

The Impact of In-kind Food Benefit Increase on Consumption: Evidence from the SNAP

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Introduction

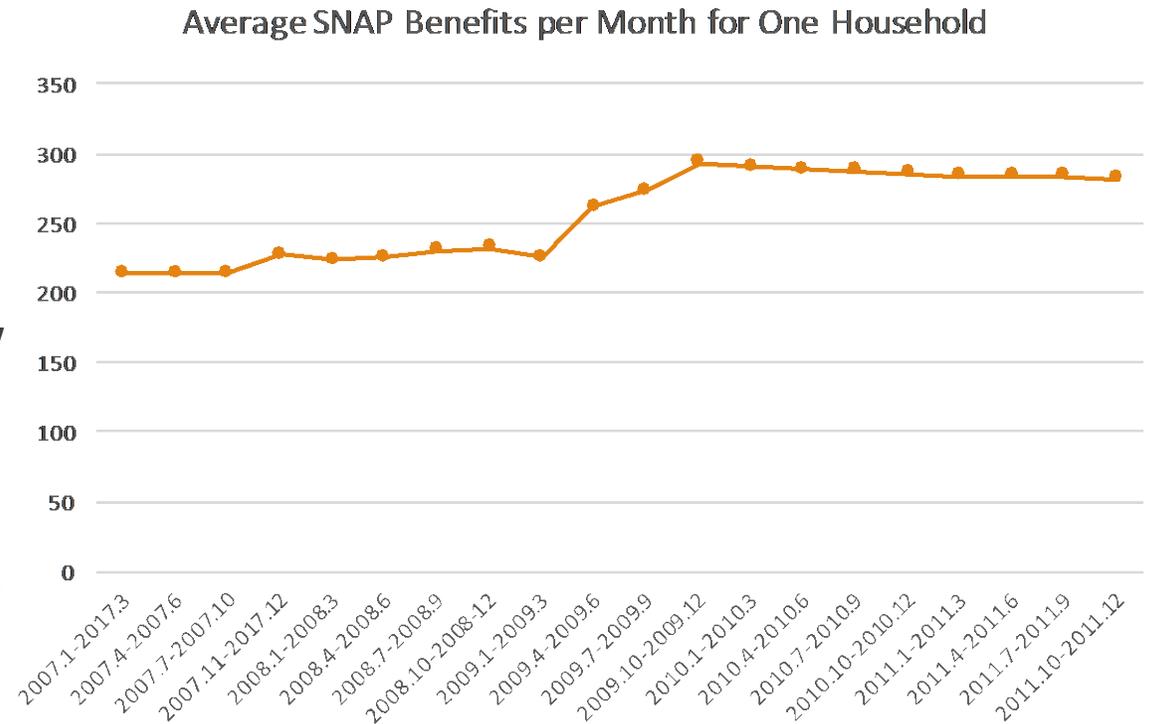
- **SNAP:** The Supplemental Nutrition Assistance Program, was Food Stamp Program, the largest program in the U.S. that provides nutrition assistance to low-income and no-income families

- **ARRA:** The American Recovery and Reinvestment Act of 2009 increased benefit levels for the SNAP and expanded SNAP eligibility.

Does ARRA's SNAP enhancements improve the low income household diet?

Food at home, vegetable, fruit

My model show limited evidence that the increase of SNAP benefits improve SNAP participants' food consumption behavior.



Data

- Consumer Expenditure Survey (Diary) 2007-2011 (70770 records)
- Diary Survey is designed to collect data on small, frequently purchased items, including most food and clothing.
- Dependent variables: food at home (FOODHOME), fresh vegetables (FRSHVEG), fresh fruits (FRSHFRUT) , processed vegetables(PROCFRUT), processed fruits(PROCFRUT)
- Independent variables: if any members of THE CU received any Food Stamps in the past month (FD_STMPS), if any members of THE CU received any Food Stamps in the past 12 month (REC_FS), Dollar value of the last food stamps or EBT received (mean of imputation iterations) (FS_AMTXM)
- Demographic variables: gender, age, race, family size, education level, income, etc.

