Medicare Hospice Payment Reform: Hospice Study Technical Report

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1. Introduction

Section 3132(a) of The Patient Protection and Affordable Care Act of 2010 (ACA) requires the Secretary of Health and Human Services (HHS) to revise Medicare's payment system for hospice care. This legislation comes as a response to (1) significant changes in hospice utilization since the hospice benefit was established in 1983, and (2) recommendations by the Medicare Payment Advisory Commission (MedPAC) and others, for updating the hospice payment system. These updates, as required by the ACA include revising the Routine Home Care rate and the corresponding methodology, as well as the rates for other hospice services as deemed appropriate by the Centers for Medicare and Medicaid Services (CMS). Additionally, it allows for the Secretary to collect "…additional data and information as the Secretary determines appropriate to revise payments for hospice care." These additional data collection efforts may include data on:

- Hospice-related charges, payments, costs, number of days, and number of visits attributable to each type of service;
- Type of practitioner providing the hospice visit;
- Length of visit and other information related to visit;
- Number of hospice days attributable to Medicare beneficiaries enrolled under Part A; and/or
- Charitable contributions and other revenues for hospice providers.

From data such as these (which, as required by the legislation, the Secretary should begin collecting no later than January 1, 2011), HHS is required to implement revisions to the hospice payment methodology no earlier than October 1, 2013. The ACA mandates that the revisions to Medicare's hospice payment system "…shall result in the same estimated amount of aggregate expenditures under this title for hospice care furnished in the fiscal year in which such revisions in payment are implemented as would have been made under this title for such care in such fiscal year if such revisions had not been implemented." That is, revisions need to be budget neutral for the first year.[1]

CMS contracted with Abt Associates Inc., teaming with Social and Scientific Systems, Inc. and the Brown University Center for Gerontology and Healthcare Research, to conduct comprehensive data analyses. This report will share some initial results of that data analysis, as described below.

- Section 2 describes the construction of the analytic files used for this project.
- Section 3 provides heat maps which highlight geographic variations in per-beneficiary hospice utilization rate and payment amounts across markets.
- Section 4 presents an analysis of General Inpatient Care (GIP) utilization among hospice beneficiaries and the characteristics of hospice providers who provide GIP services compared to those who do not provide any GIP services.
- Section 5 presents the findings of an analysis of FY 2004–2011 Medicare hospice cost reports which examined the sources of costs for hospice providers.

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[1] The law does not provide HHS with the authority to change the eligibility and coverage requirements under the hospice benefit. We also note that the ACA makes additional changes to the hospice program that are unrelated to its payment program (e.g., 3132(b), 3140, and 10326).

- Section 6 presents an analysis of the impact of the "face-to-face" encounter requirement for recertification based on the number of benefit periods a Medicare beneficiary uses.
- Section 7 examines trends in hospice live discharges during 2010.
- Section 8 examines Part D billing of analgesic medications while a beneficiary is enrolled in hospice.
- Section 9 describes one potential payment reform option—a tiered model for Routine Home Care—and describes potential impacts of implementing such an option.
- Section 9 also describes one approach to rebasing the Routine Home Care base payment rate.

2. Construction of Data Files for the Analysis

This section provides an overview of the data files used for the analyses presented in this report.

We constructed multiple data files to support our analyses. They included data on two mutually-exclusive groups of individuals:

1. One set of files contains data on all Medicare beneficiaries who used at least 1 day of hospice services (based on claims) between 2005 and 2011 (n = 5,974,234) [These are referred to as the Hospice Beneficiary files].

2. Another set of files contains data on all Medicare beneficiaries who died in 2010 (n = 1,142,296) and 2011 (n = 1,118,612) and never utilized hospice (based on claims) while on Medicare [These are referred to as the non-Hospice Decedents files].

The first set of files (on Hospice Beneficiaries) is comprised of two files: The Hospice Claims files and the Hospice Day file. These files were used in the majority of analyses discussed in this report including the examination of geographic variation in hospice utilization and payment (Section 3), analysis of trends in GIP utilization (Section 4), analysis of the face-to-face visit requirement (Section 6), trends in live discharge (Section 7), trends in Part D utilization while enrolled in hospice, analyses in the reform options section (Section 9), descriptive statistics on hospice utilization for 2011 (Appendix A), and average resource use for routine home care days in 2011 (Appendix B). The second set of files was used to help us better understand key differences in utilization of healthcare services between decedents using hospice and those not using hospice. These results are not included in this report. We also created provider level files that include information on provider characteristics (Provider of Services file) and the Medicare Hospice Cost Reports (Cost Reports file). These files were used in a variety of analyses, including the analysis of benchmarks and trends in hospice cost reports (Section 5).

2.1 Specific Analytic Files Created

For Hospice Beneficiaries, we created two types of files: The Hospice Claims File and the Hospice Day File.

2.1.1 Hospice Claims File (Created from the Hospice SAF)

Social & Scientific Systems, Inc. (SSS) has created a hospice claim-level analytic file using information from the Hospice Standard Analytic File (SAF). The unit of observation in this file is a specific hospice claim for a particular beneficiary. This file contains claim-level information, that is, variables that do not change over the course of the claim. Examples of these variables include:

- Provider number
- Diagnoses codes
- Payment amount
- Claim from and through dates
- Dates identifying the start and end of a hospice benefit period.

2.1.2 Day Level Hospice Analytic File (Created from the Hospice SAF)

SSS also created a day-level hospice analytic file using information from the Hospice SAF. The unit of observation in this file is an individual day of hospice services for a particular beneficiary at a specific provider. The file is meant to describe the level of services (in terms of the number and length of visits and minutes) on a particular day of hospice enrollment. Examples of these variables include:

- Number of visits by discipline
- Number of minutes of care by discipline
- Level of care for a particular day of hospice
- Site of service for a particular day of hospice
- Daily payment amounts

Abt Associates has added information from the Enrollment Database (EDB) to this file, such as demographic data, and hospice enrollment period information for time periods prior to the earliest SAF file we acquired.

2.2 Data Sources Used

To analyze trends in Medicare hospice utilization, we have acquired several administrative data files from CMS in addition to the Hospice SAF. They are:

- Hospice Provider of Services (POS) File
- Medicare Enrollment Database (EDB)
- Hospice Cost Reports
- Inpatient SAF
- Skilled Nursing Facility (SNF) SAF
- Outpatient SAF
- Home Health Agency SAF
- Part B Claims (e.g. Carrier SAF)
- Durable Medical Equipment (DME) SAF
- Part D Drug Claims

Table 1 shows the years for which each type of data have been obtained and incorporated into an analytic file:

Table 1: Years of Data Currently Acquired and Incorporated into an Analytic File

Dataset	2004	2005	2006	2007	2008	2009	2010	2011
Hospice (SAF)		✓	✓	✓	✓	✓	✓	✓
Hospice POS				✓	✓	✓	✓	✓
Enrollment Database (EDB)		✓	✓	✓	✓	✓	✓	✓
Hospice Cost Reports	✓	✓	✓	✓	✓	✓	✓	✓
Inpatient SAF				✓	✓	✓	✓	✓
SNF SAF				✓	✓	✓	✓	✓
Outpatient SAF				✓	✓	✓	✓	✓
HHA SAF				✓	✓	✓	✓	✓
Part B Claims				✓	✓	✓	✓	✓
DME SAF				✓	✓	✓	✓	✓
Part D Drug Claims				✓	✓	✓	✓	✓

2.2.1 Hospice SAF

We use information from the Hospice SAF. SSS has used the Hospice SAF to create both the "Day-level" file and "Claim-level" file described above. Both files currently include claims with "Through Dates" between January 2005 and December 2011. The 2011 Hospice SAF data represented the June 2012 final SAF. Table 2 provides details regarding the number of beneficiaries, providers, and hospice days represented in each year of data.

Table 2: Number of Beneficiaries, Providers, and Days of Hospice as Found in the Hospice SAF

Calendar year	Number of unique beneficiary IDs	Number of unique provider numbers	Number of hospice days[2]
2005	870,424	2,878	57,023,165
2006	934,323	3,044	64,170,179
2007	996,641	3,248	70,136,822
2008	1,051,498	3,329	73,587,195
2009	1,090,840	3,385	77,014,398
2010	1,160,235	3,497	81,292,368
2011	1,220,682	3,585	85,049,995

2.2.2 Enrollment Database (EDB)

We use information from the Medicare Enrollment Database (EDB) for both the Hospice Day-Level file and the Non-Hospice Decedent file.

These items include:

- Birth and death date
- Sex and race
- Indicators for Part A, B, D, Medicaid, and Medicare Advantage Coverage
- Indicator for hospice election period

[2] This counts hospice days billed at any level of care. Days are considered CHC if the CHC rate was billed on a particular day.

2.2.3 Hospice Provider of Services (POS) File

The provider of services (POS) files contain quarterly updates of information on the hospice itself. Examples of variables found in this file include:

- Location (city, state, county)
- Age of provider
- Provider number
- Staffing information (as of most recent survey)[3]
- Facility type (freestanding or facility-based)
- Ownership type

We currently have the POS extracts that correspond to the following dates:

- POS as of January 1, 2008
- POS as of January 1, 2009
- POS as of January 1, 2010
- POS as of January 1, 2011
- POS as of April 1, 2011

2.2.4 Hospice Cost Reports

We have collected hospice Medicare costs reports for fiscal years 2004–2011. We use this information to study hospice costs by cost center. More information about how cost reports are trimmed and how they are used for analysis can be found in Section 5 of this report.

2.3 Construction of the Hospice Analytic Files

This section provides some additional detail describing the data, data elements, and exclusions used in the creation of the analytic file(s).

2.3.1 Hospice Beneficiary Exclusions

A number of beneficiaries were excluded from the Hospice SAF data due to missing or unusual data that would make the creation of the "day-level" file excessively complicated. These exclusions are made by looking at all years of the Hospice SAF combined (e.g., 2005–2011) and dropping a small number of beneficiaries (roughly 0.23% of the sample). Prior to the exclusions, there were 5,988,057 unique beneficiary IDs included in the file. Due to the exclusions listed below, 13,823 beneficiaries were dropped, leaving 5,974,234 beneficiaries in the SSS analytic files.[4] All claims for a beneficiary were dropped if any of the following occurred[5]:

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[3] Note that hospice providers are not surveyed frequently. Examining the CMS Provider of Services file (as of March 2011) shows that on average active providers have gone 4 years since their last survey. One provider had not been surveyed in 26 years.

[4] Due to the short length of time many individuals utilize hospice before they die, we did not cross-reference beneficiary IDs. It is therefore possible that a single person may be represented in either the Hospice SAF data or any other Medicare claims we use under multiple beneficiary IDs.

[5] Note, some beneficiaries appear in multiple exclusions.

1. A claim for a beneficiary was missing the hospice start date [1,487 beneficiaries].
2. A line item for a beneficiary had revenue units equal to 0 and the revenue center was not equal to "0001" [924 beneficiaries].
3. A line item for a beneficiary had a missing revenue date and the revenue center was not equal to "0001" [6,021 beneficiaries].
4. A claim for a beneficiary had a benefit period start date that is later than the "from" date of the claim [2,287 beneficiaries].
5. Two claims (from the same provider) for a beneficiary covered overlapping time periods [2,782 beneficiaries].
6. A beneficiary had service days without corresponding hospice period days [74 beneficiaries].
7. Two claims for a beneficiary were duplicates (same from- and through- dates, different providers) [111 beneficiaries].
8. A claim for a beneficiary had inconsistent or out of order start dates (based on through date) [375 beneficiaries].

2.4 Analysis of Hospice Analytic Files

We use the analytic files described above to examine several aspects of hospice utilization. Appendix A in this report provides several basic descriptive statistics on hospice utilization from 2011. Appendix B in this report provides average resource utilization for routine home care (RHC) days in 2011 based on when the day fell within a beneficiary's lifetime length of stay in hospice**.** The other sections of this report also use the analytic files to produce the results that are described.

2.4.1 Background Information Regarding Hospice Utilization by Medicare Beneficiaries in 2011

Table A.1 in Appendix A provides detailed information about hospice utilization based on episodes that occurred in 2011. The results include information on 129,253,613 hospices days across 1,312,819 hospice episodes among 1,220,680 unique beneficiaries. Episodes were concentrated amongst the older population of Medicare beneficiaries. Of the episodes examined, 47.3% were for beneficiaries who were 85 years or older on the first day of the episode. We found that 31.0% of the episodes were for beneficiaries who were between (and including) 75 years of age and 84 years of age. Almost 60% of the hospice episodes were for female beneficiaries. Hospice is predominantly (87.4% of episodes) used by beneficiaries identifying themselves as White, non-Hispanic. Hospice is primarily being used for individuals without a primary diagnosis of cancer. Specifically, 71.3% of the episodes had a non-cancer principal diagnosis listed on the first claim of the episode. We also found that 12.0% of the episodes had "adult failure to thrive" as the principal diagnosis on the first claim of the episode. Typically (75.4% of episodes), only 1 diagnosis is listed on each of the claims that corresponded to the episodes. 43.94% of the episodes occurred at for-profit providers based on the provider identified during the first day of the episode. In addition, 41.43% of the episodes occurred in the South census region.

There was some variation in the length of the episodes with 13.5% of the episodes examined (not restricted to decedents) lasting between 1–3 days, 13.8% lasting between 4–7 days, and 6.4% lasting between 8–10 days. We also found that 16.3% of episodes lasted 181 days or longer. Overall, average length of stay for the episodes examined was 81 days (Figure A.1). There was some variation in this number by site of service with average length of stay in the patient home being 81 days, average length of stay in the nursing home being 88 days, and average length of stay in an assisted living facility being 121 days.

As shown in Figure A.2, based on the episodes examined, 83% died in hospice, 8% were alive in hospice as of December 31, 2011. Four percent were discharged/revoked from hospice and alive after discharge/revocation. Five percent were discharged/revoked from hospice and died after discharge/revocation. These figures are mostly consistent across each site of service. However, the assisted living site of service had a smaller percentage of episodes that died in hospice and a larger percentage of episodes that were alive and in hospice as of December 31, 2012.

On average, episodes received 72.38 Part A visits (including Physician/NP visits recorded on the hospice claim as well as discipline visits) as shown in Figure A.3. There was substantial variation related to the site of service (which will also related to the length of stay mentioned above) with average visits in the patient home being 56, average visits in the nursing home being 71, and average visits in the assisted living facility being 93.

Although we do not report the following in Appendix A, we also examined all Medicare hospice claims that occurred in 2011 and found:

- Total Medicare payments on hospice claims equaled $13.8 billion.
- There were 3,585 hospice providers that provided at least 1 day of hospice.

2.4.2 The Average Resource Curve for Routine Home Care Days in 2011

Appendix B provides detailed information about average resource utilization for RHC days in 2011. An episode's resource use is a description of the wage weighted minutes of care (as reported on the claim) the hospice provides on a particular day of hospice. Resource use does not measure the actual costs a hospice incurs on a daily basis, but is used as a proxy for the key labor costs that a hospice incurs; non-labor costs are not reflected in this analysis. The purpose of this analysis is to describe relative costs (e.g. such as the beginning and end of a hospice episode are more intensive than the middle) as opposed to absolute costs. We use data from the Bureau of Labor Statistics to determine a national hourly wage rate (which include the hourly wage plus an estimate of fringe benefit costs) for the six disciplines of care whose minutes are reported on the claim. For 2011, the national hourly wage rate that was used for the six disciplines of care was:

- Skilled Nursing: $38.82
- Physical Therapy: $54.30
- Occupational Therapy: $54.06
- Speech Language Pathology: $59.46
- Medical Social Service: $36.19
- Home Health Aide: $13.89

Those hourly wage rates are multiplied by the number of hours of service reported on the claim for a particular day of hospice to compute the resource use that occurred on a particular day of hospice.[6]

Figure B.1 shows resource utilization is highest at the beginning of a beneficiary's lifetime length of stay and the end of the beneficiary's lifetime length of stay. RHC falling on the first three days of a beneficiary's lifetime length of stay in hospice had average resource use of $82.30, $36.52, and $22.70 respectively. Looking at the last 6 days before a beneficiary died, average resource use starts out at $25.65 on the 6th day before death and ends up at $56.89 on the day of death. The other days typically had average resource use ranging between $12 and $16. Average resource utilization peaked every 7th day after the beneficiary's first day in hospice.

