

NATIONAL STUDY OF CAREGIVING (NSOC) I-III WEIGHTING GUIDE

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Release 1.0

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NSOC Design and Need for Weights

The National Study of Caregiving (NSOC) is designed to represent several different target populations of caregivers in the United States:

- NSOC I included family and unpaid caregivers to a representative sample of living Medicare beneficiaries ages 65 and older in 2011
- NSOC II included family and unpaid caregivers to a representative sample of living Medicare beneficiaries ages 65 and older in 2015
- NSOC III represents two different groups of caregivers:
 - family and unpaid caregivers to a representative sample of living and recently deceased Medicare beneficiaries ages 67 and older in 2017 (cross-sectional files)
 - outcomes in 2017 for family and unpaid caregivers to a representative sample of Medicare beneficiaries ages 65 and older in 2015 (longitudinal files)

In order to be able to make statements about estimates for these groups, the NSOC samples must be weighted to account for caregivers having different probabilities of selection and different probabilities of responding to NSOC. In order to make accurate statements about the variance of those estimates, design variables must also be used to account for NSOC's complex sample design.

This technical paper describes the NSOC weights and design variables for NSOC I, II and NSOC III. A separate technical paper will describe weights that have been developed for the time diary supplement to NSOC III.

Overview of Weight and Design Variables

Each NSOC data file contains a set of weights (full sample weight, replicate weights) adjusted for nonresponse and design variables (stratum, cluster) that allow for proper variance estimation.

	File	Full sample weight	Replicate weights	Stratum	Cluster
NSOC I	Cross-sectional	w1cgfinwgt0	w1cgfinwgt1- w1cgfinwgt56	c1varstrat	c1varunit
NSOC II	Cross-sectional	w5cgfinwgt0	w5cgfinwgt1- w5cgfinwgt56	c5varstrat	c5varunit
NSOC III	Cross-sectional-living	w7cgfinwgt0	w7cgfinwgt1- w7cgfinwgt56	c7varstrat	c7varunit
NSOC III	Cross-sectional-deceased	w7cglmlfinwgt0	w7cglmlfinwgt1- w7cglmlfinwgt56	c7varstrat	c7varunit
NSOC III	Longitudinal tracker	lw7cgtrwgt0	lw7cgtrwgt1- lw7cgtrwgt56	c7varstrat	c7varunit
NSOC III	Longitudinal	lw7cgfinwgt0	lw7cgfinwgt1- lw7cgfinwgt56	c7varstrat	c7varunit

Analyses in which the caregiver is the unit of analysis should use the NSOC weight. (NHATS weights should be used when the unit of analysis is the care recipient (NHATS Sample person)). The design variables (stratum and cluster) should be specified when using software that uses Taylor series linearization to estimate the variances of estimates from complex sample surveys.

Replicate weights are also provided and may be used with software that uses replication methods to estimate to variances of estimates from complex sample surveys. The replication approach that was used is the modified balanced repeated replication (BRR) method suggested by Fay (Judkins 1990). Fay's method perturbs the weights by $\pm 100(1-K)$ percent where K is referred to as "Fay's factor." The perturbation factor for standard BRR is 100 percent, or $K=0$. For NHATS and NSOC, $K = 0.3$ was used.

How to Use NSOC Full Sample Weights and Design Variables

Stata Commands. In Stata, users should specify the following svyset command for NSOC I and II.

```
/*NSOC I*/
    recode c1varstrat (54=55)1
    svyset c1varunit [pweight=w1cgfinwgt0], strata(c1varstrat)
```

```
/*NSOC II*/
    svyset c5varunit [pweight=w5cgfinwgt0], strata(c5varstrat)
```

For NSOC III, there are two weights in the cross-sectional file, one for caregivers to living sample persons and the other for caregivers to deceased sample persons. You should use the 'subpop' command to run analyses with svy commands. Below we show an example for tabulating relationship using svy: tab.

```
/*NSOC III*/
    /*Cross-sectional file*/
    /*Caregivers to living sample persons*/
    svyset c7varunit [pweight=w7cgfinwgt0], strata(c7varstrat)
    svy, subpop(if fl7spdied==-1): tab c7relatnshp
    /*Caregivers to deceased sample persons*/
    svyset c7varunit [pweight=w7cglmlfinwgt0], strata(c7varstrat)
    svy, subpop(if fl7spdied==1): tab c7relatnshp
```

To use living and deceased cases together, create a new weight that has the value of w7cgfinwgt0 if the caregiver assisted a living sample person and w7cglmlfinwgt0 if the caregiver assisted in the last month of life. Then set pweight to the combined weight.

SAS Commands. We also provide an example of how to estimate frequency of relationship in SAS:

```
/* NSOC I */
    if c1varstrat = 54 then c1varstrat = 551;
    run;
```

¹ For NSOC I only, users should first recode c1varstrat=54 to c1varstrat=55 because c1varstrat=54 has no cases in cluster 1.

```
proc surveyfreq;
  table c1relatnshp;
  weight w1cgfinwgt0;
  strata c1varstrat;
  cluster c1varunit;
run;
```

/* NSOC II */

```
proc surveyfreq;
  table c5relatnshp;
  weight w5cgfinwgt0;
  strata c5varstrat;
  cluster c5varunit;
run;
```

/*NSOC III*/

For NSOC III, use either a domain statement (domain fl7spdied) or in the case of proc surveyfreq a crosstab by fl7spdied. Specify the correct weight, depending on whether you are interested in caregivers to living or deceased SPs.

/*Caregivers to living sample persons*/

```
proc surveyfreq;
  table fl7spdied*c7relatnshp;
  weight w7cgfinwgt0;
  strata c7varstrat;
  cluster c7varunit;
run;
```

```
proc surveymeans;
  domain fl7spdied;
  var c7relatnshp;
  weight w7cgfinwgt0;
  strata c7varstrat;
  cluster c7varunit;
run;
```

/*Caregivers to deceased sample persons */

```
proc surveyfreq;
  table fl7spdied*c7relatnshp;
  weight w7cglmlfinwgt0;
  strata c7varstrat;
  cluster c7varunit;
run;
```

```
proc surveymeans;
  domain fl7spdied;
  var c7relatnshp;
```

```
weight w7cglmlfinwgt0;  
strata c7varstrat;  
cluster c7varunit;  
run;
```

To use living and deceased cases together, create a new weight that has the value of $w7cgfinwgt0$ if the caregiver assisted a living sample person and $w7cgfinlmlwgt0$ if the caregiver assisted in the last month of life. Then use this combined weight in the 'weight' statement.

Using Weights for Multilevel (Random Effects) Models

Some NSOC users may wish to fit multilevel models that take into account the non-independence of caregivers within networks. In these models, the caregiver is the “level 1” unit and the NHATS SP (care recipient) is the “level 2” unit. In specifying a multilevel analysis, the level 1 and level 2 weights will generally need to be specified.

For NSOC I, the unconditional weights for levels 1 and 2 are the caregiver weight $w1cgfinwgt0$ and the NHATS SP analytic weight $w1anfinwgt0$, respectively. For NSOC II, the unconditional weights for levels 1 and 2 are the caregiver weight $w5cgfinwgt0$ and the NHATS SP analytic weight $w5anfinwgt0$, respectively. For NSOC III, the unconditional weights for levels 1 are 2 are the caregiver weight $w7cgfinwgt0$ (for caregivers to living SPs) or $w7cgfinlmlwgt0$ (for caregivers to deceased SPs) and the NHATS SP analytic weight $w7anfinwgt0$.

If the software being used for the analysis requires specification of a level 1 weight that is conditional on level 2, you may divide the caregiver weight by the NHATS SP analytic weight to create a conditional level 1 weight.

Calculation of Weights

In each round, the calculation of the NSOC (cross-sectional file) weights began with the final NHATS analytic weight (see Montaquila, Freedman, Edwards and Kasper, 2012; DeMatteis, Freedman, and Kasper, 2016). For caregivers in networks with more than 5 eligible caregivers, the NHATS analytic weight was adjusted for caregiver subsampling (by multiplying by the number of eligible caregivers divided by 5). In NSOC III, separate weights were constructed for caregivers to living and deceased SPs.²

For each weight, a 2-step weighting class adjustment for nonresponse was applied (Kalton and Flores-Cervantes 2003). A 2-step adjustment was used because there were two opportunities for NSOC interview nonresponse with potentially different mechanisms for nonresponse—refusal to provide contact information by the NHATS Sample Person) and other non-response at the caregiver level (for caregivers for whom the NHATS Sample Person did not refuse).

² Caregivers of sample persons who died between NHATS and NSOC were treated as caregivers to living SPs for purposes of constructing NSOC III cross-sectional sample weights. However, the value of their weight was assigned to $w7cglmlfinwgt0$.

At each stage of adjustment, a set of variables were input into a classification tree analysis to determine which variables were associated with nonresponse. This approach uses a search algorithm to identify variables associated with response propensities. At each step in the process, chi-square tests were performed to determine the most significant predictor of response, given the set of conditions already specified in the particular “branch.” For the cross sectional weights, we set a minimum cell size of 50, but allowed occasional exceptions (e.g. when the final split resulted in cells with differences in response rates of more than 10 percentage points; we relaxed the cell size to 35 for the NSOC III longitudinal weights (because of the more limited sample size in the longitudinal file).

Finally, a raking adjustment was imposed to align weighted totals with those computed from the NHATS OP file (using NHATS analytic weights). The raking adjustment consisted of two dimensions: (1) the number of caregivers in the NHATS sample person’s network and (2) the relationship of the caregiver to the sampled person.

In NSOC III, weights were also constructed for the longitudinal file. The starting weight was the NSOC II analytic weight. An NSOC III longitudinal tracker weight was constructed using a 2-step process. A 2-step process was adopted because there were two opportunities for nonresponse with potentially different mechanisms for nonresponse—nonresponse to the NHATS Round 6 or Round 7 interviews and nonresponse at the caregiver level. A final raking adjustment was imposed to align weighted totals with those computed from the NHATS OP file (using NHATS analytic weights) on two dimensions: (1) the number of caregivers in the NHATS sample person’s network and (2) the relationship of the caregiver to the sampled person. To create the NSOC III longitudinal analytic weight, the longitudinal tracker weight was assigned to the subset of caregivers that completed the NSOC III interview.³ For longitudinal analyses intended to make inferences to the population of caregivers who were eligible as of NSOC II (primarily those who died between NSOC II and NSOC III), the longitudinal tracker weight should be used; for longitudinal analyses that use the NSOC III data, the longitudinal analytic weight should be used.

NSOC I Nonresponse Adjustments

Appendix Table 1 shows variables considered for the first and second adjustments in NSOC I, along with weighted response rates for each level of each variable. Final non-response cells included 11 indicators (indicated in Appendix Table 1 with a * for the first step and ^ for the second step). Combinations of these variables created 18 unique nonresponse cells for the first adjustment and 22 nonresponse cells for the second adjustment (see Appendix Figures 1 and 2). In constructing these final trees, two exceptions to the cell size of 50 were allowed (cell sizes of 43 and 44) because the final split resulted in final cells with differences in response rates of more than 10 percentage points.

