MEMORANDUM

TO: Mark Denably, Economic Research Service

FROM: Nancy Cole and John Hall, Mathematica Policy Research   **DATE:** 10/10/2011
                                                                          Revised 03/08/2012

SUBJECT: FoodAPS Field Test – Nonresponse Bias Analysis

The field test of the National Household Food Acquisition and Purchase Survey (FoodAPS), was conducted from February through May 2011. This memo reviews survey response rates and presents the results of the nonresponse bias analysis.

BACKGROUND

The field test was conducted in two purposively selected PSUs in the mid-Atlantic region. Within each PSU, 8 Secondary Sampling Units (SSUs) were selected as local survey areas. Within each sampled SSU, we sampled addresses for screening from a sampling frame constructed from two sources:

- **SNAP List.** A list of addresses for SNAP recipients (in each SSU), obtained from the State SNAP agency; these addresses were used in selecting households expected to be receiving SNAP.

- **Non-SNAP List.** A commercial list of addresses (in each SSU), known as an Address-Based Sampling (ABS) file, compiled from the United States Postal Service Delivery Sequence File. These addressed were matched against those on the SNAP list, and the SNAP list addresses were flagged. The flagged addresses were sampled at a different rate than those appearing only on the ABS file.

All sampled addresses were randomly grouped into replicate subsamples and randomly assigned to one of two survey protocols (Single Book or Multiple Book) and one of two incentive levels (low or high). Field interviewers confirmed the presence of an occupied dwelling unit at each sampled address and administered a screener to determine the household's eligibility for the survey. Eligibility was determined by membership in a quota group:

1. Quota group A – Non-SNAP, household income ≤ 100% of poverty

2. Quota group B – Non-SNAP, household income between 100-185% of poverty

3. Quota group C – Non-SNAP, household income ≥ 185% of poverty (not eligible)

4. Quota group D – SNAP participant household

Households in Quota group C were not eligible for the field test. Households screened into quota group B from releases 2 and 3 were also not eligible for the field test.

Table 1 shows unweighted and weighted response rates for the addresses released to the field. Response rates are calculated for each stage of response, overall and by experimental groups and sampling frame.

Table 1. Response Rates to the FoodAPS Field Test

| Response rate | Overall response rate, unweighted | Weighted Response Rates | | | | | | | |
| | | Overall | Survey Protocol | | Incentive Level | | Sampling Frame | |
			Single Book	Multiple Books	Low	High	SNAP	ABS
Dwelling unit determination rate (DRR)[1]	97.1	96.79	96.68	96.90	96.80	96.78	98.16	96.68
Screener contact rate (screening eligibility determination rate) (EDR)[2]	83.1	84.93	84.73	85.12	85.15	84.72	89.12	84.57
Screening completion rate (SCR)[3]	72.2	70.25	69.11	71.35	67.59	72.73	76.56	69.68*
Screening response rate (SRR = DRR*EDR*SCR)	58.2	57.75	56.61	58.85	55.71	59.63	66.97	56.97
Household interview completion rates (CR)								
HH #1	62.9	60.98	60.80	61.16	56.02	65.25*	67.02	60.18
HH #2	53.6	53.26	53.01	53.51	47.03	58.61*	57.40	52.71
HH #3	56.3	55.19	54.62	55.75	49.00	60.50*	59.79	54.57
Household interview response rates (RR = SRR*CR)								
HH #1	36.6	35.21	34.42	35.99	31.21	38.91*	44.89	34.29
HH #2	31.2	30.76	30.01	31.49	26.20	34.95*	38.44	30.03
HH #3	32.7	31.87	30.92	32.81	27.30	36.08*	40.04	31.09

* Indicates statistically significant subgroup differences based on t-tests.
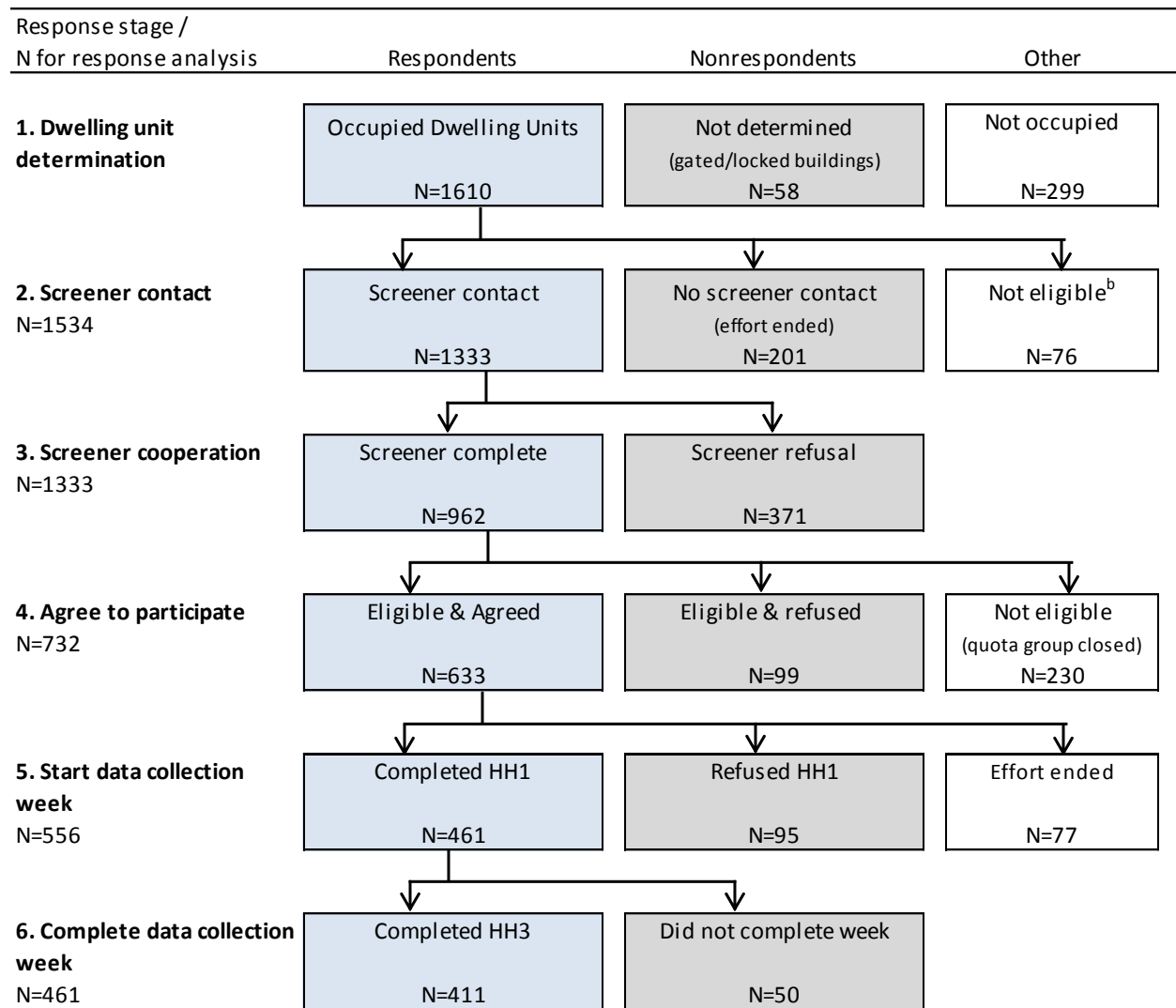[1] The dwelling unit could not be determined for 58 addresses in locked buildings and gated communities.
[2] Eligibility was not determined if the case was untouched (N=1) or expired due to maximum attempts (N=200).
[3] Completed screeners as a percentage of eligible addresses.

