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Healthy Incentives Pilot (HIP) Interim Report

Technical Appendix:

Participant Survey Weighting Methodology

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Healthy Incentives Pilot (HIP) Interim Report: Participant Survey Weighting Methodology

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1. Introduction

The Healthy Incentives Pilot (HIP) investigates the impact of making fruits and vegetables more affordable for participants in the Supplemental Nutrition Assistance Program (SNAP). The Food, Conservation, and Energy Act of 2008, also known as the 2008 Farm Bill, authorized funds for pilot projects to determine if financial incentives provided to SNAP recipients at the point of sale increase the consumption of fruits, vegetables, or other healthful foods. On the basis of this legislative authority, USDA's Food and Nutrition Service (FNS) designed HIP.

HIP is being evaluated using a rigorous research design in which SNAP participating households in Hampden County were randomly assigned to a HIP group or a non-HIP group. Within both groups, households were divided into three waves, which corresponded to when DTA enrolled households into HIP. The HIP households in the first wave began receiving the HIP incentive on November 1, 2011, the second wave on December 1, 2011, and the third wave on January 1, 2012.

Within the HIP and non-HIP groups (and within each of the three waves), individuals were randomly selected to complete data collection activities. Eligibility for the survey depended on whether or not the person was an active SNAP participant in the wave to which the person was assigned. Special monthly SNAP enrollment files provided by Hampden County (referred to as "update" files) were used to determine SNAP eligibility status in a particular month.

The overall goal of the evaluation is to assess the impact of HIP on participants' intake of fruits and vegetables, which required surveys of HIP participants and persons not participating in HIP. We collected three rounds of data on sampled participants:

- Round 1: baseline or pre-implementation data were collected prior to HIP implementation. Data collection extended from August to December 2011.
- Round 2: early post-implementation data were collected when households had been earning HIP incentives for 4-6 months. Data collection occurred between March and July 2012.
- Round 3: late post-implementation data collection occurred when households had been earning HIP incentives for 9-11 months. The data collection period began in August and was completed in November 2012.

Each round was fielded in three waves, with waves beginning about 4 weeks apart.

The evaluation design required that we develop sampling weights for analyses of the participant surveys so that findings would be representative of SNAP participating households in Hampden County. Weights were constructed at the end of each data collection round, computed for the completed cases in the sample. In general, weights were needed to compensate for differential probabilities of selection and nonresponse. This volume discusses the weighting methodology.

As discussed in the following chapters, *sampled-person weights* were constructed for analysis of the Round 1 (pre-implementation) sampled person interviews. A parallel set of *primary-shopper weights* were constructed for the primary shopper interviews. For many household-level variables, the primary-shopper weights serve as household weights, because there is only one primary shopper per household, and the corresponding questions appeared on the primary shopper portion of the survey. In

addition to the two sets of full-sample weights, a series of replicate weights using a jackknife method was constructed for variance estimation purposes.

Similarly, sampled-person and primary shopper-level weights were created for Round 2. The starting point for the construction of the Round 2 sampling weights was the set of final nonresponse-adjusted person weights developed for analysis of respondents in Round 1. The Round 2 weights serve as longitudinal weights for participants that responded to both rounds. Nonresponse adjustments were calculated to reflect the fact that nonresponse could occur either prior to or after ascertaining eligibility for the survey.

Chapter 2 discusses construction of the Round 1 participant survey weights and Chapter 3 discusses construction of the Round 2 weights.

2. Round 1 Participant Survey Weights

This chapter describes the procedures used to construct the weights for the participant survey sample respondents from Round 1 (baseline) of the Healthy Incentives Pilot (HP) evaluation surveys. In addition to the sampled-person weights and the primary-shopper weights, corresponding sets of replicate weights were constructed for variance estimation purposes.

The sampled-person weights for analysis of the Round 1 (baseline) interviews are described in Section 2.1. The primary-shopper weights for analysis of the Round 1 (baseline) interviews are described in Section 2.2. Within these two sections, we describe (1) base weights and the population that is described by the sum of the base weights, (2) nonresponse adjustment, and (3) construction of replicate weights for variance estimation.

2.1 Construction of Sampled-Person Weights

Base Weights

The base weights are theoretically unbiased weights designed to inflate the selected sample to population levels. As described in the *Healthy Incentives Pilot (HIP) Interim Report* (Bartlett, et al., 2013; see Appendix A), as part of the random assignment process, evaluation households were randomly assigned to three *waves* of data collection (corresponding to the three waves of implementation). Within each wave, households in the sampling frames were classified in 12 *blocking groups* based on location and demographic characteristics (e.g., see the numbered rows 1-12 in Exhibits 1 and 2). Within each wave and blocking group, households were randomly assigned a treatment status (HIP or non-HIP).

Within each of the three waves, the basic design would have yielded 24 possible classes or sampling strata (12 blocking groups by 2 treatment statuses). However, within a few of these classes, we needed to distinguish households according to the number of adults in the household, because some large households were sampled with certainty. This distinction slightly increased the number of sampling classes within each wave (as shown in Exhibits 1 and 2), and also led to some variation in sampling rates within the blocking groups. For brevity, we refer to the (nonempty) cells defined in Exhibits 1 and 2 as *strata* in the sections that follow.

The wave-specific base weight for person *i* in stratum *s* in wave *v* is equal to the reciprocal of the probability of selecting that individual for the sample and was computed as:

$$w_{vsi}^{base} = 1/P_{vs} \quad (1)$$

where P_{vs} = the probability of selecting persons in stratum *s* and wave *v* (*v* = 1, 2, 3). This probability generally equals the number of adults sampled in a given wave and stratum divided by the corresponding number of adults in the sampling frame.

For waves 1 and 2, all initially sampled adults were released for data collection. For wave 3, a portion of the initially-selected sample was withheld from data collection, resulting in somewhat smaller

sample sizes than for waves 1 and 2.[1] About 83 percent of the original HIP sample (703/846) and 82 percent of the non-HIP sample (693/846) were released for data collection in wave 3. As a result, the wave-specific selection probabilities for sampled persons in wave 3 were reduced by these percentages as compared with the wave-specific selection probabilities for waves 1 and 2.

Exhibits 1 and 2 summarize the wave-specific base weights by wave and stratum in the HIP and non-HIP evaluation samples, respectively. Exhibits 3 and 4 show the corresponding numbers of sampled persons in the HIP and non-HIP samples. Since the samples for the evaluation were selected independently from each of the three waves defined in the sampling frame, the sum of the base weights for a particular wave provides an estimate of the number of adults that had been preassigned to that wave at the time the sample was drawn in July 2011.

Exhibit 5 summarizes the weighted sample counts using the base weights given by formula (1) by treatment status, blocking group, and wave. These weighted counts are estimates of the SNAP population at the time of sampling; i.e., July 2011. Exhibit 6 summarizes the corresponding numbers of adults in the sampling frame (population) at the time of sampling. Note that the sum of the base weights across all three waves of data collection provides a consistent estimate of the total number of persons in the July 2011 sampling frame for a particular treatment group. For wave 3, it can be seen that the weighted counts in Exhibit 5 differ slightly from the corresponding population counts in Exhibit 6. This is due to sampling variance resulting from the fact that a random subsample of the originally-designated wave 3 sample was released for interviewing.

Exhibit 1: Person Base Weights for the Round 1 HIP Sample by Wave, Blocking Group, and Size of Household

WAVE/Blocking Group	Number of adults in household				
	1-3	4	5	6	7
WAVE 1					
1. Springfield, HH Size 1, Female Head	3.70	--	--	--	--
2. Springfield, HH Size 1, Male Head	3.70	--	--	--	--
3. Springfield, HH Size 2+, Female Head	3.61	4.00	5.00	--	--
4. Springfield, HH Size 2+, Male Head	3.40	4.00	--	--	--
5. Chicopee/Holyoke HH Size 1, Female Head	3.73	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	3.72	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	3.54	4.00	--	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	3.57	--	--	--	--
9. Hampden Balance, HH Size 1, Female Head	3.72	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	3.68	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	3.74	4.00	5.00	--	--

[1] SNAP exit rates were lower than anticipated and thus survey eligibility rates were expected to be higher than anticipated. See following section for additional details.

WAVE/Blocking Group	Number of adults in household				
	1-3	4	5	6	7
12. Hampden Balance, HH Size 2+, Male Head	3.38	--	--	--	--
WAVE 2					
1. Springfield, HH Size 1, Female Head	3.70	--	--	--	--
2. Springfield, HH Size 1, Male Head	3.71	--	--	--	--
3. Springfield, HH Size 2+, Female Head	3.53	4.00	5.00	6.00	--
4. Springfield, HH Size 2+, Male Head	3.62	4.00	--	--	--
5. Chicopee/Holyoke HH Size 1, Female Head	3.73	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	3.70	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	3.58	4.00	--	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	3.36	--	--	--	--
9. Hampden Balance, HH Size 1, Female Head	3.72	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	3.68	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	3.76	4.00	5.00	--	--
12. Hampden Balance, HH Size 2+, Male Head	3.60	--	5.00	--	--
WAVE 3 *					
1. Springfield, HH Size 1, Female Head	4.45	--	--	--	--
2. Springfield, HH Size 1, Male Head	4.45	--	--	--	--
3. Springfield, HH Size 2+, Female Head	4.38	4.81	6.02	7.22	--
4. Springfield, HH Size 2+, Male Head	4.09	4.81	--	--	--
5. Chicopee/Holyoke HH Size 1, Female Head	4.49	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	4.47	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	4.22	4.81	6.02	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	4.38	--	0.00	--	--
9. Hampden Balance, HH Size 1, Female Head	4.47	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	4.46	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	4.62	4.81	--	--	--
12. Hampden Balance, HH Size 2+, Male Head	4.06	4.81	--	--	--

*Base weights correspond to the subsample released for data collection in wave 3.

Exhibit 2: Person Base Weights for the Round 1 non-HIP Sample by Wave, Blocking Group, and Size of Household

WAVE/Blocking Group	Number of adults in household				
	1-3	4	5	6	7
WAVE 1					
1. Springfield, HH Size 1, Female Head	23.47	--	--	--	--
2. Springfield, HH Size 1, Male Head	23.50	--	--	--	--
3. Springfield, HH Size 2+, Female Head	23.14	31.38	31.38	--	--
4. Springfield, HH Size 2+, Male Head	22.32	38.50	--	--	--
5. Chicopee/Holyoke HH Size 1, Female Head	23.69	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	23.57	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	23.16	36.00	36.00	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	24.14	24.14	--	--	--
9. Hampden Balance, HH Size 1, Female Head	23.61	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	23.42	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	23.76	34.75	34.75	--	--
12. Hampden Balance, HH Size 2+, Male Head	23.27	23.27	--	--	--
WAVE 2					
1. Springfield, HH Size 1, Female Head	23.47	--	--	--	--
2. Springfield, HH Size 1, Male Head	23.50	--	--	--	--
3. Springfield, HH Size 2+, Female Head	22.77	49.17	--	--	--
4. Springfield, HH Size 2+, Male Head	23.12	12.00	--	--	--
5. Chicopee/Holyoke HH Size 1, Female Head	23.69	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	23.54	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	23.06	32.33	--	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	23.00	23.00	--	--	--
9. Hampden Balance, HH Size 1, Female Head	23.63	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	23.39	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	23.54	20.80	20.80	--	--
12. Hampden Balance, HH Size 2+, Male Head	20.76	48.00	--	--	--
WAVE 3*					
1. Springfield, HH Size 1, Female Head	28.64	--	--	--	--
2. Springfield, HH Size 1, Male Head	28.70	--	--	--	--
3. Springfield, HH Size 2+, Female Head	28.10	55.14	55.14	--	55.14
4. Springfield, HH Size 2+, Male Head	29.15	--	26.86	--	--

WAVE/Blocking Group	Number of adults in household				
	1-3	4	5	6	7
5. Chicopee/Holyoke HH Size 1, Female Head	28.92	--	--	--	--
6. Chicopee/Holyoke HH Size 1, Male Head	28.74	--	--	--	--
7. Chicopee/Holyoke HH Size 2+, Female Head	28.32	36.62	--	--	--
8. Chicopee/Holyoke HH Size 2+, Male Head	28.08	28.08	--	--	--
9. Hampden Balance, HH Size 1, Female Head	28.85	--	--	--	--
10. Hampden Balance, HH Size 1, Male Head	28.58	--	--	--	--
11. Hampden Balance, HH Size 2+, Female Head	28.12	59.41	--	--	--
12. Hampden Balance, HH Size 2+, Male Head	26.45	31.74	--	--	--

*Base weights correspond to the subsample released for data collection in wave 3.

Exhibit 3: Number of Persons Selected for the Round 1 HIP Sample by Wave, Blocking Group, and Size of Household

WAVE/Blocking Group	Number of adults in household					Total
	1-3	4	5	6	7	
WAVE 1						
1. Springfield, HH Size 1, Female Head	93	0	0	0	0	93
2. Springfield, HH Size 1, Male Head	106	0	0	0	0	106
3. Springfield, HH Size 2+, Female Head	207	7	1	0	0	215
4. Springfield, HH Size 2+, Male Head	25	2	0	0	0	27
5. Chicopee/Holyoke HH Size 1, Female Head	45	0	0	0	0	45
6. Chicopee/Holyoke HH Size 1, Male Head	46	0	0	0	0	46
7. Chicopee/Holyoke HH Size 2+, Female Head	100	3	0	0	0	103
8. Chicopee/Holyoke HH Size 2+, Male Head	14	0	0	0	0	14
9. Hampden Balance, HH Size 1, Female Head	46	0	0	0	0	46
10. Hampden Balance, HH Size 1, Male Head	41	0	0	0	0	41
11. Hampden Balance, HH Size 2+, Female Head	80	3	1	0	0	84
12. Hampden Balance, HH Size 2+, Male Head	26	0	0	0	0	26
WAVE 2						
1. Springfield, HH Size 1, Female Head	93	0	0	0	0	93
2. Springfield, HH Size 1, Male Head	106	0	0	0	0	106
3. Springfield, HH Size 2+, Female Head	209	4	1	1	0	215
4. Springfield, HH Size 2+, Male Head	26	1	0	0	0	27
5. Chicopee/Holyoke HH Size 1, Female Head	45	0	0	0	0	45
6. Chicopee/Holyoke HH Size 1, Male Head	46	0	0	0	0	46
7. Chicopee/Holyoke HH Size 2+, Female Head	100	3	0	0	0	103
8. Chicopee/Holyoke HH Size 2+, Male Head	14	0	0	0	0	14
9. Hampden Balance, HH Size 1, Female Head	46	0	0	0	0	46
10. Hampden Balance, HH Size 1, Male Head	41	0	0	0	0	41
11. Hampden Balance, HH Size 2+, Female Head	79	3	2	0	0	84
12. Hampden Balance, HH Size 2+, Male Head	25	0	1	0	0	26
WAVE 3 *						
1. Springfield, HH Size 1, Female Head	79	0	0	0	0	79
2. Springfield, HH Size 1, Male Head	90	0	0	0	0	90
3. Springfield, HH Size 2+, Female Head	172	3	1	1	0	177
4. Springfield, HH Size 2+, Male Head	20	2	0	0	0	22

WAVE/Blocking Group	Number of adults in household					Total
	1-3	4	5	6	7	
5. Chicopee/Holyoke HH Size 1, Female Head	37	0	0	0	0	37
6. Chicopee/Holyoke HH Size 1, Male Head	38	0	0	0	0	38
7. Chicopee/Holyoke HH Size 2+, Female Head	82	2	1	0	0	85
8. Chicopee/Holyoke HH Size 2+, Male Head	13	0	0	0	0	13
9. Hampden Balance, HH Size 1, Female Head	37	0	0	0	0	37
10. Hampden Balance, HH Size 1, Male Head	34	0	0	0	0	34
11. Hampden Balance, HH Size 2+, Female Head	69	2	0	0	0	71
12. Hampden Balance, HH Size 2+, Male Head	19	1	0	0	0	20
TOTAL	**2,349**	**36**	**8**	**2**	**0**	**2,395**

*Counts correspond to the subsample released for data collection in wave 3.