The design effect due to variation in the NSOC I base weights (before nonresponse adjustment

³ The only caregivers (NSOC II completes) who have a longitudinal tracker weight but do not have a longitudinal analytic weight are caregivers who died between NSOC II and NSOC III, cases determined based on review of NHATS data to not be eligible caregivers as of NSOC III, and one caregiver who was determined between NSOC II and NSOC III to be a duplicate listing.

and raking) was 1.35. The design effect due to variation in the NSOC I analytic weights (after nonresponse adjustment and raking) was 1.61. The steps involved in creating the analytic weight did not introduce any influential outlier weights.

NSOC II Nonresponse Adjustments

Appendix Table 2 shows variables considered for the first and second adjustments in NSOC II, along with weighted response rates for each level of each variable. Final non-response cells included a total of eleven indicators (indicated in Appendix Table 2 with a * for the first step and ^ for the second step). Combinations of these variables created 20 unique nonresponse cells for the first adjustment and 17 nonresponse cells for the second adjustment (see Appendix Figures 3 and 4). In constructing these final trees, four exceptions to the cell size of 50 were allowed (cell sizes of 48 and 49 for the first adjustment and 42 and 49 for the second adjustment) because the final split resulted in final cells with differences in response rates of more than 10 percentage points.

The design effect due to variation in the NSOC II base weights (before nonresponse adjustment and raking) was 1.53. The design effect due to variation in the NSOC II analytic weights (after nonresponse adjustment and raking) was 1.93. The steps involved in creating the analytic weight did not introduce any influential outlier weights.

NSOC III Nonresponse Adjustments

Cross-sectional Files

Appendix Table 3 shows variables considered for the first and second adjustments in NSOC III for caregivers to living and deceased SPs, along with weighted response rates for each level of each variable. Final non-response cells included a total of 10 indicators for caregivers of living SPs and 5 indicators for caregivers of deceased SPs (indicated in Appendix Table 3 with “a” and “b” for the first and second steps, respectively, for living SPs, and “c” and “d” for the first and second steps, respectively, for deceased SPs). Combinations of these variables created 25 unique nonresponse cells for the first adjustment and 6 nonresponse cells for the second adjustment for caregivers to living SPs (see Appendix Figures 5 and 6) and 6 unique nonresponse cells for the first adjustment and 4 nonresponse cells for the second adjustment for caregivers to deceased SPs (see Appendix Figures 7 and 8). In constructing these final trees, two exceptions to the cell size of 50 were allowed for caregivers to living SPs (cell sizes of 44 and 38 for the first adjustment) and two exceptions were allowed for caregivers to deceased SPs (cell sizes of 42 and 37 for the second adjustment) because the final split resulted in final cells with differences in response rates of more than 10 percentage points.

Overall, for both weights combined, the design effect due to variation in the NSOC III base weights (before nonresponse adjustment and raking) was 1.67. The design effect due to variation in the NSOC III analytic weights (after nonresponse adjustment and raking) was 1.87. The steps involved in creating the analytic weight did not introduce any influential outlier weights.

Longitudinal Files

Appendix Tables 4 and 5 show variables considered for the first and second adjustments, respectively, in computing the longitudinal NSOC tracker weights, for caregivers to living and deceased SPs, along with weighted response rates for each level of each variable. Final nonresponse cells included a total of 23 indicators for caregivers of living SPs and 9 indicators for caregivers of deceased SPs (indicated in Appendix Tables 4 and 5 with an “a” for living SPs and a “b” for deceased SPs). Combinations of these variables created 25 unique nonresponse cells for the first adjustment and 23 nonresponse cells for the second adjustment for caregivers to living SPs (see Appendix Figures 9 and 10) and 5 unique nonresponse cells for the first adjustment and 8 nonresponse cells for the second adjustment for caregivers to deceased SPs (see Appendix Figures 11 and 12). In constructing these final trees, two exceptions to the minimum cell size of 35 were allowed for caregivers to deceased SPs (cell sizes of 26 and 34 for the second adjustment) because the final split resulted in final cells with differences in response rates of more than 10 percentage points.

Overall, the design effect due to variation in the NSOC longitudinal base weights (before nonresponse adjustment and raking) was 1.93. The design effect due to variation in the NSOC longitudinal weights (after nonresponse adjustment and raking) was 1.92 (for both the longitudinal tracker weight and the longitudinal analytic weight). The steps involved in creating the longitudinal analytic weight did not introduce any influential outlier weights.

Table 1. Weighted Responses Rates for Variables used in Nonresponse Adjustment for NSOC I Weights

Contact info not refused by SP	(Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
OVERALL	67.7	58.2
Hours of Help SP received last month* ^ - (HOURSMONTH)		
0:0	52.5	56.8
1:1-<10	58.0	52.8
2:10-<20	70.2	61.8
3:20-<30	75.6	58.9
4:30-<10/wk	73.8	62.9
5:10-<20/wk	79.8	68.9
6:20-<40/wk	82.0	62.7
7:40/wk-<16/day	82.7	64.1
8:16+/day	79.1	70.7
9:Missing / Inapplicable	61.0	43.6
Relationship to SP*^ - (RELATION)		
1:Spouse/Partner	76.8	66.9
2:Son	66.1	51.4
3:Daughter	70.0	61.4
4:Sibling	78.4	69.1
5:In-law	66.0	52.6
6:Other relative	61.4	46.2
7:Nonrelative	52.0	59.0
Census Division¹*^ - (DIVISION)		
1:New England	69.0	54.1
2:Middle Atlantic	68.9	50.1
3:East North Central	59.5	67.6
4:West North Central	70.3	62.6
5:South Atlantic	68.1	57.0
6:East South Central	69.4	64.8
7:West South Central	70.6	54.8
8:Mountain	57.7	66.0
9:Pacific	68.6	58.5
SP Race/Ethnicity*^ - (RL1DRACEHISP)		
1:White, non-Hispanic	65.7	63.9
2:Black, non-Hispanic	71.8	60.4
3:Other, non-Hispanic	64.0	42.9
4:Hispanic	76.1	32.0
5:More than one	55.6	42.5
6:DK/RF	90.1	1.3
SP Age at interview*^ - (R1D2INTVRAGE)		
1:65-69	68.6	62.6
2:70-74	72.1	52.5
3:75-79	63.6	53.8
4:80-84	67.9	58.4
5:8-89	67.7	60.4
6:90 +	67.6	63.6

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	Contact info not refused by SP (Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
Number of NSOC eligible helpers*^ – (FL1NSOCCNT)		
1:1 Eligible helper	73.3	69.9
2:2 Eligible helpers	68.7	56.0
3:3 Eligible helpers	65.9	55.9
4:4 Eligible helpers	62.2	60.3
5: 5 or more Eligible helpers	65.4	44.5
SP Education*^ – (EL1HIGSTSCHL)		
0:DK / RF	78.8	23.9
1:No schooling completed	74.1	36.0
2:1st - 8th grade	73.9	46.6
3: 9th - 12th grade	69.5	55.0
4:High school graduate	63.8	61.5
5:Vocational, technical, business, or trade school certificate or diploma	68.9	64.4
6: Some college but no degree	65.5	68.4
7:Associate's degree	62.8	74.9
8: Bachelor's degree	66.6	63.3
9: Master's, professional, or doctoral degree	63.3	68.8
SP gender^ – (R1GENDER)		
1:Male	72.0	58.5
2:Female	65.9	58.1
Reason for Proxy is Dementia – (IS1REASNPRX1)		
0-inapplicable	66.5	58.4
1=Yes	73.1	67.7
2=No	72.8	45.6
NSOC Brochure accepted by SP^ – (CC26)		
0:Missing	18.3	44.7
1:Yes	89.3	60.5
2:No	80.9	41.1
Helper Gender^ – (OP1GENDER)		
0:Missing	100.0	0.0
1:Male	66.5	54.0
2:Female	68.5	61.0
Helper lives with SP^ – (OP1PRSNINHH)		
0:Inapplicable	60.2	54.4
1:Yes	78.2	62.3
2:No	75.5	72.3
SP Residence – (R1DRESID)		
1:Community	68.7	57.3
2:Residential care resident, not nursing home (SP interview complete)	62.2	64.1
Census Metro/Micro Area Designation (2008)¹ – (S_METMICRO_N)		
1:Metropolitan area	67.3	57.3
2:Micro metropolitan area	69.4	61.9
3:Non-metro	68.4	60.3

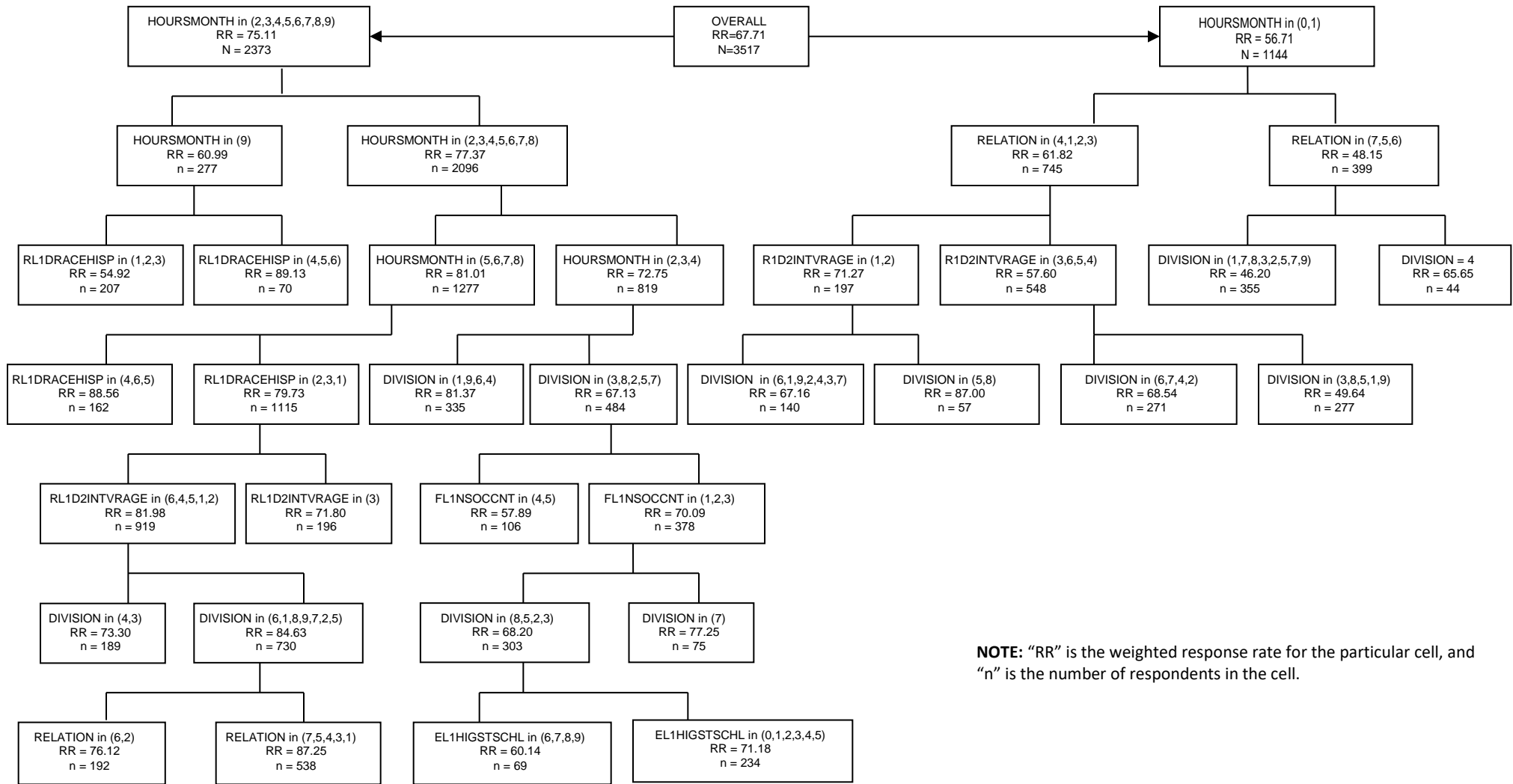
¹Based on Information on the September 30, 2010 CMS 20% Health Insurance Skeleton Eligibility Write-Off (HISKEW) file.