Figure 1 provides a graphical depiction of response at each stage of contact. Of the 2,017 sampled addresses, 50 were released in error or not in the sample frame, leaving 1,967 addresses in the sample. Of the 1,967 remaining addresses, 1,610 were determined to be occupied dwelling units and 299 were found unoccupied for a dwelling determination rate of 97.1 percent ((1610+299)/1967). Five stages of response followed the determination of an occupied unit: screener contact, screener cooperation, agreement to participate in the study, completion of the first household interview to start the data collection week, and completion of the data collection week. At

each stage after the first, we can examine the marginal response (at that stage only) or total response (cumulative through that stage).

Figure 1. Response by Stage of Contact

Response stage / N for response analysis	Respondents	Nonrespondents	Other
1. Dwelling unit determination	Occupied Dwelling Units N=1610	Not determined (gated/locked buildings) N=58	Not occupied N=299
2. Screener contact N=1534	Screener contact N=1333	No screener contact (effort ended) N=201	Not eligible[b] N=76
3. Screener cooperation N=1333	Screener complete N=962	Screener refusal N=371	
4. Agree to participate N=732	Eligible & Agreed N=633	Eligible & refused N=99	Not eligible (quota group closed) N=230
5. Start data collection week N=556	Completed HH1 N=461	Refused HH1 N=95	Effort ended N=77
6. Complete data collection week N=461	Completed HH3 N=411	Did not complete week N=50	

[b] Cases not eligible for screening include those with language other than English or Spanish, not available during the survey period, or with physical impairments making participation impossible. For the purpose of subsequent analysis, we coded those not eligible for screening as having been contacted.

Nonresponse bias analysis includes comparisons of respondents and nonrespondents at each stage of response. Information available for this comparison varies by the stage of response, as shown in Table 2. At the first two stages (screener contact and screener cooperation) a comparison of respondents and nonrespondents is limited to information about the sample frame and the timing of contacts. We focus on marginal response rates because after the first two stages, we have more information available for examining marginal response rates (as opposed to total response).

Response at the third and fourth stages (agreement to participate; start of data collection week) can be assessed using information from the sample frame and the screener. Response at the final

stage (completing the study week, among those that start the week) can be assessed using sample frame information and household characteristics from the first household interview.

Table 2. Information for Assessing Nonreponse Bias

| | Information available for response bias analysis | |
Response stage	Data source	Data elements
1. Screener contact	Sample information	PSU, SSU, interviewing team, incentive level
2. Screener cooperation	Sample information	PSU, SSU, interviewing team, incentive level
3. Agreement to participate at the time of screening (among eligible households)	Sample & screener	Sample info plus, language, household size, SNAP participation, income group, received study letter, store type for most food shopping, other types of food stores in last 30 days, food bank in last 30 days, number of household members by age group [a]
4. Start data collection week (among households that agree at screening)	Sample & screener	Sample info plus, survey protocol[b], language, household size, SNAP participation, income group, received study letter, respondent is meal planner or food shopper
5. Complete data collection week (among households that start the week	Sample, screener, and household interview	Same as above plus, respondent characteristics (age, gender, education, race, employment status, and marital status), number of household members by age group.[c]

[a] Information about food shopping, food banks, and household members by age group was obtained from about half of respondents who did not agree to participate at the time of screening (the other half declined to answer these additional questions. These items were not collected from respondents who agreed to participate at the time of screening and later declined before the first household interview.

[b] Survey protocol is known at the time of contact, however, it does not become known to respondents until after they agree to participate.

[c] Characteristics are available for all household members, however, degrees of freedom are limited for the analysis at stage 5.

The following methods are recommended for analysis of nonresponse bias[1]:

1. Compare the distributions of respondents and nonrespondents across subgroups using sample frame characteristics

2. Use multivariate analysis to identify characteristics of cases associated with nonresponse

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[1] Items 1-4 are recommended by the National Center for Education Statistics, Statistical Standards Program: http://nces.ed.gov/statprog/2002/std4_4.asp

3. Compare respondents to known population characteristics from external sources (we do not use this method for the field test because population characteristics are measured imprecisely at the block group level[2])

4. Compare the characteristics of easy/early completed cases with the characteristics of difficult/later completed cases (this assumes that nonrespondents are similar to "hard to reach" respondents)

Distributions of Respondents and Nonrespondents

We used the first method to examine the weighted distribution of respondents and nonrespondents by frame characteristics and the timing of contacts (Table 3). Chi-square tests are used to identify statistically significant differences in response by subgroups.

The results in Table 3 show that geography is associated with differences in response rates:

- PSU – Differences in response by PSU are not statistically significant at the first two stages of contact; differences are significant for agreement to participate and starting a data collection week, with Atlantic county having lower response.

- SSU –At every stage of contact, there were statistically significant differences in response by SSU. SSU and interviewing team are correlated so that it is difficult to draw conclusions from univariate analyses. One pattern is that SSUs/interviewing teams with the highest screener contact rates have the lowest screener cooperation rates, and vice versa.

For the most part, characteristics of the sampling frame other than geography are not associated with statistically significant differences in response. The incentive level has a statistically significant impact only at the final stage of response (completing the data collection), although there are large differences in response for incentive groups at other stages. The SNAP frame has the higher response rates at every stage of response except the last, though not statistically significant. Differences between SNAP participants and other target survey groups were not statistically significant, but there are potentially important differences in response between groups. For example, the lowest income group is 8 percentage points more likely to agree to the study, compared with the higher income group, but 11 percentages points less likely to complete (from among those that start).

Timing during the data collection period was important in four respects:

1. The screener contact rate declined throughout the data collection period, as expected. This is because the hard-to-reach cases remain in the pool for longest.

Table 3. Percent of Households Responding at Each Stage, By Frame Characteristics and Timing

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[2] For the full-scale survey, we will compare respondent characteristics with national estimates from the American Community.

