

## **The Analysis of Food Stamp Program Participation with Matched Administrative and Survey Data\***

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### **Abstract**

Benefit receipt in major household surveys is often underreported. This mis-reporting has important implications for our understanding of the economic circumstances of disadvantaged populations, program takeup, the distributional effects of government programs, and studies of other program effects. We use administrative data on Food Stamp Program (FSP) participation matched to American Community Survey (ACS) household data. We show that over thirty percent of true recipient households do not report receipt in the ACS. Mis-reporting, both false negatives and false positives, varies with individual characteristics. From these results we infer likely biases in several types of FSP analyses. We then directly examine the determinants of program receipt using our combined administrative and survey data. The combined data allow us to examine accurate participation using individual characteristics missing in administrative data. Our results differ from conventional estimates using only survey data, as such estimates overstate multiple program participation and participation by families with children. To evaluate the use of imputed ACS data, we also examine whether our estimates using survey data alone are closer to those using the accurate combined data when imputed survey observations are excluded. Interestingly, excluding the imputed observations leads to worse estimates.

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Table 1 - Mis-reporting of Food Stamp Receipt, 2001 ACS, Full Sample

Administrative Receipt	ACS Report		Total
	No Food Stamps	Food Stamps	
<i>Illinois</i>			
No Food Stamps	18,618	145	18,763
	3,899,939	29,867	3,929,805
	91.43	0.70	92.13
	99.24	0.76	100.00
	97.31	11.63	92.13
Food Stamps	526	1,108	1,634
	108,060	227,635	335,695
	2.53	5.34	7.87
	32.19	67.81	100.00
	2.69	88.37	7.87
Total	19,144	1,254	20,398 <sup>a</sup>
	4,007,999	257,501	4,265,500
	93.96	6.04	100.00
	93.96	6.04	100.00
	100.00	100.00	100.00
<i>Maryland</i>			
No Food Stamps	8,903	46	8,949
	1,784,739	9,149	1,793,888
	93.38	0.48	93.86
	99.49	0.51	100.00
	97.64	10.87	93.86
Food Stamps	215	371	585
	43,067	74,283	117,350
	2.25	3.89	6.14
	36.70	63.30	100.00
	2.36	89.13	6.14
Total	9,118	416	9,534
	1,827,807	83,431	1,911,238
	95.64	4.36	100.00
	95.64	4.36	100.00
	100.00	100.00	100.00

<sup>a</sup>May not equal actual sample size due to rounding error.

Note: Cell key as follows: sample count, population estimate, overall %, row %, column %.

Table 2 - Mis-reporting of Food Stamp Receipt, 2001 ACS, Imputed Food Stamp Receipt Sample

Administrative Receipt	ACS Report		Total
	No Food Stamps	Food Stamps	
<i>Illinois</i>			
No Food Stamps	108	47	156
	28,353	12,413	40,767
	31.53	13.81	45.34
	69.55	30.45	100.00
	94.59	20.71	45.34
Food Stamps	6	181	187
	1,622	47,525	49,146
	1.80	52.86	54.66
	3.30	96.70	100.00
	5.41	79.29	54.66
Total	114	229	343
	29,975	59,938	89,913
	33.33	66.66	100.00
	33.33	66.66	100.00
	100.00	100.00	100.00
<i>Maryland</i>			
No Food Stamps	54	11	65
	11,462	2,153	13,616
	42.65	8.01	50.66
	82.88	17.12	100.00
	96.49	15.57	51.05
Food Stamps	2	61	63
	416	12,845	13,261
	1.55	47.79	49.34
	3.14	96.86	100.00
	3.51	84.43	48.95
Total	56	72	128
	11,879	14,998	26,877 <sup>a</sup>
	44.20	55.80	100.00
	43.85	56.15	100.00
	100.00	100.00	100.00

<sup>a</sup>May not equal actual population estimate due to rounding error.

Note: Cell key as follows: sample count, population estimate, overall %, row %, column %.

Table 3 - Mis-reporting of Food Stamp Receipt, 2001 ACS, Non-imputed Food Stamp Receipt Sample

Administrative Receipt	ACS Report		Total
	No Food Stamps	Food Stamps	
<i>Illinois</i>			
No Food Stamps	18,937	86	19,023
	3,871,641	17,501	3,889,142
	92.72	0.42	93.14
	99.55	0.45	100.00
Food Stamps	97.33	8.87	93.14
	520	881	1,401
	106,386	180,059	286,445
	2.55	4.31	6.86
Total	37.14	62.86	100.00
	2.67	91.13	6.86
	19,458	966	20,424
	3,978,026	197,561	4,175,587
	95.27	4.73	100.00
	95.27	4.73	100.00
	100.00	100.00	100.00
	<i>Maryland</i>		
No Food Stamps	8,852	34	8,886
	1,773,190	6,764	1,779,954
	94.11	0.36	94.47
	99.62	0.38	100.00
Food Stamps	97.65	9.82	94.47
	213	307	520
	42,698	61,495	104,193
	2.27	3.26	5.53
Total	40.98	59.02	100.00
	2.35	90.18	5.53
	9,065	341	9,406
	1,815,888	68,259	1,884,147
	96.38	3.62	100.00
	96.38	3.62	100.00
	100.00	100.00	100.00

Note: Cell key as follows: sample count, population estimate, overall %, row %, column %.