[6] As a data cleaning step, for a given day, minutes reported on the claim were censored at 1,440. That is, it was imposed that no hospice provided more than 24 hours of care for one specific discipline on a given day of hospice.

3. Geographic Variation in Hospice Utilization and Payment

3.1 Background and Methods

In this section of the report we present two "heat maps" which highlight geographic variations in per-beneficiary hospice utilization rates and payment amounts across markets that are defined using the CBSA (or rural area) where hospice service occurred. Heat maps are charts in which values are depicted by the shading intensity within a geographical boundary. They are useful to quickly compare differences across areas and advantageous over tables by incorporating a spatial arrangement of the data.

To construct these maps, we used the Hospice Day File to develop an analytic file comprised of all hospice service days provided in calendar year 2011. We then assigned each hospice day to the "market" in which the service took place. "Markets" fell into two categories:

Urban Markets: Hospice services occurring in urban counties were assigned to the Core Based Statistical Area (CBSA) of which the county belongs.

Rural Markets: Non-CBSA counties were grouped into state-wide rural markets. Hospice service days not occurring within an urban county were assigned by state to these rural markets.

In addition to the total number of hospice service days, our analytic file includes the total number of beneficiaries receiving hospice services and the total payment amounts made for hospice services provided.

3.2 Results

We identified 85.2 million days of hospice service provided to Medicare beneficiaries in 2011. There were 69.4 million days (81%) provided in urban markets and 15.7 million days (18%) provided in rural markets. We also identified 84,038 days (less than 1%) for which no service location was provided which we subsequently omitted from our analyses.

We calculated that total hospice payments in 2011 were $13.8 billion. In urban markets total payments were $11.6 billion (84% of total payments in 2011), and total payments in rural markets were $2.2 billion (16% of total payments in 2011). Total payments for service days with an unidentified location amounted to $5 million.

Figure 1 (at the end of this section) presents a map entitled "Hospice Utilization Days per Hospice Beneficiary (All Markets), 2011." This heat map displays the average number of Medicare hospice service days per user in 2011 for markets in the continental 48 states, constructed from the U.S. Census Bureau's county-level TIGER shapefile (Alaska and Hawaii are not displayed but we note underneath the values for these states' markets).[7] Average days of hospice service per user were calculated for each market by aggregating the total number of hospice service days provided in 2011

[7] The boundaries of these shapefiles extend to the limit of U.S. territory. This feature results in some atypical boundary shaping around some counties tangential to water (the Great Lakes in particular).

and dividing by the total number of beneficiaries receiving hospice service in that market in 2011. These estimates were then applied to the county-level shapefile map. Due to the structure of the underlying data, all counties within a CBSA, and all non-CBSA counties within a state, were assigned the same estimate value.[8]

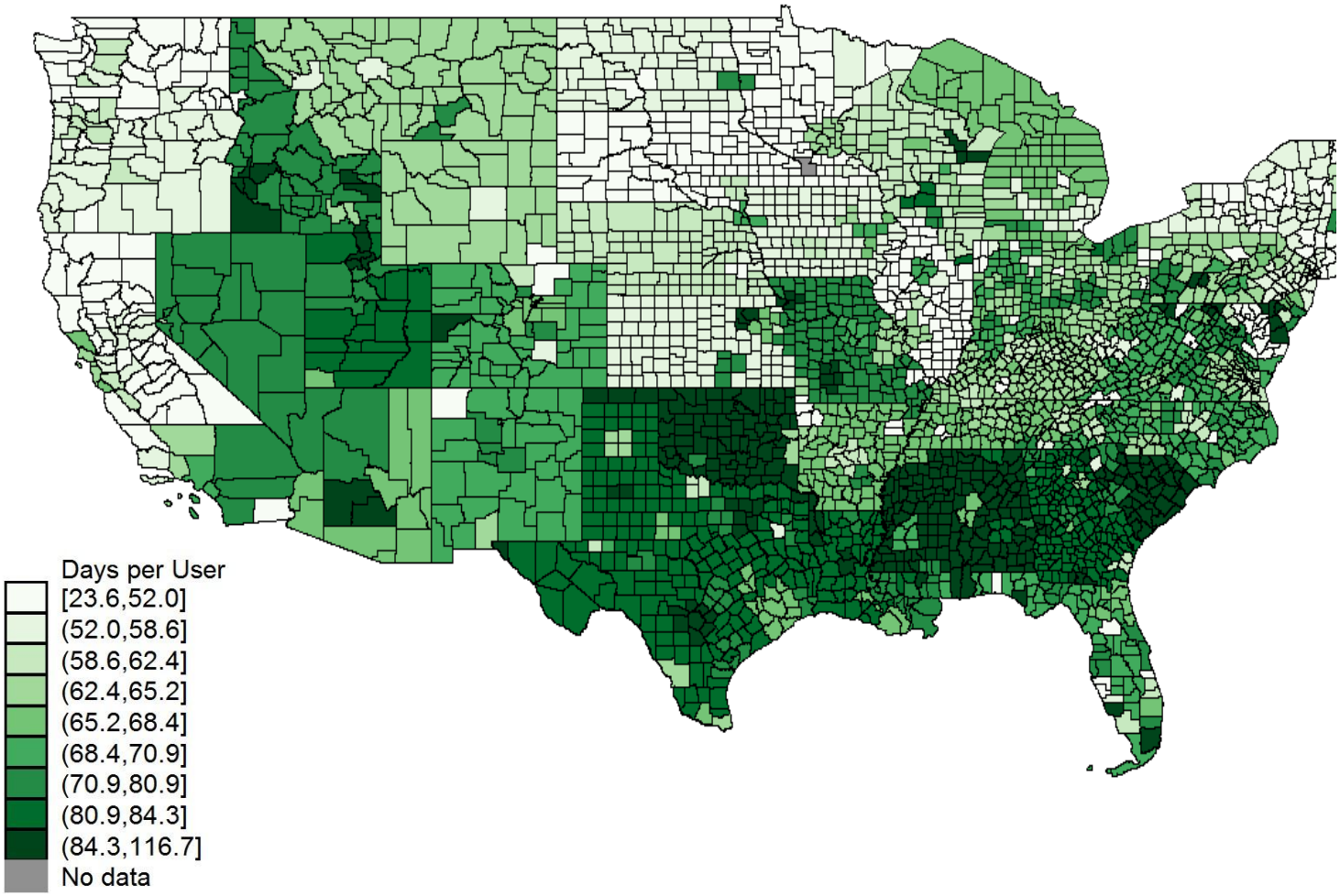
Among urban markets, the average service days per beneficiary ranged from 23.6 days per beneficiary in Cheyenne, WY to 116.7 days per beneficiary in Morgantown, WV; followed in decreasing order by Gadsden, AL (108.5 days); Johnstown, PA (104.9 days); and Florence, SC (103.5 days). Among rural markets, the average service days per beneficiary ranged from 42.1 days per beneficiary in rural Connecticut to 99.4 days per beneficiary in rural Mississippi, followed in decreasing order by rural Alabama (91.9 days), rural Delaware (87.2 days), and rural Oklahoma (87.0 days). The median among urban markets was 64.9 service days per beneficiary (Oxnard-Thousand Oaks-Ventura, CA) and the median among rural markets was 65.4 service days per beneficiary (rural Arkansas).

A second map, entitled "Hospice Payments per Hospice Beneficiary (All Markets), 2011," is presented in Figure 2 (below). This heat map displays the average hospice payments (in $1,000s) per Medicare hospice user in 2011 by hospice market again for the continental 48 states. Average hospice payments per Medicare hospice user were calculated for each market by aggregating total hospice payments for services provided in 2011 and dividing by the total number of beneficiaries receiving hospice service in that market in 2011. These estimates were then applied to the county-level national map in a similar manner to utilization days per beneficiary, above.

Among urban markets, the average payments per beneficiary in 2011 ranged from $3,618 per beneficiary in Cheyenne, WY to $17,662 per beneficiary in Miami-Miami Beach-Kendall, FL; followed in decreasing order by Ft. Lauderdale-Pompano Beach-Deerfield, FL ($16,917); Columbus, GA-AL ($16,466); and Grand Junction, CO ($16,110). Among rural markets, the average payments per beneficiary ranged from $6,101 per beneficiary in rural South Dakota to $14,521 per beneficiary in rural Delaware, followed in decreasing order by rural Massachusetts ($14,175), rural Mississippi ($13,604), and rural South Carolina ($12,110). The median among urban markets was $10,246 per beneficiary (Memphis TN-MS-AR) and the median among rural markets was $9,355 per beneficiary (rural Ohio).

[8] We are only able to identify the CBSA (or state) in which hospice service occurred; we cannot identify the exact county of service. For this reason, all counties within an urban or rural market are grouped and the same estimate value is applied to all counties in that grouping. There is presumably additional geographic variation county-by-county *within* markets.

Figure 1: Hospice Utilization Days per Hospice Beneficiary (All Markets), 2011



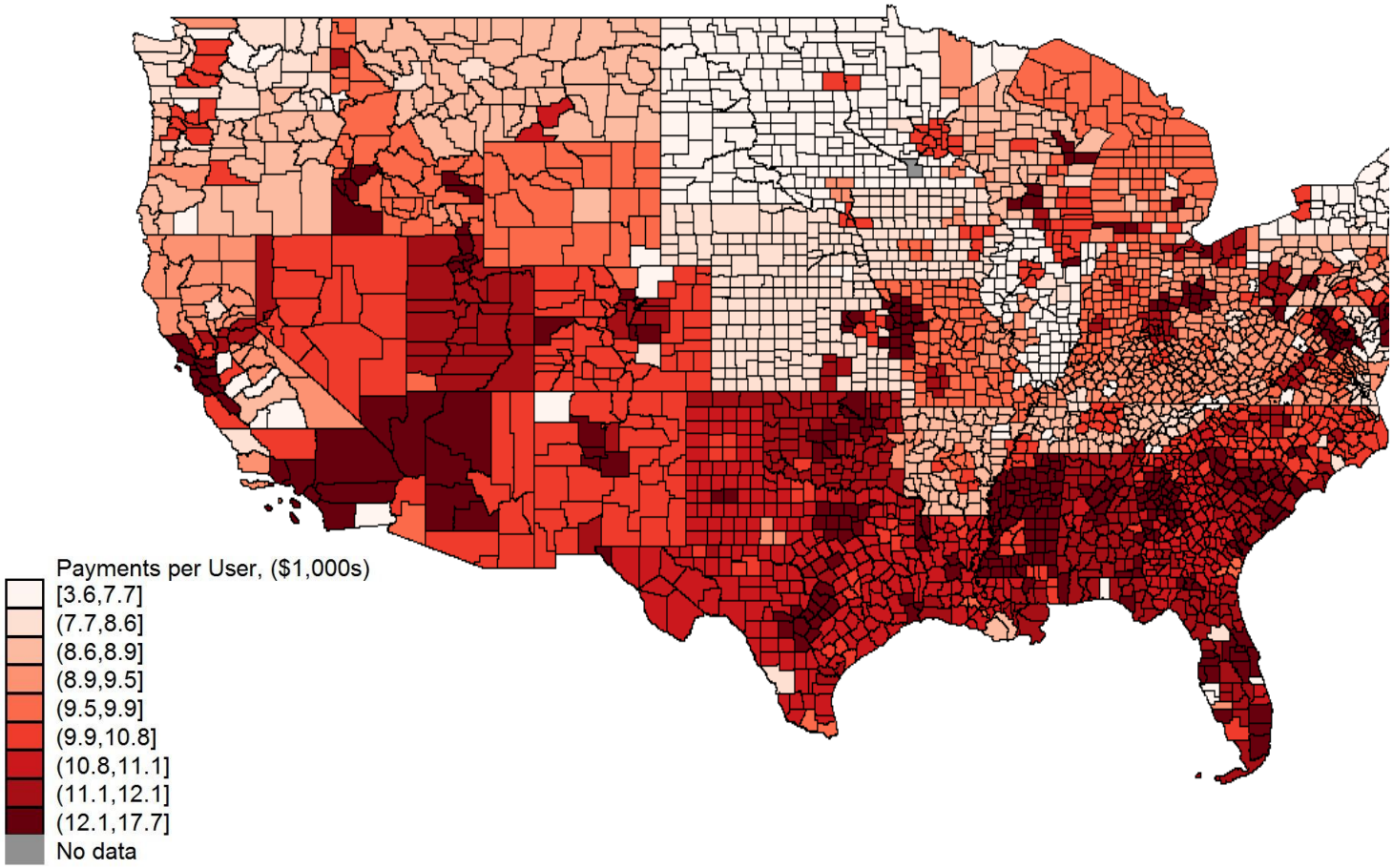
Note: (1) Values for Alaska and Hawaii are: urban AK 45.0; rural AK 54.5; urban HI 63.1; rural HI 60.5

(2) Limitations in the underlying data result in some atypical boundary shpaing around some counties tangential to water (the Great Lakes in particular)

(3) Data on service location was available only at the CBSA/non-CBSA level; therefore, a single average value is assigned to all counties within a CBSA and to all non-CBSA counties in each state.

Source: Abt Associates Analysis of 2011 Medicare claims data.

Figure 2: Hospice Payments per Hospice Beneficiary (All Markets), 2011



Note: (1) Values for Alaska and Hawaii (not displayed) are: urban AK 7.8; rural AK 9.3; urban HI 11.0; rural HI 9.9 (all in $1,000s)

(2) Limitations in the underlying data result in some atypical boundary shpaing around some counties tangential to water (the Great Lakes in particular)

(3) Data on service location was available only at the CBSA/non-CBSA level; therefore, a single average value is assigned to all counties within a CBSA and to all non-CBSA counties in each state.

Source: Abt Associates Analysis of 2011 Medicare claims data.

4. Analysis of Trends in General Inpatient Care Utilization

4.1 Background

General inpatient care (GIP) is one of the four levels of care under the hospice benefit. GIP is short-term inpatient care provided in a hospice facility, a hospital, or a SNF for pain control or acute or chronic symptom management which cannot be managed in other settings. Overall, it is used relatively infrequently (as reported below, GIP accounts for just 1.5% of all hospice days in 2010–2011). However, it is relatively expensive compared to the more commonly billed routine home care (RHC): the FY 2012 payment rate for GIP was $671.84 per day compared to $151.03 for a day of RHC.

To better understand the GIP level of care, we used Medicare hospice claims from 2010–2011 to analyze GIP utilization among hospice beneficiaries and to compare the characteristics of hospice providers who provide GIP services to those who do not provide any GIP services.

4.2 GIP Utilization

We found that approximately one-quarter of all hospice beneficiaries (N=500,579) had 553,397 GIP stays comprised of 3,134,952 GIP days (Table 3); "GIP stay" is defined as one or more consecutive GIP days in hospice claims file.

Table 3: Summary of GIP Utilization

	Total number
Beneficiaries with any GIP days in 2010–2011:	500,759
GIP stays (i.e., consecutive periods of GIP days) in 2010–2011:	553,397
GIP days in 2010–2011:	3,134,952

Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

Among beneficiaries who had a GIP stay, the average number of GIP stays per beneficiary was 1.1, and the vast majority (92.5%) of beneficiaries had just 1 stay (Table 4). A small percentage (<1%) had four or more GIP stays over the two year period.

