



**Analyses in
Support of
Rebasing &
Updating the
Medicare Home
Health Payment
Rates – CY 2014
Home Health
Prospective
Payment System
Final Rule**

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1. Introduction and Overview

Payment rates under Medicare’s home health prospective payment system (HH PPS) were originally set based on analysis of the most recent home health agency (HHA) cost and service utilization data available at the time the HH PPS was implemented (2000). While the rates have been adjusted for market basket increases since 2000 (as reflected in the Home Health payment update percentage), the payment rates have not been updated using more recent cost report or utilization data. The Patient Protection and Affordable Care Act of 2010 (PPACA) requires Medicare to rebase home health payment rates beginning in 2014, phasing in any adjustments in equal increments over a four (4) year period:

SEC. 3131. PAYMENT ADJUSTMENTS FOR HOME HEALTH CARE.

(a) REBASING HOME HEALTH PROSPECTIVE PAYMENT AMOUNT.—

(1) IN GENERAL.—Section 1895(b)(3)(A) of the Social Security Act (42 U.S.C. 1395fff(b)(3)(A)) is amended—

(A) in clause (i)(III), by striking “For periods” and inserting “Subject to clause (iii), for periods”; and
(B) by adding at the end the following new clause:

“(iii) ADJUSTMENT FOR 2013 AND SUBSEQUENT YEARS.—

“(I) IN GENERAL.—Subject to subclause (II), for 2013 and subsequent years, the amount (or amounts) that would otherwise be applicable under clause (i)(III) shall be adjusted by a percentage determined appropriate by the Secretary to reflect such factors as changes in the number of visits in an episode, the mix of services in an episode, the level of intensity of services in an episode, the average cost of providing care per episode, and other factors that the Secretary considers to be relevant. In conducting the analysis under the preceding sentence, the Secretary may consider differences between hospital-based and freestanding agencies, between for-profit and nonprofit agencies, and between the resource costs of urban and rural agencies. Such adjustment shall be made before the update under subparagraph (B) is applied for the year.

“(II) TRANSITION.—The Secretary shall provide for a 4-year phase-in (in equal increments) of the adjustment under subclause (I), with such adjustment being fully implemented for 2016. During each year of such phase-in, the amount of any adjustment under subclause (I) for the year may not exceed 3.5 percent of the amount (or amounts) applicable under clause (i)(III) as of the date of enactment of the Patient Protection and Affordable Care Act.”

Abt Associates Inc. has been supporting the Centers for Medicare & Medicaid Services’ (CMS) fulfillment of this mandate by constructing data files and conducting a variety of data analyses examining the cost, volume, and intensity of Medicare home health services. These analyses are intended to support rebasing of the national, standardized 60-day episode payment rate, the national per-visit payment amounts, and the Non-Routine Medical Supplies (NRS) conversion factor. We have also conducted additional data analyses in support of updating the LUPA add-on payments, using the most recent available claims to provide data on episode and visit characteristics, and using national per-visit payment amounts that reflect a rebasing adjustment.

This document describes the data files used and the analytic files created to estimate average cost per visit, and provides the analyses and the resultant summary statistics that CMS used to begin the rebasing process. Section 2 describes data acquisition and processing needed to create the analytic files used in the analyses. Section 3 presents the methodology for estimating the cost per visit for home health providers in 2011 using the analytic files. Section 4 describes results from cost report audits conducted by Cahaba Safeguard Administrators under contract to CMS to assess accuracy of cost report data in the trimmed sample. Section 5 describes the rebasing of the NRS conversion factor, and Section 6 describes the updating of the Low Utilization Payment Adjustment (LUPA) add-on payment amount using the national per-visit payment amounts that reflect a rebasing adjustment and claims data.

2. Data

Our analyses relied on two major data sources: Medicare cost report data for Fiscal Years (FY) 2000-2011, and data on service utilization from Medicare home health claims for 2008-2012. Claims data samples are described further below. We complemented these data with HHA characteristics from the Provider of Services (POS) file.

2.1 Claims Data

The majority of the rebasing analyses utilized cost report data. However, for select analyses we also used data on home health service utilization from Medicare home health claims. These data were used in the cost report file trimming process (section 2.2.2), to weight the trimmed cost reports for national representativeness (sections 3.1 and 4.2), to identify the distribution of home health episodes with and without NRS charges (information which is not available from the cost reports; section 5.2), and to calculate the average minutes of visit length in order to update the LUPA add-on amount using national per-visit amounts that reflect a rebasing adjustment (section 6.2).

2.1.1 Data Acquisition

For our analyses which used claims data from 2010 and earlier, we used the CMS Datalink file. The Datalink file was prepared for CMS by Fu Associates (Fairfax, VA) and was made available to Abt staff at the CMS Data Center. For our rebasing analyses, which used data from the 2011 cost reports, we used final action 2011 and 2012 claims data from the home health Standard Analytic Files (SAF) produced by CMS. The SAF files were obtained through the Data Extract System (DESY) utility at the CMS Data Center. In all cases, we obtained and processed 100% of the data available (rather than a statistical sample). For our analyses of visit length and NRS billing, we used claims data from 2012.

For rebasing, we initially obtained calendar year (CY) 2011 HHA claims processed as of March 31, 2012; we later updated the data with the final SAF file for CY 2011 (claims processed as of June 30, 2012). Similarly, we examined preliminary data for CY 2012 (claims processed as of December 31, 2012) for the CY 2014 HH PPS proposed rule (78 FR 40284) and have updated these using the full year of CY2012 claims (processed through June 30, 2013) for the CY 2014 HH PPS final rule. For the analyses of NRS utilization and visit lengths for the LUPA add-on analyses, we examined full years of both CY 2011 and CY 2012 claims data in the final analyses.

2.1.2 Processing

For the analyses using the Datalink file, little additional processing was needed. For the 2011 and 2012 data files, we read them into SAS, processed any adjustments, and dropped any duplicates or Requests for Anticipated Payment (RAPs). The episode-level variables needed for the analysis were extracted and the SAS data file was downloaded to the Abt secure server. In addition, visit-level variables needed for the analysis were extracted from the revenue center trailers and downloaded as a separate visit-level file, with selected episode-level variables merged onto the records for visits from those episodes.

In preparing analytic files based on Datalink or on SAF data, a set of data cleaning exclusions were applied to the episode-level file, which resulted in the exclusion of: episodes with no covered visits; episodes with no visit minute data available; and episodes with zero or negative payments.

OASIS data. For the purposes of other analyses conducted under the project, information on patient characteristics from the Outcome and Assessment Information Set (OASIS) assessment was linked to the service utilization data on the episode claim. The assessment data are electronically submitted by home

health agencies to state repositories which feed a central CMS repository. In constructing the Datalink file, Fu Associates obtains the OASIS assessment data from the CMS repository and links the claim for each episode with the OASIS assessment conducted at its start which supplied the information used to classify the episode into a Home Health Resource Group (HHRG) for payment. In constructing our data files for 2011 and 2012, Abt staff obtained 100% of the OASIS assessments submitted December 2010 through January 2013 from the CMS repository and merged them with our 2011 and 2012 episodes using an algorithm developed to be analogous to that used for constructing the Datalink file (utilizing all available patient identifiers as well as dates and other relevant variables from both the OASIS assessment and the claim). While the OASIS variables were not actually used in any of the rebasing analyses, in order to maintain consistency of samples across the project analyses (and the ability to be able to classify all episodes into case-mix groups), a small fraction of the episodes were dropped from the analysis files because an appropriate OASIS assessment was not available.¹

2.2 Cost Report Data

Cost report data employed in our analyses are drawn from Fiscal Year (FY) 2000-2012 cost reports from freestanding and hospital-based HHAs. These data are used to provide a representation of the average costs of visits provided by HHAs in the six Medicare home health disciplines (skilled nursing, physical therapy, occupational therapy, speech-language pathology, medical social services, and home health aide services).

2.2.1 Data Acquisition

Cost report data are publicly available at <http://www.cms.gov/Research-Statistics-Data-and-Systems/Files-for-Order/CostReports/Cost-Reports-by-Fiscal-Year.html>. The twelve years of cost reports used in our analyses were acquired through download at that site or provided to Abt Associates by CMS. Specifically, FY 2000-2012 cost reports for freestanding providers were provided by CMS. Cost reports from hospital-based providers were downloaded from the CMS website, except for FY 2011, which was also received from CMS. Prior to the final analyses FY 2000-2011 freestanding and hospital cost reports were combined to create one dataset (N = 98,812 cost reports). FY 2012 cost reports were incomplete and used for sensitivity analyses described below in section 4.5.

2.2.2 Processing

When setting the payment rates in 2000, CMS used 567 audited cost reports from FY 1997 (64 FR 58189). Since the Medicare home health cost reports available for the rebasing analyses were not audited, the quality of the cost report data was evaluated. We began by reviewing the data to assess the presence of data problems and extreme values. Trimming the sample of HHA cost reports used for statistical analysis is an approach used by MedPAC², CMS Office of the Actuary, and others. A complete, “untrimmed” set of cost reports includes data representing extreme values of costs, visits, or episodes. Extreme-value cost reports are often markedly different from the usual experiences of the same provider over time, or from the majority of HHAs during the same FY. In addition, these extreme values substantially influence the commonly-used descriptive measures of costs and services, such as the mean. As a result, descriptive measures of the untrimmed sample do not accurately represent the “average” HHA costs and service experience.

¹ For example, approximately 2.5% of CY2012 episodes were dropped for this reason.

² MedPAC. (2005). Report to the Congress: Home Health Agency Case Mix and Financial Performance.

We reviewed the trimming methods used in the past, and selected those to be replicated in our analyses through ongoing consultation with CMS staff. We also developed the additional trimming approaches described below. We used both longitudinal and cross-sectional information from the cost reports to generate trimmed annual cost report samples for FY 2000-2011.

Longitudinal Data Exclusions

Prior to applying any exclusions, the aggregated dataset, including freestanding and hospital-based cost reports from all years, was sorted in ascending order by provider number and fiscal year.³

We used information from providers over time as references for identifying inconsistencies in the number of episodes provided as recorded on the cost reports by looking for extreme year-to-year changes by providers. We looked at the sum of both *normal episodes*, for which providers received the standard case-mix adjusted episode payments, and of *outlier episodes*, for which providers received additional payments for beneficiaries incurring unusually large costs. We considered counts of both episode types when making our longitudinal extreme-value exclusions.⁴

A necessary condition for comparing the count of normal and outlier episodes across reports was for each cost report to contain information on the number of episodes. Thus, cost reports were eliminated from the dataset if information on the number of episodes provided was missing. The exclusion eliminated 18,020 cost reports from the FY 2000-2011 dataset due to missing episode information. However, a majority of these reports (12,065) also failed to report total costs or payments—an exclusion restriction applied later in the process—and would additionally have been excluded on that basis.

Because longitudinal cost report exclusion restrictions require tracking providers over time, cost reports missing provider numbers (n=5) and providers contributing only one cost report during the first eleven FYs (FY 2000-2010) (n=527) were eliminated before processing. However, providers in the last year of the sample (FY 2011) with no other cost reports in previous years were presumed to be new providers and remain in the sample. Table 1 shows the number of cost reports excluded in each year due to the multi-year requirement.