	Screener contact		Screener cooperation (Among contacted)		Agree to participate (Among screened)		Start data collection (Among agreed)		Complete data collection (Among started)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Primary Sampling Unit										
Atlantic	92.2	7.8	69.1	30.9	78.3	† 21.7	76.2	† 23.8	87.0	13.0
Essex	85.3	14.7	72.3	27.7	91.6	8.4	87.0	13.0	92.8	7.2
Secondary Sampling Unit										
A-1	87.6	† 12.4	82.8	† 17.2	82.9	† 17.1	80.6	† 19.4	78.0	† 22.0
A-2	93.2	6.8	74.1	25.9	75.0	25.0	90.2	9.8	76.8	23.2
A-3	87.0	13.0	70.4	29.6	69.8	30.2	68.9	31.1	100.0	-
A-4	98.6	1.4	80.3	19.7	81.8	18.2	92.2	7.8	81.2	18.8
A-5	100.0	-	72.7	27.3	86.8	13.2	76.1	23.9	93.3	6.7
A-6	96.4	3.6	61.1	38.9	77.4	22.6	73.1	26.9	76.9	23.1
A-7	88.8	11.2	69.7	30.3	82.1	17.9	73.4	26.6	86.7	13.3
A-8	90.6	9.4	67.9	32.1	75.0	25.0	73.6	26.4	97.2	2.8
E-1	72.4	27.6	69.1	30.9	86.4	13.6	93.8	6.2	80.4	19.6
E-2	79.0	21.0	76.2	23.8	97.6	2.4	82.0	18.0	89.0	11.0
E-3	81.4	18.6	75.9	24.1	100.0	-	86.9	13.1	96.4	3.6
E-4	79.4	20.6	64.0	36.0	97.9	2.1	86.5	13.5	87.4	12.6
E-5	90.0	10.0	77.3	22.7	92.9	7.1	93.8	6.2	94.6	5.4
E-6	82.3	17.7	72.8	27.2	96.1	3.9	93.5	6.5	96.8	3.2
E-7	80.6	19.4	70.1	29.9	98.5	1.5	83.5	16.5	89.5	10.5
E-8	93.7	6.3	74.0	26.0	81.1	18.9	84.1	15.9	98.1	1.9
Field team										
Team#1	95.4	† 4.6	66.5	33.5	82.1	† 17.9	90.8	† 9.2	82.6	17.4
Team#2	92.2	7.8	68.2	31.8	77.2	22.8	73.1	26.9	87.9	12.1
Team#3	80.0	20.0	78.9	21.1	96.4	3.6	90.6	9.4	92.4	7.6
Team#4	87.0	13.0	71.0	29.0	88.2	11.8	83.3	16.7	93.7	6.3
Incentive level										
Low	88.8	11.2	68.6	31.4	82.3	17.7	80.1	19.9	87.5	† 12.5
High	88.1	11.9	72.9	27.1	88.2	11.8	83.9	16.1	92.6	7.4
Sampling Frame										
ABS	87.9	12.1	69.7	30.3	83.8	16.2	81.8	18.2	90.8	9.2
SNAP	91.2	8.8	76.6	23.4	92.2	7.8	84.0	16.0	89.2	10.8
Target Survey Groups										
SNAP households	-	-	-	-	91.6	8.4	85.3	14.7	91.4	8.6
Income < 100% FPL	-	-	-	-	88.3	11.7	78.7	21.3	81.9	18.1
Income 100-185	-	-	-	-	80.0	20.0	81.5	18.5	93.5	6.5
Data Collection Period										
Week #1-4	100.0	-	77.5	22.5	82.0	18.0	90.7	9.3	90.4	9.6
Week #5-8	99.7	† 0.3	67.3	32.7	88.2	11.8	68.4	31.6	91.4	8.6
Week #9-12	90.6	9.4	64.8	35.2	81.6	18.4	82.6	17.4	88.0	12.0
Week #13-16	61.6	38.4	80.9	19.1	93.4	6.6	92.0	8.0	93.2	6.8
Weekday of final screener status										
Sunday	91.3	† 8.7	73.5	26.5	83.5	16.5	89.0	† 11.0	85.2	14.8
Monday	89.7	10.3	76.4	23.6	85.2	14.8	86.7	13.3	91.2	8.8
Tuesday	90.0	10.0	69.5	30.5	91.3	8.7	73.6	26.4	85.3	14.7
Wednesday	83.9	16.1	70.4	29.6	85.6	14.4	82.3	17.7	93.7	6.3
Thursday	82.1	17.9	66.2	33.8	83.0	17.0	69.3	30.7	96.9	3.1
Friday	88.0	12.0	73.2	26.8	88.2	11.8	86.8	13.2	94.8	5.2
Saturday	95.3	4.7	68.4	31.6	80.6	19.4	91.0	9.0	85.5	14.5

Note: Significant differences in distributions are noted by †. Differences are tested using chi-square tests.

2. All response rates from screener cooperation to completion rose somewhat at the end of the data collection period (not statistically significant), possibly due to reductions in field staff, with only the most productive interviewers remaining.

3. Day of the week was significantly related to screener contact rates, with the highest contact rates on the weekend.

4. The day of the week that the screener was conducted was significantly related to the likelihood of starting a data collection week. Screeners conducted on Wednesday and Thursdays were least likely to result in data collection; screeners conducted on the weekend were most likely to result in data collection.

For the most part, however, this first method of analyzing nonresponse provides little information about potential bias because sample frame characteristics are limited to geography and timing.

Multivariate Analysis to Identify Characteristics of Cases Associated with Nonresponse

Multivariate analysis of response was implemented using unweighted logistic regression. At each stage of response, we modeled the likelihood of response as a function of the characteristics available for both respondents and nonrespondents (covariates). We examined marginal rates of response at each stage to make use of additional information available for both respondents and nonrespondents at each stage.

The tables presented in this section include information for (a) odds ratios, (b) statistical tests of individual predictors (Wald chi-square tests), (c) overall model evaluation (Likelihood ratio, Score, and Wald tests), and (d) goodness-of-fit statistics (Hosmer-Lemeshow chi-square test). Statistically significant predictors are denoted by asterisks on the odds ratio for that predictor.[3] For the first two stages of response, covariates are limited to the characteristics included in Table 3. For stages 3 through 5 (agreement to participate, starting the week, and completing the week), additional covariates are taken from the screener and the first household interview. All of the tables presented in this section include multiple specifications to show the sensitivity of results to alternative sets of included variables. For the most part, we focus attention on statistically significant results, however, we also observe odds ratios with large magnitude that persist across model specifications and are not statistically significant. This is likely due to small sample size and limited power.

Table 4 presents the results of logistic regressions for the likelihood of response at every stage, as a function of sample frame characteristics and timing of contact. We present each model with and

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[3] Good model fit is indicated by Likelihood ratio, Score, and Wald tests with p-values < .05; individual predictors are identified in the table as statistically significant if the p-value for the Wald chi-square statistic is <.05; the Hosmer-Lemeshow chi-square test is insignificant at p-value>.05 indicating that we cannot reject the null hypothesis that the model fit to the data well.