Table 4: Frequency of GIP Stays (Among Beneficiaries Who Had at Least 1 GIP Stay in 2010–2011)

Number of GIP stays	Number of beneficiaries	%
1	463,256	92.5%
2	28,927	5.8%
3	5,531	1.1%
4–44	3,045	0.6%
Total	500,759	100%

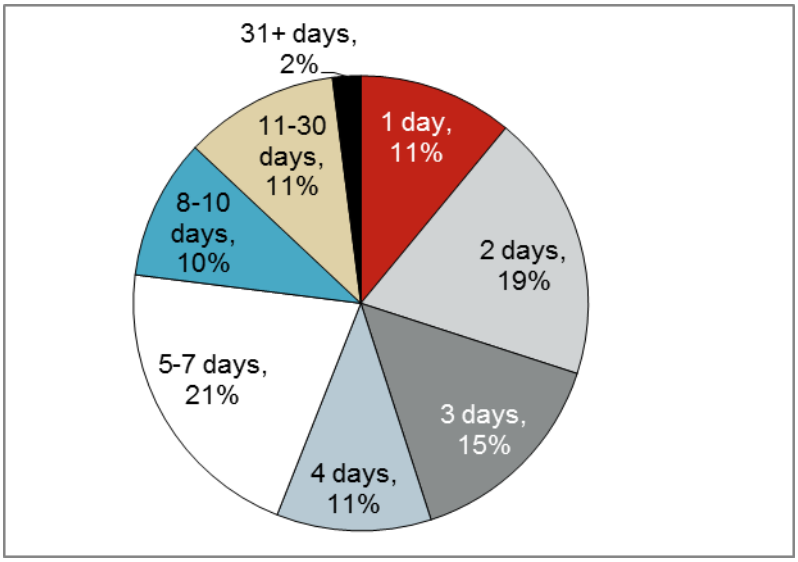
Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.2.1 Length of GIP stay

The total number of GIP stays among all beneficiaries who had at least 1 GIP stay is 553,397 (as mentioned above, a GIP stay was defined as consecutive GIP days). The average duration of a GIP

stay was 5.7 days per stay with a median of 4 days. Figure 3 provides additional detail on the length of stay per GIP stay. Most GIP stays were just two days (mode). Over half (56%) of GIP stays were 1–4 days, and nearly all (98%) were 30 days or less.

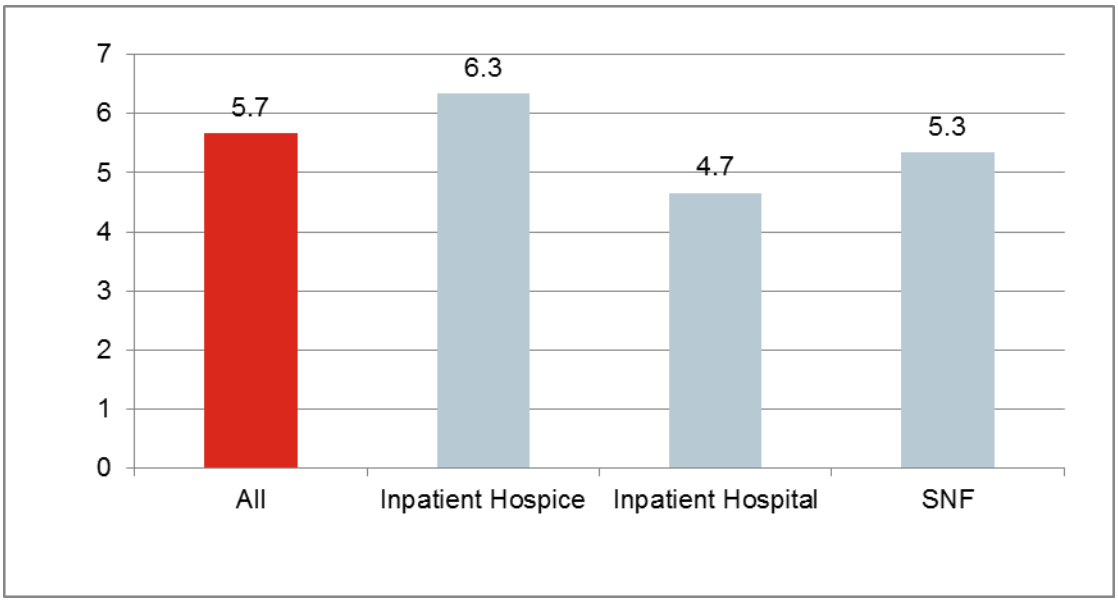
Figure 3: Length of GIP Stays (in 2010–2011)



Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

The average length of a GIP stay varied by site of service (Figure 4). GIP stays provided at inpatient hospices had a slightly longer average length of stay compared to all GIP stays (6.3 days vs. 5.7 days, respectively). GIP stays provided at inpatient hospital sites had the shortest average LOS (4.7 days).

Figure 4: Average Length of GIP Stay (Days) Across Sites of Service (2010–2011)

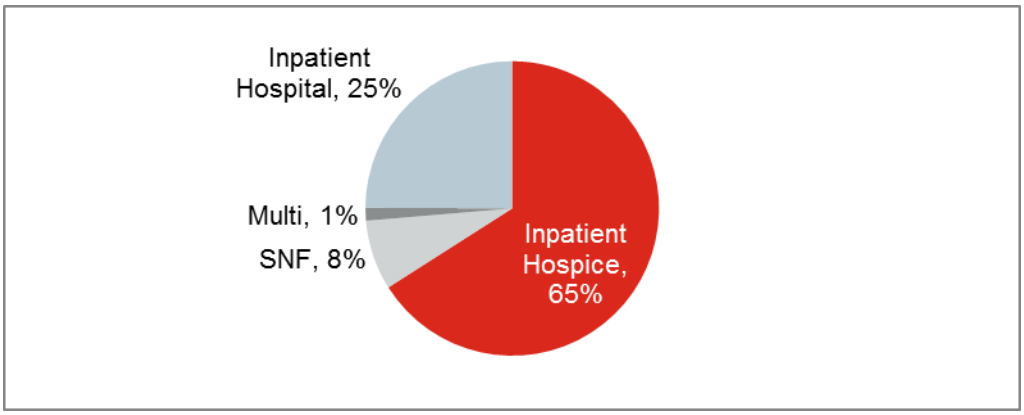


Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.2.2 Site of Service of GIP Stay

The corresponding total number of days associated with the 553,397 GIP stays in 2010–2011 is 3,134,952. Over 65% of all GIP days were provided in an inpatient hospice facility, and a quarter of GIP days were provided in an inpatient hospital (Figure 5). Approximately 8% of GIP days were provided in a skilled nursing facility (SNF).

Figure 5: Share of GIP Days by Site of Service (2010–2011)

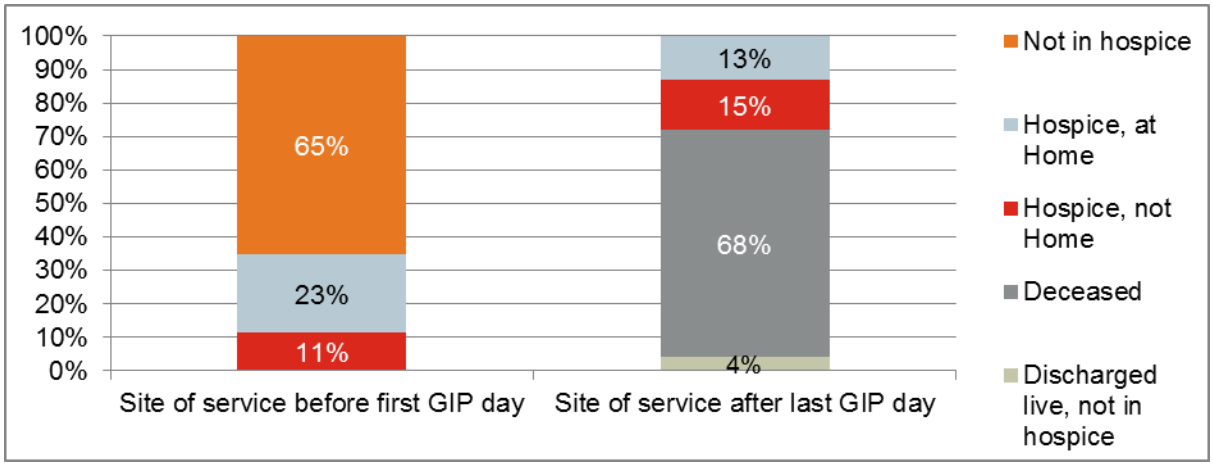


Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.2.3 Transitions to and from a GIP Stay

We also examined transitions to and from a GIP stay. On the day immediately preceding the GIP stay, nearly two-thirds (65%) of beneficiaries were not in hospice (that is, their first day in hospice was the GIP stay), nearly a quarter (23%) were receiving hospice services at home, and the remaining 11% were receiving hospice services not at home (first bar of Figure 6). Over two-thirds (68%) of beneficiaries die during their GIP stay while 28% remained in hospice but received services in a non-inpatient setting (13% +15%; second bar of Figure 6). Only 4% of beneficiaries were discharged alive from hospice immediately following their GIP stay.

Figure 6: Site of Service Before and After GIP Stay (2010–2011)

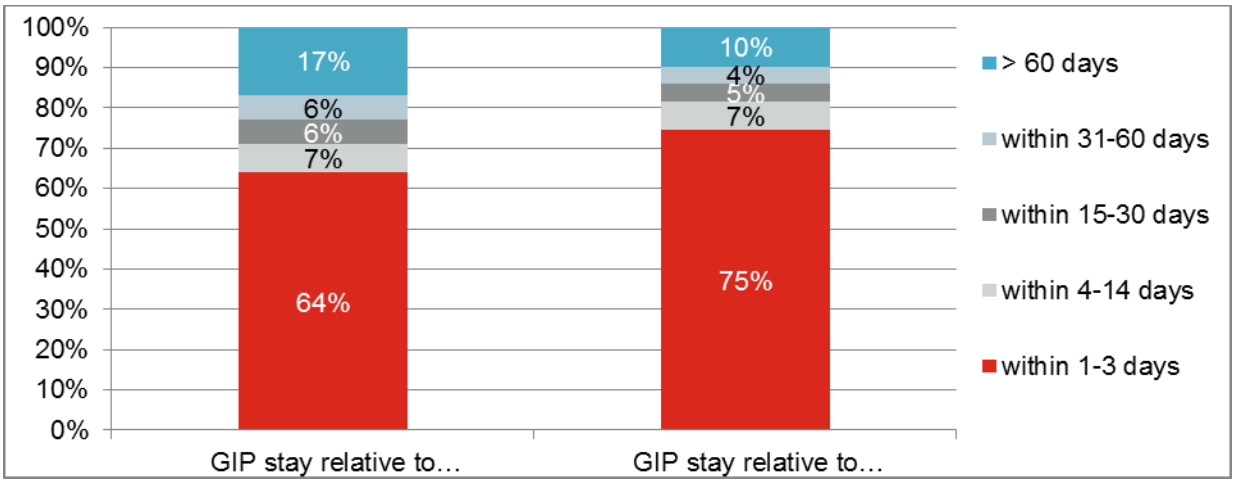


Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.2.4 Timing of a GIP Stay Within the Hospice Episode

Figure 7 shows when the GIP stay occurred relative to the beneficiaries' entire hospice episode. Nearly two thirds (64%) of GIP stays began within 3 days of the beginning of the beneficiary's hospice episode, while almost a quarter (23%) of GIP stays began over 30 days after the beneficiary began hospice (first bar of Figure 7). Three-quarters of GIP stays ended within 3 days of the end of the beneficiary's hospice episode (second bar of Figure 7).

Figure 7: Timing of GIP Stay (2010–2011)



Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.3 Provider Characteristics

Among the 3,593 hospice providers who had at least one hospice claim in 2010–2011, 2,853 (79%) provided at least one GIP day. For the 2,853 "GIP providers," the percentage of GIP days out of their total number of hospice days (i.e., sum of all RHC days, continuous home care (CHC) days, inpatient respite care (IRC) days, and GIP days) was 1.5% on average, with a median of 0.4% (Table 5). Over 99% of these GIP providers had 13% or fewer GIP days out of their total number of billed hospice days, although there were a small number of providers who had over 20% of their hospice days as GIP days (maximum=28.4%).

Table 5: Percent GIP Days Among GIP Providers (N=2,853)

		Percentile of GIP providers						
	Average	25th	50th	75th	90th	95th	99th	Max
Percent GIP days (GIP days/all hospice days billed by the provider)	1.5%	0.1%	0.4%	1.7%	4.6%	6.8%	12.9%	28.4%

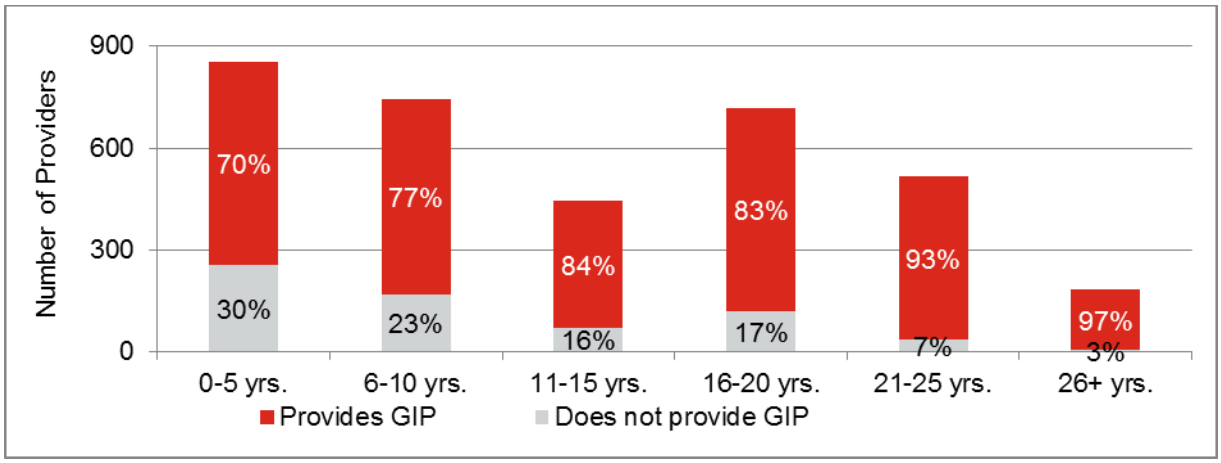
Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

We also examined variation in provision of GIP by the following hospice provider characteristics: age, size, and geographic location. Each is discussed below.

4.3.1 Provider Age

The average age of providers is approximately 13 years (the age of providers was calculated as of 1/1/2011). As Figure 8 shows, a higher proportion of established hospice providers provide GIP compared to newer hospice providers. For example, only 70% of hospice providers who had been in operation for 0–5 years provided GIP whereas nearly all (97%) of hospice providers who had been in operation for over 25 years provided GIP.