The next step in the data trimming process identified providers with extreme increases over time in the count of normal and outlier episodes on the submitted cost reports. Specifically, the trimming methodology made restrictions to exclude cost reports with large increases in the number of Medicare-payer normal and outlier episodes reported by the same provider from report to report. The trim excluded a cost report if the sum of normal and outlier episodes increased from the previous cost report by: 1) more than a factor of ten, and the new report counted more than 1,000 episodes, or 2) more than a factor of five, and the new report counted 5,000 or more episodes. After applying these exclusions, the data were again sorted and the process repeated for two additional iterations. The three iterations resulted in the exclusion of 777, 275, and 141 cost reports, respectively. The top panel of Table 1 shows the number of cost reports excluded at each step, and that 79,455 cost reports remained in the sample at this stage.

³ Note that some providers have multiple cost reports in the same fiscal year. For this reason, the sorting was done in Stata/MP 12.1 (64-bit) using the *stable* option to maintain the same sorting order. However, the sorting order depends on the original sorting of the dataset and may not be replicable.

⁴ Payment for some episodes included a partial episode payment (PEP) adjustment, applied, for example, when a beneficiary receiving home care enrolls in a Medicare Advantage plan, transfers to a different HHA before the end of the episode, or was discharged with goals of the plan of care met, but was readmitted to the same HHA within the 60-day episode; in these cases, the payment for the initial partial episode is proportionally adjusted downward to account for the shorter episode length. Similarly, for episodes including four or fewer visits, a LUPA adjustment is applied to pay by the visit rather than the 60-day episode. However, we do not consider LUPA or PEP episodes in applying longitudinal restrictions.

To check the performance of the longitudinal exclusions, we matched FY 2008-2011 cost reports that were excluded due to an extreme year-to-year increase in episode counts to each provider's claims data for the same time period. Comparing the two sources of information for each FY revealed that the episode counts on the excluded cost reports differed from the number of episodes found in the claims, by factors ranging from 21 to 50 on average. Appendix A provides detailed information on the cost-report-to-claims comparison of the cost reports excluded due to an extreme year-to-year increase in episode counts.

Cross-Sectional Data Exclusions

The remaining exclusion restrictions used to trim the data compare cost reports to other cost reports in the same FY and eliminate problematic or extreme-value reports. Ten individual cross-sectional exclusion restrictions were applied simultaneously for cost reports within each FY. Specifically, cost reports were excluded if:

1. Time covered by the cost report was less than 10 or greater than 14 months.
2. The cost report was missing total payment or total cost information.
3. Reported costs per episode were in the highest or lowest 1% across all cost reports in the same FY.
4. The cost report had negative total costs.
5. The cost report had negative average cost per visit in any discipline, calculated from reported costs and visits reported on the cost report.
6. The cost report had a negative value for the number of visits per episode in any discipline, calculated as visits divided by episodes.
7. The cost report showed an unreasonably high visit count (greater than 500,000,000) in any discipline.
8. The cost report was missing costs (visits) information where there was information on visits (costs).
9. The cost report was not settled.⁵
10. The provider was an extremely low-volume provider (fewer than 10 Medicare non-LUPA episodes).

Table 1 shows the summary of *all* exclusions made for the 2000-2011 years of cost reports. Because the cross-sectional restrictions were made simultaneously, a cost report appears separately in the count for each restriction violated; that is, if a cost report included fewer than 10 months and also was missing payment or cost information, it would appear separately in the counts for both exclusion restriction categories. Therefore the total number of violations does not sum to the total number of cost reports excluded.

⁵ This restriction was made for freestanding provider cost reports; the restriction would have eliminated too many hospital-based cost reports to provide a representative sample.

Comparison to MedPAC trimming methodology. The cross-sectional exclusion restrictions include several restrictions previously used by MedPAC.⁶ First, the time period covered must be no less than 10 and no greater than 14 months. Second, the exclusion of cost reports with missing total costs, payments, or episodes (in our longitudinal restrictions) was also used by MedPAC. Finally, MedPAC excluded providers with average cost per episode less than \$100 or more than \$10,000 on the FY 2002 cost reports; as we were working across multiple years in nominal dollars, we chose to exclude the highest and lowest 1% in each year of cost reports with respect to cost per episode.

We did not follow MedPAC in excluding extreme payment-to-cost ratios or excluding the highest and lowest 5% of cost reports according to margins.⁷ We did, however, identify extreme value cost reports in other ways. Specifically, we excluded cost reports with negative or missing values (where negative or missing values were not expected) and cost reports with implausible values (i.e. greater than 500,000,000 visits). Also, we excluded cost reports with fewer than 10 non-LUPA episodes, as well as freestanding cost reports that had not been settled.

⁶ MedPAC. *ibid.*

⁷ Extreme payment-to-cost ratios were defined as cost reports where the log of the ratio of payments-to-costs were greater (or less) than the 90th (10th) percentile plus (minus) 1.5 times the interdecile range between the 90th and 10th percentiles.

Table 1: Number of Cost Reports Violating Longitudinal and Cross-Sectional Exclusion Restrictions

Fiscal Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	All Years
Untrimmed Sample Size	6,068	6,009	6,105	6,443	7,468	8,012	8,724	9,126	9,584	10,489	10,457	10,327	98,812
Longitudinal Restrictions (LRs)													
Missing Provider Number	1	0	0	0	3	0	0	0	1	0	0	0	5
One year in sample	379	31	14	8	8	8	9	7	8	23	32	0	527
Missing Episode Count	1,916	768	726	779	825	915	1,185	1,971	2,003	2,189	2,395	2,348	18,020
Significant Episode Increase	0	58	42	22	19	28	52	149	109	95	111	92	777
2 nd Iteration	0	1	22	13	9	2	9	18	66	41	40	54	275
3 rd Iteration	0	0	0	15	6	7	0	8	13	46	21	25	141
Number Excluded	1,994	844	796	833	864	954	1,251	2,149	2,198	2,381	2,574	2,519	19,357
Sample Size after LRs	4,074	5,165	5,309	5,610	6,604	7,058	7,473	6,977	7,386	8,108	7,883	7,808	79,455
Cross-Sectional Restrictions													
Not Settled (Freestanding only)	531	272	190	401	33	64	35	9	37	123	868	874	3,437
<10 or >14 Months in Report	125	418	456	512	537	579	637	361	362	339	230	210	4,766
Missing Payments or Costs	19	14	4	7	6	5	3	20	24	33	23	11	169
Top and Bottom 1% of Costs/Episode	99	115	110	121	136	144	150	142	149	165	159	163	1,653
Greater than 500,000,000 visits	0	0	0	0	0	0	11	3	1	0	0	0	15
Negative cost per visit	5	8	11	8	2	6	5	5	4	2	3	5	64
Negative visits per episode	0	1	0	0	2	0	1	1	0	0	0	0	5
Negative total costs	0	0	0	0	0	1	0	0	0	0	0	0	1
Less than ten episodes	348	97	88	75	76	82	128	103	161	153	61	60	1,432
Missing visits (costs) when costs (visits) are reported	358	530	556	557	629	608	623	482	453	489	364	375	6,024
Number Excluded	1,264	1,251	1,229	1,470	1,236	1,321	1,391	971	999	1,177	1,564	1,556	15,429
Trimmed Sample Size	2,810	3,914	4,080	4,140	5,368	5,737	6,082	6,006	6,387	6,931	6,319	6,252	64,026

Table 1 displays the number of cost reports violating the longitudinal (top panel) and cross-sectional (bottom panel) exclusion restrictions. Note that cost reports may fail to meet multiple exclusion criteria; therefore, the sum of violations does not match the number excluded.

2.3 Provider of Services File

As described in greater detail below, our average cost estimates for FY 2011 incorporate weighting methodology that depends, in part, on provider type (freestanding non-profit, freestanding for-profit, freestanding government, or facility-based provider) and urban/rural status. Data on provider type and urban/rural status for each provider in our sample were obtained from the Provider of Services (POS) file.

The POS file is an extract created from the CMS Quality Improvement Evaluation System (QIES) database. These data are collected through the CMS Regional Offices as part of the survey and certification process. The file contains an individual record for each Medicare-certified provider and is updated quarterly.

2.3.1 Data Acquisition

For the preparation of our data files, we obtained the POS extract that was current as of December 31, 2012. The extract provided data on 12,436 currently active providers as well as 11,054 providers who were terminated by that date, (but who might have been active and included in one or both of our years of interest.) The file was obtained through the CMS Data Center.

2.3.2 Processing

The POS extract file was read into a SAS dataset. Little additional processing was needed.

2.3.3 Matching to Claims and Cost Report Data

Provider type variables (profit/nonprofit/government status and whether the facility was freestanding or facility-based) were defined using the provider facility type and provider control type variables listed in the POS. Urban/rural status was also assigned using the POS; if the provider was located in a core-based statistical area (CBSA) in the POS it was coded as “urban”; other providers were considered to be rural. These designations were used in place of the status reported on the cost report.

One provider number from the cost report sample did not appear in the POS file. The cost report indicated that this provider was located within a CBSA and we coded it as “urban.” There were also four providers who did not have urban/rural status listed on the POS. We found that two of these providers were located in CBSAs and coded them as “urban” providers. The other two providers, based on their provider numbers, were located in the Northern Mariana Islands and were coded as “rural.”

3. Cost Report Audits

To provide some perspective on the accuracy of the information in the trimmed sample of cost reports, CMS initiated an audit of 100 cost reports from FY 2010. The purpose of the audit was, first, to examine the accuracy, and thus usefulness, of cost reports and, second, to identify trends in reporting inaccuracies, should they exist. To that end, we selected a sample of cost reports that were deemed accurate based on trimming and used audits to test whether the reports were indeed accurate. This provided information regarding our ability to identify accurate cost reports without audit, and the types and frequency of the misreports which occurred in these cost reports.

3.1 Audit Sample Selection

To select a sample of cost reports believed to be accurate, we selected cost reports which had not only passed the trimming methodology described above, but had met further restrictions. Specifically, the pool of cost reports eligible for audit included those FY 2010 cost reports that had passed the trimming methodology above (N = 6,319), and for which the ratio of outlier payments to revenue did not exceed 10%, following the 10% outlier cap in force for CY 2010 (N = 6,057).

The cost reports were then validated using the claims data. However, due to timing and availability of cost reports, this validation exercise was conducted using CY 2009 claims and cost reports matching the same time period. Specifically, we identified cost reports where the fiscal year aligned with the calendar year of claims (Jan. 1, 2009 to Dec. 31, 2009) and compared the average number of visits per episode for non-LUPA non-PEP episodes as calculated on the cost report and from the claims. We then deleted the 1% of cost reports with the greatest overcount of visits per episode on the cost report, relative to the claims, and the 1% of cost reports with the greatest undercount of visits per episode on the cost report, relative to the claims. We included a provider's cost reports for FY 2010 in the eligible audit sample if the provider's FY 2009 cost report covered CY 2009 and reflected average visits per episode that were consistent with data from its CY 2009 claims.

Therefore, the final sampling frame of FY 2010 cost reports included only reports for those providers who:

- (1) submitted cost reports in FY 2009 and FY 2010;
- (2) reported at least 95 episodes during the cost reporting period;
- (3) passed the trimming methodology restrictions in both FY 2009 and FY 2010;
- (4) did not have a ratio of outlier payments to revenue that exceeded 10% in either FY 2009 or FY 2010; and
- (5) passed the final restriction comparing visits per episode from FY 2009 cost reports with visits per episode from CY 2009 claims.