Exhibit 4: Number of Persons Selected for the Round 1 non-HIP Sample by Wave, Blocking Group, and Size of Household

WAVE/Blocking Group	No. adults in household					Total
	1-3	4	5	6	7	
WAVE 1						
1. Springfield, HH Size 1, Female Head	93	0	0	0	0	93
2. Springfield, HH Size 1, Male Head	106	0	0	0	0	106
3. Springfield, HH Size 2+, Female Head	207	7	1	0	0	215
4. Springfield, HH Size 2+, Male Head	25	2	0	0	0	27
5. Chicopee/Holyoke HH Size 1, Female Head	45	0	0	0	0	45
6. Chicopee/Holyoke HH Size 1, Male Head	46	0	0	0	0	46
7. Chicopee/Holyoke HH Size 2+, Female Head	100	2	1	0	0	103
8. Chicopee/Holyoke HH Size 2+, Male Head	13	1	0	0	0	14
9. Hampden Balance, HH Size 1, Female Head	46	0	0	0	0	46
10. Hampden Balance, HH Size 1, Male Head	41	0	0	0	0	41
11. Hampden Balance, HH Size 2+, Female Head	80	2	2	0	0	84
12. Hampden Balance, HH Size 2+, Male Head	23	3	0	0	0	26
WAVE 2						
1. Springfield, HH Size 1, Female Head	93	0	0	0	0	93
2. Springfield, HH Size 1, Male Head	106	0	0	0	0	106
3. Springfield, HH Size 2+, Female Head	209	6	0	0	0	215
4. Springfield, HH Size 2+, Male Head	26	1	0	0	0	27
5. Chicopee/Holyoke HH Size 1, Female Head	45	0	0	0	0	45
6. Chicopee/Holyoke HH Size 1, Male Head	46	0	0	0	0	46
7. Chicopee/Holyoke HH Size 2+, Female Head	100	3	0	0	0	103
8. Chicopee/Holyoke HH Size 2+, Male Head	13	1	0	0	0	14
9. Hampden Balance, HH Size 1, Female Head	46	0	0	0	0	46
10. Hampden Balance, HH Size 1, Male Head	41	0	0	0	0	41
11. Hampden Balance, HH Size 2+, Female Head	79	4	1	0	0	84
12. Hampden Balance, HH Size 2+, Male Head	25	1	0	0	0	26
WAVE 3 *						
1. Springfield, HH Size 1, Female Head	75	0	0	0	0	75
2. Springfield, HH Size 1, Male Head	87	0	0	0	0	87
3. Springfield, HH Size 2+, Female Head	171	3	1	0	1	176
4. Springfield, HH Size 2+, Male Head	20	0	2	0	0	22

WAVE/Blocking Group	No. adults in household					Total
	1-3	4	5	6	7	
5. Chicopee/Holyoke HH Size 1, Female Head	38	0	0	0	0	38
6. Chicopee/Holyoke HH Size 1, Male Head	41	0	0	0	0	41
7. Chicopee/Holyoke HH Size 2+, Female Head	81	2	0	0	0	83
8. Chicopee/Holyoke HH Size 2+, Male Head	10	1	0	0	0	11
9. Hampden Balance, HH Size 1, Female Head	36	0	0	0	0	36
10. Hampden Balance, HH Size 1, Male Head	33	0	0	0	0	33
11. Hampden Balance, HH Size 2+, Female Head	66	2	0	0	0	68
12. Hampden Balance, HH Size 2+, Male Head	22	1	0	0	0	23
TOTAL	**2,334**	**42**	**8**	**0**	**1**	**2,385**

*Counts correspond to the subsample released for data collection in wave 3.

Exhibit 5: Base-Weighted Counts of Sampled Adults in the HIP and non-HIP Groups by Block and Wave of Round 1

Blocking Group	HIP				Non-HIP			
	Wave 1	Wave 2	Wave 3*	Total	Wave 1	Wave 2	Wave 3*	Total
1. Springfield, HH Size 1, Female Head	344	344	352	1,040	2,183	2,183	2,148	6,514
2. Springfield, HH Size 1, Male Head	392	393	401	1,186	2,491	2,491	2,497	7,479
3. Springfield, HH Size 2+, Female Head	781	764	780	2,325	5,040	5,054	5,080	15,174
4. Springfield, HH Size 2+, Male Head	93	98	91	282	635	613	637	1,885
5. Chicopee/Holyoke HH Size 1, Female Head	168	168	166	502	1,066	1,066	1,099	3,231
6. Chicopee/Holyoke HH Size 1, Male Head	171	170	170	511	1,084	1,083	1,178	3,345
7. Chicopee/Holyoke HH Size 2+, Female Head	366	370	362	1,098	2,424	2,403	2,367	7,194
8. Chicopee/Holyoke HH Size 2+, Male Head	50	47	57	154	338	322	309	969
9. Hampden Balance, HH Size 1, Female Head	171	171	166	508	1,086	1,087	1,039	3,212
10. Hampden Balance, HH Size 1, Male Head	151	151	152	454	960	959	943	2,862
11. Hampden Balance, HH Size 2+, Female Head	316	319	328	963	2,040	1,964	1,975	5,979
12. Hampden Balance, HH Size 2+, Male Head	88	95	82	265	605	567	614	1,786
TOTAL	3,091	3,090	3,107	9,288	19,952	19,792	19,886	59,630

*These are base-weighted counts for the subsample released for data collection in wave 3.

Exhibit 6: Number of Adults in the Round 1 HIP and Non-HIP Sampling Frames as of July 2011 by Block and Wave

Blocking Group	HIP				Non-HIP			
	Wave 1	Wave 2	Wave 3	Total	Wave 1	Wave 2	Wave 3	Total
1. Springfield, HH Size 1, Female Head	344	344	344	1,032	2,183	2,183	2,182	6,548
2. Springfield, HH Size 1, Male Head	392	393	392	1,177	2,490	2,491	2,491	7,472
3. Springfield, HH Size 2+, Female Head	781	764	787	2,332	5,038	5,054	5,081	15,173
4. Springfield, HH Size 2+, Male Head	93	98	93	284	635	612	641	1,888
5. Chicopee/Holyoke HH Size 1, Female Head	168	168	168	504	1,066	1,066	1,066	3,198
6. Chicopee/Holyoke HH Size 1, Male Head	171	170	171	512	1,084	1,083	1,083	3,250
7. Chicopee/Holyoke HH Size 2+, Female Head	366	370	364	1,100	2,423	2,403	2,410	7,236
8. Chicopee/Holyoke HH Size 2+, Male Head	50	47	51	148	338	322	322	982
9. Hampden Balance, HH Size 1, Female Head	171	171	171	513	1,086	1,087	1,087	3,260
10. Hampden Balance, HH Size 1, Male Head	151	151	152	454	960	959	960	2,879
11. Hampden Balance, HH Size 2+, Female Head	316	319	323	958	2,040	1,964	2,012	6,016
12. Hampden Balance, HH Size 2+, Male Head	88	95	89	272	605	567	572	1,744
TOTAL*	3,091	3,090	3,105	9,286	19,948	19,791	19,907	59,646

*Counts exclude six duplicate records in sampling frame.

Adjustment for Differences in Population Coverage by Wave

Because Round 1 data collection began in August 2011, some individuals who were originally selected from the July 2011 sampling frame left SNAP before they could be interviewed in their designated wave. This meant that an individual who was enrolled in SNAP in August 2011 but left SNAP in the following month would have been eligible for the survey if he/she had been assigned to wave 1 of data collection but not waves 2 or 3. Thus, as described below, the overall probability of selecting a person for Round 1 depended on SNAP participation status in the subsequent months. Persons leaving SNAP during the data collection period generally had lower chances of selection than persons who were enrolled in SNAP throughout the period. To account for these differential selection

probabilities, the base weights were adjusted so as to minimize the variation in weights across the three waves to the extent feasible, while at the same time providing unbiased estimates of the corresponding population counts. The construction of these adjusted weights, referred to as "pooled" or composite weights, are described below.

Although the samples for the three waves of data collection were selected from the same July 2011 sampling frame, the corresponding wave-specific respondent samples represent slightly different populations. This occurs because eligibility for the survey depended on whether or not the person was an active SNAP participant in the wave to which the person was assigned. Hampden County provided monthly update files on SNAP enrollment which were used to determine SNAP eligibility status in a particular month. The differing coverage of the three sample waves can be seen in Exhibit 7, which summarizes the numbers of persons in the sampling frame and the evaluation samples by wave and the following four mutually exclusive subgroups defined by SNAP participation status.

Exhibit 7: Distribution of Evaluation Sample and Implied Weights Under Simple Random Sampling by SNAP Eligibility Status, Treatment Status (HIP/non-HIP) and Wave

SNAP Participation Status	Coverage in sample	HIP (H)			Non-HIP (K)		
		Frame	Sample	Implied weight*	Frame	Sample	Implied weight*
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	All Waves	8,368	2,154	3.88	54,028	2,125	25.42
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	W1	399	108	3.69	2,369	107	22.14
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	W1 and W3	118	28	4.21	711	26	27.35
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	W1 and W2	401	105	3.82	2,538	127	19.98
TOTAL	---	9,286	2,395	3.88	59,646	2,385	25.01
SNAP participation status—*wave 1*							
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,820	783	3.60	18,053	769	23.48
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	Yes	108	33	3.27	819	27	30.33
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	Yes	33	5	6.60	250	11	22.73
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	Yes	130	25	5.20	826	39	21.18
TOTAL	---	3,091	846	3.65	19,948	846	23.58
SNAP participation status—*wave 2*							
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,790	774	3.60	17,965	753	23.86
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	No	151	34**	---	783	42**	---
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	No	41	11**	---	209	5**	---
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	Yes	108	27	4.00	834	46	18.13
TOTAL	---	3,090	846	3.65	19,791	846	23.39

SNAP Participation Status	Coverage in sample	HIP (H)			Non-HIP (K)		
		Frame	Sample	Implied weight*	Frame	Sample	Implied weight*
SNAP participation status—*wave 3*							
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,758	597	4.62	18,010	603	29.87
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	No	140	41**	---	767	38**	---
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	Yes	44	12	3.67	252	10	25.20
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	No	163	53**	---	878	42**	---
TOTAL	---	3,105	703	4.42	19,907	693	28.73

*Hypothetical weight for analysis of pooled samples under simple random sampling assumptions.
**Not eligible to be sampled in given wave.

Subgroup *a*: Persons known to be in SNAP at the time of sampling and were still active in both the end-of-August and end-of-September update files.

Subgroup *b*: Persons known to be in SNAP at the time of sampling and were coded as non-active in both the end-of-August and end-of-September update files.

Subgroup *c*: Persons known to be in SNAP at the time of sampling and were coded as non-active in the end-of-August update file but coded as active in the end-of-September update file.

Subgroup *d*: Persons known to be in SNAP at the time of sampling and were coded as active in the end-of-August update file but coded as non-active active in the end-of-September update file.

As indicated in Exhibit 7, subgroup *a* is represented by all three waves, whereas subgroup *b* is represented by wave 1 only. On the other hand, subgroup c is represented only by waves 1 and 3, while subgroup *d* is represented by waves 1 and 2. To account for these differences in coverage, a composite or "pooled" base weight was constructed as described later in this section.

To illustrate the basic idea behind the method of pooling or compositing, consider the HIP treatment group in Exhibit 7. For subgroup *a*, the total sample for this subgroup is composed of 783 persons from wave 1, 774 persons from wave 2, and 597 persons from wave 3. If the samples from each wave were simple random samples (SRS) from the *same* population, the three wave-specific samples could be combined to form a pooled sample of 2,154 persons. These 2,154 sampled persons would then represent 8,368 individuals in the sampling frame. Thus, assuming SRS, each sampled person in subgroup *a* would be assigned an implied pooled weight of 3.88 (= 8,368/2,154). Note that the variation in the wave-specific weights across the three waves of data collection would be eliminated under this procedure.

Similarly, consider subgroup *b* of the HIP treatment group in Exhibit 7. In this case, individuals in this subgroup can only be sampled in wave 1. Thus, the sample of 33 persons in wave 1 represent the corresponding 399 individuals in the sampling frame. Again assuming SRS, each sampled person in subgroup *b* would receive an implied weight of 12.09 (= 299/33).

Individuals in subgroup *c* of the HIP treatment group can only be sampled in waves 1 and 3. In this case, the combined sample of five persons in wave 1 and 12 persons in wave 3 represent the corresponding 118 individuals in the sampling frame. Under SRS, each person in the pooled sample would receive an implied weight of 6.94 (= 118/17).

Finally, individuals in subgroup *d* of the HIP treatment group can only be sampled in waves 1 and 2. In this case, the combined sample of 25 persons in wave 1 and 27 persons in wave 2 represent the corresponding 401 individuals in the sampling frame. Under SRS, each person in the pooled sample would receive an implied weight of 7.71 (= 401/52).

The method of deriving pooled weights described above would be appropriate if the wave-specific samples were simple random samples. However, as indicated at the beginning of Section 2.1, special procedures were used in sampling that departed from strict simple random sampling. As a result, the use of the ratio of population counts to sample counts to construct the pooled base weights is not appropriate. Instead, an unbiased procedure using composite weighting factors was applied that takes account of the variable selection probabilities used to select the wave-specific samples.

Exhibit 8 summarizes the base-weighted counts of the sample by treatment status and subgroup along with the corresponding sampling frame (population) counts. The "scaling factor" shown in the last column of the table is the ratio of the frame count to the weighted sample count. Although the base-weighted counts are unbiased estimates of the corresponding population count, the actual weighted counts for any particular sample can differ considerably from the population numbers. This can be seen in Exhibit 8, where the wave-specific scaling factors range from around 0.7 to 1.8. This variation around the theoretical value of 1.0 is a consequence of the fact that SNAP participation status (defined by the four subgroups) could not be controlled for in the sampling process. Thus, prior to the compositing steps described below, the wave-specific base weights were scaled up or down by the corresponding wave-specific scaling factors shown in Exhibit 8 to align the resulting weighted sample counts to the known population counts. That is, a rescaled base weight for the ith sample person in wave *v* and subgroup *g* was computed as:

$$w_{vgi}^{adj} = S_{vg}\, w_{vgi}^{base} \quad (1a)$$

where S_{vg} is the appropriate wave-specific scaling factor from Exhibit 8.

The goal of the compositing was to adjust the w_{vgi}^{adj}'s of the eligible sampled persons in a manner that minimized the variation in weights across the three waves, while at the same time providing unbiased estimates of the corresponding population counts. This was accomplished through the use of appropriate composite estimation factors, A_{vg} (v = 1, 2, 3), that depended on wave (denoted by the subscript *v*) and subgroup (denoted by the subscript *g*). The values of the A_{vg}'s that approximately minimize the variation of the resulting pooled weights are proportional to the wave-specific sample sizes, subject to the condition that $A_{1g} + A_{2g} + A_{3g} = 3$. These factors were applied to the wave-specific weighted counts to produce an overall (combined) estimate for a particular subgroup *g* as follows:

$$A_{1g} \sum_{i=1}^{1g} w_{1gi}^{adj} + A_{2g} \sum_{i=1}^{2g} w_{2gi}^{adj} + A_{3g} \sum_{i=1}^{3g} w_{3gi}^{adj} \quad (2)$$

where w_{vgi}^{adj} = the wave-specific rescaled base weight (defined by formula 1a) for sampled person *i* in subgroup *g* and wave *v*.

The pooled weight resulting from formula (2) for sampled person *i* in subgroup *g* and wave *v* was then computed as:

$$w_{vgi}^{pool} = A_{vg}\, w_{vgi}^{adj} \quad (3)$$

where the values of the optimum compositing factors A_{1g}, A_{2g}, and A_{3g} are summarized in Exhibit 9 by treatment status, wave, and subgroup.