Table 4 - The Determinants of Mis-reporting, 2001 ACS, Probit Estimate Derivatives,  
Households with Income Less Than Twice the Poverty Line

	False Negative Reporting		False Positive Reporting	
	Illinois	Maryland	Illinois	Maryland
Single, no children	-0.1179 (0.0749)	0.0626 (0.1250)	-0.0057 (0.0048)	
Single, with children	-0.0477 (0.0584)	0.1637 (0.1160)	0.0016 (0.0026)	
Married, no children	-0.1116 (0.0518)	0.0169 (0.1488)	-0.0016 (0.0011)	
Number of members under 18	-0.0382 (0.0276)	-0.0258 (0.0452)	0.0002 (0.0006)	-0.0014 (0.0011)
Number of members 18 or older	-0.0107 (0.0353)	0.0388 (0.0471)	0.0000 (0.0005)	0.0011 (0.0012)
Number of members PIKed	0.0209 (0.0283)	0.0516 (0.0458)	-0.0014 (0.0009)	0.0021 (0.0014)
Age >= 50	0.1865 (0.0696)	0.1728 (0.1060)	-0.0017 (0.0015)	-0.0028 (0.0025)
Male	0.1013 (0.0473)	-0.0700 (0.0535)	-0.0005 (0.0007)	0.0002 (0.0019)
Less than high school	0.0660 (0.0502)	0.0729 (0.0801)	0.0042 (0.0024)	0.0023 (0.0031)
High school graduate	0.0172 (0.0472)	0.1292 (0.0867)	-0.0004 (0.0011)	0.0043 (0.0044)
College graduate and beyond	0.3416 (0.1300)	-0.0680 (0.1093)		
Hispanic	0.1154 (0.1032)			
Black	0.1114 (0.0461)			
Other	0.0136 (0.1134)			
Nonwhite		-0.1170 (0.0478)	-0.0062 (0.0030)	-0.0031 (0.0026)
Employed				-0.0083 (0.0055)
Unemployed	-0.0170 (0.0563)	-0.1905 (0.0393)	0.0056 (0.0062)	
Not in labor force	-0.0098 (0.0448)	-0.0646 (0.0673)	0.0004 (0.0010)	
Poverty index	0.1105 (0.0393)	0.1246 (0.0609)	-0.0011 (0.0007)	-0.0007 (0.0016)
Disabled	-0.0661 (0.0397)	-0.0440 (0.0777)	0.0021 (0.0023)	-0.0021 (0.0015)
Disabled, not working	-0.0417 (0.0452)	0.1947 (0.0857)	0.0058 (0.0040)	0.0131 (0.0087)
Speaks English well	-0.0592 (0.0665)		-0.0011 (0.0008)	
Speaks English poorly	0.0192 (0.0894)		-0.0017 (0.0011)	
Speaks English only		-0.2215 (0.1618)		

Table 4 continued - The Determinants of Mis-reporting, 2001 ACS, Probit Estimate  
 Derivatives, Households with Income Less Than Twice the Poverty Line

	False Negative Reporting		False Positive Reporting	
	Illinois	Maryland	Illinois	Maryland
Non-U.S. citizen	-0.1294 (0.0415)	0.1217 (0.1794)	0.0012 (0.0034)	
MSA central city				-0.0032 (0.0021)
Rural	-0.0803 (0.0417)	-0.1124 (0.0430)	-0.0009 (0.0009)	
Public assistance receipt	-0.1932 (0.0245)	-0.1930 (0.0441)	0.0565 (0.0335)	0.1181 (0.0995)
Housing assistance receipt	-0.0563 (0.0411)	-0.0430 (0.0597)	0.0014 (0.0021)	0.0038 (0.0048)
Food stamp receipt imputed	-0.2036 (0.0219)	-0.2267 (0.0347)	0.2396 (0.0761)	0.1312 (0.0842)
Length of FS receipt spell	-0.0281 (0.0044)	-0.0505 (0.0070)		
TANF receipt	0.0721 (0.0564)	0.0133 (0.0721)		
Sample size	797	342	3,416	1,496
Dependent variable mean	0.2585	0.2971	0.0266	0.0151

Note: Reported results are derivatives at average. Heteroskedasticity-robust standard errors in parentheses. All specifications also include controls for mode of interview (mail-back, CATI, CAPI). All analyses conducted using household weights adjusted for PIK probability. The unreported omitted family type is married with children, the education category is some college, the race group is white, and the geographic area is MSA non-central city.