*—retained in classification tree analysis for nonresponse adjustment for SP refusal to provide contact information

^—retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal

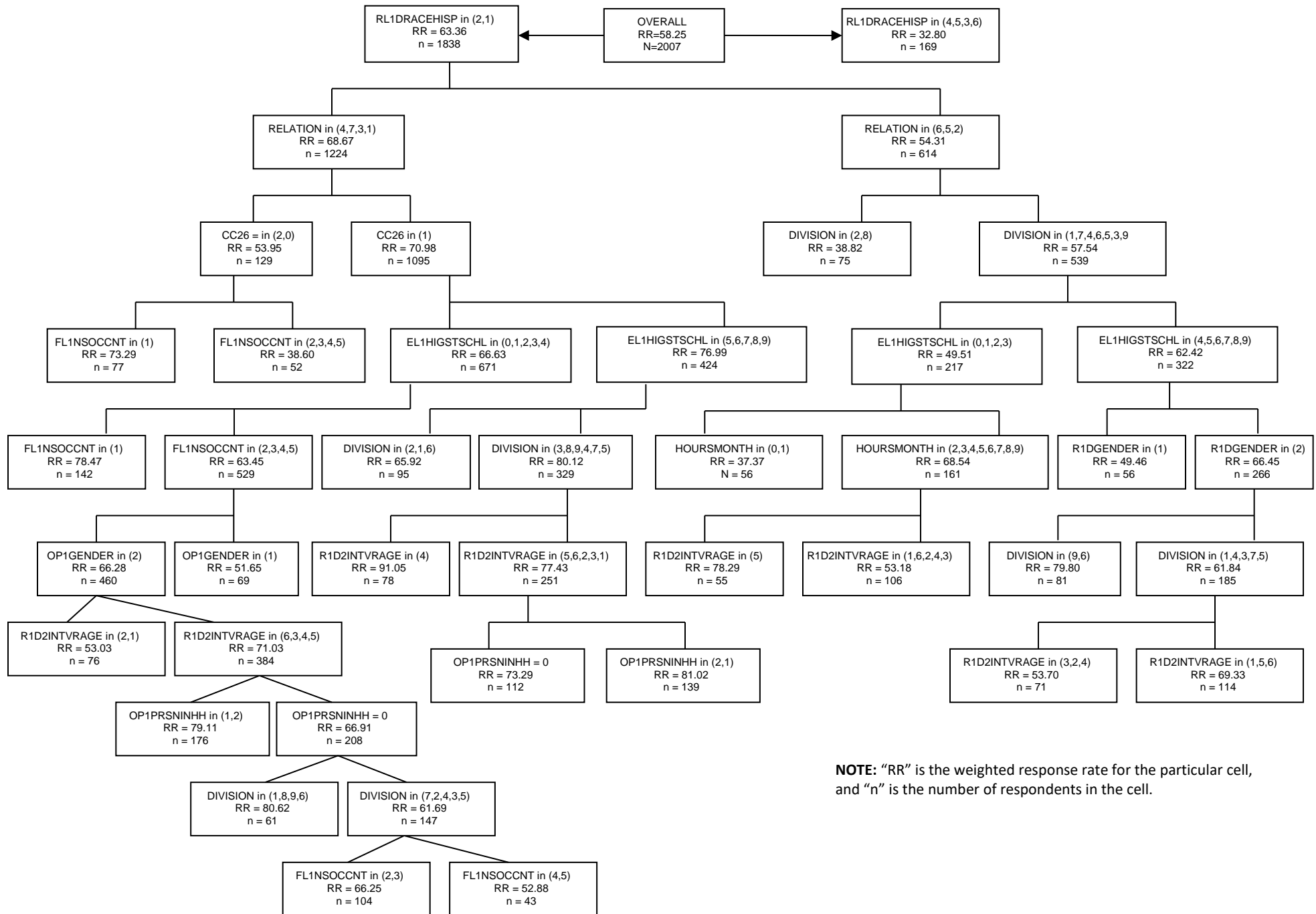
Variable names used in classification trees shown parenthetically

Figure 1: Stage 1 NSOC weight nonresponse adjustment cells – SP Refusal



NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Figure 2: Stage 2 NSOC weight nonresponse adjustment cells



NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Table 2. Weighted Responses Rates for Variables used in Nonresponse Adjustment for NSOC II Weights

	Contact info not refused by SP (Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
OVERALL	66.2	60.4
Hours of Help SP received last month* ^ - (HOURSMONTH)		
0: Not codeable (<1)	62.9	61.3
1:1-<10	60.4	55.9
2:10-<20	69.4	56.4
3:20-<30	75.2	64.3
4: 30-<40	76.0	70.5
5: 40-<60	71.5	62.5
6: 60-<120	81.1	64.0
7: 120-<180	87.1	69.7
8: 180-744 (24/7)	87.0	70.8
9:Missing / Inapplicable	47.2	54.9
Relationship to SP*^ - (RELATION)		
1:Spouse/Partner	74.2	70.9
2:Son	62.9	54.6
3:Daughter	70.3	61.5
4:Sibling	63.8	48.6
5:In-law	66.7	55.8
6:Other relative	62.8	50.5
7:Nonrelative	49.2	62.0
Census Division¹*^ - (DIVISION)		
1:New England	62.8	56.1
2:Middle Atlantic	63.7	52.6
3:East North Central	65.4	67.8
4:West North Central	73.8	62.6
5:South Atlantic	64.5	62.9
6:East South Central	74.8	60.2
7:West South Central	65.4	59.9
8:Mountain	69.3	60.6
9:Pacific	64.9	58.8
SP Race/Ethnicity*^ - (RL5DRACEHISP)		
1:White, non-Hispanic	63.9	65.8
2:Black, non-Hispanic	73.3	59.2
3:Other, non-Hispanic	73.5	38.8
4:Hispanic	70.5	36.7
5:More than one	96.2	85.2
6:DK/RF	50.8	50.9
R5 SP Age at interview*^ - (R5D2INTVRAGE)		
1:65-69	66.0	58.1
2:70-74	71.0	57.1
3:75-79	63.7	59.7
4:80-84	64.0	58.4
5:8-89	67.1	63.7
6:90 +	65.0	66.3

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	Contact info not refused by SP (Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
Number of NSOC selected eligible helpers* – (SAMPLECG_CNT)		
1:1 Selected eligible helper	75.6	67.8
2:2 Selected eligible helpers	64.5	60.1
3:3 Selected eligible helpers	61.0	58.2
4:4 Selected eligible helpers	71.6	63.0
5: 5 Selected eligible helpers	62.7	48.5
SP Education* – (EL5DHIGSTSCHL)		
0:DK / RF	74.9	74.9
1:No schooling completed	76.6	28.1
2:1st - 8th grade	69.6	53.1
3: 9th - 12th grade	70.4	59.9
4:High school graduate	65.4	59.3
5:Vocational, technical, business, or trade school certificate or diploma	65.1	68.1
6: Some college but no degree	66.8	62.7
7:Associate's degree	66.8	47.8
8: Bachelor's degree	61.6	65.1
9: Master's, professional, or doctoral degree	57.4	75.4
SP gender – (R5DGENDER)		
1:Male	70.1	62.4
2:Female	64.3	59.3
Reason for Proxy is Dementia² – (IS1REASNPRX)		
0-inapplicable	65.0	NA
1=Yes	72.1	NA
2=No	73.1	NA
NSOC Brochure accepted by SP³ – (CC26)		
0:Missing	NA	73.5
1:Yes	NA	60.1
2:No	NA	56.8
Helper Gender^{3^} – (OP5DGENDER)		
0:Missing	NA	54.8
1:Male	NA	57.6
2:Female	NA	62.1
Helper lives with SP^{3^} – (OP5PRSNINHH)		
0:Inapplicable	NA	56.4
1:Yes	NA	65.4
2:No	NA	69.7
SP Residence – (R5DRESID)		
1:Community	67.7	59.6
2:Residential care resident, not nursing home (SP interview complete)	58.1	65.1
4: Nursing home (SP interview complete)	62.1	60.5
Census Metro/Micro Area Designation (2013)¹* – (S_METMICRO)		
1:Metropolitan area	65.9	59.0
2:Metropolitan area	72.0	66.1
3:Non-metro	54.7	68.0

¹Based on county-level information from the September 30, 2014 CMS 5% EDB extract linked to the beneficiary's EDB address.

²The variable was only used in nonresponse modeling for nonresponse adjustment for SP refusal to provide contact information

³The variables were only used in nonresponse modeling for nonresponse adjustment for caregiver interview, given no SP refusal

*=retained in classification tree analysis for nonresponse adjustment for SP refusal to provide contact information

^=retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal

Variable names used in classification trees shown parenthetically.

