

# “Long Run Impacts of Childhood Access to the Safety Net”



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# Overview



- Does increasing income/food available during childhood improve long-term health and economic outcomes?
- Use introduction of large social safety net program: Food Stamp Program (FSP)
  - Rolled out across counties between 1961-75; creates variation in timing and extent of exposure to program during childhood
- Main findings are that FSP in childhood improves adult health outcomes and, for women, improves economic self-sufficiency
- Demonstrates potential for positive external benefits of social safety net programs
- Contributes to literature relating resources during childhood and *in utero* to adult economic and health outcomes
  - Our setting allows us to explore when treatment matters

# Broader research program



- The Food Stamp program is a central element of the U.S. safety net
- The relative stability of the program across space and over the past 50 years represents a challenge for evaluation
- Our research program uses the geographic rollout as an alternative source of identification
- In prior work, we examined effects of the Food Stamp rollout on consumption, labor supply, and contemporaneous health (birth weight)
- Here we examine the effects on long term health and economic outcomes
- This is part of a broader interest in exploring the health impacts of non-health programs; and the health effects of redistribution more broadly
- Further, the work speaks to the strong SES health gradient in the U.S., that appears to unfold in early life (Case, Lubotsky and Paxson 2002)

# Plan for the talk



1. Food Stamps and the U.S. safety net
2. Theory: Effects of FSP on health
3. The FSP rollout
4. Research design and data
5. Results



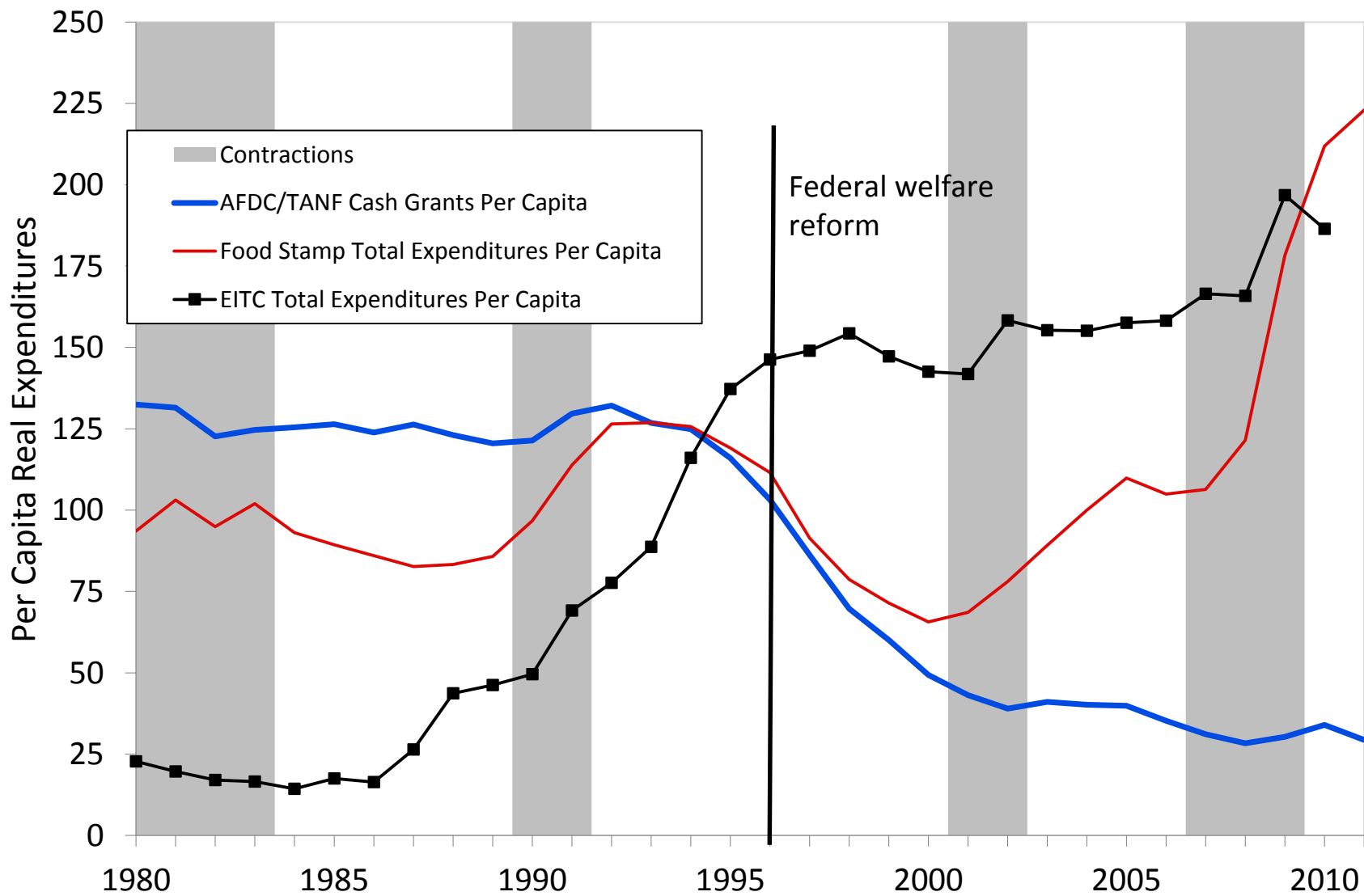
(1) The state of the safety-net in the U.S.  
and how Food Stamps fits into it

# The cash and “near cash” safety net for nonelderly families



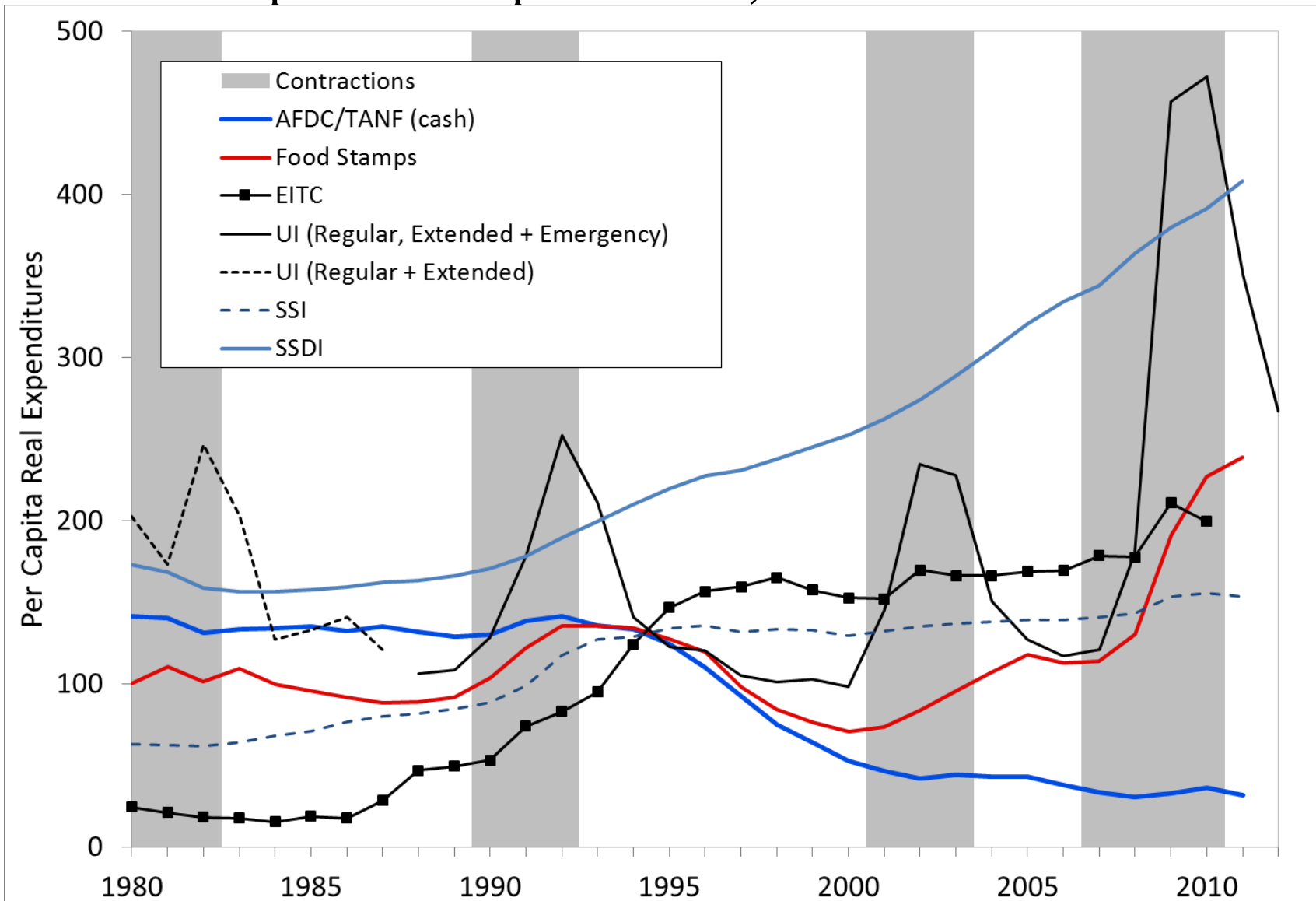
1. Food Stamps [means tested]
2. The EITC [means tested, requires employment]
3. Cash welfare AFDC/TANF [means tested]
4. Unemployment Compensation [social insurance]
5. Disability benefits: DI, SSI

# Per capita real expenditures (2011 \$)



Source: Bitler and Hoynes (2010).

# Per capita real expenditures, cash and near-cash



Source: Bitler and Hoynes (2013).





# What are Food Stamps?



- Originally (and during our rollout period) vouchers that can be used at grocery stores
- Now distributed through debit cards
- Used to purchase most food items available in the market
  - Exceptions include ready to eat foods, alcohol
- Means tested: eligibility based on income and asset tests
- Benefits phased out as income increases
- Federal program; no area variation and few reforms over time
  - challenge for evaluation

# What makes Food Stamps unique in the U.S. safety net?



- Only element of U.S. safety net that is *universal*—not targeted to a particular group (female heads, elderly, disabled)

# Where is the program today?



- 47.6 million people in 23 million households (average monthly participation)
- Average monthly benefit \$275 per household, \$133 per person
- Currently, funding for SNAP is at risk; proposals to move away from its *universal* access and towards time and group limitations as in welfare reform

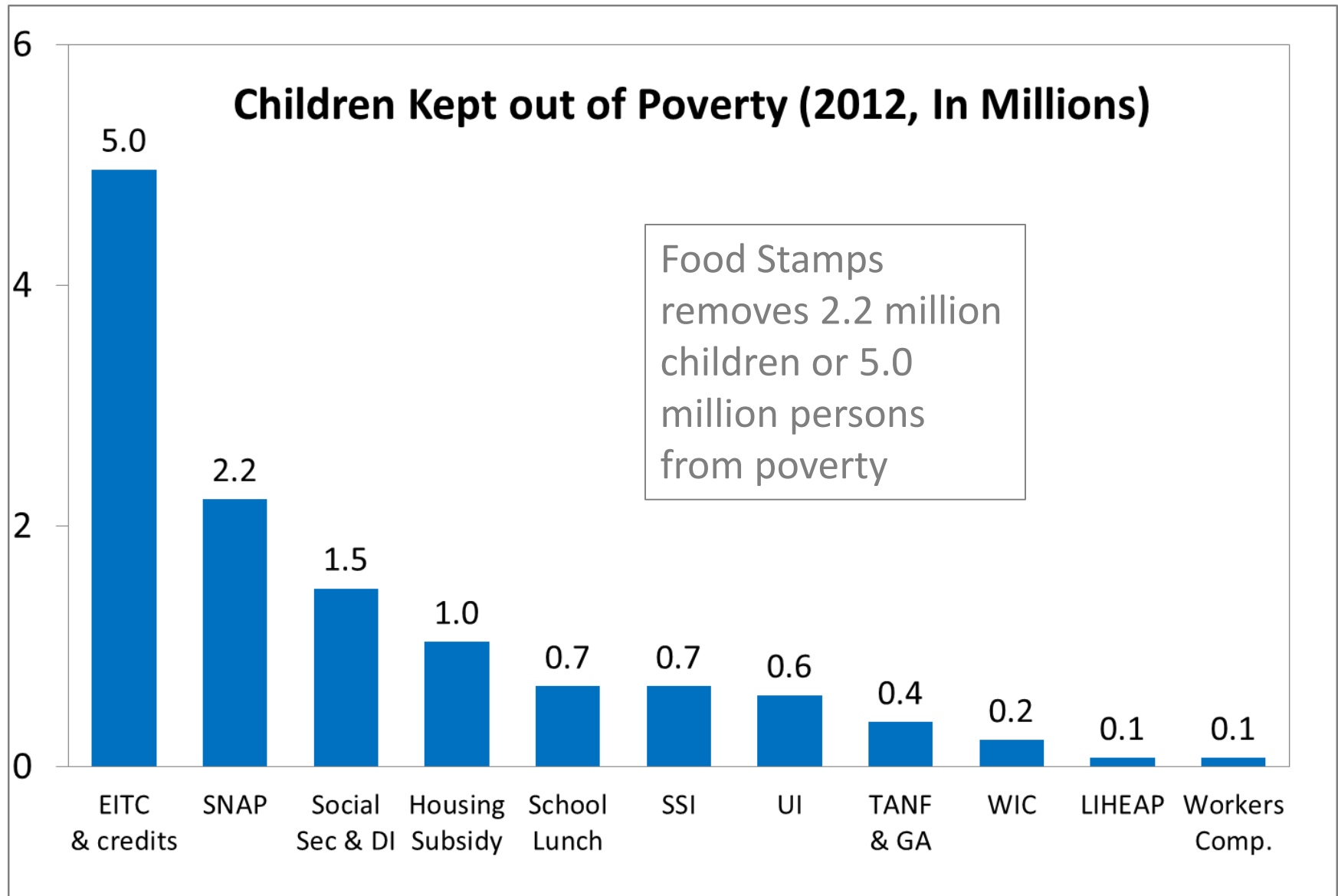
Source: 2013 data from Food and Nutrition Service, USDA

# The FSP is a central element of the safety net



- Features of a safety net:
  1. Increase income at the bottom of the distribution, reduce poverty
  2. Provide protection in times of economic need: insurance, smooth consumption
- SNAP is one of the largest anti-poverty programs in the U.S.
- It played a big role in protecting families in the Great Recession
- In the post-welfare reform era, it is THE remaining true safety net

