# NATIONAL HEALTH AND AGING TRENDS STUDY (NHATS)
## Development of Round 8 Survey Weights

September 10, 2019

## 1. Introduction

The NHATS public use data originally supported weighted analysis of Medicare beneficiaries ages 65 and older living in the contiguous United States on September 30, 2010. The original cohort has been interviewed annually. Replenishment took place in Round 5 so that the sample could be used to study disability trends as well as individual trajectories. The replenishment sample was drawn as of September 30, 2014. Details on sample design and selection are available elsewhere (Montaquila et al. 2012a and DeMatteis et al. 2016a).

For Round 8, as for Rounds 5, 6, and 7, separate sets of weights are provided for analyses pertaining to the original target population (the "2011 Cohort") and for analyses pertaining to the new target population (the "2015 Cohort"). The survey weights included with the Round 8 public use file account for differential probabilities of selection and adjust for potential bias related to unit nonresponse to the Round 1 through 8 interviews.

As in prior rounds, for Round 8 of NHATS, two types of sampling weights have been produced (for each cohort): a tracker weight (on the Tracker file with the variable names w8trfinwgt0 and w8tr2011wgt0) and an analytic weight (on the Sample Person file with the variable names w8anfinwgt0 and w8an2011wgt0). For variance estimation (see Section 7), NHATS has also included replicate versions of these weights (w8trfinwgt1-w8trfinwgt56 and w8anfinwgt1-w8anfinwgt56 for the 2015 Cohort; w8tr2011wgt1- w8tr2011wgt56 and w8an2011wgt1- w8an2011wgt56 for the 2011 Cohort).

The methodology that was used to develop these weights and appropriate uses of each of these weights are discussed in the following sections. The next section provides an overview of how cases were classified for purposes of weight development. Sections 3 and 4 detail the creation of the tracker and analytic weights, respectively. Section 5 reports on the effect of weighting adjustments on the precision of NHATS survey estimates. Section 6 provides guidance on the use of the tracker and analytic weights. A final section provides information on the proper calculation of variance estimates to account for the complex design and estimation procedures used in NHATS.

## 2. Definition of Respondent

In the development of survey weights, an important first step is the classification of cases into groups based on eligibility and response status. For Round 8 of NHATS, Table 1 shows how the disposition codes map into respondent, ineligible, and nonrespondent statuses.

In the computation of the 2015 Cohort weights, both original sample and replenishment sample cases were included. In the computation of the 2011 Cohort weights, only cases in the original sample were included.

**2015 Cohort Weights**

For the 2015 Cohort Round 8 Tracker weight, only cases that were eligible as of September 30, 2014, and were classified in Round 8 as Respondents (including cases for whom a Round 8 Last Month of Life (LML) interview was completed) or Ineligible are assigned a positive weight (n=6,008). Cases for which at least one survey component is available (codes 60, 61, 62, 63 and 64) are considered respondents for purposes of the tracker weight.

Cases who became ineligible for the Round 8 interviews after they were selected, either due to death prior to their first interview (Round 1 for original sample cases, Round 5 for replenishment sample cases) or due to moving outside the contiguous U.S., also have positive Round 8 Tracker weights

For the 2015 Cohort Round 8 Analytic weight, only Respondents (codes 60, 61, 62, 63; n=5,435) are assigned a positive weight. For the SP interview, cases were required to have completed the self-reported disability protocol (through the section on Participation; PA) to be considered complete.

## 2011 Cohort Weights

For the 2011 Cohort Round 8 Tracker weight, only original sample cases classified as Respondents and Ineligible are assigned a positive weight (N = 3,123). Original sample cases for which at least one survey component is available (codes 60, 61, 62, 63 and 64) are considered respondents for purposes of the tracker weight.

Original sample cases who became ineligible for the Round 1 interview after they were selected, either because they died or moved out of the contiguous U.S. by the time of the fieldwork, have positive Round 8 Tracker weights. Those who became ineligible in subsequent rounds for an interview because they moved out of the contiguous U.S. or completed a Last Month of Life (LML) interview because they died also have positive tracker weights in Round 8. Replenishment sample cases added in 2015 do not have positive 2011 Cohort Round 8 Tracker weights.

For the 2011 Cohort Round 8 Analytic weight, only original sample Respondents (codes 60, 61, 62, 63; n=2,776) are assigned a positive weight. For the SP interview, cases were required to have completed the self-reported disability protocol (through the section on Participation; PA) to be considered complete.

**Table 1. Classification of Round 8 NHATS Sample for Weight Development Purposes**

| Disposition code | Original Sample | | | Replenishment Sample | | |
|---|---|---|---|---|---|---|
| | N | Classification for Tracker Weight | Classification for Analytic Weight | N | Classification for Tracker Weight | Classification for Analytic Weight |
| 60 Complete, community | 2,250 | Respondent | Respondent | 2,275 | Respondent | Respondent |
| 60-Complete, NH or residential care | 233 | Respondent | Respondent | 143 | Respondent | Respondent |
| 61 Complete, NH facility | 31 | Respondent | Respondent | 61 | Respondent | Respondent |
| 62 Complete, SP deceased, proxy interview | 231 | Deceased respondent[+] | Respondent[+] | 166 | N/A | N/A |
| 63 Complete SP, FQ not complete | 31 | Respondent | Respondent | 14 | Respondent | Respondent |
| 64 Complete FQ, SP not complete | 69 | Respondent | Nonrespondent | 43 | Respondent | Nonrespondent |
| 75 Physically/mentally unable to participate, no proxy | 4 | Nonrespondent | Nonrespondent | 2 | Nonrespondent | Nonrespondent |
| 76 Too ill to participate, no proxy | 12 | Nonrespondent | Nonrespondent | 14 | Nonrespondent | Nonrespondent |
| 77 Refusal, Sample Person | 62 | Nonrespondent | Nonrespondent | 133 | Nonrespondent | Nonrespondent |
| 78 Language barrier | 1 | Nonrespondent | Nonrespondent | 1 | Nonrespondent | Nonrespondent |
| 79 Unable to locate | 1 | Eligibility unknown[++] | Eligibility unknown[++] | 7 | Eligibility unknown[++] | Eligibility unknown[++] |
| 80 Unavailable during field period | 2 | Nonrespondent | Nonrespondent | 7 | Nonrespondent | Nonrespondent |
| 82 Outside of Primary Sampling Unit | 1 | Nonrespondent | Nonrespondent | 2 | Nonrespondent | Nonrespondent |
| 83 Ineligible (moved out of contiguous US) | 2 | Ineligible | Ineligible | 0 | Ineligible | Ineligible |
| 85 Refusal, facility | 3 | Nonrespondent | Nonrespondent | 6 | Nonrespondent | Nonrespondent |
| 86 Deceased, no proxy | 4 | Deceased nonrespondent[+] | Nonrespondent[+] | 11 | N/A | N/A |
| 87 Refusal, proxy | 16 | Nonrespondent | Nonrespondent | 13 | Nonrespondent | Nonrespondent |
| 88 Work stopped | 0 | Nonrespondent | Nonrespondent | 0 | Nonrespondent | Nonrespondent |
| 89 Final other/specify* | 0 | Nonrespondent* | Nonrespondent* | 2 | Nonrespondent* | Nonrespondent* |
| Not attempted in Round 8 | | | | | | |
|     Deceased in Round 1, 2, 3, or 4 | 2,127 | Ineligible[#] | Ineligible[#] | 0 | N/A | N/A |
|     Deceased in Round 5, 6, or 7 | 852 | Ineligible | Ineligible | 808 | Ineligible | Ineligible |
|     Other Round 1, 2, 3, or 4 ineligible | 120 | Ineligible[#] | Ineligible[#] | 0 | N/A | N/A |
|     Other Round 5, 6, or 7 ineligible | 5 | Ineligible | Ineligible | 50 | Ineligible | Ineligible |
|     Round 1, 2, 3, 4, 5, 6, or 7 nonrespondent | 6,354 | Nonrespondent** | Nonrespondent** | 3,361 | N/A | N/A |
| Total and number assigned weight | 12,411 | 3,704 (5,951[##]) | 2,776 | 7,119 | 3,560 | 2,659 |

[+] For the original sample, the weights of deceased SPs were adjusted separately from those of living SPs.

[++] Due to the very low proportion of fielded cases in this category in Round 2 (0.46% of fielded cases), as well as the low proportion of Round 1 respondents that were ineligible for Round 2 (0.38%), these cases were treated as living nonrespondents in the computation of Round 2 weights. The same approach was used in the computation of Round 3 and Round 4 weights, and for original sample cases, in the computation of the Round 5, Round 6, Round 7, and Round 8 weights. For the replenishment sample, these cases were treated as cases with unknown eligibility in Round 5, and as living nonrespondents in the computation of Round 6, Round 7, and Round 8 weights.

**These cases were previously adjusted for in the Round 1, Round 2, Round 3, Round 4, Round 5, Round 6, or Round 7 nonresponse adjustment to the tracker weight; the Round 7 nonresponse adjusted tracker weight was used as input to the Round 8 weighting process, so these cases are not included in the Round 8 nonresponse adjustment.

SP=Sample Person interview; FQ=Facility Questionnaire

[#]These categories only apply to the 2011 Cohort.

[##]The number assigned tracker weights for the 2011 Cohort is given in parentheses.

4

### 3. Computation of Round 8 Tracker Weights

**2015 Cohort Tracker Weights**

To produce the 2015 Cohort Round 8 Tracker weight, two adjustments were made to the Round 7 nonresponse adjusted tracker weight—an adjustment for Round 8 nonresponse and a raking adjustment to estimated population totals from the Medicare Enrollment Database (EDB).

Response rates differed between the members of the original 2011 cohort and members of the 2015 cohort. Although the response rates for the two samples are converging, there is still enough of a difference to warrant adjusting the two samples separately for Round 8 nonresponse.

Potential variables for creating nonresponse cells for the 2015 Cohort Round 8 Tracker weights came from five sources:
- Beneficiary information from the sampling frame (the 20% HISKEW File for the original sample; the 20% extract of the EDB for the replenishment sample[1]), including demographic characteristics of the beneficiary (e.g., age as of September 30, 2014, gender) and geographic information (e.g., census division, metro and micropolitan status) based on the beneficiary's address on the frame;
- County-level demographic information based on the 5% HISKEW file or the 5% extract of the EDB (e.g., percent of beneficiaries in the county who are Black; percent of beneficiaries in the county who are Hispanic) for the county linked to the beneficiary's address from the EDB;
- Census tract-level information based on the 2009-2013 5-year American Community Survey (e.g. tract-level demographic information), based on linkages to the beneficiary's address from the EDB;
- For the original sample, variables from the NHATS Rounds 1 through 7 interviews (race/ethnicity, highest education, and residential settings); and
- For the replenishment sample, variables from the NHATS Rounds 5 through 7 interviews (race/ethnicity, highest education, and Rounds 5, 6, and 7 residential settings).

Appendix Table 1 provides weighted response rates (using the 2015 cohort Round 7 Tracker nonresponse adjusted weights) by categories of the various indicators. We used these variables as input to a classification tree analysis to determine which of these 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." We also set a minimum cell size of 50.[2]

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[1] The HISKEW file was a 20% sample of the Medicare EDB (as of Sept. 30, 2010) that served as the sampling frame for the original selection. At the time of selection of the replenishment sample, CMS no longer created HISKEW files, but instead, a customized extract of the EDB was created.

[2] The classification tree analysis is designed to work with categorical predictor variables. Alternatives to this approach are propensity modeling based on logistic regression and Cartesian product cross-classification. The logistic regression approach uses a parametric model to identify predictors of response. When the pool of potential predictors includes continuous variables and categorizing the continuous variables would result in substantial losses of information, logistic regression modeling would be preferred over classification tree analysis. The Cartesian product cross-classification approach involves specifying a set of adjustment cell variables based on prior experience (generally, (1) prior analyses that identified predictors associated with response propensities;

We fit separate classification trees for the original sample and the replenishment sample. For the original sample, separate trees were fit for all living non-nursing home cases (Figure 1), nursing home residents (Figure 2), and deceased SPs (Figure 3) because underlying nonresponse processes differed for these three groups. Likewise, for the replenishment sample, separate trees were fit for living non-nursing home cases (Figure 4), nursing home residents (Figure 5), and deceased SPs (Figure 6). For the original sample, nursing home residents include both Round 1 residents who were not required to complete an SP Interview in Round 5 and new nursing home cases who were eligible for the SP interview in Round 5. Respondents to the LML interview conducted when the SP was deceased were proxy respondents. We included all variables as input for each of the trees.

Appendix Table 1 indicates the variables used in the final non-response cells for the 2015 Cohort Round 8 Tracker weights; an "a" indicates variables retained in the non-nursing home tree for the original sample, a "b" indicates those retained in the nursing home tree for the original sample, a "c" indicates those retained in the deceased original sample tree, a "d" indicates those retained in the non-nursing home tree for the replenishment sample, an "e" indicates those retained in the nursing home tree for the replenishment sample, and an "f" indicates those retained in the deceased replenishment sample tree.