Table 4. Logistic Regression Analysis of Response at Each Stage of Contact (Odds Ratios in Table)

Covariate	Screener contact		Screener cooperation		Agree to participate	Start data collection	Complete data collection
	#1	#2	#1	#2			
Sample frame characteristics							
Atlantic County	1.55	1.07					
SSU = A-1			1.99	2.02	0.72	0.34	0.39
SSU = A-2			1.22	1.24	0.54	0.56	0.37
SSU = A-3			1.44	1.51	0.39	0.60	1.08E6
SSU = A-4			1.91	1.98	0.80	0.75	0.66
SSU = A-5			1.39	1.43	1.07	0.25	2.56
SSU = A-6			0.83	0.87	0.83	0.34	1.05
SSU = A-7			1.16	1.23	0.81	0.61	1.26
SSU = A-8			1.26	1.33	0.48	0.93	6.83
SSU = E-1			0.33*	0.35*	0.15*	2.16	0.09
SSU = E-2			0.53	0.55	1.60	0.90	0.52
SSU = E-3			0.88	0.89	1.06E6	1.23	1.59
SSU = E-4			0.50*	0.49*	5.39	1.06	0.41
SSU = E-5			0.55	0.57	0.58	1.37	0.76
SSU = E-6			0.40*	0.43*	0.72	1.53	1.93
SSU = E-7			0.68	0.70	9.36*	0.78	0.58
Team#1	2.65*	0.83	0.61	0.59	1.34	2.62	0.44
Team#2	1.37	1.10	0.64	0.61	1.13	0.81	0.24
Team#3	0.77	0.95	2.89*	2.88*	8.88*	0.96	1.51
High incentive level	0.96	0.95	1.00	1.01	1.54	1.23	1.98*
Multiple Book						1.16	0.85
SNAP frame	1.68*	0.81	1.27	1.20	1.76	0.65	0.58
Survey Strata							
SNAP household					1.33	1.57	0.99
Very low income HH					1.36	1.10	0.44
Timing of screener contact							
Week #5-8			0.63*	0.64*	2.32*	0.23*	1.31
Week #9-12			0.56*	0.62*	1.57	0.42*	1.43
Week #13-16			0.91	1.09	1.57	1.16	5.73*
Sunday	0.53	0.31*	1.33	1.32	1.08	0.95	1.06
Monday	0.60	0.67	1.55	1.54	1.22	0.92	1.62
Tuesday	0.54	0.50	1.27	1.26	2.30	0.40	1.18
Wednesday	0.22*	0.32*	1.28	1.29	1.60	0.32*	2.96
Thursday	0.21*	0.52	0.92	0.94	1.29	0.29*	3.26
Friday	0.43*	0.59	1.10	1.12	1.88	0.45	4.41
# Contact attempts		0.78*		0.98	1.01	1.04	0.93
Goodness of fit tests							
Likelihood Ratio test	95.25*	565.91*	67.06*	68.48*	92.81*	68.58*	56.39*
Score test	92.58*	654.60*	64.58*	65.75*	75.71*	66.97*	53.06*
Wald test	84.03*	287.36*	61.17*	62.23*	52.40*	56.25*	39.02
H-L test	18.77*	10.51	3.94	11.06	10.25	15.04	7.03

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies except the number of contact attempts. Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions are N=1610 (screener contact), N=1334 (screener cooperation), N=732 (agree to participate), N=556 (start data collection), and N=461 (complete data collection). Each column after the first includes analysis of the conditional rate of response, among those responding at the prior stage.

without the "number of attempts at contact" (model 1 does not include number of attempts; model 2 includes number of attempts) since this measure is likely to be correlated with observed and unobserved household characteristics. Table 3 indicates that geography and timing during the field period affect screener contact. However, because of cells with perfect response (SSU A-5 and Weeks #1-4) we include only a PSU indicator and do not control for timing in the models of screener contact. Day of the week is important at the first stage, with Saturday (the left-out group) providing the best opportunity for contact. Households screened on Wednesday and Thursday are the least likely to start data collection. After controlling for other factors, the higher incentive has a statistically significant impact only on the final stage of response (probability of completing the data collection week).

Tables 5-8 present alternative specifications of logistic regressions for the marginal response at stages 3-5 (agree to the study, start the data collection week, complete the data collection). Since SSUs were not significantly related to response in stages 3-5 in Table 4, SSUs are not included in subsequent analyses.[4] In all tables, Model 1 replicates Table 4 without SSUs, and subsequent models include increasing numbers of covariates.

Table 5 presents logistic regressions for "agree to participate." Models 2-6 provide consistent evidence that response was lower in Atlantic county and higher among (a) the higher incentive group, (b) households reporting receipt of the study letter, and (c) Spanish language respondents. Study letters were mailed to all sampled addresses and respondents were asked, during the screener, if they received the letter. Receipt of the letter may proxy for household motivation to participate, however, we are unable to control for other characteristics to test this hypothesis at this stage of response. Spanish language respondents may also proxy for the strength of bilingual interviewers who had more experience on average.

Table 6 presents logistic regressions for "agree to participate and starting the data collection week" versus "agreeing and not starting the data collection week." At this stage response was lower in Atlantic county and among single-person households; higher among the higher incentive group, those that received the letter, and Spanish language households; and varied by interviewing team.

Table 7 presents logistic regressions for "start the data collection week" among all those who agree to participate. At this stage of response none of the sample frame characteristics are significant. Timing of the screener had an impact on the probability of starting the data collection week: response was lowest in weeks 5-8 (possibly due to the break in activities to conduct the 50-case analysis); response was also lowest for screeners conducted in the middle of the week (relative to Saturday). None of the available household characteristics were significantly related to the likelihood of beginning the data collection week, among those that agreed to participate.

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[4] Interviewing team is correlated with geography. Two teams were assigned to each PSU (team 1 and 2 to Atlantic; Team 3 and 4 to Essex). Teams 1 and 4 worked across PSUs but mostly in their own PSU. Each team in a PSU covered all SSUs in the PSU but there was some concentration of effort leading to correlation of teams and SSU, especially as we move across the stages of response to smaller samples.

Table 5. Logistic Regression Analysis – Probability of Agreeing to Participate at Screening Among those Screened and Eligible (Odds Ratios in Table)

Covariate	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sample frame characteristics						
Atlantic County	0.37	0.21*	0.19*	0.19*	0.17*	0.17*
Team#1	1.16	1.94	2.06	2.06	2.19	2.21
Team#2	0.88	1.38	1.54	1.52	1.73	1.73
Team#3	2.11	2.53	2.47	2.44	2.53	2.52
High incentive level	1.52	1.74*	1.68*	1.70*	1.71*	1.74*
SNAP frame	1.71	1.90	1.92	1.85	1.83	1.77
Survey Strata						
SNAP household	1.45	1.30	1.30	1.38	1.09	1.14
Very low income HH	1.59	1.28	1.20	1.20	1.14	1.13
Timing of screener contact						
Week #5-8	2.03*	2.32*	1.98	1.94	1.99	1.96
Week #9-12	1.18	1.21	1.03	1.01	1.09	1.06
Week #13-16	1.38	1.18	1.08	1.06	0.97	0.95
Sunday	1.11	0.81	0.89	0.84	0.91	0.85
Monday	1.24	1.17	1.08	1.00	1.11	1.03
Tuesday	2.36	2.05	2.09	1.94	2.12	1.97
Wednesday	1.65	1.60	1.56	1.44	1.61	1.48
Thursday	1.25	1.16	1.08	1.01	1.04	0.96
Friday	1.72	1.87	1.73	1.61	1.82	1.70
# Contact attempts	1.01	1.02	1.02	1.02	1.03	1.03
Screener responses						
Received advance study letter		2.19*	2.10*	2.07*	2.20*	2.17*
Addtl units at this address		1.16	1.32	1.48	1.31	1.50
Language, Spanish		13.01*	13.75*	14.21*	16.66*	16.97*
HH size = 1			0.63	0.64	0.55	0.57
HH size = 2			1.56	1.56	1.36	1.36
HH size = 3			1.82	1.79	1.80	1.80
# Dinners prepared per week				0.99		0.99
Food shopping more than once a wk					0.62	0.57
Food shopping weekly					0.48	0.45
Food shopping bi-weekly					1.28	1.19
Goodness of fit tests						
Likelihood Ratio test	62.41*	97.69*	107.84*	105.88*	116.88*	115.02*
Score test	58.08*	85.60*	96.70*	94.98*	104.23*	102.59*
Wald test	49.81*	69.84*	77.16*	76.05*	82.55*	81.54*
Hosmer-Lemeshow test	10.75	6.11	17.60*	19.21*	5.91	5.57

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies except where indicated by "#." Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=732.

