

Appendix:

Bias in Error Rates with Misclassification in the Administrative Measure

Let the 2x2 matrix of potentially biased but observed response probabilities conditional on administrative receipt be

		Survey Data	
		No Receipt	Receipt
Administrative Data	No Receipt	p_{00}	p_{01}
	Receipt	p_{10}	p_{11}

where p_{ij} is the probability of j being reported in the survey given that i is recorded in the administrative data. Thus, the row probabilities sum to 1. A subscript of 1 means food stamp receipt, while 0 means no food stamp receipt.

Now some households that are true food stamp recipient households will not be recorded as recipient households in the linked administrative data. As discussed above, such misclassification may occur because some, but not all, household members have a PIK in the survey data, and only those without a PIK are the recipients. Alternatively, the recipients with a PIK in the survey data may not have one in the administrative data. Finally, someone who is not a recipient in the state may have moved into the state from another state where he or she was a recipient. These households will appear in the first row of the above matrix, but should be in the second row. Thus, the number of recipient households will be understated in the administrative data. Let p_1 be the probability that a household reports receipt in the survey when it is one of these true recipient households that is misclassified in the linked administrative data as a nonrecipient household.

Let the matrix for households that are not subject to this misclassification be

		Survey Data	
		No Receipt	Receipt
Administrative Data	No Receipt	\tilde{p}_{00}	\tilde{p}_{01}
	Receipt	\tilde{p}_{10}	\tilde{p}_{11}

The observations subject to the misclassification in the administrative data are those where some, but not all household members received food stamps and some but not all household members have a PIK, or those currently not receiving food stamps, or those with incomplete administrative records. It seems reasonable to assume that such households are more likely to report food stamp receipt than households where no-one receives food

stamps, given that they are true recipient households. However, such households seem less likely to report receipt than households where everyone has a PIK and at least one household member receives food stamps and has complete and accurate records. In inequalities, these assumptions mean that $\tilde{p}_{01} < p_1 < \tilde{p}_{11}$.

Under these conditions, it is easy to show that the true false positive rate $p_{01}^* = \tilde{p}_{01}$ will be lower than the observed rate p_{01} , and the true false negative rate p_{10}^* will be higher than the observed rate $p_{10} = \tilde{p}_{10}$. These conclusions follow because the observed false positive rate p_{01} is a weighted average of the true rate $p_{01}^* = \tilde{p}_{01}$ and p_1 which is larger than \tilde{p}_{01} . Similarly, the true false negative rate p_{10}^* is a weighted average of $p_{10} = \tilde{p}_{10}$ and $1 - p_1$ which is larger than \tilde{p}_{10} since $p_1 < \tilde{p}_{11}$ and $\tilde{p}_{10} = 1 - \tilde{p}_{11}$.

These two results imply that our data overstate the false positive rate and understate the false negative rate, if the reporting rate of the misclassified observations is between the reporting rate of true recipients and true non-recipients.

Appendix Table 1 – The Determinants of a Household having a PIK, Probit Average Derivatives