Figure 8: Percent of Hospice Providers Who Provided GIP, by Provider Age



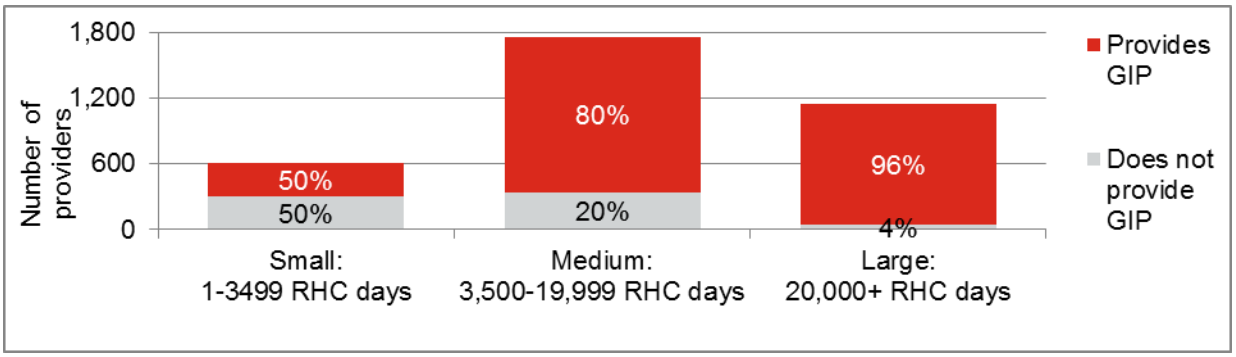
Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.3.2 Provider Size

We grouped providers into three size categories using CMS' definition[9]: Small=1–3,499 RHC days; Medium=3,500–19,999 RHC days; and Large=20,000+ RHC days. We used RHC days reported in the first three quarters of 2011 to accommodate incomplete claims, and the size thresholds were adjusted accordingly (i.e., multiplied by 0.75). Like provider age, there was also variation in provision of GIP by provider size (Figure 9). Only half of small providers provide GIP whereas nearly all (96%) large providers provide GIP.

[9] See page 28 of http://edocket.access.gpo.gov/2009/pdf/E9-18553.pdf

Figure 9: Percent of Hospice Providers Who Provided GIP, by Provider Size



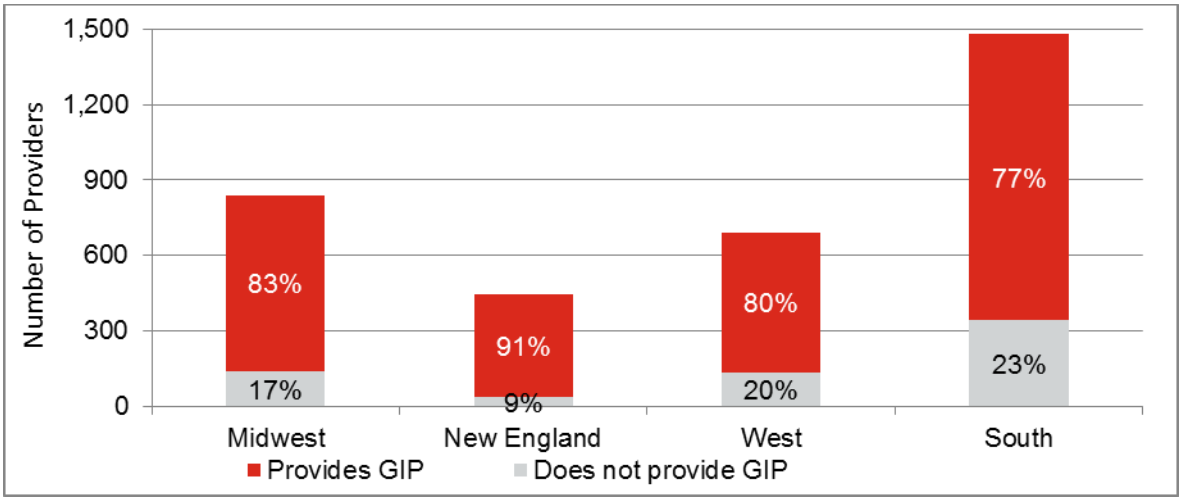
Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.3.3 Provider Region

Finally, we also found variation in the provision of GIP by hospice provider's geographic location (Figure 10). About 40% of providers are located in the South census region, a quarter of providers are in the Midwest, nearly a fifth are in the West, and just over 10% are located in New England.

Although the South has the greatest number of hospice providers across the four regions (N=1,481), it has the lowest percentage of providers who provide GIP (77%). Conversely, New England has the smallest number of hospice providers across the four regions (N=445) and nearly all of them (91%) provide GIP.

Figure 10: Percent of Hospice Providers Who Provided GIP, by Provider Region



Source: All hospice claims 1/1/10–12/31/11. The last quarter of 2011 did not contain all final claims when this analysis was completed.

4.4 Conclusion

About a quarter of all hospice beneficiaries in 2010–2011 had at least one GIP stay; the vast majority of these beneficiaries had just one GIP stay. Sixty-five percent of GIP days were provided in inpatient hospices, a quarter were provided in inpatient hospitals, and 8% were provided in skilled

nursing facilities. Across all sites of service, the average GIP stay was 5.7 days, but varied by site of service (6.3 days in inpatient hospices; 4.7 days in inpatient hospitals; 5.3 days in skilled nursing facilities). Over half of beneficiaries were not in hospice the day immediately before their GIP stay, and relatively few (4%) were discharged alive from hospice immediately following their GIP stay. Almost a quarter of GIP stays began over 30 days after the beneficiary began hospice, while three-quarters of GIP stays ended within 3 days of the end of the beneficiary's hospice episode.

Our analysis also revealed considerable variation in provider characteristics and provision of GIP. Among the nearly 80% of hospice providers who provided at least one GIP day in 2010–2011, nearly all of them had 13% or fewer GIP days out of their total number of billed hospice days (average= 1.5%). However, a small number of providers billed over 20% of their hospice days as GIP days. A higher proportion of established hospice providers provide GIP compared to newer hospice providers, and nearly all large providers provide GIP compared to only half of small providers. Finally, we also found variation in the provision of GIP by hospice provider's geographic location: 77% of providers in the South provided GIP compared to 91% of providers in New England.

5. Hospice Cost Reports—Benchmarks and Trends (2004–2011)

5.1 Introduction

As part of Abt's ongoing work for the Centers for Medicare and Medicaid Services, we have been conducting analyses of Healthcare Cost Report Information System (HCRIS) data to inform specific policy questions surrounding hospice payment reform. These analyses use FY 2004–2011 cost reports from freestanding hospice providers to describe the sources of costs for hospice providers. In particular, we use this information to determine: how much various cost centers contribute to total costs for a "typical" provider; how sources of costs vary across providers; and how the average total costs per election period have changed over time.

The set of cost reports used for analyses was trimmed of cost reports that contain missing or unusual data values that may cause measures of "average" to be misleading. Specifically, the following exclusion restrictions were applied to the 2004 to 2011 free-standing hospice provider cost reports. The exclusions were made individually to each year of cost reports and were not applied sequentially. Therefore, any exclusion based on the distribution of costs, payments, or margins is calculated on the complete sample of providers.

1. Short or long cost report periods: Cost reports with period less than 10 months or greater than 14 months.
2. Missing or negative value costs or payments: Cost reports with missing information or negative reported values for total costs or payments.
3. Top and bottom 1% of cost per day: providers in the highest and lowest percentile in costs per days across all levels of care.
4. Top and bottom 5% of provider margins.
5. Aggregate of cost centers does not equal total costs as reported.

Using the trimmed sets of cost reports, cost centers are grouped into four broad categories: Inpatient Care, Visiting Services, Other Hospice Services, and Non-reimbursable Services. All costs are taken from Worksheet B of the freestanding hospice cost reports and include allocated costs from general services (e.g. A&G costs).[10] Information regarding the number of patients and hospice patient-days is taken from worksheet S1 of the cost reports and includes patients from all payer sources. The patient count describes a census count of the number of election periods and, thus, patients with two or more election periods will be counted multiple times. The result of using such a census count is that figures calculated as "cost per patient" will more accurately provide a cost per election period and underestimate the true cost per *patient*. Additionally, if a patient's election period spans two cost reporting periods, even if she only has one election period, she will be counted as a patient in both cost reports. However, to be consistent with the cost report terminology the following refers to this the patient count including duplicates as "patients."

[10] General service costs include costs for capital, plant operation and maintenance, staff transportation, volunteer service coordination, and administrative and general costs.

Throughout the document means are calculated two ways: over all providers, and at the provider level. If a mean is calculated over all providers (weighted), then it is defined using the totals across providers in a given year. For instance, the mean cost per patient calculated over all providers is defined as the sum of costs across all providers divided by the sum of patients across all providers. When the mean is calculated in this manner, larger providers influence the mean to a greater degree than smaller providers and may be more representative of the industry as a whole.

Alternatively, when the mean is calculated at the provider level, it is calculated for each provider; then a mean of those provider means is calculated. When calculated in this manner, smaller providers and larger providers have an equal weight in the calculation.

Below is a brief description of each broad cost category, as taken from the Provider Cost Reporting Forms and Instructions (Form CMS-1984-99), and accompanying tables regarding the costs for each year of cost reports. Again, the costs from each cost center include general service costs allocated to the cost centers which receive the services on a statistical basis.

5.2 Inpatient Care

Inpatient care includes costs from general inpatient (GIP) care and inpatient respite care. Costs represent direct costs of furnishing routine and ancillary services associated with general inpatient or respite care—such as 24-hour nursing, meals, laundry, and housekeeping—and includes drug costs incurred while the patient is in an inpatient unit. Direct patient care services, such as patient-specific nursing or therapy, for patients receiving GIP or respite care are recorded in the visiting services cost centers. If a provider does not maintain its own inpatient beds, but furnishes inpatient care through a contractual arrangement with another facility, the contracted costs for routine and ancillary services are included.

Table 6 shows information regarding the average inpatient costs per patient for hospice providers. Section (a) of Table 6 shows the mean inpatient costs when averaged over all providers (i.e. all provider inpatient costs/ all patients from all providers). Section (b) shows the mean, standard deviation, and median costs per patient across providers attributed to the inpatient care cost centers for freestanding providers. The mean of costs is significantly higher than the median indicating that the data are skewed right. Given that these three measures of central tendency disagree, care should be taken when describing the “average” costs of inpatient care for hospice providers.

Section (c) of Table 6 shows that roughly one-third of providers report zero inpatient costs. As these costs should include contractual costs for inpatient care, if a provider does not have inpatient beds, zero costs on the cost report should reflect zeros rather than differences in accounting.

Section (d) of Table 6 shows the mean, standard deviation, and median for inpatient costs per patient for providers who report that they had inpatient costs.

Table 6: Inpatient Care Costs per Patient by Year, Nominal Dollars

	2004	2005	2006	2007	2008	2009	2010	2011
PANEL A[a]								
Number	n = 1,046	n= 1,218	n = 1,490	n = 1,694	n = 1,834	n = 1,882	n = 1,928	n = 1,814
(a) Costs per patient averaged over all providers								
Mean	$1,046	$1,121	$1,170	$1,201	$1,187	$1,246	$1,254	$1,302
(b) Provider-level costs per patient								
Mean	$762	$808	$744	$761	$755	$772	$712	$828
Std dev	(2,263)	(2,593)	(1,569)	(1,756)	(1,627)	(1,594)	(1,412)	(2,991)
Median	$203	$99	$92	$100	$107	$128	$122	$120
(c) Proportion of providers reporting inpatient costs = 0								
	0.27	0.36	0.36	0.36	0.33	0.33	0.34	0.33
PANEL B[b]								
Number	n = 766	n= 776	n = 955	n = 1,084	n = 1,230	n = 1,259	n = 1,274	n = 1,220
(d) Provider-level costs per patient | costs > 0								
Mean	$1,040	$1,269	$1,161	$1,189	$1,125	$1,154	$1,078	$1,232
Std Dev	(2,590)	(3,158)	(1,833)	(2,077)	(1,880)	(1,832)	(1,620)	(3,579)
Median	$396	$475	$476	$447	$402	$424	$404	$396

Data are from the Abt Trim sample of freestanding hospice cost reports. The total inpatient care service costs include inpatient general care and inpatient respite care. Costs are in nominal dollars. Costs of direct patient care provided by hospice staff are not included.

[a]Panel A shows descriptive information on the Abt Trim sample of freestanding hospice cost reports for each fiscal year.

[b]Panel B further restricts the sample to providers with non-zero inpatient costs.

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Investigating the high count of $0 inpatient costs, there is an issue with providers reporting conflicting information regarding inpatient stays for hospice patients. Specifically, significant numbers of cost reports list a non-zero number of days but zero costs for inpatient care, i.e., conflicting information. A smaller proportion report non-zero costs and zero inpatient days. Table 7 below shows the cross tabulation of indicators for reports of non-zero inpatient costs and days, conflicting information is highlighted in bold.

Table 7: Cross Tabulation of Indicators for Reports of Non-Zero Inpatient Costs and Days

Inpatient costs	Inpatient days > 0	No inpatient days	Row total
Inpatient costs > 0	63.49%	**3.03%**	66.52%
No inpatient costs	**21.93%**	11.55%	33.48%
Column total	85.42%	14.58%	

In fiscal years 2004–2011, 11.55% of cost reports have both zero inpatient costs and zero inpatient days reported, and 63.49% of cost reports denote positive amounts of both inpatient costs and days. However, a significant proportion of providers report that they did not incur inpatient costs but reported providing some inpatient days (21.93%); and a smaller proportion of cost reports denote serving zero inpatient days but positive inpatient costs (3.03%).

5.3 Visiting Services (Labor)

This includes thirteen labor disciplines: physician services, nursing care, nursing care—CHC, physical therapy, occupational therapy, speech/language pathology, medical social services, spiritual counseling, dietary counseling, counseling-other, home health aide and homemaker, home health aide/homemaker-CHC, and other.

Table 8 shows the mean weighted visiting service costs per patient calculated over all providers, as well as the mean, standard deviation, and median of provider-level costs per patient in the visiting services (labor) cost centers. The weighted mean is slightly higher than the mean costs averaged at the provider level. This suggests that smaller hospice providers have slightly higher visiting service costs per patient. For the provider-level averages, the mean is greater than the median; but, the difference is not as dramatic as that seen for inpatient costs. This is partly because almost all providers report some costs associated with visiting services. The mean value of nominal costs increases by a significant amount for the 2006 and 2011 years. However, these changes are driven by high cost outliers—note the large standard deviations associated with these means. Conversely, the median provider visiting service cost per patient trends upward over time without significant year-to-year jumps in value.

Table 8: Visiting Services Costs per Patient by Year, Nominal Dollars

	2004	2005	2006	2007	2008	2009	2010	2011
Number	n = 1,046	n= 1,218	n = 1,490	n = 1,694	n = 1,834	n = 1,882	n = 1,928	n = 1,814
Costs averaged over all providers								
Mean	$5,303	$5,568	$6,295	$6,856	$6,816	$7,185	$7,078	$7,329
Costs averaged at provider level								
Mean	$6,028	$6,899	$8,718	$7,933	$8,034	$8,156	$8,060	$11,278
Std dev	(2,577)	(6,386)	(60,438)	(5,622)	(4,150)	(3,518)	(3,708)	(83,556)
Median	$5,588	$6,205	$6,548	$7,184	$7,327	$7,577	$7,515	$7,815

Data are from the Abt Trim sample of freestanding hospice cost reports.

5.4 Other Hospice Services

Other Hospice Services include the following ten cost centers: drugs, biologicals, and infusion; durable medical equipment/oxygen; patient transportation; imaging services; labs and diagnostics; medical supplies; outpatient services (incl. E/R dept.); radiation therapy; chemotherapy; and "other." For the drugs, biological, and infusion cost center, we have also aggregated the sub-lines (i.e. analgesics and sedatives/hypnotics) up to this center. Three costs centers—drugs, DME, and medical supplies—account for the majority of the "Other Hospice Service" costs. Only a few providers (fewer than 5%) have more than half of other service costs come from cost centers other than these three; and three-quarters of providers report that 90% or more of other service costs are attributed to these three cost centers.