Table 6. Logistic Regression Analysis – Probability of Agreeing and Starting Data Collection (HH1 complete) versus Not Agreeing (Refusal Short Form complete) (Odds Ratios in Table)

Covariate	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sample frame characteristics						
Atlantic County	0.05*		0.15*			
Team#1	8.10*	0.60		0.61	0.56	0.68
Team#2	5.01*	0.35*		0.33*	0.27*	0.38*
Team#3	3.77*	5.16*		4.78*	4.26*	4.71*
High incentive level	2.36*	2.36*	2.31*	2.42*	2.38*	2.28*
SNAP frame	2.19	1.73	1.73	1.63	1.71	1.60
Survey Strata						
SNAP household	1.88	1.72	2.18*	1.77	2.08	2.01
Very low income HH	1.15	1.15	1.25	1.12	1.18	1.64
Timing of screener contact						
Week #5-8	2.11	1.98	1.67	1.96	1.92	1.70
Week #9-12	0.89	0.93	0.77	0.95	0.95	1.06
Week #13-16	1.19	1.26	1.02	1.09	1.31	1.48
Sunday	0.95	1.11	0.91	0.97	0.93	1.60
Monday	1.29	1.33	1.31	1.22	1.35	1.68
Tuesday	1.58	1.56	1.50	1.37	1.30	2.43
Wednesday	1.90	1.65	1.70	1.54	1.59	1.98
Thursday	1.16	1.19	1.16	1.03	1.01	1.42
Friday	1.82	1.94	1.93	1.74	1.65	2.01
# Contact attempts	1.02	1.02	1.02	1.02	1.02	1.03
Screener responses						
Received advance study letter	2.48*	2.60*	2.28*	2.77*	2.85*	2.77*
HH size = 1	0.54	0.54*	0.53*	0.51*	0.58	
Language, Spanish	26.99*	20.40*	24.00*	30.54*	4.23E6	
# Dinners prepared per week				0.95	0.94	
Food shopping more than once a wk				0.75	0.80	
Food shopping weekly				0.53	0.56	
Food shopping bi-weekly				1.51	1.69	
Short form / HH1 responses						
Usual store is supermarket					1.73	1.32
Food bank was visited in past 30 dys					1.08	1.10
Any children						1.45
Goodness of fit tests						
Likelihood Ratio test	121.34*	108.36*	110.33*	115.83*	127.60*	86.54*
Score test	102.33*	91.95*	96.87*	98.53*	103.89*	75.86*
Wald test	73.28*	67.83*	72.24*	72.11*	69.43*	58.62*
Hosmer-Lemeshow test	12.76	12.02	9.21	9.20	3.88	8.90

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies except where indicated by "#." Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=556.

Table 7. Logistic Regression Analysis – Probability of Starting Data Collection, Among those Agreeing to Participate (Odds Ratios in Table)

Covariate	Model 3	Model 4	Model 5	Model 6
Sample frame characteristics				
Atlantic County	0.33	0.33	0.32	0.32
Team#1	3.99	4.02	4.01	4.03
Team#2	1.34	1.35	1.35	1.30
Team#3	1.23	1.23	1.20	1.18
High incentive level	1.26	1.26	1.27	1.27
Multiple Book protocol	1.15	1.15	1.14	1.17
SNAP frame	0.69	0.70	0.68	0.70
Survey Strata				
SNAP household	1.62	1.62	1.58	1.64
Very low income HH	1.02	1.02	1.01	1.01
Timing of screener contact				
Week #5-8	0.26*	0.27*	0.27*	0.27*
Week #9-12	0.46	0.46	0.45*	0.45*
Week #13-16	1.03	1.03	1.04	1.03
Sunday	0.78	0.77	0.73	0.73
Monday	0.86	0.85	0.84	0.83
Tuesday	0.37*	0.37*	0.36*	0.37*
Wednesday	0.31*	0.31*	0.31*	0.30*
Thursday	0.28*	0.28*	0.28*	0.28*
Friday	0.48	0.48	0.48	0.48
# Contact attempts	1.04	1.04	1.04	1.04
Screener responses				
HH size = 1	1.10	1.10	1.06	1.12
Language, Spanish	1.17	1.20	1.18	1.17
# Dinners prepared per week		0.99		0.99
Food shopping more than once a wk				1.39
Food shopping weekly				1.05
Food shopping bi-weekly				1.03
Screener respondent = meal planner or food shopper			2.07	2.00
Goodness of fit tests				
Likelihood Ratio test	61.03*	61.04*	62.34*	63.45*
Score test	59.98*	59.93*	61.33*	61.84*
Wald test	52.48*	52.44*	53.53*	53.99*
Hosmer-Lemeshow test	8.00	6.21	6.06	5.03

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies except where indicated by "#." Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=556.

Table 8 presents logistic regressions for "completing the data collection week" among those that start the week. At this stage of response, geography and interviewing team were not significant and they were dropped from the models. The high incentive resulted in a near doubling of response at this stage, and the impact of the incentive is robust to alternative model specifications. Timing of the screener (and thus start of data collection) has a significant impact, with greater completion rates for

households that start data collection close to the weekend. Household size reduces the probability of completion. The impact of Spanish language at this stage is negative (less likely to complete), in contrast to the positive impact on response at earlier stages, however it is not robust to other included variables, casting doubt on the role of Spanish language at other response stages (where variables for inclusion in the model are not available). The impact of Spanish language disappears when we control for age and education, with response lower among the elderly and less educated (age greater than 60 is not statistically significant, nor were other education cutoffs).