	ACS		CPS		SIPP	
	Illinois	Maryland	Illinois	Maryland	2001: IL & MD	2004: IL only
Single, no children	-0.0124 (0.0119)	-0.0032 (0.0169)	-0.2860 (0.0263)	-0.1697 (0.0447)	-0.0503 (0.0217)	-0.0391 (0.0226)
Single, with children	0.0215 (0.0122)	0.0039 (0.0138)	-0.0269 (0.0252)	-0.0648 (0.0393)	-0.0329 (0.0191)	-0.0105 (0.0164)
Multiple adults, no children	0.0032 (0.0126)	0.0115 (0.0166)	-0.2737 (0.0230)	-0.1307 (0.0398)	-0.0665 (0.0215)	0.0618 (0.0235)
Number of members under 18	0.0243 (0.0053)	0.0207 (0.0076)	0.0610 (0.0118)	0.0553 (0.0217)	-0.0399 (0.0084)	0.0090 (0.0094)
Number of members 18 or older	0.0322 (0.0047)	0.0219 (0.0052)	0.0248 (0.0089)	0.0034 (0.0129)	0.0357 (0.0067)	0.0239 (0.0064)
Age 16-29	-0.0130 (0.0084)	0.0240 (0.0104)	-0.0282 (0.0165)	-0.0098 (0.0271)	0.1237 (0.0200)	-0.0293 (0.0137)
Age 30-39	-0.0084 (0.0080)	-0.0027 (0.0087)	-0.0034 (0.0148)	-0.0219 (0.0235)	-0.0120 (0.0150)	0.0227 (0.0143)
Age 50-59	0.0065 (0.0082)	0.0080 (0.0089)	-0.0168 (0.0149)	-0.0448 (0.0224)	0.0059 (0.0151)	-0.0049 (0.0143)
Age 60-69	-0.0022 (0.0092)	0.0152 (0.0104)	-0.0380 (0.0178)	-0.0318 (0.0277)	-0.0275 (0.0185)	0.0667 (0.0198)
Age ≥ 70	-0.0192 (0.0093)	0.0187 (0.0106)	-0.0322 (0.0190)	-0.0343 (0.0291)	0.0232 (0.0201)	-0.0458 (0.0150)
Less than high school	-0.0000 (0.0075)	-0.0184 (0.0100)	-0.0194 (0.0165)	0.0257 (0.0252)	-0.0690 (0.0168)	-0.0428 (0.0147)
High school graduate	0.0052 (0.0064)	-0.0172 (0.0084)	-0.0299 (0.0123)	-0.0270 (0.0203)	-0.0700 (0.0130)	-0.0376 (0.0117)
College graduate and beyond	0.0071 (0.0065)	-0.0220 (0.0075)	-0.0071 (0.0128)	-0.0274 (0.0196)	-0.0176 (0.0135)	-0.0354 (0.0121)
Hispanic	-0.0435 (0.0104)	-0.0782 (0.0151)	-0.0268 (0.0157)	-0.1032 (0.0290)		
White					0.0234 (0.0133)	0.0359 (0.0107)
Black	-0.0298 (0.0075)	-0.0082 (0.0071)	0.0428 (0.0126)	-0.0150 (0.0154)		
Other	-0.0710 (0.0107)	-0.0779 (0.0113)	0.0537 (0.0237)	-0.0056 (0.0345)		
					0.0676 (0.0141)	-0.0050 (0.0102)
Unemployed	-0.0101 (0.0125)	0.0023 (0.0158)	0.0702 (0.0246)	0.0045 (0.0524)		
Not in the labor force	-0.0019 (0.0066)	-0.0243 (0.0080)	0.0223 (0.0133)	-0.0158 (0.0212)		
Income divided by poverty line	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0007 (0.0012)	0.0046 (0.0027)
Disabled	-0.0119 (0.0067)	0.0165 (0.0090)	0.0172 (0.0456)	0.1547 (0.0805)	-0.0024 (0.0183)	-0.0111 (0.0154)
Disabled, not working	-0.0080 (0.0081)	-0.0048 (0.0091)				
Speaks English only	0.0162 (0.0092)	-0.0048 (0.0111)				
Speaks English poorly	0.0097 (0.0110)	-0.0107 (0.0141)			-0.0117 (0.0144)	-0.0544 (0.0190)
Non-U.S. citizen	-0.0300 (0.0102)	0.0055 (0.0123)			0.0790 (0.0242)	-0.0517 (0.0171)
Rural	0.0142 (0.0077)	-0.0042 (0.0078)	0.0922 (0.0151)	0.0828 (0.0278)	-0.1061 (0.0128)	0.0148 (0.0124)
Reported housing assistance receipt	-0.0106 (0.0106)	0.0110 (0.0125)	0.1844 (0.0278)	0.0481 (0.0320)	0.0906 (0.0288)	0.0898 (0.0286)
Reported receipt of any transfers					0.0815 (0.0157)	0.0048 (0.0133)
HH in Maryland					-0.0026 (0.0112)	omitted
Linear Time Trend			-0.0307 (0.0041)	-0.0484 (0.0084)		
Observations	21,957	9,996	10,836	3,744	10,354	4,486

Notes: Delta-method standard errors in parentheses. The CPS specifications also include controls for mode of interview (mail-back, CATI, CAPI). All analyses conducted using household weights. The unreported omitted family type is multiple adults with children, the education category is some college, the age category is 40-49, the employment category is employed, the race group is non-Hispanic white, and the geographic area is within-MSA.

Appendix Table 2 – Summary Statistics, PIKed Households with Income Less than Twice the Poverty Line