Cleaning Data

1. How to distinguish SNAP participates and non-participates?

if any members of THE CU received any Food Stamps in the past month (FD_STMPS)

if any members of THE CU received any Food Stamps in the past 12 month (REC_FS)

Dollar value of the last food stamps or EBT received (mean of imputation iterations)(FS_AMTXM)

Constant answers towards two questions and provide valid benefits value.

Useful tips: Data flags

Cleaning Data

2. One week records & two weeks records

To keep as more as possible samples, average two weeks' consumption.

	one week record=one week family	two weeks record=2*two weeks family	total records	two week family	total family
2007	707	13040	13747	6520	7227
2008	693	13486	14179	6743	7436
2009	741	13882	14623	6941	7682
2010	618	13678	14296	6839	7457
2011	623	13302	13925	6651	7274
sum records	3382	67388	70770	33694	37076

3. Difficulty in choosing income variable

Family income before taxes, mean of imputation iterations. $\text{FINCBEFM} = \text{mean}(\text{FINCBEF1}-\text{FINCBEF5})$:
FINCBEFM and FINCBEF1-FINCBEF5

The sum of the amount of wage/salary income before deductions for all household members
 $\text{FWAGEX} = \text{sum of } (\text{WAGEX} + \text{WAGEBX})$ for all the household members: FWAGEX

Hypothesis

Hypothesis1. The SNAP households will increase their expenditure for food at home when their SNAP benefits increase, and it is represented by the increase of food at home.

Hypothesis2. The SNAP households will increase the amounts of healthy foods purchased in the home when their SNAP benefits increase, and it is represented by the increase of fresh vegetables at home.

Hypothesis3. The SNAP households will increase the amounts of healthy foods purchased in the home when their SNAP benefits increase, and it is represented by the increase of fresh fruits at home.

Method

$$y_{ij} = \beta_{0j} + \beta_{1j}after + \beta_{2j}SNAP_i + \beta_{3j}after * SNAP_i + X_i\Gamma_j + \varepsilon_{ij}$$

The i is for individual, the j is for the outcome variable of the expenditure for food at home, fresh vegetables available at home and fresh fruits available at home. The *After* is a dummy variable for data period. The *SNAP* is a dummy variable indicating whether the households are SNAP participants, it equals to 0 if the household did not receive SNAP benefits in the last month and they did not report an amount of SNAP benefits. And it equals to 1 if the households did receive SNAP benefits in the last month and they did report an amount of SNAP benefits. The variable *After*SNAP* is the interaction term to test whether the increase of benefits has an impact on the amount of food purchased. X_i is a matrix of the household demographic fixed effect, and ε_{ij} is the error.

Summary statistics

Variable	SNAP Participants		Nonparticipants		Total	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
White	0.669	0.471	0.842	0.365	0.829	0.376
Black	0.27	0.444	0.097	0.296	0.11	0.313
Asian	0.022	0.146	0.044	0.205	0.042	0.201
Male	0.28	0.449	0.48	0.5	0.46	0.499
Age	50.011	16.874	44.587	16.094	49.619	16.877
Family size	3.181	1.883	2.5	1.429	2.549	1.477
SNAP Amount (per month)	282.668	207.361				
Fresh Vegetables (two weeks)	7.215	9.641	9.422	11.687	9.263	11.566
Fresh Fruits (two weeks)	7.267	10.603	10.194	13.23	9.982	13.08
Food at Home (two weeks)	149.307	133.222	158.704	125.012	158.025	125.644
Household Income before tax	11692.84	18559.84	47022.052	66651.385	444471.193	65039.375
Observations	2219		28514		30733	

In general, the fresh vegetables, fresh fruits and sweets consumption for SNAP nonparticipants are all higher than SNAP participants. Demographics also differ between two groups, SNAP participants are more likely to be black, and headed by younger, female, and tend to have larger family size.