For living SPs in the original sample who were living in the community and other residential settings (not nursing homes) in Round 7, final nonresponse cells included 15 indicators. For living SPs in the original sample who were living in nursing homes in Round 7 and for deceased SPs in the original sample, final nonresponse cells for each included just one indicator. Combinations of these variables created 26 nonresponse cells among the original sample in the non-nursing home group, 2 nonresponse cells among the nursing home group, and 2 nonresponse cells for the deceased group (See Appendix Figures 1, 2, and 3, respectively). For living SPs in the replenishment sample who were residing in the community and other residential settings (not nursing homes) in Round 7, final nonresponse cells included 18 indicators. Combinations of these variables created 26 nonresponse cells (See Appendix Figure 4). For living SPs in the replenishment sample who were residing in nursing homes in Round 7, the sample size was small enough to warrant the use of just a single nonresponse cell (See Appendix Figure 5). For deceased SPs in the replenishment sample, the total of 3 final nonresponse cells included 2 indicators (See Appendix Figure 6).

The final step in creating the 2015 Cohort Round 8 Tracker weight involved raking the nonresponse adjusted weights to control totals developed from the 5% EDB extract (of Medicare beneficiaries as of September 30, 2014) that was used for sampling. For consistency, the raking adjustment also included the ineligibles (primarily deaths), since the frame that served as the source of the control totals also includes beneficiaries who were ineligible for NHATS. In Round 8, weight trimming was done in conjunction with this raking adjustment, due to a few outlier weights; this is discussed further in section 5.

As in Rounds 1 through 7, four dimensions were used in this Round 8 raking adjustment[3]:

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and/or (2) predictors associated with response and/or subject matter expertise that informs the choice of variables).

[3] For purposes of raking, age categories refer to age at Round 5 sampling.

(1) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by sex by race from the EDB (Black; non-Black);
(2) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by Census region;
(3) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by MSA status (from the EDB); and
(4) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by a binary indicator of whether the SP was enrolled in Medicare prior to age 65.

In addition, as in Rounds 5 through 7, a fifth dimension—whether or not the beneficiary was eligible for selection into the original sample (i.e., age 65 or older and enrolled in Medicare as of September 30, 2010)—was used.

**2011 Cohort Weights**

The 2011 Cohort Round 8 Tracker weight applies only to the original sample, and followed the approach used to compute the Rounds 1 through 7 Tracker weights. This process began with the Round 7 nonresponse adjusted tracker weight (prior to raking). This Round 7 weight accounted for differential probabilities of selection and included adjustments for nonresponse to Rounds 1 through 7, but was not raked to the HISKEW[4]. See Montaquila et al. (2012b) for details on the specific methodology used in computing and adjusting the Round 1 weights; also, refer to Montaquila et al. (2014, 2015a, 2015b) and DeMatteis et al. (2016b, 2017, 2018) for information about the specific adjustments applied in Rounds 2 through 7, respectively.

To produce the 2011 Cohort Round 8 Tracker weight, two adjustments were made to the Round 7 nonresponse adjusted tracker weight—an adjustment for Round 8 nonresponse and a raking adjustment to estimated population totals from the EDB. Potential variables for creating nonresponse cells for the 2011 Cohort Round 8 Tracker weights came from four sources:
- Beneficiary information from the sampling frame (the 20% HISKEW File for the original sample), including demographic characteristics of the beneficiary (e.g., age computed as of September 30, 2014 based on birthdate, gender) and geographic information (e.g., census division, metro and micropolitan status) based on the beneficiary's address in the EDB;
- County-level demographic information based on the 5% HISKEW file (e.g., percent of beneficiaries in the county who are Black; percent of beneficiaries in the county who are Hispanic) for the county linked to the beneficiary's address from the EDB;
- Census tract-level information based on the 2009-2013 5-year American Community Survey (e.g. tract-level demographic information), based on linkages to the beneficiary's address from the EDB; and
- Variables from NHATS Rounds 1 through 7 (race/ethnicity, highest education, and residential settings).

Appendix Table 2 provides weighted response rates (using the Round 7 nonresponse adjusted tracker weights that were the basis for the 2011 Cohort Round 8 Tracker weights) by categories of the various indicators. We used these variables as input to a classification tree analysis to determine which of these

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[4] The HISKEW file was a 20% sample of the Medicare enrollment database (as of Sept. 30, 2010) that served as the sampling frame for the original selection.

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." We also set a minimum cell size of 50.[5]

Separate trees were fit for all living non-nursing home cases (Figure 7), nursing home residents (Figure 8), and deceased SPs (Figure 9) because underlying nonresponse processes differed for these three groups. For the original sample, nursing home residents include both Round 1 residents who were not required to complete an SP Interview and new Rounds 2 through 7 nursing home residents who were eligible for the SP interview in Round 8. Respondents to the LML interview conducted when the SP was deceased were proxy respondents. We included all variables as input for each of the trees.

Appendix Table 2 indicates the variables used in the final nonresponse cells for the 2011 Cohort Tracker weights, with an "a" for the non-nursing home tree, a "b" for the Round 7 nursing home residents tree, and a "c" for the deceased SP tree. For living SPs who were living in the community and other residential settings (not nursing homes) in Round 7, final nonresponse cells included 16 indicators; combinations of these variables created 26 nonresponse cells. Among living SPs who were nursing home residents in Round 7, final nonresponse cells included 1 indicator, resulting in 2 nonresponse cells. For deceased SPs, final non-response cells included 2 indicators, resulting in 3 nonresponse cells (See Appendix Figures 7, 8, and 9).

The final step in creating the 2011 Cohort Round 8 Tracker weight involved raking the nonresponse adjusted weights to control totals developed from the 5% HISKEW as of September 30, 2010 that was used for sampling of the original sample. For consistency, the raking adjustment also included the ineligibles (primarily deaths), since the frame that served as the source of the control totals also includes beneficiaries who were ineligible for NHATS. In Round 8, weight trimming was done in conjunction with this raking adjustment, due to a few outlier weights; this is discussed further in section 5.

As in Rounds 1 through 5, four dimensions were used in this Round 8 raking adjustment[6]:

(1) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by sex by race from the EDB (Black; non-Black);
(2) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by Census region;
(3) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by MSA status (from the HISKEW); and
(4) Age category (65-69, 70-74, 75-79, 80-84, 85-89, 90+) by a binary indicator of whether the SP was enrolled in Medicare prior to age 65.

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[5] The classification tree analysis is designed to work with categorical predictor variables. Alternatives to this approach are propensity modeling based on logistic regression and Cartesian product cross-classification. The logistic regression approach uses a parametric model to identify predictors of response. When the pool of potential predictors includes continuous variables and categorizing the continuous variables would result in substantial losses of information, logistic regression modeling would be preferred over classification tree analysis. The Cartesian product cross-classification approach involves specifying a set of adjustment cell variables based on prior experience (generally, (1) prior analyses that identified predictors associated with response propensities; and/or (2) predictors associated with response and/or subject matter expertise that informs the choice of variables).

[6] For purposes of raking, age categories refer to age at Round 1 sampling.

### 4. Computation of Round 8 Analytic Weights

As with the tracker weights, separate Round 8 Analytic weights were computed for the 2015 Cohort (designed for analysis of the original and replenishment samples combined) and for the 2011 Cohort (designed for analysis of the original sample alone).

The computation of the analytic weights begins with the final Round 8 Tracker weight for the respective cohort. A weighting class adjustment was developed for the class of nonrespondents who were eligible for but did not complete the SP interview: those living in nursing homes or non-nursing home residential care in Round 8 who had completed a facility interview but not a Sample Person interview (n=112 for the 2015 Cohort and n=69 for the 2011 Cohort; designated as code 64). (Round 8 nursing home residents who were nursing home residents at the time of their baseline interview (code 61) were not eligible for an SP interview in Round 8, thus are not part of the analytic weight nonresponse adjustment). The approach was designed to preserve the tracker weight distributions by Round 8 residence type (nursing home, non-nursing home). That is, we allowed the weights of residential care cases with both a completed FQ and a completed SP interview (n=376 for the 2015 Cohort and n=233 for the 2011 Cohort) to be adjusted to account for similar cases missing the SP Interview.

**2015 Cohort Analytic Weights**

Because it was believed that response mechanisms may be different for the two samples (since members of the original sample had been engaged in the study for several rounds, whereas Round 8 was the fourth contact and attempt at gaining cooperation with the replenishment sample), the two samples were adjusted separately for Round 8 analytic nonresponse. Since the sample size is much smaller for this nonresponse adjustment, only a subset of variables used in tracker weight classification tree analysis was considered for the analytic weight nonresponse adjustments; additionally, three variables that characterize the Round 8 nursing home status, non-nursing home residential care status, and area of the facility where the SP lives were included (see Appendix Table 3). In order to preserve the tracker weight distribution, for each sample separately by Round 8 residence type, the first split in each tree was forced to be Round 8 nursing home status. (All subsequent splitting was based on response propensities.) For the original sample, 3 variables (designated with "o" in Appendix Table 3) were retained in the final classification tree, forming 4 cells (see Appendix Figure 10); for the replenishment sample, 2 variables designated with "r" in Appendix Table 3) were retained in the final classification tree, forming 3 cells (see Appendix Figure 11).

As a final step, we applied a raking procedure so that marginal totals based on the analytic weights would match the totals at replenishment sampling by: 5-year age groups, sex, race, region, micro/metropolitan status, and whether Medicare was received before age 65.

**2011 Cohort Analytic Weights**

As with the 2011 Cohort Round 8 Tracker weights, the 2011 Cohort Round 8 Analytic weight applies only to the original sample. Since the sample size is much smaller for this nonresponse adjustment, only a subset of variables used in tracker weight classification tree analysis was considered for the analytic weight nonresponse adjustments; additionally, three variables that characterize the Round 8 nursing home status, non-nursing home residential care status, and area of the facility where the SP lives were

included (see Appendix Table 4). In order to preserve the tracker weight distribution by Round 8 residence type, the first split was forced to be Round 8 nursing home status. (All subsequent splitting was based on response propensities.) Three variables (designated with "*" in Appendix Table 4) were retained in the final classification tree, forming 4 cells (see Appendix Figure 12).

As a final step, we applied a raking procedure so that marginal totals based on the analytic weights would match the totals at sampling by: 5-year age groups, sex, race, region, micro/metropolitan status, and whether Medicare was received before age 65.

## 5. Design Effects Related to Weighting

Although weighting adjustments are aimed at reducing bias, increased variation in weights generally increases the variances of survey estimates (Kish, 1965). Thus, in the development and implementation of the weighting methodology for NHATS, care was taken to balance the bias reductions against the potential increases in variance.

The estimated overall design effect due to variation in the Round 1 nonresponse adjusted tracker weights was 1.28. After applying Round 2 nonresponse adjustments within cells determined by the classification tree results, the estimated overall design effect due to unequal weighting increased to 1.33. Incorporating the Round 3 nonresponse adjustments, the estimated overall design effect due to unequal weighting was 1.35, and after Round 4 nonresponse adjustment this overall design effect was 1.34.

**2015 Cohort Weights**

The composited weights used in computing the 2015 Cohort Round 5 Tracker weights had an overall design effect (due to variation in the weights) of 1.34. After Round 5 nonresponse adjustment, the overall design effect was 1.55, with the increase being due to the extent of variation in response propensities between and within the two samples (the original sample and Round 5 replenishment sample). The nonresponse adjusted Round 6 Tracker weights and the nonresponse adjusted Round 7 Tracker weights had overall design effects of 1.62 and 1.64, respectively. The nonresponse adjusted Round 8 Tracker weights had an overall design effect of 1.65. In order to limit the variation in the weights, after the raking adjustment, trimming of the tracker weights was considered; 1 case with an influential outlier weight was identified, and its tracker weight was trimmed, the weights were re-raked. After the raking adjustment, the design effect for the final 2015 Cohort Round 8 Tracker weights was 1.66.

After the adjustments applied in computing the analytic weight (nonresponse adjustment and raking), four cases were identified as influential outliers, and their analytic weights were trimmed; following trimming, the weights were re-raked. After the re-raking, the design effect for the final 2015 Cohort Round 8 Analytic weights was 1.64 overall, and 1.62 for living SPs and 1.69 for deceased SPs.

**2011 Cohort Weights**

For the 2011 Cohort weights, after Round 5 nonresponse adjustment, the overall design effect was 1.33. After adjusting for Round 6 nonresponse and for Round 7 nonresponse, the overall design effects were 1.32 and 1.32, respectively. After adjusting for Round 8 nonresponse, the overall design effect was 1.31.