Figure 3: Stage 1 NSOC II weight nonresponse adjustment cells – SP Refusal

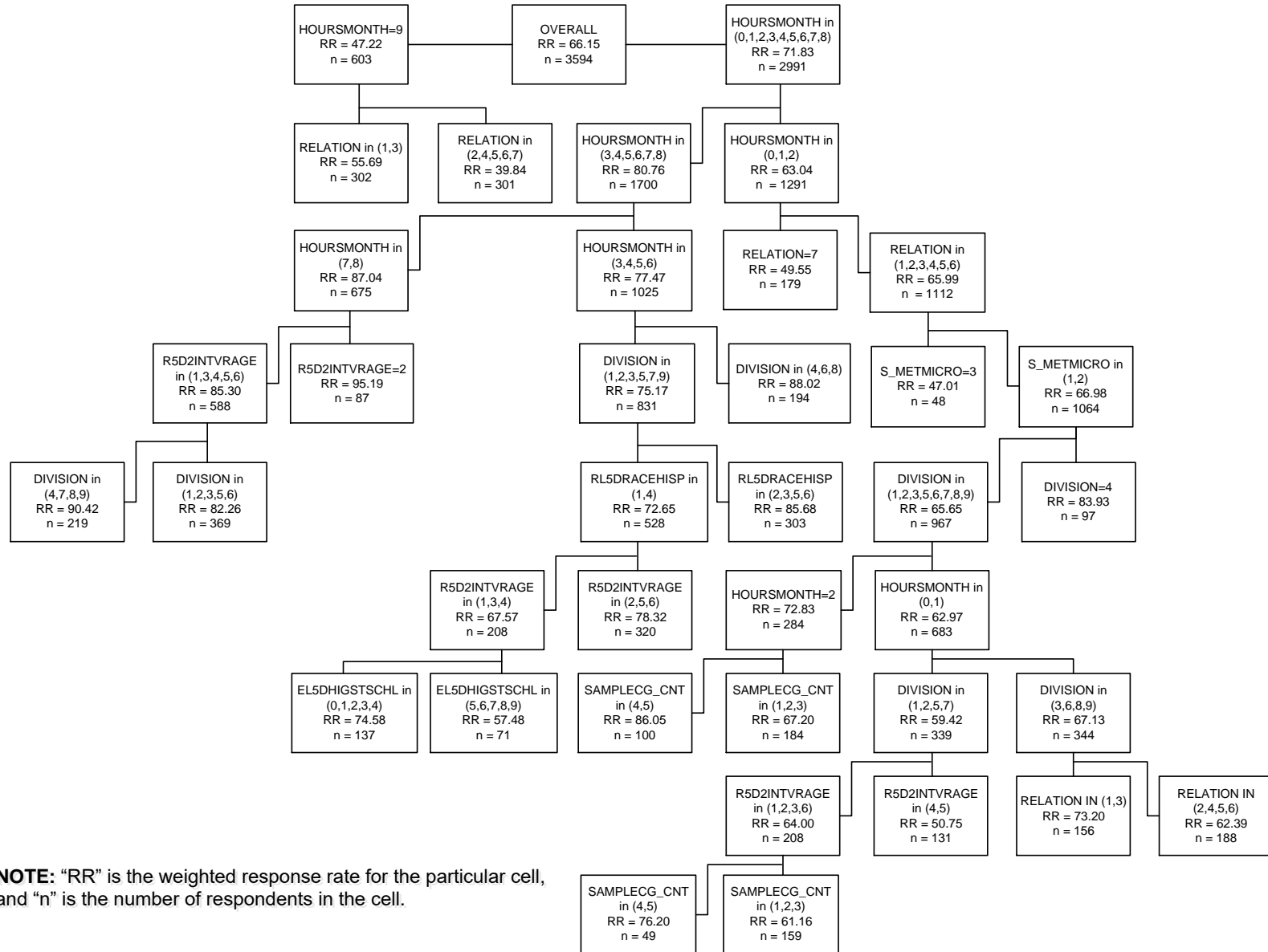
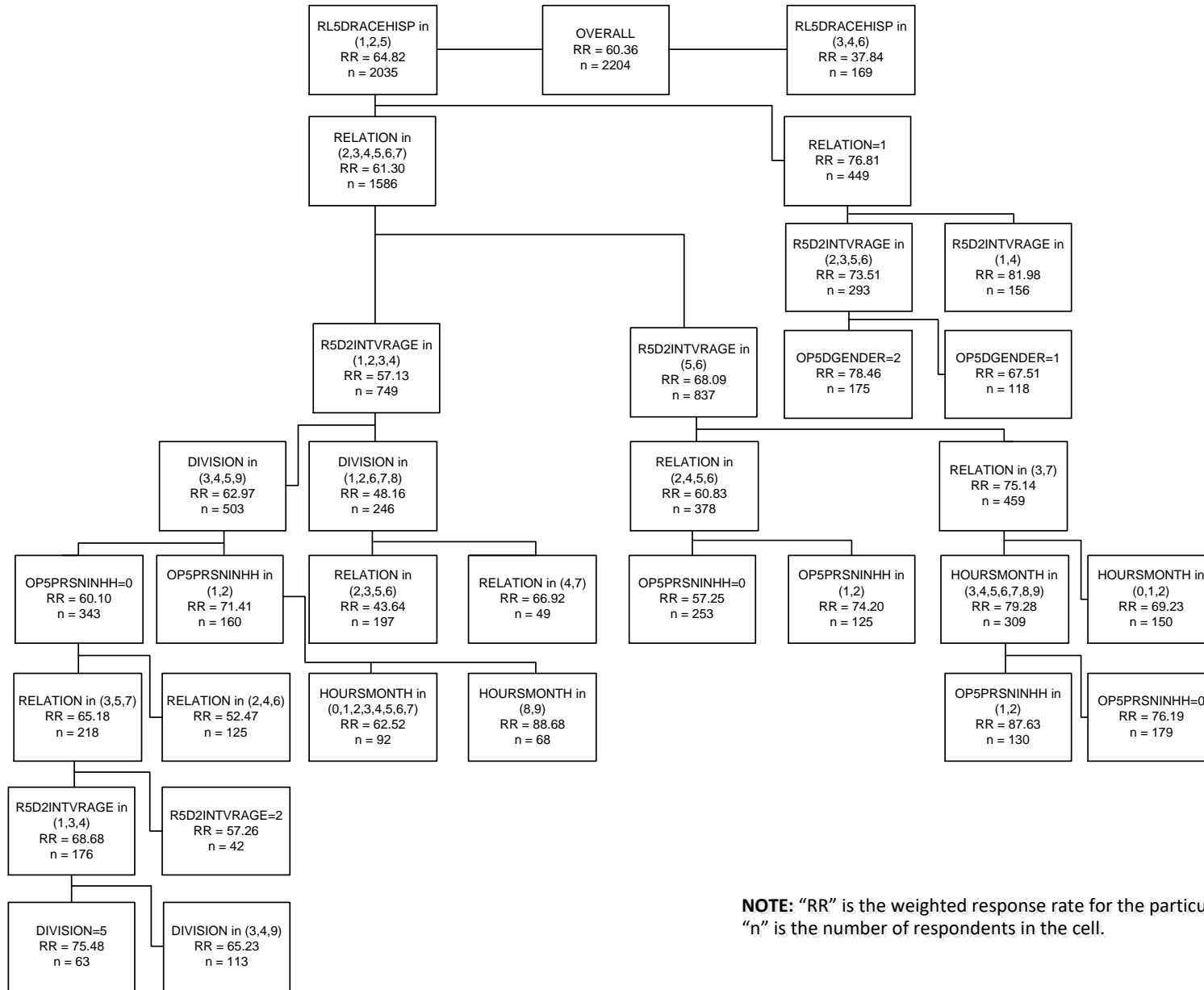


Figure 4: Stage 2 NSOC II weight nonresponse adjustment cells



NOTE: “RR” is the weighted response rate for the particular cell, and “n” is the number of respondents in the cell.

Table 3. Weighted Responses Rates for Variables used in Nonresponse Adjustment for NSOC III Cross-sectional Weights

	New caregivers only, Contact info not refused by SP (Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
OVERALL	88.6	57.8
Hours of Help SP received last month^{a b} - (HOURSMONTH)		
0: Not codeable (<1)	87.3	53.1
1:1-<10	83.2	51.8
2:10-<20	92.4	61.4
3:20-<30	92.5	50.8
4: 30-<40	96.8	63.0
5: 40-<60	98.9	67.9
6: 60-<120	96.7	65.7
7: 120-<180	97.2	63.3
8: 180-744 (24/7)	97.7	73.4
9:Missing / Inapplicable	83.9	53.2
Relationship to SP^{a b c d} - (RELATION)		
1:Spouse/Partner	92.2	73.2
2:Son	90.0	50.1
3:Daughter	91.9	63.1
4:Sibling	86.8	57.0
5:In-law	87.7	50.0
6:Other relative	90.8	44.1
7:Nonrelative	73.1	44.9
Census Division^{1 a c} - (DIVISION)		
1:New England	91.3	57.2
2:Middle Atlantic	91.0	50.6
3:East North Central	84.0	65.4
4:West North Central	85.5	63.1
5:South Atlantic	89.5	58.5
6:East South Central	91.1	58.3
7:West South Central	92.8	56.3
8:Mountain	95.8	61.4
9:Pacific	85.0	54.5
SP Race/Ethnicity^a - (RL5DRACEHISP)		
1:White, non-Hispanic	86.8	61.6
2:Black, non-Hispanic	95.1	56.2
3:Other (Am Indian/Asian/Native Hawaiian /Pacific Islander/other specify), non-Hispanic	94.1	38.3
4:Hispanic	94.1	40.5
5:More than one	73.3	16.0
6:DK/RF	84.8	57.1
R7 SP Age at interview^{4 a b} - (R7D2INTVRAGE)		
1:65-69	89.3	59.6
2:70-74	88.6	53.7
3:75-79	88.0	55.9
4:80-84	89.9	61.8
5:8-89	87.2	57.5
6:90 +	89.9	62.1

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	New caregivers only, Contact info not refused by SP (Weighted Response Rate)	Interview complete, given contact info not refused (Weighted Response Rate)
Number of NSOC selected eligible helpers^{a d} – (SAMPLECG_CNT)		
1:1 Selected eligible helper	91.3	70.0
2:2 Selected eligible helpers	90.5	58.2
3:3 Selected eligible helpers	88.2	56.0
4:4 Selected eligible helpers	86.0	49.7
5: 5 Selected eligible helpers	83.7	49.9
SP Education^{a c} – (EL5DHIGSTSCHL)		
0:DK / RF	85.0	58.8
1:No schooling completed	100.0	54.1
2:1st - 8th grade	93.6	50.9
3: 9th - 12th grade	95.0	49.8
4:High school graduate	89.3	58.5
5:Vocational, technical, business, or trade school certificate or diploma	86.6	54.7
6: Some college but no degree	81.1	63.7
7:Associate's degree	90.8	56.4
8: Bachelor's degree	86.9	61.0
9: Master's, professional, or doctoral degree	83.9	71.2
SP gender – (R5DGENDER)		
1:Male	89.9	60.0
2:Female	87.9	56.7
Reason for Proxy is Dementia² – (IS7REASNPRX)		
0-inapplicable	89.1	NA
1=Yes	84.4	NA
2=No	87.5	NA
NSOC Brochure accepted by SP³ – (CC17)		
0:No	NA	54.7
1:Yes	NA	58.2
Helper Gender³ – (OP7DGENDER)		
1:Male	NA	52.4
2:Female	NA	61.0
Helper lives with SP³ – (OP7PRSNINHH)		
0:Inapplicable	NA	52.0
1:Yes	NA	66.6
2:No	NA	72.6
SP Residence⁴ – (R7DRESID)		
1:Community	89.2	58.6
2:Residential care resident, not nursing home (SP interview complete)	86.8	58.5
4: Nursing home (SP interview complete)	87.6	49.5
Census Metro/Micro Area Designation (2013)^{1 a} – (S_METMICRO)		
1:Metropolitan area	88.3	57.1
2:Micro metropolitan area	89.9	63.5
3:Non-metro	89.5	55.5
New caregivers sampled in NSOC III^{3 b d} – (FLAG_N3CGNEW)		
0: No	NA	83.1
1: Yes	NA	51.4

¹Based on county-level information from the September 30, 2014 CMS 5% EDB extract linked to the beneficiary's EDB address.