Difference-in-Difference

Difference-in-Difference-Food at home, Fresh Fruits and Fresh Vegetables

		Before	After	Difference-in-Difference
Food at Home	Treatment	141.767	153.219	5.214
		114.139	141.996	
	Control	155.301	161.539	
		121.588	127.73	
Fresh Fruits	Treatment	6.703	7.56	-0.464
		10.398	10.7	
	Control	9.473	10.794	
		12.558	13.737	
Fresh Vegetables	Treatment	6.864	7.397	-0.335
		8.901	10	
	Control	8.949	9.817	
		11.515	11.815	

Difference-in-Difference

Main Results: 2007-2010

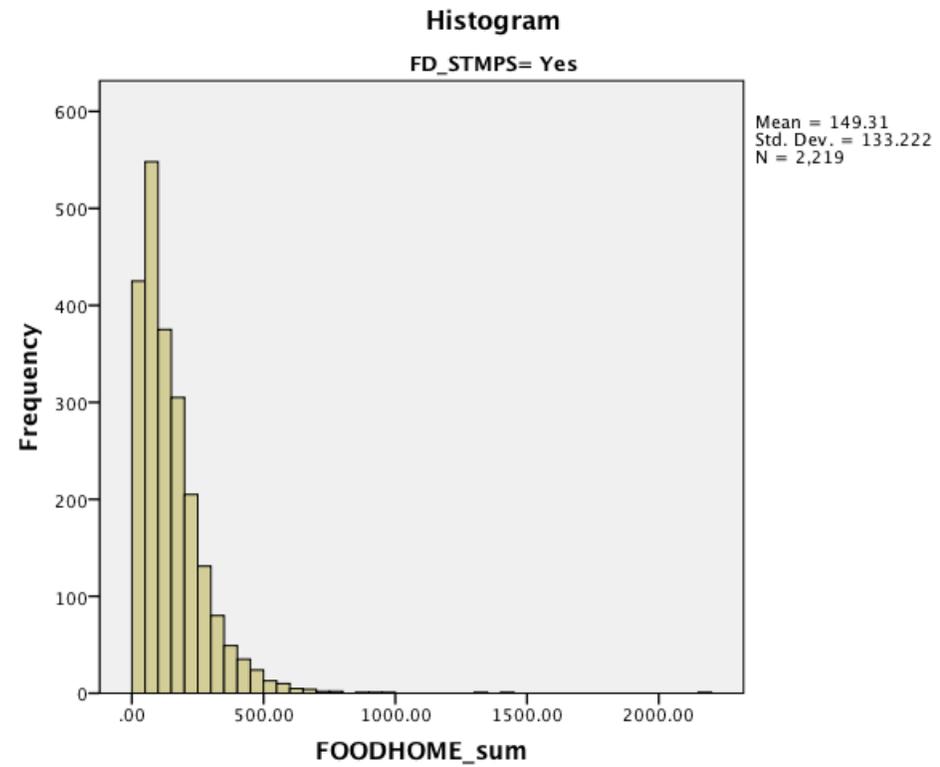
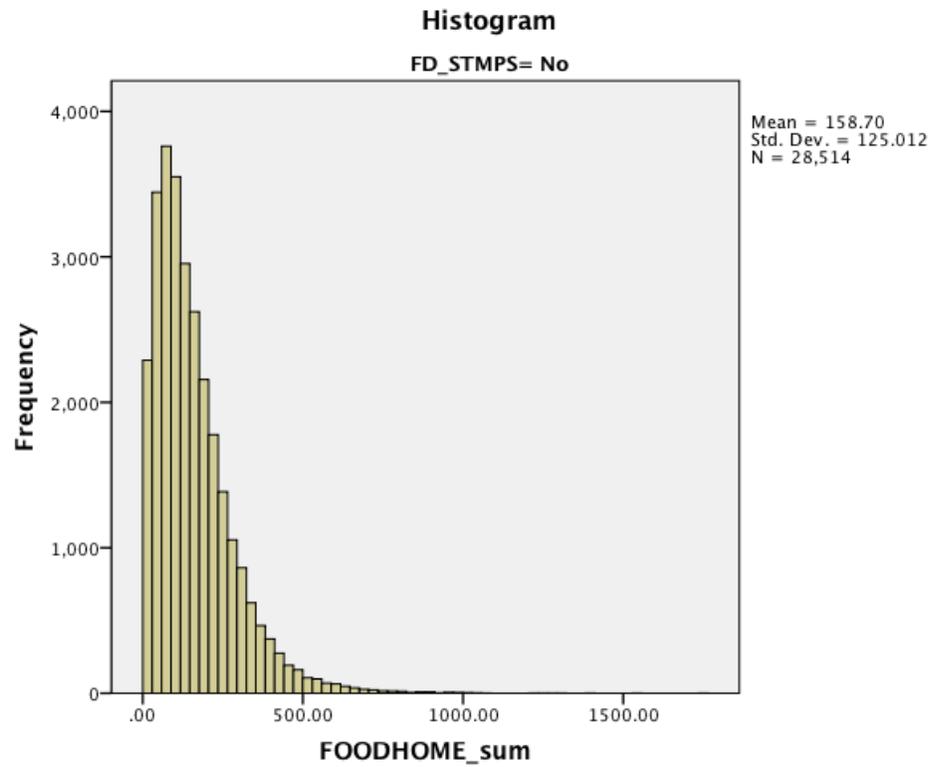
Variables	Fresh Fruit	Fresh Vegetables	Food at Home
After	1.298*** (0.152)	0.808*** (0.134)	5.308*** (1.377)
SNAP	-3.916*** (0.477)	-3.258*** (0.421)	-33.819*** (4.315)
After*SNAP	-0.421 (0.588)	-0.237 (0.519)	5.328 (5.319)
Quarter	-0.129* (0.065)	-0.023 (0.058)	1.415* (0.591)
Family Size	2.154*** (0.052)	1.882*** (0.046)	36.075*** (0.467)
Age	0.065*** (0.005)	0.058*** (0.004)	0.606*** (0.041)
Sex	0.127 (0.146)	0.027 (0.129)	2.733* (1.321)
Race	0.219** (0.085)	0.831*** (0.075)	-2.955*** (0.766)
Observations	30733	30733	30733
R-squared	0.059	0.060	0.1647