In order to limit the variation in the weights, after the raking adjustment, the tracker weights were trimmed and then re-raked; four cases with extreme weights were trimmed at this point. After the raking adjustment and trimming, the design effect for the final 2011 Cohort Round 8 Tracker weights was 1.34.

After the adjustments applied in computing the analytic weight (nonresponse adjustment and raking), one case was identified as an influential outlier, and its analytic weight was trimmed; following trimming, the weights were re-raked. After the re-raking, the design effect for the final 2011 Cohort Round 8 Analytic weights was 1.33 overall; and 1.32 for living SPs and 1.31 for deceased SPs.

**6.    Use of the Tracker vs. Analytic Weight**

When using the tracker weight from any round, respondents are weighted up to represent all Medicare beneficiaries ages 65 and older who were alive on or as of the target date for the cohort (September 30, 2014 for the 2015 Cohort; September 30, 2010 for the 2011 Cohort) and residing in the contiguous United States. In contrast, the analytic weight at a given round reproduces only those alive and eligible for NHATS during the prior round fieldwork period (with the exception of a small number of persons from the prior round who are deemed ineligible in the current round because they relocated outside the contiguous U.S.). Thus, the Round 8 Analytic weight reproduces those alive and eligible for NHATS during the Round 7 fieldwork period.

The only other difference between the two sets of weights is the treatment of respondents who live in residential care settings other than nursing homes. In cases where an FQ interview was completed but an (eligible) SP interview was not completed in Round 8, a positive Round 8 weight sits in the Tracker file and a zero Round 8 weight in the Analytic file. The analytic weights of individuals with both an SP and FQ interview have been adjusted to represent these cases (persons assigned both an SP and FQ interview but with only an FQ). For all other respondents (including cases with proxy responses to the LML interview) the analytic and tracker weights are equal.

Most often analyses will use the analytic weight. The tracker weight is appropriate for making national estimates using the FQ information (e.g. for services available to older adults living in residential care settings) and for investigating the role of mortality on Round 1 disability estimates and successive cross-sections.

Another important consideration is whether to use a round-specific weight and, for Rounds 5 through 8, whether to use the 2015 Cohort weight or the 2011 Cohort weight. A useful rule of thumb is to always consider the population to which an estimate is being generalized. To estimate, for example, the proportion of the population in Round 1 who has a particular characteristic in Round 2, 3, 4, 5, 6, 7, or 8 (measured in the SP interview) or who was in a particular type of residential care in Round 2, 3, 4, 5, 6, 7, or 8 (measured in the FQ interview), a Round 1 weight should be used. The former would use the Round 1 Analytic weight and the latter the Round 1 Tracker weight. To estimate characteristics of people ages 75 and older in Round 8, or the characteristics of those living in residential care settings in Round 8 as measured in the Round 8 FQ interview, the Round 8 weight should be used. The former would use the Round 8 Analytic weight and the latter the Round 8 Tracker weight. To estimate characteristics (as of Round 8) of people 65 and older in Round 5, the 2015 Cohort Round 8 weight should be used. To examine associations between a characteristic in Round 8 and a characteristic in Round 1 (or any round prior to Round 5), the 2011 Cohort Round 8 weight should be used.

**7. Variance Estimation**

Two broad classes of methods have been developed for computation of standard errors of estimates from complex sample surveys: (1) Taylor series linearization and (2) replication methods. The NHATS data files contain the information necessary for analysts to use either of these approaches to compute standard errors. The "stratum" and "cluster" variables that allow users to compute variance estimates using Taylor series linearization are provided on the NHATS Tracker and SP files as the variables w5varstrat and w5varunit, respectively.

The replication approach that was used in NHATS (Montaquila et al. 2012b) is the modified balanced repeated replication (BRR) method suggested by Fay (Judkins 1990). When estimating the variance of ratios of rare subsets, one problem that occasionally arises from standard BRR is that one or more replicate estimates will be undefined due to zero denominators. Instead of increasing the weights of one half-sample by 100 percent and decreasing the weights of the other half-sample to zero as in standard BRR, Fay's method perturbs the weights by ±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, K = 0.3 was used.

Nonresponse adjustment and raking were repeated for each of the replicates. For Round 8, the final tracker replicate weights are provided in the variables w8trfinwgt1-w8trfinwgt56 for the 2015 Cohort and w8tr2011wgt1- w8tr2011wgt56 for the 2011 Cohort, and the analytic replicate weights are provided in the variables w8anfinwgt1-w8anfinwgt56 for the 2015 Cohort and w8an2011wgt1-w8an2011wgt56 for the 2011 Cohort. Through the creation of person-level replicate weights, Fay's method approximately reflects the contribution of variance due to nonresponse adjustments, calibration adjustments (e.g., poststratification or raking), and other weight adjustment factors that are dependent on the observed sample.

For additional information on application of weights and variance estimation in NHATS analyses, see the National Health and Aging Trends Study (NHATS) User Guide at www.nhats.org

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# Appendix: Variables Used in Nonresponse Adjustment for Round 8 NHATS Weights

**Appendix Table 1. Response Rates by Various Indicators:  NHATS Round 8 2015 Cohort**

| Variable & Values | Weighted Response Rate | Variable & Values | Weighted Response Rate |
|---|---|---|---|
| **OVERALL** | 94.0% | **TRACT-LEVEL INDICATORS (Quartiles)** | |
| **BENEFICIARY INDICATORS** | | **Household Income**[3][a][d]  (C_AGG_HH_INC) | |
| **Age**[1][d]  (H_AGECAT_R5) | | 1: 1st quartile | 93.2% |
| 1: 65-69 | 93.5% | 2: 2nd quartile | 92.3% |
| 2: 70-74 | 93.4% | 3: 3rd quartile | 94.4% |
| 3: 75-79 | 94.5% | 4: 4th quartile | 95.0% |
| 4: 80-84 | 94.5% | 9: Missing | 100.0% |
| 5: 85- 89 | 96.2% | **Median Household Income**[3][a]  (C_MED_HH_INC) | |
| 6: 90+ | 95.3% | 1: 1st quartile | 92.4% |
| **Gender**[1][a][d]  (H_SEX) | | 2: 2nd quartile | 93.8% |
| 1: Male | 93.2% | 3: 3rd quartile | 94.2% |
| 2: Female | 94.6% | 4: 4th quartile | 95.0% |
| **Census Region**[2][a]  (S_REGION) | | 9: Missing | 100.0% |
| 1: Northeast | 96.2% | **Median Household Income 65+**[3][d] | |
| 2: Midwest | 94.4% | (C_MED_HH_INC_65) | |
| 3: South | 92.7% | 1: 1st quartile | 92.5% |
| 4: West | 93.9% | 2: 2nd quartile | 93.7% |
| **Census Division**[2][a][d][f]  (DIVISION) | | 3: 3rd quartile | 95.2% |
| 1: New England | 96.9% | 4: 4th quartile | 94.2% |
| 2: Middle Atlantic | 95.9% | 9: Missing | 84.3% |
| 3: East North Central | 94.3% | **% Households with Adult 65+**[3][a][d]  (C_PCT_HH_65) | |
| 4: West North Central | 94.5% | 1: 1st quartile | 91.0% |
| 5: South Atlantic | 91.8% | 2: 2nd quartile | 93.5% |
| 6: East South Central | 90.9% | 3: 3rd quartile | 95.5% |
| 7: West South Central | 95.3% | 4: 4th quartile | 94.4% |
| 8: Mountain | 99.2% | **% Households in Poverty**[3][a][d]  (C_PCT_HH_POV) | |
| 9: Pacific | 93.1% | 1: 1st quartile | 95.4% |
| **Census Metro/Micro Area Designation (2013)**[2] | | 2: 2nd quartile | 94.0% |
| (S_METMICRO) | | 3: 3rd quartile | 93.0% |
| 1: Metropolitan area | 93.9% | 4: 4th quartile | 93.1% |
| 2: Micropolitan area | 93.7% | **% Households Reporting Public Assistance**[3][d] | |
| 3: Non-metro | 95.3% | (C_PCT_HH_PUBASST) | |
| **Health Maintenance Organization Beneficiary**[1] | | 1: 1st quartile | 93.9% |
| (HMOTYPE) | | 2: 2nd quartile | 95.2% |
| 0: Yes | 94.1% | 3: 3rd quartile | 92.7% |
| 9: No | 93.9% | 4: 4th quartile | 93.9% |
| **Age First Enrolled in Medicare**[1]  (MEDIC_BEG) | | **% Households Reporting Retirement Income**[3][a][d] | |
| 1: Prior to age 65 | 91.1% | (C_PCT_HH_RETIREINC) | |
| 2: At or after age 65 | 94.3% | 1: 1st quartile | 93.9% |
| **Race/Ethnicity**[4][a][d]  (RL5DRACEHISP_R) | | 2: 2nd quartile | 92.5% |
| 1: White, non-Hispanic | 94.6% | 3: 3rd quartile | 94.9% |
| 2: Black, non-Hispanic | 92.9% | 4: 4th quartile | 94.3% |
| 3: Other, non-Hispanic | 90.7% | **% Households Reporting Social Security**[3][d] | |
| 4: Hispanic | 94.2% | (C_PCT_HH_SOCSEC) | |
| 5: DK/RF | 83.6% | 1: 1st quartile | 92.9% |
| **Highest Education (R5)** [4][^][d][f]  (EL5HIGSTSCHL_R) | | 2: 2nd quartile | 93.7% |
| 0: Not applicable | 90.5% | 3: 3rd quartile | 94.4% |
| 1: DK/RF | 83.4% | 4: 4th quartile | 94.3% |
| 2: Below high school | 91.8% | | |
| 3: High school | 93.1% | | |
| 4: Above High school | 94.0% | | |

| Variable & Values | Weighted Response Rate | Variable & Values | Weighted Response Rate |
|---|---|---|---|
| **Highest Education (R1)[4][#][c]** (EL1HIGSTSCHL_R) | | **TRACT-LEVEL INDICATORS (Quartiles)** | |
| 0: Not applicable | 97.8% | **% Households Reporting SSI[3][d]** (C_PCT_HH_SSS) | |
| 1: DK/RF | 87.5% | 1: 1st quartile | 94.8% |
| 2: Below high school | 95.0% | 2: 2nd quartile | 94.4% |
| 3: High school | 96.8% | 3: 3rd quartile | 93.0% |
| 4: Above High school | 96.5% | 4: 4th quartile | 93.8% |
| | | **% Households Owning Their Home[3][a][d]** | |
| **COUNTY LEVEL INDICATORS** | | (C_PCT_OWNHOME) | |
| **% Black 65+ (deciles)[2][a][b][d]** (PCTBLK) | | 1: 1st quartile | 92.7% |
| 0: 1st decile | 95.7% | 2: 2nd quartile | 93.7% |
| 1: 2nd decile | 94.8% | 3: 3rd quartile | 93.7% |
| 2: 3rd decile | 95.1% | 4: 4th quartile | 95.1% |
| 3: 4th decile | 96.1% | **% Households 65+ Owning Their Home[3][a][d]** | |
| 4: 5th decile | 90.3% | (C_PCT_OWNHOME_65) | |
| 5: 6th decile | 92.3% | 1: 1st quartile | 94.3% |
| 6: 7th decile | 93.5% | 2: 2nd quartile | 92.8% |
| 7: 8th decile | 94.4% | 3: 3rd quartile | 94.2% |
| 8: 9th decile | 93.2% | 4: 4th quartile | 94.6% |
| 9: 10th decile | 93.2% | **% Households 65+ Below Poverty[3][a]** | |
| **% Hispanic 65+ (deciles)[2][a][d]** (PCTHISP) | | (C_PCT_POV_65) | |
| 0: 1st decile | 93.8% | 1: 1st quartile | 94.6% |
| 1: 2nd decile | 92.4% | 2: 2nd quartile | 93.6% |
| 2: 3rd decile | 94.3% | 3: 3rd quartile | 93.6% |
| 3: 4th decile | 92.7% | 4: 4th quartile | 94.1% |
| 4: 5th decile | 93.3% | **Per Capita Income[3]** (C_PER_CAP_INC) | |
| 5: 6th decile | 94.5% | 1: 1st quartile | 92.3% |
| 6: 7th decile | 95.1% | 2: 2nd quartile | 93.0% |
| 7: 8th decile | 95.9% | 3: 3rd quartile | 95.5% |
| 8: 9th decile | 95.0% | 4: 4th quartile | 94.6% |
| 9: 10th decile | 92.8% | | |
| **% Poverty (deciles)[2][d]** (PCTPOV) | | **OTHER INDICATORS** | |
| 0: 1st decile | 95.2% | **R7 Residential Care Status[4][a]** (R7DRESID) | |
| 1: 2nd decile | 95.4% | 1: R7 Community | 93.9% |
| 2: 3rd decile | 94.6% | 2: R7 Residential Care Resident not nursing home (SP interview complete) | 96.3% |
| 3: 4th decile | 95.1% | 3: R7 Residential Care Resident not nursing home (FQ only) | 86.0% |
| 4: 5th decile | 93.1% | | |
| 5: 6th decile | 92.7% | | |
| 6: 7th decile | 93.7% | 4: R7 nursing home (SP interview complete) | 99.3% |
| 7: 8th decile | 94.5% | 5: R7 nursing home (FQ only) | 94.4% |
| 8: 9th decile | 93.7% | 7: R1 to R6 Residential Care Resident not nursing home (FQ only) | 88.0% |
| 9: 10th decile | 90.7% | | |
| | | 8: R1 to R6 nursing home | 94.1% |

[1]Based 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.