Exhibit 8: Weighted Counts of the Evaluation Sample by SNAP Eligibility Status, Treatment Status (HIP/Non-HIP) and Wave

SNAP Participation Status	Coverage in sample	HIP (H)				Non-HIP (K)			
		Frame	Sample	Base-wtd count*	Scaling factor	Frame	Sample	Base-wtd count*	Scaling factor
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	All Waves	8,368	2,154	8,328	1.00	54,028	2,125	53,073	1.02
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	W1	399	108	426	0.94	2,369	107	2,683	0.88
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	W1 and W3	118	28	111	1.06	711	26	667	1.07
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	W1 and W2	401	105	423	0.95	2,538	127	3,207	0.79
TOTAL	---	9,286	2,395	9,287	1.00	59,646	2,385	59,630	1.00
Snap participation status—*wave 1*									
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,820	783	2,861	0.99	18,053	769	18,124	1.00
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	Yes	108	33	121	0.89	819	27	640	1.28
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	Yes	33	5	18	1.84	250	11	268	0.93
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	Yes	130	25	91	1.43	826	39	920	0.90
TOTAL	---	3,091	846	3,091	1.00	19,948	846	19,952	1.00
SNAP Participation Status—*Wave 2*									
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,790	774	2,827	0.99	17,965	753	17,613	1.02
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	No	151	34**	124	1.22	783	42**	967	0.81
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	No	41	11**	40	1.02	209	5**	116	1.80
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	Yes	108	27	98	1.10	834	46	1,096	0.76
TOTAL	---	3,090	846	3,090	1.00	19,791	846	19,792	1.00

SNAP Participation Status	Coverage in sample	HIP (H) Frame	HIP (H) Sample	HIP (H) Base-wtd count*	HIP (H) Scaling factor	Non-HIP (K) Frame	Non-HIP (K) Sample	Non-HIP (K) Base-wtd count*	Non-HIP (K) Scaling factor
SNAP Participation Status—*Wave 3*									
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	Yes	2,758	597	2,639	1.05	18,010	603	17,336	1.04
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	No	140	41**	181	0.77	767	38**	1,076	0.71
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	Yes	44	12	53	0.83	252	10	283	0.89
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	No	163	53**	234	0.70	878	42**	1,191	0.74
TOTAL	---	3,105	703	3,107	1.00	19,907	693	19,886	1.00

*Wave-specific base weights defined by formula (1). The weighted counts include all persons selected for the sample, including those not eligible for the given wave.

**Not eligible to be sampled in given wave.

Exhibit 9: Composite Estimation Factors by Treatment Status, Wave, and Participation Subgroup

	HIP (H)			Non-HIP (K)		
	Wave 1	Wave 2	Wave 3	Wave 1	Wave 2	Wave 3
SNAP PARTICIPATION STATUS	A1	A2	A3	A1	A2	A3
(a) clients with statusCD of ACTIVE in both Aug file and Sep file	1.0905	1.0780	0.8315	1.0856	1.0631	0.8513
(b) clients with statusCD = any non-ACTIVE code in both Aug file and Sep file	3.0000	0.0000	0.0000	3.0000	0.0000	0.0000
(c) clients with statusCD = any non-ACTIVE code in Aug file but a code of ACTIVE in the Sep file	0.8824	0.0000	2.1176	1.5714	0.0000	1.4286
(d) clients with statusCD = ACTIVE in Aug file but a code = any non-ACTIVE in the Sep file	1.4423	1.5577	0.0000	1.3765	1.6235	0.0000

Exhibit 10 summarizes the sum of the resulting pooled weights, w_{vgi}^{pool}, the coefficient of variation (CV) of the weights expressed as a percentage of the mean weight, and the ratio of the frame count to the corresponding weighted count, by blocking group. The CV of the weights provides a measure of the variability of the weights and is informative because $1 + (CV/100)2$ represents a variance inflation factor relative to a self-weighting (equal probability) sample of the same size. For example, in Exhibit 10 it can be seen that the CV of the weights for the total HIP sample is 22.1 percent. This means that the variance of an estimated proportion can be expected to be roughly (.221)2 = 0.049 (or 4.9 percent) larger than the corresponding variance based on a self-weighting sample of the same size. This minor loss in precision of the pooled weights results from the differential adjustment of the four participation subgroups.

Exhibit 10: Weighted Counts of the Sample Using the Pooled Weights, the Coefficient of Variation (CV) of the Weights, and the Ratio of Frame Counts to Weighted Sample Counts by Treatment Status and Blocking Group

	HIP				Non-HIP			
Blocking Group	Wtd. count (pooled) wt)*	CV of weights (%)	Frame Count	Ratio frame to wtd. count	Wtd. count (pooled wt)*	CV of weights (%)	Frame Count	Ratio frame to wtd. count
1. Springfield, HH Size 1, Female Head	1,022	13.0%	1,032	1.01	6,382	4.2%	6,548	1.03
2. Springfield, HH Size 1, Male Head	1,173	25.9%	1,177	1.00	7,627	31.9%	7,472	0.98
3. Springfield, HH Size 2+, Female Head	2,309	24.2%	2,332	1.01	15,259	33.6%	15,173	0.99
4. Springfield, HH Size 2+, Male Head	272	20.1%	284	1.04	1,733	13.3%	1,888	1.09
5. Chicopee/Holyoke HH Size 1, Female Head	488	1.1%	504	1.03	3,246	3.6%	3,198	0.99
6. Chicopee/Holyoke HH Size 1, Male Head	500	17.5%	512	1.02	3,216	22.9%	3,250	1.01
7. Chicopee/Holyoke HH Size 2+, Female Head	1,072	18.8%	1,100	1.03	7,291	26.3%	7,236	0.99
8. Chicopee/Holyoke HH Size 2+, Male Head	156	32.9%	148	0.95	1,008	40.7%	982	0.97
9. Hampden Balance, HH Size 1, Female Head	496	5.6%	513	1.03	3,249	22.7%	3,260	1.00
10. Hampden Balance, HH Size 1, Male Head	463	26.5%	454	0.98	2,940	23.4%	2,879	0.98
11. Hampden Balance, HH Size 2+, Female Head	953	28.4%	958	1.01	6,040	37.5%	6,016	1.00
12. Hampden Balance, HH Size 2+, Male Head	274	20.8%	272	0.99	1,740	44.7%	1,744	1.00
TOTAL	9,178	22.1%	9,286	1.01	59,731	28.9%	59,646	1.00

*Weights are the pooled (composite) weights, w_{vgi}^{pool}.

Ratio Adjustment of Pooled Weights

Although the pooled weights constructed in the previous section are theoretically unbiased, it can be seen in Exhibit 10 that the sum of the weights by blocking group differs from known population counts in the July 2011 sampling frame due to sampling variability. Therefore, we applied a ratio adjustment to the pooled weights so that weighted counts of the sample agreed with the corresponding population (frame) counts for the 12 blocking groups. The resulting weights are referred to as the "poststratified pooled" weights.

The ratio (or "poststratification") adjustment factor for blocking group (stratum) s, $F_s^{(ps)}$, was computed as:

$$F_s^{(ps)} = N_s \ / \sum_{i=1}^{n_s} w_{si}^{pool} \quad (4)$$

where N_s is the population control total for blocking group *s*, w_{si}^{pool} is the pooled (composite) base weight described in the previous section associated with the i^{th} sampled person in the blocking group *s*, and where the sum in the denominator of $F_s^{(ps)}$ extends over the sampled persons in the given blocking group. The poststratified pooled weight was then computed as:

$$w_{si}^{ps} = F_s^{(ps)} \, w_{si}^{pool} \quad (5)$$

Exhibit 11 summarizes the sum of the poststratified pooled weights, w_{si}^{ps}, the coefficient of variation (CV) of the weights expressed as a percentage of the mean weight, and the ratio of the frame count to the corresponding weighted count, by blocking group. Comparing the CVs of the weights in this exhibit with those in Exhibit 10, we see that the poststratification adjustment had minimal impact on the variation of the weights.

Exhibit 11: Weighted Counts of the Sample After Ratio Adjustment and the Coefficient of Variation (CV) of the Weights, by Treatment Status and Blocking Group

Blocking Group	HIP			Non-HIP		
	Frame count	Wtd. count (PSWT)	CV of weights (%)	Frame count	Wtd. count (PSWT)	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	1,032	13.0%	6,548	6,548	4.2%
2. Springfield, HH Size 1, Male Head	1,177	1,177	25.9%	7,472	7,472	31.9%
3. Springfield, HH Size 2+, Female Head	2,332	2,332	24.2%	15,173	15,173	33.6%
4. Springfield, HH Size 2+, Male Head	284	284	20.1%	1,888	1,888	13.3%
5. Chicopee/Holyoke HH Size 1, Female Head	504	504	1.1%	3,198	3,198	36.2%
6. Chicopee/Holyoke HH Size 1, Male Head	512	512	17.5%	3,250	3,250	22.9%
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,100	18.8%	7,236	7,236	26.3%
8. Chicopee/Holyoke HH Size 2+, Male Head	148	148	32.9%	982	982	40.7%
9. Hampden Balance, HH Size 1, Female Head	513	513	5.6%	3,260	3,260	22.9%
10. Hampden Balance, HH Size 1, Male Head	454	454	26.5%	2,879	2,879	23.4%
11. Hampden Balance, HH Size 2+, Female Head	958	958	28.4%	6,016	6,016	37.5%
12. Hampden Balance, HH Size 2+, Male Head	272	272	20.8%	1,744	1,744	44.7%
TOTAL	9,286	9,286	21.0%	59,646	59,646	28.7%

*Weights are the poststratified pooled weights, w_{si}^{ps}.

Nonresponse Adjustment

The final step in the weighting process was to adjust the post-stratified pooled weights defined by formula (5) to compensate for nonresponse in the baseline survey (Round 1). The adjustments were made in two phases separately for the two treatment groups. The second-phase nonresponse-adjusted weight is the final analytic weight for analysis of Round 1 data. See Exhibit B-3 in Appendix B for additional information about the response rates achieved in Round 1. The procedures used are described below.

(a) We specified the five response status groups shown in Exhibit 12. Note that two types of "ineligibles" are specified. Response-status group 3 consists of sampled persons who were precoded as ineligible because they were not active in SNAP as of the sample determination date (i.e., "lock down" date) specified for the particular data collection wave. Such cases were identified in advance of data collection. On the other hand, response-status group 4 consists of other types of ineligible persons who could not be identified in advance of data collection. This group includes persons who were found during data collection to have moved, become institutionalized, died, etc. To ascertain whether a sampled person is in group 4, it was generally necessary to contact the sampled person or a knowledgeable household member. Consequently, nonresponse could have occurred either (1) prior to determining eligibility (e.g., the sampled person could not be contacted or located); or (2) after determining eligibility (e.g., the person was located and eligibility was determined). Thus, the nonresponse adjustment was done in two phases as described in (b) and (c) below.

Exhibit 12: Distribution of the Evaluation Sample by Treatment Group, Wave, and Round 1 (Baseline) Response Status

Round 1 response status group*		HIP				NON HIP			
	Total	Wave 1	Wave 2	Wave 3	Total	Wave 1	Wave 2	Wave 3	Total
1. Respondent	2,784	447	511	430	1,388	464	521	411	1,396
2. Eligible nonrespondent	964	271	133	83	487	217	145	115	477
3. Ineligible - not in SNAP per lock-down date	266	0	45	94	139	0	47	80	127
4. Ineligible - other	111	12	14	20	46	14	30	21	65
5. Eligibility unknown	655	116	143	76	335	151	103	66	320
TOTAL	4,780	846	846	703	2,395	846	846	693	2,385

*See Appendix A for definition of response status groups.

(b) Excluding the cases in response-status group 3 (which were deleted from the sample prior to data collection), the purpose of the first-phase adjustment was to distribute a portion of the weighted count of the cases in response status group 5 (unknown eligibility) to the three remaining groups (1, 2, and 4) defined in Exhibit 12. First, we conducted a CHAID analysis (Chi Square Automatic Interaction Detector) separately for each treatment group to identify cells within which the predicted probabilities of ascertaining eligibility were similar.

The person-level "dependent" variable used in the analysis was defined by the zero-one variable:

$$Y = \begin{cases} 1, \text{if the sampled person belonged to response status group } 1, 2, \textit{or } 4 \\ 0, \text{if the sampled person belonged to response status group } 5 \end{cases}$$

In addition to the 12 blocking groups, we specified the variables listed in Exhibits B-1 and B-2 of Appendix B as potential independent (predictor) variables in the CHAID analysis.

The output from the CHAID analysis was a tree diagram that defined the final cells (labeled r = 1, 2, ..., R) used in the first-phase nonresponse adjustment. Exhibits 13 and 14 summarize the first-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively. It can be seen that for both HIP and non-HIP samples, the weighted response rate varies from around 50 percent to over 95 percent across the adjustment cells.

Exhibit 13: Definition of First-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 1 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hmls_h = 0, block = 1, wave = 1, 2	83.1%
2	hmls_h = 0, block = 1, wave = 3	95.8%
3	hmls_h = 0, block = 2, age_p = 1, 2, 3	72.4%
4	hmls_h = 0, block = 2, age_p = 4	90.5%
5	hmls_h = 0, block = 3, 4, 5, wave = 1, 3	89.5%
6	hmls_h = 0, block = 3, 4, 5, wave = 2, gende_p = 0	61.9%
7	hmls_h = 0, block = 3, 4, 5, wave = 2, gende_p = 1, lang_h = 0	86.8%
8	hmls_h = 0, block = 3, 4, 5, wave = 2, gende_p = 1, lang_h = 1	73.2%
9	hmls_h = 0, block = 6	76.6%
10	hmls_h = 0, block = 7, 8, 9, 10, 11, age_h = 1	81.9%
11	hmls_h = 0, block = 7, 8, 9, 10, 11, age_h = 2, 3, 4	93.6%
12	hmls_h = 0, block = 12	97.3%
13	hmls_h = 1	57.4%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**Poststratified pooled weights.

Exhibit 14. Definition of First-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 1 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hmls_h = 0, ben_h = 1, dsbl_p = 0	96.6%
2	hmls_h = 0, ben_h = 1, dsbl_p = 1, race_p = 1, 4	83.2%
3	hmls_h = 0, ben_h = 1, dsbl_p = 1, race_p = 2, 3	94.1%
4	hmls_h = 0, ben_h = 2, age_p = 1	69.6%
5	hmls_h = 0, ben_h = 2, age_p = 2, 3, 4	84.5%
6	hmls_h = 0, ben_h = 3, 4, reeva_h = 1, race_p = 1	81.0%
7	hmls_h = 0, ben_h = 3, 4, reeva_h = 1, race_p = 2, 3, 4, gende_p = 0	82.8%
8	hmls_h = 0, ben_h = 3, 4, reeva_h = 1, race_p = 2, 3, 4, gende_p = 1	92.6%
9	hmls_h = 0, ben_h = 3, 4, reeva_h = 2, 3, age_p = 1, 2, 4	91.6%
10	hmls_h = 0, ben_h = 3, 4, reeva_h = 2, 3, age_p = 3	98.7%
11	hmls_h = 1, gende_p = 0	50.7%
12	hmls_h = 1, gende_p = 1	72.9%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**Poststratified pooled weights.

The first-phase nonresponse adjustment factor, A_r , was computed as the inverse of the weighted first-phase response rate in final cell *r*:

$$A_r = \sum_{i=1}^{n_{123b4}^{(r)}} w_{ri}^{ps} / \sum_{i=1}^{n_{123b}^{(r)}} w_{ri}^{ps} \quad (6)$$

where the sum of poststratified pooled weights in the numerator extends over the $n_{1245}^{(r)}$ sampled persons in response-status groups 1, 2, 4, and 5 in final cell r, while the sum of poststratified pooled

weights in the denominator extends over the $n_{124}^{(r)}$ sampled persons in response-status groups 1, 2, and 4 in final cell *r*.