²The variable was only used in nonresponse modeling for nonresponse adjustment for SP refusal to provide contact information

³The variables were only used in nonresponse modeling for nonresponse adjustment for caregiver interview, given no SP refusal

⁴The variables were only used in nonresponse modeling for nonresponse adjustment for caregiver to living SPs

a=retained in classification tree analysis for nonresponse adjustment for SP refusal to provide contact information among caregivers to living SPs

b=retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal, among caregivers to living SPs

c=retained in classification tree analysis for nonresponse adjustment for SP refusal to provide contact information among caregivers to deceased SPs

d=retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal, among caregivers to deceased SPs

Variable names used in classification trees shown parenthetically

Figure 5: Stage 1 NSOC III cross-sectional weight nonresponse adjustment cells – SP Refusal (living SP)

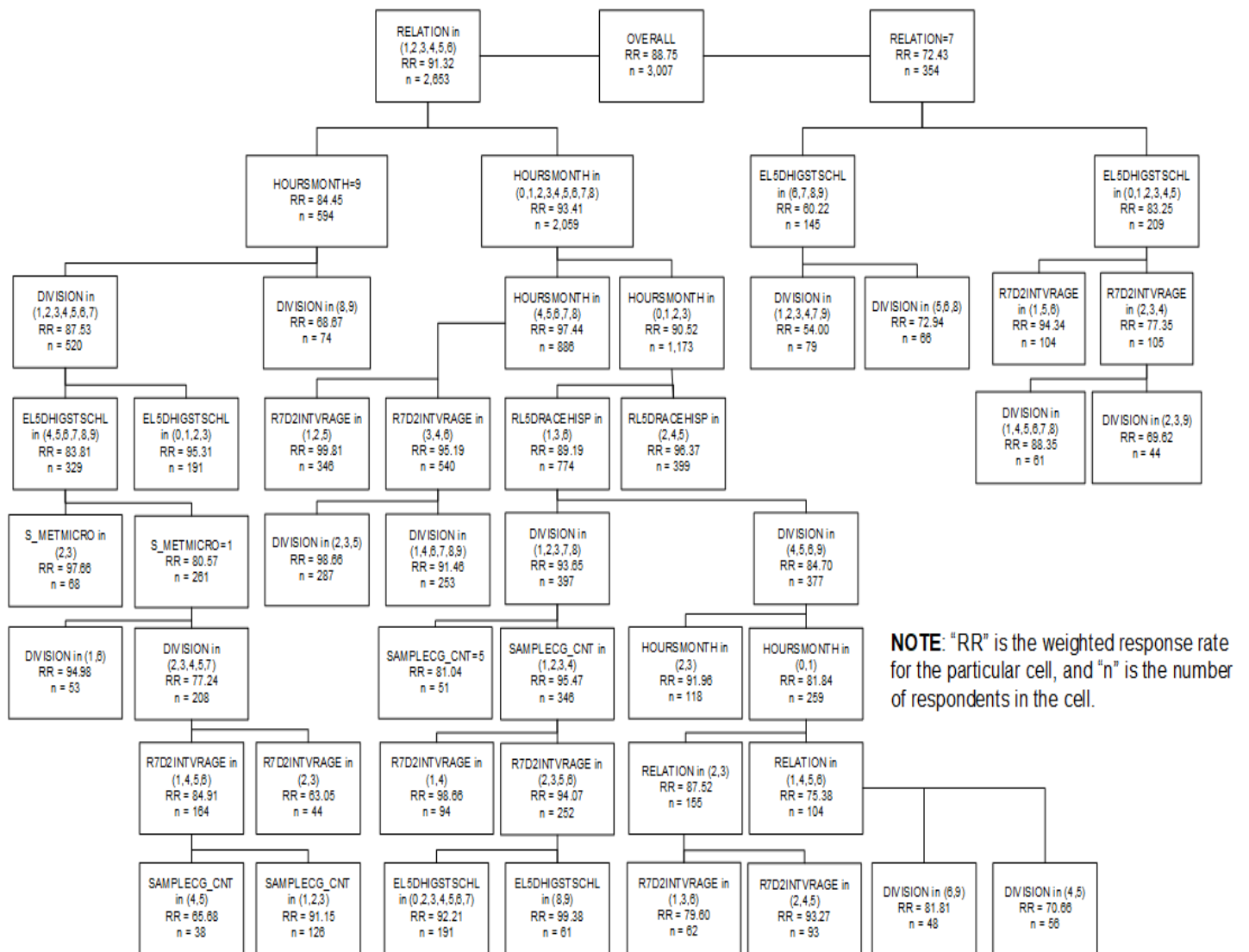
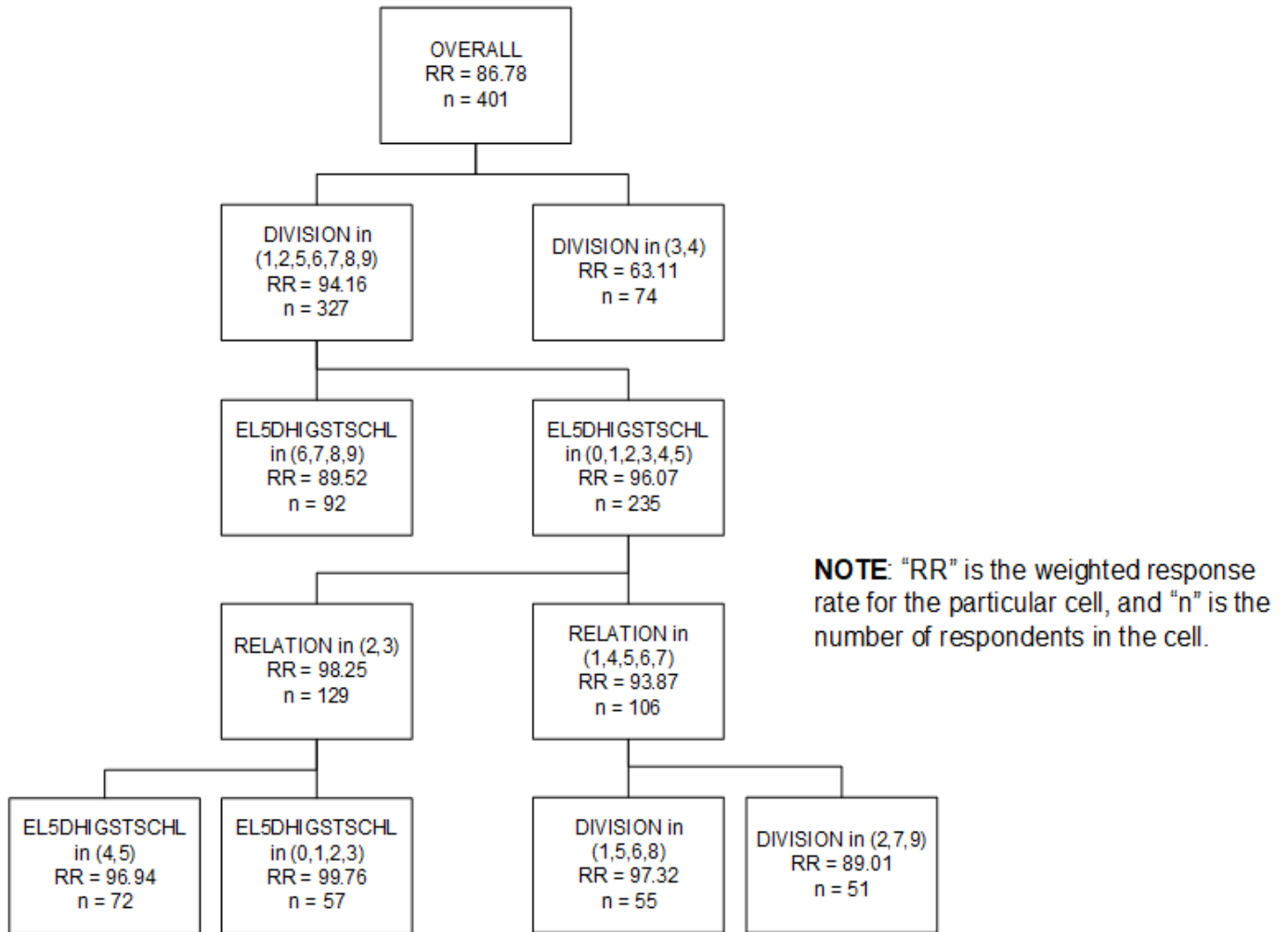
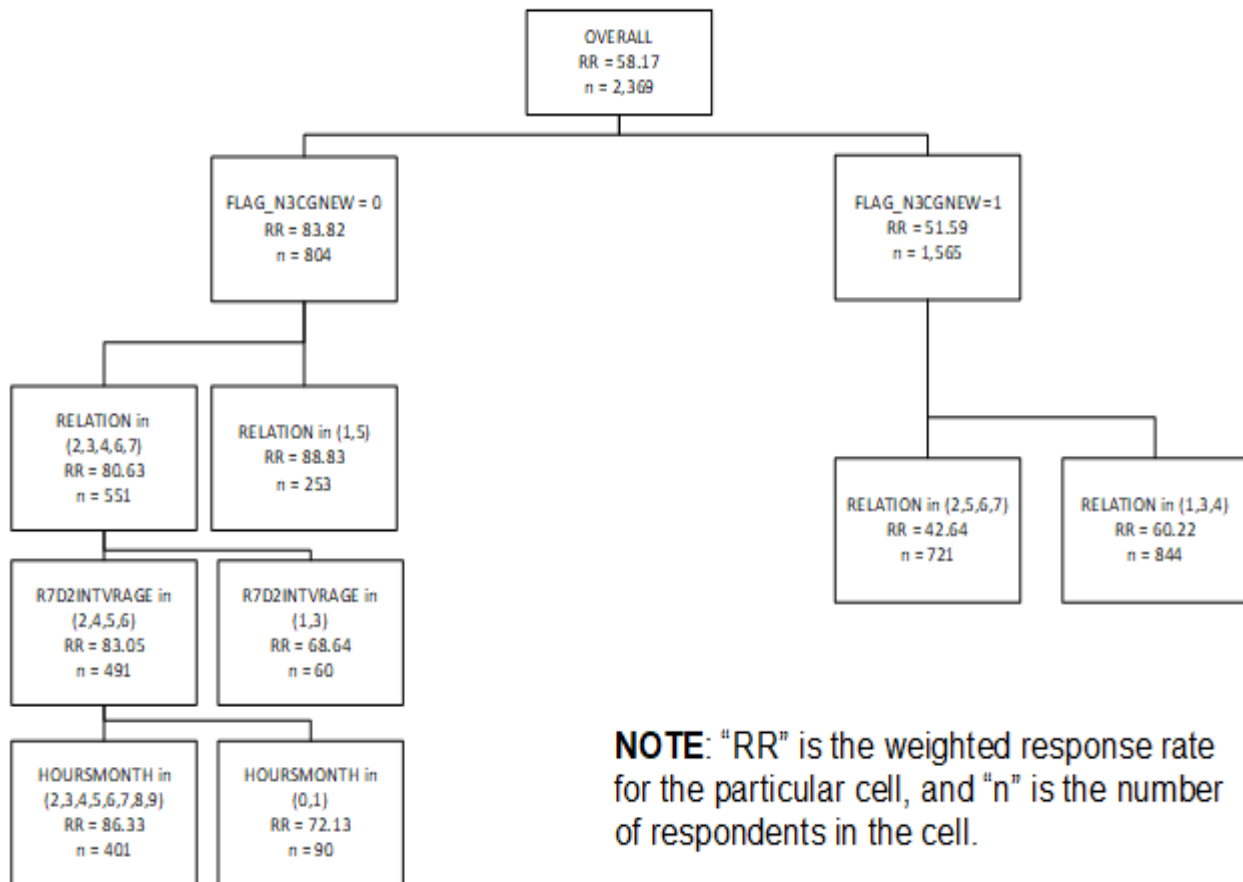