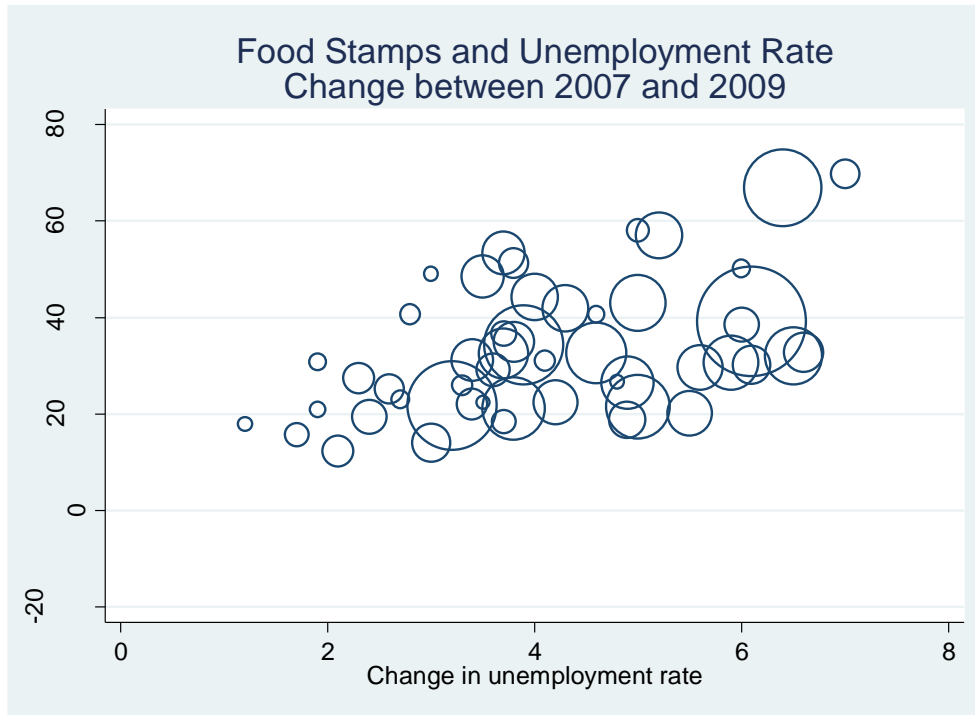
## *Food Stamps is Second to EITC in Anti-Poverty Effects for Children*



Source: Calculations based on Supplemental Poverty Measure Census report (2013, p60-247).

# Food Stamps has become the fundamental safety net program

## FSP response in the Great Recession



- The countercyclical response of FSP is much greater than TANF, but not as responsive as UI

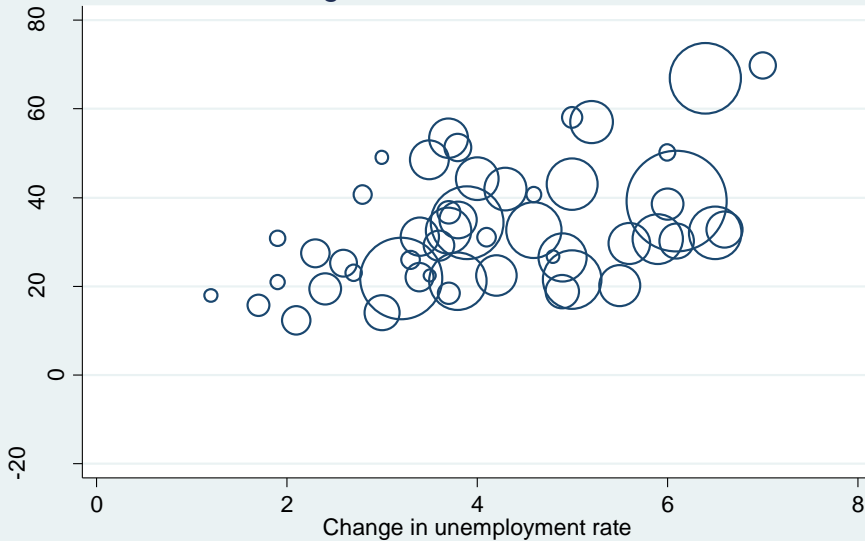
Source: Bitler and Hoynes, *Brookings Papers on Economic Activity* 2010 and working paper 2013.

# Food Stamps has become the fundamental safety net program

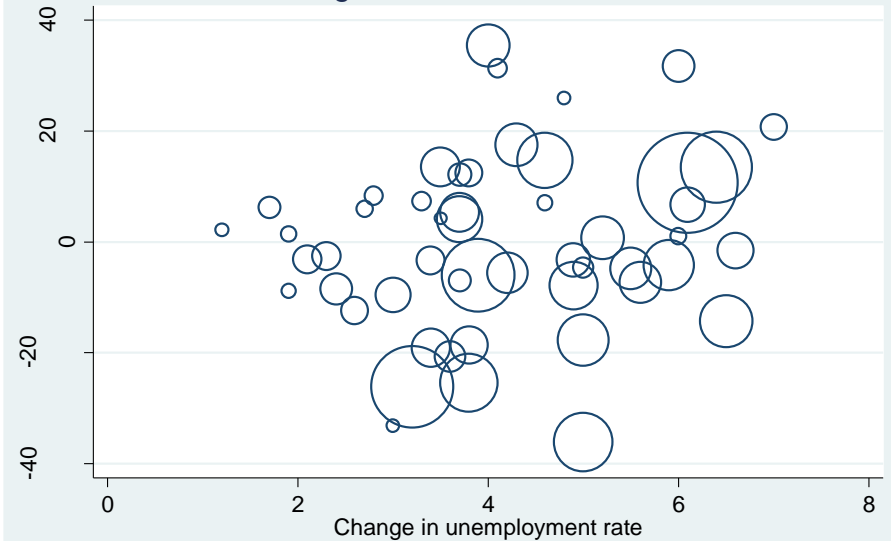
## *Comparison to TANF; current recession*

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Food Stamps and Unemployment Rate  
Change between 2007 and 2009



Cash Welfare (TANF) and Unemployment Rate  
Change between 2007 and 2009



Source: Bitler and Hoynes, *Brookings Papers on Economic Activity* 2010.



## (2) Effects of Food Stamps on Health



# Our paper and prior work



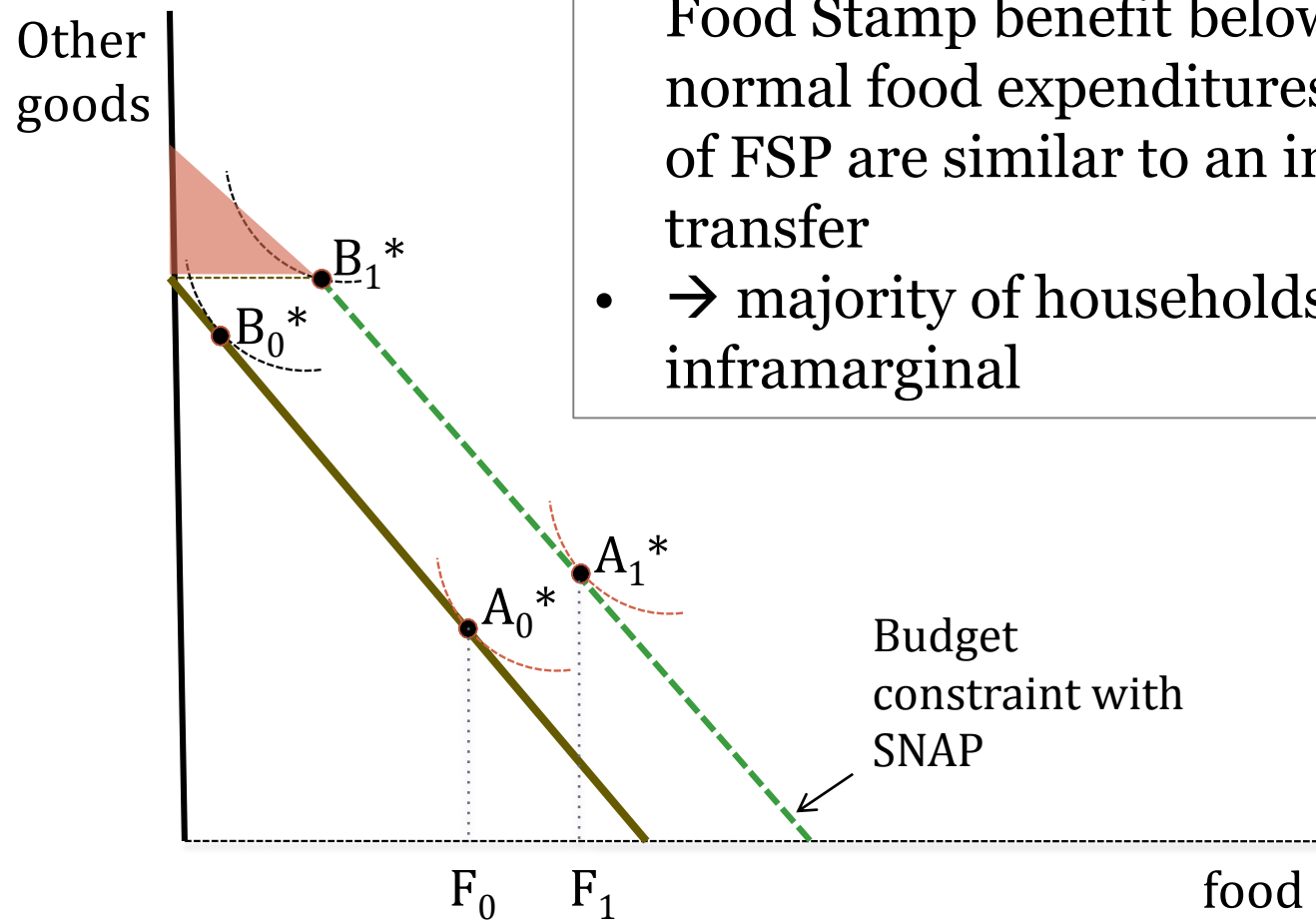
- In this paper, we provide new evidence on whether providing access to the safety net in childhood can affect longer term health and economic outcomes
- We are the first paper to analyze the potential long run impacts of food stamps
  - Our earlier work (Almond et al 2011) shows that food stamps lead to an increase in contemporaneous health; rollout leads to a reduction in the incidence of low birth weight
- Given the importance of food stamps, it is surprising that so little is known about the program
  - The lack of credible evidence on the impacts of FSP derives from the fact that the program is national
  - Little variation across space or time; no variation in program parameters that are typically exploited by researchers (Currie 2003)
  - Most prior studies compare recipients to non-recipients (or structural modeling; some experiments)

# Theory: How might food stamps affect adult health?

- Our earlier work (Hoynes and Schanzenbach *AEJ Applied* 2009) shows that households are infra-marginal
  - Because most recipients receive a Food Stamp benefit below their normal food expenditures, the program is similar to an income transfer
- Given this, we argue that our results provide an estimate of the impact of an exogenous increase in income on health. Few studies provide any convincing evidence on this issue.
- Nonetheless, because recipients were by definition poor, a large portion of FS is spent on food. Thus we expect that one channel for health gains would operate through improvement in nutrition
- *Understanding the health effects of the FSP is important in its own right and for what it reveals about the relationship between income and health.*

In earlier work (Hoynes and Schanzenbach 2009) we examined the effect of the rollout on food expenditures:

- Because most recipients received a Food Stamp benefit below their normal food expenditures, the effects of FSP are similar to an income transfer
- → majority of households are inframarginal



## Theory (cont): Early life “shocks” and later life outcomes



- Economic outcomes: Heckman and others argue that investment in early childhood leads to higher returns to human capital than investments later in life
- Health outcomes: The *fetal origins* hypothesis, from developmental biology and Barker (1990), argues that there is a connection between fetal development and early “critical” periods (nutrition in particular) and chronic conditions in adulthood.

# Fetal Origins Hypothesis; Nutrition



- Events in *early life* “program” body for the type of environment likely to face
- Example: Limited nutrition pre/post natal → expect future to be nutrition-deprived → body invokes (irreversible) biological mechanisms to adapt to predicted poor postnatal environment
- If future world is *not* nutrient-deficient, it is maladapted to the environment
- Adverse effects for “metabolic syndrome”: Obesity, cardiovascular disease, high blood pressure, type 2 diabetes
- Negative consequences latent, show up later in life
- Unclear when “critical” period ends (post-natal exposure may matter too)

# Evidence on the Fetal Origins Hypothesis

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- Literature (largely correlational) in public health
- Experimental rat studies (pre- and post- natal matters)
- Interest in economics pioneered by Currie and Almond
  - Typically examine severe, short duration, negative shocks during pre-natal environment
  - Quasi experimental evidence
- The research finds that while birth weight is affected, the long term outcomes do not appear to operate only through birth weight

# Examples of studies on fetal origins

See recent reviews by Currie and Almond 2011a,b and Currie 2009

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- Dutch hunger winter (Painter et al 2005); other famines
- 1918 Flu (Almond 2006)
- Fasting in Ramadan (Almond and Mazumder 2011)
- Shock to wine production in 19<sup>th</sup> century France (Banerjee et al 2010)
- Pollution (Sanders 2011)
- Malaria (Barreca 2010)

Also connected to the larger literature on long run impacts of early life interventions

- E.g., Head start/model preschools (Campbell et al 2014, Anderson 2008, Ludwig & Miller 2006, Deming 2009)

# What does this theory predict for FSP introduction?



- Health: FSP leads to better nutrition in childhood → lower metabolic syndrome in adulthood
  - Expect lower incidence of obesity, cardiovascular disease, high blood pressure, type 2 diabetes
  - Both pre- and post-natal nutrition may matter
- Economic outcomes: increase in human capital (education, earnings)



# Stress as alternative pathway

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- Chronic stress leads to adverse health outcomes
- Recent work using credible designs shows that the SES/cortisol correlations may be causal and manipulated by policy
- Expansion of the EITC lowered risky biomarkers for mothers (Evans and Garthwaite 2011)
- Conditional cash transfers (Oportunidades) lead to reduction in cortisol among children 2-6 (Fernald and Gunnar 2009)
- Negative shocks to rainfall lead to higher cortisol in Kenya (Haushofer et al 2012)
- Prenatal maternal cortisol negatively affects health, cognition, and education of children (Aizer, Stroud and Buka 2009)

# Our contribution to the literature

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- Given the focus on *extreme, negative* shocks, a natural question to ask is – how generalizable are these linkages between early life and long run outcomes?
- There is little evidence that uses convincing research designs allowing for causal identification to analyze more commonplace treatments
- We are the first to look at the long term effects of a *positive* and *policy-driven* change in resources
- Further, we can explore when treatment matters; our policy affects resources *in utero* and through childhood

# What we do



- Use variation in childhood exposure to FSP based on county and year of birth
  - Note that our treatment never “turns off” once it starts
- Use Panel Study of Income Dynamics
  - Data on economic outcomes, health conditions, general health status, and disability. Allows for measurement of metabolic syndrome.
  - Restricted use data allows for measurement of county of birth for cohorts affected by introduction of FSP.
- Explore when in childhood the intervention is most beneficial.