The first-phase adjusted weight for the i^{th} sampled person in cell *r* for whom eligibility was determined (i.e., cases in response status groups 1, 2, and 4) was computed as:

$$w_{ri}^{NR1} = A_r \, w_{ri}^{ps} \quad (7)$$

Exhibit 15 summarizes the (nonresponse-adjusted) weighted counts of the sampled persons in response-status groups 1, 2, and 4 and the CV of the weights by treatment status and blocking group.

Exhibit 15. Sum of First-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 1 Person Weights

Blocking Group	HIP			Non-HIP		
	Frame count	Wtd. count (NR1WT)*	CV of weights (%)	Frame count	Wtd. count (NR1WT)*	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	1,014	13.8%	6,548	6,609	9.4%
2. Springfield, HH Size 1, Male Head	1,177	1,160	28.4%	7,472	6,714	28.5%
3. Springfield, HH Size 2+, Female Head	2,332	2,336	24.2%	15,173	15,157	32.1%
4. Springfield, HH Size 2+, Male Head	284	288	30.9%	1,888	1,935	17.8%
5. Chicopee/Holyoke HH Size 1, Female Head	504	480	9.4%	3,198	3,274	9.4%
6. Chicopee/Holyoke HH Size 1, Male Head	512	502	17.0%	3,250	3,362	32.5%
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,162	22.4%	7,236	7,493	22.9%
8. Chicopee/Holyoke HH Size 2+, Male Head	148	149	33.3%	982	948	38.8%
9. Hampden Balance, HH Size 1, Female Head	513	508	8.8%	3,260	3,190	10.8%
10. Hampden Balance, HH Size 1, Male Head	454	453	39.7%	2,879	3,088	37.1%
11. Hampden Balance, HH Size 2+, Female Head	958	954	31.2%	6,016	6,083	35.9%
12. Hampden Balance, HH Size 2+, Male Head	272	280	23.7%	1,744	1,793	46.2%
TOTAL	9,286	9,286	25.8%	59,646	59,646	28.6%

*Weighted counts using w_{ri}^{NR1}.

(c) For the second-phase adjustment, we restricted the sample to cases with response-status codes of 1 (respondents) or 2 (eligible nonrespondents). We conducted separate CHAID analyses for each treatment group to identify cells with similar conditional response propensities (i.e., conditional on the subset of cases that were determined to be eligible for the study).

The person-level "dependent" variable for the second-phase adjustment was defined by the zero-one variable:

$$Z = \begin{cases} 1, \text{if the sampled person belonged to response status group 1} \\ 0, \text{if the sampled person belonged to response status group 2} \end{cases}$$

We specified the same set of independent variables used previously for the first-phase adjustment as potential independent variables in the second-phase CHAID analyses. The output from the CHAID analysis was used to define the second-phase nonresponse-adjustment weighting cells (denoted by the subscript s = 1, 2, ..., S). Exhibits 16 and 17 summarize the second-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively.

Exhibit 16: Definition of Second-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 1 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	wave = 1, dsbl_p = 0, hh_typ = 1, 2, in_h = 1, 4	44.8%
2	wave = 1, dsbl_p = 0, hh_typ = 1, 2, in_h = 2, 3	63.4%
3	wave = 1, dsbl_p = 0, hh_typ = 3	63.9%
4	wave = 1, dsbl_p = 1, gende_p = 0	59.4%
5	wave = 1, dsbl_p = 1, gende_p = 1, rsdi_h = 0	67.9%
6	wave = 1, dsbl_p = 1, gende_p = 1, rsdi_h = 1	82.7%
7	wave = 2, 3, citzn_h = 0	64.3%
8	wave = 2, citzn_h = 1, lang_h = 0	78.0%
9	wave = 3, citzn_h = 1, lang_h = 0, reeva_h = 1, 3	89.0%
10	wave = 3, citzn_h = 1, lang_h = 0, reeva_h = 2	75.3%
11	wave = 2, 3, citzn_h = 1, lang_h = 1, age_h = 1, 2, 4	82.9%
12	wave = 2, 3, citzn_h = 1, lang_h = 1, age_h = 3	97.0%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**First-phase nonresponse-adjusted weights.

Exhibit 17: Definition of Second-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 1 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	wave = 1, age_p = 1, reeva_h = 1	69.9%
2	wave = 1, age_p = 1, reeva_h = 2, 3	54.1%
3	wave = 1, age_p = 2	78.8%
4	wave = 1, age_p = 3, 4, gende_p = 0	57.7%
5	wave = 1, age_p = 3, 4, gende_p = 1	71.2%
6	wave = 2, 3, block = 1-8, gende_p = 0	76.7%
7	wave = 2, 3, block = 1-8, gende_p = 1, res_h = 1	81.6%
8	wave = 2, 3, block = 1-8, gende_p = 1, res_h = 2, 3	91.0%
9	wave = 2, 3, block = 9, 10, 12	61.8%
10	wave = 2, 3, block = 11	74.8%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**First-phase nonresponse-adjusted weights.

The second-phase nonresponse adjustment factor, B_s, was computed as the inverse of the weighted second-phase response rate in final cell s:

$$B_s = \sum_{i=1}^{n_{12}^{(s)}} w_{ri}^{NR1} / \sum_{i-1}^{n_1^{(s)}} w_{ri}^{NR1} \qquad (8)$$

where the sum of the first-phase nonresponse-adjusted weights in the numerator extends over the $n_{12}^{(s)}$ eligible sampled persons in final cell s, while the sum of first-phase nonresponse-adjusted weights in the denominator extends over the $n_1^{(s)}$ responding persons in final cell *s*.

The final nonresponse-adjusted weight for the i[th] responding person in cell *s* (i.e., cases in response status group 1) was then computed as:

$$w_{si}^{NR2} = B_s \, w_{si}^{NR1} \qquad (5)$$

Exhibit 18 summarizes the (second-phase nonresponse-adjusted) weighted counts of the sampled persons in response-status group 1 (the survey respondents) and the CV of the weights by treatment status and blocking group.

Exhibit 18: Sum of Second-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 1 Person Weights

	HIP			Non-HIP		
Blocking Group	Frame count	Wtd. count (NR2WT)*	CV of weights (%)	Frame count	Wtd. count (NR1WT)*	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	1,001	22.8%	6,548	6,648	14.5%
2. Springfield, HH Size 1, Male Head	1,177	1,137	32.4%	7,472	5,975	20.4%
3. Springfield, HH Size 2+, Female Head	2,332	2,291	31.7%	15,173	14,590	35.4%
4. Springfield, HH Size 2+, Male Head	284	269	27.6%	1,888	1,968	22.9%
5. Chicopee/Holyoke HH Size 1, Female Head	504	439	15.7%	3,198	3,123	13.3%
6. Chicopee/Holyoke HH Size 1, Male Head	512	449	19.8%	3,250	2,839	29.9%
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,186	33.8%	7,236	7,739	32.1%
8. Chicopee/Holyoke HH Size 2+, Male Head	148	181	56.6%	982	879	50.7%
9. Hampden Balance, HH Size 1, Female Head	513	476	14.3%	3,260	2,959	11.6%
10. Hampden Balance, HH Size 1, Male Head	454	374	39.8%	2,879	3,076	50.0%
11. Hampden Balance, HH Size 2+, Female Head	958	973	44.9%	6,016	6,125	42.4%
12. Hampden Balance, HH Size 2+, Male Head	272	261	36.9%	1,744	1,504	15.4%
TOTAL	9,286	9,035	33.6%	59,646	57,425	32.8%

*Weighted counts using w_{ri}^{NR2} do not include ineligible cases in the sample. For this reason, the weighted counts in the table are generally lower than the frame counts.

Replicate Weights for Variance Estimation

For variance estimation, 100 jackknife replicates were created from the full sample, where each jackknife replicate reflects the stratification of the full sample. The entire weighting process described in the previous sections was applied to each replicate, resulting in a set of 100 replicate-specific weights for each responding person. Together with the full-sample weight, the replicate weights can be used to generate sampling errors of the survey-based estimates as follows:

Let y_i denote a survey characteristic (variable) for the i^{th} responding person in the sample, and let w_i^F denote the corresponding final full-sample weight. Let $w_{(k)i}$ denote the k^{th} replicate weight for the i^{th} person, where $k = 1, 2, ..., K$. The estimated total for a survey variable y_i based on the full sample is given by the weighted sum

$$\hat{y} = \sum_{i=1}^{n} w_i^F \, y_i \qquad (9)$$

The corresponding replicate estimates are given by the weighted sums

$$\hat{y}k = \sum_{i=1}^{n} w_{(k)i} \, y_i \quad \text{for } k = 1, 2, ..., 100 \quad (10)$$

The variance of the full-sample estimate can then be computed as:

$$\text{var}(\hat{y}) = \sum_{k=1}^{K} G_k \, (\hat{y}k - \hat{y})2 \quad (11)$$

where the G_k 's are appropriate scaling factors referred to as JKN factors. The values of JKN factors (i.e., the G_k 's) to be used for variance estimation are summarized in Exhibit 19. For example, see WesVar User's Guide (http://www.westat.com/Westat/pdf/wesvar/WV_4-3_Manual.pdf) for examples of the use of the JKN factors in variance estimation.

Exhibit 19: JKN Factors to be Used for Variance Estimation

BLOCK (Variance Stratum)	No. of variance units used to form replicates in variance stratum	JKN FACTOR	Replicates to which factors are applied
1	11	0.9091	1 to 11
2	13	0.9231	12 to 24
3	25	0.9600	25 to 49
4	3	0.6667	50 to 52
5	5	0.8000	53 to 57
6	6	0.8333	58 to 63
7	12	0.9167	64 to 75
8	2	0.5000	76 to 77
9	5	0.8000	78 to 82
10	5	0.8000	83 to 87
11	10	0.9000	88 to 97
12	3	0.6667	98 to 100

2.2 Construction of Weights for Analysis of Shopper Data

A second set of person weights was constructed for analysis of respondents for which the corresponding shopper survey was also completed in Round 1. The construction of these weights essentially followed the same steps described in Section 2.1. The only difference was in the manner in

which the nonresponse adjustments were calculated. Note that it was not necessary to recompute the required poststratified pooled weights created above.

Nonresponse Adjustment

The first step in the weighting process was to adjust the poststratified pooled weights computed previously to compensate for nonresponse in the shopper survey. Similar to the procedures described in the Nonresponse Adjustment section of Section 2.1 above, the adjustments were made in two phases separately for each of the two treatment groups. The second-phase nonresponse-adjusted weight is the final analytic weight for analysis of Round 1 shopper data. See Exhibit B-4 in Appendix B for additional information about the response rates achieved in Round 1.

(a) We defined the five response status groups specified in Exhibit 20. Note that this table differs from Exhibit 12 in that the set of respondents (response status group 1) includes persons for which *both* the baseline and shopper interviews were completed. Since nonresponse could have occurred either (1) prior to determining eligibility (e.g., the sampled person could not be contacted or located); or (2) after determining eligibility (e.g., the person was located and eligibility was determined), the nonresponse adjustment was done in two phases as described in (b) and (c) below.

Exhibit 20: Distribution of the Round 1 Evaluation Sample by Treatment Group, Wave, and Response Status for the Shopper Survey

		HIP				Non-HIP			
Response status group*	Total	Wave 1	Wave 2	Wave 3	Total	Wave 1	Wave 2	Wave 3	Total
1. Respondent **	2,645	425	487	409	1,321	437	492	395	1,324
2. Eligible nonrespondent	1,069	286	147	102	535	240	167	127	534
3. Ineligible - not in SNAP per lock-down date	266	0	45	94	139	0	47	80	127
4. Ineligible - other	112	12	14	20	46	15	30	21	66
5. Eligibility unknown	688	123	153	78	354	154	110	70	334
TOTAL	4,780	846	846	703	2,395	846	846	693	2,385

*See Appendix A for definition of response status groups for the main (baseline) interview.
**In this table, a respondent is a person who completed the main (baseline) survey *and* for whom a shopper interview was also completed.

(b) Initially, we distributed a portion of the weighted count of the persons in response status group 5 (unknown eligibility) to three of the remaining groups (response-status groups 1, 2 and 4) defined in Exhibit 20. We conducted a CHAID analysis (Chi Square Automatic Interaction Detector) for each treatment group to identify cells within which the predicted probabilities of ascertaining eligibility were similar.

The person-level "dependent" variable was defined by the zero-one variable:

$$Y = \begin{cases} 1, \text{if the sampled person belonged to response status group } 1, 2, \textit{or } 4 \\ 0, \text{if the sampled person belonged to response status group } 5 \end{cases}$$

In addition to blocking group, the household-level variables listed in Exhibit 1 and the person-level variables listed in Exhibit B-2 of Appendix B were specified as potential independent (predictor) variables in the CHAID analysis.

The output from the CHAID analysis was a tree diagram that defined the final cells (labeled r = 1, 2, ..., R) used in the first-phase nonresponse adjustment. Exhibits 21 and 22 summarize the first-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively. It can be seen that for both HIP and non-HIP samples, the weighted response rates varied from around 50 percent to over 95 percent across the adjustment cells.

Exhibit 21: Definition of First-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 1 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hmls_h = 0, block = 1, wave = 1, 2	81.4%
2	hmls_h = 0, block = 1, wave = 3	95.8%
3	hmls_h = 0, block = 2, age_p = 1, 2, 3	70.8%
4	hmls_h = 0, block = 2, age_p = 4	89.2%
5	hmls_h = 0, block = 3-5, wave = 1, 3	88.3%
6	hmls_h = 0, block = 3-5, wave = 2, lang_h = 0, race_h = 1, 2	78.3%
7	hmls_h = 0, block = 3-5, wave = 2, lang_h = 0, race_h = 3, 4	96.3%
8	hmls_h = 0, block = 3-5, wave = 2, lang_h = 1	62.8%
9	hmls_h = 0, block = 6	75.8%
10	hmls_h = 0, block = 7-11, age_h = 1	81.4%
11	hmls_h = 0, block = 7-11, age_h = 2, 3, 4	93.1%
12	hmls_h = 0, block = 13	97.3%
13	hmls_h = 1	57.5%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**Poststratified pooled weights.

Exhibit 22: Definition of First-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 1 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hmls_h = 0, ben_h = 1, dsbl_p = 0	96.0%
2	hmls_h = 0, ben_h = 1, dsbl_p = 1, lang_h = 0	91.1%
3	hmls_h = 0, ben_h = 1, dsbl_p = 1, lang_h = 1	80.3%
4	hmls_h = 0, ben_h = 2, age_p = 1	68.6%
5	hmls_h = 0, ben_h = 2, age_p = 2-4	84.4%
6	hmls_h = 0, ben_h = 3, 4, reeva_h = 1, res_h = 1	81.8%
7	hmls_h = 0, ben_h = 3, 4, reeva_h = 1, res_h = 2, 3	92.4%
8	hmls_h = 0, ben_h = 3, 4, reeva_h = 2, 3, dsbl_h = 0, age_p = 1, 2	92.3%
9	hmls_h = 0, ben_h = 3, 4, reeva_h = 2, 3, dsbl_h = 0, age_p = 3, 4	100.0%
10	hmls_h = 0, ben_h = 3, 4, reeva_h = 2, 3, dsbl_h = 1	84.5%
11	hmls_h = 1, gende_p = 0	50.7%
12	hmls_h = 1, gende_p = 1	72.9%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**Poststratified pooled weights.