Figure 6: Stage 1 NSOC III cross-sectional weight nonresponse adjustment cells – SP Refusal (deceased SP)



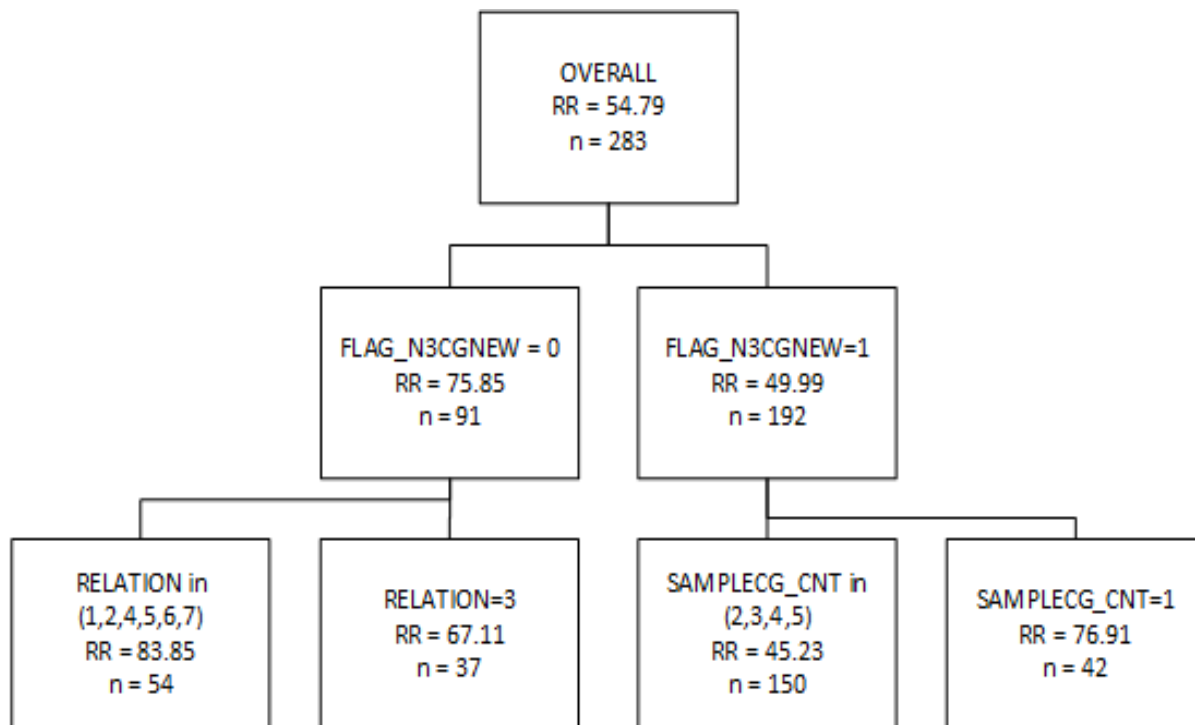
NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Figure 7: Stage 2 NSOC III cross-sectional weight nonresponse adjustment cells – Caregiver to living SP



NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Figure 8: Stage 2 NSOC III cross-sectional weight nonresponse adjustment cells – Caregiver to deceased SP



NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Table 4. Weighted Responses Rates for Variables used in Stage 1 Nonresponse Adjustment for NSOC III Longitudinal Weights

Stage 1 - Caregivers with SP interview complete in R6 & R7 (Weighted Response Rate)		
	Caregivers with living SP who completed NHATS interview (Weighted Response Rate)	Caregivers with deceased SP for whom NHATS LML interview was completed (Weighted Response Rate)
OVERALL	83.2	97.6
BENEFICIARY INDICATORS Age^{1 a} – (H_AGE CAT_R5)		
1: 65-69	81.0	100.0
2: 70-74	83.0	98.5
3: 75-79	86.5	99.4
4: 80-84	81.6	94.3
5: 85- 89	81.5	98.1
6: 90+	88.2	98.1
Gender^{1 a} – (H_SEX)		
1: Male	79.5	96.4
2: Female	85.0	98.2
Census Region² – (S_REGION)		
1: Northeast	79.0	96.9
2: Midwest	85.1	98.7
3: South	84.6	99.2
4: West	82.4	94.4
Census Division^{2 a b} – (DIVISION)		
1: New England	91.2	100.0
2: Middle Atlantic	75.1	95.0
3: East North Central	85.7	97.7
4: West North Central	84.2	100.0
5: South Atlantic	83.0	98.2
6: East South Central	92.3	100.0
7: West South Central	83.3	100.0
8: Mountain	91.5	100.0
9: Pacific	81.5	93.2
Census Metro/Micro Area Designation (2013)² – (S_METMICRO)		
1: Metropolitan area	83.1	97.6
2: Micropolitan area	84.9	100.0
3: Non-metro	80.2	92.0
Health Maintenance Organization Beneficiary¹ – (HMOTYPE)		
0: Yes	85.6	96.6
9: No	82.0	98.1
Age First Enrolled in Medicare¹ – (MEDIC_BEG)		
1: Prior to age 65	82.3	98.0
2: At or after age 65	83.4	97.5
SP Race/Ethnicity^a – (RL5DRACEHISP)		
1: White, non-Hispanic	83.0	98.0
2: Black, non-Hispanic	83.0	96.7
3: Other (Am Indian/Asian/Native Hawaiian /Pacific Islander/other specify), non-Hispanic	71.7	97.8
4: Hispanic	90.9	94.6
5: More than one	100.0	100.0
6: DK/RF	86.1	100.0

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	Caregivers with living SP who completed NHATS interview (Weighted Response Rate)	Caregivers with deceased SP for whom NHATS LML interview was completed (Weighted Response Rate)
SP Education^{a b} – (EL5DHIGSTSCHL)		
0:DK / RF	95.4	53.3
1:No schooling completed	94.9	100.0
2:1st - 8th grade	71.0	96.6
3: 9th - 12th grade	81.6	97.6
4:High school graduate	85.8	97.9
5:Vocational, technical, business, or trade school certificate or diploma	87.4	100.0
6: Some college but no degree	84.4	98.5
7:Associate’s degree	86.9	100.0
8: Bachelor’s degree	80.9	99.1
9: Master’s, professional, or doctoral degree	89.7	99.4
% Black 65+ (deciles)^{2 a b} – (PCTBLK)		
0: 1 st decile	88.6	96.2
1: 2 nd decile	85.9	97.5
2: 3 rd decile	81.2	100.0
3: 4 th decile	85.1	99.4
4: 5 th decile	73.8	92.0
5: 6 th decile	88.1	95.2
6: 7 th decile	81.8	98.0
7: 8 th decile	89.5	99.4
8: 9 th decile	77.0	100.0
9: 10 th decile	86.4	100.0
% Hispanic 65+ (deciles)² – (PCTHISP)		
0: 1 st decile	87.8	97.2
1: 2 nd decile	86.9	98.5
2: 3 rd decile	85.5	100.0
3: 4 th decile	85.2	95.9
4: 5 th decile	84.4	100.0
5: 6 th decile	78.2	100.0
6: 7 th decile	88.6	95.5
7: 8 th decile	73.3	100.0
8: 9 th decile	81.2	95.4
9: 10 th decile	84.9	92.3
% Poverty (deciles)^{2 a b} – (PCTPOV)		
0:1 st decile	88.3	99.4
1: 2 nd decile	88.9	100.0
2: 3 rd decile	74.3	98.0
3: 4 th decile	82.9	100.0
4: 5 th decile	81.1	92.5
5: 6 th decile	87.3	93.1
6: 7 th decile	88.3	96.3
7: 8 th decile	81.5	100.0
8: 9 th decile	83.9	100.0
9: 10 th decile	81.9	94.6