The final sampling frame consisted of 3,834 cost reports from FY 2010.

To obtain an audit sample that was representative of the population of cost reports, we used a stratified sampling approach to ensure selection of a cross-section of cost reports representing a variety of provider types (4 types: non-profit freestanding, for-profit freestanding, government-owned freestanding, and hospital-based) and provider sizes (4 size ranges: 95 to 249 episodes, 250 to 499 episodes, 500 to 999 episodes and 1,000 or more episodes). In all, there were therefore 16 type-size strata from which we drew the audit sample.

Typical stratified sampling methodology suggests that an efficient sample is drawn with a sample proportional to the distribution of the population over the strata. In our context, this would draw samples proportional to the number of providers or episodes within each stratum in order to gain representativeness. This traditional methodology makes the assumption that the variance in outcomes within a stratum is equal across all strata—the variance of outcomes in stratum i is the same as the variance of outcomes in stratum j . We, however, have additional information from the cost reports to update this assumption, specifically an estimate of the variance in cost per visit within each stratum at the provider level. Neyman (1934)⁸ showed that one can minimize the sampling variances if the sample is drawn proportionate to the contribution of a stratum to the variance of the mean rather than proportionate to the size of the population. To do this, one must have an estimate of the variance of the outcome in each cell and the weight of that cell in contribution to the mean. The Neyman allocation requires that we know the weight of each stratum, W_c , and the standard deviation of the outcome within the stratum, S_c . With this information the sample size selected for a cell is:

$$n_c = n \frac{W_c S_c}{\sum_{c=1}^C W_c S_c}$$

where n_c and n are the sample size of the stratum and total sample, respectively.

The Neyman method is applicable when appropriate estimates of the weights and the standard deviations are available. We used the weights according to episodes and the standard deviation of the costs per skilled nursing visits across providers to proxy for this information. Episodes have a high correlation with the number of visits for each discipline in each stratum. We have chosen to use the standard deviation for skilled nursing costs because they are reported for all providers, unlike other disciplines such as speech pathology, and consistently follow a pattern of declining variance moving from strata for smaller episode providers to higher episode providers. This pattern is often, though not always, shared among the other disciplines.

An additional benefit of this method is that it will return the same sampling patterns if the standard deviations change proportionally across strata. In particular, if there is reporting error in the cost reports such that the strata standard deviations are inflated by 10%, the result of the sampling strategy remains the same as long as this change is a shift by a common factor across strata. Therefore, to use this method we must assume that reporting error shifts the standard deviations in cells by a common factor. Without additional information, which is the sort of information that we will want to gather from the audit, alternatives to this assumption are subjective.

Following the Neyman methodology, we planned to audit 100 cost reports across provider ownership type and episode counts as displayed in Table 2.

The cost report sample was stratified and the appropriate number of cost reports was randomly selected within each stratum to complete the sample of 100 cost reports.

⁸ Neyman, J. (1934), “On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection,” *Journal of the Royal Statistical Society, Ser. A*, 97, 558-606.

Table 2: Sample Size for Strata, FY 2010 Audit Sample

		Number of Episodes				All Sizes
		95 to 249	250 to 499	500 to 999	1000 or More	
Provider Type	Non Profit	1	1	2	12	16
	For Profit	4	11*	16	37*	68
	Government	1	1	1	1	4
	Hospital	1	1	2	8	12
	All types	7	14	21	58	100

Table 2 displays the number of cost reports in the provider-type/episode-group strata designated for the audit sample.

*Two for-profit providers, one each from the 250-499 episodes and 1,000 episodes or more strata, were excluded from the final sample due to insufficient documentation required to complete the audit.

To allow for replacement cost reports in the event that an initially-selected cost report would not be appropriate for auditing, we oversampled the strata. Replacement cost reports were needed for 27 audit selections: 10 initially-selected cost reports came from providers with open investigations by the Center for Program Integrity, and reports were not received from the Medicare Administrative Contractor in time to request documentation and complete an audit for 17 cost reports. Finally, from the 100 cost reports in the final audit sample (including the 27 replacement reports), two cost reports from for-profit providers (one each from the 250-499 episodes and 1,000 episodes or more strata) had insufficient documentation for audit completion, and are therefore not included in the audit results reported below.

3.2 Weighting Methodology

As described above, the audit sample was not selected to exactly mimic the same distribution of visits that was used to weight our average cost per visit statistics. As such, we constructed and applied analytic weights to allow comparability between the audit results and our average cost per visit estimates.

To appropriately describe the average cost per visit over all visits, the weighted cost per visit averages should be calculated such that each *visit* receives an equal weight in the average. This means that providers with a higher (lower) number of visits receive more (less) weight in the average. Thus, when we calculate the average cost per visit in the audit sample, we want the weights for providers in each cell to be such that the visits in the cell for the audit sample receive a weight that mimics the proportion of visits in that cell from the total population.

Table 3 displays the percentages of skilled nursing visits in each cell in the trimmed sample of cost reports and in the audit sample. The difference between these percentages shows whether visits in the audit sample are over- or under-represented if we do not weight the audit sample statistics.

The appropriate weights for each cell will weight the number of visits in each cell of the audit sample to mimic that cell's proportion of visits in the trimmed cost report sample. Specifically, we calculate the weighted estimates by weighting the cost per visit for each provider by the provider's number of visits in the discipline multiplied by the ratio of the number of trimmed-cost-report visits in the cell to the number of audit-sample visits in the cell. Representing providers, audited providers, and the trimmed cost report sample with *i*, *A*, and *S*, respectively, we take the mean of the audit sample providers' cost per visit weighting the values by: $(\sum \text{Visits}_i * (\sum \text{Visits}_i / \sum \text{Visits}_A))$. Weights are created specific to each of the labor disciplines in the average cost per visit calculations.

After weighting, the weighted visit count in each cell (and total) represent the number of visits recorded for the broader trimmed sample of cost reports and the proportion of visits represented by each cell in the audit sample mimic the broader trimmed sample of cost reports.

Table 3: Percentage of Skilled Nursing Visits Recorded in Strata

Provider Type		Number of Episodes				All Sizes
		95 to 249	250 to 499	500 to 999	1000 or More	
Non Profit	Trimmed CR	0.3%	0.9%	1.4%	9.5%	12.1%
	Audit Sample	0.4%	1.2%	1.6%	10.9%	14.2%
For Profit	Trimmed CR	7.8%	14.4%	17.1%	38.1%	77.4%
	Audit Sample	5.3%	11.3%	17.2%	41.5%	75.3%
Government	Trimmed CR	0.2%	0.4%	0.3%	1.6%	2.6%
	Audit Sample	0.2%	0.4%	0.4%	0.9%	1.8%
Hospital	Trimmed CR	0.4%	0.9%	1.5%	5.0%	7.8%
	Audit Sample	0.4%	1.1%	1.8%	5.4%	8.7%
All types	Trimmed CR	8.7%	16.6%	20.3%	54.4%	100.0%
	Audit Sample	6.3%	14.1%	21.0%	58.7%	100.0%

Table 3 shows the percentage of skilled nursing visits recorded on the cost reports by provider type and size for both the trimmed cost report sample (“Trimmed CR”) and the sample of cost reports that were audited (“Audit Sample”).

3.3 Audit Results

CMS directs its audit contractors to accurately state the data in the Medicare cost report, whether adjustments are made to increase or decrease costs. The auditing contractor reviewed each cost report using an audit program that addresses the various categories of HHA expenses and revenues. The auditing contractor had previous knowledge of auditing HHAs that led to a focus on historically common problem areas: non-allowable costs (such as marketing costs, non-allowable personal expenses, undisclosed related party costs) and lack of documentation to support costs. They reviewed any discrepancies and adjusted the data to reflect the accurate amounts, whether positive or negative in effect.

Of the 100 cost reports selected for audit, two were excluded due to insufficient documentation to complete the audit, as noted above. Of the remaining 98, most cost reports had adjustments made to one or more cost centers from the audit. Most commonly, the costs were adjusted downward, although a number of reports had the average cost per visit adjusted upward or unchanged. Table 4 displays the unweighted number (%) of cost reports with allowable costs that were adjusted downward (row 1), remained the same (row 2), or were adjusted upward (row 3). Note that skilled nursing and physical therapy are the only two disciplines for which all 98 providers reported allowable costs.

Table 4: Unweighted Number of Cost Reports (%) with Downward, Zero, or Upward Adjustments in Cost per visit by Discipline (N=98)

	Skilled Nursing	Physical Therapy	Occupational Therapy	Speech Language Pathology	Medical Social Services	Home Health Aides
Costs adjusted downward	79 (81%)	75 (77%)	70 (75%)	67 (75%)	66 (76%)	74 (76%)
No Adjustment	8 (8%)	8 (8%)	8 (9%)	7 (8%)	7 (8%)	9 (9%)
Costs adjusted upward	11 (11%)	15 (15%)	15 (16%)	15 (17%)	14 (16%)	14 (14%)

Table 4 displays the count (percentage) of audited cost reports with cost adjustments made in the associated directions.

Table 5 displays the average cost per visit from four sources of data. Column (1) shows the mean cost per visit for the trimmed sample of cost reports in FY 2010. Column (2) shows the mean cost per visit for “audit eligible” cost reports in FY 2010—those with 95 or more episodes reported on the cost report and with less than 10% of payments from outlier episodes. Both columns (1) and (2) display means where providers are weighted according to the number of visits provided in each discipline. Column (3) displays the weighted mean cost per visit for the 98 providers in the audit sample prior to any cost adjustments. Column (4) displays the weighted mean cost per visit for the audited sample after adjusting for costs and visits according to the audit results.

Table 5: Population Weighted Estimates of Cost per visit, by Discipline

	(1) Trimmed Sample n= 6,319	(2) Trimmed Sample Audit Eligible* n= 5,510	(3) Audit Sample Pre-audit n= 98	(4) Audit Sample Post-audit n= 98
Skilled Nursing	\$123.31	\$126.57	\$137.90 (\$5.51) ^(a)	\$127.19 (5.93)
Physical Therapy	\$150.89	\$150.62	\$149.51 (\$5.34)	\$137.82 (\$5.13)
Occupational Therapy	\$148.63	\$148.59	\$147.03 (\$5.36)	\$133.97 (\$5.17)
Speech Language Pathology	\$159.73	\$160.04	\$168.65 (\$5.10)	\$154.61 (\$5.75)
Medical Social Services	\$213.17	\$213.52	\$190.10 (\$11.33)	\$180.62 (\$10.48)
Home Health Aides	\$64.36	\$62.18	\$52.60 (\$6.65)	\$48.22 (\$2.26)

Source: Medicare Cost Reports for FY 2010. “Audit eligible” = HHAs with 95 or more episodes reported on the cost report and with less than 10% of payments from outlier episodes.

^(a) Standard errors are in parentheses.

Figure 1 shows the average change in cost per visit in each of the six disciplines for the audit sample along with the upper and lower bounds of the 95% confidence interval. Because the cost per visit varies across disciplines, Figure 2 redisplayes the changes as a percentage change from the original cost report values for each discipline. Interestingly, the audit induces a roughly 8% reduction in the cost per visit in all disciplines, except medical social services where the reduction is 5% in the allowable cost per visit.