The first-phase nonresponse adjustment factor, A_r , was computed as the inverse of the weighted first-phase response rate in final cell r:

$$A_r = \sum_{i=1}^{n_{123b4}^{(r)}} w_{ri}^{ps} / \sum_{i-1}^{n_{123b}^{(r)}} w_{ri}^{ps} \quad (12)$$

where the sum of the weights in the numerator extends over the $n_{1245}^{(r)}$ sampled persons in response-status groups 1, 2, 4, and 5 in final cell *r*, while the sum of weights in the denominator extends over the $n_{124}^{(r)}$ sampled persons in response-status groups 1, 2, and 4 in final cell *r*.

The first-phase adjusted weight for the i^{th} sampled person in cell *r* for which eligibility was determined (i.e., cases in response status groups 1, 2, and 4) was computed as:

$$w_{ri}^{NR1} = A_r \; w_{ri}^{ps} \qquad (13)$$

Exhibit 23 summarizes the (nonresponse-adjusted) weighted counts of the sampled persons in response-status groups 1, 2, and 4 and the CV of the weights by treatment status and blocking group.

Exhibit 23: Sum of First-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 1 Shopper Weights

Blocking Group	HIP			Non-HIP		
	Frame count	Wtd. count (SNR1WT)*	CV of weights (%)	Frame count	Wtd. count (SNR1WT)*	CV of weights (%)
1. Springfield, HH Size 1, Female Head	.	1,014	14.4%	6,548	6,616	9.1%
2. Springfield, HH Size 1, Male Head	1,177	1,160	28.3%	7,472	6,695	28.5%
3. Springfield, HH Size 2+, Female Head	2,332	2,330	23.9%	15,173	15,116	12.3%
4. Springfield, HH Size 2+, Male Head	284	275	26.4%	1,888	1,951	17.6%
5. Chicopee/Holyoke HH Size 1, Female Head	504	499	12.8%	3,198	3,272	9.1%
6. Chicopee/Holyoke HH Size 1, Male Head	512	502	16.9%	3,250	3,379	32.1%
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,168	23.3%	7,236	7,492	23.1%
8. Chicopee/Holyoke HH Size 2+, Male Head	148	150	33.3%	982	923	39.4%
9. Hampden Balance, HH Size 1, Female Head	513	511	8.7%	3,260	3,216	10.2%
10. Hampden Balance, HH Size 1, Male Head	454	451	39.6%	2,879	3,101	36.7%
11. Hampden Balance, HH Size 2+, Female Head	958	946	31.4%	6,016	6,133	36.4%
12. Hampden Balance, HH Size 2+, Male Head	272	280	23.7%	1,744	1,752	45.2%
TOTAL	9,286	9,286	25.4%	59,646	59,646	28.6%

*Weighted counts using w_{ri}^{NR1}.

(c) For the second-phase adjustment, we restricted the sample to persons with response status codes of 1 (respondents) or 2 (eligible nonrespondents). We conducted separate CHAID analyses for each treatment group to identify cells with similar (conditional) response propensities.

The person-level "dependent" variable for the second-phase adjustment was defined by the zero-one variable:

$$Z = \begin{cases} 1, \text{if the sampled person belonged to response status group 1} \\ 0, \text{if the sampled person belonged to response status group 2} \end{cases}$$

We specified the same independent variables used previously for the first-phase adjustment as independent variables in the second-phase CHAID analyses. The output from the CHAID analysis was used to define the second-phase nonresponse-adjustment weighting cells (denoted by the subscript s = 1, 2, ..., S). Exhibits 24 and 25 summarize the second-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively.

Exhibit 24: Definition of Second-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 1 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	wave = 1, race_p = 1, 4, dsbl_p = 0, reeva_h = 1	32.6%
2	wave = 1, race_p = 1, 4, dsbl_p = 0, reeva_h = 2, 3	52.7%
3	wave = 1, race_p = 1, 4, dsbl_p = 1, in_h = 1, 2	43.8%
4	wave = 1, race_p = 1, 4, dsbl_p = 1, in_h = 3, 4	74.8%
5	wave = 1, race_p = 2, dsbl_p = 0, age_h = 1, 4	41.7%
6	wave = 1, race_p = 2, dsbl_p = 0, age_h = 2, 3	66.1%
7	wave = 1, race_p = 2, dsbl_p = 1	71.0%
8	wave = 1, race_p = 3	77.6%
9	wave = 2, 3, citzn_h = 0	63.3%
10	wave = 2, 3, citzn_h = 1, gende_p = 0	74.7%
11	wave = 2, 3, citzn_h = 1, gende_p = 1	81.1%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**First-phase nonresponse-adjusted weights.

Exhibit 25: Definition of Second-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 1 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	wave = 1, age_p = 1, reeva_h = 1	65.5%
2	wave = 1, age_p = 1, reeva_h = 2, 3	52.3%
3	wave = 1, age_p = 2	77.0%
4	wave = 1, age_p = 3, 4, reeva_h = 1, lang_h = 0, gende_p = 0	48.6%
5	wave = 1, age_p = 3, 4, reeva_h = 1, lang_h = 0, gende_p = 1	69.8%
6	wave = 1, age_p = 3, 4, reeva_h = 1, lang_h = 1	41.7%
7	wave = 1, age_p = 3, 4, reeva_h = 2, 3	70.7%
8	wave = 2, 3, block = 1-7, gende_p = 0	72.0%
9	wave = 2, 3, block = 1-7, gende_p = 1, res_h = 1	78.7%
10	wave = 2, 3, block = 1-7, gende_p = 1, res_h = 2, 3	87.5%
11	wave = 2, 3, block = 8-10, 12	60.0%
12	wave = 2, 3, block = 11	71.8%

*See Exhibits B-1 and B-2 of Appendix B for definitions of variables used to construct cells.
**First-phase nonresponse-adjusted weights.

The second-phase nonresponse adjustment factor, B_s , was computed as the inverse of the weighted second-phase response rate in final cell *s*:

$$B_s = \sum_{i=1}^{n_{12}^{(s)}} w_{ri}^{NR1} / \sum_{i-1}^{n_1^{(s)}} w_{ri}^{NR1} \quad (14)$$

where the sum of the first-phase nonresponse-adjusted weights in the numerator extends over the $n_{12}^{(s)}$ eligible sampled persons in final cell *s*, while the sum of first-phase nonresponse-adjusted weights in the denominator extends over the $n_1^{(s)}$ responding persons in final cell *s*.

The final nonresponse-adjusted weight for the i^{th} responding household in cell *s* (i.e., cases in response status group 1) was computed as:

$$w_{si}^{NR2} = B_s \, w_{si}^{NR1} \quad (19)$$

Exhibit 26 summarizes the (second-phase nonresponse-adjusted) weighted counts of the sampled persons in response-status group 1 (the survey respondents) and the CV of the weights by treatment status and blocking group.

Exhibit 26: Sum of Second-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 1 Shopper Weights

Blocking Group	HIP			Non-HIP		
	Frame count	Wtd. count (SNR2WT)*	CV of weights (%)	Frame count	Wtd. count (SNR2WT)*	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	1,020	29.8%	6,548	6,653	18.0%
2. Springfield, HH Size 1, Male Head	1,177	1,113	33.4%	7,472	5,960	24.1%
3. Springfield, HH Size 2+, Female Head	2,332	2,274	31.9%	15,173	14,216	37.0%
4. Springfield, HH Size 2+, Male Head	284	239	29.4%	1,888	1,952	28.8%
5. Chicopee/Holyoke HH Size 1, Female Head	504	478	19.4%	3,198	3,139	20.0%
6. Chicopee/Holyoke HH Size 1, Male Head	512	502	26.9%	3,250	2,911	34.2%
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,206	36.9%	7,236	7,893	34.2%
8. Chicopee/Holyoke HH Size 2+, Male Head	148	177	37.5%	982	963	41.7%
9. Hampden Balance, HH Size 1, Female Head	513	494	18.1%	3,260	2,966	11.7%
10. Hampden Balance, HH Size 1, Male Head	454	369	36.1%	2,879	3,094	50.8%
11. Hampden Balance, HH Size 2+, Female Head	958	912	35.1%	6,016	6,236	41.9%
12. Hampden Balance, HH Size 2+, Male Head	272	249	34.5%	1,744	1,411	19.0%
TOTAL	9,286	9,033	33.1%	59,646	57,393	34.5%

*Weighted counts using w_{ri}^{NR2} do not include ineligible cases in the sample. For this reason, the weighted counts in the table are generally lower than the frame counts.

Replicate Weights

Corresponding to the full-sample weights described above, 100 jackknife replicates were created for variance estimation from the full sample, where each jackknife replicate reflects the stratification of the full sample. The entire weighting process described in the previous section was applied to each replicate, resulting in a set of 100 replicate-specific weights for each respondent. Together with the full-sample weight, the replicate weights can be used to generate sampling errors of the survey-based estimates (see Section 2.1).

3. Round 2 Participant Survey Weights

This chapter describes the procedures used to weight the sample respondents from Round 2 of the Healthy Incentives Pilot (HIP) evaluation surveys. Two versions of person-level weights were constructed: a set for analysis of persons who completed the first intake (AMPM) interview, and another for analysis of the persons for whom both the intake interview and the associated shopper interview were completed. Corresponding to each of the two versions of weights, a set of replicate weights was also constructed for variance estimation purposes.

3.1 Starting Point

The starting point for the construction of the Round 2 sampling weights was the set of final nonresponse-adjusted person weights developed for analysis of respondents in the baseline (Round 1) survey, described in the previous chapter. These weights are designed to provide for substantially unbiased estimation of the characteristics of SNAP beneficiaries (by treatment group) who (a) resided in Hampden County Massachusetts, (b) were listed as active participants in the July 2011 case files provided by the Massachusetts DTA, and (c) remained eligible through the end of Round 1 data collection.

Exhibit 27 summarizes the unweighted and weighted counts for the two sets of person weights that were previously created for analysis of Round 1 survey data. As indicated in the table, weights were created for 2,784 persons who completed the baseline extended interview, and for 2,645 persons for whom both the baseline interview and the associated shopper interview were completed. Note that only the first set of weights corresponding to the 2,784 respondents completing the extended interview were used to develop the Round 2 weights described in this report. The results shown for the second set of weights (referred to as the "Round 1 shopper" weights) are given for reference only, since they were not used to construct the Round 2 weights.

Exhibit 27: Summary of Previously-Constructed Round 1 Analysis Weights by Type and Treatment Status

Type of weight	Weighted cases	Treatment Group		
		Total	HIP	Non-HIP
Round 1 "person" weight	Number	2,784	1,388	1,396
	Weighted count*	68,681	9,035	59,646
Round 1 "shopper" weight	Number	2,645	1,321	1,324
	Weighted count**	66,426	9,033	57,393

*Weights apply to persons completing the Round 1 extended interview.
**Weights apply to persons completing the Round 1 extended interview and for whom the primary shopper interview was also completed (i.e., participant-shopper "dyads"). Counts exclude dyads with no eligible shoppers.

3.2 Nonresponse Adjustment

Since all of the still-eligible responding cases from Round 1 were carried over into (i.e., "sampled" for) Round 2 the final weights from Round 1 are essentially the "base" weights for Round 2 weighting. If there were no nonresponses in Round 2, the final weights from Round 1 would also be the final analytic weights for Round 2. However, as can be seen in Exhibit 28, sample losses due to both nonresponse and attrition were experienced in Round 2, and the rates of loss varied by type of interview. The response rates for the four types of interviews conducted in Round 2 are shown at the

bottom of Exhibit 28. To reflect the fact that nonresponse could occur either prior to or after ascertaining eligibility for the survey, the overall Round 2 response rate for a particular type of interview was computed as the product of the two preceding percentages in the table.

Exhibit 28: Distribution of Round 2 Sample by Type-of-Interview and Response Status

Response status	Type of Interview			
	Person	Shopper	First Intake*	Second Intake
1. Respondent	1,998	1,974	2,006	230
2. Eligible nonrespondent**	351	375	343	245
3. Ineligible based on DTA case files (non-released)	311	311	311	---
4. Ineligible based on survey	64	64	64	15
5. Unknown eligibility (not locatable)	60	60	60	14
TOTAL	2,784	2,784	2,784	504
Percentage of released sample for which eligibility was determined	97.6%	97.6%	97.6%	97.2%
Percentage of known eligible cases for which interview was completed	85.1%	84.0%	85.4%	48.4%
Round 2 response rate	83.0%	82.0%	83.3%	47.1%

* Intake interview was first module of person survey; some respondents broke off after the intake module.
**Counts include four cases that were not released in Round 2 because they were precoded as "do not contact" cases and were still active participants in DTA case files.

Exhibit 29 provides a cross-tabulation of the 2,784 cases from Round 1 by response status for each of the three primary components of the Round 2 surveys: intake (AMPM), shopper, and extended participant interview. Prior to fielding the second round of interviews, 315 of the 2,784 cases were deleted from the sample for various reasons (e.g., were no longer active in SNAP according to DTA case files, opted out of the study, moved to a household of a different treatment status (shifters), or were ineligible for other reasons). Five of the 315 were “do not contact” cases, of which one was no longer active according to DTA case files. Thus, of the 315 cases that were not fielded in Round 2, four were still active in SNAP and were included in the weighting process as eligible nonrespondents. The remaining 311 were excluded from the weighting process.

Exhibit 29: Distribution of Round 2 Sample by Response Status for Intake, Shopper, and Extended Interviews

Response status* by type of interview			
Intake (AMPM)	Shopper	Ext. Interview	Number
1	1	1	1,933
1	2	1	21
1	2	2	52
2	1	1	41
2	2	1	3
2	2	2	299
4	4	4	64
5	5	5	60
Not released (ineligible)			311**
Total			2,784

*See Exhibit 28 for description of response-status codes 1-5.
**Out of a total of 315 non-released cases, five were "do not contact" cases, of which four were eligible according to updated DTA case files. These four cases are treated as nonrespondents for weighting purposes (i.e., have response status = 2 for intake, shopper, and extended interviews).

Similar to the general procedures used to weight the Round 1 sample, nonresponse adjustments were made separately for the two treatment groups, for each of the following two types of Round 2 weights.

- Round 2 person weights. These weights apply to the 2,006 respondents completing the first *intake* (AMPM) interview. Note that interview data from Round 2 are missing for 52 of the 2,006 AMPM respondents (see Exhibit 29).
- Round 2 shopper weights. These weights are analogous to the shopper weights created for Round 1. These weights apply to the 1,933 respondents who completed the first intake interview *and* for whom the associated shopper interview was also completed. (All 1,933 respondents also completed the extended interview.)

Nonresponse Adjustment of Person Weights

We specified the five response status groups shown in Exhibit 30. Note that two types of “ineligibles” were specified. Response-status group 3 consisted of 311 persons who were precoded as ineligible because they were no longer active in SNAP, opted out of the study, or moved to a household in a different treatment group. Such cases were removed from the sample in advance of data collection. On the other hand, response-status group 4 consisted of other types of ineligible persons who could not be identified in advance of data collection. This group included persons who moved, were no longer in SNAP at the time of the interview, became institutionalized, died, etc. To ascertain whether a sampled person is in group 4, it was generally necessary to contact the sampled person or a knowledgeable household member. Consequently, nonresponse could have occurred either (1) prior to determining eligibility (e.g., the sampled person could not be contacted or located); or (2) after determining eligibility (e.g., the person was located and eligibility was determined). Thus, the nonresponse adjustment was done in two phases as described below.

Exhibit 30: Distribution of the Evaluation Sample by Treatment Group, Wave, and Round 2 Intake (AMPM) Response Status

Round 2 intake interview (AMPM) response status group*	Total	HIP				NON HIP			
		Wave 1	Wave 2	Wave 3	Total	Wave 1	Wave 2	Wave 3	Total
1. Respondent	2,006	337	378	294	1,009	335	389	273	997
2. Eligible nonrespondent	343	40	60	62	162	59	56	66	181
3. Ineligible—not released	311	48	61	51	160	49	53	49	151
4. Ineligible—other	64	10	8	10	28	9	18	9	36
5. Eligibility unknown	60	12	4	13	29	12	5	14	31
TOTAL	2,784	447	511	430	1,388	464	521	411	1,396

*See Appendix A for cross-walk of final result codes to response-status groups.