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	Caregivers with living SP who completed NHATS interview (Weighted Response Rate)	Caregivers with deceased SP for whom NHATS LML interview was completed (Weighted Response Rate)
Household Income^{3 4 a} – (C_AGG_HH_INC)		
1: 1 st quartile	86.1	NA
2: 2 nd quartile	77.8	NA
3: 3 rd quartile	87.9	NA
4: 4 th quartile	81.8	NA
Median Household Income^{3 4} – (C_MED_HH_INC)		
1: 1 st quartile	88.4	NA
2: 2 nd quartile	85.5	NA
3: 3 rd quartile	76.1	NA
4: 4 th quartile	83.2	NA
Median Household Income 65+^{3 4} – (C_MED_HH_INC_65)		
1: 1 st quartile	80.7	NA
2: 2 nd quartile	85.3	NA
3: 3 rd quartile	83.4	NA
4: 4 th quartile	83.5	NA
9: Missing	100.0	NA
% Households with Adult 65+^{3 4 a} – (C_PCT_HH_65)		
1: 1 st quartile	91.1	NA
2: 2 nd quartile	78.4	NA
3: 3 rd quartile	83.1	NA
4: 4 th quartile	83.5	NA
% Households in Poverty^{3 4} – (C_PCT_HH_POV)		
1: 1 st quartile	84.1	NA
2: 2 nd quartile	76.5	NA
3: 3 rd quartile	85.6	NA
4: 4 th quartile	87.4	NA
% Households Reporting Public Assistance^{3 4} – (C_PCT_HH_PUBASST)		
1: 1 st quartile	75.0	NA
2: 2 nd quartile	83.9	NA
3: 3 rd quartile	85.2	NA
4: 4 th quartile	87.6	NA
% Households Reporting Retirement Income^{3 4 a} – (C_PCT_HH_RETIREINC)		
1: 1 st quartile	91.2	NA
2: 2 nd quartile	80.1	NA
3: 3 rd quartile	86.9	NA
4: 4 th quartile	79.4	NA
% Households Reporting Social Security^{3 4} – (C_PCT_HH_SOCSEC)		
1: 1 st quartile	89.9	NA
2: 2 nd quartile	79.5	NA
3: 3 rd quartile	80.3	NA
4: 4 th quartile	85.9	NA
% Households Reporting SSI^{3 4 a} – (C_PCT_HH_SSS)		
1: 1 st quartile	87.5	NA
2: 2 nd quartile	88.8	NA
3: 3 rd quartile	74.1	NA
4: 4 th quartile	85.5	NA

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	Caregivers with living SP who completed NHATS interview (Weighted Response Rate)	Caregivers with deceased SP who completed NHATS interview (Weighted Response Rate)
% Households Owning Their Home^{3 4 a} – (C_PCT_OWNSHOME)		
1: 1 st quartile	91.6	NA
2: 2 nd quartile	84.5	NA
3: 3 rd quartile	79.0	NA
4: 4 th quartile	80.2	NA
% Households 65+ Owning Their Home^{3 4 a} – (C_PCT_OWNSHOME_65)		
1: 1 st quartile	80.1	NA
2: 2 nd quartile	85.6	NA
3: 3 rd quartile	80.2	NA
4: 4 th quartile	86.7	NA
% Households 65+ Below Poverty^{3 4 a} – (C_PCT_POV_65)		
1: 1 st quartile	89.2	NA
2: 2 nd quartile	72.1	NA
3: 3 rd quartile	90.2	NA
4: 4 th quartile	84.5	NA
Per Capita Income^{3 4} – (C_PER_CAP_INC)		
1: 1 st quartile	87.0	NA
2: 2 nd quartile	82.5	NA
3: 3 rd quartile	79.2	NA
4: 4 th quartile	84.5	NA
R5 RESIDENTIAL CARE STATUS – (R5DRESID)		
1: R5 Community	82.5	98.1
2: R5 Residential Care Resident not nursing home (SP interview complete)	87.9	94.2
4: R5 nursing home (SP interview complete)	84.4	100.0

¹Based on Information either on the September 30, 2010 CMS 20% Health Insurance Skeleton Eligibility Write-Off (HISKEW) file if the case is in the original sample, or on the September 30, 2014 CMS 20% Enrollment Database (EDB) extract if the case is in the replenishment sample .

²Based on county-level information from the September 30, 2014 CMS 5% EDB extract linked to the beneficiary's EDB address.

³Based on tract-level information from the 2009-2013 5-year American Community Survey file linked to the beneficiary's EDB address.

⁴The variables were only used in nonresponse modeling for nonresponse adjustment for caregivers to living SPs

a=retained in classification tree analysis for nonresponse adjustment for SP refusal to complete NHATS interview among caregivers to living SPs

b=retained in classification tree analysis for nonresponse adjustment for SP refusal to complete NHATS interview among caregivers to deceased SPs

Variable names used in classification trees shown parenthetically

Table 5. Weighted Responses Rates for Variables used in Stage 2 Nonresponse Adjustment for NSOC III Longitudinal Weights

Stage 2 – Caregiver interview complete, given a completed SP interview (Weighted Response Rate)		
	Caregiver interview complete, for caregivers to living SP (Weighted Response Rate)	Caregiver interview complete, for caregivers to deceased SP (Weighted Response Rate)
OVERALL	75.1	65.2
Hours of Help SP received last month^{2 a} - (HOURLSMONTH)		
0: Not codeable (<1)	79.6	NA
1:1-<10	76.4	NA
2:10-<20	79.4	NA
3:20-<30	81.1	NA
4: 30-<40	79.0	NA
5: 40-<60	77.3	NA
6: 60-<120	90.1	NA
7: 120-<180	84.2	NA
8: 180-744 (24/7)	86.6	NA
9:Missing / Inapplicable	64.5	NA
R5 Hours of Help SP received last month³ – (R5HOURLSMONTH)		
0: Not codeable (<1)	NA	66.0
1:1-<10	NA	59.1
2:10-<20	NA	63.2
3:20-<30	NA	61.1
4: 30-<40	NA	70.8
5: 40-<60	NA	64.2
6: 60-<120	NA	67.4
7: 120-<180	NA	69.8
8: 180-744 (24/7)	NA	62.8
9:Missing / Inapplicable	NA	69.4
R7 Relationship to SP^{2 a} – (RELATION)		
1:Spouse/Partner	87.0	NA
2:Son	68.1	NA
3:Daughter	80.2	NA
4:Sibling	73.6	NA
5:In-law	78.1	NA
6:Other relative	64.3	NA
7:Nonrelative	58.1	NA
R5 Relationship to SP^{3 b} – (R5RELATION)		
1:Spouse/Partner	NA	73.8
2:Son	NA	65.5
3:Daughter	NA	67.1
4:Sibling	NA	62.8
5:In-law	NA	71.7
6:Other relative	NA	44.4
7:Nonrelative	NA	73.3

(Continued next page)

	Caregiver interview complete, for caregivers to living SP (Weighted Response Rate)	Caregiver interview complete, for caregivers to deceased SP (Weighted Response Rate)
R7 SP Age at interview^{2 a} – (R7D2INTVRAGE)		
1:65-69	66.7	NA
2:70-74	76.6	NA
3:75-79	69.2	NA
4:80-84	77.0	NA
5:8-89	79.1	NA
6:90 +	77.4	NA
R5 SP Age at interview^{3 b} – (R5D2INTVRAGE)		
1:65-69	NA	100.0
2:70-74	NA	43.1
3:75-79	NA	63.8
4:80-84	NA	53.5
5:8-89	NA	68.6
6:90 +	NA	76.9
Census Division^{1 a b} – (DIVISION)		
1: New England	80.2	68.3
2: Middle Atlantic	77.7	46.1
3: East North Central	75.7	76.2
4: West North Central	76.5	62.2
5: South Atlantic	79.8	71.5
6: East South Central	77.5	66.2
7: West South Central	73.3	55.9
8: Mountain	73.8	88.5
9: Pacific	66.8	63.1
SP Race/Ethnicity^{a b} – (RL5DRACEHISP)		
1:White, non-Hispanic	78.5	67.8
2:Black, non-Hispanic	76.9	71.7
3:Other (Am Indian/Asian/Native Hawaiian /Pacific Islander/other specify), non-Hispanic	71.0	45.8
4:Hispanic	55.1	47.4
5:More than one	59.8	0.0
6:DK/RF	63.3	0.0
Number of NSOC selected eligible helpers^{a b} – (R5SAMPLECG_CNT)		
1:1 Selected eligible helper	80.4	74.2
2:2 Selected eligible helpers	77.9	72.1
3:3 Selected eligible helpers	72.7	73.9
4:4 Selected eligible helpers	70.2	64.2
5: 5 Selected eligible helpers	66.9	38.6
Census Metro/Micro Area Designation (2013)^{1 a} – (S_METMICRO)		
1: Metropolitan area	75.8	64.5
2: Micropolitan area	72.6	73.9
3: Non-metro	71.6	56.9
SP gender^{a b} – (R5DGENDER)		
1:Male	76.9	66.0
2:Female	74.2	64.8

(Continued next page)

	Caregiver interview complete, for caregivers to living SP (Weighted Response Rate)	Caregiver interview complete, for caregivers to deceased SP (Weighted Response Rate)
SP Education^a – (EL5DHIGSTSCHL)		
0:DK / RF	51.3	39.3
1:No schooling completed	96.6	29.2
2:1st - 8th grade	75.7	70.4
3: 9th - 12th grade	63.5	66.4
4:High school graduate	82.1	63.3
5:Vocational, technical, business, or trade school certificate or diploma	66.2	76.0
6: Some college but no degree	78.9	52.5
7:Associate's degree	82.1	41.3
8: Bachelor's degree	71.2	69.3
9: Master's, professional, or doctoral degree	81.5	79.7
R7 NSOC Brochure accepted by SP² – (CC17)		
0:No	38.8	NA
1:Yes	75.2	NA
R5 NSOC Brochure accepted by SP³ – (CC26)		
0:Missing	NA	75.6
1:Yes	NA	64.3
2:No	NA	69.3
R7 Helper Gender² – (OP7DGENDER)		
1:Male	68.2	NA
2:Female	79.1	NA
R7 Helper lives with SP² – (OP7PRSNINHH)		
0:Inapplicable	68.1	NA
1:Yes	84.9	NA
2:No	75.9	NA
R7 SP Residence² – (R7DRESID)		
1:Community	76.4	NA
2:Residential care resident, not nursing home (SP interview complete)	65.5	NA
4: Nursing home (SP interview complete)	84.7	NA
Caregivers who stopped giving care^{2a} – (STOPPED)		
1: Yes	65.8	NA
2: No	81.2	NA
R5 Helper Gender³ – (OP5DGENDER)		
0:Missing	NA	100.0
1:Male	NA	69.7
2:Female	NA	62.0
R5 Helper lives with SP³ – (OP5PRSNINHH)		
0:Inapplicable	NA	61.8
1:Yes	NA	69.5
2:No	NA	86.8
R5 SP Residence³ – (R5DRESID)		
1:Community	NA	65.3
2:Residential care resident, not nursing home (SP interview complete)	NA	69.7
4: Nursing home (SP interview complete)	NA	55.5

¹Based on county-level information from the September 30, 2014 CMS 5% EDB extract linked to the beneficiary's EDB address.