Notes: Regression include household and quarter fixed effects. *, **, *** represent 10%, 5%, and 1% significance respectively

In average SNAP participants consume about \$3.916 fresh fruits less, \$3.258 fresh vegetables less and \$33.819 food at home less, compared with nonparticipants when controlling for other variables. In general, the model explained about 5.9% of the variance of fresh fruits consumption, 6.0% of the variance of fresh vegetables consumption and 16.47% of the food at home consumption. However, there is no evidence showing that SNAP participants change their fresh fruit, vegetables and sweets consumption in response to increases in SNAP benefits.

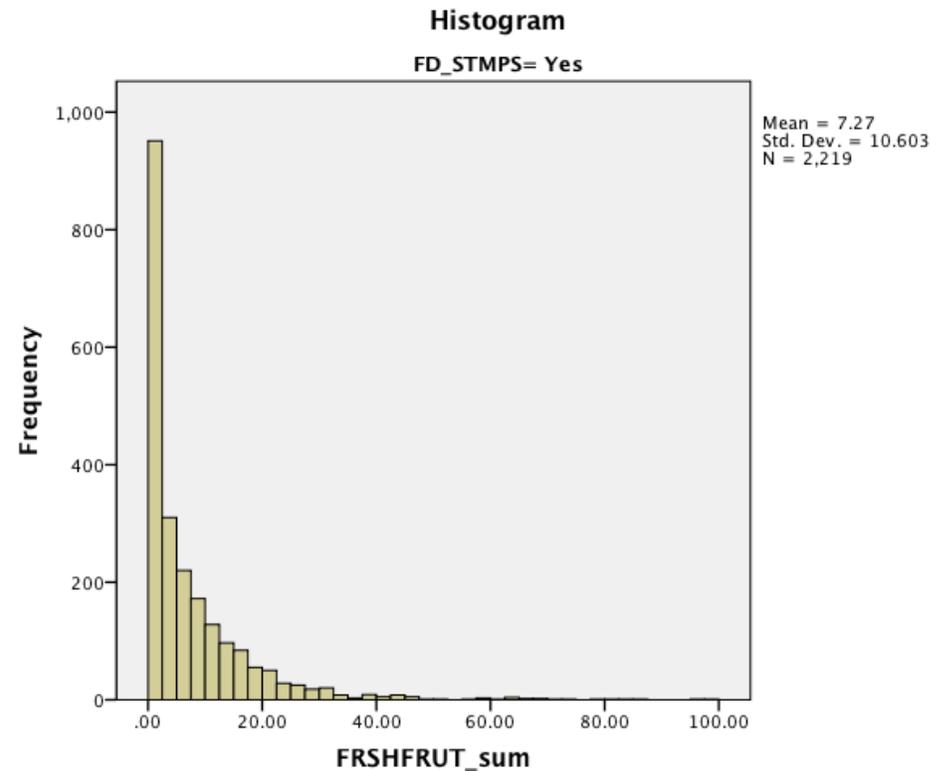
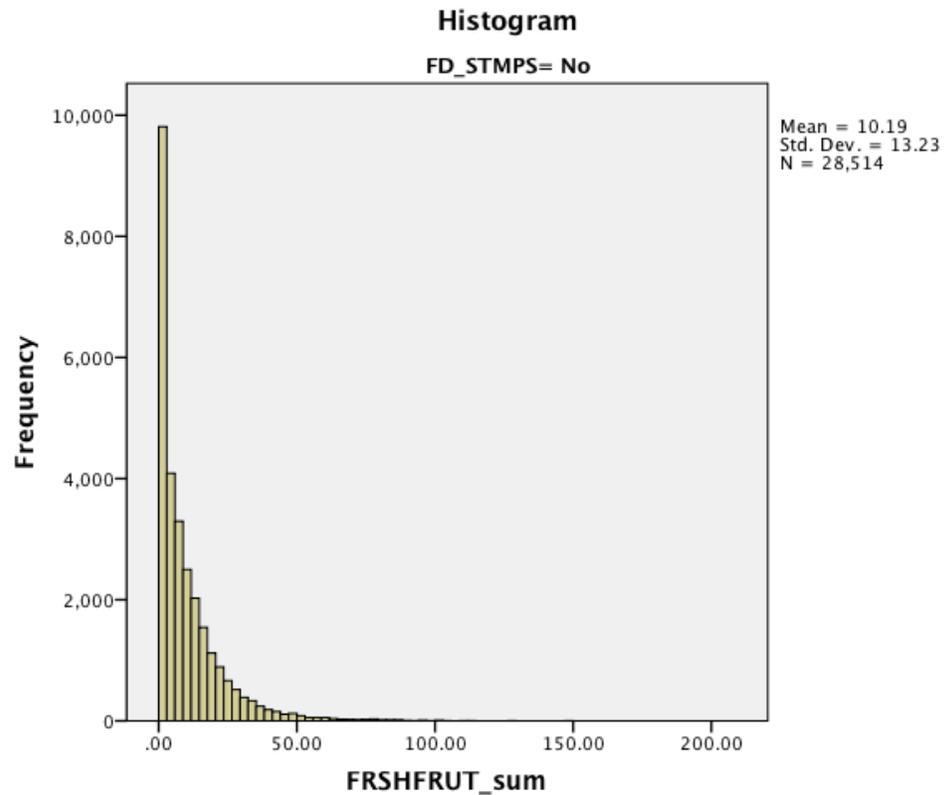
Discussion about data