Table 8. Logistic Regression Analysis – Probability of Completing Data Collection, Among those Starting Data Collection (Odds Ratios in Table)

Covariate	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Sample frame characteristics						
High incentive level	1.97*	1.94*	1.94*	1.91*	1.99*	1.98*
SNAP frame	0.93	0.96	0.96	0.99	1.01	1.05
Survey Strata						
SNAP household	0.97	0.94	0.83	0.79	0.89	0.86
Very low income HH	0.52	0.51	0.55	0.53	0.64	0.62
Timing of screener contact						
Sunday	0.83	0.87	1.09	1.15	1.39	1.45
Monday	1.38	1.40	1.85	1.91	1.96	2.01
Tuesday	1.24	1.27	1.62	1.68	1.61	1.64
Wednesday	2.15	2.22	2.74	2.89	3.17	3.30*
Thursday	3.12	3.20	3.31	3.42	3.81	3.86
Friday	3.42	3.46	4.29*	4.31*	4.46*	4.42*
Screener responses						
Received advance study letter	1.23		1.29		1.23	
Household size					0.78*	0.78*
Language, Spanish			0.37*	0.37*	1.01	1.01
Respondent characteristics (from HH1)						
Female			1.77	1.80	1.96	1.99
Age < 30			0.99	0.96	0.92	0.90
Age > 70			0.22*	0.23*	0.12*	0.13*
Race = Black					1.56	1.55
Married					1.30	1.31
Education less than H.S.					0.31*	0.31*
Employed					0.51	0.51
Goodness of fit tests						
Likelihood Ratio test	18.40	17.99	32.27*	31.71*	52.01*	51.65*
Score test	18.25	17.86	34.72*	34.13*	57.07*	56.76*
Wald test	16.79	16.45	29.48*	29.07*	43.51*	43.54*
Hosmer-Lemeshow test	6.45	9.40	5.40	11.02	3.08	7.18

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies. Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=461.

Across all stages of contact, the main predictors of response are: geography at the early stages (Atlantic City households were hard to contact); timing of contact by day of week (for initial contact and likelihood of starting and completing the week); incentive level (for every stage after screener cooperation); receipt of the advance letter (this may be a proxy for interest in the study); and Spanish language (this may proxy for more experienced interviewers or other unmeasured household characteristics). To the extent that Spanish language proxies for less education, we may not be worried about response bias (positive) at the point of starting the data collection week because this is a group that we consider hard to reach. The lower completion rate among the elderly and less education is a cause for concern (Table 8) and suggests that additional field interviewer follow-up during the data collection week may be warranted for these groups of respondents.

It is worth noting that the screener questions we used to measure response bias (short form for respondents who do not agree to participate) are not significantly related to response. However, those questions were completed by only half of eligible households who refused to participate, and were not completed by any of the respondents who initially agreed and refused at the time of the first household interview.

Easy/Early Completed Cases Compared with Difficult/Later Completed Cases

The final method that we used to examine nonresponse bias is a comparison of the characteristics of easy/early completed cases with the characteristics of difficult/later completed cases. This method assumes that nonrespondents are similar to "hard to reach" respondents.

We have two options for defining easy/early cases: (a) elapsed days from sample release to recruitment into the study (or completed screener), or (b) number of attempts at contact prior to complete screener. Table 9 shows the schedule of sample release to the field. Most sample was released within the first two weeks of the field period and interviewers were allowed to work cases in the most efficient manner to conserve travel time. For this reason, elapsed time since sample release is not a good measure for identifying easy/early cases.[5]

The number of attempts at contact prior to completing the screener provides a measure of "easy" cases that is consistent across cases (this measure does not count idle time when the case was not being worked). For the full-scale study we plan to work all cases through 8 attempts in phase 1. Cases not contacted in phase 1 will form the sampling frame for phase 2, with a sample of the hard-to-reach cases worked through additional attempts. In the field test, 75 percent of completed cases were contacted with 8 or fewer attempts; 83 percent were contacted with 10 or fewer attempts; and 90 percent were contacted with 13 or fewer attempts.

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[5] The distribution of completed cases by elapsed time since release was: 30 percent within 16 days of release, 50 percent within 43 days of release, and 75 percent within 64 days of release, 90 percent within 80 days (maximum days in the field was 102 days).

Table 9. Timing of Sample Release

Release	Replicates	Number of sampled addresses	Mailing date for advance letters	Date sent to field	Comments
1	1-9	1,223	January 14	January 31	12 of 16 SSUs
1	1-9	423	January 23	January 31	3 SSU
1	1-9	151	February 8	February 14	1 SSU
2	10-15	1,104	February 8	February 14	SNAP & ABS frames released. On March 13, we pulled back all non-SNAP cases leaving 118 SNAP addresses from release 2.
1	From listing	55	March 23	March 30	
3	16-20	102	April 9	April 14	SNAP only
Total in field	1-18	2,017			

Table 10 shows the results of logistic regression with three definitions of the "easy" cases (dependent variable). Among completed cases, the probability of a successful contact with eight or fewer attempts is higher for Hispanic households and lower for single person households and employed respondents. The odds ratios for female, elderly (age > 70), and education less than high school all indicate that these respondents are easy to contact, but these characteristics are not statistically significant and dissipate somewhat by 10 attempts. These results suggest that the planned cutoff for phase 1 should potentially be raised from 8 to 10 attempts; however, the implementation of two-phase sampling is being done in conjunction with other changes to screening procedures (requiring a certain number of attempts in different time periods) so that field test results do not necessarily provide a reliable guide for the phase 1 cutoff.

No household characteristics are statistically significant in predicting "easy" cases defined by 10 or fewer attempts for a successful contact, although the odds ratio for Hispanic is still large. There were only 22 complete cases with Hispanic households (from among 412 completed cases) and all Hispanic cases were completed with 13 or fewer attempts, so that covariate is not included in the final model. The 10 percent of completed cases requiring more than 13 attempts had a disproportionate percentage of married respondents, as reflected in the final column of Table 10.

Table 10. Logistic Regression Analysis – Probability of Completing With Few Attempts (Odds Ratios in Table)

Covariate	Easy ≤ 8 attempts	Easy ≤ 10 attempts	Easy ≤ 13 attempts
Sample frame characteristics			
Team#1	2.27	6.19*	6.70
Team#2	0.78	0.57	0.94
Team#3	0.57	0.58	0.57
High incentive level	0.96	1.24	1.40
SNAP frame	1.62	1.43	1.81
Survey Strata			
SNAP household	0.69	1.06	0.76
Very low income HH	2.04	2.02	1.74
Screener responses			
Received advance study letter	1.07	1.32	1.15
HH size = 1	0.36*	0.43	0.36
HH size = 2	0.91	1.49	1.40
HH size = 3	1.30	1.18	1.14
Language, Spanish	0.61	0.66	0.54
Respondent characteristics (from HH1)			
Age < 30	0.79	0.98	0.61
Female	1.76	1.29	1.22
Age > 70	3.15	1.92	1.10
Hispanic	8.60*	7.10	
Race = Black	0.65	0.60	
Married	0.88	0.79	0.40*
Education less than H.S.	1.43	1.85	1.57
Employed	0.59*	0.88	0.59
Goodness of fit tests			
Likelihood Ratio test	50.73*	40.27*	29.69*
Score test	45.70*	34.29*	27.27
Wald test	39.50*	28.68	22.90
Hosmer-Lemeshow test	15.12	6.40	10.31

Note: Logistic regressions estimate the likelihood of completing data collection with fewer attempts (as defined in column headers) All covariates are zero-one dummies. Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=411.