First-Phase Adjustment of Person Weights

The purpose of the first-phase adjustment was to distribute a portion of the weighted count of the cases in response status group 5 (unknown eligibility) to the three remaining groups (1, 2, and 4) defined in Exhibit 30. The cases in response-status group 3, which were deleted from the sample prior to data collection, were excluded from this process. First, we conducted a CHAID analysis (Chi Square Automatic Interaction Detector) separately for each treatment group to identify cells within which the predicted probabilities of ascertaining eligibility were similar.

The person-level "dependent" variable used in the analysis was defined by the zero-one variable:

$$Y = \begin{cases} 1, \text{if the sampled person belonged to response status group } 1, 2, \textit{or } 4 \\ \\ 0, \text{if the sampled person belonged to response status group } 5 \end{cases}$$

In addition to the classification variables used previously to weight the Round 1 sample, we also used selected responses from the Round 1 baseline interview as potential independent (predictor) variables in the CHAID analysis. See Appendix C for a list of the variables from the baseline interview that were used in the CHAID analysis.

The output from the CHAID analysis was a tree diagram that defined the final cells (labeled $r = 1, 2, ..., R$) used in the first-phase nonresponse adjustment. Exhibits 31 and 32 summarize the first-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively. It can be seen that for both HIP and non-HIP samples, the weighted (conditional) response rates were high, varying from around 87 percent to 100 percent across the adjustment cells. The response rates in this table are "conditional" response rates since they apply to the set of Round 1 respondents and do not reflect the earlier nonresponse losses.

Exhibit 31: Definition of First-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 2 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hh_typ = 1	100.0%
2	hh_typ = 2, 3, uc_h = 1	100.0%
3	hh_typ = 2, 3, uc_h = 0, tryvg = 1, 2, 3, wave = 1, 3	89.4%
4	hh_typ = 2, 3, uc_h = 0, tryvg = 1, 2, 3, wave=2	100.0%
5	hh_typ = 2, 3, uc_h = 0, tryvg = 4, 5, 99, ben_h = 1, 4	96.8%
6	hh_typ = 2, 3, uc_h = 0, tryvg = 4 ,5, 99, ben_h = 2, 3	99.8%

*See Appendix C for definitions of the variables used to construct cells.
**Conditional response rates using the final Round 1 person weights.

Exhibit 32: Definition of First-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 2 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	edlv = 1, 2, 3, 4, 99	94.6%
2	edlv = 5, 6, 7	98.4%
3	edlv = 8, 9, 10, age_h = 1	86.9%
4	edlv = 8, 9, 10, age_h = 2, 3, ben_h = 1, 4	95.3%
5	edl v= 8, 9, 10, age_h = 2, 3, ben_h = 2, 3	100.0%
6	edlv = 8, 9, 10, age_h = 4	100.0%
7	edlv = 11	100.0%
8	12 =< edlv <= 22, vegh = 1, 2, 99	100.0%
9	12 =< edlv <= 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 1, 2, 3	95.4%
10	12 =< edlv <= 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 4, 5, 12	100.0%
11	12 =< edlv <= 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 6, 7, 8	96.9%
12	12 =< edlv <= 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 9, 10, 11	95.9%
13	12 =< edlv <= 22, vegh = 3, 4, 5, shopv = 4, 5, 99	100.0%

*See Appendix C for definitions of the variables used to construct cells.
**Conditional response rates using the final Round 1 person weights.

The first-phase nonresponse adjustment factor, A_r , was computed as the inverse of the weighted first-phase response rate in final cell *r*:

$$A_r = \sum_{i=1}^{n_{1245}^{(r)}} w_{ri}^{Round\ 1} \Big/ \sum_{i=1}^{n_{124}^{(r)}} w_{ri}^{Round\ 1}, \quad (1)$$

where the sum of the final Round 1 weights in the numerator extends over the $n_{1245}^{(r)}$ sampled persons in response-status groups 1, 2, 4, and 5 in final cell *r*, while the sum of the final Round 1 weights in the denominator extends over the $n_{124}^{(r)}$ sampled persons in response-status groups 1, 2, and 4 in final cell *r*.

The (intermediate) first-phase adjusted weight for the i^{th} sampled person in cell *r* for whom eligibility was determined (i.e., cases in response status groups 1, 2, and 4) was computed as:

$$w_{ri}^{NR1} = A_r\, w_{ri}^{Round\ 1} \quad (2)$$

Exhibit 33 summarizes the (first-phase nonresponse-adjusted) weighted counts of the sampled persons in response-status groups 1, 2, and 4 and the coefficient of variation (CV) of the weights by treatment status and blocking group. The CV of the weights is informative because $1+(CV/100)^2$ represents the design effect due to unequal weighting.

Exhibit 33: Sum of First-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 2 Person Weights

Blocking Group	HIP			Non-HIP		
	Frame count*	Wtd. count**	CV of weights (%)	Frame count*	Wtd. count**	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	933	24.5	6,548	6,140	20.6
2. Springfield, HH Size 1, Male Head	1,177	887	27.5	7,472	5,635	25.5
3. Springfield, HH Size 2+, Female Head	2,332	2,042	34.3	15,173	12,945	29.6
4. Springfield, HH Size 2+, Male Head	284	238	28.3	1,888	1,719	24.1
5. Chicopee/Holyoke HH Size 1, Female Head	504	432	21.1	3,198	2,971	18.3
6. Chicopee/Holyoke HH Size 1, Male Head	512	422	28.1	3,250	2,435	34.9
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,027	34.8	7,236	6,277	25.6
8. Chicopee/Holyoke HH Size 2+, Male Head	148	133	25.6	982	734	56.1
9. Hampden Balance, HH Size 1, Female Head	513	416	10.2	3,260	2,671	22.2
10. Hampden Balance, HH Size 1, Male Head	454	282	36.2	2,879	2,506	32.3
11. Hampden Balance, HH Size 2+, Female Head	958	766	26.3	6,016	5,027	25.5
12. Hampden Balance, HH Size 2+, Male Head	272	198	27.2	1,744	1,264	10.6
TOTAL	9,286	7,773	30.6	59,646	50,324	28.1

*Population counts in original sampling frame.
**Weighted counts using w_{rl}^{NR1}.

Second-Phase Adjustment of Person Weights

For the second-phase adjustment, we restricted the sample to cases with response-status codes of 1 (respondents) or 2 (eligible nonrespondents). We conducted separate CHAID analyses for each treatment group to identify cells with similar conditional response propensities (i.e., conditional on the subset of cases that were determined to be eligible for the study).

The person-level "dependent" variable for the second-phase adjustment was defined by the zero-one variable:

$$Z = \begin{cases} 1, \text{if the sampled person belonged to response status group 1} \\ 0, \text{if the sampled person belonged to response status group 2} \end{cases}$$

We specified the same set of independent variables used previously for the first-phase adjustment as potential independent variables in the second-phase CHAID analyses. The output from the CHAID

analysis was used to define the second-phase nonresponse-adjustment weighting cells (denoted by the subscript s = 1, 2, ..., S). Exhibits 34 and 35 summarize the second-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively.

Exhibit 34: Definition of Second-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 2 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	rsdi_h = 1, fixv = 1	98.6%
2	rsdi_h = 1, fixv = 2, 3, 4, 5, 99	89.0%
3	rsdi_h = 0, tryvg = 1, 2, 3, 99, wave = 1	88.4%
4	rsdi_h = 0, tryvg = 1, 2, 3, 99, wave = 2, 3	70.8%
5	rsdi_h = 0, tryvg = 4, 5, ensp = 1, reeva_h = 1	93.6%
6	rsdi_h = 0, tryvg = 4, 5, ensp = 1, reeva_h = 2,3	83.8%
7	rsdi_h = 0, tryvg = 4, 5, ensp = 2	81.2%

*See Appendix C for definitions of the variables used to construct cells.
**Weighted using first-phase nonresponse-adjusted person weights.

Exhibit 35: Definition of Second-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 2 Person Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	blk = 1, ssi_h = 1	98.3%
2	blk = 1, ssi_h = 0	87.8%
3	blk = 2, 99, wave = 1, 2	85.3%
4	blk = 2, 99, wave = 3, age_p = 1, 4	72.1%
5	blk = 2, 99, wave = 3, age_p = 2, 3	86.4%

*See Appendix C for definitions of the variables used to construct cells.
**Weighted using first-phase nonresponse-adjusted person weights.

The second-phase nonresponse adjustment factor, B_s , was computed as the inverse of the weighted second-phase response rate in final cell s:

$$B_s = \sum_{i=1}^{n_{12}^{(s)}} w_{ri}^{NR1} \Big/ \sum_{i=1}^{n_1^{(s)}} w_{ri}^{NR1} \qquad (3)$$

where the sum of the first-phase nonresponse-adjusted weights in the numerator extends over the $n_{12}^{(s)}$ eligible sampled persons in final cell s, while the sum of first-phase nonresponse-adjusted weights in the denominator extends over the $n_1^{(s)}$ responding persons in final cell s.

The final nonresponse-adjusted weight for the i^{th} responding person in cell s (i.e., cases in response status group 1) was then computed as:

$$w_{si}^{Round\ 2} = B_s\, w_{si}^{NR1} \qquad (4)$$

Exhibit 36 summarizes the final nonresponse-adjusted weighted counts of sampled persons in response-status group 1 (the survey respondents) and the CV of the weights by treatment status and blocking group.

Exhibit 36: Sum of Second-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 2 Person Weights

Blocking Group	HIP			Non-HIP		
	Frame count*	Wtd. count**	CV of weights (%)	Frame count*	Wtd. count**	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	908	24.6	6,548	5,918	15.6
2. Springfield, HH Size 1, Male Head	1,177	897	22.3	7,472	5,650	19.3
3. Springfield, HH Size 2+, Female Head	2,332	1,964	29.2	15,173	12,627	22.8
4. Springfield, HH Size 2+, Male Head	284	228	27.8	1,888	1,609	22.7
5. Chicopee/Holyoke HH Size 1, Female Head	504	472	19.6	3,198	3,025	14.5
6. Chicopee/Holyoke HH Size 1, Male Head	512	432	21.4	3,250	2,080	30.1
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	997	29.0	7,236	6,296	19.7
8. Chicopee/Holyoke HH Size 2+, Male Head	148	124	25.1	982	654	61.8
9. Hampden Balance, HH Size 1, Female Head	513	410	14.3	3,260	2,746	15.1
10. Hampden Balance, HH Size 1, Male Head	454	266	23.1	2,879	2,308	23.4
11. Hampden Balance, HH Size 2+, Female Head	958	743	25.5	6,016	4,787	20.3
12. Hampden Balance, HH Size 2+, Male Head	272	148	19.7	1,744	992	13.1
TOTAL	9,286	7,588	27.0	59,646	48,692	23.0

*Population counts in original sampling frame.

**Weighted counts using the final Round 2 person weights, $w_{ri}^{Round\ 2}$. The weighted counts represent the portion of the persons in the original frame who remained eligible through the end of Round 2.

Replicate Person Weights for Variance Estimation

For variance estimation, 100 jackknife replicates were created from the full Round 2 sample using the same procedures as in Round 1. See Chapter 2, Replicate Person Weights for Variance Estimation section for a description of the process.

Nonresponse Adjustment of Shopper Weights

A second set of person-level weights was constructed for analysis of persons completing the intake interview for whom the corresponding shopper survey was also completed in Round 2. These are referred to as the Round 2 "shopper" weights. The construction of these weights essentially followed the same steps described in the previous section for constructing "person weights." The main difference was in the manner in which the response status groups were defined.

First-Phase Adjustment of Shopper Weights

The first step in the weighting process was to adjust the final person-level weights from Round 1 to compensate for nonresponse in the shopper survey. Similar to the procedures described in the previous section, the adjustments were made separately for each of the two treatment groups.

We defined the five response status groups specified in Exhibit 37. Note that this table differs from Exhibit 30 in that the set of respondents (response status group 1) includes persons for which *both* the intake and shopper interviews were completed. Since nonresponse could have occurred either (1) prior to determining eligibility (e.g., the sampled person could not be contacted or located); or (2) after determining eligibility (e.g., the person was located and eligibility was determined), the nonresponse adjustment was done in two phases as described in (b) and (c) below.

Exhibit 37: Distribution of the Round 2 Evaluation Sample by Treatment Group, Wave, and Response Status for the Shopper Survey

		HIP				Non-HIP			
Round 2 intake-shopper dyad response status group*	Total	Wave 1	Wave 2	Wave 3	Total	Wave 1	Wave 2	Wave 3	Total
1. Respondent**	1,933	329	366	276	971	329	372	261	962
2. Eligible nonrespondent	416	48	72	80	200	65	73	78	216
3. Ineligible—not released	311	48	61	51	160	49	53	49	151
4. Ineligible—other	64	10	8	10	28	9	18	9	36
5. Eligibility unknown	60	12	4	13	29	12	5	14	31
TOTAL	2,784	447	511	430	1,388	464	521	411	1,396

*See Appendix A for cross-walk of final result codes to response-status groups.
**Persons completing the intake and for whom a shopper interview was also completed.

Initially, we distributed a portion of the weighted count of the persons in response status group 5 (unknown eligibility) to three of the remaining groups (response-status groups 1, 2 and 4) defined in Exhibit 38. We conducted a CHAID analysis (Chi Square Automatic Interaction Detector) for each treatment group to identify cells within which the predicted probabilities of ascertaining eligibility were similar.

The person-level "dependent" variable was defined by the zero-one variable:

$$Y = \begin{cases} 1, \text{if the sampled person belonged to response status group } 1, 2, \textit{or } 4 \\ \\ 0, \text{if the sampled person belonged to response status group } 5 \end{cases}$$

In addition to blocking group, the variables listed in Appendix C were specified as potential independent (predictor) variables in the CHAID analysis.

The output from the CHAID analysis was a tree diagram that defined the final cells (labeled r = 1, 2, ..., R) used in the first-phase nonresponse adjustment. Exhibits 38 and 39 summarize the first-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively. It can be seen that for both HIP and non-HIP samples, the weighted (conditional) response rates varied from around 87 percent to 100 percent across the adjustment cells.

Exhibit 38: Definition of First-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 2 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	hh_typ = 1	100.0%
2	hh_typ = 2, 3, uc_h = 1	100.0%
3	hh_typ = 2, 3,uc_h = 0,tryvg = 1, 2, 3, wave = 1, 3	89.4%
4	hh_typ = 2, 3,uc_h = 0,tryvg = 1, 2, 3, wave = 2	100.0%
5	hh_typ = 2, 3,uc_h = 0,tryvg = 4, 5, 99, ben_h = 1, 4	96.8%
6	hh_typ = 2, 3,uc_h = 0,tryvg = 4, 5, 99, ben_h = 2, 3	99.8%

*See Appendix C for definitions of the variables used to construct cells.
**Conditional response rates using the final Round 1 person weights.

Exhibit 39: Definition of First-Phase Nonresponse Adjustment Cells For the non-HIP Group, Round 2 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	edlv = 1, 2, 3, 4, 99	94.6%
2	edlv = 5, 6, 7	98.4%
3	edlv = 8, 9, 10, age_h = 1	86.9%
4	edlv = 8, 9, 10, age_h = 2, 3, ben_h = 1, 4	95.3%
5	edlv = 8, 9, 10, age_h = 2, 3, ben_h = 2, 3	100.0%
6	edlv = 8, 9, 10, age_h = 4	100.0%
7	edlv = 11	100.0%
8	12 = < edlv < = 22, vegh = 1, 2, 99	100.0%
9	12 = < edlv < = 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 1, 2, 3	95.4%
10	12 = < edlv < = 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 4, 5, 12	100.0%
11	12 = <edlv < = 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 6, 7, 8	96.9%
12	12 = < edlv < = 22, vegh = 3, 4, 5, shopv = 1, 2, 3, block = 9, 10, 11	95.9%
13	12 = < edlv < = 22, vegh = 3, 4, 5, shopv = 4, 5, 99	100.0%

*See Appendix C for definitions of the variables used to construct cells.
**Conditional response rates using the final Round 1 person weights.

