312)	(0.586)
% Impact (coef/mean)	5.19%	-3.42%
Observations	2422	10052
R-squared (white)	0.19	0.16
mean of dependant variable	22.37	20.69
1960 CCDB * linear time	x	x
REIS controls	x	x
cty per cap real income	x	x
yr x qtr fixed effects	x	x
county fixed effects	x	x
state * linear time	x	x

Notes: Each parameter is from a separate regression of the neonatal infant mortality rate (deaths in first 28 days per 1000 live births) on the FSP implementation. The treatment is assigned as of 3 months prior to birth (proxy for beginning of the 3rd trimester). The sample includes means by race-county-quarter for years including 1968-1977 where cells with less than 50 births are dropped. In addition to the fixed effects, controls include 1960 county variables (log of population, percent of land in farming, percent of population black, urban, age<5, age>65 and with income less than $3,000) each interacted with a linear time trend, per capita county transfer income (public assistance, medical care, and retirement and disability benefits), and county real per capita income. Estimates are weighted using the number of births in the cell and are clustered on county. Standard errors are in parentheses. Quartiles are assigned using 1970 county poverty rates (weighted using county population).

Appendix Table 10: Impact of FSP Introduction on Infant Mortality, Expanded Sample 1959+

	Original data (1968-1977)			Full Period (1959-1977)			Post pilot period (1964-77)		
	All	Nutritional	Other	All	Nutritional	Other	All	Nutritional	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
All Races									
Ave FSP (0/1)	-0.197	-0.116	-0.081	-0.200	-0.122	-0.078	-0.193	-0.058	-0.136
	(0.150)	(0.102)	(0.101)	(0.112)	(0.094)	(0.110)	(0.180)	(0.123)	(0.087)
% Impact (coef/mean)	-1.47%	-1.71%	-1.23%	-1.26%	-1.50%	-1.01%	-1.32%	-0.76%	-1.93%
REIS controls	x	x	x	x	x	x	x	x	x
cty per cap real income	x	x	x	x	x	x	x	x	x
yr x qtr fixed effects	x	x	x	x	x	x	x	x	x
county fixed effects	x	x	x	x	x	x	x	x	x
county * linear time	x	x	x	x	x	x	x	x	x
Observations	81,753	81,753	81,753	161,955	161,955	161,955	115,682	115,682	115,682
R-squared	0.24	0.17	0.19	0.51	0.41	0.34	0.41	0.34	0.28
mean of dependent variable	13.35	6.81	6.53	15.83	8.13	7.70	14.60	7.57	7.03

Notes: Each parameter is from a separate regression of the neonatal infant mortality rate (deaths in first 28 days per 1000 live births) on the Food Stamp implementation dummy. The treatment is assigned as of 3 months prior to birth (proxy for beginning of the 3rd trimester). The estimation sample includes means by county-quarter for years including 1959-1977 where cells with less than 50 births are dropped. See data section for method for constructing number of births by county-quarter for 1959-1967. Estimates are weighted using the number of births in the cell and are clustered on county. Standard errors are in parentheses. Inflated impacts divide the parameter estimate by an estimate of the food stamp participation rate for the regression sample.