Figure 1: Audit Impact on Average Cost per Visit by Discipline (\$'s)

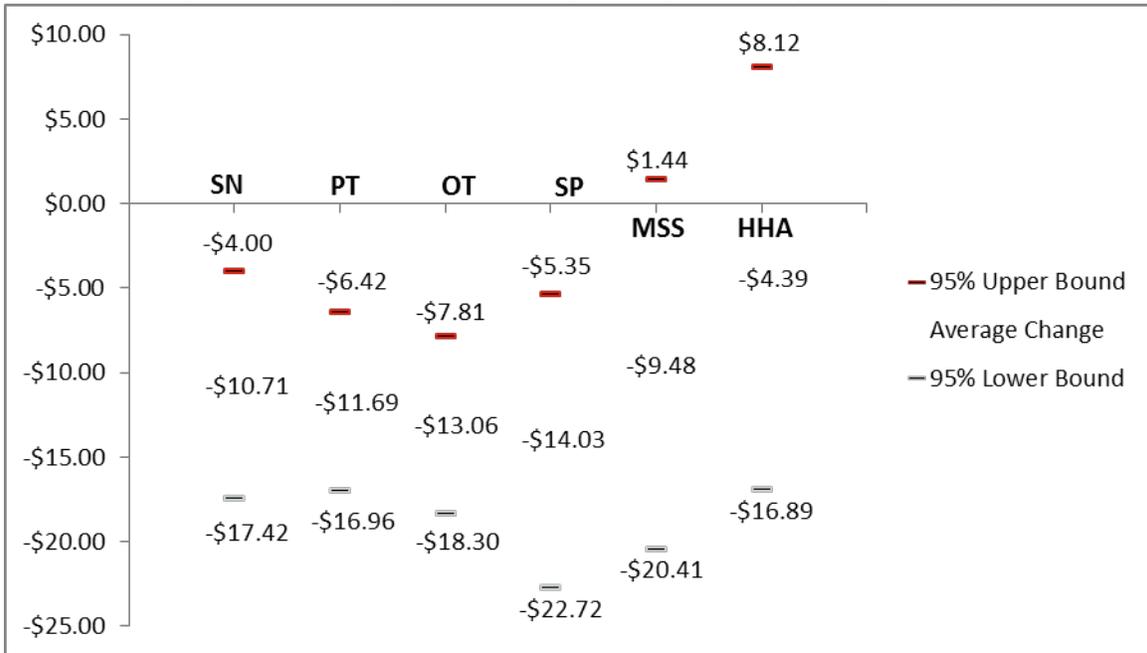
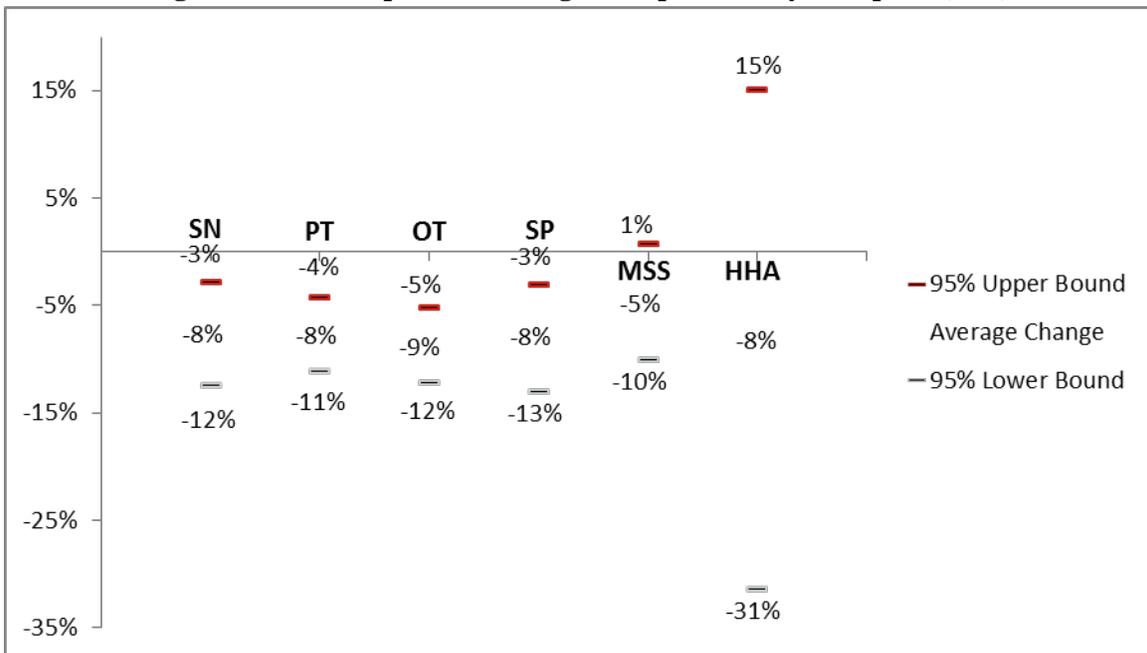


Figure 2: Audit Impact on Average Cost per Visit by Discipline (%'s)



4. Calculating the Average Cost per Visit and per Episode

The cost-per-visit averages were created using cost reports from the trimmed sample. Costs used in the calculation include all expenses incurred during the cost reporting period for each of the cost centers (levels of costs listed on the cost report). In particular, we are using cost measures where both direct service and indirect (administrative and general) costs have been allocated to the appropriate cost centers. For FY 2011, this information comes from worksheet B, column 6, rows 6 to 11 for freestanding providers and worksheet H2, part 1, column 28, rows 2 to 7 for hospital-based providers. Visits used in determining the cost per visit include all (Medicare and other) visits provided. For FY 2011, visit counts for each discipline are taken from worksheet S3, column 5, rows 1 to 6 for freestanding providers and worksheet H3, part 1, column 4, rows 1 to 6.⁹

A cost report's average cost per visit values in a fiscal year are easily calculated by dividing total discipline costs by the number of visits provided. However, simply calculating the mean of these averages does not necessarily provide an accurate picture of the average cost experience for the Medicare home health provider population for two reasons. First, the mean of the cost report averages does not account for the fact that some agencies provide many more visits than other agencies. Second, because the set of cost reports was trimmed, as described above, the subset of cost reports available for the analysis is not necessarily representative of the broader population.

4.1 Weighting Methodology

The mean of cost-report-level average cost per visit would treat all cost reports with an equal weight—they would influence the mean equally. However, this approach would not accurately capture the episode-frequency of cost experiences. For instance, if Provider A delivers 100 visits at an average cost of \$100 per visit and Provider B delivers 1,000 visits at an average cost of \$50 per visit then the simple provider mean of \$75 $[(\$100 + \$50)/2 = \$75]$ does not account for the fact that Provider B visits are more common in the population. In order to more accurately capture the overall average cost per visit, we need to look at the distribution of cost per visit weighted by visits rather than providers. A weighted average, where each provider's influence on the mean is relative to the number of visits provided, more accurately captures the more commonly experienced average costs of a visit.

Weighting each cost report's cost per visit by the number of visits can be achieved by: (1) multiplying each average cost per visit by the number of visits in the discipline on the cost report; (2) summing the products from step one overall cost reports; (3) summing the number of visits for the discipline over all cost reports; (4) dividing the results of step 2 by the results of step 3 to calculate the visit-weighted average cost per visit.¹⁰ Note that this process produces the same result as if we summed the costs of all visits from all providers and divided by the total number of visits.

Simple weighting of cost-report means by the number of visits accounts for differences in provider volume. However, because our trimmed sample includes only a subset of providers who may not represent the universe of home health providers, simple visit-level weighting is insufficient to obtain estimates that are fully representative of the industry. That is, our subset of cost reports may not be

⁹ For prior fiscal years, cost information for hospital-based providers is located on worksheet H5, part 1, column 29, rows 2 to 7. Visit information is located on worksheet H6, part 1, column 4, rows 1 to 6.

¹⁰ Alternatively, standard statistical packages commonly allow for weights to be used when calculating means.

representative of the industry along characteristics that are related to costs, such as urban/rural locations, ownership type, or size of the providers.¹¹

To correct for selection into the trimmed sample of cost reports, we used information from the cost reports and POS file to weight the cost reports in the trimmed sample so that the distribution of visits in each discipline was representative of the distribution of visits in the CY 2011 Medicare SAF of home health claims over provider type (non-profit, for-profit, government-owned, and facility-based), size groups (based on the number of episodes), and urban/rural location of the provider. That is, in addition to weighting cost reports' average cost per visit based on the number of visits recorded, we adjusted the weights such that the visits for each combination of provider type, size group, and urban/rural status were representative of the universe of providers in the CY 2011 claims.¹²

In order to weight the cost per visit per discipline in our sample to be nationally representative, we compared the number of visits in our sample in each provider type-size-urban/rural combination ("stratum") to the number of visits in that stratum as taken from the national CY 2011 claims. The visits for a particular provider were weighted by the ratio of the number of visits in a stratum in the national claims over the number of visits in that stratum in our trimmed cost report sample. For simplicity, we omit the summation symbol and denote the sum of visits over all episodes for provider i in discipline d with $Visits_{i,d}$. Then, letting N_s and \tilde{n}_s represent the number of providers in stratum s for the national claims and trimmed cost report samples, respectively, the weight for provider i in stratum s applied to discipline d is:

$$W_{i,s,d} = Visits_{i,d} * \frac{\sum_{i=1}^{N_s} Visits_{i,d}}{\sum_{i=1}^{\tilde{n}_s} Visits_{i,d}}$$

In other words, the visits in the sample were weighted such that the total weights (weighted visits) in each type-size-urban/rural combination equaled the number of visits in the type-size-urban/rural combination as recorded on the claims; the proportion of weights in each stratum, relative to the total, is equal to the proportion of visits in the stratum, relative to the total, as recorded on the claims; and, the sum of weights across all type-size-urban/rural combinations equals the total number of visits recorded on the claims.¹³

¹¹ Appendix Table B1 shows how the subset of cost reports used for analyses compares to the untrimmed sample of cost reports by provider margins, provider type, urban/rural location, regional location, and number of episodes.

¹² Appendix Tables B2-B7 display the proportion of all visits by providers in each stratum for the trimmed sample of cost reports and the 2011 claims. The applied weights alter the representation of the proportion in the trimmed cost report sample to mirror the proportion in the claims when calculating the average cost per visit.

¹³ An equivalent ratio to that used above for each stratum can be derived using the information available in Appendix Tables B2-B7, which display the proportion of all visits by providers in each stratum for the trimmed sample of cost reports and the CY 2011 claims. To calculate ratio adjustment used in the weights, one can simply divide the proportion of all claims visits occurring in a cell by the proportion of trimmed cost report visits occurring in the cell.

Public Use File. As described in Section 2 above, a step in the trimming process cross-references sequential reports from the same provider over time. However, because some providers have multiple reports in the same FY, sorting by provider and FY does not lead to a unique ordering of cost reports for these restrictions. As such, it may be difficult to replicate this portion of the trimming methodology. Additionally, Medicare claims data and the POS file are not publicly available to create the appropriate weights to replicate the weighted average cost per visit. For these reasons, CMS has provided a public use file accompanying this report to allow for replication of our results or further analyses available at <http://www.cms.gov/Center/Provider-Type/Home-Health-Agency-HHA-Center.html>.