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

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

[4]Based on responses to items in the Rounds 1 to 5 interviews.

[#]Response rates were computed only for the original sample.

[^] Response rates were computed only for the replenishment sample.

a=retained in classification tree analysis for living SP non-nursing home branch of the original sample

b=retained in classification tree analysis for living SP nursing home branch of the original sample

c=retained in classification tree analysis for deceased SP branch of the original sample

d= retained in classification tree analysis for living SP non-nursing home branch of the replenishment sample
e= retained in classification tree analysis for living SP nursing home branch of the replenishment sample
f= retained in classification tree analysis for deceased SP branch of the replenishment sample
N=5,851 (5,547 respondents and 304 non-respondents)
Variable names used in classification trees shown parenthetically.

**Appendix Table 2. Response Rates by Various Indicators:  NHATS Round 8 Cohort 2011**

| Variable & Values | | Weighted Response Rate | Variable & Values | | Weighted Response Rate |
|---|---|---|---|---|---|
| **OVERALL** | | 96.2% | **TRACT-LEVEL INDICATORS (Quartiles)** | | |
| **BENEFICIARY INDICATORS** | | | **Household Income**[3][a] | (C_AGG_HH_INC) | |
| **Age**[1] | (H_AGECAT) | | 1: 1st quartile | | 96.9% |
| 1: 65-69 | | 96.4% | 2: 2nd quartile | | 95.4% |
| 2: 70-74 | | 96.5% | 3: 3rd quartile | | 96.0% |
| 3: 75-79 | | 95.2% | 4: 4th quartile | | 96.5% |
| 4: 80-84 | | 96.6% | **Median Household Income**[3][a] | (C_MED_HH_INC) | |
| 5: 85- 89 | | 95.5% | 1: 1st quartile | | 95.8% |
| 6: 90+ | | 95.4% | 2: 2nd quartile | | 97.0% |
| **Gender**[1][a] | (H_SEX) | | 3: 3rd quartile | | 95.7% |
| 1: Male | | 96.9% | 4: 4th quartile | | 96.2% |
| 2: Female | | 95.6% | **Median Household Income 65+**[3] | | |
| **Census Region**[1] | (S_REGION) | | | (C_MED_HH_INC_65) | |
| 1: Northeast | | 96.9% | 1: 1st quartile | | 96.4% |
| 2: Midwest | | 96.8% | 2: 2nd quartile | | 96.9% |
| 3: South | | 95.8% | 3: 3rd quartile | | 96.0% |
| 4: West | | 95.5% | 4: 4th quartile | | 95.8% |
| **Census Division**[1][a][b][c] | (DIVISION) | | 9: Missing | | 45.1% |
| 1: New England | | 98.4% | **% Households with Adult 65+**[3][a] | (C_PCT_HH_65) | |
| 2: Middle Atlantic | | 96.2% | 1: 1st quartile | | 94.0% |
| 3: East North Central | | 97.0% | 2: 2nd quartile | | 95.5% |
| 4: West North Central | | 96.4% | 3: 3rd quartile | | 97.5% |
| 5: South Atlantic | | 94.4% | 4: 4th quartile | | 96.6% |
| 6: East South Central | | 96.8% | **% Households in Poverty**[3][a] | (C_PCT_HH_POV) | |
| 7: West South Central | | 97.7% | 1: 1st quartile | | 96.6% |
| 8: Mountain | | 96.9% | 2: 2nd quartile | | 95.9% |
| 9: Pacific | | 95.3% | 3: 3rd quartile | | 97.0% |
| **Census Metro/Micro Area Designation (2013)**[2] | | | 4: 4th quartile | | 95.0% |
| | (S_METMICRO) | | **% Households Reporting Public Assistance**[3][a] | | |
| 1: Metropolitan area | | 95.8% | | (C_PCT_HH_PUBASST) | |
| 2: Micropolitan area | | 97.5% | 1: 1st quartile | | 95.6% |
| 3: Non-metro | | 97.9% | 2: 2nd quartile | | 96.8% |
| **Health Maintenance Organization Beneficiary**[1] | | | 3: 3rd quartile | | 96.2% |
| | (HMOTYPE) | | 4: 4th quartile | | 96.1% |
| 0: Yes | | 95.6% | **% Households Reporting Retirement Income**[3][a] | | |
| 9: No | | 96.4% | | (C_PCT_HH_RETIREINC) | |
| **Age First Enrolled in Medicare**[1] | (MEDIC_BEG) | | 1: 1st quartile | | 95.8% |
| 1: Prior to age 65 | | 95.2% | 2: 2nd quartile | | 95.5% |
| 2: At or after age 65 | | 96.3% | 3: 3rd quartile | | 96.3% |
| **Race/ethnicity**[4][a] | (RL1DRACEHISP_R) | | 4: 4th quartile | | 96.8% |
| 1: White, non-Hispanic | | 96.6% | **% Households Reporting Social Security**[3] | | |
| 2: Black, non-Hispanic | | 96.0% | | (C_PCT_HH_SOCSEC) | |
| 3: Other, non-Hispanic | | 92.9% | 1: 1st quartile | | 94.9% |
| 4: Hispanic | | 94.2% | 2: 2nd quartile | | 95.6% |
| 5: DK/RF | | 84.5% | 3: 3rd quartile | | 95.8% |
| **Highest Education (R1)**[4] | (EL1HIGSTSCHL_R) | | 4: 4th quartile | | 97.5% |
| 0: Not applicable | | 97.6% | **% Households Reporting SSI**[3][a] | (C_PCT_HH_SSS) | |
| 1: DK/RF | | 86.7% | 1: 1st quartile | | 95.6% |
| 2: Below high school | | 94.7% | 2: 2nd quartile | | 97.0% |
| 3: High school | | 96.8% | 3: 3rd quartile | | 95.1% |
| 4: Above High school | | 96.5% | 4: 4th quartile | | 96.7% |

| Variable & Values | | Weighted Response Rate | Variable & Values | | Weighted Response Rate |
|---|---|---|---|---|---|
| **COUNTY LEVEL INDICATORS** | | | **TRACT-LEVEL INDICATORS (Quartiles)** | | |
| **% Black 65+ (deciles)[2][a]** | (PCTBLK) | | **% Households Owning Their Home[3][a]** | | |
| 0: 1st decile | | 98.2% | | (C_PCT_OWNHOME) | |
| 1: 2nd decile | | 97.7% | 1: 1st quartile | | 94.4% |
| 2: 3rd decile | | 97.9% | 2: 2nd quartile | | 96.3% |
| 3: 4th decile | | 95.6% | 3: 3rd quartile | | 96.7% |
| 4: 5th decile | | 95.1% | 4: 4th quartile | | 96.5% |
| 5: 6th decile | | 95.2% | **% Households 65+ Owning Their Home[3][a]** | | |
| 6: 7th decile | | 95.5% | | (C_PCT_OWNHOME_65) | |
| 7: 8th decile | | 94.0% | 1: 1st quartile | | 94.6% |
| 8: 9th decile | | 95.9% | 2: 2nd quartile | | 95.7% |
| 9: 10th decile | | 95.6% | 3: 3rd quartile | | 96.3% |
| **% Hispanic 65+ (deciles)[2][a][c]** | (PCTHISP) | | 4: 4th quartile | | 97.5% |
| 0: 1st decile | | 96.5% | **% Households 65+ Below Poverty[3][a]** | | |
| 1: 2nd decile | | 96.2% | | (C_PCT_POV_65) | |
| 2: 3rd decile | | 98.2% | 1: 1st quartile | | 96.2% |
| 3: 4th decile | | 96.4% | 2: 2nd quartile | | 96.0% |
| 4: 5th decile | | 96.9% | 3: 3rd quartile | | 95.6% |
| 5: 6th decile | | 94.6% | 4: 4th quartile | | 96.9% |
| 6: 7th decile | | 97.1% | **Per Capita Income[3]** | (C_PER_CAP_INC) | |
| 7: 8th decile | | 96.3% | 1: 1st quartile | | 95.0% |
| 8: 9th decile | | 93.6% | 2: 2nd quartile | | 96.6% |
| 9: 10th decile | | 95.7% | 3: 3rd quartile | | 96.1% |
| **% Poverty (deciles)[2][a]** | (PCTPOV) | | 4: 4th quartile | | 96.5% |
| 0: 1st decile | | 97.7% | | | |
| 1: 2nd decile | | 95.1% | **OTHER INDICATORS** | | |
| 2: 3rd decile | | 95.0% | **R7 Residential Care Status[4]** | (R7DRESID) | |
| 3: 4th decile | | 97.7% | 1: R7 Community | | 96.0% |
| 4: 5th decile | | 94.3% | 2: R7 Residential Care Resident not nursing home (SP interview complete) | | 98.3% |
| 5: 6th decile | | 97.1% | 3: R7 Residential Care Resident not nursing home (FQ only) | | 98.7% |
| 6: 7th decile | | 95.9% | | | |
| 7: 8th decile | | 95.4% | 4: R7 nursing home (SP interview complete) | | 100.0% |
| 8: 9th decile | | 97.5% | 5: R7 nursing home (FQ only) | | 85.4% |
| 9: 10th decile | | 96.3% | 7: R1-R6 Residential Care Resident not nursing home (FQ only) | | 95.9% |
| | | | 8: R1- R6 nursing home | | 100.0% |

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

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

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

[4]Based on responses to items in the Rounds 1 and 6 interviews.

a=retained in classification tree analysis for living SP non-nursing home branch

b=retained in classification tree analysis for living SP nursing home branch

c=retained in classification tree analysis for deceased SP branch

N=2,951 (2,845 respondents and 106 non-respondents)

Variable names used in classification trees shown parenthetically.

**Appendix Table 3. Sampled Person Interview Response Rates Among Cases with Completed Facility Questionnaires, by Various Indicators: NHATS Round 8 2015 Cohort**

| Variable & Values | | Weighted Response Rate | Variable & Values | | Weighted Response Rate |
|---|---|---|---|---|---|
| OVERALL | | 77.2% | COUNTY LEVEL INDICATORS | | |
| BENEFICIARY INDICATORS | | | % Black 65+ (deciles)[2] | (PCTBLK) | |
| Age[1] | (H_AGECAT_R5) | | 0: 1st decile | | 75.9% |
| 1: 65-69 | | 97.2% | 1: 2nd decile | | 75.6% |
| 2: 70-74 | | 79.1% | 2: 3rd decile | | 74.8% |
| 3: 75-79 | | 76.9% | 3: 4th decile | | 78.7% |
| 4: 80-84 | | 72.5% | 4: 5th decile | | 87.3% |
| 5: 85- 89 | | 78.6% | 5: 6th decile | | 66.1% |
| 6: 90+ | | 73.6% | 6: 7th decile | | 83.4% |
| R5 Race Ethnicity[8] | (RL5DRACEHISP_R) | | 7: 8th decile | | 69.3% |
| 1: White, non-Hispanic | | 81.2% | 8: 9th decile | | 81.8% |
| 2: Black, non-Hispanic | | 76.6% | 9: 10th decile | | 82.2% |
| 3: Other, non-Hispanic | | 68.9% | % Hispanic 65+ (deciles)[2] | (PCTHISP) | |
| 4: Hispanic | | 61.0% | 0: 1st decile | | 82.0% |
| 5: DK/RF | | 32.3% | 1: 2nd decile | | 86.5% |
| Gender[1] | (H_SEX) | | 2: 3rd decile | | 73.0% |
| 1: Male | | 77.6% | 3: 4th decile | | 78.6% |
| 2: Female | | 77.0% | 4: 5th decile | | 80.9% |
| Census Region[1][o] | (S_REGION) | | 5: 6th decile | | 76.3% |
| 1: Northeast | | 72.0% | 6: 7th decile | | 63.2% |
| 2: Midwest | | 73.9% | 7: 8th decile | | 78.9% |
| 3: South | | 82.5% | 8: 9th decile | | 69.7% |
| 4: West | | 77.6% | 9: 10th decile | | 84.1% |
| Census Division[1] | (DIVISION) | | % Poverty (deciles)[2] | (PCTPOV) | |
| 1: New England | | 64.0% | 0: 1st decile | | 63.6% |
| 2: Middle Atlantic | | 75.9% | 1: 2nd decile | | 72.0% |
| 3: East North Central | | 74.3% | 2: 3rd decile | | 83.8% |
| 4: West North Central | | 73.5% | 3: 4th decile | | 72.3% |
| 5: South Atlantic | | 77.5% | 4: 5th decile | | 79.4% |
| 6: East South Central | | 89.9% | 5: 6th decile | | 88.1% |
| 7: West South Central | | 91.0% | 6: 7th decile | | 70.8% |
| 8: Mountain | | 89.9% | 7: 8th decile | | 88.9% |
| 9: Pacific | | 74.8% | 8: 9th decile | | 77.2% |
| Census Metro/Micro Area Designation (2013) [1] (S_METMICRO) | | | 9: 10th decile | | 86.2% |
| 1: Metropolitan area | | 77.6% | OTHER INDICATORS | | |
| 2: Micropolitan area | | 68.6% | Facility Type Indicator[3] | (FQ8DLOCSP) | |
| 3: Non-metro | | 81.8% | 1: Independent living/other | | 78.8% |
| Health Maintenance Organization Beneficiary[1] (HMOTYPE) | | | 2: Assisted Living | | 78.1% |
| | | | 3: Special care/memory care/Alzheimers unit | | 84.2% |
| 0: Yes | | 75.6% | 4: Nursing home | | 70.2% |
| 9: No | | 77.8% | 8: Not Reported | | 100.0% |
| Age First Enrolled in Medicare[1] | (MEDIC_BEG) | | R1 Residential Care Status[4][#][o] | (R1DRESID_R) | |
| 1: Prior to age 65 | | 75.0% | 1: Community | | 85.2% |
| 2: At or after age 65 | | 77.4% | 2: Residential Care Resident not nursing home | | 57.4% |
| | | | R2 Residential Care Status[5][#] | (R2DRESID_R) | |
| | | | 1: Community in R2 | | 84.9% |
| | | | 2: Residential care in R2 | | 63.4% |
| | | | 3: Nursing home in R2 | | 57.3% |