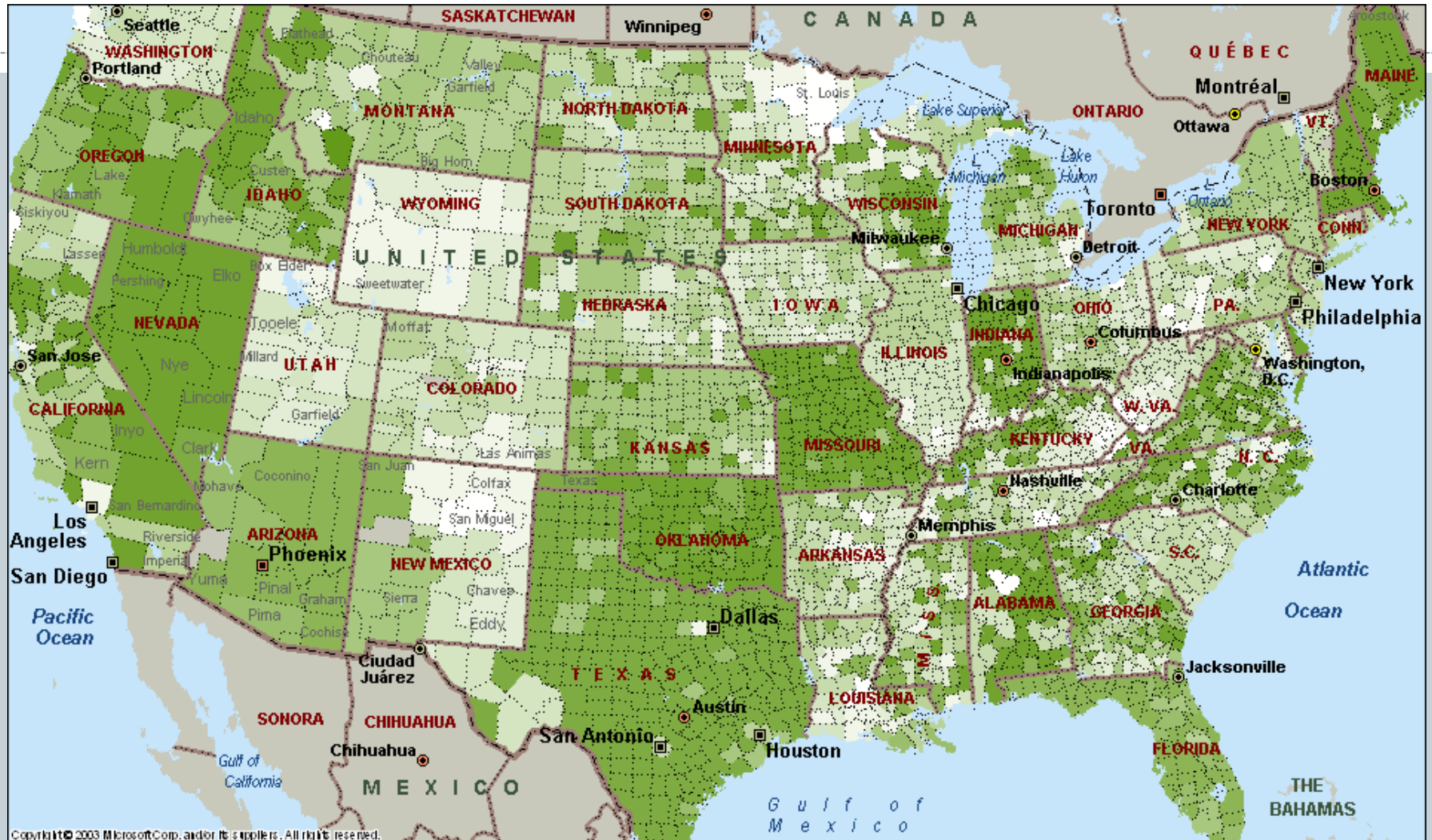
## (3) The Food Stamp roll out

# A Short History of the (modern) Food Stamp Program

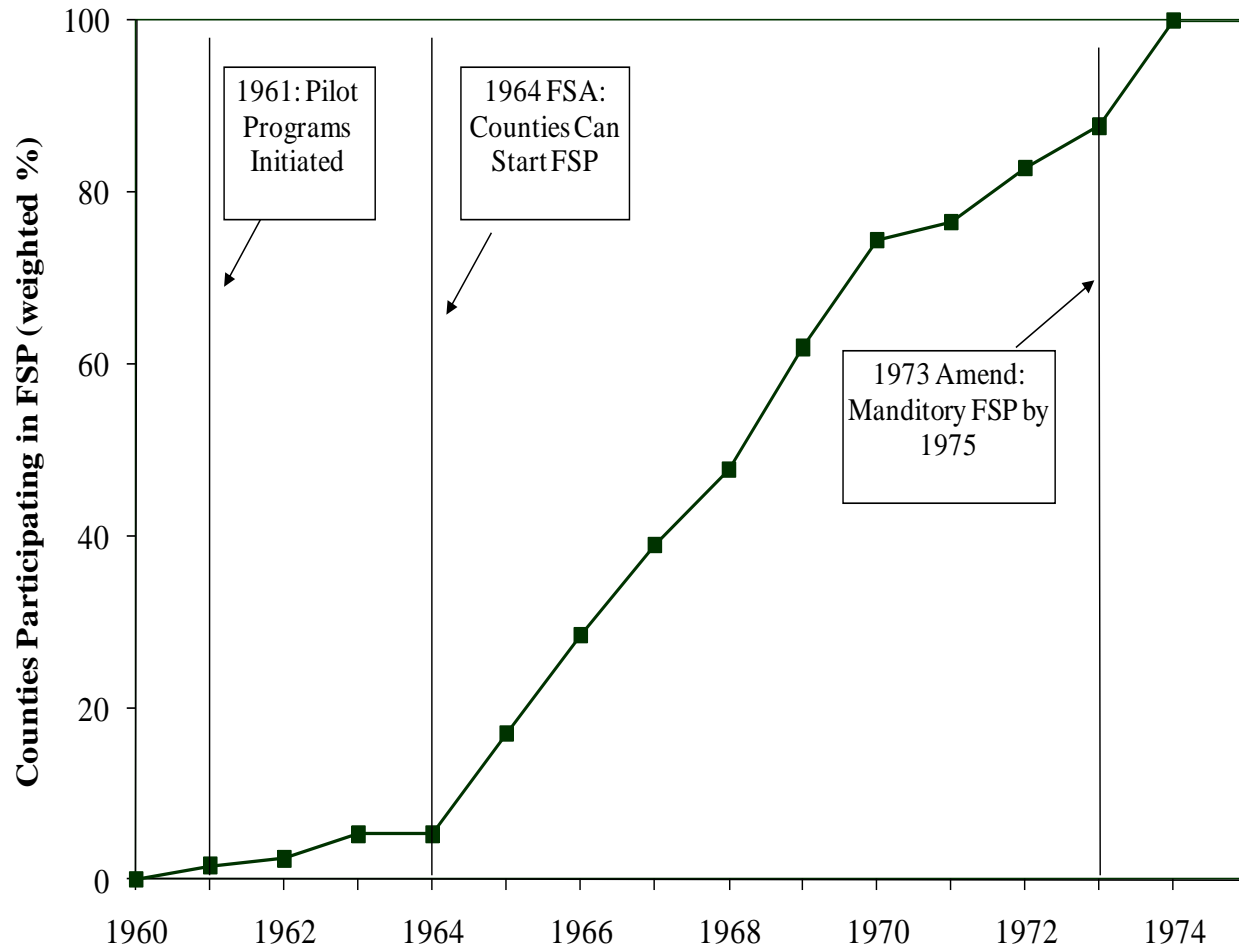


- 1961 Pres. Kennedy executive order; established 8 county-level pilot programs; 1962-1963 expanded to 43 counties
- Food Stamp Act of 1964:
  - Gave local areas the authority to start up FSP in their county
  - Federally funded
  - Voluntary adoption by counties
- Steady increases in county adoption; constrained somewhat by budgetary limits
- 1973 amendments to Food stamp act: mandated that all counties offer FSP by 1975
- Result: rollout over 3,000 counties over 1961-1975.

# Food Stamp Start Date, by County



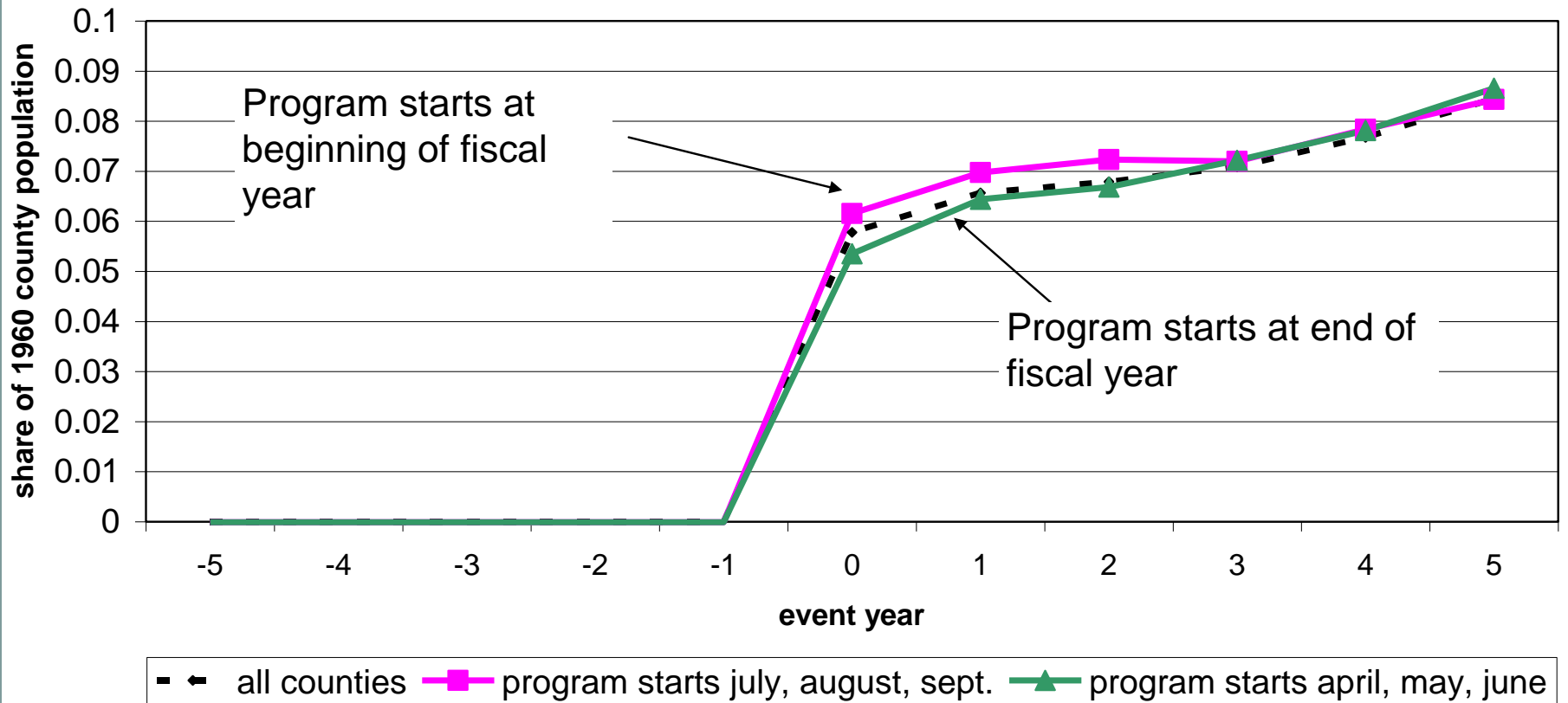
# Percent of US population covered by FSP



# County programs appeared to ramp up quickly

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## Share of 1960 County Population on Food Stamps by Number of Years from Program Start







## (4) Research Design and Data

# Research Design



- Use variation across counties in difference-in-difference model:  
$$y_{icbt} = \alpha + \delta FSP_{cb} + X_{icbt} \beta + \eta_c + \lambda_b + \gamma_t + \theta_s * b + \varphi CB60_c * b + \varepsilon_{icbt}$$
- Identification comes from variation across counties  $c$  and birth cohorts  $b$  in adoption of FSP
- Baseline models measure FSP treatment as the *share of time between conception and age 5* that FSP was available in county of birth
- Controls include fixed effects for county, birth cohort and interview year; state specific linear time trends
  - $X_{icb}$  = *individual controls* (gender, marital status, race, age) and *family background* (female head, education of head, income to needs – all in first 5 years of life)
- *SE clustered by county* and use PSID weights

## Methodology (cont)



- Because of our many outcome variables, we follow Kling, Liebman and Katz (2007) and Anderson (2008) and estimate standardized indices that aggregate information over multiple outcomes.
- Aggregating multiple measures in a given area can improve statistical power
- We use two indices: *metabolic syndrome* and *economic self sufficiency*
- Each are an equal weighted average of the z-score of each component
$$y_i = \frac{1}{J} \sum_j \frac{y_{ij} - \mu_j}{\sigma_j}$$
- We use the mean and SD of “untreated cohorts” (born before 1962) in constructing the z-scores

## Metabolic Syndrome

- Obese (=1)
- High blood pressure (=1)
- Diabetes (=1)
- Heart disease (=1)
- Heart attack (=1)

## Economic self-sufficiency

- High school graduate (=1)
- Employed (=1)
- Not poor (=1)
- Not on TANF (=1)
- Not on food stamps (=1)
- Earnings
- Family income

# War on Poverty: Other papers using “rollout” design

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- Head Start (Ludwig and Miller 2007)
- Medicare (Finkelstein and McKnight 2008)
- WIC (Hoynes et al 2012)
- Family planning programs (Bailey 2012)
- Civil rights (Almond, Chay and Greenstone, forthcoming)
- Title I (Cascio et al. 2010)
- Community health centers (Bailey and Goodman-Bacon 2012)

# Exogeneity of FSP adoption



- Recall county adoption was voluntary (until mandated in 1975)
- Political battle between farm interests (supporting CDP) and advocates for the poor (supporting FSP)
- If differences between counties affected the timing of FSP adoption AND if the trends in outcomes were correlated with this timing, then our identification is not valid
- To address this we:
  - Explore determinants of county FSP adoption and control for these factors in the regression (Hoynes and Schanzenbach 2009)
  - Directly control for possible county confounders (hospital resources from AHA, community health centers, and per capita county non-FSP government spending – all averaged over first 5 years of life)
  - Flexibly examine results in context of event study model to examine pre-trends

# Bottom line is that variation in adoption dates:

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- Have little relation to county per capita income, other transfers, etc.
- Adoption in individual counties is constrained by federal appropriations

*“The program was quite in demand, as congressmen wanted to reap the good will and publicity that accompanied the opening of a new project. At this time there was always a long waiting list of counties that wanted to join the program. Only funding controlled the growth of the program as it expanded.”*

(Berry 1984, p. 36-37)

# PSID Sample

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- Use PSID data through 2009. Most health variables are collected beginning in 1999.
- Our sample includes heads and wives born between 1956-1981, measured at ages 18-53 (or 24-53 for economic outcomes) [→ still relatively young]
- County from geocode file (restricted data)
- Match adults to their families at birth/early life:
  - Assign county codes at birth
  - Assign family background : higher/lower risk of being impacted by FSP
- Match to FSP start dates (from USDA)



- Our main estimates are for a high impact sample.
- Those raised in families where the head was low education (less than high school).
- [Note not own education, but parent's education using family background in PSID.]