The public use file includes all data used in calculating the weighted cost per visit averages used in rebasing. The provided public use file includes data on the trimmed subset of cost reports, including the CMS Certification Number (CCN) formerly known as Provider Number, episode count grouping, and cost per visit for each discipline from the cost reports; the provider type and urban/rural location of providers as determined from the POS file; and the provider-specific weight used in calculating the weighted average cost per visit for each discipline. The weighted average cost per visit can be replicated using the providers' cost per visit weighted by the discipline weights listed in the file. In order to calculate the weighted average for each discipline: (1) multiply each provider's average cost per visit by the provider's weight; (2) sum the products from step one over all providers; (3) sum the weights for the discipline over all providers; (4) divide the results of step two by the results of step three to calculate the weighted average cost per visit. Alternatively, standard statistical packages commonly allow for weights to be used when calculating means.

4.2 Average Cost per Visit Estimates

We produced estimates of average costs per visit for all patients using the trimmed cost report sample, and then assessed how per-visit costs might differ for Medicare versus non-Medicare patients.

4.2.1 Average Costs of Visits for All Patients

We calculated the average cost per visit by taking the weighted average of the cost-report cost per visit. Note that the weight each cost report contributes to the overall average cost per visit is equal to the number of visits reported on the cost report times the total number of visits for the provider's type-size-urban/rural combination in the national claims divided by the number of visits in the provider's type-size-urban/rural combination in our sample. As such, providers with a higher number of visits receive more weight in calculating the mean aside from the type-size-urban/rural representativeness adjustment.

Table 6 displays the estimated cost per visit from the trimmed sample of cost reports. The first column of estimates shows the average costs when each provider in the sample is given a weight equal to the total number of visits provided in each discipline (Visit-weighted); as such, providers with a higher number of visits receive more weight in calculating the mean. The second column of estimates (Three-variable) displays means calculated when the FY 2011 trimmed sample of cost reports is weighted such that the distribution of visits is representative of the distribution of visits in the CY 2011 Medicare claims data in terms of facility type (non-profit, for-profit, government-owned, and facility-based), size groups (based on the number of episodes), and urban/rural location of the provider.

**Table 6: FY 2011 Weighted Estimates of Cost per visit
in the Trimmed Sample of Cost Reports (n=6,252)**

Discipline	Visit-weighted	Three-variable
Skilled Nursing	\$129.56	\$131.51
Physical Therapy	\$159.99	\$160.69
Occupational Therapy	\$158.96	\$159.55
Speech Pathology	\$169.28	\$170.80
Medical Social Services	\$217.63	\$218.91
Home Health Aides	\$65.07	\$65.22

Note: “Visit-weighted” weights the providers in the trimmed sample according to the number of visits provided. “Three-variable” weights the providers in the sample according to the number of visits provided and adjusts these weights such that the sample is representative of the universe of 2011 claims over provider type, provider size, and urban/rural location of the provider.

4.2.2 Average Costs of Visits for Medicare Patients

Costs reported on the cost report and used in determining the average costs per visit are incurred over all patients, regardless of payer. As such, the average cost of a visit is the cost determined over a mix of patient-payer sources. If patients are both Medicare- and non-Medicare-paid, and if the costs of visits for Medicare- and non-Medicare-paid patients differ, then the average cost per visit is a weighted average which includes a different non-Medicare-patient amount.

A particular concern, from comments received for the CY 2014 HH PPS proposed rule (78 FR 40284), is that Medicare-paid visits are more costly than visits for other payers—because of costs related to completing the OASIS and reassessments, the Consumer Assessment of Healthcare Providers and Systems Home Health Care Survey (HHAHPS), or the face-to-face certification requirement. This would imply that the average cost of a Medicare-paid visit is higher than the average cost when weighted over all visits. Medicare-paid visits account for the majority of visits recorded on cost reports in our sample, implying that average costs per visit more closely reflect Medicare-paid visit costs than per-visit costs for other payers. Nonetheless we wished to assess whether Medicare-paid visits are more costly than visits for other payers, influencing our average cost per visit estimates used in rebasing.

In particular, we examined whether the average costs per visit may be different for Medicare versus other payers by examining the relationship between the providers’ average costs per visit and the provider’s proportion of visits that were paid by Medicare. However, the difference in costs per visit between providers who report higher and lower proportions of Medicare-paid visits is confounded by other observed and unobserved characteristics. For instance, in the sample of cost reports, the proportion of visits that were provided for Medicare-paid episodes tends to be higher for HHAs with fewer visits. Agencies with fewer visits have higher average costs for reasons unrelated to whether visits are for Medicare-paid episodes or not; such agencies tend to be newer, more rural, and have higher administrative and general costs allocated to each visit.

To address the above concerns and attempt to identify if differences exist between the average costs of visits for Medicare-paid and non-Medicare-paid patients, we compared average per visit costs for providers with varying but similar proportions of Medicare vs. non-Medicare visits using both descriptive and multivariate regression analyses. Specifically, we grouped providers with similar proportions of Medicare visits (e.g. those less or more than 50% of visits reported as Medicare-paid visits). Providers with similar proportions of Medicare-paid visits are more similar in the observed characteristics in our

data (i.e. size, ownership status, and urban/rural status). Thus, the approach assumes that they are also similar in unobserved ways. Importantly, we assume that the costs of attracting their particular pools of patients are similar and not related to the difference in costs of having more or less Medicare-paid patients.

The results did not suggest a consistent relationship between the proportion of Medicare-paid visits and the average costs per visit. For instance, across providers with fewer than half of skilled nursing visits reported as Medicare-paid, there was a positive correlation between the proportion of Medicare-paid visits and average costs (0.2969) and statistically different from zero. However, among providers with more than half of skilled nursing visits being paid by Medicare, which is the vast majority of providers, the correlation was significantly negative (-0.0646) and suggests that higher proportions of Medicare visits are related to lower average per-visit costs. Adding observed covariates for freestanding or hospital based, non- or for-profit status, urban/rural, number of episodes, and number of visits attenuated but did not change the direction of the relationship between the proportion of Medicare-paid visits and the average costs per visit. This relationship held for skilled nursing, home health aide, speech pathology, and medical social service visits. The exceptions to these relationships are found for physical therapy and occupational therapy visits, where those with a higher proportion of Medicare visits may have flat or higher costs.

We further examined the relationship between the proportion of Medicare-paid visits and average costs using smaller intervals to group providers. Specifically, we estimated spline regressions which estimated the linear relationship between the proportion of Medicare-paid visits and average costs per visit over intervals greater than and less than 50%. The smallest intervals tested compared the average costs per visit for providers Medicare-paid proportions within 10 percentage point intervals (e.g.50%-60%, 60%-70%, 70%-80%) of visits as Medicare-paid. The results did not consistently indicate that higher proportions of Medicare-paid visits led to higher average costs for similar providers. However, the results demonstrated that the relationship between higher proportions of Medicare-paid visits and higher physical and occupational therapy visit costs are driven by providers with all visits (100%) being Medicare-paid.

Because the majority of visits in the all-payor costs per visit calculation are to Medicare-paid beneficiaries and the cost-report analysis did not provide conclusive or consistent evidence that per-visit costs are higher for otherwise similar providers with more or fewer Medicare-paid visits, we believe the cost-per-visit calculation over all HHA patients, and visits is appropriate.

4.3 Average Visits per Episode

In order to calculate a cost per episode, in addition to the cost per visit for each of the labor disciplines, we identified the average visit profile for home health episodes. To calculate the average number of visits we used the universe of claims to provide an accurate picture of utilization rather than the trimmed sample of cost reports. The mean was averaged at the episode-level such that all normal, outlier, and PEP episodes received an equal weight. However, because they are not paid as a bundled episode, LUPA episodes were excluded from the calculation. Table 7 displays the average visits per episode in the six labor disciplines separately for non-LUPA episodes occurring in calendar year 2011 and calendar year 2012. The visit profiles between the two time periods are similar with the largest difference being a decline in the number of aide visits per episode from 2.80 to 2.63 visits per episode.

Table 7: Average Number of Visits per Non-LUPA Episode by Discipline

Discipline	2011	2012
Skilled Nursing	9.43	9.44
Physical Therapy	4.86	4.86
Occupational Therapy	1.15	1.16
Speech Pathology	0.21	0.23
Medical Social Services	0.14	0.14
Home Health Aides	2.80	2.63
Sum	18.59	18.46

Source: Non-LUPA episodes occurring in calendar year 2011 or calendar year 2012.

4.4 Average Cost per Episode

To derive the average cost per episode, we multiplied the average cost per visit by the average number of visits per episode for each of the six labor disciplines, resulting in an estimated cost per episode for each discipline. Finally, we summed the cost per episodes across discipline to arrive at an average cost per episode. At CMS's direction, we used the latest available information to calculate both cost per visit and visits per episode. As such, we used the trimmed FY 2011 cost report sample to derive cost per visit and claims data from CY 2012 to derive the average number of visits per episode. Table 8 displays the calculation of the average cost per episode of \$2,448.94.

Table 8: Calculation of Average Cost per Episode

Discipline	Cost x Visits	Episode Costs
Skilled Nursing	\$131.51 x 9.44 =	\$1,241.45
Physical Therapy	\$160.69 x 4.86 =	\$ 780.95
Occupational Therapy	\$159.55 x 1.16 =	\$185.08
Speech Pathology	\$170.80 x 0.23 =	\$39.28
Medical Social Services	\$218.91 x 0.14 =	\$30.65
Home Health Aides	\$65.22 x 2.63 =	\$171.53
Cost per Episode		\$2,448.94

Note: Data are for non-LUPA episodes. Cost per visit values are calculated using a weighted average of costs and visits from the trimmed sample of FY 2011 cost reports. Average visits per episode are taken from all non-LUPA episodes in the SAF claims file for CY 2012.

4.5 Preliminary FY 2012 Cost Reports

As of June 30, 2013, there were over 10,000 FY 2011 freestanding and hospital-based HHA cost reports of which over 90 percent are settled. Also, as of June 30, 2013, there were only about 6,800 FY 2012 freestanding and hospital-based cost reports of which roughly only 60 percent were settled. Therefore, the FY 2011 cost report data were the most complete data available at the time of the rebasing analysis.

However, the FY 2012 cost reports may portray a more current picture of providers' current financial state. To test whether FY 2012 data indicated any significant changes in providers' financial states, we compared a matched sample of cost reports for providers that submitted cost reports for both years (approximately 5,700 FY 2012 and FY 2011 cost reports). Specifically, we calculated costs per visit and Medicare margins for providers who (a) had cost reports available in the FY 2011 trimmed sample used in calculating the rebased rates; and (b) had submitted cost reports available from FY 2012. Matching the

sample limits the differences between providers in the FY 2011 and FY 2012 results, relative to using all available reports. Thus, the 2012 reports may be more comparable to their 2011 reports, but neither set may be representative of all providers.