Table 9 shows the proportion of total costs attributed to the other service costs lines for each year of cost reports. The means calculated over all facilities show the proportion of total costs over all providers attributed to the other service cost centers (i.e. all provider "other service" costs/ all provider total costs). The bottom panel describes the proportion of total costs attributed to other service lines when calculated at the provider level. There are not significant year-to-year changes in these proportions. However, there is a downward trend in this proportion over time.

Examining the drivers of a downward trend in other hospice service costs, Table 10 shows mean, standard deviation, and median costs of drugs, biologicals, and infusions per patient-day for hospice providers. Additionally, Table 10 presents trimmed means of the costs per patient-day when the top and bottom 1% and 5% of providers, in terms of cost per patient-day, are eliminated from the calculation. The costs are in constant 2010 dollars, indexed using the producer price index for prescription pharmaceuticals. The information in Table 10 suggests that drug costs for hospice providers were trending downward significantly, in real dollars, from an average of $20 per patient day to $11 per patient day over the 2004–2011 FYs. Conversely, in results not shown, the daily costs of medical supplies remained flat, or slightly increased, over the same time periods.

Non-reimbursable services include bereavement counseling, volunteer program, and fundraising costs. While there is a cost center line for "other" non-reimbursable costs on the cost report, these "other" costs are omitted from total costs and are not described below. Omitting "other" non-reimbursable costs is consistent with instructions for calculating the total costs and per diem costs on Worksheet D of the cost report.

As with inpatient costs, measures of "average" do not tend to agree; this is the result of a significant proportion of facilities reporting zero costs in these cost centers. Up to 25% of cost reports include $0 in non-reimbursable costs with the proportion of providers reporting zero costs trending upward over time. The report of $0 in non-reimbursable costs comes despite the requirement of providing bereavement services.

Table 9: Proportion of Total Costs Attributed to "Other Hospice Service Costs" Lines

	2004	2005	2006	2007	2008	2009	2010	2011
Number	n = 1,052	n= 1,222	n = 1,500	n = 1,698	n = 1,838	n = 1,887	n = 1,930	n = 1,818
Calculated over all providers								
Mean	0.227	0.216	0.212	0.204	0.200	0.196	0.198	0.192
Costs averaged at provider level								
Mean	0.243	0.231	0.228	0.215	0.210	0.206	0.211	0.207
Median	0.239	0.220	0.213	0.203	0.203	0.201	0.205	0.203

Data are from the Abt Trim sample of freestanding hospice cost reports.

Table 10: Costs per Patient-Day by Year, 2010 Dollars

	2004	2005	2006	2007	2008	2009	2010	2011
Number	n = 1,046	n= 1,218	n = 1,490	n = 1,694	n = 1,834	n = 1,882	n = 1,930	n = 1,818
Provider-level drug costs per patient-day								
Mean	$20	$18	$17	$15	$14	$13	$12	$11
Std dev	(10)	(11)	(11)	(9)	(9)	(9)	(7)	(6)
Median	$20	$18	$16	$15	$14	$13	$12	$11
Trimmed means								
1%-99%	$21	$19	$17	$16	$15	$14	$13	$12
5%-95%	$20	$18	$16	$15	$14	$13	$12	$11

Data are from the Abt Trim sample of freestanding hospice cost reports. The costs are averaged at the provider-level and adjusted to constant 2010 dollars using the Producer Price Index for prescription pharmaceuticals.

Total Costs: Table 11 displays information regarding total costs. The top portions of Table 11 display the weighted proportion of total costs attributed to each broad group of cost centers and the average total costs per patient. The bottom portions of Table 11 display the provider-level mean proportion of costs attributed to each broad cost center grouping and the median total cost per patient in each year. The costs per patient statistics have been adjusted to constant 2010 dollars using the hospital market basket update.

Using either the weighted or provider-level measures suggests that the visiting services cost centers make up the largest and an increasing proportion of the total costs over time. Other hospice services account for the second largest proportion of costs; however, this proportion is declining over time.

The measures of average cost per patient when measured in constant dollars have remained fairly flat over time, trending upward until 2007 and downward after this time. Compared to 2004, the 2011 average costs per patient increased by roughly $200 to $300 dollars (2% to 3%). Note that the mean costs per patient reflect costs associated with the mean length of episode, which is significantly longer than the median length of episode.

Table 11: Proportion of Total Costs by Cost Center Grouping and Average Total Costs per Patient

Cost center group	2004	2005	2006	2007	2008	2009	2010	2011
Total costs by cost center group over all providers								
Visiting services	61%	62%	63%	65%	65%	65%	66%	66%
Other services	23%	22%	21%	20%	20%	20%	20%	19%
Inpatient services	12%	13%	12%	11%	11%	11%	12%	12%
Non-reimbursable services	4%	4%	4%	4%	4%	4%	3%	3%
Total costs per patient over all providers (2010 dollars)	$10,509	$10,522	$11,053	$11,544	$11,259	$11,243	$10,775	$10,710
Total costs by cost center group at provider level								
Visiting services	65%	67%	67%	69%	70%	70%	70%	71%
Other services	24%	23%	23%	22%	21%	21%	21%	21%
Inpatient services	7%	7%	7%	7%	6%	7%	6%	6%
Non-reimbursable services	4%	3%	3%	3%	3%	3%	2%	2%
Median of providers' average costs per patient (2010 dollars)	$10,510	$11,084	$11,216	$11,560	$11,103	$11,209	$10,822	$10,819

*Costs per patient are in 2010 dollars, normalized using the hospital market basket update.

6. Analysis of Face-to-Face Physician Visit Requirement

The Affordable Care Act (ACA) requires that a hospice physician or nurse practitioner (NP) must have a face-to-face encounter with every hospice patient to determine the continued eligibility of that patient prior to the 180th day recertification (e.g., interpreted as the 3rd benefit period recertification) and prior to each subsequent recertification. This analysis provides an impact of the impact of the face-to-face visit requirement for hospice on the probability of a beneficiary having a recertification that is the second or later. One possible impact of this requirement is that beneficiaries who do not have an expectation of death within six months would be discharged from hospice more frequently than prior to the requirement's existence.

- The specific face-to-face requirement has several components, two of which are relevant for the analysis included in the report.
- A hospice physician or hospice NP must have a face-to-face encounter with hospice patients prior to, but not more than 30 days prior to, the 3rd benefit period recertification, and prior to, but not more than 30 days prior to, each recertification thereafter, to determine continued eligibility for the hospice benefit.

A hospice physician or nurse practitioner who performs the encounter must attest in writing that he or she had a face-to-face encounter with the patient, including the date of that visit. The attestation of the nurse practitioner or non-certifying hospice physician shall state that the clinical findings of that visit were provided to the certifying physician for use in determining continued eligibility for hospice care.

The face-to-face requirement was effective January 1, 2011. By April 1st, 2011 hospices were required to have fully established internal processes to meet the face-to-face requirement and provide appropriate documentation. Any third or later benefit period recertification on or after April 1, 2011 requires a face-to-face encounter.

6.1 Methodology

This analysis attempts to answer a very specific question that should provide information on the impact of the face-to-face requirement by comparing the frequency of certain recertifications before the requirement to the frequency after the requirement.

For beneficiaries whose first and second benefit periods are both 63 days or longer (a proxy for a beneficiary not receiving hospice prior to the start of the data), is the frequency of a 3rd benefit period recertification or subsequent recertification greater for beneficiaries who began their first period during October 2009–January 2010 (for recertifications before the requirement) compared to beneficiaries who began their first period during October 2010–January 2011 (for recertifications after the requirement)? We consider benefit periods 63 days or longer to be a 1st or 2nd benefit period or later, and thus a 90-day benefit period.

For the beneficiaries whose first benefit period began during October 2009–January 2010 (with 3rd benefit period recertifications occurring before the face-to-face requirement), the analysis included first benefit periods that started between October 4, 2009 and January 31, 2010. For those beneficiaries, the analysis included subsequent benefit periods that had a start date through September 2010. Similarly, for the beneficiaries whose first benefit period began during October 2010–January 2011 (with 3rd benefit period recertifications occurring after the requirement), the analysis included

first benefit periods that started between October 4, 2010 and January 31, 2011. Table 12 shows information on when benefit periods begin if beneficiaries are continuously enrolled in hospice.

For the beneficiaries in this analysis, all subsequent benefit periods that had a start date through September 2011 were included. The analysis included beneficiaries whose first two benefit periods are 63 days or longer as this indicates that these benefit periods are a beneficiary's first two 90-day benefit periods. This is currently the only way to accurately identify the 2nd recertification period using our data, which begins with claims in 2010. That is, in our data, it is possible that the first and/or second benefit period that is seen, in the sequence of benefit periods, are not 60-day benefit periods. Conversely, one or both of those benefit periods may be a 90-day benefit period. To determine whether these benefit periods are 60-day or 90-day benefit periods, we look to see if either benefit period lasts 63 days or more. We consider benefit periods 63 days or longer to be a 1st or 2nd benefit period or later, and thus a 90-day benefit period.

The following bullets help explain why the time period mentioned was picked:

- If a benefit period starts on October 4, April 1st (the day hospices were required to have fully established internal processes to meet the face-to-face requirement and provide appropriate documentation in 2011) occurs 180 days later.
- 180 days including and after January 31st is July 29th. 60 days including after July 29th is September 26th.

Table 12: Select Time Periods and Start Dates of Benefit Periods for the Sample Examined

	Start Date of				
	First Benefit Period	**Second Benefit Period**	**Third Benefit Period**	**Fourth Benefit Period**	**Fifth Benefit Period**
Beneficiaries Not Impacted by Face to Face	October 4, 2009	January 2, 2010	April 2, 2010	June 1, 2010	July 31, 2010
	November 1, 2009	January 30, 2010	April 30, 2010	June 29, 2010	August 28, 2010
	December 1, 2009	March 1, 2010	May 30, 2010	July 29, 2010	September 27, 2010
	January 1, 2010	April 1, 2010	June 30, 2010	August 29, 2010	October 28, 2010
	January 31, 2010	May 1, 2010	July 30, 2010	September 28, 2010	November 27, 2010
Beneficiaries Impacted by Face to Face	October 4, 2010	January 2, 2011	April 2, 2011	June 1, 2011	July 31, 2011
	November 1, 2010	January 30, 2011	April 30, 2011	June 29, 2011	August 28, 2011
	December 1, 2010	March 1, 2011	May 30, 2011	July 29, 2011	September 27, 2011
	January 1, 2011	April 1, 2011	June 30, 2011	August 29, 2011	October 28, 2011
	January 31, 2011	May 1, 2011	July 30, 2011	September 28, 2011	November 27, 2011

The analysis examined a beneficiary's benefit periods from their first benefit period to the time they leave hospice. Table 13 shows the number of beneficiaries based on the number of consecutive benefit periods they had. From Table 13, there are a similar (but slightly fewer) number of episodes that started between October 2009 and January 2010 compared to October 2010 and January 2011. However, the percentage of beneficiaries who did not make it past their second benefit period is nearly identical between the two time periods. During the 4th period, slightly fewer beneficiaries (1.3 percentage point fewer) were recertified in the October 2010–January 2011 category compared to the October 2009–January 2010 category. Note, the date of the third benefit period would fall on or after April 1st.

Table 13: Number of Consecutive Benefit Periods for Beneficiaries Whose First Two Benefit Periods Had at Least 63 Days

	First benefit period had a start date between:			
	October 2009–January 2010 (before face-to-face)		October 2010–January 2011 (after face-to-face)	
Benefit period	Beneficiaries	% of beneficiaries who have left hospice	Beneficiaries	% of beneficiaries who have left hospice
1	39,783	—	40,608	—
2	39,783	—	40,608	—
3	30,046	24.5%	30,525	24.8%
4	22,129	44.4%	22,048	45.7%
5	8,735	78.0%	8,573	78.9%

Note: In the analytic file, there are 298,235 beneficiaries with a benefit period start date during October 2009–January 2010 while there are 313,783 beneficiaries with a benefit period start date during October 2010–January 2011.

Table 14 provides information on the discharge status of a beneficiary at the end of a benefit period. Again, this table shows beneficiaries whose first two periods had at least 63 days. Benefit period refers to consecutive benefit period.

The discharge status at the end of the second period looks similar for the period after face-to-face (October 2010–January 2011) compared to the period before face-to-face (October 2009–January 2010). The beneficiaries affected by face-to-face have a slightly higher percentage of benefit periods ending in live discharge or "still in hospice" but a slightly lower percentage of benefit periods ending in death compared to the beneficiaries not affected by face-to-face. The discharge status in the 3rd benefit period looks almost identical across the period affected by face-to-face versus the period not affected.

In addition to examining the number of benefit periods for a hospice user, we also examined the frequency of physician billing on the hospice claim before and after the face-to-face requirement. Table 15 provides a day-by-day tabulation of how many physician services appear on a claim for a particular day of hospice. Table 15 is further broken down into two parts to compare the beneficiaries affected by face-to-face (2010–2011) to those beneficiaries who were not (2009–2010). While the face-to-face encounter is not billable, hospice physicians may bill for direct patient care provided in the course of such a visit; NPs may bill for such visits if they provide physician services and are the designated attending physician. This table shows that physician services are rarely recorded on the claim. Since the physician or NP would have a face-to-face encounter with the beneficiary at the

second and subsequent recertification period, it is possible that more physician services would be recorded during that time period.

There are a few things to note from this table. First, for most of the different periods of days, slightly fewer days in the face-to-face period have physician services recorded compared to the non-face-to-face period. Second, it appears that for the days that would fall under the second or later recertification (Days 161–215, 216-270, 271) fewer physician services are being recorded in the face-to-face period compared to the earlier days (day 1–90 and 91–160).

Table 14: Discharge Status Upon End of Benefit Period for Beneficiaries Whose First Two Benefit Periods Had At Least 63 Days

		First claim has a start date between October 2009 and January 2010 (before face-to-face)				First claim has a start date between October 2010 and January 2011 (after face-to-face)			
Benefit period	Statistics	Died	Live discharge	Still in hospice	Unknown discharge code	Died	Live discharge	Still in hospice	Unknown discharge code
1	N	0	9	39,774	0	0	10	40,597	1
	Row %	0	0.02	99.98	0	0	0.02	99.97	0
2	N	5,415	4,112	30,200	56	5,057	4,536	30,957	58
	Row %	13.61	10.34	75.91	0.14	12.45	11.17	76.23	0.14
3	N	4,652	3,063	22,287	44	4,781	3,067	22,610	67
	Row %	15.48	10.19	74.18	0.15	15.66	10.05	74.07	0.22
4	N	3,129	2,179	16,784	37	3,021	1,891	17,098	38
	Row %	14.14	9.85	75.85	0.17	13.7	8.58	77.55	0.17
5	N	1118	826	6,775	16	1067	678	6,809	19
	Row %	12.8	9.46	77.56	0.18	12.45	7.91	79.42	0.22
Total	N	14,324	10,209	115,934	153	13,967	10,196	118,250	183
	Row %	10.19	7.26	82.44	0.11	9.79	7.15	82.93	0.13

Note: Changes in sample size from one benefit period to the next are due to censoring.

Table 15: Number of Services by Clinician Provider by Day

	Number of physician services					
	First claim has a start date between October 2009 and January 2010 (before face-to-face)			First claim has a start date between October 2010 and January 2011 (after face-to-face)		
Day In hospice	0	1	2 or more	0	1	2 or more
Day 1–90	223,077	1,616	93	358,109	2,630	113
	99.24	0.72	0.04	99.24	0.73	0.03
Day 91–160	277,401	1,538	60	279,074	1,327	57
	99.43	0.55	0.02	100	0.47	0.02
Day 161–215	176,678	1,265	59	179,774	1,222	36
	99.26	0.71	0.03	99.31	0.68	0.02
Day 216–270	124,825	936	57	126,955	738	16
	99.21	0.74	0.05	99.41	0.58	0.01
Day 271+	64,669	595	34	66,532	363	12
	99.04	0.91	0.05	99.44	0.54	0.02

Note: A beneficiary with multiple days in a category (e.g. Day 0–90) would appear multiple times on that row.