Impact of Higher Incentive on Nonresponse Bias

The field test included an experimental test of the impact of incentive on response. Evaluation of the impact of the higher incentive level on nonresponse bias is limited because: (1) the incentive level for the main data collection was not known to the respondent before they completed the screener, thus the incentive level could only affect response among those who completed the screener and were eligible for the main data collection; (2) household and respondent characteristics

that are useful for non-response bias analysis were not measured until **the first household interview, after the respondent agreed to participate in the study.** As discussed above, the incentive level has a statistically significant impact at multiple stages of response. Tables 3 and 4 indicate that the higher incentive significantly affects response only at the last stage(completing the data collection). In all tables after Table 4, we control for household characteristics and find that the higher incentive significantly impacts the probability of agreeing to participate (Table 5), agreeing to participate and starting the data collection week (Table 6), and completing the data collection week (Table 8). Although it is not shown in the tables, we note that the increased response for the higher incentive level was consistent across sites and across subgroups noted in the tables (language, whether black and whether education was more or less than high school). This section examines the impact of the higher incentive on nonresponse bias. As recommended by OMB, we use the following methods:

1. Multivariate modeling of response using respondent and nonrespondent frame variables to determine if nonresponse bias exists and varies by incentive level (Guideline 3.2.9).

2. Examination of item nonresponse to determine if it is random, or varies by incentive level (Guideline 3.2.10).

These two methods are used to test the hypothesis that the higher incentive, by bringing more people into the study through increased response, also moderates response bias.

Impact of Incentives on Nonresponse Bias – Evidence from Frame/Screener Variables

We reran logistic regression models from Tables 5-8 separately for subgroups defined by incentive level to determine if nonresponse bias varies by incentive level. These results are presented in Tables 11 and 12. For each stage of response, these tables include three columns with results for the full sample, low incentive group, and high incentive group.

The first three columns of Table 11 present logistic regressions for "agree to participate." Among the full sample, response was lower in Atlantic county and higher among (a) the higher incentive group, (b) households reporting receipt of the study letter, and (c) Spanish language respondents. Nonresponse bias associated with receipt of the study letter and Spanish language are moderated by the higher incentive (Odds ratios on these variables are statistically significant for the low incentive group, but reduced in magnitude and not significant for the high incentive group.) In addition, although the odds ratio for additional units at address was not statistically significant for either incentive group it is substantially smaller for the high incentive group than for the low incentive group.

The last three columns of Table 11 present logistic regressions for "agree to participate and start the data collection week" versus "agree and do not starting the data collection week." Among the full sample, response was lower in Atlantic county and among single-person households; higher among the higher incentive group, SNAP households, those that received the letter, and Spanish language households. Nonresponse bias associated with receipt of the study letter, household size, and Spanish language are moderated by the higher incentive (these characteristics are not statistically significant for the high incentive group and the odds ratio is close to one). The greater propensity to respond among SNAP households is even stronger with the high incentive; however, this is not a concern because the SNAP group will often be analyzed separately, and when it is combined with other groups the relative sizes of those groups can be controlled by post-stratifying the weights.

Table 11. Logistic Regression Analysis – Probability of Agreeing to Participate, and Probability of Agreeing and Starting the Study: Overall and by Incentive Group (Odds Ratios in Table)

Covariate	Agree to Participate at Screening (Table 5, Model2)			Agree and Start Data Collection (Table 6, Model 3)		
	All	Low	High	All	Low	High
Sample frame characteristics						
Atlantic County	0.21*	0.23	0.20	0.15*	0.11*	0.18*
Team#1	1.94	2.18	1.38			
Team#2	1.38	1.74	0.94			
Team#3	2.53	8.62*	0.77			
High incentive level	1.74*			2.31*		
SNAP frame	1.90	1.92	1.69	1.73	1.19	2.84
Survey Strata						
SNAP household	1.30	0.89	2.42	2.18*	1.99	3.38*
Very low income HH	1.28	0.86	2.31	1.25	1.08	1.75
Timing of screener contact						
Week #5-8	2.32*	1.92	5.10*	1.67	1.05	4.29*
Week #9-12	1.21	0.82	2.24	0.77	0.33	2.05
Week #13-16	1.18	0.87	1.91	1.02	0.66	1.91
Sunday	0.81	0.87	0.52	0.91	0.89	0.61
Monday	1.17	1.25	0.94	1.31	2.03	0.73
Tuesday	2.05	1.76	2.11	1.50	1.60	1.19
Wednesday	1.60	0.75	3.51	1.70	0.76	4.79*
Thursday	1.16	1.02	1.39	1.16	1.00	1.24
Friday	1.87	1.90	1.52	1.93	1.90	1.54
# Contact attempts	1.02	1.05	0.99	1.02	1.03	0.98
Screener responses						
Received advance study letter	2.19*	2.85*	1.87	2.28*	3.33*	1.85
Addtl units at address	1.16	3.33	0.64			
HH size = 1				0.53*	0.36*	0.81
Language, Spanish	13.01*	19.67*	8.11	24.00*	17.60*	--
Goodness of fit tests						
Likelihood Ratio test	97.69*	66.71*	47.28*	110.33*	69.56*	53.83*
Score test	85.60*	54.03*	43.72*	96.87*	59.59*	47.02*
Wald test	69.84*	40.48*	35.74*	72.24*	42.65*	31.39*
Hosmer-Lemeshow test	6.11	2.18	3.97	9.21	4.52	3.04

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies. Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05. Number of observations included in regressions is N=461.

Table 12 presents logistic regressions for "starting the data collection week" among all those who agree to participate. At this stage of response none of the sample frame characteristics are significant, but timing of the screener had an impact on the probability of starting the data collection week. The last three columns of Table 12 present logistic regression for the probability of completing data collection. Among the full sample, completing data collection is less likely for (1) single-person households, (2) less educated respondents, and (3) elderly respondents. The estimates for single-person and less educated are not significant among the high incentive group. It appears that nonresponse bias associated with elderly is stronger in the high incentive group. However, the

small sample sizes at this stage of response provide unreliable estimates. Of the 461 households starting data collection, only 19 were elderly and 14 of the 19 completed the data collection week (74%); 8 of 10 elderly were completes in the low incentive group and 6 of 9 elderly were completes in the high incentive group.

Impact of Incentives on Adherence to Survey Protocols

A key indicator of respondent adherence to survey protocols is whether respondents save receipts. Respondents are asked to save receipts for purchases; no receipt is expected for free food and school meals. A significant percentage of acquisitions were acquisitions for which we do not expect a receipt.

The high incentive group was more likely to report FAH **purchases** for which receipts could be saved and less likely to report FAFH **purchases** for which receipts could be saved (Table 13). Examination of adherence to protocols is complicated because the probability of saving a receipt is conditional on having made purchases for which receipts are available. A proper modeling of this conditional relationship is beyond the scope of this memo. For our examination of nonresponse, we use multivariate logistic regression to examine (a) the impact of the incentive on the probability of reporting FAH and FAFH purchases, and (b) the impact of the incentive on the probability of saving receipts, among households with any purchases.

The higher incentive was associated with a higher probability of reporting FAH purchase (odds ratio is 1.76 and statistically significant). The higher incentive did not have a statistically significant impact on the probability of reporting FAFH purchases, saving FAH (conditional on making a purchase), or saving FAFH receipts (conditional on making a purchase).[6]

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[6] The multivariate logistic regressions controlled for incentive group, SNAP frame, SNAP household, very low income HH, HH size, Spanish language, Age< 30, Female, Age > 70, Race = Black, Married, Education less than HS, and employed. Only the following were statistically significant: very low income households were less likely to report FAH purchase (odds ratio =.28), respondents with education less than HS were less likely to report FAFH acquisitions (odds ratio=.37); lower education was associated with a lower probability of saving FAH receipts (odds ratio=.22); SNAP frame was associated with a lower probability of saving FAH receipts (odds ratio=.50).