First, we calculated the average cost per visit using preliminary FY 2012 home health agency Medicare cost report data. We found that the average costs per visit for all disciplines (home health aide, medical social services, occupational therapy, physical therapy, skilled nursing, and speech-language therapy) remained virtually unchanged relative to FY 2011(see Table 9 below). As seen in Table 7, claims data indicated a drop in the average number of visits per episode from 18.59 in CY 2011 to 18.46 in CY 2012. Similarly, our matched sample of cost reports showed a reduction in the average number of visits per episode from FY 2011 to FY 2012. The drop in visits per episode from FY 2011 to FY 2012, with virtually no changes in the costs per visit, suggests that the FY 2012 estimated cost per episode may be less than the cost per episode estimated using FY 2011 cost report data.

Table 9: Average Cost per Visit, FY 2011 and FY 2012

Discipline	FY 2011	FY 2012
Skilled Nursing	\$ 133.65	\$ 133.71
Physical Therapy	\$ 161.05	\$ 162.81
Occupational Therapy	\$ 158.80	\$ 159.22
Speech-Language Pathology	\$ 170.20	\$ 173.06
Medical Social Services	\$ 220.91	\$ 219.74
Home Health Aide	\$ 69.79	\$ 65.63

Source: FY 2011 Medicare cost report data as of December 31, 2012 and FY 2012 Medicare cost report data as of June 30, 2013 for providers who were included in the rebasing sample described in section IV.D.1.a. and for which a FY 2012 cost report was on file. We weighted the average costs per visit in 2012 by size, ownership type, and urban-rural status to mimic the distribution of providers in the 2011 claims used for weighing the 2011 average costs per visit used for rebasing.

In addition to examining costs per visit, we examined the profitability of providers in the FY 2011 and FY 2012 cost report samples by examining Medicare margins. Medicare margins are defined as the amount of Medicare payments greater than allowed Medicare costs normalized by the payment amount. These margins are represented as a percentage of the Medicare payments.

Again, we matched providers available in both the trimmed sample of FY 2011 and the preliminary set of FY 2012 cost reports. Comparing FY 2011 to FY 2012, the results show that the distribution of margins did not shift significantly for providers between years. Specifically, the median change in margin from FY 2011 to FY 2012 was <0.2 percentage points; the median margin was 10% in both FY 2011 and FY 2012 and the proportion of providers with negative margins dropped slightly from 0.32 to 0.31. The results suggest that financial performance of providers was similar using either the FY 2011 or FY 2012 cost reports. As such, we conclude that any effects on our average costs estimates using updated FY 2012 data are likely to be negligible.

5. Calculating Average NRS Cost per Episode

The purpose of this section is to describe the analyses conducted to support an updating of the base rate used to pay for nonroutine medical supplies (NRS) provided by home health agencies during an episode of care, commonly called the “conversion factor.” This analysis was conducted using the FY 2011 cost reports and matched claims.

5.1 Background

When the HH PPS was implemented on October 1, 2000, the national, standardized 60-day episode payment rate included an amount for NRS that was calculated based on costs from the audited FY 1997 cost reports and the average cost of NRS unbundled and billed through Medicare Part B. In that audit sample, the total NRS costs for the agencies were \$234,547,615. The total number of episodes performed by these agencies was 5,733,010. From these estimates, the average NRS cost per episode was calculated to be \$40.91. This figure was then updated to \$43.54 using the FY 2001 Market Basket update factor. Added to this amount was \$6.08 to account for the average cost of unbundled NRS billed through Medicare Part B, resulting in a total of \$49.62 included in the national, standardized 60-day episode payment rate to account for NRS.

Effective CY 2008, an NRS conversion factor of \$52.35 was created (the \$49.62 that CMS originally included in the national, standardized 60-day episode payment rate, updated by the market basket and adjusted for nominal change in case-mix.) This “base rate” is further adjusted by one of six severity levels to ensure that the variation in NRS usage is more appropriately reflected in the HH PPS. Table 10 lists published NRS conversion factors for several recent years.

**Table 10: Recent NRS Conversion Factors,
Market Basket Updated from CY 2000 Estimate (of \$40.91)**

Calendar Year	NRS Conversion Factor
2008	\$52.35
2009	\$52.39
2010	\$53.34
2011	\$52.54
2012	\$53.28
2013	\$53.97

The original regulation calculated the base payment for NRS using NRS cost per episode. This year’s rebased base payment rate (“conversion factor”) for NRS was developed based on NRS cost per visit. This change was made so that the derivation of the NRS payment rate mirrors that of the rebased payment rate for the 60-day home health episode (where the cost per visit was calculated using cost report data and then multiplied by per-episode visit utilization calculated from the claims data).

5.2 Methods

Our analytic file originates by selecting the 10,327 (full universe) of HHA cost reports submitted for FY 2011. We use this untrimmed sample to produce baseline estimates. Applying our trimming criteria described above, we retain 6,252 cost reports in the sample. We note that among the untrimmed universe of cost reports, 4,941 cost reports (47.8%) reported NRS costs, and among the trimmed cost reports, 3,690 cost reports (59.0%) reported NRS costs. Using our cost report sample, we calculated total costs,

total NRS costs, total visits, total cost per visit, and total NRS cost per visit. We calculate both raw and visit-weighted estimates of NRS cost per visit for the trimmed cost report sample. The weighting methodology used is analogous to the procedure we used to adjust estimates of cost per visit using the 2011 SAF home health claims. The only difference is that we cannot differentiate NRS costs among the six disciplines. Therefore, we employ a coarser weighting strategy which does not differentiate by visit discipline.

5.3 Analytic Results

We present estimates of NRS cost per episode for 2011 in Table 11. Highlights follow below:

Full Universe of (Untrimmed) FY 2011 Cost Reports: Among the 10,327 cost reports submitted in FY 2011, total NRS costs were \$300,708,664 and total visits were 99,429,672. The average NRS cost per visit in this full universe of cost reports was \$3.02. We note we should view these results with caution because they were developed using the untrimmed universe of cost reports. Data irregularities exist among some cost reports present within the full universe which led them to be excluded from the trimmed sample.

Trimmed FY 2011 Cost Report Sample: Among the 6,252 cost reports in the FY 2011 trimmed sample, total NRS costs were \$168,633,843. There were 73,775,475 visits reported in the trimmed sample. The raw (unweighted) NRS cost per visit for the trimmed cost reports were calculated to be \$2.29; the visit-weighted estimate for national representativeness was \$2.26.

Table 11: Estimates of NRS Cost per episode and NRS Cost per visit; Fiscal Year 2011

	Full Cost Report Universe: 10,327 Cost Reports	All Trimmed Cost Reports: 6,252 Cost Reports
Total Costs	\$14,100,296,011	\$9,992,204,048
Total Visits	99,429,672	73,775,475
Total Cost per visit	\$142	\$135
Total NRS Costs	\$300,708,664	\$168,633,843
NRS Cost per visit [<i>Unweighted</i>]	\$3.02	\$2.29
NRS Cost per visit [<i>Weighted</i>]	-	\$2.26

Source: Abt Associates analysis of FY 2011 Medicare Home Health Cost Reports and SAF Claims. Universe is Medicare Home Health agencies' cost reports submitted in FY 2011. The trimmed cost per visit estimates are additionally visit-weighted for national representativeness based on providers' size, ownership, and urban/ rural status.

6. Updating the LUPA Add-On Payment Amount

This section describes the analyses conducted to support an update to the Low-Utilization Payment Adjustment (LUPA) add-on payment amount using 2012 claims data and the national per-visit payment rates for 2014 that reflect a rebasing adjustment.

6.1 Background

LUPA episodes are episodes having four or fewer visits. Payments for LUPA episodes are made on a per-visit basis rather than per episode. At the time of HH PPS implementation, CMS received comments that this flat, per-visit approach for LUPA episodes did not accurately reflect the variation in visit costs over the course of an episode. The issue raised was that the first visit made to a patient typically includes patient assessment as well as administrative procedures and paperwork and these visits are therefore longer and costlier than other visits. While this is true for all episodes, LUPA episodes have fewer total visits (by definition), so they offer less opportunity for later, less costly, visits in the episode to offset the high cost of the initial visit.

In 2007, we examined the degree to which episodes' initial visits were costlier than other visits in an analysis discussed at length in the CY 2008 HH PPS proposed and final rules (72 FR 25356 and 72 FR 49762, respectively). Because we could not access data on the actual cost of each visit, the analysis used visit length as a proxy for visit cost. This analysis demonstrated that initial visits in both regular episodes and LUPA episodes were longer than other visits, supporting the need for a payment adjustment for the LUPA episodes to offset the added cost of these visits. CMS updated the HH PPS (effective January 1, 2008) so that payments for LUPA episodes occurring as either the only episode, or the initial episode within a sequence¹⁴ of adjacent episodes, were increased by an additional payment amount (the "LUPA add-on"). The intent of the add-on payment amount was that it would reflect the average proportional excess cost of an initial visit.

The original LUPA add-on payment amount was calculated as follows.

1. For each of the three home health disciplines which predominantly perform assessment visits (skilled nursing, physical therapy, and speech pathology), the excess minutes per initial visit (compared to other visits) were measured to be 38.5 minutes for skilled nursing, 25.1 minutes for physical therapy, and 22.6 minutes for speech pathology.
2. These excess values were then expressed as a proportion of the average number of minutes for all non-first visits in non-LUPA episodes¹⁵ (42.5, 45.6, and 48.6 minutes for skilled nursing, physical therapy, and speech pathology, respectively) and costed-out by multiplying these proportions by the per-visit payment rates for the respective disciplines.

¹⁴ Terminology note: A "sequence" or spell is a series of episodes with no more than 60 days between the end of one episode and the beginning of the next episode.

¹⁵ To specify the numerator and denominator explicitly in calculating the proportional increase in excess minutes for initial visits in initial LUPA episodes in the 2008 rule, the numerator was the difference in average minutes between first and subsequent visits in initial LUPA episodes and the denominator was based on the average visit length for subsequent visits in initial non-LUPA episodes. Therefore, we calculate the proportional increase in first visit LUPA excess minutes as:

$$\frac{(\text{Average Minutes in 1st Visits, Initial LUPA Episodes}) - (\text{Average Minutes in Subsequent Visits, Initial LUPA Episodes})}{(\text{Average Minutes in Subsequent visits, Initial non-LUPA Episodes})}$$

3. Finally, a weighted average of the excess cost per initial visit was calculated by using the share of LUPA initial visits provided by each discipline (skilled nursing (77.8%), physical therapy (21.7%), and speech pathology (0.5%)), yielding a LUPA add-on payment amount of \$87.93.

6.2 Methods

The original LUPA add-on analysis utilized home health claims data from calendar year 2005. For this replication, we drew visit data from the revenue center line items in the full 2012 SAF of home health claims (processed as of June 30, 2013). Our analytic sample included 100% of the LUPA episodes as well as a 20% sample of non-LUPA episodes. We drew claims from the full universe of providers. Since the original add-on calculation used only those episodes which were first in a sequence of episodes, we excluded episodes where there was not a gap of sixty days or more since the end of the beneficiary's previous home health episode.

The unit of analysis was a visit, with certain episode characteristics merged onto each visit record from the episode header record. We sequenced and categorized each visit according to:

- whether the visit was the first or only visit in the episode versus a subsequent visit in the episode; and
- whether the visit was part of a LUPA episode or a non-LUPA episode.