Table 5 - Food Stamp Receipt in Survey Data and Combined Data, Probit Estimate Derivatives, Households with Income Less Than Twice the Poverty Line

	Illinois			Maryland		
	Survey Data	Combined Data	Equality Test P-value	Survey Data	Combined Data	Equality Test P-value
Single, no children	0.0630 (0.0360)	0.0991 (0.0419)	0.5715	0.0419 (0.0512)	0.1090 (0.0658)	0.3937
Single, with children	0.1085 (0.0372)	0.1475 (0.0402)	0.6495	0.0755 (0.0488)	0.2058 (0.0678)	0.1284
Married, no children	0.0772 (0.0497)	0.0996 (0.0550)	0.8595	0.0281 (0.0644)	0.0901 (0.0904)	0.5089
Number of members under 18	0.0215 (0.0109)	-0.0098 (0.0170)	0.0142	0.0133 (0.0169)	-0.0232 (0.0266)	0.0461
Number of members 18 or older	-0.0031 (0.0114)	-0.0296 (0.0162)	0.0804	-0.0191 (0.0186)	-0.0270 (0.0258)	0.9797
Number of members PIKed	0.0171 (0.0087)	0.0815 (0.0161)	0.0000	0.0231 (0.0130)	0.0937 (0.0235)	0.0055
Age 16-29	-0.0311 (0.0235)	-0.0167 (0.0297)	0.3840 <sup>a</sup> 0.2315 <sup>a</sup>	0.0421 (0.0388)	0.0169 (0.0438)	0.6298 <sup>a</sup> 0.3486 <sup>a</sup>
Age 30-39	-0.0046 (0.0237)	-0.0031 (0.0303)	0.8773	-0.0516 (0.0246)	-0.0740 (0.0335)	0.9783
Age 50-59	-0.0689 (0.0192)	-0.0181 (0.0318)	0.0057	-0.0112 (0.0371)	-0.0197 (0.0432)	0.9381
Age 60-69	-0.0824 (0.0193)	-0.0548 (0.0311)	0.0365	-0.0661 (0.0254)	-0.0735 (0.0377)	0.5154
Age >= 70	-0.1318 (0.0187)	-0.1415 (0.0257)	0.1408	-0.1022 0.0241	-0.1327 0.0322	0.6017
Less than high school	0.0664 (0.0232)	0.0733 (0.0283)	0.6479	0.0665 0.0305	0.1315 0.0414	0.2268
High school graduate	0.0248 (0.0213)	0.0368 (0.0255)	0.8234	0.0193 0.0266	0.0744 0.0357	0.1765
College graduate and beyond	-0.0652 (0.0228)	-0.0642 (0.0296)	0.5587	-0.0027 (0.0403)	-0.0359 (0.0438)	0.4773
Hispanic	-0.0290 (0.0315)	-0.0003 (0.0425)	0.2347			
Black	0.0776 (0.0246)	0.1650 (0.0288)	0.0074			
Other	0.0619 (0.0492)	0.0339 (0.0562)	0.3624			
Nonwhite				-0.0117 (0.0205)	-0.0745 (0.0271)	0.0240
Employed				-0.0439 (0.0248)	-0.0032 (0.0311)	0.0787
Unemployed	0.0508 (0.0321)	0.0157 (0.0377)	0.2560			
Not in labor force	0.0205 (0.0203)	-0.0020 (0.0236)	0.1752			
Poverty index	-0.0876 (0.0131)	-0.0845 (0.0157)	0.0848	-0.1023 (0.0166)	-0.1443 (0.0226)	0.9647



Table 5 continued - Food Stamp Receipt in Survey Data and Combined Data, Probit Estimate Derivatives, Households with Income Less Than Twice the Poverty Line