1. "zero" consumption



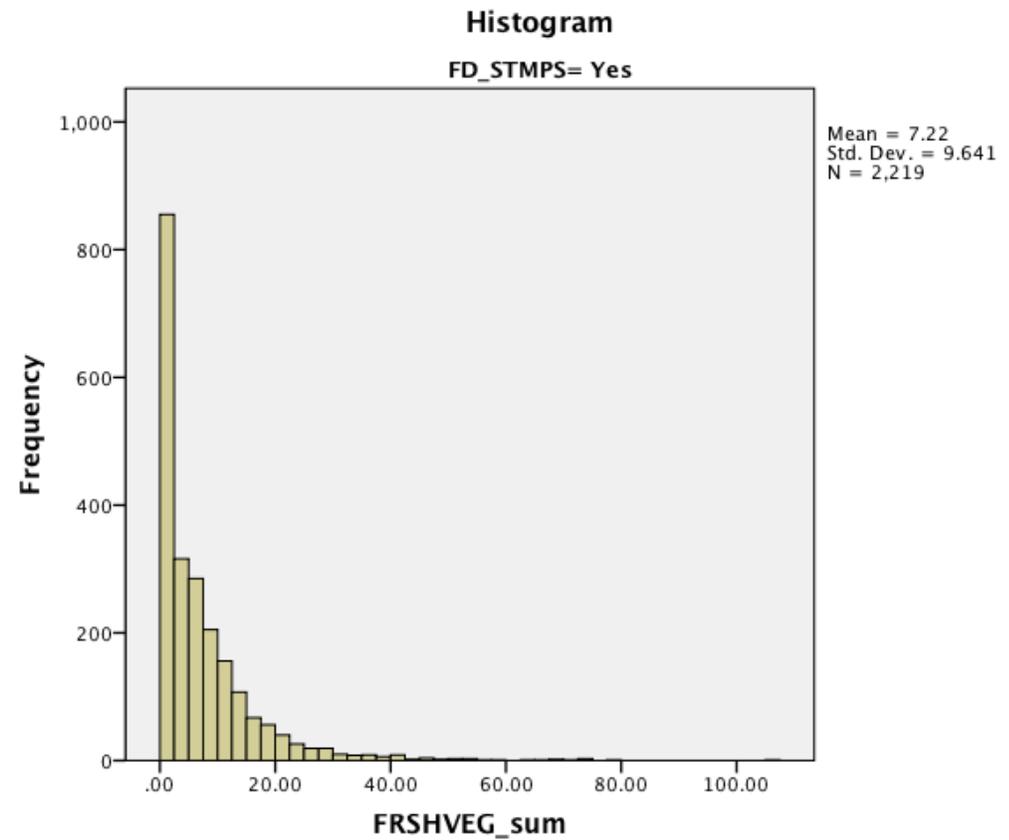
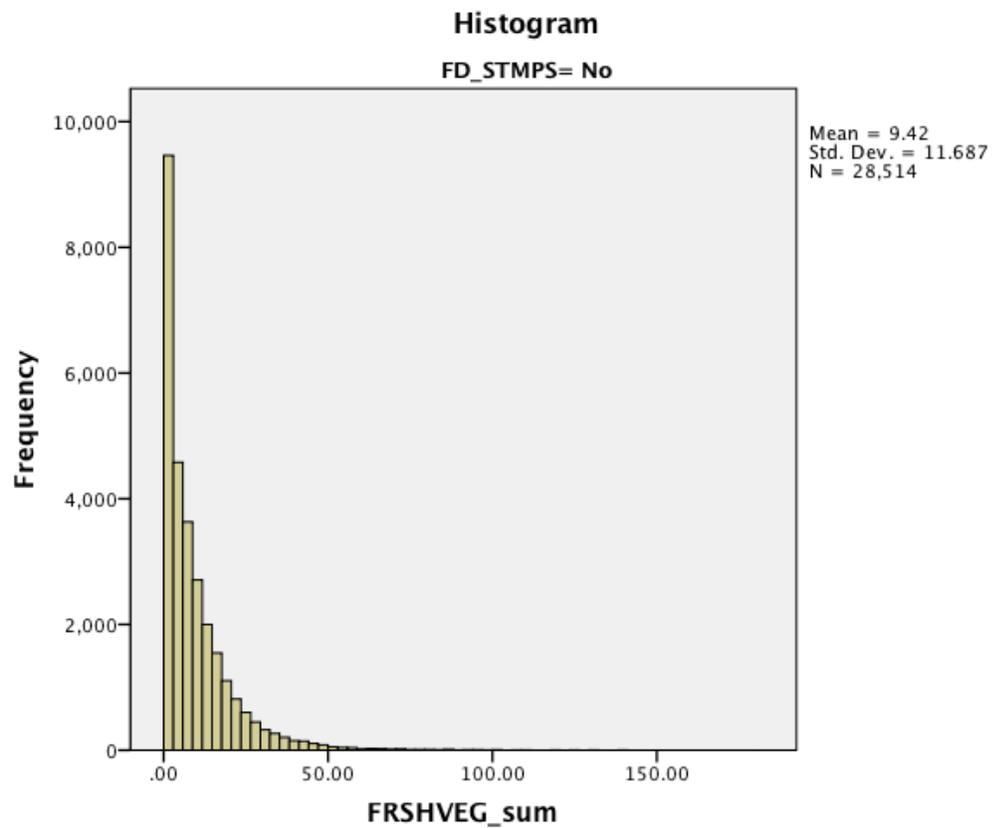
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Discussion about data