## (5) Results

# Metabolic Syndrome for High Impact Sample



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	Metabolic syndrome (index)
FS share IU-5	-0.294*** (0.107)
Mean of dep va	0.01
Observations	8,246
R-squared	0.26

---

Includes fixed effects for birth year, county, interview year, state linear trends, 1960 county characteristics by linear time, individual demographics and family background. Clustered by county and weighted using PSID weights.

# Metabolic Syndrome for High Impact Sample



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	Metabolic syndrome (index)
FS share IU-5	-0.294*** (0.107)
Mean of dep va	0.01
Observations	8,246
R-squared	0.26

---

Change from no exposure to full exposure (in utero to age 5) reduces metabolic syndrome by 0.3 standard deviations; significant at 1% level.

# Magnitudes

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- These are intent-to-treat estimates
- Even in the high impact sample, not everyone is participating
- Need to scale up the estimates by the FSP participation rate
- Since our treatment variable is share of years exposed to FSP, we construct a “ever participate” in FSP among families with children
- High impact sample, participation rate = 0.24.

# Metabolic Syndrome for High Impact Sample

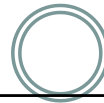


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---

# Metabolic Syndrome for High Impact Sample



	Metabolic syndrome (index)	Components of metabolic syndrome index				
		Diabetes	High blood pressure	Obesity	Heart disease	Heart attack
FS share IU-5	-0.294*** (0.107)	-0.032 (0.048)	-0.13 (0.086)	-0.159* (0.086)	-0.053 (0.027)	-0.031 (0.019)
Mean of dep va	0.01	0.05	0.19	0.33	0.03	0.01
Observations	8,246	8,431	8,430	9,217	8,430	8,432
R-squared	0.26	0.19	0.22	0.26	0.13	0.08

While only obesity reaches statistical significance, all the individual components indicate an improvement in adult health. (Component regressions use 0/1 not z-scores.)

# Other Health Outcomes, High Impact Sample

	Other health outcomes			Health behaviors	
	In good health	Disabled	Height below 5th perc.	Ever smoked	Drink any
FS share IU-5	0.110 (0.074)	-0.004 (0.039)	-0.060** (0.026)	-0.056 (0.064)	-0.023 (0.049)
Y-mean	0.59	0.12	0.02	0.44	0.70
Observations	25,738	25,731	9,398	20,946	20,896
R-squared	0.16	0.13	0.22	0.19	0.18

All outcomes show improvement, only stunting measure is significant. (Note variation in sample size due to how frequently the questions are included in the survey.)



# Economic Self Sufficiency Index, High Impact Sample



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	Economic self sufficiency (index)
FS share IU-5	0.182 (0.124)
Y-mean	-0.25
Observations	20,115
R-squared	0.38

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Access to food stamps leads to an insignificant 0.2 standard deviation increase in economic self-sufficiency.

# Economic Self Sufficiency Index, High Impact Sample



	Components of economic self sufficiency index							
	Economic self sufficiency (index)	High school plus	Poor	Food stamp receipt	TANF receipt	Employed	Earnings	log(family income)
FS share IU-5	0.182 (0.124)	0.184* (0.108)	-0.052 (0.067)	-0.032 (0.052)	-0.023 (0.026)	-0.008 (0.056)	3610 (5,064)	0.247 (0.165)
Y-mean	-0.25	0.80	0.30	0.14	0.05	0.76	24495	10.52
Observations	20,115	21,197	21,209	20,115	21,347	21,348	20,529	21,160
R-squared	0.38	0.29	0.30	0.38	0.16	0.18	0.34	0.37

Each component (except employment) shows an improvement with food stamp access. [Note in the self-sufficiency index each component is converted to a “positive” outcome.]

# Main Results for High Impact Sample, by Gender

	Women			Men		
	Metabolic syndrome (index)	Good Health	Economic self sufficiency (index)	Metabolic syndrome (index)	Good Health	Economic self sufficiency (index)
FS Share IU-5	-0.312** (0.130)	0.336*** (0.100)	0.306* (0.164)	-0.526** (0.251)	-0.077 (0.112)	0.005 (0.168)
Mean of Dependent \	0.03	0.53	-0.37	-0.01	0.66	-0.11
Observations	5,062	15,702	12,208	3,184	10,036	7,907
R-squared	0.37	0.22	0.43	0.32	0.18	0.46

Economic impacts strong for women, nonexistent for men. Consistent with other studies finding stronger impacts for girls (Anderson 2008, Bleakley 2007, Dahl/Lochner 2012, Milligan/Stabile 2009, MTO; less evidence from fetal origins/nutritional studies)

# Evidence on the validity of the design

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- The identification is at the county by cohort level. A potential concern is that this could be capturing some prevailing trends (by county) or a confounding county variable.
  1. [Table 7] We estimate results for a low impact sample (those born into families with a highly educated head). Those results are small, insignificant, and mixed in sign.
  2. [Table 6] We add county variables averaged over first five years of life (hospital resources, community health centers, government transfers). The results are little changed by controlling for these potential confounders.

# Placebo Test: Family background w/ head high education



	Metabolic syndrome (index)	Economic Self Sufficiency (index)
FS share IU-5	-0.013 (0.060)	0.073 (0.087)
Y-mean	-0.17	0.22
Observations	5,398	10,180
R-squared	0.24	0.33
"right" signed components	obesity, high blood pressure	employed, earnings, TANF
"wrong" signed components	good health, disability, diabetes, heart disease	education, family income, food stamps

# Adding County Variables

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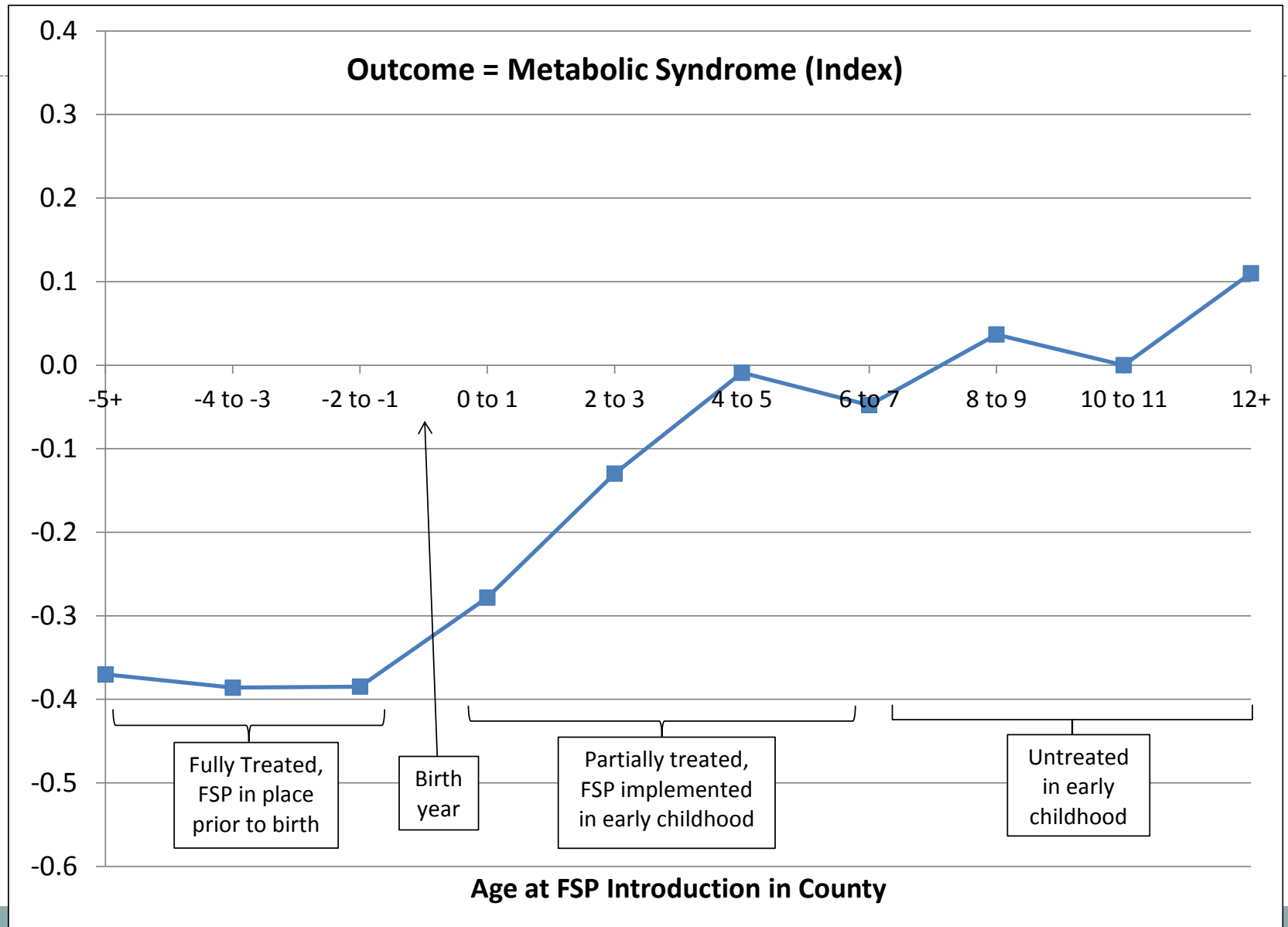
	Metabolic syndrome (index)			Economic Self Sufficiency (index)		
FS share IU-5	-0.294*** (0.107)	-0.200** (0.079)	-0.209** (0.081)	0.182 (0.124)	0.171 (0.125)	0.210 (0.150)
Y-mean	0.01	0.01	-0.02	-0.25	-0.27	-0.26
Observations	8,246	7,737	6,561	20,115	18,992	13,268
R-squared	0.26	0.27	0.26	0.38	0.38	0.37
Hospitals, beds per capita		X	X		X	X
Community health center		X	X		X	X
REIS real per capita transfers			X			X

# Exploring the timing of treatment

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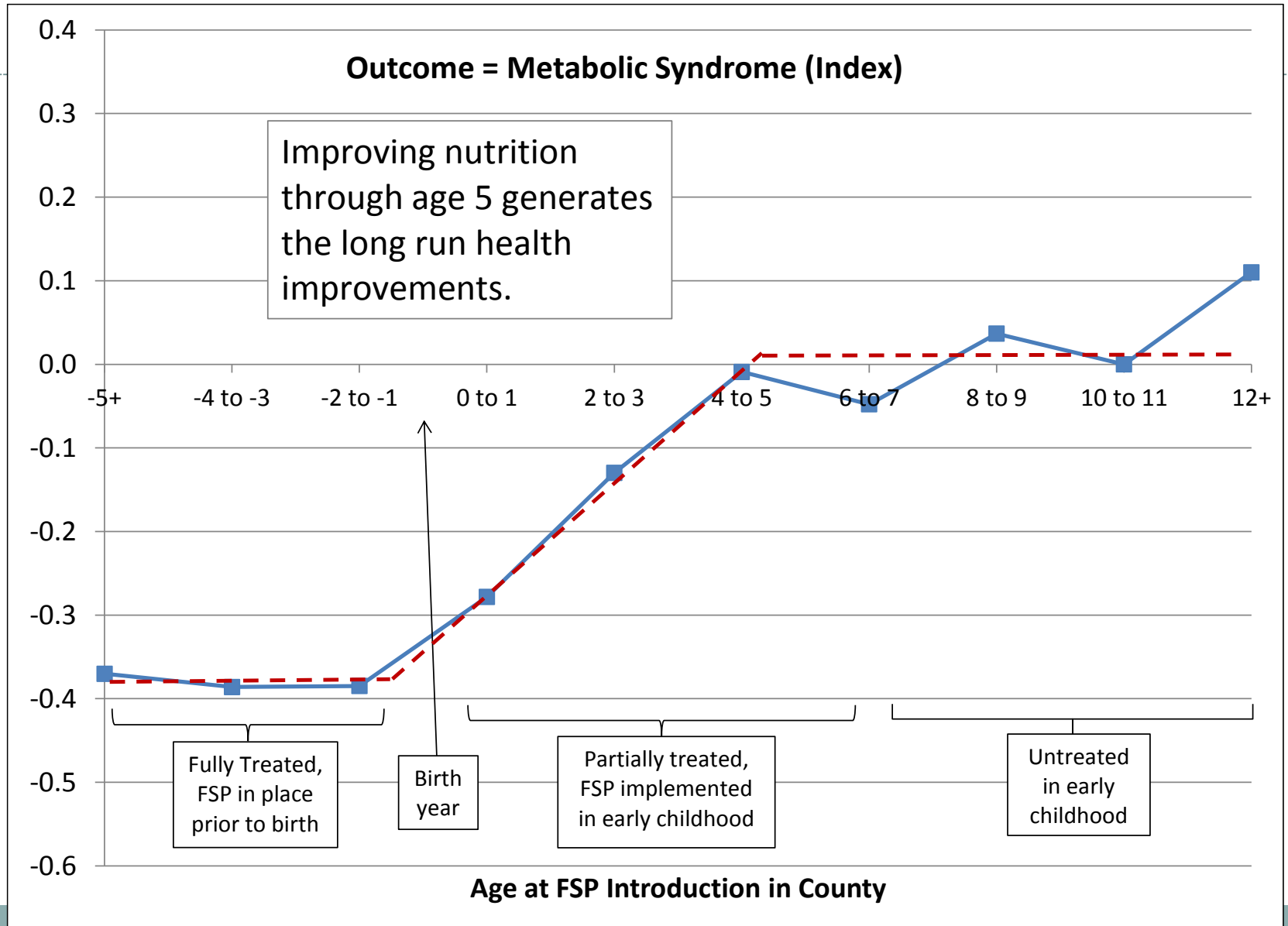
- Event study approach
- Traces out the treatment effect for years prior to and after the treatment
- Advantages: (1) can test for absence of pre-treatment trends, and (2) can examine impacts of treatment over time, and (3) can explore when in childhood the treatment matters
- The tricky thing about our treatment is that:
  - We do not have a strong prior about *when* treatment matters (and hence when to assign someone as treated)
  - Treatment turns on, and then never turns off
- Solution: make event time = age when food stamps introduced in your county

# Event study: by age when FSP introduced, high impact group





# Event Study: by age when FSP introduced, high impact group



# More on when exposure matters, high impact sample

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	Metabolic syndrome (index)		
FS share IU-5	-0.294*** (0.107)	-0.279** (0.127)	-0.241** (0.111)
FS share 6-18		0.060 (0.270)	
FS in 1st trimester			-0.107 (0.070)
Y-mean	-0.01	-0.01	-0.01
Observations	8,246	8,246	8,246
R-squared	0.26	0.26	0.26

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- Additional exposure at ages 6-18 has no effect. Point estimate consistent with in utero exposure mattering, but not statistically significant.