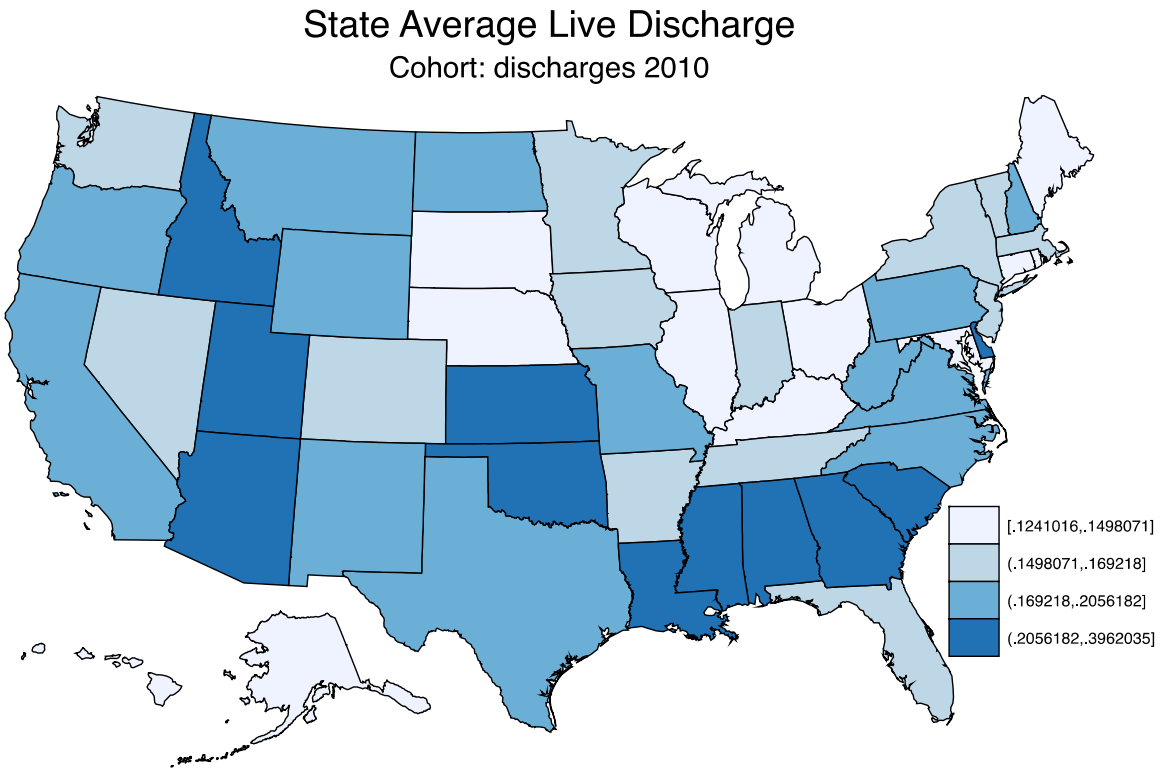
7. Trends in Live Discharge

A hospice patient may be discharged because of extended prognosis such that the patient is no longer meeting hospice eligibility or the patient and/or family may choose to revoke the hospice benefit to pursue curative treatment for their terminal illnesses or potentially seek care from another hospice provider. By statute, hospices cannot enroll a patient who does not meet eligibility for hospice services or discharge a patient so that patient can receive an expensive test or procedure that would be paid for outside of the hospice benefit (Code of Federal Regulations, title 42, sec. 418.26). A potential vulnerability of the hospice payment system though is that these behaviors may exist and therefore result in inappropriate live discharge. Further, there could be a lack of understanding of what the hospice benefit really entails and the beneficiary may decide they no longer want to be enrolled so they can pursue curative treatment. Also, it is possible beneficiaries may revoke their benefit from a particular hospice because they are receiving low quality care. MedPAC in 2011 noted that hospices with high rate of live discharges were often those hospices that exceeded the hospice annual per patient cap rate suggesting that these hospices may be inappropriately enrolling patients who are not qualified for the Medicare Hospice Benefit (MedPAC, 2011).

Previous research suggests that the majority of live discharges (79%) are because the patient condition has improved or stabilized with only 7% leaving hospice to pursue aggressive treatment and 12% was the patient or family decision to leave hospice care. Transfer between hospices was a rare reason for hospice discharge (Kutner et al., 2004). The limited research is conflicting over whether more cancer patients are live discharges compared to non-cancer patients (Bain et al., 2009; Albain et al., 1991). As part of the analysis to examine potential vulnerabilities in the Medicare Hospice Benefit, the rate of live discharges, its variation, and overall six outcomes post discharge was examined among all Medicare Hospice Beneficiaries who were discharged in 2010.

In 2010, there were 956,497 discharges among 3,489 hospice providers whose provider number linked to the provider of service file (MedPAC, 2011). Eighteen percent of theses discharges were live discharges. Of those live discharges from hospice in 2010, 18.5% were admitted to an acute care hospital within 2 days of that discharge and 16.1% were readmitted to hospice within 2 weeks. That state variation of live discharges is shown in Figure 11.

Figure 11: Variation in the Rate of Live Discharges in 2010



Our analysis shows that among those 3,033 hospice programs with at least 30 discharges in 2010, there was variation in the rate of live discharge with a median rate of 18.4% and an interquartile range of 13.4% to 26.2%. Nearly one-fourth of these live discharges occurred within 19 days of hospice admission. Overall, 49.2% of discharged hospice patients are dead within six months of the discharge. The next step in this analysis is to better estimate how live discharges impact Medicare costs (Carlson et al., 2010; Taylor et al., 2008). The observed variation suggest that the rate of live discharge potentially could be an important vulnerability of Medicare hospice payment that should be monitored during payment reform.

8. Part D Utilization While Enrolled in Hospice

8.1 Background

Medicare Part D is a Federal program, implemented in 2006, which subsidizes prescription drug costs for Medicare beneficiaries. The program is relatively large: annual Part D expenditures were $56 billion in 2010 whereas hospice expenditures were $13 billion the same year. Individuals entitled to Medicare Part A benefits are eligible for Part D coverage, therefore all (Part A) hospice beneficiaries are also eligible to enroll in Part D.

Prior to the creation of Part D (and through the present), the hospice benefit provided medications. All medications related to beneficiaries' terminal illness and related conditions are fully covered by the hospice benefit:

> "…[D]rugs…used primarily for the relief of pain and symptom control related to the individual's terminal illness are covered [hospice services]." (42 CFR § 418.202f)

Moreover, the provision of such medications is a condition of participation for hospice providers:

> "…[D]rugs and biologicals related to the palliation and management of the terminal illness and related conditions, as identified in the hospice plan of care, must be provided by the hospice while the patient is under hospice care." (42 CFR § 418.106)

Providers are compensated for providing these medications through the *per diem* payments they receive each day a beneficiary they are treating is enrolled in the benefit. That is, the *per diem* payment amounts are set to incorporate the costs of these medications. If Part D were ever billed for a hospice beneficiary's covered medication, Medicare would effectively pay twice for the same drug: once directly through Part D, and then a second time—implicitly—through the *per diem* payment the provider received.

Concerned about the possibility of paying twice, CMS issued an advance notice call letter in 2011[11] to educate plan sponsors on how to identify hospice enrollment. CMS informed sponsors (*i*) how to identify hospice enrollment using transaction reply reports, (*ii*) that Part D should not be billed for drugs related to hospice beneficiaries' terminal illnesses or related conditions, and (*iii*) to enact processes preventing such payments from occurring. CMS's concerns were validated the following year (2012) when the Office of Inspector General issued a report (A-06-10-00059; "Medicare Could Be Paying Twice for Prescription Drugs for Beneficiaries in Hospice") finding that in 2009, Medicare Part D was billed $33.6 million for "prescription analgesic, antinausea, laxative, and antianxiety drugs, as well as prescription drugs used to treat COPD and ALS, that likely should have been covered under the per diem payments made to hospice organizations."

In this section of the technical report, we expand upon the Office of Inspector General's findings using updated data. We focus on *analgesic medications* (one class of drugs included in the Office of Inspector General's report), medications for which the primary usage is to treat pain. Thus, these

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[11] See "Preventing Part D Payment for Hospice Drugs" (p. 85), accessible via: http://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/downloads/Advance2012.pdf

drugs are likely examples of drugs falling under the scope of standard palliate care at the end-of-life care. Thus, these drugs should probably be covered by hospice providers under the rule cited above. Our results tabulate the total number of hospice beneficiaries receiving an analgesic prescription through Medicare Part D in calendar year 2010. We estimate the total amount billed to Medicare for these analgesics and the total amount paid for by hospice beneficiaries. We identify the generic drug names which were most frequently billed to Part D, and which medications amounted to the greatest total dollar value billed to Part D. Finally, we investigate geographical variation in billing patterns by calculating the per-enrollment average analgesic billing amount for each state and territory.

8.2 Methods

We created an analytic file which identifies all analgesic prescriptions filled to hospice beneficiaries in 2010 on days which the beneficiary was also enrolled in hospice. To build our file we combined both our Hospice Day File and Medicare Part D claims to identify medications meeting the following criteria:

1. *The medication was an analgesic*. This was accomplished using the 11-digit National Drug Code provided on the Part D claim. Using external databases we established a list of drug codes for which "analgesic" was the therapeutic usage (primarily opiates and non-steroidal anti-inflammatory drugs) and retained only those medications in our file.

2. *The medication was filled for a hospice beneficiary*. We verified this criterion by ensuring the beneficiary identifier on the hospice day file matched the beneficiary identifier on the Part D claims.

3. *The hospice beneficiary was enrolled in Medicare Part D within thirty days prior to hospice election*. We believe that the most appropriate rate of Part D billing would limit the total base of beneficiaries to only those enrolled in Medicare Part D. We identified Part D enrollment (within thirty days of hospice election) using the corresponding Master Beneficiary Summary File field which we joined to our day file.

4. *The medication was filled on a day in which the hospice beneficiary was enrolled in hospice.* This was accomplished by matching drug fill dates listed on the Part D claims to the service dates listed on the Hospice claim day file.

    a. We are unable to determine when the prescription was written, when the beneficiary received the medication from the dispensing pharmacy, or when the beneficiary began taking the medication.

    b. We were informed by the Research Data Assistance Center to interpret the "drug fill date" on the Part D claim as the "date in which the pills went in the bottle."

    c. We omitted medications filled on hospice admission days. We did this to reduce the inclusion of analgesic prescriptions written before beneficiaries elected hospice. By excluding all drugs filled on the first day of hospice we note that our estimates may be a conservative lower bound on the true amount billed to Part D for hospice patients' analgesics.

5. *The medication was filled in 2010*. This was accomplished by ensuring that the drug fill date (and hospice service date) occurred during calendar year 2010.

8.3 Results

We identified 773,168 Medicare beneficiaries utilizing the hospice benefit at least one day in 2010 who were also enrolled in Part D within thirty days prior to hospice election. These beneficiaries correspond to 832,028 admissions because some beneficiaries received the benefit over multiple elections in 2010. Among these individuals, 112,555 beneficiaries (14.6% of all those enrolled in Part D) received 334,387 analgesic prescriptions through Part D during their hospice enrollment. The total gross value of these medications was $13,000,430. We calculate that over four-fifths of this amount was paid by the Federal government: more than $6.6 million (51% of the total amount) was billed directly to the Federal government and another $4.2 million (32%) was paid indirectly through the low income subsidy reduction (this subsidy lowers qualifying beneficiaries' coinsurance responsibilities; the program is administered by the states using Federal funds). Medicare beneficiaries paid $1.4 million (11%) through coinsurance and the remaining $0.8 million (6%) was paid by a variety of sources including charities and auxiliary military benefits.

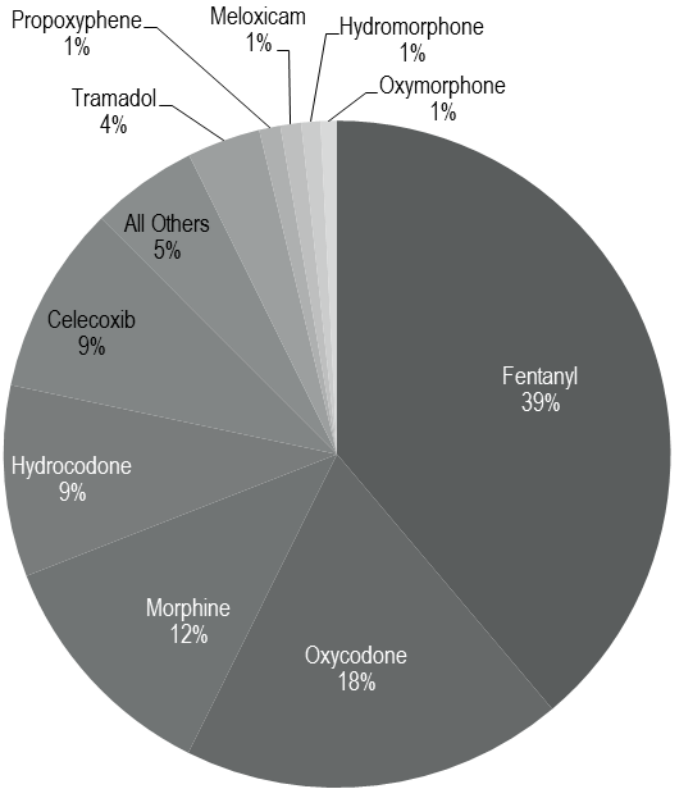
In Table 16 ("Hospice Patients' Analgesics billed to Part D, 2010" below) we tabulate the total number of prescriptions and aggregate dollar amounts billed to Part D for hospice beneficiaries' analgesics in 2010 by generic medication for the most common generic medications we identified. The accompanying figure (Figure 12 below, "Distribution of Costs Billed to Part D by Drug, 2010") illustrates the proportion of the total amount ($13 million) billed to Part D accounted for by each generic analgesic drug. Table 16 indicates that the most common analgesic billed to Part D was morphine. There were 54,850 morphine prescriptions billed to Part D for hospice beneficiaries in 2010, the greatest number among all analgesics. In terms of costs, Fentanyl accounts for the greatest portion: 39%, or $5.0 million, of the total amount for analgesics billed to Part D for hospice beneficiaries. In order of decreasing proportion of total costs, Fentanyl is followed by Oxycodone (18%), Morphine (12%), Hydrocodone (9%), and Celecoxib (9%). These five generic prescriptions together account for over 87% of the total dollar amount billed to Part D for hospice beneficiaries' analgesics in 2010.

Table 16: Hospice Patients' Analgesics Billed to Part D, 2010

Generic name	# Drug fills	Total costs
Fentanyl	48,420	$5,048,762
Oxycodone	35,971	$2,407,254
Morphine	54,850	$1,521,362
Hydrocodone	89,312	$1,206,089
Celecoxib	9,093	$1,192,967
Tramadol	34,942	$673,539
Propoxyphene	11,147	$462,499
Meloxicam	12,092	$133,774
Hydromorphone	3,835	$130,875
Oxymorphone	267	$120,190

Source: Abt Associates analysis of 2010 Medicare Claims Data

Figure 12: Distribution of Costs Billed to Part D by Drug, 2010



9. Reform Options

9.1 Simulation of a Hypothetical Tiered Model for the Hospice Benefit

This section of the report starts to build a framework for assessing the potential impacts of a tiered model. The tiered model being simulated in this report primarily has characteristics of a U-Shaped payment system—where days at the beginning or end of a hospice episode are paid at rates that are relatively higher than those paid for days in the middle of the episode. The payment rates in this tiered model also vary according to selected other characteristics of the episode (e.g. whether the episode is an extremely short stay, and/or whether the episode includes visits at the end of life).