| Variable & Values | | Weighted Response Rate | Variable & Values | | Weighted Response Rate |
|---|---|---|---|---|---|
| **OTHER INDICATORS** | | | **R3 Residential Care Status[6] #** | (R3DRESID_R) | |
| **R2 Nursing Home Status[5] #** | (R2NH) | | 1: Community in R3 | | 86.9% |
| 1: Yes | | 57.3% | 2: Residential care in R3 | | 66.0% |
| 2: No | | 77.8% | 3: Nursing home in R3 | | 38.5% |
| **R3 Nursing Home Status[6] #** | (R3NH) | | **R4 Residential Care Status[7] #** | (R4DRESID_R) | |
| 1: Yes | | 38.5% | 1: Community in R4 | | 87.6% |
| 2: No | | 79.5% | 2: Residential care in R4 | | 69.4% |
| **R4 Nursing Home Status[7] #** | (R4NH) | | 3: Nursing home in R4 | | 51.1% |
| 1: Yes | | 51.1% | **R5 Residential Care Status[8] r** | (R5DRESID_R) | |
| 2: No | | 79.7% | 1: Community in R5 | | 89.9% |
| **R5 Nursing Home Status[8]** | (R5NH) | | 2: Residential care in R5 | | 66.2% |
| 1: Yes | | 52.3% | 3: Nursing home in R5 | | 52.3% |
| 2: No | | 78.2% | **R6 Residential Care Status[9]** | (R6DRESID_R) | |
| **R6 Nursing Home Status[9]** | (R6NH) | | 1: Community in R6 | | 91.9% |
| 1: Yes | | 57.8% | 2: Residential care in R6 | | 69.5% |
| 2: No | | 79.0% | 3: Nursing home in R6 | | 57.8% |
| **R7 Nursing Home Status[10]** | (R7NH) | | **R7 Residential Care Status[10]** | (R7DRESID_R) | |
| 1: Yes | | 69.8% | 1: Community in R7 | | 91.2% |
| 2: No | | 78.6% | 2: Residential care in R7 | | 75.3% |
| **R8: Nursing Home Status[11] o** | (R8NH) | | 3: Nursing home in R7 | | 69.8% |
| 1: Yes | | 71.9% | **R8 Residential Care Status[11]** | (R8DRESID_R) | |
| 2: No | | 78.9% | 2: Residential care in R8 | | 78.9% |
| | | | 3: Nursing home in R8 | | 71.9% |

[1]Based 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.

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

[3]Based on the responses to two items on the type of facility from the FQ, FQ6 (fq6facdescri; including answers from FQ6A) and FQ10 (fq6faaretype).

[4]Based on responses to items in the Round 1 interview or interview process.

[5]Based on responses to items in the Round 2 interview or interview process.

[6]Based on responses to items in the Round 3 interview or interview process.

[7]Based on responses to items in the Round 4 interview or interview process.

[8]Based on responses to items in the Round 5 interview or interview process.

[9]Based on responses to items in the Round 6 interview or interview process.

[10]Based on responses to items in the Round 7 interview or interview process.

[11]Based on responses to items in the Round 8 interview or interview process.

#Response rates were computed only for the available original sample.

^ Response rates were computed only for the available replenishment sample.

o=retained in classification tree analysis for adjustment of missing SP interview of the original sample.

r=retained in classification tree analysis for adjustment of missing SP interview of the replenishment sample.

N=488 (376 respondents and 112 nonrespondents); Variable names used in classification trees shown parenthetically.

**Appendix Table 4. Sampled Person Interview Response Rates Among Cases with Completed Facility Questionnaires, by Various Indicators:  NHATS Round 8 2011 Cohort**

| Variable & Values | Weighted Response Rate | Variable & Values | Weighted Response Rate |
|---|---|---|---|
| OVERALL | 78.1% | COUNTY LEVEL INDICATORS | |
| BENEFICIARY INDICATORS | | % Black 65+ (deciles)[2]  (PCTBLK) | |
| Age[1]  (H_AGECAT) | | 0: 1st decile | 75.5% |
| 1: 65-69 | 72.5% | 1: 2nd decile | 89.8% |
| 2: 70-74 | 84.6% | 2: 3rd decile | 79.7% |
| 3: 75-79 | 85.5% | 3: 4th decile | 74.9% |
| 4: 80-84 | 73.9% | 4: 5th decile | 88.8% |
| 5: 85- 89 | 71.4% | 5: 6th decile | 53.8% |
| 6: 90+ | 75.3% | 6: 7th decile | 85.4% |
| R1 Race Ethnicity[4]  (RL1DRACEHISP_R) | | 7: 8th decile | 78.9% |
| 1: White, non-Hispanic | 80.8% | 8: 9th decile | 75.8% |
| 2: Black, non-Hispanic | 75.5% | 9: 10th decile | 88.7% |
| 3: Other, non-Hispanic | 62.9% | % Hispanic 65+ (deciles)[2]  (PCTHISP) | |
| 4: Hispanic | 34.0% | 0: 1st decile | 86.3% |
| 5: DK/RF | 0.0% | 1: 2nd decile | 82.9% |
| Gender[1]  (H_SEX) | | 2: 3rd decile | 83.7% |
| 1: Male | 78.0% | 3: 4th decile | 87.2% |
| 2: Female | 78.1% | 4: 5th decile | 84.1% |
| Census Region[1]  (S_REGION) | | 5: 6th decile | 71.7% |
| 1: Northeast | 63.0% | 6: 7th decile | 52.9% |
| 2: Midwest | 79.9% | 7: 8th decile | 76.2% |
| 3: South | 83.7% | 8: 9th decile | 74.0% |
| 4: West | 83.2% | 9: 10th decile | 98.8% |
| Census Division[1]  (DIVISION) | | % Poverty (deciles)[2]  (POVERTY_PCT) | |
| 1: New England | 67.3% | 0: 1st decile | 56.8% |
| 2: Middle Atlantic | 61.4% | 1: 2nd decile | 72.9% |
| 3: East North Central | 76.7% | 2: 3rd decile | 86.2% |
| 4: West North Central | 83.0% | 3: 4th decile | 83.5% |
| 5: South Atlantic | 80.0% | 4: 5th decile | 75.4% |
| 6: East South Central | 84.3% | 5: 6th decile | 89.9% |
| 7: West South Central | 93.1% | 6: 7th decile | 74.8% |
| 8: Mountain | 88.7% | 7: 8th decile | 93.1% |
| 9: Pacific | 82.0% | 8: 9th decile | 86.0% |
| Census Metro/Micro Area Designation (2013)[2]  (S_METMICRO) | | 9: 10th decile | 84.2% |
| 1: Metropolitan area | 78.8% | OTHER INDICATORS | |
| 2: Micropolitan area | 61.9% | Facility Type Indicator[3]  (FQ8DLOCSP) | |
| 3: Non-metro | 85.2% | 1: Independent living/other | 80.4% |
| Health Maintenance Organization Beneficiary[1]  (HMOTYPE) | | 2: Assisted Living | 83.0% |
| | | 3: Special care/memory care/Alzheimer's unit | 74.0% |
| 0: Yes | 79.6% | 4: Nursing home | 69.4% |
| 9: No | 77.6% | R1 Residential Care Status[4] *  (R1DRESID_R) | |
| Age First Enrolled in Medicare[1]  (MEDIC_BEG) | | 1: Community | 86.3% |
| 1: Prior to age 65 | 76.8% | 2: Residential Care Resident not nursing home | 57.2% |
| 2: At or after age 65 | 78.3% | R2 Residential Care Status[5]  (R2DRESID_R) | |
| | | 1: Community in R2 | 86.1% |
| OTHER INDICATORS | | 2: Residential care in R2 | 63.4% |
| R2 Nursing Home Status[5]  (R2NH) | | 3: Nursing home in R2 | 57.5% |
| 1: Yes | 57.5% | R3 Residential Care Status[6]  (R3DRESID_R) | |
| 2: No | 78.6% | 1: Community in R3 | 88.1% |
| R3 Nursing Home Status[6]  (R3NH) | | 2: Residential care in R3 | 66.2% |
| 1: Yes | 36.8% | 3: Nursing home in R3 | 36.8% |
| 2: No | 80.3% | | |

| Variable & Values | | Weighted Response Rate | Variable & Values | | Weighted Response Rate |
|---|---|---|---|---|---|
| **R4 Nursing Home Status[7]** | (R4NH) | | **R4 Residential Care Status[7]** | (R4DRESID_R) | |
| 1: Yes | | 50.8% | 1: Community in R4 | | 88.7% |
| 2: No | | 80.6% | 2: Residential care in R4 | | 69.8% |
| **R5 Nursing Home Status[8]** | (R5NH) | | 3: Nursing home in R4 | | 50.8% |
| 1: Yes | | 51.9% | **R5 Residential Care Status[8]** | (R5DRESID_R) | |
| 2: No | | 80.8% | 1: Community in R5 | | 90.9% |
| **R6 Nursing Home Status[9]** | (R6NH) | | 2: Residential care in R5 | | 70.9% |
| 1: Yes | | 63.0% | 3: Nursing home in R5 | | 51.9% |
| 2: No | | 80.4% | **R6 Residential Care Status[9] \*** | (R6DRESID_R) | |
| **R7 Nursing Home Status[10]** | (R7NH) | | 1: Community in R6 | | 93.9% |
| 1: Yes | | 71.2% | 2: Residential care in R6 | | 71.2% |
| 2: No | | 80.0% | 3: Nursing home in R6 | | 63.0% |
| **R8 Nursing Home Status[11] \*** | (R8NH) | | **R7 Residential Care Status[10]** | (R7DRESID_R) | |
| 1: Yes | | 70.2% | 1: Community in R7 | | 94.6% |
| 2: No | | 80.9% | 2: Residential care in R7 | | 76.3% |
| | | | 3: Nursing home in R7 | | 71.2% |
| | | | **R8 Residential Care Status[11]** | (R8DRESID_R) | |
| | | | 2: Residential care in R8 | | 80.9% |
| | | | 3: Nursing home in R8 | | 70.2% |

[1] Based on Information on the September 30, 2010 CMS 20% Health Insurance Skeleton Eligibility Write-Off (HISKEW) file.
[2] Based on county-level information from the September 30, 2014 CMS 5% EDB extract linked to the beneficiary's EDB address.
[3] Based on the responses to two items on the type of facility from the FQ, FQ6 (fq6facdescri; including answers from FQ6A) and FQ10 (fq6faaretype).
[4] Based on responses to items in the Round 1 interview or interview process.
[5] Based on responses to items in the Round 2 interview or interview process.
[6] Based on responses to items in the Round 3 interview or interview process.
[7] Based on responses to items in the Round 4 interview or interview process.
[8] Based on responses to items in the Round 5 interview or interview process.
[9] Based on responses to items in the Round 6 interview or interview process.
[10] Based on responses to items in the Round 7 interview or interview process.
[11] Based on responses to items in the Round 8 interview or interview process.