# More on when exposure matters, high impact sample

	Metabolic syndrome (index)			Economic Self Sufficiency (index)		
FS share IU-5	-0.294*** (0.107)	-0.279** (0.127)	-0.241** (0.111)	0.182 (0.124)	0.383** (0.185)	0.159 (0.116)
FS share 6-18		0.060 (0.270)			0.729* (0.428)	
FS in 1st trimester			-0.107 (0.070)			0.069 (0.080)
Y-mean	-0.01	-0.01	-0.01	-0.25	-0.25	-0.25
Observations	8,246	8,246	8,246	20,115	20,115	20,115
R-squared	0.26	0.26	0.26	0.38	0.38	0.38

# Expand to full sample and weight by group-specific participation rate ( $P_g$ )



- Define group-specific participation rate  $P_g$  using family background (race, education, and marital status of head)
- Interact FSP indicator with participation rate

$$y_{icb} = \alpha + \varphi FSP_{cb} + \delta FSP_{cb} P_g + X_{icb} \beta + \eta_c + \lambda_b + \gamma_t + \mu_g + \theta_s * b + \varphi CB60_c * b + \varepsilon_{icb}$$

- Main effect for  $g \rightarrow$  triple difference

## Main Outcomes, Full Sample (TOT)

	Metabolic syndrome (index)	Good Health	Economic self sufficiency (index)
FS Share IU-5 * Pg	-0.438** (0.204)	0.292** (0.133)	0.400 (0.323)
FS share IU-5	-0.032 (0.073)	-0.021 (0.051)	-0.045 (0.083)
Mean of Dependent Vari	-0.08	0.68	0.69
Observations	19,948	54,787	43,117
R-squared	0.20	0.13	0.35

- Use full sample, but scale by higher/lower probability of being impacted by FSP (→ coefficients are therefore TOT)
- Positive effects; magnitudes somewhat smaller than TOT estimates from high impact sample

# Conclusions



- Exogenous shock to income during early life improves adult health and (for women) economic outcomes
- Consistent with predicted improvement in “metabolic syndrome”
- The paper provides new evidence concerning role of early life conditions:
  - We examine a positive, policy-driven shock (rather than the extreme, negative shocks in prior literature)
  - Extend our investigation beyond in utero exposure and find evidence that critical period is through age 5
- Show that benefits of safety net are both broader than previously thought. Positive external benefits to taxpayers.

# EXTRA SLIDES

# Examining the timing of county introduction of food stamps





Year: 1961

Implemented by 1961

Implemented by 1961

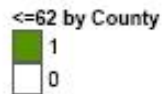
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Year: 1962

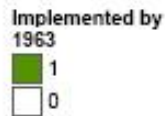
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# Year: 1963

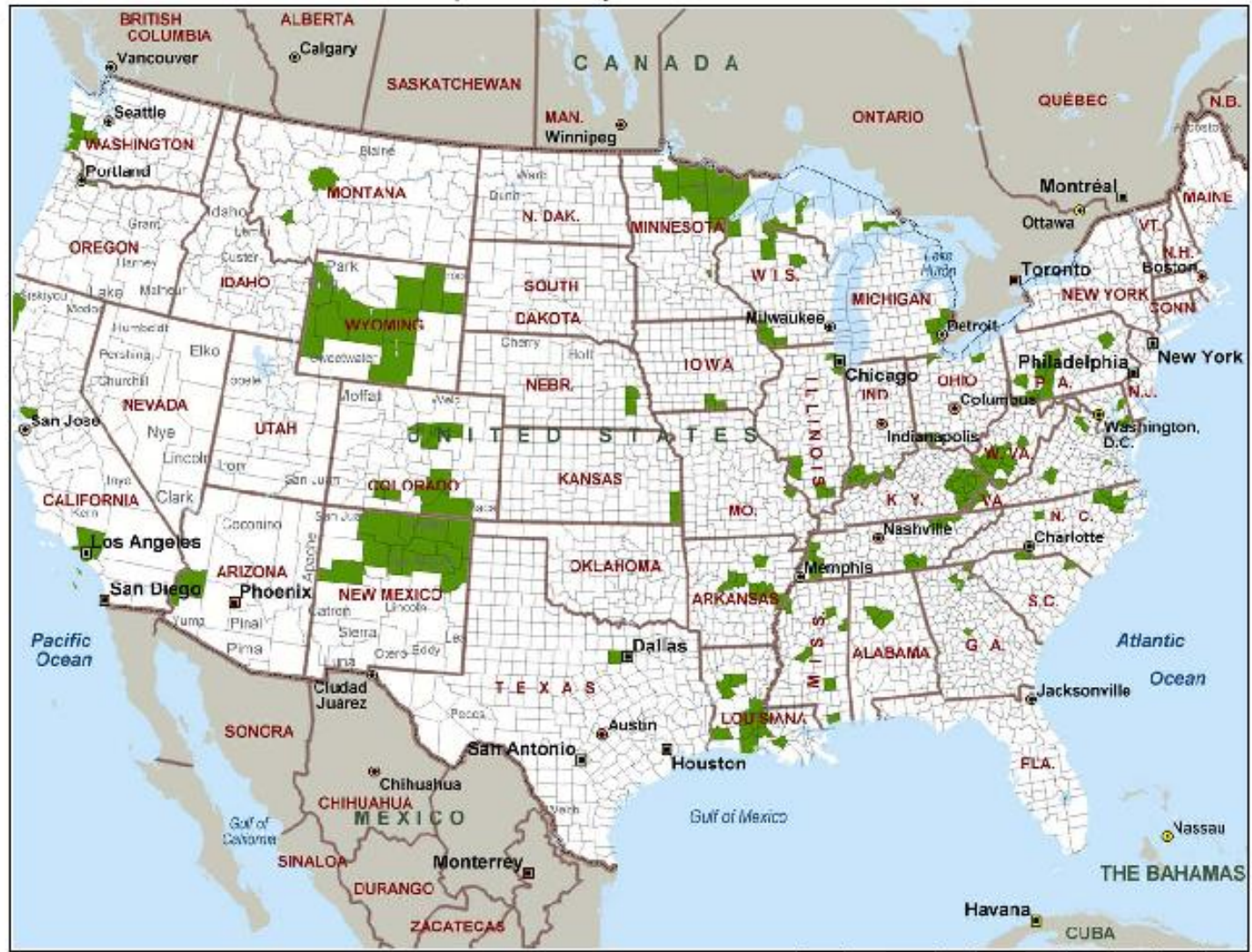
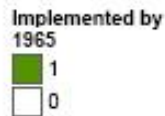
Implemented by 1963



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# Year: 1965

Implemented by 1965

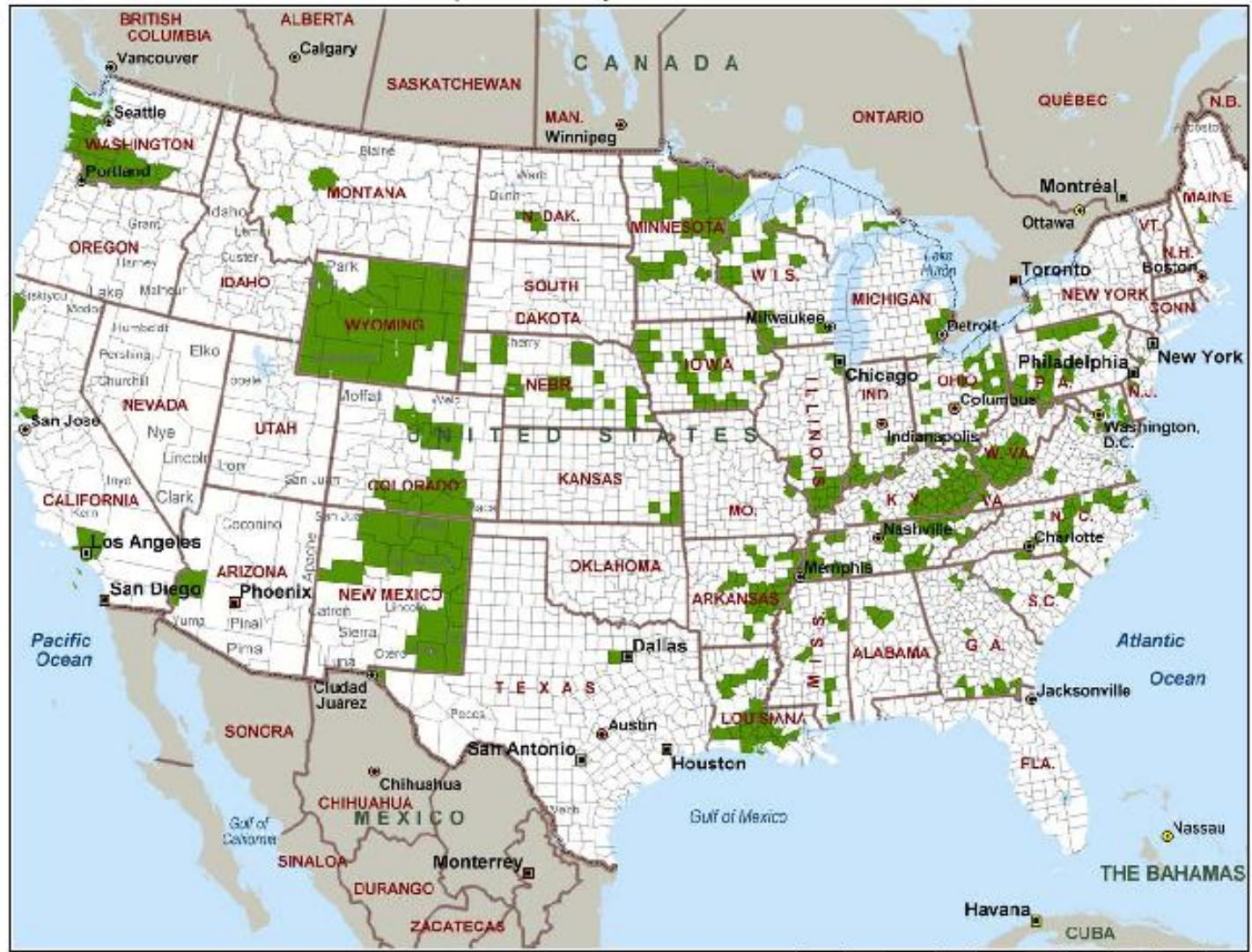


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## Implemented by 1966

Implemented by  
1966

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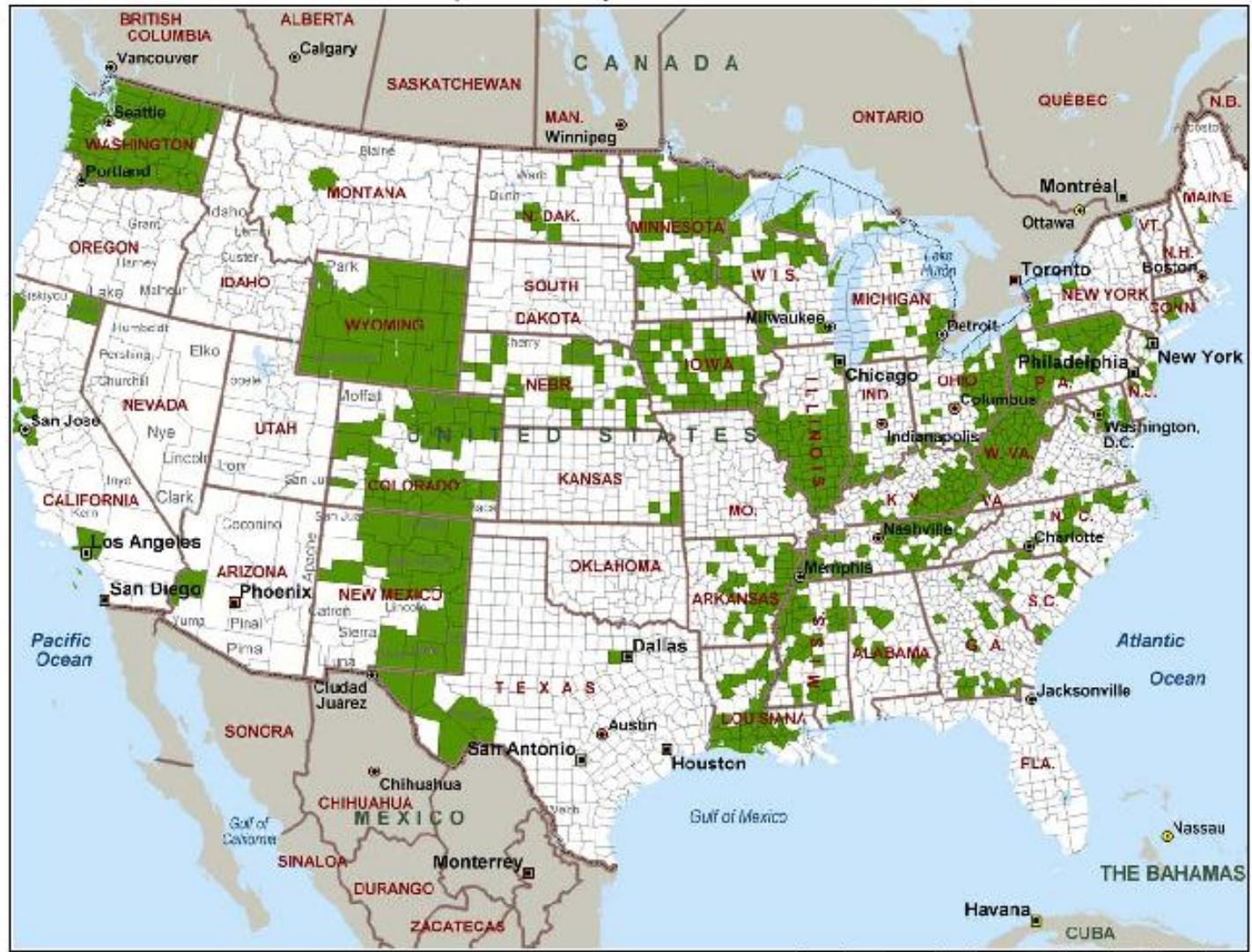
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# Year: 1967