²The variables were only used in nonresponse modeling for nonresponse adjustment for caregiver with living SP

³The variables were only used in nonresponse modeling for nonresponse adjustment for caregiver with deceased SP
a=retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal, among caregivers to living SPs
b=retained in classification tree analysis for nonresponse adjustment for caregiver interview, given no SP refusal, among caregivers to deceased SPs
Variable names used in classification trees shown parenthetically

Figure 9: Stage 1 NSOC III longitudinal weight nonresponse adjustment cells – NHATS Interview nonresponse, living SP

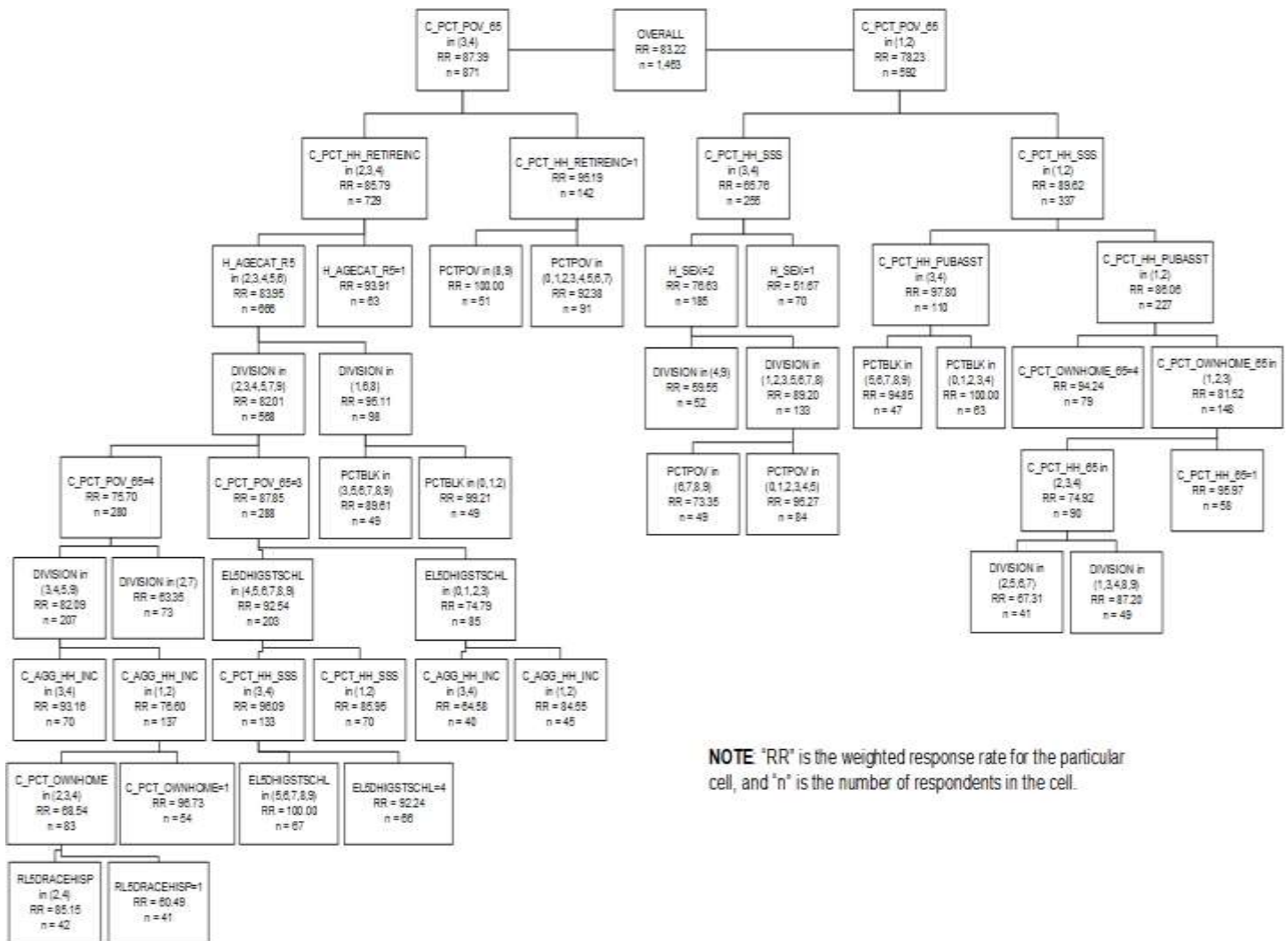
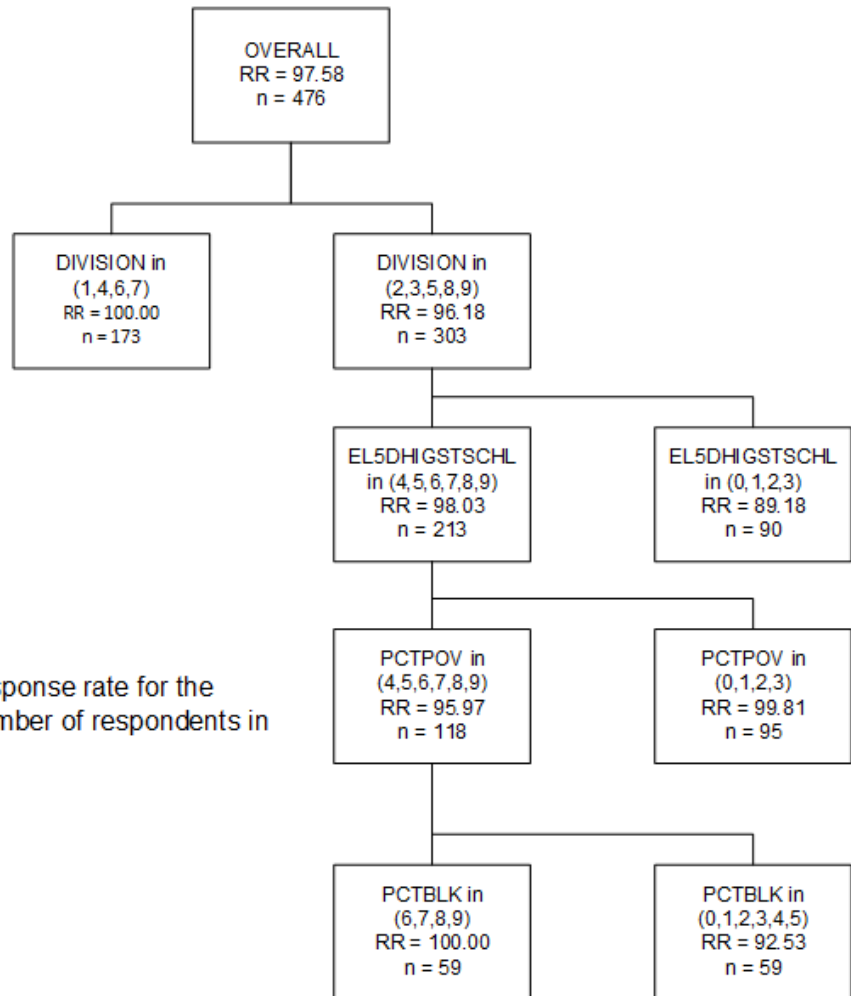
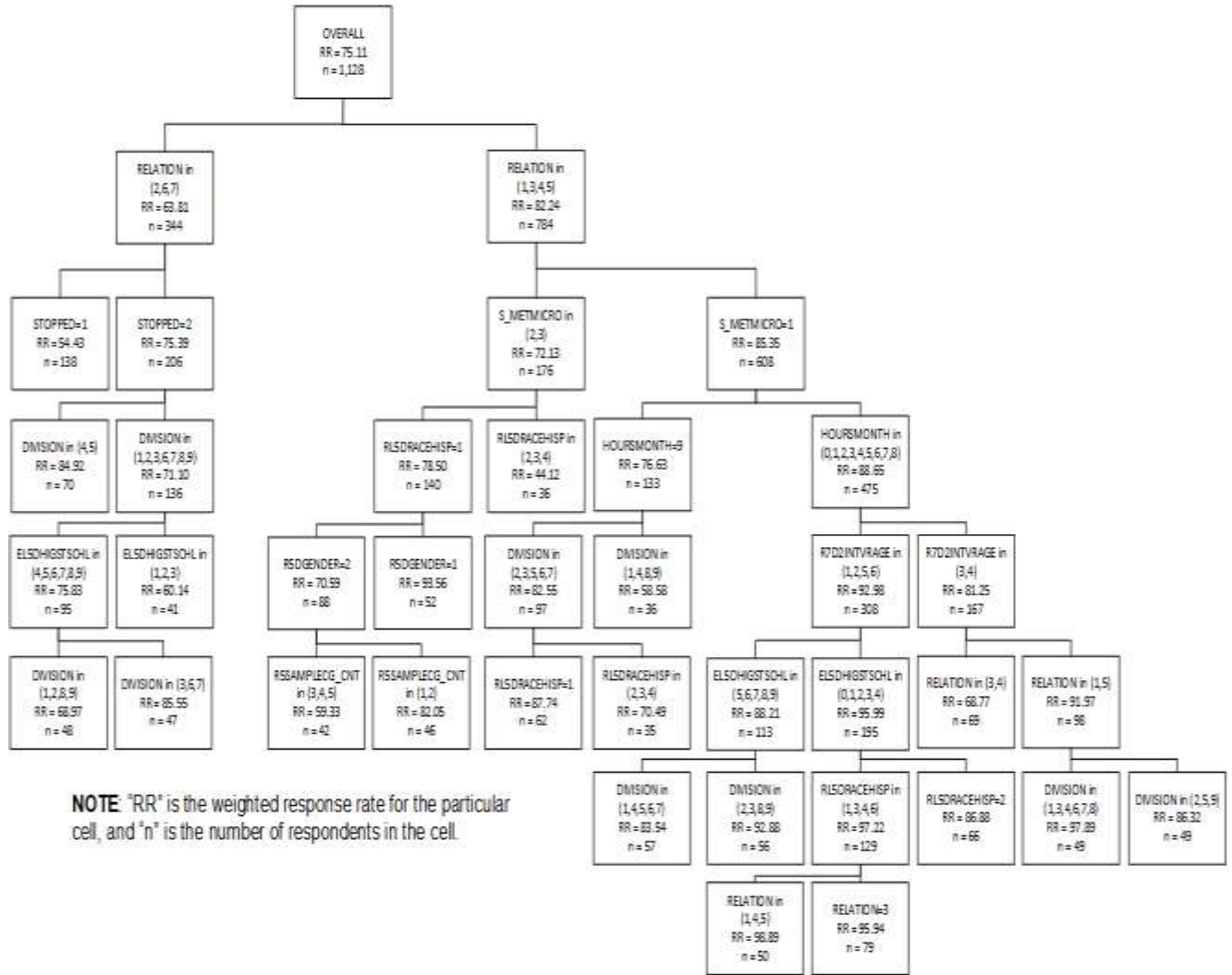


Figure 10: Stage 1 NSOC III longitudinal weight nonresponse adjustment cells – NHATS Interview nonresponse, deceased SP



NOTE: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Figure 11: Stage 2 NSOC III longitudinal weight nonresponse adjustment cells – Caregiver Interview nonresponse, living SP



NOTE "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell.

Figure 12: Stage 2 NSOC III longitudinal weight nonresponse adjustment cells – Caregiver Interview nonresponse, deceased SP