\*=retained in classification tree analysis for adjustment of missing SP interview.
N=302 (233 respondents and 69 nonrespondents); Variable names used in classification trees shown parenthetically.

**Figure 1. Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – non nursing home cases in original sample**

OVERALL
RR = 96.12
n = 2,501

PCTBLK in (3,4,5,6,7,8,9)
RR = 95.19
n = 1,651

PCTBLK in (0,1,2)
RR = 97.90
n = 850

C_PCT_OWNHOME_65=4
RR = 97.24
n = 396

C_PCT_OWNHOME_65 in (1,2,3)
RR = 94.44
n = 1,255

DIVISION in (1,2,5,6)
RR = 100.00
n = 165

DIVISION in (3,4,7,8,9)
RR = 97.36
n = 685

PCTHISP in (7,8,9)
RR = 100.00
n = 100

PCTHISP in (0,1,2,3,4,5,6)
RR = 96.17
n = 296

DIVISION in (4,5,9)
RR = 92.63
n = 605

DIVISION in (1,2,3,6,7,8)
RR = 96.10
n = 650

C_PCT_HH_POV=4
RR = 100.00
n = 91

C_PCT_HH_POV in (1,2,3)
RR = 96.96
n = 594

C_MED_HH_INC in (3,4)
RR = 94.28
n = 183

C_MED_HH_INC in (1,2)
RR = 100.00
n = 113

C_PCT_HH_65 in (2,3,4)
RR = 94.28
n = 493

C_PCT_HH_65=1
RR = 85.83
n = 112

R7DRESID in (2,3,7,8)
RR = 100.00
n = 68

R7DRESID=1
RR = 95.74
n = 582

H_SEX=2
RR = 95.72
n = 330

H_SEX=1
RR = 98.47
n = 264

C_PCT_POV_65 in (2,3,4)
RR = 92.15
n = 116

C_PCT_POV_65=1
RR = 98.40
n = 67

C_PCT_OWNHOME in (3,4)
RR = 89.47
n = 176

C_PCT_OWNHOME in (1,2)
RR = 97.58
n = 317

C_PCT_HH_RETIREINC in (2,3,4)
RR = 80.04
n = 58

C_PCT_HH_RETIREINC=1
RR = 92.89
n = 54

H_SEX=2
RR = 86.71
n = 55

H_SEX=1
RR = 97.08
n = 61

PCTHISP in (7,8,9)
RR = 83.26
n = 62

PCTHISP in (0,1,2,3,4,5,6)
RR = 93.64
n = 114

RL5DRACEHISP_R in (1,3,5)
RR = 99.57
n = 171

RL5DRACEHISP_R in (2,4)
RR = 93.59
n = 146

C_MED_HH_INC in (2,3,4)
RR = 96.79
n = 376

C_MED_HH_INC=1
RR = 92.76
n = 206

C_PCT_OWNHOME=4
RR = 98.57
n = 105

C_PCT_OWNHOME in (1,2,3)
RR = 94.47
n = 225

C_PCT_OWNHOME_65=3
RR = 96.58
n = 65

C_PCT_OWNHOME_65 in (1,2)
RR = 89.65
n = 49

DIVISION in (1,3,7)
RR = 99.60
n = 177

DIVISION in (2,6,8)
RR = 94.70
n = 199

H_SEX=1
RR = 100.00
n = 78

H_SEX=2
RR = 88.15
n = 128

C_MED_HH_INC in (3,4)
RR = 91.65
n = 108

C_MED_HH_INC in (1,2)
RR = 97.38
n = 117

PCTHISP in (4,6,7,8,9)
RR = 97.10
n = 121

PCTHISP in (0,1,2,3)
RR = 90.65
n = 78

S_REGION=3
RR = 92.59
n = 71

S_REGION in (1,2,4)
RR = 83.34
n = 57

C_AGG_HH_INC=4
RR = 95.37
n = 62

C_AGG_HH_INC in (1,2,3)
RR = 86.64
n = 46

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

**Figure 2. Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – nursing home cases in original sample**

```
                    ┌─────────────────┐
                    │    OVERALL      │
                    │  RR = 95.95     │
                    │   n = 113       │
                    └─────────────────┘
                  ┌──────────┴──────────┐
        ┌───────────────────┐  ┌───────────────────┐
        │ PCTBLK in (6,7,8,9)│  │PCTBLK in (0,1,2,3,4,5)│
        │   RR = 92.81       │  │   RR = 98.20       │
        │    n = 48          │  │    n = 65          │
        └───────────────────┘  └───────────────────┘
```
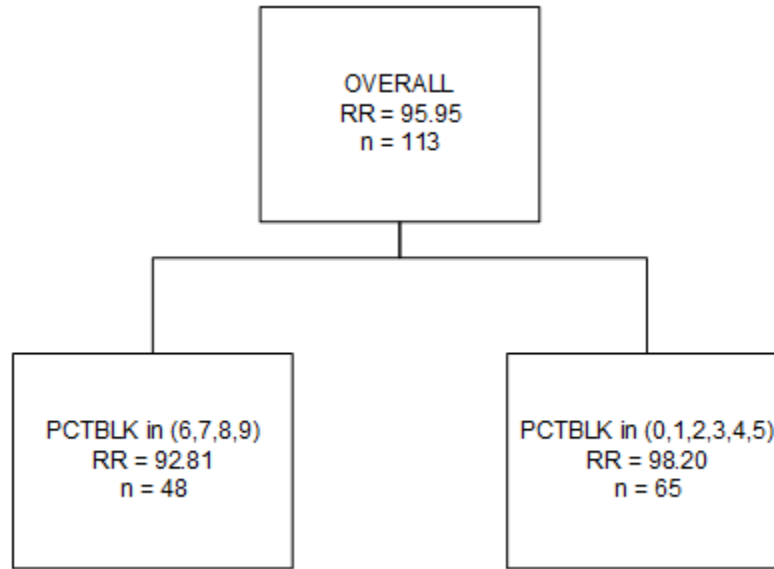
Note: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell

**Figure 3.  Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – deceased cases in original sample**



```
                    ┌─────────────────┐
                    │    OVERALL      │
                    │   RR = 98.01    │
                    │    n = 231      │
                    └────────┬────────┘
              ┌──────────────┴──────────────┐
    ┌─────────────────────┐      ┌─────────────────────┐
    │ EL1HIGSTSCHL_R in    │      │ EL1HIGSTSCHL_R in    │
    │       (3,4)          │      │      (0,1,2)         │
    │   RR = 100.00        │      │   RR = 94.44         │
    │    n = 147           │      │    n = 84            │
    └─────────────────────┘      └─────────────────────┘
```

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

**Figure 4. Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – non nursing home cases in replenishment sample**

OVERALL
RR = 93.10
n = 2,452

DIVISION in (1,2,8)
RR = 96.79
n = 460

DIVISION in (3,4,5,6,7,9)
RR = 92.14
n = 1,992

C_PCT_HH_SOCSEC=4
RR = 92.52
n = 136

C_PCT_HH_SOCSEC in (1,2,3)
RR = 98.60
n = 324

RL5DRACEHISP_R in (1,2,4)
RR = 92.87
n = 1,881

RL5DRACEHISP_R in (3,5)
RR = 83.14
n = 111

C_PCT_HH_PUBASST in (3,4)
RR = 87.37
n = 56

C_PCT_HH_PUBASST in (1,2)
RR = 96.38
n = 80

PCTPOV=9
RR = 87.07
n = 192

PCTPOV in (0,1,2,3,4,5,6,7,8)
RR = 93.40
n = 1,689

DIVISION in (3,4,5,6)
RR = 74.39
n = 49

DIVISION in (7,9)
RR = 90.41
n = 62

C_PCT_HH_RETIREINC=4
RR = 71.73
n = 43

C_PCT_HH_RETIREINC in (1,2,3)
RR = 91.55
n = 149

C_PCT_HH_65 in (3,4)
RR = 95.10
n = 970

C_PCT_HH_65 in (1,2)
RR = 91.22
n = 719

C_PCT_OWNHOME in (3,4)
RR = 97.91
n = 57

C_PCT_OWNHOME in (1,2)
RR = 85.44
n = 92

C_PCT_OWNHOME_65=4
RR = 93.26
n = 312

C_PCT_OWNHOME_65 in (1,2,3)
RR = 96.08
n = 658

H_SEX=2
RR = 93.50
n = 427

H_SEX=1
RR = 88.12
n = 292

C_PCT_HH_POV in (3,4)
RR = 89.07
n = 94

C_PCT_HH_POV in (1,2)
RR = 94.77
n = 218

PCTBLK in (5,6,7,8,9)
RR = 93.62
n = 293

PCTBLK in (0,1,2,3,4)
RR = 97.94
n = 365

DIVISION in (3,5,9)
RR = 90.76
n = 270

DIVISION in (4,6,7)
RR = 98.24
n = 157

PCTBLK in (6,7,8,9)
RR = 93.09
n = 155

PCTBLK in (0,1,2,3,4,5)
RR = 83.47
n = 137

DIVISION in (4,7)
RR = 90.80
n = 54

DIVISION in (3,5,6,9)
RR = 96.23
n = 164

C_AGG_HH_INC in (3,4)
RR = 96.23
n = 154

C_AGG_HH_INC in (1,2)
RR = 89.16
n = 139

H_AGECAT_R5 in (2,3,4,5,6)
RR = 96.62
n = 251

H_AGECAT_R5=1
RR = 99.44
n = 114

C_PCT_HH_SSS=4
RR = 98.13
n = 66

C_PCT_HH_SSS in (1,2,3)
RR = 89.11
n = 204

PCTHISP in (5,6,7,8,9)
RR = 98.87
n = 68

PCTHISP in (0,1,2,3,4)
RR = 87.38
n = 87

PCTBLK in (4,5)
RR = 68.39
n = 38

PCTBLK in (0,1,2,3)
RR = 91.54
n = 99

EL5HIGSTSCHL_R in (3,4)
RR = 85.38
n = 87

EL5HIGSTSCHL_R in (0,2)
RR = 97.92
n = 52

C_AGG_HH_INC in (3,4,9)
RR = 92.26
n = 157

C_AGG_HH_INC in (1,2)
RR = 79.06
n = 47

DIVISION in (3,7)
RR = 100.00
n = 54

DIVISION in (4,5,9)
RR = 83.95
n = 45

C_MED_HH_INC_65 in (4,9)
RR = 86.88
n = 53

C_MED_HH_INC_65 in (1,2,3)
RR = 95.74
n = 104

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

**Figure 5.  Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – nursing home cases in replenishment sample**

```
┌─────────────────────┐
│                     │
│      OVERALL        │
│    RR = 93.83       │
│      n=84           │
│                     │
└─────────────────────┘
```