The first-phase nonresponse adjustment factor, A_r , was computed as the inverse of the weighted first-phase response rate in final cell r:

$$A_r = \sum_{i=1}^{n_{1245}^{(r)}} w_{ri}^{Round\ 1} \Big/ \sum_{i=1}^{n_{124}^{(r)}} w_{ri}^{Round\ 1} \qquad (8)$$

where the sum of the final Round 1 weights in the numerator extends over the $n_{1245}^{(r)}$ sampled persons in response-status groups 1, 2, 4, and 5 in final cell *r*, while the sum of weights in the denominator extends over the $n_{124}^{(r)}$ sampled persons in response-status groups 1, 2, and 4 in final cell *r*.

The first-phase adjusted weight for the i^{th} sampled person in cell *r* for which eligibility was determined (i.e., cases in response status groups 1, 2, and 4) was computed as:

$$w_{ri}^{SNR1} = A_r \; w_{ri}^{Round\ 1} \quad (9)$$

Exhibit 40 summarizes the (first-phase nonresponse-adjusted) weighted counts of the sampled persons in response-status groups 1, 2, and 4 and the CV of the weights by treatment status and blocking group.

Exhibit 40: Sum of First-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 2 Shopper Weights

Blocking Group	HIP			Non-HIP		
	Frame count*	Wtd. count**	CV of weights (%)	Frame count*	Wtd. count**	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	933	24.5	6,548	6,140	20.6
2. Springfield, HH Size 1, Male Head	1,177	887	27.5	7,472	5,635	25.5
3. Springfield, HH Size 2+, Female Head	2,332	2,042	34.3	15,173	12,945	29.6
4. Springfield, HH Size 2+, Male Head	284	238	28.3	1,888	1,719	24.1
5. Chicopee/Holyoke HH Size 1, Female Head	504	432	21.1	3,198	2,971	18.3
6. Chicopee/Holyoke HH Size 1, Male Head	512	422	28.1	3,250	2,435	34.9
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	1,027	34.8	7,236	6,277	25.6
8. Chicopee/Holyoke HH Size 2+, Male Head	148	133	25.6	982	734	56.1
9. Hampden Balance, HH Size 1, Female Head	513	416	10.2	3,260	2,671	22.2
10. Hampden Balance, HH Size 1, Male Head	454	282	36.2	2,879	2,506	32.3
11. Hampden Balance, HH Size 2+, Female Head	958	766	26.3	6,016	5,027	25.5
12. Hampden Balance, HH Size 2+, Male Head	272	198	27.2	1,744	1,264	10.6
TOTAL	9,286	7,773	30.6	59,646	50,324	28.1

*Population counts in original sampling frame.
**Weighted counts using w_{ri}^{SNR1}.

For the second-phase adjustment, we restricted the sample to person-shopper dyads with response status codes of 1 (respondents) or 2 (eligible nonrespondents). We conducted separate CHAID analyses for each treatment group to identify cells with similar (conditional) response propensities.

The "dependent" variable for the second-phase adjustment was defined by the zero-one variable:

$$Z = \begin{cases} 1, \text{if the sampled person belonged to response status group 1} \\ 0, \text{if the sampled person belonged to response status group 2} \end{cases}$$

We specified the same independent variables used previously for the first-phase adjustment as independent variables in the second-phase CHAID analyses. The output from the CHAID analysis was used to define the second-phase nonresponse-adjustment weighting cells (denoted by the subscript s = 1, 2, ..., S). Exhibits 41 and 42 summarize the second-phase nonresponse adjustment cells determined by the CHAID analysis for the HIP and non-HIP groups, respectively.

Exhibit 41: Definition of Second-Phase Nonresponse Adjustment Cells for the HIP Treatment Group, Round 2 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	wave = 1, 2, race_h = 1, 4, ben_h = 1, 2, 4	82.2%
2	wave = 1, 2, race_h = 1, 4, ben_h = 3	67.7%
3	wave = 1, 2, race_h = 2, 3, wave = 1, in_h = 1, 2, 4	89.7%
4	wave = 1, 2, race_h = 2, 3, wave = 1, in_h = 3	100.0%
5	wave = 1, 2, race_h = 2, 3, wave = 2, shopf = 1, 99	75.8%
6	wave = 1, 2, race_h = 2, 3, wave = 2, shopf = 2, 3, 4, 5	88.4%
7	wave = 3	77.1%

*See Appendix C for definitions of the variables used to construct cells.
**Weighted using first-phase nonresponse-adjusted shopper weights.

Exhibit 42: Definition of Second-Phase Nonresponse Adjustment Cells for the non-HIP Group, Round 2 Shopper Weights

Nonresponse adjustment cell	Definition of cell based on CHAID analysis*	Weighted response rate**
1	blk = 1, rsdi_h = 1	96.5%
2	blk = 1, rsdi_h = 0	86.8%
3	blk = 2, 99, wave = 1, 2, race_p = 1, 2, dsbl_h = 1	84.8%
4	blk = 2, 99, wave = 1, 2, race_p = 1, 2, dsbl_h = 0	78.2%
5	blk = 2, 99, wave = 1, 2, race_p = 3, 4	94.8%
6	blk = 2, 99, wave = 3, age_p = 1, 4	67.8%
7	blk = 2, 99, wave = 3, age_p = 2, 3	82.4%

*See Appendix C for definitions of the variables used to construct cells.
**Weighted using first-phase nonresponse-adjusted shopper weights.

Second-Phase Adjustment of Shopper Weights

The second-phase nonresponse adjustment factor, B_s , was computed as the inverse of the weighted second-phase response rate in final cell *s*:

$$B_s = \sum_{i=1}^{n_{12}^{(s)}} w_{ri}^{SNR1} \Big/ \sum_{i=1}^{n_1^{(s)}} w_{ri}^{SNR1} \quad (10)$$

where the sum of the first-phase nonresponse-adjusted weights in the numerator extends over the $n_{12}^{(s)}$ eligible sampled persons in final cell *s*, while the sum of first-phase nonresponse-adjusted weights in the denominator extends over the $n_1^{(s)}$ responding persons in final cell *s*.

The final nonresponse-adjusted weight for the i^{th} responding person-shopper dyad in cell *s* (i.e., cases in response status group 1) was computed as:

$$w_{si}^{R2\ Shopper} = B_s\ w_{si}^{SNR1} \quad (11)$$

Exhibit 43 summarizes the (second-phase nonresponse-adjusted) weighted counts of the sampled persons in response-status group 1 (the survey respondents) and the CV of the weights by treatment status and blocking group.

Exhibit 43: Sum of Second-Phase Nonresponse-Adjusted Weights and CV of Weights by Treatment and Blocking Group, Round 2 Shopper Weights

Blocking Group	HIP			Non-HIP		
	Frame count*	Wtd. count**	CV of weights (%)	Frame count*	Wtd. count**	CV of weights (%)
1. Springfield, HH Size 1, Female Head	1,032	919	18.4	6,548	5,794	16.2
2. Springfield, HH Size 1, Male Head	1,177	897	18.3	7,472	5,565	21.4
3. Springfield, HH Size 2+, Female Head	2,332	2,000	29.4	15,173	12,520	22.5
4. Springfield, HH Size 2+, Male Head	284	213	25.0	1,888	1,576	24.3
5. Chicopee/Holyoke HH Size 1, Female Head	504	463	14.8	3,198	3,073	16.1
6. Chicopee/Holyoke HH Size 1, Male Head	512	409	18.0	3,250	2,131	31.6
7. Chicopee/Holyoke HH Size 2+, Female Head	1,100	972	27.8	7,236	6,393	20.2
8. Chicopee/Holyoke HH Size 2+, Male Head	148	122	25.3	982	631	60.8
9. Hampden Balance, HH Size 1, Female Head	513	417	11.6	3,260	2,757	16.2
10. Hampden Balance, HH Size 1, Male Head	454	274	19.1	2,879	2,383	24.9
11. Hampden Balance, HH Size 2+, Female Head	958	752	22.6	6,016	4,837	22.1
12. Hampden Balance, HH Size 2+, Male Head	272	150	24.0	1,744	1,031	15.5
TOTAL	9,286	7,588	25.2	59,646	48,692	23.6

*Population counts in original sampling frame.

**Weighted counts using the final Round 2 shopper weights, $w_{ri}^{R2\ Shopper}$. The weighted counts represent the portion of the persons in the original frame who remained eligible through the end of Round 2.

Replicate Shopper Weights for Variance Estimation

Corresponding to the full-sample weights described above, 100 jackknife replicates were created for variance estimation from the full sample, where each jackknife replicate reflects the stratification of the full sample. The entire weighting process described in the previous section was applied to each replicate, resulting in a set of 100 replicate-specific weights for each respondent. Together with the full-sample weight, the replicate weights can be used to generate sampling errors of the survey-based estimates.

Appendix A: Definition of Response Status Groups

Response status group *	Code	Description
1	C1	Complete interview in English with selected respondent.
1	C2	Complete interview in English with shopper.
1	C3	Complete interview in Spanish with selected respondent.
1	C4	Complete interview in Spanish with shopper.
4	I2	The only person in the HH who shops is not 18+.
3	I3	The household identified by the study area as not participating in SNAP.
7	I4	Case was not released
2	LH	Two calls to this respondent resulted in a hearing or speech communication problem.
2	LM	Questionnaire had an additional language problem and has reached the maximum calling algorithm.
2	LP	Two calls to this respondent resulted in a non-English communication problem.
2	MC	The calling algorithm has been fulfilled. At least one "human" contact has been made at the number and there are no refusals or language problems in the call history for the household.
2	ML	The calling algorithm has been fulfilled. An attempt to contact someone else in the HH resulted in an interim language problem, but this particular questionnaire has had no interim language problem in its call history.
2	MR	Max call refusal
4	ND	Nonresponse: subject deceased
5	NL	The sampled person was not located. If the project is tracing, this code is assigned after the use of tracing resources.
2	NO	Nonresponse: other. Questionnaire for which no other final result code is applicable.
2	NM	No answer - Answering machine
2	NP	Nonresponse: subject not available in field period
2	NS	Nonresponse: subject physically or mentally incapable of completing interview and no proxy available.
2	RB	Refusal - On at least two calls, the respondent refused to be interviewed or broke off during the interview and refused to continue.
2	RG	Guardian or parent refused to grant consent for minor to participate in the study.
2	R3	A Re-Released Final Refusal (RB) has received an additional refusal.
4	OA	Subject never lived in Hampden County, MA.
4	OJ	Subject is in an institution (Nursing Home, jail, half-way house).
4	OO	Other out of scope - The questionnaire is out of scope and no other final code applies.
4	OP	On two separate attempts, the respondent enumerated in the screener is 'never heard of' at the extended interview level and the correct phone # has been dialed.
4	OS	After the case is loaded, study area pulls case from TRC because Subject no longer participates in SNAP project.

*Applies to respondent and primary shopper surveys and to all rounds of data collection.

Appendix B: Round 1 Variables Used in CHAID Analyses and Calculated Response Rates

Exhibit B-1: Household-Level Variables Included in CHAID Analyses and Corresponding Sample Sizes by Treatment Status and Wave

Household Variable	HIP			Non-HIP		
	Wave 1	Wave 2	Wave 3*	Wave 1	Wave 2	Wave 3*
Total sample size	846	846	703	846	846	693
Monthly SNAP benefit						
$1-$161	184	203	163	187	192	178
$162 - $200	278	276	241	286	287	208
$201 - $349	117	120	90	103	120	94
$350 +	267	247	209	270	247	213
Spanish language	188	176	157	201	204	151
Recertification type						
Recertification	454	439	365	429	449	333
Semiannual reporting	291	300	257	302	297	255
Other reevaluation	101	107	81	115	100	105
Monthly Income						
$0	176	183	165	176	194	141
$1 - $787	213	209	156	211	191	161
$788 - $1,088	200	181	145	197	182	160
$1,089 +	257	273	237	262	279	231
Baystate CAP	57	59	46	65	64	53
Homeless	44	44	47	56	56	43
Housing type						
Private	678	679	576	698	677	537
Public	132	128	83	97	125	117
Other	36	39	44	51	44	39
Household head age						
16 - 30	214	228	175	214	217	178
31 - 40	202	202	184	204	220	154
41 - 54	235	229	190	241	220	203
55 +	195	187	154	187	189	158
Household head race/ethnicity						
Hispanic	363	369	307	371	383	319
White	311	308	269	317	297	258
Black	107	115	89	105	97	69
Other	65	54	38	53	69	47
Disabled	412	392	333	398	397	337
US Citizen	809	803	668	806	809	656
TANF/AFDC	126	141	100	136	147	107
Unearned income	513	497	407	494	485	415
SSI	259	266	209	256	249	231
RSDI	225	206	168	206	212	179
Unemployment compensation	41	45	37	40	42	32
Household type						
Household with elderly	93	90	82	94	96	83
Household with children	348	351	304	351	351	290
Other household	405	405	317	401	399	320
Size of household (no. adults 16+)						
1	829	830	690	825	829	680

Household Variable	HIP			Non-HIP		
	Wave 1	Wave 2	Wave 3*	Wave 1	Wave 2	Wave 3*
2	17	16	13	21	17	13

*Counts for wave 3 correspond to the subsample that was released for data collection.

Exhibit B-2: Person-level Variables Included in CHAID Analyses and corresponding Sample Sizes by Treatment Status and Wave

Household Characteristic	HIP			Non-HIP		
	Wave 1	Wave 2	Wave 3*	Wave 1	Wave 2	Wave 3*
Total sample size	846	846	703	846	846	693
Female	519	536	444	517	518	437
Age of person						
16 - 30	310	308	233	316	318	256
31 - 40	152	165	158	159	176	121
41 - 54	195	195	163	188	175	168
55 +	189	178	149	183	177	148
Race/ethnicity						
Hispanic	364	371	309	375	379	322
White	310	307	265	313	300	257
Black	106	113	88	106	101	68
Other	66	55	41	52	66	46
US citizen	808	805	669	805	810	655
Disabled	384	372	316	377	361	311
Unemployment compensation	43	37	38	33	35	25

*Counts for wave 3 correspond to the subsample that was released for data collection.