Variable	ACS				CPS				SIPP	
	Illinois		Maryland		Illinois		Maryland		IL & MD	
	(1) Mean	(2) SD	(3) Mean	(4) SD	(5) Mean	(6) SD	(7) Mean	(8) SD	(9) Mean	(10) SD
Number of members PIKed	2.1410	1.4885	2.1357	1.4431	2.0670	1.4670	1.8763	1.3195	2.0982	1.4857
Administrative SNAP receipt	0.2432	0.4291	0.2323	0.4224	0.2744	0.4463	0.1721	0.3777	0.1819	0.3859
Number of months of SNAP receipt	9.1006	4.1855	8.9877	4.2661	9.4111	3.3482	8.7004	4.0234	3.6562	7.9704
Months since last admin. SNAP receipt									3.5746	1.0286
Reported SNAP receipt	0.2035	0.4027	0.1745	0.3797	0.1947	0.3960	0.1175	0.3223	0.1861	0.3892
SNAP receipt imputed	0.0512	0.2205	0.0426	0.2020	0.0963	0.2951	0.0793	0.2704	0.0737	0.2614
Administrative TANF receipt	0.0634	0.2438	0.0787	0.2694	0.0416	0.1998	0.0482	0.2144	0.0284	0.1661
Reported public assistance receipt	0.0601	0.2377	0.0565	0.2310	0.0415	0.1995	0.0349	0.1838	0.0357	0.1855
Reported housing assistance receipt	0.1429	0.3500	0.1732	0.3785	0.1348	0.3416	0.1713	0.3771	0.1216	0.3269
Reported receipt of any transfers									0.4397	0.4964
Single, no children	0.5227	0.4995	0.5515	0.4975	0.4194	0.4936	0.4861	0.5002	0.4884	0.4999
Single, with children	0.1944	0.3958	0.2258	0.4182	0.1358	0.3426	0.1143	0.3184	0.1926	0.3944
Multiple adults, no children	0.1263	0.3323	0.1046	0.3062	0.2014	0.4011	0.2119	0.4090	0.1262	0.3321
Multiple adults, with children	0.1566	0.3635	0.1180	0.3227	0.2435	0.4293	0.1877	0.3907	0.1928	0.3946
Number of members under 18	0.8757	1.3459	0.8510	1.3016	0.8709	1.3472	0.6069	1.0789	0.8038	1.2485
Number of members over 18	1.5941	0.8070	1.4988	0.7065	1.5845	0.7965	1.5087	0.7572	1.6384	0.8266
Rural	0.1852	0.3885	0.1286	0.3349	0.2118	0.4087	0.0653	0.2472	0.1681	0.3740
Income divided by poverty line	111.67	56.62	114.14	55.63	116.93	54.61	116.35	56.57	1.1575	-0.5678
Age 17-29	0.2034	0.4025	0.1699	0.3756	0.1775	0.3821	0.1220	0.3275	0.1254	0.3313
Age 30-39	0.1796	0.3839	0.1896	0.3921	0.1821	0.3860	0.1614	0.3682	0.1702	0.3759
Age 40-49	0.1677	0.3736	0.1655	0.3717	0.1467	0.3539	0.1442	0.3516	0.1781	0.3826
Age 50-59	0.1134	0.3171	0.1157	0.3199	0.1041	0.3055	0.1370	0.3441	0.1461	0.3533
Age 60-69	0.1112	0.3144	0.1316	0.3381	0.1331	0.3397	0.1151	0.3195	0.1187	0.3235
Age ≥ 70	0.2249	0.4176	0.2278	0.4195	0.2565	0.4368	0.3203	0.4670	0.2613	0.4394
Age ≥ 50	0.4494	0.4975	0.4751	0.4995	0.4937	0.5001	0.5724	0.4951		
Less than high school	0.3436	0.4750	0.3330	0.4714	0.3024	0.4594	0.2827	0.4507	0.2476	0.4317
High school graduate	0.3264	0.4690	0.3409	0.4741	0.3658	0.4818	0.3921	0.4886	0.3477	0.4763
Some college	0.2298	0.4207	0.2319	0.4222	0.2255	0.4180	0.1744	0.3798	0.2384	0.4262
College graduate and beyond	0.1002	0.3003	0.0942	0.2922	0.1063	0.3083	0.1508	0.3581	0.1664	0.3725
Male	0.4043	0.4908	0.3585	0.4797	0.3912	0.4881	0.3939	0.4890	0.3913	0.4881
Non-Hispanic white	0.5762	0.4942	0.5149	0.4999	0.5917	0.4916	0.6033	0.4896	0.7057	0.4558
Non-U.S. citizen	0.1113	0.3145	0.0631	0.2433					0.0692	0.2538
Speaks English only	0.7738	0.4184	0.8836	0.3208						
Speaks no or poor English									0.1328	0.3394
Employed	0.4263	0.4946	0.3967	0.4894	0.3894	0.4877	0.3707	0.4834	0.4447	0.4970
Unemployed	0.0676	0.2511	0.0674	0.2508	0.0517	0.2215	0.0372	0.1894		
Not in labor force	0.5061	0.5000	0.5359	0.4988	0.5588	0.4966	0.5921	0.4918		
Disabled	0.3038	0.4599	0.3475	0.4763	0.0113	0.1055	0.0129	0.1130	0.1820	0.3859
Disabled, not working	0.1790	0.3834	0.2018	0.4015						
CATI	0.0927	0.2900	0.0962	0.2949						
CAPI	0.4625	0.4987	0.4138	0.4927						
Mail-back	0.4448	0.4970	0.4900	0.5000						
Number of members interviewed									1.1218	0.3942
No interview with reference person									0.1245	0.3303
Interview with someone without PIK									0.0737	0.2614
HH had bad data record									0.4704	0.4992
Reference person had bad data record									0.1575	0.3644
2001									2.6756	1.2913
2002									0.2478	0.4318
2003									0.2281	0.4196
2004									0.2016	0.4012
2005									0.2458	0.4306
HH in Maryland									0.0767	0.2662
Linear time trend					3.5455	1.1136	3.0543	0.8323		

Notes: All analyses conducted using household weights corrected for PIK probability. Reported demographic characteristics are for the household head. Sample sizes are 4146 for IL and 1799 for MD in the ACS, 2151 for IL and 640 for MD in the CPS and 2973 in the combined SIPP sample. The number of months of SNAP receipt in row 3 is estimated for the sample of recipients only, which is 789 in IL and 344 in MD in the ACS, 689 in IL and 136 in MD in the CPS and 540 in the combined SIPP sample.