Table 12. Logistic Regression Analysis – Probability of Starting Data Collection (Among those Agreeing) and Probability of Completing Data Collection: Overall and by Incentive Group (Odds Ratios in Table)

Covariate	Probability of Starting (among those that agree) (Table 7, Model 5)			Probability of Completing Data Collection (Table 8, Model 5)		
	All	Low	High	All	Low	High
Sample frame characteristics						
Atlantic County	0.32	0.83	0.09*			
Team#1	4.01	5.26	8.38*			
Team#2	1.35	0.37	5.73			
Team#3	1.20	1.42	1.05			
High incentive level	1.27			1.99*		
Multiple Book protocol	1.14	0.63	1.84			
SNAP frame	0.68	0.28*	1.51	1.01	1.14	0.94
Survey Strata						
SNAP household	1.58	1.87	1.10	0.89	1.64	0.36
Very low income HH	1.01	1.20	0.80	0.64	0.70	0.39
Timing of screener contact						
Week #5-8	0.27*	0.45	0.15*			
Week #9-12	0.45*	0.52	0.48			
Week #13-16	1.04	6.13	0.38			
Sunday	0.73	1.37	0.28	1.39	0.87	2.70
Monday	0.84	4.58	0.19	1.96	1.29	4.28
Tuesday	0.36*	0.86	0.18*	1.61	1.78	1.35
Wednesday	0.31*	0.56	0.12*	3.17	2.01	7.95*
Thursday	0.28*	0.31	0.18	3.81	8.76	1.60
Friday	0.48	0.69	0.23	4.46*	9.00	3.08
# Contact attempts	1.04	1.05	1.05			
Received advance letter				1.23	1.70	0.95
Screener responses						
HH size = 1	1.06	1.90	0.80	0.78*	0.74*	0.80
Language, Spanish	1.18	0.79	1.92	1.01	1.05	1.28
Age < 30				0.92	0.90	0.74
Female				1.96	1.72	2.33
Age > 70				0.12*	0.32	0.02*
Race = Black				1.56	1.57	1.95
Married				1.30	0.82	2.49
Education less than H.S.				0.31*	0.30*	0.30
Employed				0.51	0.72	0.32
Screener respondent = meal planner or food shopper	2.07	9.72*	1.11			
Goodness of fit tests						
Likelihood Ratio test	62.34*	59.61*	38.47*	52.01*	32.77*	29.29
Score test	61.33*	52.82*	37.95*	57.07*	31.86*	32.47*
Wald test	53.53*	38.57*	31.46	43.51*	24.34	23.26
Hosmer-Lemeshow test	6.06	5.64	11.47	3.08	7.21	5.77

Note: Logistic regressions estimate the likelihood of response. All covariates are zero-one dummies except where indicated by "#." Table shows odds ratios. Asterisks denote odds ratios from estimates with p-value <.05.
Number of observations included in regressions is N=556.

Table 13. Percentage of Households with Saved Receipts

Covariate	Incentive level	
	Low	High
Food at Home (FAH)		
Saved any receipts		
Yes	72.4	80.2
No	9.1	7.1
No FAH purchases	18.5	12.7
Food away from home (FAFH)		
Saved any receipts		
Yes	60.8	54.5
No	20.8	22.5
No FAH purchases	18.4	23.0

Notes: Percentages are weighted. Free acquisitions such as school meals, food from food banks, and gifts from friends are not expected to have a receipt.

Summary

Key findings from the nonresponse bias analysis are:

1. **Screener contact rates varied by survey area and interviewing team.** One SSU in each county provided significantly easier contacts; Saturday was the best day for contacts; there was a pattern of SSUs/interviewing teams with the highest screener contact rates having the lowest screener cooperation rates, and vice versa.

   This finding points to a need for better management of the screening effort to achieve consistent effort across interviewing teams. Mathematica is implementing a new web browser based system for interviewers to use to track their contact attempts. The system will provide real-time reports for management and feedback to interviewers to help them reach a target number of contacts per case per time period (2 contacts per case in each of 4 time slots: weekday morning, weekday evening, weekend day, weekend evening).

2. **SNAP frame** required fewer contact attempts and had higher screener contact and screener cooperation rates, with little difference between SNAP and ABS for agreement to participate and completion rates.

3. **Receipt of the study letter** was either a critical determinant of response, or a proxy for household willingness to participate (it is possible that the letter was remembered only by those interested in the study). The potential importance of the letter indicates a need for revised procedures.

   For the full-scale study, the advance letter will be replaced by a full-color postcard so that households cannot discard the mailing without opening it. In addition, we will release smaller batches of sample to the field so that households are contacted soon after receipt of the mailing.

4. **Lowest income households** were least likely to start and complete the data collection week, however, multivariate analysis (Table 8) indicates that this is largely due to difficulty among the elderly and less educated.[7]

   This finding points to a need for field support during the data collection week for vulnerable households (elderly and less educated). During the field test, the primary method of supporting households during the data collection week was via telephone. There were few instances of field interviewer visits to households in mid-week as a follow-up to problems reported by telephone. For the full-scale study, we will revise the protocols that we provide to telephone interviewers for notifying the field. We will also setup automatic notification to field interviews if the household does not complete a food reporting call by mid-week, so that field interviewers follow-up with these households.

5. **The higher incentive** resulted in higher rates of agreement to participate (Tables 5 and 6) and higher completion rates (Table 8). In addition, household size was significantly related to response (Table 6) and completion (Table 8) indicating the value of the incentives for additional household members.

   The higher base incentive was adopted for the full-scale study, and the study will experiment with two levels of "additional household member" incentives during the first half of the study period.

6. **Timing during the week mattered.** Households were asked to begin data collection on the day following screening. Thus, if screening was done in mid-week, data collection would begin mid-week. The likelihood that households agreed to participate (Table 5) was somewhat lower if screened on the weekend (not statistically significant). The probability of starting data collection was lowest (and significant) if screened on Tues-Thurs, perhaps reflecting the fact that respondents do not have time in mid-week to review study materials and initiate this effort. The likelihood of completing the week, once started, was not related to the day that it was started.

   During the field test, interviewers were trained to try to begin the data collection right after screening whenever possible (this involved training the household and conducting the first interview). Appointments were made to come back and start the process on another day, but for fear that we would lose the household, this was not encouraged. We will examine the data in more detail (rates of response and number of acquisition by household that did and did not start immediately after screening) to determine if a shift in policy is advised so that households can begin data collection on a day of the week that is most convenient for them. Since all households provide seven days of data, food acquisitions will represent the full week, regardless of when households begin the process.

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[7] Lowest income households (income<100%FPL) were more likely to agree to the study than higher income households (income 100-185% FPL) and were on par with SNAP households for screener cooperation.

7. **Higher incentive moderates nonresponse bias.** Household characteristics that have a statistically significant relationship with response, at various stages, are either not significant among the high incentive group, or significantly moderated by the higher incentive.