9.1.1 Methodology for a Hypothetical Tiered Model

The construction of the tiered model involves calculating average resource use for a variety of groups of hospice days that correspond to characteristics of hospice use. An episode's resource use is a description of the wage weighted minutes of care (as reported on the claim) the hospice provides on a particular day of hospice. Resource use does not measure the actual costs a hospice incurs on a daily basis, but is just a proxy for the key labor costs that a hospice incurs; non-labor costs are not reflected in this analysis. It is meant to describe relative costs (e.g. such as the beginning and end of a hospice episode are more intensive than the middle) as opposed to absolute costs. We use data from the Bureau of Labor Statistics to calculate a national hourly wage rate (including the hourly wage plus an estimate of fringe benefit costs) for the six disciplines of care whose minutes are reported on the claim. For 2011, the national hourly wage rates that were used for the six disciplines of care were:

- Skilled Nursing: $38.82
- Physical Therapy: $54.30
- Occupational Therapy: $54.06
- Speech Language Pathology: $59.46
- Medical Social Service: $36.19
- Home Health Aide: $13.89

Those hourly wage rates are multiplied by the number of hours of service reported on the claim for a particular day of hospice to compute the resource use that occurred on that particular day of hospice care.[12]

The tiered model discussed in this report is applicable only to Routine Home Care (RHC) days. The general approach is to determine the average resource use for several different groups of hospice episodes. As described below, these groups correspond to the characteristics such: where the hospice day is in relation to the start and end of the episode, whether a beneficiary is an extremely short stay hospice user, and whether the beneficiary received visits as recorded on the claim at the end of life. The base payment rate for Routine Home Care (RHC) could then be multiplied by the ratio of the average resource use for a particular group over the overall average resource use for all RHC days.

[12] As a data cleaning step, for a given day, minutes reported on the claim were censored at 1,440. That is, it was imposed that no hospice provided more than 24 hours of care of one specific discipline on a single day of hospice care.

The result would be the new base payment rate for RHC days that corresponded to one of the categories. Several potential categories are described below.

Each grouping is applied to each day of hospice care. Groupings are applied in sequential order, therefore a day may initially be assigned to "Group 1," but once the "Group 7" logic is applied the day could be assigned to "Group 7." Groups 1 to 4 are relevant to the initial high and then the low (middle) part of the U-shaped curve. Groups 5 and 6 are relevant to the high end (near death) part of the U-shaped curve. Group 7 days are used by beneficiaries with a short length of stay.

- Group 1: RHC care that occurs between days 1 and day 5 of a beneficiary's lifetime length of stay.[13]
- Group 2: RHC care that occurs between days 6 and day 10 of a beneficiary's lifetime length of stay.
- Group 3: RHC care that occurs between days 11 and day 30 of a beneficiary's lifetime length of stay.
- Group 4: RHC care that occurs on day 31 or later of a beneficiary's lifetime length of stay.
- Group 5: RHC care that occurs during the last 7 days of a beneficiary's lifetime length of stay and the beneficiary is discharged dead. Beneficiary receives visiting service (nursing, aide, MSS, therapy) during the last 2 days of life if the last two days of life are RHC or the last two days of life are not RHC.
- Group 6: RHC care that occurs during the last 7 days of a beneficiary's lifetime length of stay and the beneficiary is discharged dead. Beneficiary does not receive visiting service (nursing, aide, MSS, therapy) during the last 2 days of life. Last two days of life are RHC.
- Group 7: RHC care when the beneficiary's lifetime length of hospice is 5 days or less, each day of hospice is RHC, and beneficiary is discharged deceased.

Note, groups were not picked to guide any conception about the appropriate length of stay in a hospice. Instead, categories were defined to reflect differences in average resource use that appeared meaningful. There is a little meaningful change in average daily resource following 30 days in hospice (when the beneficiary is not in the last 7 days of life). However, this does not mean the benefit is designed to only last 30 days.

9.1.2 Results

Table 17 shows summary statistics for the number of observations within each group and information on the mean, 25th percentile, median, and 75th percentile value of resource usage within each group. The implied weight is calculated by taking the average resource use of each group and dividing it by the total average resource use across all RHC days in the analysis.

[13] For this particular example of a tiered payment system, the issue of live discharge is not considered. RHC days are grouped based on the beneficiary's lifetime length of stay. Future versions of this analysis will address the issue of live discharge/revocation followed by a readmission into hospice.

Table 17: Summary Statistics on Average Daily Resource Use by Payment Groups in the Tiered Model

Group	Days of hospice	Unique providers	Unique beneficiaries	Resource use				Implied weight
				Mean	p25	p50	p75	
Group 1: RHC Days 1 – 5	2,800,144	3,570	613,274	$38.06	$0.00	$18.09	$58.23	2.30
Group 2: RHC days 6 – 10	2,493,004	3,562	532,779	$18.34	$0.00	$0.00	$29.11	1.11
Group 3: RHC days 11 – 30	7,767,918	3,565	501,445	$16.12	$0.00	$0.00	$24.31	0.97
Group 4: RHC Days 31+	65,958,740	3,573	567,484	$14.27	$0.00	$0.00	$19.41	0.86
Group 5: RHC during last 7 days, skilled visits during last 2 days	2,832,620	3,416	485,802	$40.35	$0.00	$25.04	$57.76	2.44
Group 6: RHC during last 7 days, no skilled visits during last 2 days	476,809	3,012	74,144	$15.11	$0.00	$0.00	$19.41	0.91
Group 7: RHC when hospice LOS is 5 days or less, and discharged dead	510,787	3,334	142,703	$60.18	$0.00	$48.53	$87.35	3.64
Total	82,840,022	3,584	1,050,361	$16.55	$0.00	$0.00	$23.59	1.00

Source: 100% Sample of RHC Hospice Days from 2011

The approach described above groups every RHC day into one of seven unique groups. As described earlier, the implied weight calculated in the table could be used to set the payment rate for any RHC day that was applicable to the group. The implied weight would be multiplied by the base payment rate to determine the payment rate applicable to the group. For example, the base payment rates for Fiscal Year (FY) 2012 are shown in Table 18.

Table 18: Base Payment Rates for FY 2012

Description	Rate	Wage component subject to index	Non-weighted amount
Routine home care	$151.03	$103.77	$47.26
Continuous home care full rate = 24 hours of care $36.73 = hourly rate	$881.46	$605.65	$275.81
Inpatient respite care	$156.22	$84.56	$71.66
General inpatient care	$671.84	$430.04	$241.80

A requirement of Section 3132(a) of the Affordable Care Act states that payment changes must be made in a budget neutral manner in the first year. One method of determining budget neutrality is to examine a set of hospice claims and determine what hospices were actually paid and then determine what hospices would have been paid under an alternative system. The difference in payments between the actual and hypothetical system is the payment amount that would need to be adjusted.

We apply a budget neutrality adjustment using hospice days that occurred in calendar year 2011. Using our 100% sample of hospice days from that period, we divided the actual per-diem payments by the hypothetical per-diem payments under the tiered model described above. That approach produced a budget neutrality adjustment equal to 0.9969. The payment weights shown in Table Table 18 would be multiplied by that budget neutrality adjustment to achieve budget neutral weights.

Table 19 below shows estimated impacts from the tiered model described above. That is, after determining the budget neutral weights, each hospice day from calendar year 2011 is grouped into one of the aforementioned tiers. The base payment rate for RHC ($146.63 in FY 2011) is multiplied by the budget neutral weights. A wage index adjustment is made and then additional payments on the claim are added back into the hypothetical payment Medicare would have made for a particular day of hospice. Each day of hospice then has two payment values. The actual payment provided for a given day of hospice and the hypothetical payment that hospice would have received if the hospice had provided that day under the tiered model. Table 19 groups hospice days into different categories (e.g. provider location, ownership type, freestanding, etc.) and compares the actual payments to the payments from the tiered model. This comparison assumes that hospices would not change their behavior in providing hospice under the tiered model. Future work will need to examine the validity of that assumption and where the assumption breaks down.

The first row of results (All Days/All Hospices) in Table 19 shows the impact of the budget neutrality adjustment. Under both the actual and payments under the tiered model, hospices receive $13,782 million in payments. However, the remaining rows of the table show that budget neutrality applies globally and not to individual hospices or even groups of hospices. Looking at hospices by Census Division shows that hospices in the South Atlantic have lower payments under the tiered model compared to the payments they actually received. The table also shows that freestanding hospices, for

profit hospices, and larger hospices receive lower payments under the tiered model compared to the payments they actually received.

Table 19: Impact of a Hypothetical Tiered Model on Payments for Different Hospice Subgroups (Using RHC Days from 2011)

Description	Hospice subgroup	Providers	Total RHC days (1,000s)	Beneficiaries (1,000s)	Actual payments (millions)	Tiered payments (millions)	Tiered as a % of actual
All days/all hospices	All Hospices	3,585	82,840	1,221	$13,782	$13,782	100%
Census division	South Atlantic	509	18,767	267	$3,262	$3,197	98%
	East North Central	475	12,544	201	$2,068	$2,092	101%
	West South Central	676	10,961	141	$1,668	$1,630	98%
	Pacific	374	9,220	149	$1,749	$1,808	103%
	Middle Atlantic	290	8,186	138	$1,405	$1,427	102%
	Mountain	352	6,845	91	$1,166	$1,144	98%
	East South Central	286	5,849	79	$854	$846	99%
	West North Central	378	5,628	89	$849	$873	103%
	New England	163	3,146	55	$577	$593	103%
	Unknown	82	1,692	15	$182	$172	95%
Facility type	Freestanding	2,490	66,726	929	$11,110	$10,990	99%
	HHA	553	9,815	174	$1,627	$1,692	104%
	Hospital	480	5,820	122	$975	$1,032	106%
	Unknown	44	332	4	$47	$45	96%
	SNF/NF	18	147	2	$23	$23	100%
Ownership status	For profit	1,931	42,744	536	$6,880	$6,734	98%
	Non-profit	1,125	31,693	563	$5,505	$5,628	102%
	Government/other	485	8,071	136	$1,351	$1,376	102%
	Unknown	44	332	4	$47	$45	96%
Hospice size	Large (20,000+ RHC days)	1,165	63,678	933	$10,856	$10,800	99%
	Medium (3,500–19,999 RHC days)	1,775	18,083	280	$2,761	$2,807	102%
	Small (0–3,499 RHC days)	645	1,079	23	$165	$175	106%
Site of service (Number of Providers describes the number of providers who used the corresponding Q-Code at least once)	Home	3,570	47,054	652	$7,239	$7,345	101%
	Non-skilled nursing facility	2,375	16,882	213	$2,549	$2,500	98%
	Assisted living	2,590	11,583	117	$1,842	$1,765	96%
	SNF	2,318	6,065	104	$998	$997	100%
	Not specified	457	516	7	$83	$82	98%
	Hospice	403	400	14	$76	$84	111%
	Inpatient	2,170	164	86	$275	$280	102%
	Hospice inpatient	848	110	138	$694	$703	101%
	LTC hospital	225	43	1	$8	$8	100%
	Psychiatric	39	2	0	$0	$0	99%
Ownership status	For profit	1,931	42,744	536	$6,880	$6,734	98%
	Non-profit	1,125	31,693	563	$5,505	$5,628	102%
	Government/other	485	8,071	136	$1,351	$1,376	102%
	Unknown	44	332	4	$47	$45	96%

Note: The same beneficiaries can appear in multiple hospice subgroups when looking at the count of the number of beneficiaries.

9.1.3 Conclusion

The results of the simulations presented in this chapter are preliminary and we are continuing to expand these analyses. We plan to conduct further analyses to better understand and model potential behavioral responses to a tiered model to address vulnerabilities to the Medicare hospice benefit.

Furthermore, we are looking into possible expansions to the tiered model to include additional tiers. The tiered model presented in this chapter does not make any adjustments for beneficiaries returning to hospice after a live discharge.

9.2 Rebasing the Routine Home Care Rate for Hospice

9.2.1 Introduction

Rebasing the Medicare hospice payment rates could be one component to CMS hospice payment reform efforts. The base payment rates were originally set in 1983 using information from a relatively small set (n=26) of hospices that were participating in a CMS hospice demonstration. Since then, CMS has updated payments rates to primarily account for inflation. This report explores how the payment rate was originally set, some information on the potential misalignment between the current payment rate and the cost of providing hospice, and the feasibility of rebasing the payment system using the current available administrative data.

9.2.2 How the Routine Home Care Base Payment was Originally Set

It is CMS' intent to ensure that reimbursement rates under the Hospice benefit align as closely as possible with the average costs hospices incur when efficiently providing covered services to beneficiaries. For the purposes of determining an appropriate reimbursement rate, CMS originally established four levels of care: Routine Home Care, Continuous Home Care, Respite Care and General Inpatient Care. In recent years, an annual payment rate update has been calculated for each of these levels of care and providers are subsequently reimbursed according to the level of care provided to hospice beneficiaries. This section of the document describes how the reimbursement rate for the Routine Home Care level of care was originally calculated, beginning with the 1983 Notice of Proposed Rule Making. Much of the material in this section comes directly from the referenced documents.

Routine Home Care (RHC) is defined as a basic level of care under the Hospice benefit, where a beneficiary receives hospice care but remains at home. With this level of care, hospice providers are reimbursed by day regardless of the volume or intensity of services provided to a beneficiary on any given day. At this level of care it is anticipated that there will be days when a beneficiary does not require any services, as well as days when a beneficiary requires several visits by the hospice provider.

Paying the average cost for every day of RHC permits hospices to provide needed care in the most efficient and convenient method possible without the need to deal with the various coverage and payment rules that would be required if a more detailed and service-oriented payment system were implemented.

RHC Payment Rate Determination—1983 Final Rule

The 1983 NPRM was revised and updated prior to public release in the *Federal Register* as a final rule.[14] In the final rule, average cost per visit estimates for nursing, home health, and social service/therapy visits were recalculated based on the 1982 cost data from the Hospice demonstration project. Average visits per day for each of these three service components were also recalculated to reflect more recent data, but limited to include only utilization that occurred within the first 210 days of a patients' stay. Other changes that were made to the NPRM are as follows:

1. A cost component was added to represent the cost of respite care delivered in the home.
2. The hospice interdisciplinary team management cost was recalculated using the 1982 hospice demonstration project data and was allocated over the average 70 day length of stay seen in the data.
3. The proposed drug, supplies and equipment cost components were adjusted to reflect inflation that occurred in 1982.
4. To account for inflation, a market basket index was implemented and developed from the price of goods and services purchased by home health agencies.
5. A cost component was added to represent hospital outpatient costs for services such as palliative radiation and chemotherapy. This component was determined by estimating the average daily cost of these services based on a sample of Medicare patients who died from cancer in 1980, but inflated for costs in 1984.

The 1983 proposed and final payment rates for RHC were determined from data obtained from the Medicare hospice demonstration project. In calculating these rates, CMS relied on data for the following cost components: kinds of services furnished by hospices, the cost of these services, how often these services were rendered to beneficiaries, overhead costs (e.g. maintenance, depreciation, general accounting, etc.) and other administrative costs (e.g. nursing or home health services). Table 20 displays the final components of the RHC base payment rate.