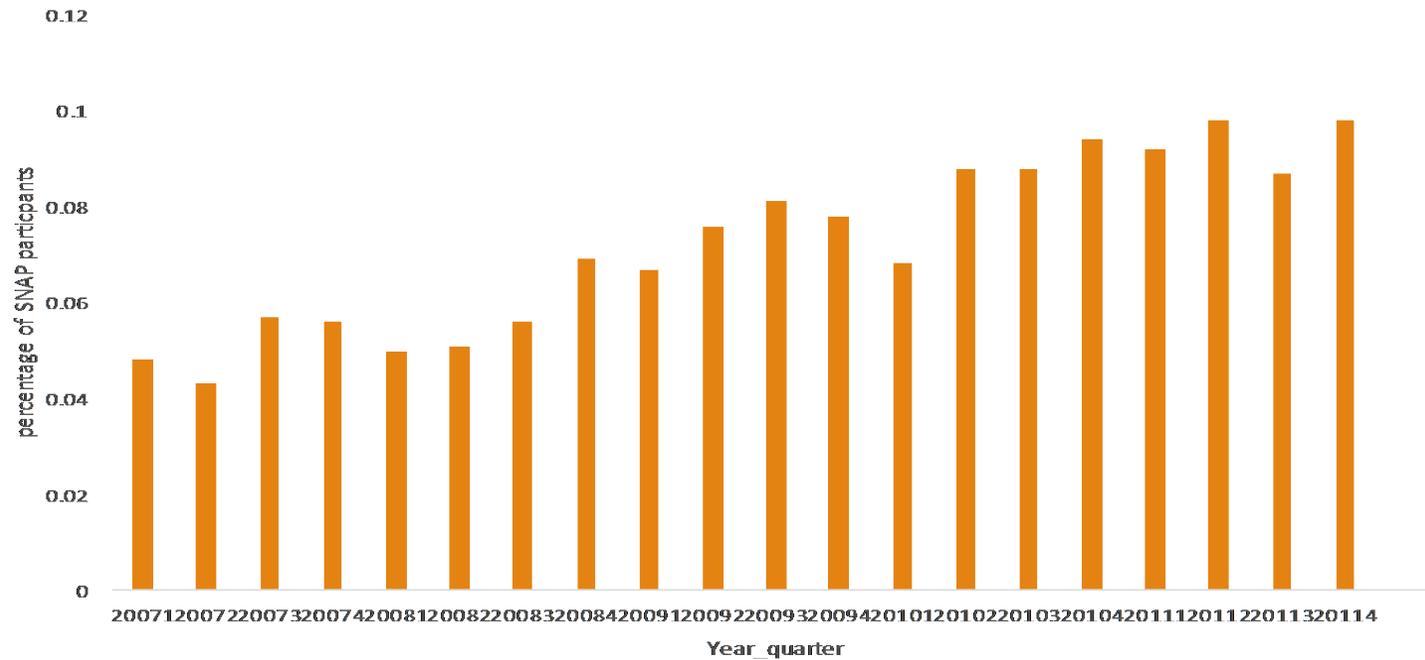
1. "zero" consumption



Discussion about data

2. sample

CEX interview vs. diary: In Beatty and Tuttle's paper (interview): (1) households that were participants in the program before *and* after the policy changes, and (2) households that were never participants in the program.