## Implemented by 1967

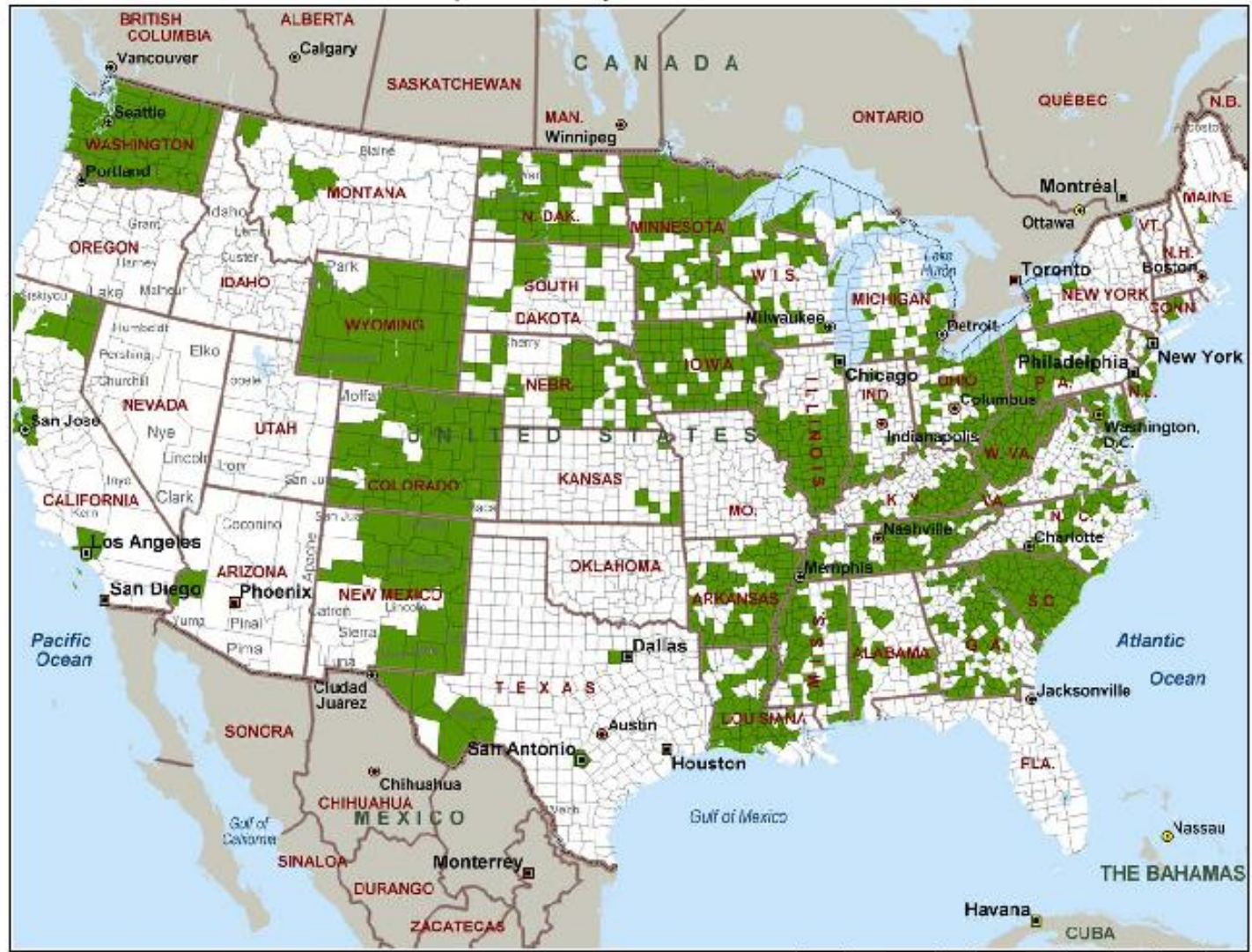
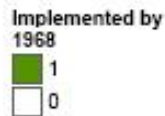
Implemented by 1967  
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# Year: 1968

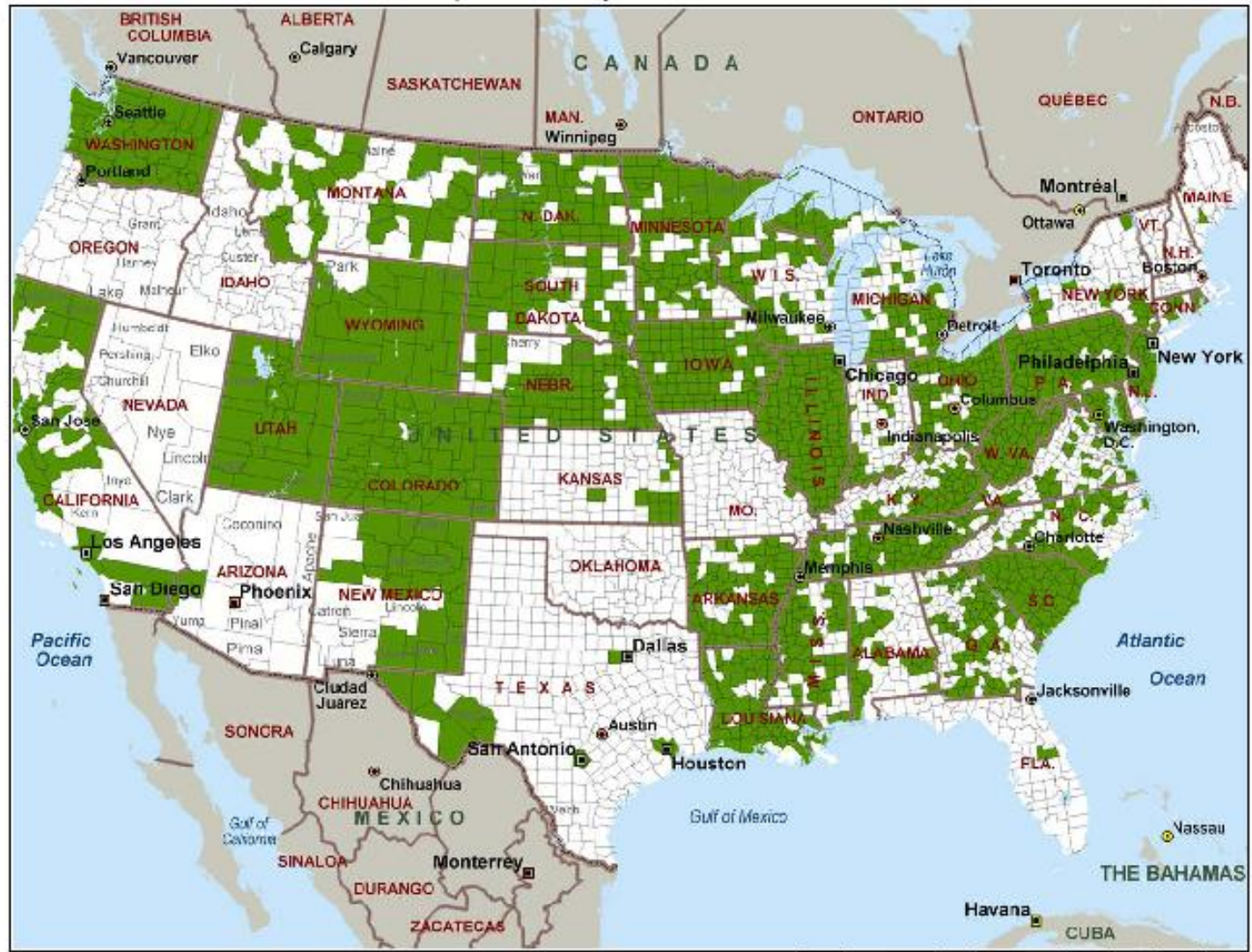
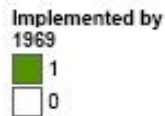
Implemented by 1968



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# Year: 1969

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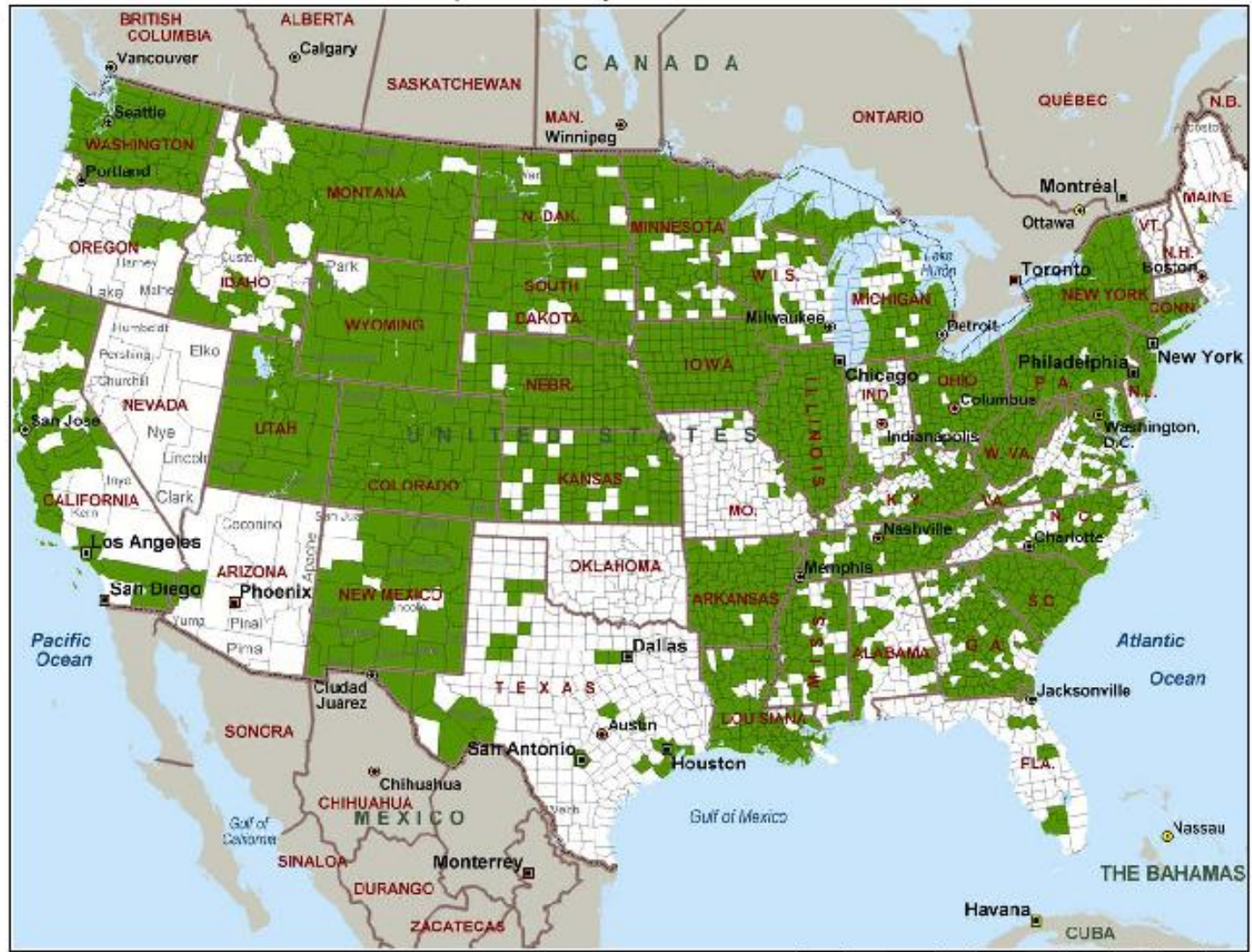