Exhibit B-3: Weighted Response Rates for the Round 1 Baseline Survey by Selected Characteristics

Characteristic (variable name)	HIP			Non-HIP		
	Phase 1*	Phase 2**	Overall	Phase 1*	Phase 2**	Overall
Household level						
Data collection wave (wave)						
1	85.6	60.9	52.1	81.3	66.1	53.7
2	81.7	79.3	64.8	87.0	78.2	68.0
3	87.6	83.5	73.1	89.3	77.8	69.5
Monthly SNAP benefit (ben_H)						
$1-$161	88.6	76.9	68.1	90.1	75.0	67.6
$162 - $200	78.4	73.5	57.6	78.0	70.5	55.0
$201 - $349	91.2	68.9	62.8	89.1	76.7	68.3
$350 +	86.0	71.6	61.6	88.0	74.2	65.3
Spanish language (lang_H)						
No	85.4	72.5	61.9	86.2	73.9	63.7
Yes	82.4	75.3	62.0	82.5	72.2	59.6
Recertification type (reeva_H)						
Recertification	83.6	74.2	62.0	84.2	73.4	61.8
Semiannual reporting	86.7	70.0	60.7	87.9	73.5	64.6
Other reevaluation	84.2	77.6	65.3	82.9	73.9	61.3
Monthly income (in_H)						
$0	78.1	69.3	54.1	79.1	72.8	57.6
$1 - $787	83.2	75.1	62.5	80.9	71.3	57.7
$788 - $1,088	86.3	75.1	64.8	87.3	74.8	65.3
$1,089 +	89.6	72.8	65.2	91.4	74.6	68.2
Baystate CAP (cap_H)						
No	84.7	72.9	61.7	85.5	73.5	62.8
Yes	86.3	76.0	65.6	83.5	73.5	61.4
Homeless (hmls_H)						
No	86.4	73.7	63.7	87.1	73.8	64.3
Yes	57.5	63.8	36.7	60.2	69.9	42.1
Housing type (res_H)						
Private	85.8	74.2	63.7	86.0	72.5	62.4
Public	89.2	70.9	63.2	91.5	79.4	72.7
Other	55.4	60.2	33.4	60.7	72.5	44.0
Household head age (age_H)						
16 - 30	76.9	68.9	53.0	80.2	73.8	59.2
31 - 40	87.2	73.6	64.2	85.1	74.0	63.0
41 - 54	85.2	76.2	64.9	88.5	74.0	65.5
55 +	90.7	73.5	66.7	87.4	72.2	63.1
Household head race/ethnicity (race_H)						
Hispanic	82.2	73.1	60.1	83.0	76.1	63.2
White	88.0	72.6	63.9	88.0	69.4	61.1
Black	82.4	78.8	64.9	88.1	79.6	70.1
Other	87.9	65.1	57.2	82.4	68.2	56.2
Disabled (dsbl_H)						
No	85.0	69.6	59.2	86.5	72.7	62.9
Yes	84.6	76.9	65.1	84.0	74.5	62.6
US citizen (citzn_H)						
No	93.5	54.6	51.1	92.4	63.1	58.3
Yes	84.3	74.1	62.5	85.0	74.1	63.0

Characteristic (variable name)	HIP			Non-HIP		
	Phase 1*	Phase 2**	Overall	Phase 1*	Phase 2**	Overall
TANF/AFDC (tafdc_H)						
No	84.5	72.5	61.3	85.0	72.0	61.2
Yes	86.0	76.3	65.6	87.0	81.0	70.5
Unearned income (ui_H)						
No	83.4	69.3	57.8	84.7	74.9	63.4
Yes	85.7	75.7	64.9	85.8	72.6	62.3
SSI (ssi_H)						
No	84.7	72.0	61.0	86.1	73.6	63.4
Yes	84.8	75.4	63.9	83.6	73.4	61.4
RSDI (rsdi_H)						
No	84.0	71.1	59.7	84.4	74.1	62.5
Yes	87.0	79.0	68.7	88.2	72.0	63.5
Unemployment compensation (uc_H)						
No	84.7	73.3	62.1	85.2	73.6	62.7
Yes	86.3	69.6	60.1	87.8	72.5	63.7
Household type (HH_TYP)						
Household with elderly	91.8	70.8	65.0	90.0	65.9	59.3
Household with children	87.7	70.5	61.8	89.9	75.5	67.9
Other household	80.6	76.1	61.3	80.3	73.7	59.2
Household with 4+ adults (nadl34)						
No	84.6	72.9	61.7	85.0	73.4	62.4
Yes	91.3	82.8	75.6	94.5	76.5	72.3
Person level						
Female (gende_P)						
No	79.6	70.0	55.7	80.7	68.2	55.0
Yes	87.8	74.8	65.7	88.2	76.5	67.5
Age of person (age_P)						
16 - 30	79.4	68.9	54.7	82.4	72.8	60.0
31 - 40	87.6	72.4	63.4	84.9	76.2	64.7
41 - 54	84.8	78.6	66.7	87.9	74.4	65.4
55 +	91.2	74.5	67.9	88.3	71.7	63.3
Race/ethnicity (race_P)						
Hispanic	82.4	72.9	60.1	82.7	76.0	62.9
White	88.1	72.2	63.6	88.2	69.5	61.3
Black	81.7	80.5	65.8	87.9	79.4	69.8
Other	87.4	65.6	57.3	82.9	68.4	56.7
US citizen (citzn_P)						
No	95.2	57.9	55.1	92.5	61.9	57.3
Yes	84.2	73.9	62.2	85.0	74.2	63.1
Disabled (dsbl_P)						
No	84.8	69.5	58.9	86.2	73.0	62.9
Yes	84.7	77.5	65.6	84.3	74.3	62.6
Unemployment compensation (uc_flg_P)						
No	84.5	73.3	61.9	85.4	73.5	62.8
Yes	90.0	68.2	61.4	84.3	73.0	61.5

*Weights are the poststratified pooled weights.
**Weights are the phase 1 nonresponse-adjusted weights.

Exhibit B-4: Weighted Response Rates for the Round 1 Shopper Survey by Selected Characteristics

Characteristic (variable name)	HIP			Non-HIP		
	Phase 1*	Phase 2**	Overall	Phase 1*	Phase 2**	Overall
Household-level						
Data collection wave (wave)						
1	84.6	58.2	49.2	81.0	62.8	50.9
2	80.4	76.7	61.7	86.1	74.8	64.4
3	87.3	79.7	69.6	88.7	75.4	66.9
Monthly SNAP benefit (ben_H)						
$1-$161	87.5	74.1	64.8	89.2	72.0	64.2
$162 - $200	77.8	69.8	54.3	77.8	67.8	52.7
$201 - $349	89.6	67.6	60.6	87.5	72.0	63.0
$350 +	85.3	68.7	58.6	87.6	71.1	62.3
Spanish language (lang_H)						
No	84.8	70.0	59.4	85.7	71.2	61.0
Yes	80.6	70.6	56.9	81.6	67.9	55.4
Recertification type (reeva_H)						
Recertification	82.6	70.4	58.2	83.5	69.4	57.9
Semiannual reporting	85.9	68.7	59.0	87.5	71.3	62.4
Other reevaluation	83.1	73.5	61.1	82.0	71.7	58.8
Monthly income (in_H)						
$0	77.5	66.7	51.7	78.9	70.9	55.9
$1 - $787	82.5	70.6	58.2	80.4	67.8	54.5
$788 - $1,088	85.4	72.7	62.1	86.8	71.5	62.1
$1,089 +	88.3	70.4	62.2	90.5	71.1	64.3
Baystate CAP (cap_H)						
No	83.8	70.1	58.7	85.0	70.3	59.8
Yes	84.4	70.9	59.8	82.4	71.1	58.6
Homeless (hmls_H)						
No	85.5	70.6	60.4	86.5	70.5	61.0
Yes	57.5	62.6	36.0	60.2	69.0	41.5
Housing type (res_H)						
Private	85.0	71.3	60.6	85.4	69.5	59.4
Public	87.6	67.5	59.1	90.9	74.3	67.5
Other	55.4	58.6	32.5	60.7	72.5	44.0
Household head age (age_H)						
16 - 30	76.5	67.1	51.3	80.0	72.1	57.7
31 - 40	85.6	69.4	59.4	84.9	71.3	60.5
41 - 54	85.1	73.8	62.8	88.1	70.4	62.0
55 +	89.1	70.0	62.4	85.8	67.6	58.0
Household head race/ethnicity (race_H)						
Hispanic	80.9	69.1	55.9	82.5	72.4	59.7
White	87.3	70.7	61.7	87.3	67.0	58.5
Black	81.8	76.8	62.8	87.7	76.2	66.8
Other	87.9	61.3	53.9	81.3	65.3	53.1
Disabled (dsbl_H)						
No	84.2	67.7	57.0	86.4	70.2	60.7
Yes	83.5	72.9	60.9	83.0	70.7	58.7

Characteristic (variable name)	HIP			Non-HIP		
	Phase 1*	Phase 2**	Overall	Phase 1*	Phase 2**	Overall
US citizen (citzn_H)						
No	92.7	53.2	49.3	90.8	58.7	53.3
Yes	83.4	71.1	59.3	84.5	71.0	60.0
TANF/AFDC (tafdc_H)						
No	83.8	69.8	58.5	84.4	68.9	58.2
Yes	84.4	72.4	61.1	86.7	77.5	67.2
Unearned income (ui_H)						
No	82.2	66.8	54.9	84.5	71.9	60.8
Yes	85.0	72.4	61.5	85.0	69.3	58.9
SSI (ssi_H)						
No	83.8	69.7	58.4	85.8	70.6	60.6
Yes	84.0	71.3	59.9	82.4	69.9	57.6
RSDI (rsdi_H)						
No	83.1	68.3	56.8	84.0	71.1	59.7
Yes	86.1	75.5	65.0	86.9	68.4	59.4
Unemployment compensation (uc_H)						
No	83.7	70.2	58.8	84.6	70.5	59.6
Yes	86.3	68.6	59.2	87.8	69.1	60.7
Household type (HH_TYP)						
Household with elderly	90.2	67.8	61.2	88.2	61.3	54.1
Household with children	86.7	68.8	59.6	89.5	72.3	64.7
Other household	79.8	72.0	57.5	79.8	71.0	56.7
Household with 4+ adults (nadl34)						
No	83.8	70.0	58.7	84.4	70.3	59.3
Yes	85.6	78.7	67.4	94.5	73.4	69.4
Person-level						
Female (gende_P)						
No	78.2	65.2	51.0	80.1	64.8	51.9
Yes	87.2	73.0	63.7	87.6	73.5	64.4
Age of person (age_P)						
16 - 30	78.5	65.2	51.2	81.9	69.4	56.8
31 - 40	86.7	70.1	60.8	84.6	74.9	63.4
41 - 54	84.1	77.0	64.8	87.7	71.8	63.0
55 +	90.0	71.0	63.9	86.8	66.9	58.1
Race/ethnicity (race_P)						
Hispanic	81.1	69.0	56.0	82.3	72.4	59.6
White	87.4	70.2	61.4	87.5	67.0	58.6
Black	81.1	78.5	63.7	87.5	76.1	66.6
Other	87.4	61.9	54.1	81.7	65.5	53.5
US citizen (citzn_P)						
No	94.3	56.6	53.4	90.8	57.6	52.3
Yes	83.3	70.9	59.1	84.5	71.1	60.1
Disabled (dsbl_P)						
No	83.8	67.0	56.1	85.8	70.0	60.1
Yes	84.0	74.1	62.2	83.4	71.0	59.2

Characteristic (variable name)	HIP			Non-HIP		
	Phase 1*	Phase 2**	Overall	Phase 1*	Phase 2**	Overall
Unemployment compensation (uc_flg_P)						
No	83.6	70.3	58.8	84.8	70.3	59.6
Yes	90.0	68.2	61.4	84.3	73.0	61.5

*Weights are the poststratified pooled weights.
**Weights are the phase 1 nonresponse-adjusted weights.

Appendix C: Round 2 Variables Included in CHAID Analyses

Source of variable	Variable name	Description	Values
Sampling Frame	wave	Data Collection Wave	1, 2 ,3
	block	Blocking group defined for sampling	1 = Springfield, HH Size 1, Female Head 2 = Springfield, HH Size 1, Male Head 3 = Springfield, HH Size 2+, Female Head 4 = Springfield, HH Size 2+, Male Head 5 = Chicopee/Holyoke HH Size 1, Female Head 6 = Chicopee/Holyoke HH Size 1, Male Head 7 = Chicopee/Holyoke HH Size 2+, Female Head 8 = Chicopee/Holyoke HH Size 2+, Male Head 9 = Hampden Balance, HH Size 1, Female Head 10 = Hampden Balance, HH Size 1, Male Head 11 = Hampden Balance, HH Size 2+, Female Head 12 = Hampden Balance, HH Size 2+, Male Head
DTA Case Files	ben_H	Monthly SNAP Benefit	1 = $1-$161
			2 = $162 - $200
			3 = $201 - $349
			4 = $350 +
	lang_H	Spanish Language	0 = NO
			1 = YES
	reeva_H	Recertification Type	1 = Recertification 2 = Semiannual Reporting 3 = Other Reevaluation
	in_H	Monthly Income	1 = 0 2 = $1 - $787 3 = $788 - $1,088 4 = $1,089 +
	cap_H	Baystate CAP	0 = NO 1 = YES
	hmls_H	Homeless	0 = NO 1 = YES
	res_H	Housing Type	1 = Private 2 = Public 3 = Other

Source of variable	Variable name	Description	Values
	age_H	Household Head Age	1 = 16 - 30 2 = 31 - 40 3 = 41 - 54 4 = 55 +
	race_H	Household Head Race/Ethnicity	1 = Hispanic 2 = White
DTA Case Files	dsbl_H	Disabled	0 = NO 1 = YES
	citzn_H	US Citizen	0 = NO 1 = YES
	tafdc_H	TANF/AFDC	0 = NO
	ui_H	Unearned Income	0 = NO 1 = YES
	ssi_H	SSI	0 = NO 1 = YES
	rsdi_H	RSDI	0 = NO 1 = YES
	uc_H	Unemployment Compensation	0 = NO 1 = YES
	HH_TYP	Household Type	1 = Household with Elderly 2 =Household with Children 3 = Other Household
	nadl34	Household with 4+ adults	0 = NO 1 = YES
	gende_P	Beneficiary is female	0 = NO 1 = YES
	age_P	Age of beneficiary	1 = 16 - 30 2 = 31 - 40 3 = 41 - 54 4 = 55 +
	race_P	Race/ethnicity of beneficiary	1 = Hispanic 2 = White 3 = Black 4 = Other
	citzn_P	Beneficiary is US Citizen	0 = NO 1 = YES

Source of variable	Variable name	Description	Values
Round 1 Interview	dsbl_P	Beneficiary is disabled	0 = NO 1 = YES
	uc_flg_P	Unemployment Compensation	0 = NO
	ENSP	Whether extended in English or Spanish	1 = ENGLISH 2 = SPANISH
	TRYFD	Enjoy trying new foods	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
	TRYFR	Enjoy trying new fruits	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
	TRYVG	Enjoy trying new vegetables	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
	FRTH	Eat enough fruits to keep me healthy	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
	VEGH	Eat enough vegetables to keep me healthy	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know

Source of variable	Variable name	Description	Values
	FAMV	Encourage my family and friends to eat fruits and vegetables	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
Round 1 Interview	RLKE	I don't eat fruits and vegetables because I don't like them	1 = strongly disagree 2 = disagree 3 = neither disagree nor agree 4 = agree 5 = strongly agree 99 = does not apply, refused or don't know
	HISP	Do you consider yourself to be Hispanic or Latino	1 = Yes 2 = No 99 = REFUSED OR DON'T KNOW
	WHIT	Do you consider yourself to be White	1 = Yes 2 = No 99 = REFUSED OR DON'T KNOW
	BLK	Do you consider yourself to be Black	1 = Yes 2 = No 99 = REFUSED OR DON'T KNOW
	ASN	Do you consider yourself to be Asian	1 = Yes 2 = No 99 = REFUSED OR DON'T KNOW

Source of variable	Variable name	Description	Values
	EDLV	What is the highest grade or level of school you have completed or the highest degree you have received	1 = 1ST GRADE 2 = 2ND GRADE 3 = 3RD GRADE 4 = 4TH GRADE 5 = 5TH GRADE 6 = 6TH GRADE 7 = 7TH GRADE 8 = 8TH GRADE 9 = 9TH GRADE 10 = 10TH GRADE 11 = 11TH GRADE 12 = 12TH GRADE, NO DIPLOMA 13 = HIGH SCHOOL GRADUATE 14 = GED OR EQUIVALENT 15 = SOME COLLEGE, NO DEGREE 16 = ASSOCIATE DEGREE: OCCUPATIONAL, ETC. 17 = ASSOCIATE DEGREE: ACADEMIC PROGRAM 18 = BACHELOR'S DEGREE (BA, AB, BS, BBA) 19 = MASTER'S DEGREE (MA, MS, MENG, MED, MBA) 20 = PROFESSIONAL DEGREE (MD, DDS, DVM, JD) 21 = DOCTORAL DEGREE (EXAMPLE: PHD, EDD) 22 = NEVER ATTENDED/KINDERGARTEN ONLY 99 = REFUSED OR DON'T KNOW