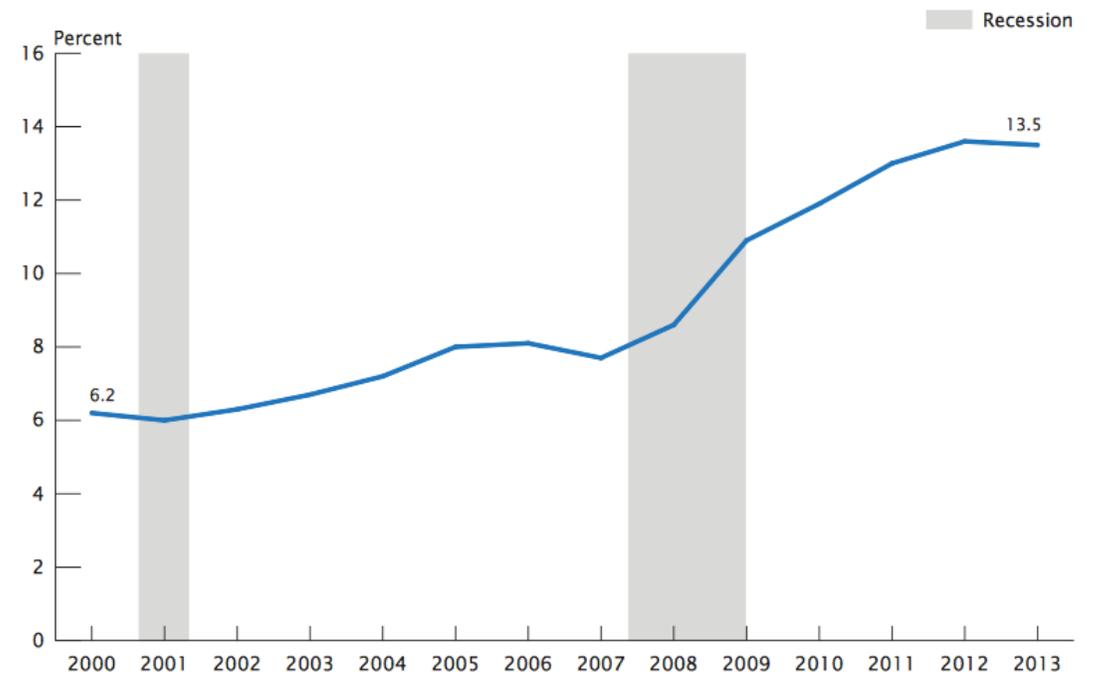
Discussion about data

3. SNAP participation rate----lower than other data

AFTER CLEANING	TERM	SNAP	NONSNAP	SUM	PERCENTAGE
2007	1	79	1599	1678	0.047079857
	2	74	1617	1691	0.043761088
	3	100	1598	1698	0.058892815
	4	94	1647	1741	0.053991959
2008	1	89	1669	1758	0.050625711
	2	88	1707	1795	0.04902507
	3	101	1637	1738	0.058112773
	4	114	1634	1748	0.065217391
2009	1	116	1666	1782	0.065095398
	2	146	1662	1808	0.080752212
	3	143	1654	1797	0.079577073
	4	144	1687	1831	0.078645549
2010	1	126	1709	1835	0.06866485
	2	149	1619	1768	0.084276018
	3	151	1560	1711	0.088252484
	4	164	1534	1698	0.096584217
2011	1	161	1559	1720	0.093604651
	2	166	1536	1702	0.097532315
	3	148	1550	1698	0.087161366
	4	171	1507	1678	0.101907032

Percentage of Households Receiving Supplemental Nutrition Assistance Program (SNAP) Benefits: 2000–2013

(Data based on sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see www.census.gov/acs/www/)



Source: U.S. Census Bureau, 2000–2013 American Community Surveys.

Discussion about data

4. average SNAP benefits value: not very consistent with policy trends

	quarter1	quarter2	quarter3	quarter4
2007	262.636	223.949	214.732	284.817
2008	227.416	228.885	218.889	273.799
2009	257.203	289.692	276.207	284.934
2010	313.016	276.262	301.582	302.03
2011	306.641	292.146	291.096	317.675
AFTER CLEANING	per household			
	quarter1	quarter2	quarter3	quarter4
2007	263.2	230.45	216.64	244.47
2008	232.28	227.34	213.44	278.02
2009	257.73	295.59	279.8	292.76
2010	320.97	282.65	307.25	312.43
2011	314.55	300.51	287.02	322.03

Next Step & Suggestions?

Thank you!