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Implemented by 1970

Implemented by 1970

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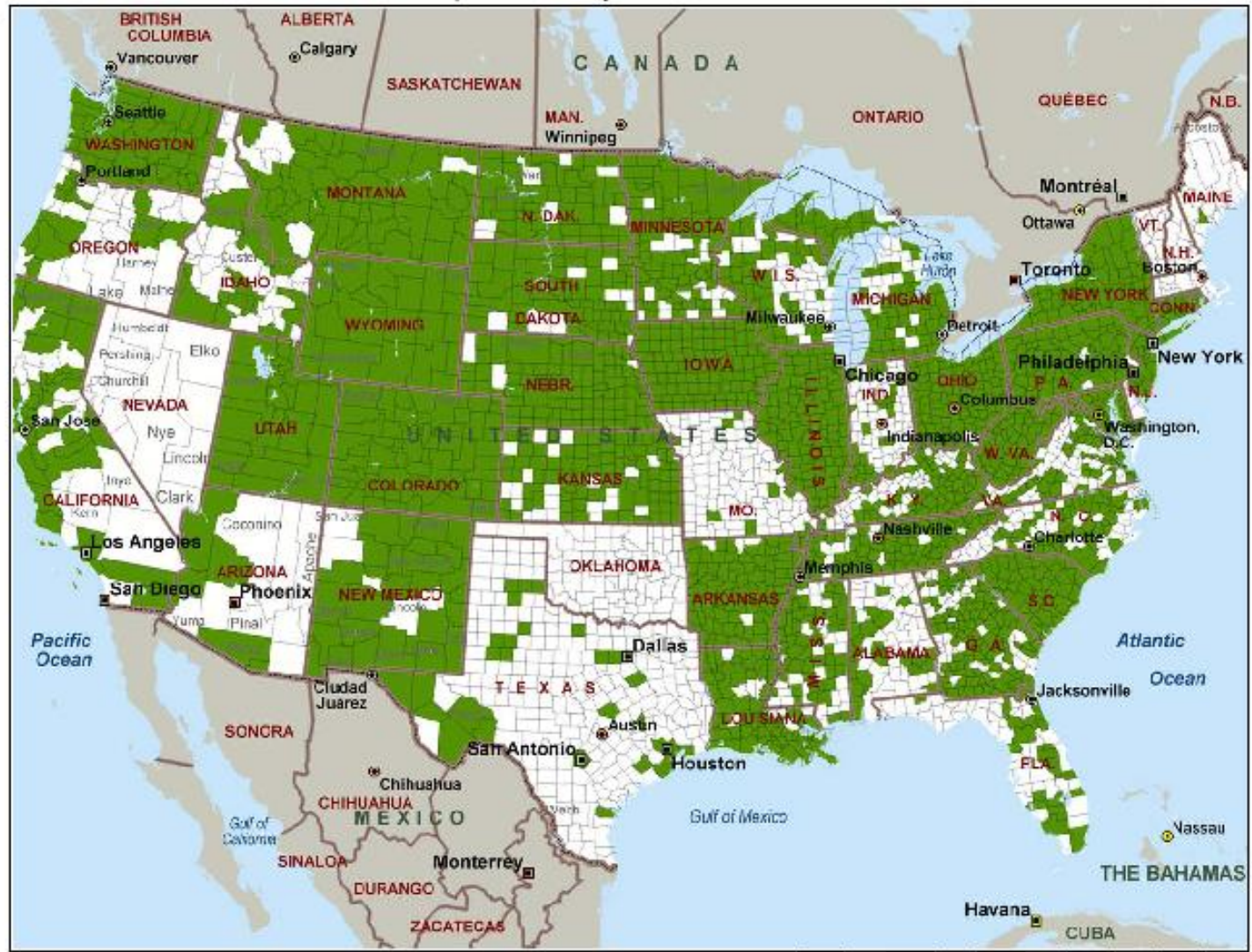


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# Year: 1971

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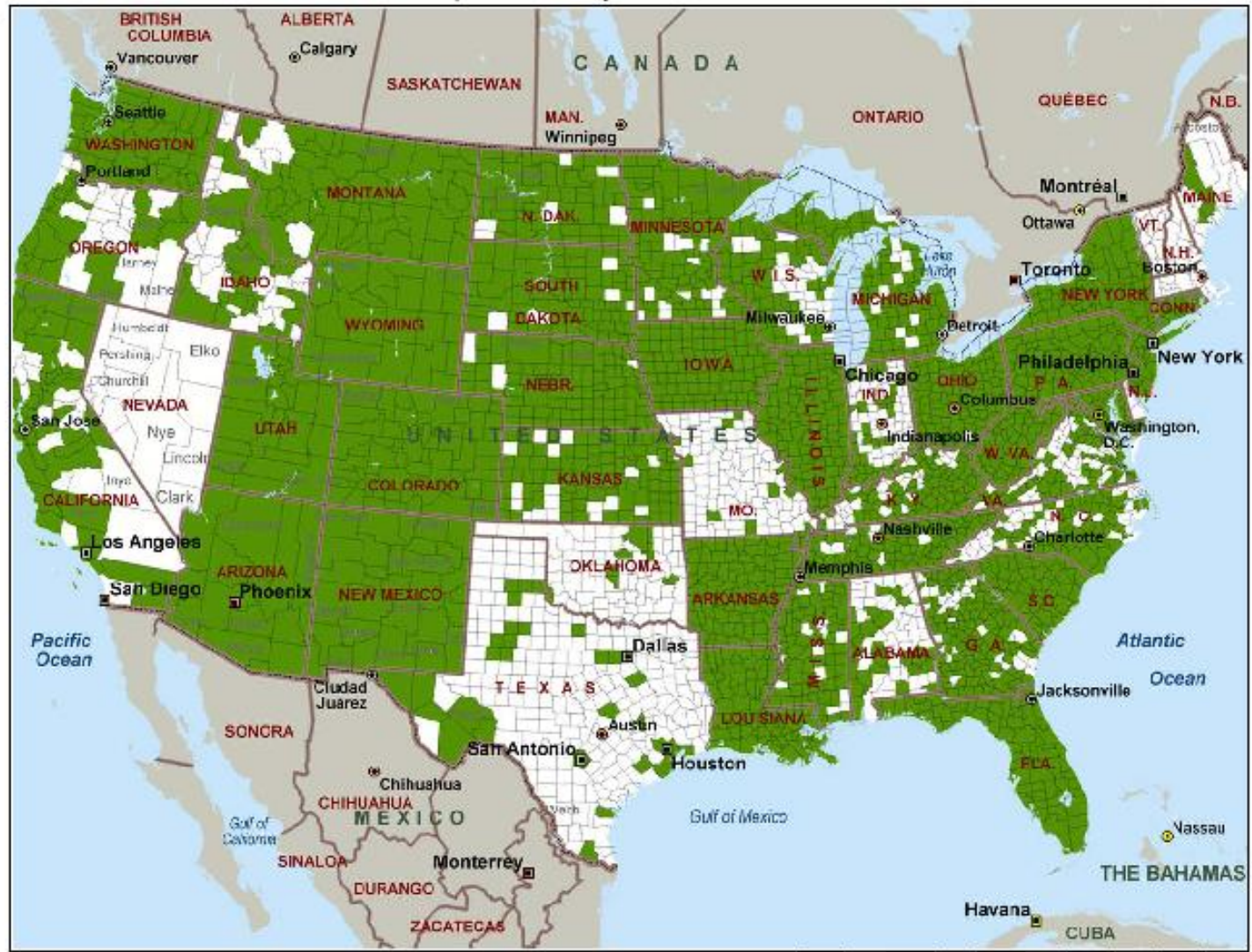
Year: 1972

Implemented by 1972

Implemented by 1972

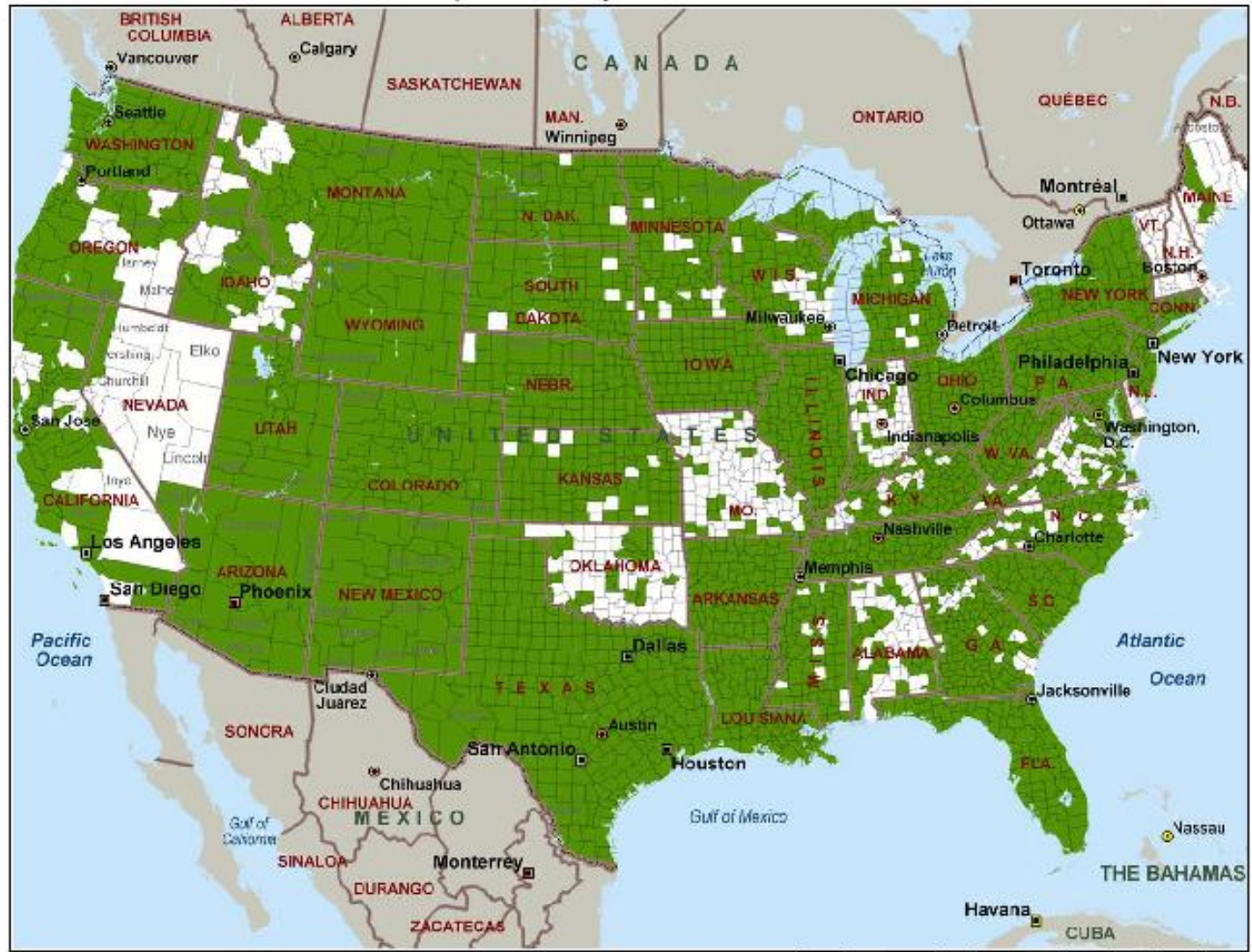
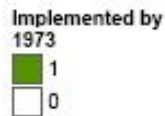
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Implemented by 1973



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Year: 1974

Implemented by 1974

Implemented by 1974

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# Year: 1975

## Implemented by 1975

<=75 by County  
■ 1



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# What existed prior to FSP?

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- Commodity distribution program (CDP) was precursor to FSP
- *Goal of CDP*: support farm prices and farm income by removing surplus commodities from market
- The evidence shows that the FSP represents an important “treatment” over and above the CDP. The CDP:
  - not universally available: in 1967, 1/3 of the poorest 1,000 counties offered no food assistance program
  - limited range of products (most common items include flour, cornmeal, rice, dried milk, cheese, butter)
  - distribution centers that were difficult to reach
  - infrequent timing of distribution of goods
- Nonetheless, unfortunately there is sparse data on county participation in the CDP so we are unable to use this in our empirical work

# Table 1: Determinants of County FSP Start Date

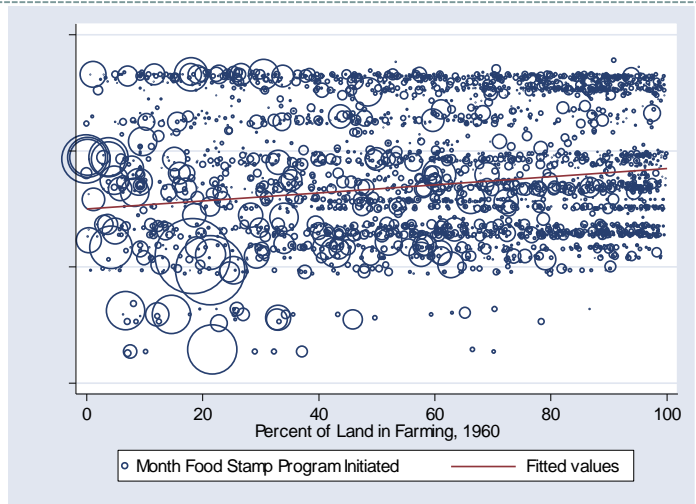
% land in farming	0.205*** (0.027)	0.216*** (0.033)
% population with income < \$3,000	-0.122 (0.096)	0.422*** (0.154)
% population urban	-0.255*** (0.035)	-0.180*** (0.047)
% population black	-0.435*** (0.072)	-0.912*** (0.141)
% population <5	-3.917*** (0.635)	-5.521*** (0.826)
% population >65	-1.326*** (0.395)	-3.689*** (0.551)
South * % land in farming		-0.177*** (0.061)
South * % population with income <\$3,000		-0.742*** (0.203)
South * % population urban		-0.075 (0.073)
South * % population black		0.700*** (0.166)
South * % population <5		2.612** (1.321)
South * % population >65		4.212*** (0.806)
State Fixed Effects	X	X
Adjusted R-squared	0.52	0.53
Number of Observations	2,823	2,823



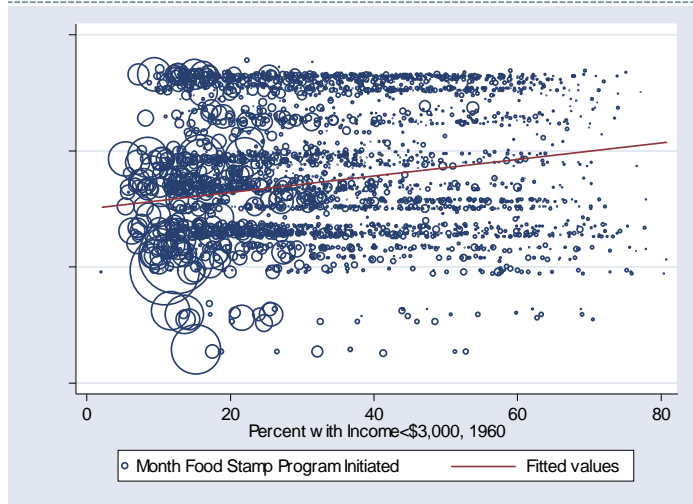
# While this analysis shows statistically significant impacts of the county characteristics, overall most of the variation remains unexplained