	Illinois			Maryland		
	Survey Data	Combined Data	Equality Test P-value	Survey Data	Combined Data	Equality Test P-value
Disabled	0.1188 (0.0237)	0.0956 (0.0271)	0.0332	0.0980 (0.0314)	0.1312 (0.0362)	0.9731
Disabled, not working	0.0359 (0.0226)	0.0119 (0.0265)	0.1719	0.0048 (0.0267)	0.0478 (0.0375)	0.2375
Speaks English only				0.0493 (0.0225)	0.0504 (0.0398)	0.5578
Speaks English well	-0.0004 (0.0331)	-0.0378 (0.0364)	0.1977			
Speaks English poorly	0.0124 (0.0363)	-0.0156 (0.0410)	0.4426			
MSA outside central city	-0.0013 (0.0373)	-0.0156 (0.0456)	0.7106			
Rural	0.0572 (0.0237)	0.0847 (0.0253)	0.4788	0.0728 (0.0270)	0.0757 (0.0332)	0.4400
Public assistance receipt	0.4985 (0.0540)	0.3176 (0.0574)	0.0003	0.4999 (0.0826)	0.5275 (0.0865)	0.6821
Housing assistance receipt	0.1995 (0.0305)	0.2356 (0.0349)	0.9672	0.1659 (0.0362)	0.2240 (0.0448)	0.8124
Food stamp receipt imputed	0.5591 (0.0474)	0.3472 (0.0593)	0.0000	0.5540 (0.0714)	0.4483 (0.0781)	0.0112
Sample size	4,656	4,213		1,985	1,838	
Dependent variable mean	0.1944	0.2403		0.1699	0.2301	
Test for all coefficients			0.0000			0.0359

Note: Reported results are derivatives at average. Heteroskedasticity-robust standard errors in parentheses. All specifications also include controls for mode of interview (mail-back, CATI, CAPI). All analyses conducted using household weights. The unreported omitted family type is married with children, the age group is 40-49, the education category is some college, the race group is white, and the geographic area is MSA central city.

<sup>a</sup>P-values for separate tests for ages 16-19 and 20-29 are reported.

## Appendix 1: Additional Tabulations

Reporting Rate	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Survey Recipient Households	1,254	416	257,501	83,431
Administrative Recipient Households	1,634	585	335,695	117,350
Reporting Rate based on Microdata	0.7674	0.7111	0.7671	0.7110

Gross Error Rate - Full Sample	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Households Mis-reported	671	261	137,927	52,216
Administrative Recipient Households	1,634	585	335,695	117,350
Gross Error Rate	0.4106	0.4462	0.4109	0.4450

Gross Error Rate - Imputed FS Receipt	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Households Mis-reported	53	13	14,035	2,569
Administrative Recipient Households	187	63	49,146	13,261
Gross Error Rate	0.2834	0.2063	0.2856	0.1937

Gross Error Rate - Unimputed FS Receipt	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Households Mis-reported	606	247	123,887	49,462
Administrative Recipient Households	1,401	520	286,445	104,193
Gross Error Rate	0.4325	0.4750	0.4325	0.4747

Share of FS Recipient HHs Below Poverty Line	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
FS Recipient HHs Below Poverty Line	613	280	169,099	63,330
Administrative Recipient Households	1,634	585	335,695	117,350
Share of FS Recipient HHs Below Poverty Line	0.3752	0.4789	0.5037	0.5397

Share of FS Recipient HHs 1x-2x Poverty Line	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
FS Recipient HHs 1x-2x Poverty Line	399	143	90,653	28,452
Administrative Recipient Households	1,634	585	335,695	117,350
Share of FS Recipient HHs Below 2x Poverty Line	0.2442	0.2444	0.2700	0.2425

Share of FS Recipient HHs Above 2x Poverty Line	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
FS Recipient HHs above 2x Poverty Line	622	162	75,943	25,568
Administrative Recipient Households	1,634	585	335,695	117,350
Share of FS Recipient HHs Below 2x Poverty Line	0.3807	0.2769	0.2262	0.2179

False Negative Rate - Illinois	Relationship to Poverty Line (Pop. Est.)			
	<1x	1x to 2x	>2x	Total
False Negative Households	28,595	38,768	40,706	108,060
Administrative Recipient Housholds	169,099	90,653	75,943	335,695
False Negative Rate	0.1691	0.4277	0.5360	0.3219

**False Negative Rate - Maryland****Relationship to Poverty Line (Pop. Est.)**

	<1x	1x to 2x	>2x	Total
False Negative Households	11,558	15,802	15,707	43,067
Administrative Recipient Housholds	63,330	28,482	25,568	117,350
False Negative Rate	0.1825	0.5548	0.6143	0.3670

**Share of False Positives Imputed**

	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Imputed False Postive Households	47	11	12,413	2,153
False Positive Households	145	46	29,867	9,149
Share of False Postives Imputed	0.3241	0.2391	0.4156	0.2353

**Share of Households Imputed**

	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Households with Imputed FS Receipt Variable	343	128	89,913	27,091
Total Households	20,767	9,534	4,265,500	1,911,238
	0.0165	0.0134	0.0211	0.0142

**Share of Reported Recipients Imputed**

	Sample Count		Population Estimates	
	Illinois	Maryland	Illinois	Maryland
Imputed Recipient Households	229	72	59,938	14,998
Reported Recipient Households	1,254	416	257,501	83,431
	0.1827	0.1727	0.2328	0.1798