We used the reported date each visit took place to sequence the visits within each episode. When multiple visits occurred on the first visit date of the episode, we selected one visit as “first” using the following tie-breaking hierarchy, the intent being to select a visit from the disciplines most likely to perform assessment visits:

1. Skilled Nursing
2. Physical Therapy
3. Speech-Language Pathology
4. Home Health Aide, Occupational Therapy, or Medical Social Worker

We identified 3,567 “first visits” which were conducted by a Home Health Aide (2,649 visits), Occupational Therapist (775 visits), or Medical Social Service worker (143 visits). These disciplines were excluded from the subsequent calculations because they cannot perform the initial patient assessment.

Visits meeting any of the following conditions were additionally omitted from the analytic sample:

- Visits with the nonpayment flag set (NPMT_FLAG = 1)
- Visits with the overlapping episodes flag (PEP_FLAG = 1)
- Visits without any reported visit time (MINUTES = 0)

After applying all exclusion criteria, the final analytic sample included 9,579,099 visits. Of these, 680,847 were from LUPA episodes (277,355 from initial visits and 403,492 from subsequent visits). The remaining 8,898,252 visits were from non-LUPA episodes (624,703 from initial visits and 8,273,549 from subsequent visits).

We used simple un-weighted means and sums across visits in the final analytic sample to produce estimates of average minutes per visit and total number of visits for each of the six disciplines. Means were calculated for four categories of visits, defined by whether the visit took place in a non-LUPA or LUPA episode, and whether the visit was the first/only visit in the episode or a subsequent (non-initial) visit.

We then used the minutes per visit and total visit count estimates to calculate the LUPA add-on. The six steps of this calculation were as follows:

1. *Initial LUPA visits excess minutes* – subtract the average number of minutes per non-initial LUPA episode visit from the average number of minutes from initial/only visits in LUPA episodes to obtain an estimate of excess minutes in initial/only LUPA visits.
2. *Proportional increase over non-LUPA, non-initial visits* – divide the excess minutes estimate obtained in step [1] by the average length of non-initial visits in non-LUPA episodes to obtain an estimate of the proportional increase over non-LUPA, non-initial visits.
3. *2014 per-visit payment rates* – report the per-discipline per-visit payment rates (incorporating the 2.3% Market Basket updates).
4. *Excess cost for initial visits (2*3)* – estimate the dollar value of the excess assessment cost by multiplying the percent increase calculated in step [2] by the 2014 per-visit payment rates calculated in step [3].
5. *Percent of initial visits provided by discipline* – calculate the proportion of initial/only visits in LUPA episodes for each discipline among the total number of initial/only visits across the three disciplines which perform OASIS assessments. (Per the Medicare Conditions of Participation at 42 CFR 484.55(a)(1) and (a)(2), home health aides, occupational therapists, and medical social service workers cannot perform initial OASIS assessments and were therefore excluded.)
6. *Weighted average excess costs for initial LUPA visits (Sum of 4*5); the “LUPA add-on”* – is the estimated average of excess costs of initial/only (assessment) visits in LUPA initial episodes (calculated in [4]), weighted by the proportion of initial/only visits that are provided by skilled nursing, speech-language pathology, and physical therapy, as calculated in [5].

6.3 Analytic Results

Our results are presented in Table 12, below. The top half of the table displays the average minutes per visit and total number of visits for each of the three disciplines which perform assessment visits. Four rows are calculated corresponding to four visit categorizations: whether the visit took place in a non-LUPA or LUPA episode, and whether the visit was the first/only visit in the episode or a subsequent (non-initial) visit. The bottom half of the table uses the estimates from the first four rows in the top half to calculate the LUPA add-on; each table row corresponds in sequence to one of the six calculation steps described in the previous section.

We found that within LUPA episodes which began a sequence of care, initial skilled nursing visits averaged 37.27 minutes longer than subsequent skilled nursing visits, initial physical therapy visits averaged 31.69 minutes longer than subsequent physical therapy visits, and initial speech-language pathology visits averaged 31.56 minutes longer than subsequent speech pathology visits. Among all subsequent visits in non-LUPA episodes (which also were at the start of a sequence of episodes), skilled nursing visits averaged 44.10 minutes, physical therapy visits averaged 47.30 minutes, and speech therapy minutes averaged 50.37 minutes. Therefore, the excess minutes for initial minutes expressed as proportional increases over non-LUPA, subsequent visits are an increase of 0.8451 for skilled nursing visits, an increase of 0.6700 for physical therapy visits, and an increase 0.6266 for speech therapy visits. Of the three disciplines that perform assessments, initial visits in LUPA episodes are provided predominantly by skilled nurses (81.97%) and physical therapists (17.61%). Speech-language pathologists account for approximately 0.42% of initial visits. Based on 2014 per-visit payment rates for LUPA episodes (incorporating the 2.3% Market Basket update), we calculate the LUPA add-on amount for 2014 to be **\$99.89 if used in lieu of the finalized LUPA add-on factors in the CY 2014 HH PPS Final Rule.**

Table 12: Calculating the LUPA Add-On (2012 SAF File Data; 9,579,099 total visits)

Episode Status	Visit Type	Skilled Nursing		Physical Therapy		Speech Language Pathology	
		Mean Minutes	# of Visits	Mean Minutes	# of Visits	Mean Minutes	# of Visits
Non-LUPA	Initial Visit	83.07	544,335	78.92	79,420	82.47	948
	Subsequent Visit	44.10	4,371,509	47.30	3,737,161	50.37	164,879
LUPA	Initial/Only Visit	82.98	227,336	81.89	48,849	85.41	1,170
	Subsequent Visit	45.71	268,664	50.20	131,033	53.85	3,795
(1) Initial LUPA visits excess minutes		37.27		31.69		31.56	
(2) Proportional increase over non-LUPA, non-initial visits		0.8451		0.6700		0.6266	
(3) 2014 per-visit payment rates		\$121.10		\$132.40		\$143.88	
(4) Excess cost for initial visits (2*3)		\$102.34		\$88.71		\$90.16	
(5) Percent of initial visits provided by discipline		81.97%		17.61%		0.42%	
(6) Weighted average excess costs for initial LUPA visits (Sum of 4*5); <i>the "LUPA Add-On"</i>		\$99.89					

Data: CY 2012 Claims data using the Medicare Standard Analytic File (SAF) for Medicare home health episodes that ended on or before December 31st, 2012, as of June 30, 2013. Analysis included 100% of LUPA episodes and a 20% sample of non-LUPA episodes. Episodes without a matched OASIS assessment and RAP-only episodes are excluded. Analysis includes only episodes that are first or (the only one) in a sequence of adjacent Medicare home health episodes.

Appendix A: Validating Unexpected Changes in Episode Counts

To check the performance of the longitudinal exclusions, we matched each FY 2008-2011 cost report that was excluded due to an extreme year-to-year increase in episode counts to the same provider's claims data for the same time period. Using the matched data, we calculated an inflation factor for each cost report equal to the percentage difference in episode counts between the cost report and the associated claims data. An inflation factor equal to 0% represents an identical episode count in the cost report as compared to the claims data. Similarly, an inflation factor equal to 100% signifies that the count of episodes in the cost report includes twice as many (100% more) episodes as the claims.

The top two rows of Table A1 show the mean and median inflation factors for each FY, 2008-2011. These measures demonstrate the extreme misreporting that occurs on the excluded cost reports. The mean inflation factor for the excluded reports suggests that on average the cost report episode counts are inflated by at least a factor of 20. The fact that the mean inflation factor exceeds the median by a substantial margin indicates that there exist extreme outliers even within this group of excluded reports. And, indeed, the third row of Table A1 shows the maximum amounts that the episode counts were inflated on the excluded cost reports reached at least 10,000% in each year.

Table A1: Inflated Episode Counts from the Cost Report Exclusions

	Fiscal Year			
	2008 (N = 187)	2009 (N = 182)	2010 (N = 172)	2011 (N = 171)
Mean Inflation Factor	2,217%	3,520%	5,004%	2,085%
Median Inflation Factor	1,512%	1,515%	1,699%	1,869%
Maximum Inflation Factor	63,503%	223,625%	437,959%	10,055%
Minimum Inflation Factor	-11%	-15%	-24%	-7%
Proportion (n) Agree, within 10% of claims*	0.18 (34)	0.25 (45)	0.29 (50)	0.15 (26)
Proportion (n) Inflated at least 50%*	0.79 (148)	0.70 (127)	0.68 (117)	0.81 (139)

Table 1 displays information regarding inconsistencies between the numbers of episodes reported on cost reports and associated claims files for cost reports excluded due to high year-to-year changes in the number of non-LUPA non-PEP episodes. *Numbers in parentheses indicate the count (n) of cost reports in that year (N)

Appendix B: Additional Detail on Cost Report and Claims Samples

**Table B1: Distribution of Provider Characteristics in Untrimmed and Trimmed
FY 2011 Cost Report Samples and CY 2011 Claims Data**

	FY 2011 Cost Reports		CY 2011 Claims
	Untrimmed	Trimmed	
Facility Type			
Non Profit	6%	5%	9%
For Profit	83%	84%	76%
Government	2%	2%	4%
Facility-based	9%	9%	11%
Urban/Rural			
Rural	15%	15%	18%
Urban	85%	85%	82%
Census Region			
New England	3%	2%	3%
Mid Atlantic	5%	3%	5%
South Atlantic	21%	22%	20%
East South Central	6%	3%	7%
West South Central	19%	19%	19%
East North Central	3%	4%	4%
West North Central	28%	29%	27%
Mountain	6%	5%	6%
Pacific	10%	12%	10%
Other	0%	1%	0%
Number of Total Episodes			
<95	11%	9%	25%
95 to 249	25%	26%	26%
250 to 499	24%	27%	21%
500 to 999	20%	21%	15%
1000 or More	19%	17%	12%

Appendix Table B1 presents the percentage of reports, containing information, on facility-type, urban-rural location of provider, Census region, and number of episodes for each of the three sources of data. A number of reports (2,341 of 10,327) in the untrimmed cost report sample were missing information on the number of episodes provided; the percentages above represent the distribution of reports for which the information could be determined.

Table B2: Skilled Nursing Visits in Strata by Source

		Number of Episodes							
		0 to 94	95 to 249	250 to 499	500 to 999	1000 or More	All Sizes		
Provider Type	Urban	Non Profit	Trimmed CR	0.03%	0.30%	0.71%	1.12%	10.81%	12.97%
			Claims	0.14%	0.39%	0.85%	1.46%	11.18%	14.02%
		For Profit	Trimmed CR	0.76%	5.43%	10.90%	15.18%	32.96%	65.23%
			Claims	2.11%	7.75%	12.16%	14.46%	25.66%	62.14%
		Government	Trimmed CR	0.01%	0.04%	0.15%	0.16%	0.30%	0.66%
			Claims	0.03%	0.11%	0.10%	0.17%	0.21%	0.62%
	Rural	Facility-based	Trimmed CR	0.05%	0.14%	0.60%	1.28%	3.99%	6.06%
			Claims	0.04%	0.24%	0.66%	1.64%	4.18%	6.76%
		Non Profit	Trimmed CR	0.00%	0.09%	0.18%	0.41%	0.61%	1.29%
			Claims	0.03%	0.16%	0.33%	0.53%	0.86%	1.91%
		For Profit	Trimmed CR	0.06%	0.54%	1.16%	2.03%	6.56%	10.35%
			Claims	0.10%	0.55%	1.36%	2.29%	6.34%	10.64%
All types	Government	Trimmed CR	0.02%	0.17%	0.13%	0.09%	0.10%	0.51%	
		Claims	0.10%	0.23%	0.22%	0.16%	0.15%	0.85%	
	Facility-based	Trimmed CR	0.09%	0.34%	0.71%	0.76%	0.55%	2.44%	
		Claims	0.13%	0.56%	0.89%	0.80%	0.68%	3.07%	
		Trimmed CR	1.02%	7.05%	14.54%	21.02%	55.86%	100%	
		Claims	2.68%	9.98%	16.57%	21.51%	49.26%	100%	

Appendix Table B2 shows the percentage of skilled nursing visits occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).