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

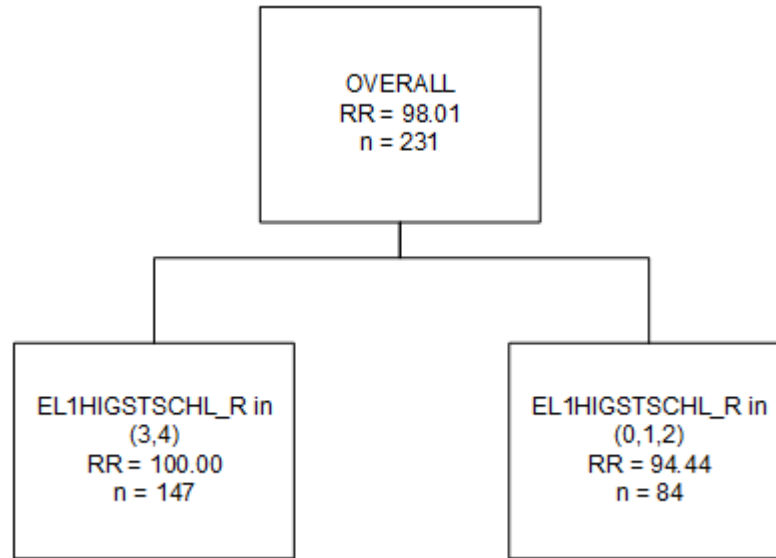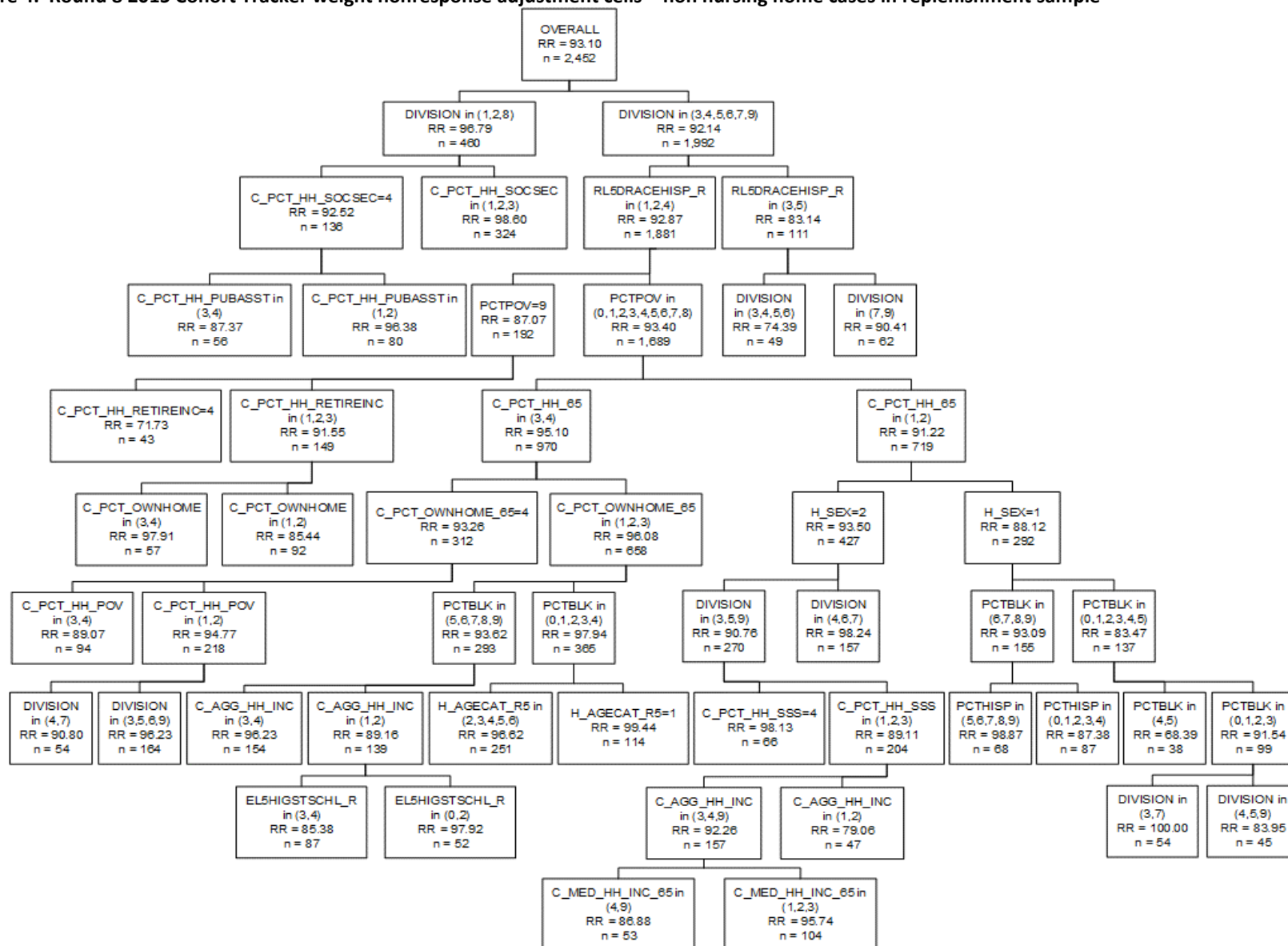**Figure 6. Round 8 2015 Cohort Tracker weight nonresponse adjustment cells – deceased cases in replenishment sample**



```
                    ┌─────────────────┐
                    │     OVERALL     │
                    │   RR = 92.19    │
                    │    n = 166      │
                    └────────┬────────┘
              ┌──────────────┴──────────────┐
   ┌──────────────────────┐      ┌──────────────────────┐
   │ DIVISION in (2,3,5,6) │      │ DIVISION in (1,4,7,8,9)│
   │     RR = 86.40        │      │     RR = 99.56        │
   │      n = 91           │      │      n = 75           │
   └──────────┬───────────┘      └──────────────────────┘
       ┌──────┴──────────────────┐
┌──────────────────┐      ┌──────────────────┐
│ EL5HIGSTSCHL_R in │      │ EL5HIGSTSCHL_R in │
│      (3,4)        │      │      (0,1,2)      │
│    RR = 85.98     │      │    RR = 86.98     │
│     n = 44        │      │     n = 47        │
└──────────────────┘      └──────────────────┘
```
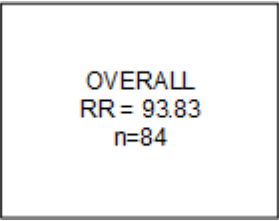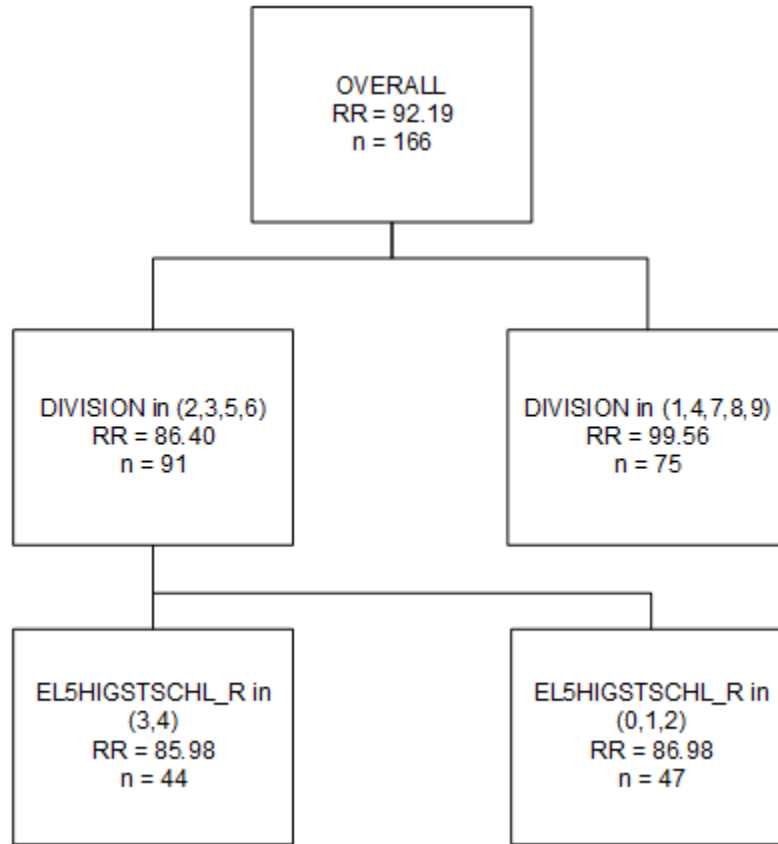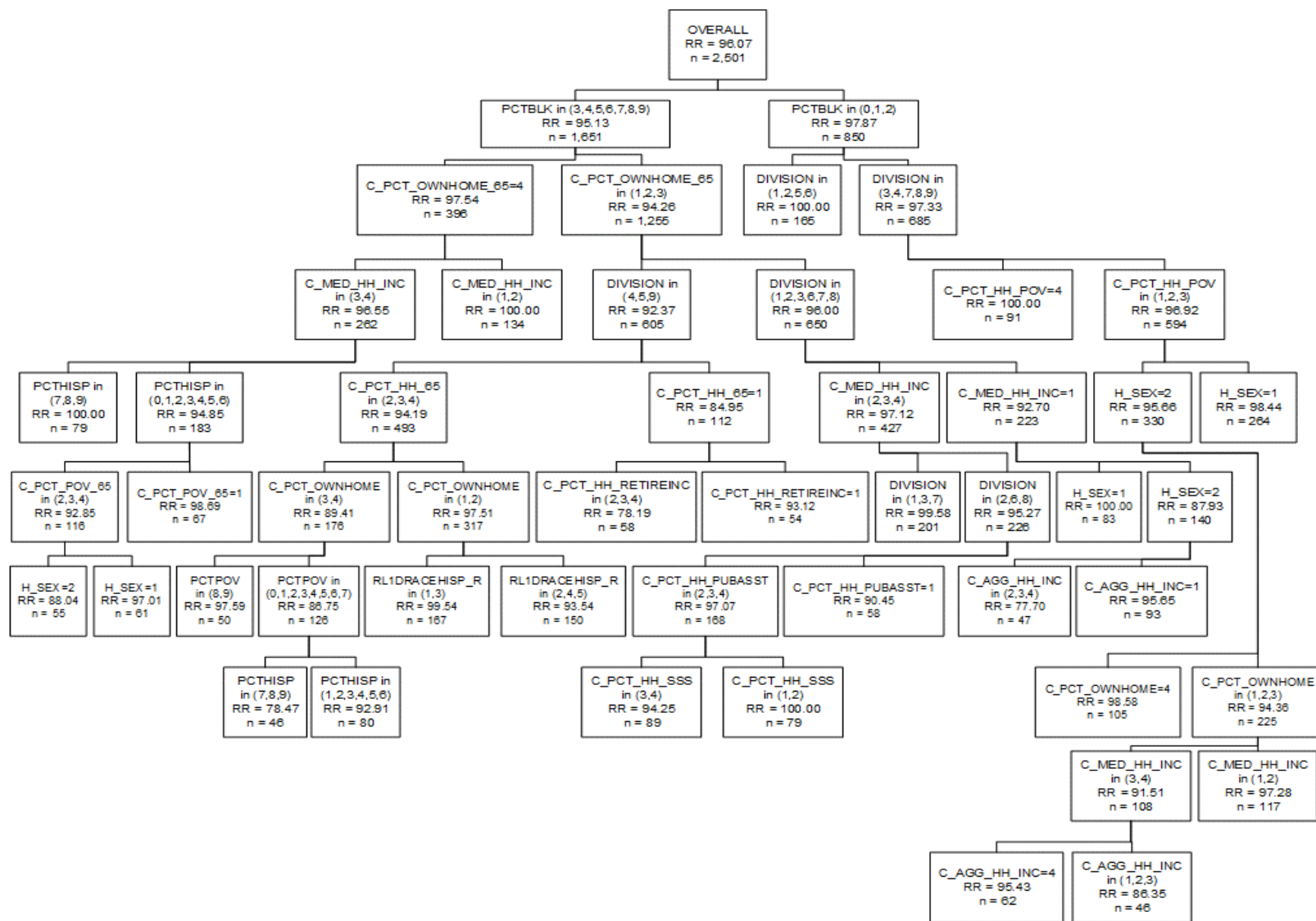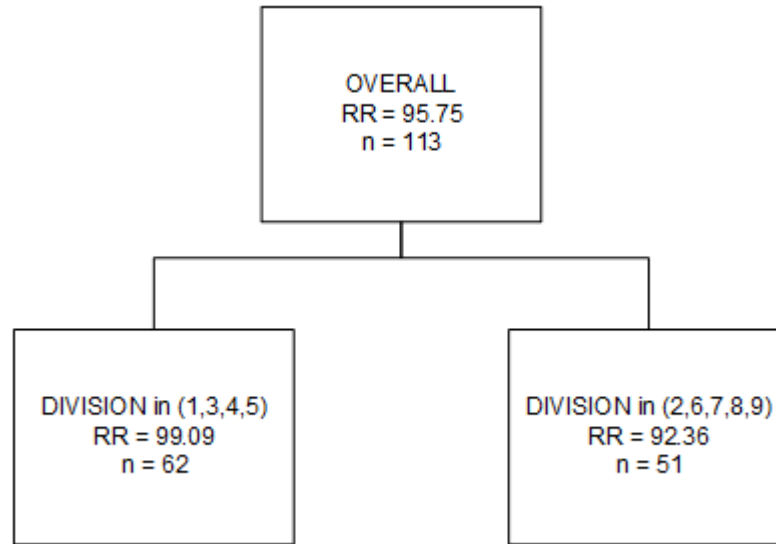
Note: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell

28

**Figure 7. Round 8 2011 Cohort Tracker weight nonresponse adjustment cells – non nursing home cases in original sample**