81

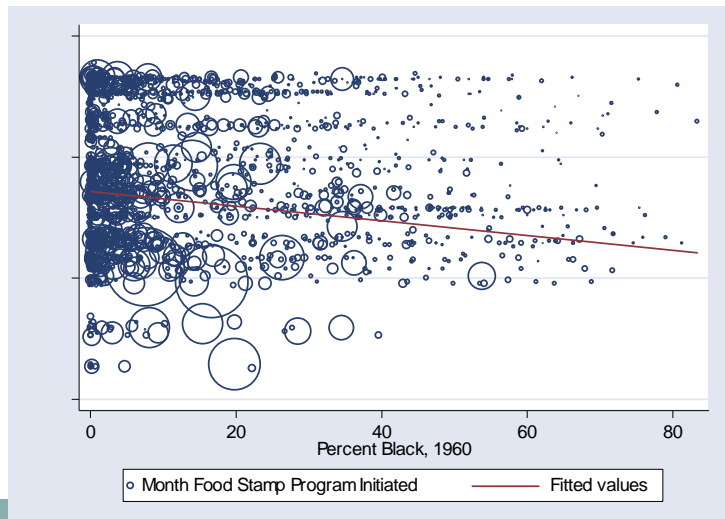
(a) % land in farming



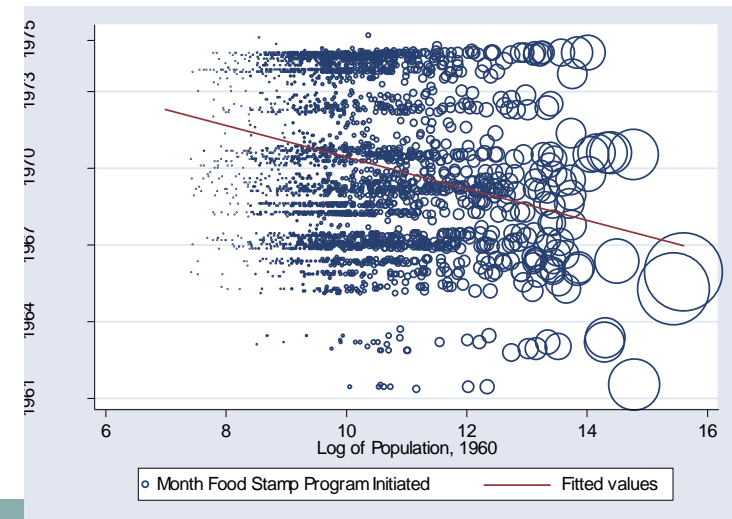
(b) % income < \$3,000



(c) % black



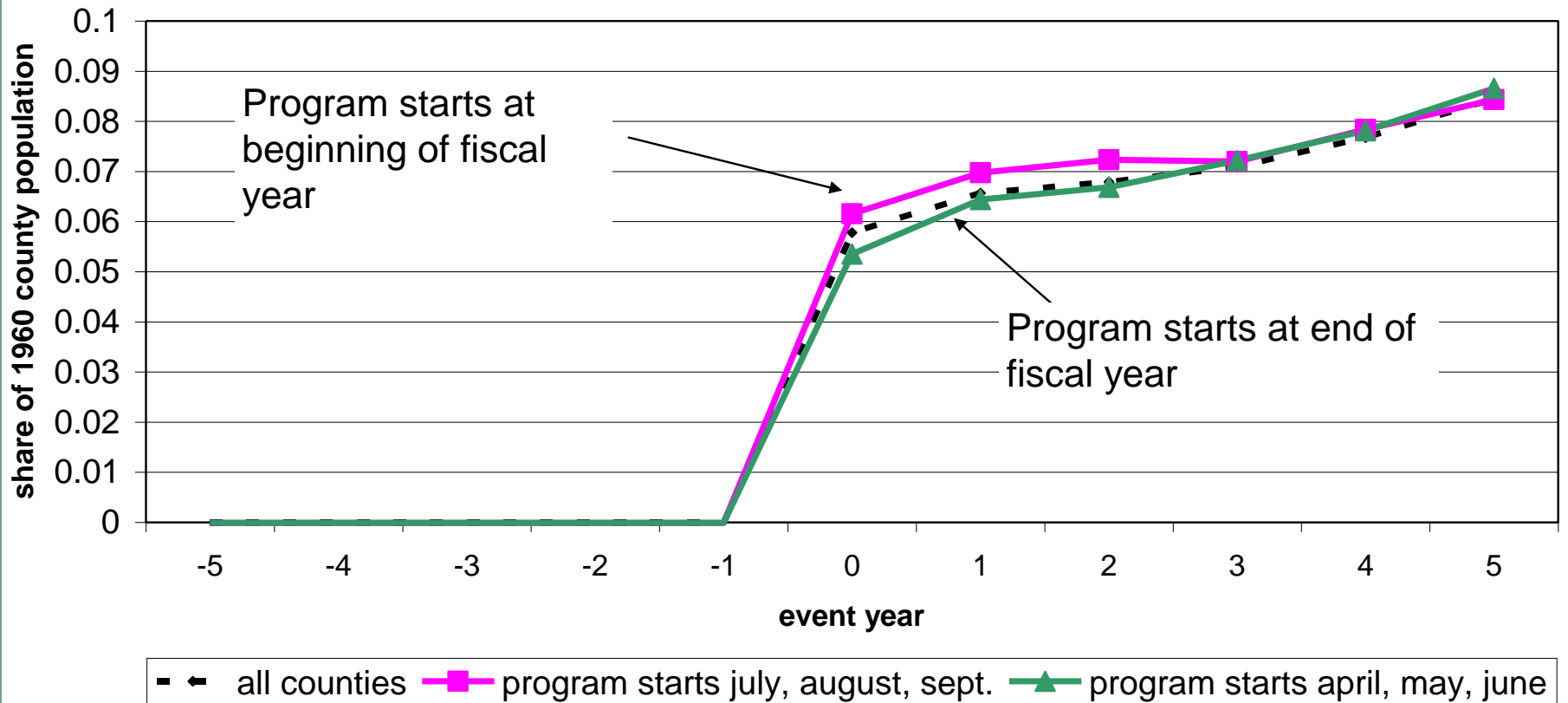
(d) log of population



# How quickly do FS Programs ramp up?

82

## Share of 1960 County Population on Food Stamps by Number of Years from Program Start

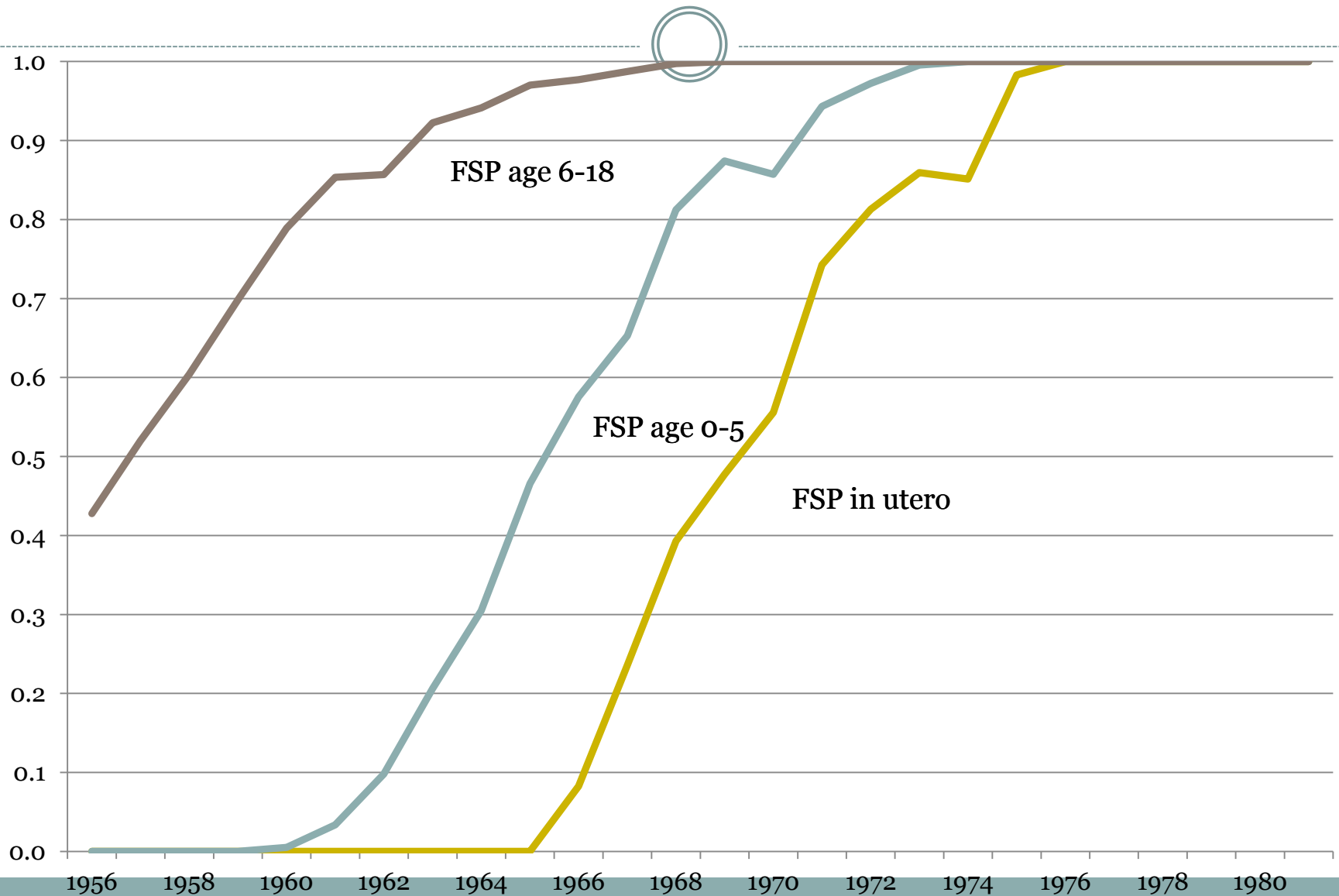


# Example: Dutch Hunger Winter

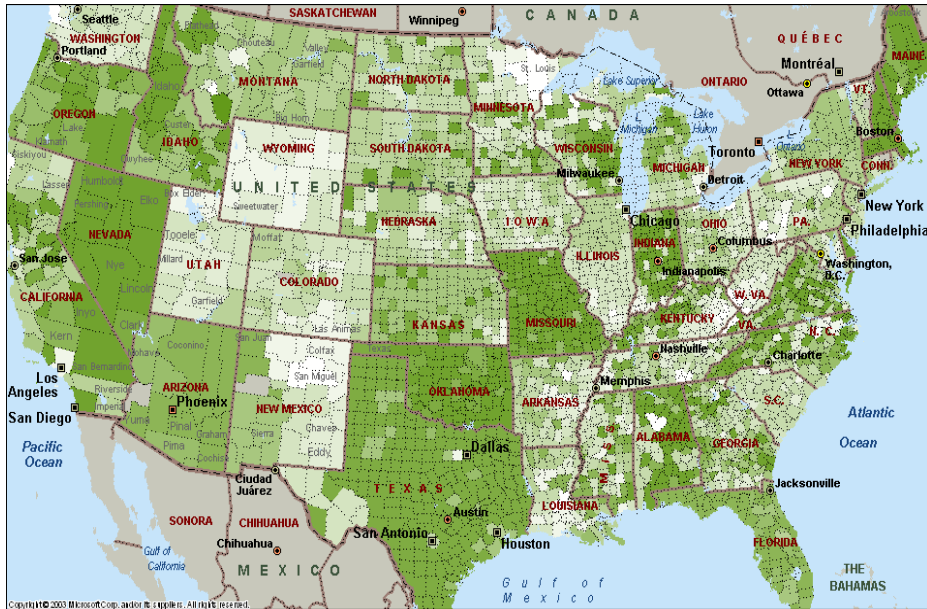


- Well-nourished society experienced abrupt, severe famine
- Nazi occupation of the Netherlands: imposed strict rationing
  - November 1944 - April 1945 (7 months)
  - Average calorie intake fell almost overnight from ~1800 to 400-800.
  - Post-war returned to normal almost instantaneously
- Studies of affected cohorts
  - Lower birth weight if famine during 3<sup>rd</sup> trimester
  - Middle age: more obesity, lower self-reported health, higher heart disease and worse mental health. Large effects.

# Cohort-Level Variation in Exposure



“Inside the War on Poverty: The Impact of Food Stamps on Health,”  
Douglas Almond, Hilary Hoynes and Diane Whitmore Schanzenbach  
*Review of Economics and Statistics* 2011

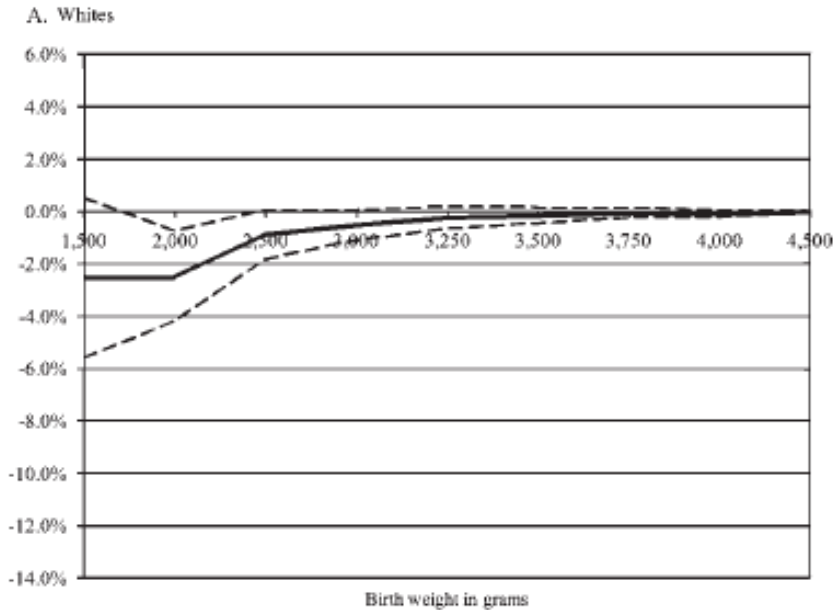


- Use initial rollout of the FSP (1961-1975) to examine effects on infant health
- Mother is “treated” during pregnancy with varying FSP depending on county and month-year of birth
- Vital statistics data on full census of births
- Event study model (difference-in-difference)

# Results: Food Stamps and Infant Health

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FIGURE 3.—EFFECTS OF FSP IMPLEMENTATION ON DISTRIBUTION OF BIRTH WEIGHT, PERCENTAGE IMPACTS (COEFFICIENT/MEAN)



- Availability of food stamps in the county leads to an increase in birth weight and a reduction in the incidence of low birth weight
- Effects concentrated at the bottom of the birth weight distribution

# Magnitudes: How do these safety net programs affect birth outcomes?



- Percent impacts on low birth weight, treatment-on-the-treated per \$1000 in 2009\$:
- Food stamps: 4% for whites, 2% for blacks [*Almond, Hoynes and Schanzenbach RESTAT 2011*]
- EITC: 7% for single low education women [*Hoynes, Miller and Simon 2012*]
- WIC: 10-20% [*Hoynes, Page and Stevens JPUBE 2011, and others*]