Table B3: Physical Therapy Visits in Strata by Source

			Number of Episodes					All Sizes	
			0 to 94	95 to 249	250 to 499	500 to 999	1000 or More		
Provider Type	Urban	Non Profit	Trimmed CR	0.02%	0.40%	0.84%	1.30%	12.05%	14.61%
			Claims	0.10%	0.47%	0.93%	1.68%	11.63%	14.81%
		For Profit	Trimmed CR	1.07%	5.83%	10.35%	14.50%	32.44%	64.20%
			Claims	1.60%	6.69%	11.31%	14.29%	28.52%	62.41%
		Government	Trimmed CR	0.01%	0.04%	0.15%	0.17%	0.21%	0.59%
			Claims	0.02%	0.13%	0.14%	0.19%	0.21%	0.70%
		Facility-based	Trimmed CR	0.04%	0.19%	0.76%	1.61%	4.42%	7.02%
			Claims	0.04%	0.33%	0.79%	1.81%	4.49%	7.46%
Rural	Non Profit	Trimmed CR	0.00%	0.08%	0.21%	0.44%	0.60%	1.33%	
		Claims	0.03%	0.18%	0.34%	0.51%	0.77%	1.83%	
	For Profit	Trimmed CR	0.03%	0.34%	0.99%	1.82%	6.27%	9.46%	
		Claims	0.09%	0.50%	1.13%	2.07%	5.37%	9.16%	
	Government	Trimmed CR	0.02%	0.13%	0.11%	0.10%	0.08%	0.44%	
		Claims	0.07%	0.22%	0.25%	0.18%	0.13%	0.84%	
	Facility-based	Trimmed CR	0.05%	0.32%	0.72%	0.83%	0.43%	2.35%	
		Claims	0.11%	0.57%	0.85%	0.80%	0.47%	2.79%	
	All types	Trimmed CR	1.24%	7.34%	14.15%	20.77%	56.50%	100%	
		Claims	2.07%	9.08%	15.73%	21.53%	51.58%	100%	

Appendix Table B3 shows the percentage of physical therapy visits occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).

Table B4: Occupational Therapy Visits in Strata by Source

			Number of Episodes					All Sizes	
			0 to 94	95 to 249	250 to 499	500 to 999	1000 or More		
Provider Type	Urban	Non Profit	Trimmed CR	0.02%	0.18%	0.55%	1.36%	13.34%	15.46%
			Claims	0.12%	0.42%	0.90%	1.79%	12.53%	15.76%
		For Profit	Trimmed CR	0.79%	4.16%	7.77%	13.96%	38.15%	64.83%
			Claims	1.05%	4.46%	8.97%	14.49%	33.80%	62.76%
	Rural	Government	Trimmed CR	0.01%	0.05%	0.09%	0.22%	0.10%	0.47%
			Claims	0.02%	0.11%	0.11%	0.15%	0.17%	0.55%
		Facility-based	Trimmed CR	0.07%	0.22%	0.82%	1.63%	4.27%	7.01%
			Claims	0.05%	0.36%	0.78%	2.00%	4.48%	7.67%
All types	Non Profit	Trimmed CR	0.00%	0.05%	0.22%	0.41%	0.54%	1.22%	
		Claims	0.02%	0.15%	0.31%	0.54%	0.78%	1.80%	
	For Profit	Trimmed CR	0.01%	0.28%	0.84%	1.61%	5.90%	8.64%	
		Claims	0.06%	0.37%	0.79%	1.95%	5.20%	8.38%	
	Government	Trimmed CR	0.01%	0.14%	0.07%	0.07%	0.06%	0.35%	
		Claims	0.03%	0.16%	0.17%	0.17%	0.09%	0.62%	
	Facility-based	Trimmed CR	0.05%	0.25%	0.60%	0.60%	0.52%	2.03%	
		Claims	0.09%	0.51%	0.64%	0.67%	0.53%	2.44%	
All types		Trimmed CR	0.96%	5.32%	10.96%	19.87%	62.89%	100%	
		Claims	1.44%	6.53%	12.68%	21.76%	57.58%	100%	

Appendix Table B4 shows the percentage of occupational therapy visits occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).

Table B5: Speech Language Pathology Visits in Strata by Source

		Number of Episodes						All Sizes	
		0 to 94	95 to 249	250 to 499	500 to 999	1000 or More			
Provider Type	Urban	Non Profit	Trimmed CR	0.01%	0.34%	0.73%	1.13%	12.42%	14.63%
			Claims	0.09%	0.42%	0.83%	1.49%	11.87%	14.71%
		For Profit	Trimmed CR	0.74%	3.19%	6.88%	12.30%	39.86%	62.95%
			Claims	0.58%	2.93%	6.82%	13.61%	39.10%	63.04%
	Rural	Government	Trimmed CR	0.00%	0.04%	0.09%	1.57%	0.08%	1.78%
			Claims	0.01%	0.07%	0.10%	0.19%	0.10%	0.47%
		Facility-based	Trimmed CR	0.05%	0.12%	0.73%	1.74%	4.22%	6.86%
			Claims	0.02%	0.28%	0.71%	1.66%	4.84%	7.51%
All types	Non Profit	Trimmed CR	0.00%	0.04%	0.16%	0.42%	0.50%	1.11%	
		Claims	0.02%	0.10%	0.32%	0.47%	0.68%	1.60%	
	For Profit	Trimmed CR	0.02%	0.98%	0.70%	2.27%	6.13%	10.10%	
		Claims	0.04%	0.22%	0.75%	2.35%	6.06%	9.42%	
All types	Government	Trimmed CR	0.01%	0.22%	0.22%	0.09%	0.02%	0.56%	
		Claims	0.03%	0.10%	0.13%	0.12%	0.08%	0.46%	
All types	Facility-based	Trimmed CR	0.04%	0.21%	0.52%	0.78%	0.46%	2.01%	
		Claims	0.07%	0.43%	0.63%	0.71%	0.95%	2.79%	
All types		Trimmed CR	0.88%	5.14%	10.02%	20.29%	63.67%	100%	
		Claims	0.87%	4.56%	10.29%	20.61%	63.67%	100%	

Appendix Table B5 shows the percentage of speech language pathology visits occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).

Table B6: Medical Social Services Visits in Strata by Source

		Number of Episodes						All Sizes	
		0 to 94	95 to 249	250 to 499	500 to 999	1000 or More			
Provider Type	Urban	Non Profit	Trimmed CR	0.04%	0.46%	0.78%	1.65%	18.65%	21.59%
			Claims	0.12%	0.43%	1.09%	2.26%	18.79%	22.70%
		For Profit	Trimmed CR	0.53%	3.97%	6.77%	12.33%	31.36%	54.95%
			Claims	0.66%	3.51%	7.76%	12.40%	29.20%	53.52%
	Rural	Government	Trimmed CR	0.00%	0.04%	0.16%	0.21%	0.19%	0.60%
			Claims	0.01%	0.09%	0.15%	0.18%	0.16%	0.59%
		Facility-based	Trimmed CR	0.45%	0.25%	0.76%	2.55%	7.66%	11.68%
			Claims	0.05%	0.30%	0.80%	2.22%	7.60%	10.99%
All types	Non Profit	Trimmed CR	0.00%	0.07%	0.16%	0.61%	0.58%	1.41%	
		Claims	0.02%	0.12%	0.20%	0.64%	1.20%	2.18%	
	For Profit	Trimmed CR	0.01%	0.14%	0.45%	1.71%	4.75%	7.06%	
		Claims	0.02%	0.23%	0.64%	1.71%	4.45%	7.06%	
All types	Government	Trimmed CR	0.00%	0.01%	0.10%	0.11%	0.13%	0.35%	
		Claims	0.00%	0.06%	0.14%	0.17%	0.08%	0.46%	
All types	Facility-based	Trimmed CR	0.03%	0.24%	0.73%	0.74%	0.61%	2.35%	
		Claims	0.03%	0.33%	0.65%	0.78%	0.72%	2.51%	
All types	Trimmed CR	1.07%	5.18%	9.91%	19.90%	63.93%	100%		
	Claims	0.92%	5.08%	11.43%	20.36%	62.20%	100%		

Appendix Table B6 shows the percentage of medical social service occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).

Table B7: Home Health Aide Visits in Strata by Source

			Number of Episodes					All Sizes	
			0 to 94	95 to 249	250 to 499	500 to 999	1000 or More		
Provider Type	Urban	Non Profit	Trimmed CR	0.05%	0.24%	0.93%	0.87%	6.61%	8.70%
			Claims	0.22%	0.50%	1.08%	1.55%	13.55%	16.91%
		For Profit	Trimmed CR	4.03%	13.86%	8.61%	12.61%	33.09%	72.21%
			Claims	2.40%	7.42%	10.42%	10.96%	23.44%	54.64%
		Government	Trimmed CR	0.01%	0.03%	0.15%	0.10%	0.61%	0.90%
			Claims	0.06%	0.18%	0.16%	0.17%	0.13%	0.70%
		Facility-based	Trimmed CR	0.39%	0.11%	0.36%	0.68%	2.44%	3.99%
			Claims	0.16%	0.38%	0.79%	1.30%	3.63%	6.26%
Rural		Non Profit	Trimmed CR	0.02%	0.10%	0.18%	0.33%	0.54%	1.17%
			Claims	0.07%	0.24%	0.40%	0.63%	1.02%	2.36%
		For Profit	Trimmed CR	0.19%	1.71%	1.36%	1.56%	5.28%	10.09%
			Claims	0.18%	0.87%	1.98%	2.72%	7.55%	13.30%
		Government	Trimmed CR	0.06%	0.26%	0.16%	0.08%	0.13%	0.69%
			Claims	0.31%	0.55%	0.40%	0.34%	0.34%	1.93%
		Facility-based	Trimmed CR	0.17%	0.51%	0.66%	0.57%	0.33%	2.25%
			Claims	0.20%	0.76%	1.19%	0.96%	0.79%	3.90%
	All types	Trimmed CR	4.92%	16.83%	12.41%	16.81%	49.03%	100%	
		Claims	3.60%	10.90%	16.41%	18.63%	50.46%	100%	

Appendix Table B7 shows the percentage of home health aide visits occurring from providers in the given provider-type-size-urban combinations for the trimmed FY 2011 cost report sample and the CY 2011 claims file (bolded).