OVERALL
RR = 96.07
n = 2,501

PCTBLK in (3,4,5,6,7,8,9)
RR = 95.13
n = 1,651

PCTBLK in (0,1,2)
RR = 97.87
n = 850

C_PCT_OWNHOME_65=4
RR = 97.54
n = 396

C_PCT_OWNHOME_65
in (1,2,3)
RR = 94.26
n = 1,255

DIVISION in
(1,2,5,6)
RR = 100.00
n = 165

DIVISION in
(3,4,7,8,9)
RR = 97.33
n = 685

C_MED_HH_INC
in (3,4)
RR = 96.55
n = 262

C_MED_HH_INC
in (1,2)
RR = 100.00
n = 134

DIVISION in
(4,5,9)
RR = 92.37
n = 605

DIVISION in
(1,2,3,6,7,8)
RR = 96.00
n = 650

C_PCT_HH_POV=4
RR = 100.00
n = 91

C_PCT_HH_POV
in (1,2,3)
RR = 96.92
n = 594

PCTHISP in
(7,8,9)
RR = 100.00
n = 79

PCTHISP in
(0,1,2,3,4,5,6)
RR = 94.85
n = 183

C_PCT_HH_65
in (2,3,4)
RR = 94.19
n = 493

C_PCT_HH_65=1
RR = 84.95
n = 112

C_MED_HH_INC
in (2,3,4)
RR = 97.12
n = 427

C_MED_HH_INC=1
RR = 92.70
n = 223

H_SEX=2
RR = 95.66
n = 330

H_SEX=1
RR = 98.44
n = 264

C_PCT_POV_65
in (2,3,4)
RR = 92.85
n = 116

C_PCT_POV_65=1
RR = 98.69
n = 67

C_PCT_OWNHOME
in (3,4)
RR = 89.41
n = 176

C_PCT_OWNHOME
in (1,2)
RR = 97.51
n = 317

C_PCT_HH_RETIREINC
in (2,3,4)
RR = 78.19
n = 58

C_PCT_HH_RETIREINC=1
RR = 93.12
n = 54

DIVISION
in (1,3,7)
RR = 99.58
n = 201

DIVISION
in (2,6,8)
RR = 95.27
n = 226

H_SEX=1
RR = 100.00
n = 83

H_SEX=2
RR = 87.93
n = 140

H_SEX=2
RR = 88.04
n = 55

H_SEX=1
RR = 97.01
n = 61

PCTPOV
in (8,9)
RR = 97.59
n = 50

PCTPOV in
(0,1,2,3,4,5,6,7)
RR = 86.75
n = 126

RL1DRACEHISP_R
in (1,3)
RR = 99.54
n = 167

RL1DRACEHISP_R
in (2,4,5)
RR = 93.54
n = 150

C_PCT_HH_PUBASST
in (2,3,4)
RR = 97.07
n = 168

C_PCT_HH_PUBASST=1
RR = 90.45
n = 58

C_AGG_HH_INC
in (2,3,4)
RR = 77.70
n = 47

C_AGG_HH_INC=1
RR = 95.65
n = 93

PCTHISP
in (7,8,9)
RR = 78.47
n = 46

PCTHISP in
(1,2,3,4,5,6)
RR = 92.91
n = 80

C_PCT_HH_SSS
in (3,4)
RR = 94.25
n = 89

C_PCT_HH_SSS
in (1,2)
RR = 100.00
n = 79

C_PCT_OWNHOME=4
RR = 98.58
n = 105

C_PCT_OWNHOME
in (1,2,3)
RR = 94.36
n = 225

C_MED_HH_INC
in (3,4)
RR = 91.51
n = 108

C_MED_HH_INC
in (1,2)
RR = 97.28
n = 117

C_AGG_HH_INC=4
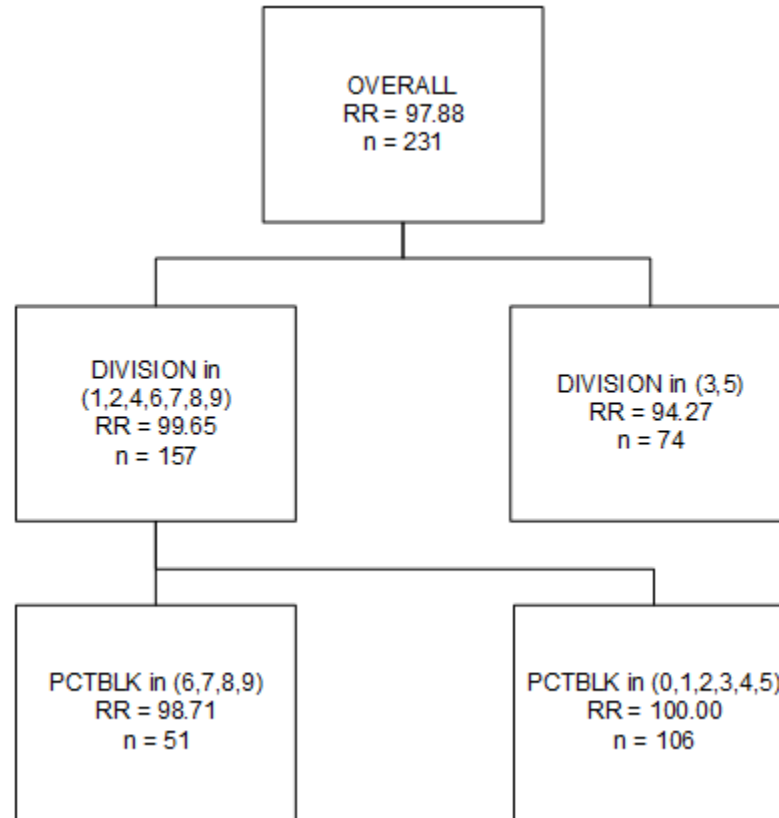RR = 95.43
n = 62

C_AGG_HH_INC
in (1,2,3)
RR = 86.35
n = 46

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

**Figure 8. Round 8 2011 Cohort Tracker weight nonresponse adjustment cells – nursing home cases in original sample**
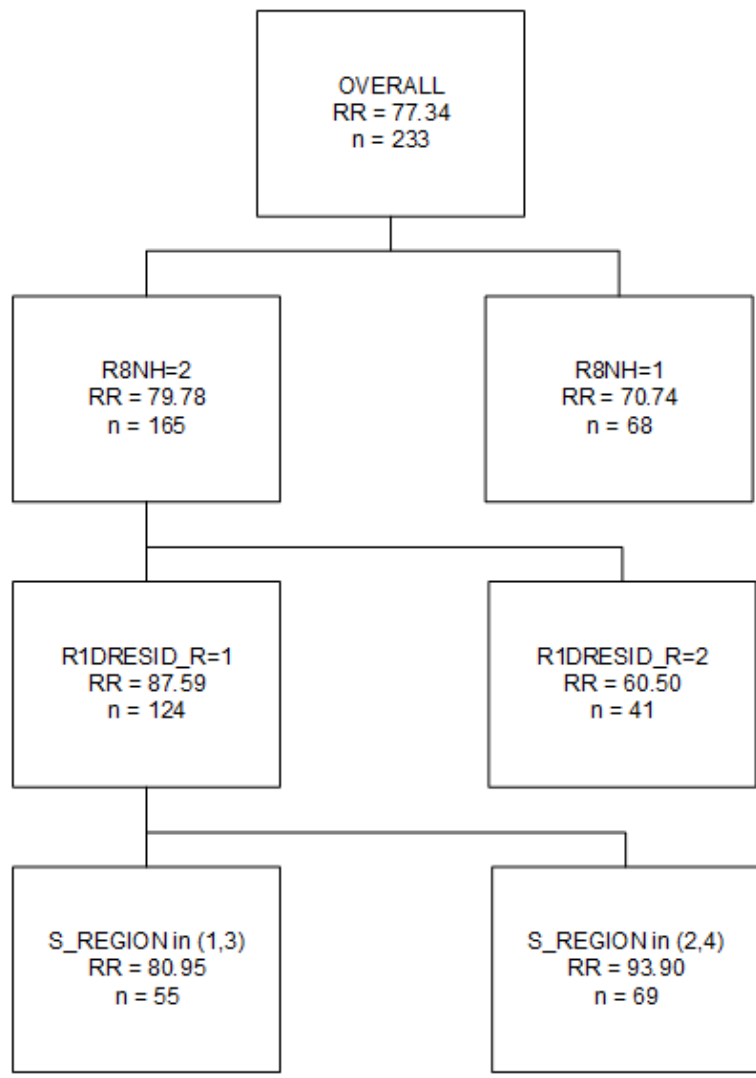
Note: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell

**Figure 9. Round 8 2011 Cohort Tracker weight nonresponse adjustment cells – deceased cases in original sample**



Note: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell
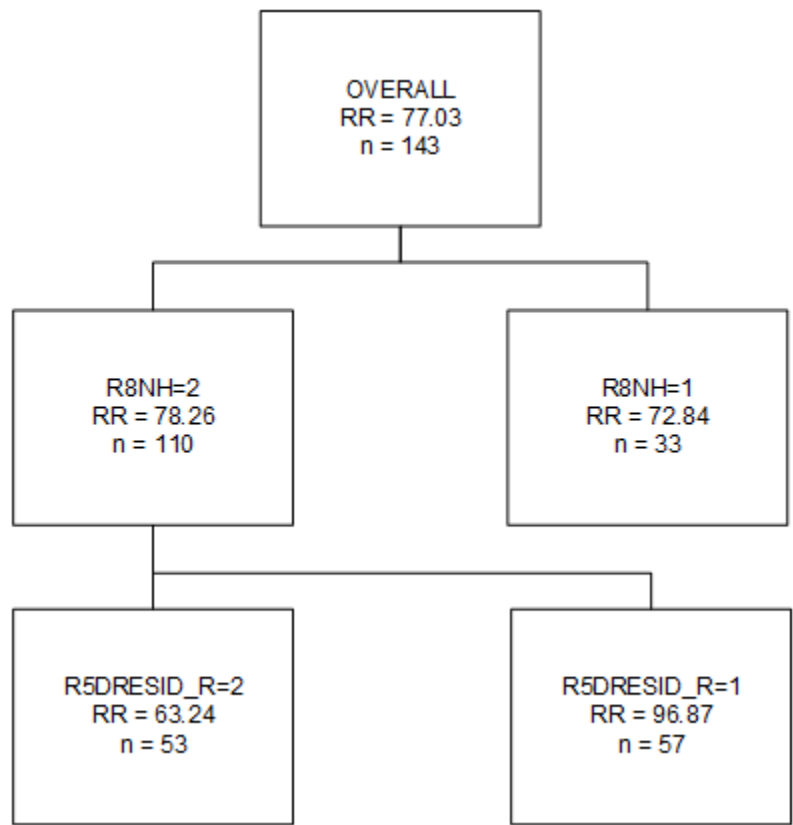
**Figure 10. Round 8 2015 Cohort Analytic weight nonresponse adjustment cells – original sample residential care (not nursing home) and nursing home cases with both an SP and FQ interview**

Note: "RR" is the weighted response rate for the particular cell, and "n" is the number of respondents in the cell
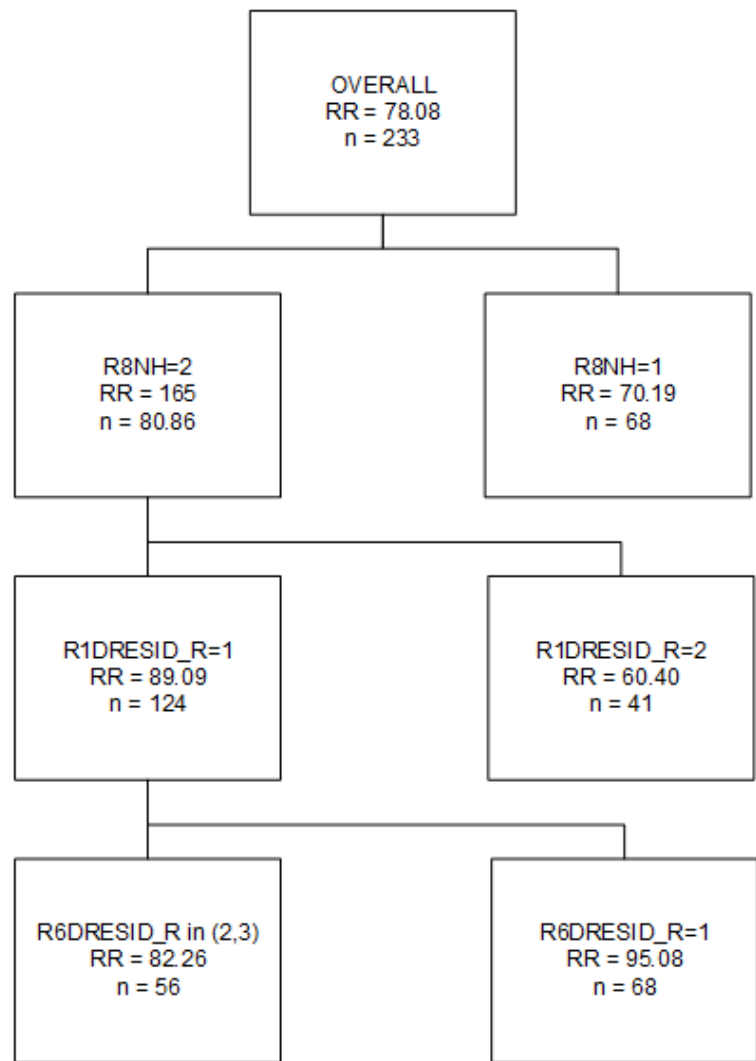
**Figure 11.** Round 8 2015 Cohort Analytic weight nonresponse adjustment cells – replenishment sample residential care (not nursing home) and nursing home cases with both an SP and FQ interview

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

**Figure 12. Round 8 2011 Cohort Analytic weight nonresponse adjustment cells –original sample residential care (not nursing home) and nursing home cases with both an SP and FQ interview**

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