Table 20: RHC Rate Determination for the 1983 Final Rule

RHC components	1983 Final Rule cost per day
Nursing care	$16.25
Home health	$12.74
Social services/therapy	$3.23
Home respite	$1.46
Interdisciplinary group	$2.78
Drugs	$1.18
Supplies	$4.49
Equipment	$1.13
Outpatient hospital therapies	$2.99

[14] 48 FR 56020; December 16, 1983

9.2.3 A Potential Method for Rebasing the Clinical Service Component of the Routine Home Care Rate

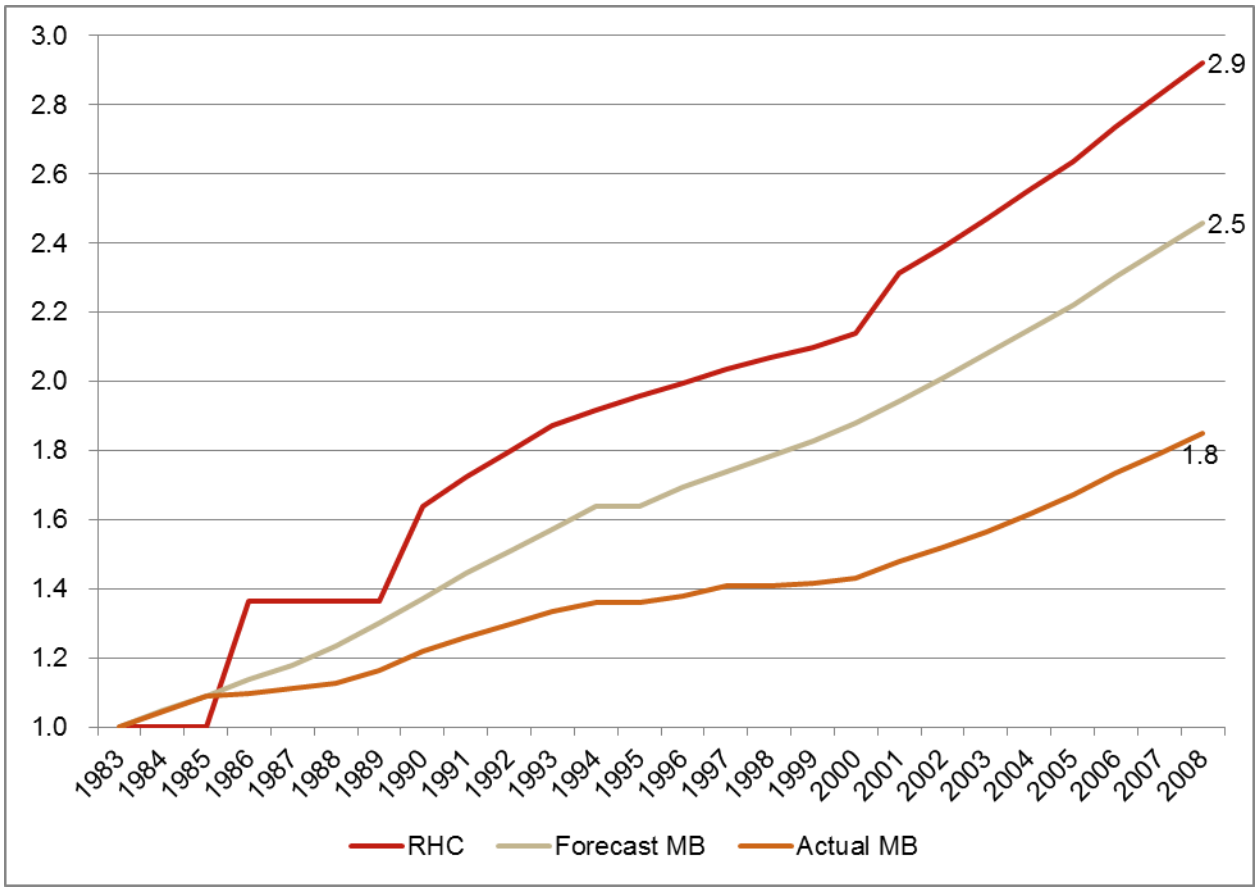
This section describes one approach to rebasing the labor portion of the RHC rate for hospice. It uses a methodology similar to the one used to create the current RHC base payment rate (as described in the previous section of this report). However, due to key limitations in the data that is currently available, a number of assumptions have to be made. We conclude that using the approach discussed in this section would cause the base payment rate to fall by $16.09. That is, using the Abt Trim sample of cost reports and weighting the sample by the number of RHC days, the RHC base payment rate in FY 2011 would fall from $146.63 to $130.54.

Summary of Methodology for Revising the Clinical Service Component of the RHC Payment Rate

When the hospice benefit was created, the RHC base rate was set using nine different components of cost as described in Section 9.2.2 (Table 20) of this chapter. The sum of the cost of all the components equals the base payment rate for RHC as stated in the final rule. During the 1980s, there were periodic rate adjustments and then starting in the early 1990's there were yearly market basket updates to account for inflation and other adjustments to the RHC base rate. The updates were not completely based on trends in inflation. This has caused some misalignment with the payment rate and the actual cost of providing services. Updating the rate using the methodology proposed in this section could better align costs with payments.

Figure 13 shows how the daily payment rates for RHC changed from 1983 to 2008. The rates are indexed to the 1983 rate (index = 1.00). In addition to the rates, the changes in the PPS hospital market basket, (forecasted and actual) are shown relative to their value in 1983 (index = 1.00). Additionally, the index value for 2008 is listed next to each respective series. Through 2008, the increase in the RHC rate was 18.7% higher than the forecasted market basket for hospitals and 63.1% higher than the actual market basket for hospitals.

Figure 13: Annual Trends in RHC Rates and Hospital Market Basket Updates (1983–2008)



Based on Figure 13, the current RHC rate is not aligned with changes to inflation that have occurred since 1983. It is not clear if the increase in the RHC rate reflects real growth in the cost of providing RHC in addition to the nominal growth that is reflected in the market basket.

The remainder of this report describes an approach to rebasing that attempts to improve the alignment between the cost of providing RHC and the payment that CMS provides. The approach proposed would rebase the three labor components (nursing, home health, social services/therapy) that currently make up the RHC rate. These components comprise 69.7% of the original base payment rate.[15]

The original RHC rate was set at $46.25. The FY 2011 rate for RHC was $146.63, meaning the original rate increased by a factor of 3.17.[16] This implies that each of the components of the original rate would have also increased by a factor of 3.17. However, the mix of services and intensity may

[15] At a later time, the components for the remaining 30.3% of the original base payment rate could be adjusted using other data. Unfortunately, it is unlikely that cost reports and claims by themselves could currently be used to rebase the non-labor components of the rate as they do not contain very detailed information on the non-labor components.

[16] 3.17 = ($146.63/$46.25)

have shifted over time so the implied increase of an individual component may not realistically describe the actual increase.

One approach to rebase the RHC base payment rate would be to use more recent cost reports and claims as follows. Each of the following steps would be taken for each hospice in the sample of hospices used for rebasing.

1. Determine the costs (from the cost report) associated with each clinical service component (e.g., nursing, home health aide and social service/therapy) and divide by the total number of minutes of care provided by that discipline during the time period of the cost report.[17]

2. Divide the total number of RHC minutes for each clinical service component by the total number of RHC days. Both pieces of information would be found on the claim and would only correspond to hospice services that matched to the time period of the cost report.

3. Multiply the result in Step 1 by the result in Step 2. This produces the average cost of each clinical service component (e.g., nursing, home health aide and social service/therapy) per RHC day for a particular hospice.

4. Step 3 produces an average for each hospice. Those averages would then be averaged across the results from all other hospices in order to determine an overall average cost per RHC day for each clinical service component. That overall average cost could then be substituted for the corresponding component that currently comprises the RHC base payment rate.

Detailed Methodology for Revising the Clinical Service Component of the RHC Payment Rate

This section reviews the methodology for revising the RHC payment rate in more detail. Limitations for each step and potential solutions for addressing those limitations are also reviewed.

- Rebasing would be based on a sample of freestanding and facility based hospices with a fiscal year start date between October 1, 2010 and December 31st, 2011 and end date during 2011. This sample of hospices includes 2,717 cost reports from 2,717 providers which matched to claims.[18] 2,473 hospices contained usable information (costs and/or minutes for skilled nursing or home health aides were not equal to 0). After applying the Abt Trim, there were 2,140 hospices remaining.[19]

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[17] This approach computes the total of minutes (for Medicare only) and the total of costs (Medicare and non-Medicare costs are combined on the cost report) looking across all levels of care. It does not focus solely on RHC. However, it is important to note that on the cost report, costs are reported across all levels of care. On the claims, minutes are reported for all levels of care **EXCEPT** GIP. This approach is conservative, creating an overestimate of the actual average cost per minute of a discipline because it includes GIP costs but no GIP minutes.

[18] This sample was pulled from HCRIS data in January 2013.

[19] The Abt Trim was applied to reduce the impact of outliers in the analysis. The Abt Trim makes the following exclusions

1. Cost reports with period less than 10 months or greater than 14 months.
2. Cost reports with missing information or negative reported values for total costs or payments.
3. Providers in the highest and lowest percentile (1% and 99%) in costs per days across all levels of care.

- In 2011, according to claims data, there were 3,585 hospices that provided 82,905,754 RHC days. The sample of usable costs reports captures 2,473 hospices (69.0% of all hospices) that provided 65,290,279 RHC days (78.8% of RHC Days) in 2011. The sample of cost reports we use in rebasing (usable cost reports that are in the Abt Trim) captures 2,140 hospices (59.7% of all hospices) that provided 60,603,864 RHC days (73.1% of RHC days) in 2011. [20]
- Data on hospice days (from the claims) that fall on or between each cost report's fiscal year beginning and end date are merged with the cost report data. Hospice days that are outside of the beginning and end date are not included in rebasing.
- Total minutes of care by discipline (from the claims) are added together for each hospice.[21] The data is limited in that it does not provide information about the minutes of care when the level of care is GIP. Therefore this approach is underestimating the total minutes of care by discipline that a hospice provides. The cost reports include costs accumulated from GIP, but the minutes (claims) data does not include information associated with GIP.
- For each hospice in the sample, a number of different variables are created in order to carry out rebasing. The most pertinent variables are discussed below.
  - Cost of a discipline (e.g. nursing) per minute.[22,23]

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4. Top and bottom 5% of provider margins.
5. Providers were excluded if the log payment to cost ratio was greater than the 90th (or less than the 10th) percentile of this value across all providers plus (minus) 1.5 times the range between the 10th and 90th percentiles of this log ratio.

[20] Of those 2,140 hospices: 1,623 (75.8%) are freestanding, 286 (13.4%) are home health agency based, 186 (8.7%) are hospital based, 2 (0.1%) are SNF based, and 43 (2.1%) are not classified. Information was obtained from the Provider of Services file. In the full sample of hospices (n= 3,585): 2,350 (65.5%) are freestanding, 563 (15.7%) are home health agency based, 490 (13.7%) are hospital based, 17 (0.5%) are SNF based, and 165 (4.6%) are not classified.

[21] Note, we censor observations that report having more than 1,440 minutes (24 hours) of a single discipline on a single day of hospice. That is we impose that no observation can have more than 1,440 minutes of care for a single discipline in a single day. Using claims for 2010 and 2011, there were 163,688,904 days of hospice reported across all levels of care. 19,453 days (across all levels of care) had at least 1,440 minutes of aide time reported. 1,341 days (across all levels of care) had at least 1,440 minutes of medical social services reported. 163,046 days (across all levels of care) had at least 1,440 minutes of skilled nursing service reported. 3 days (across all levels of care) had at least 1,440 minutes of occupational therapy services reported. 6 days (across all levels of care) had at least 1,440 minutes of occupational therapy services reported. 0 days (across all levels of care) had at least 1,440 minutes of speech therapy services reported. Censoring observations causes the base payment rate to be approximately 10 cents higher than if observations are not censored.

[22] As noted earlier, the cost will includes costs from all LOCs but the minutes do not include information from the GIP LOC. This will cause us to **overestimate** the cost per minute of each discipline.

[23] Costs in the cost report are total costs, not Medicare costs. This will also cause us to **overestimate** the cost per minute of each discipline. On average over 90% of all days referenced on the cost report are Medicare days. Presumably, a similar proportion of costs would also be Medicare costs. In 2011, 95% of providers reported at least three quarters of all their hospice days were for Medicare beneficiaries. Roughly 75% of

  - The ratio of the number of RHC minutes per discipline over the number of RHC days.
  - We multiply the cost per minute for each discipline by the RHC minutes for each discipline per RHC day to compute the cost of a discipline per RHC day.
- We then take a weighted average (using the number of RHC days a hospice provides as the weight) of the cost per discipline per RHC day across all of the hospices in the sample to compute a rebased cost per discipline per RHC day that could be substituted into the RHC base rate.

Results from Rebasing the Clinical Service Component of the RHC Rate

We present results using a Day Weighted approach. The Day Weighted approach takes a weighted average of the clinical service component costs across all hospices in the sample. The weight that is used is the number of RHC days the hospice provided during the period of time their cost report corresponds to. This way, larger hospices (who provide a larger portion of hospice services) are having a greater weight on the average labor cost per RHC day. Table 21 compares the cost per day of each component in the 1983 final rule versus the cost per day calculated from the approach described in the previous sections of this report. Non-labor components (home respite, interdisciplinary group, drugs, supplies, equipment, and outpatient hospital therapies) are costed by the implied payment growth seen in the RHC base payment rate from the 1983 final rule to the FY 2011 rate. As described earlier, the overall rate grew by a factor of 3.17 during this time and this growth rate was applied to the individual non-labor components.

Table 21: Comparison of Cost Components of the RHC Rate from 1983 vs. 2011

RHC components	1983 Final Rule cost per day	FY 2011 Actual Implied Payment Amounts	FY 2011 Day weighted rate
Nursing care	$16.25	$51.52	$56.54
Home health	$12.74	$40.39	$19.24
Social services/therapy	$3.23	$10.24	$10.29
Home respite	$1.46	$4.63	$4.63
Interdisciplinary group	$2.78	$8.81	$8.81
Drugs	$1.18	$3.74	$3.74
Supplies	$4.49	$14.23	$14.23
Equipment	$1.13	$3.58	$3.58
Outpatient hospital therapies	$2.99	$9.48	$9.48
RHC total	$46.25	146.63	$130.54

9.2.4 Conclusion

The key results from the approach to rebasing the labor portion of the RHC rate are as follows:

> The RHC base payment rate for 2011 was $146.63. The rebased RHC rate in 2011 would have been $130.54 if the Abt Trim sample using the Day Weighted approach had been used.

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providers reported at least 90% of all their hospice days were for Medicare beneficiaries. Excluding cost reports with a high percentage of non-Medicare days (e.g. >= 20%) and also reducing the costs by a factor equal to the ratio of Medicare days over total days could serve as one way to lower the aforementioned overestimate.

Appendix A: Descriptive Statistics on Hospice Utilization for 2011

Data in the table below come from several Medicare data sources, including hospice claims, the Medicare enrollment database, a provider-level data file, and the area resource file.

We constructed the dataset by identifying beneficiaries who received any hospice service in calendar 2011 and included all of their hospice episodes that occurred in calendar year 2011. A "hospice episode" was defined as contiguous days in the hospice program. Approximately 17% of the hospice episodes began prior to 1/1/2011. For these episodes, we included all hospice days that were part of the contiguous hospice stay (that is, days prior to 1/1/2011 that were part of the hospice episode). We excluded any episodes that do not include at least one claim in 2011, unless otherwise noted. In all, there were 129,253,613 hospice days across 1,312,819 hospice episodes among 1,220,680 unique beneficiaries.

For the site of service stratification: (1) episode-level summary data was defined using all episodes where at least one claim in the episode indicated the corresponding site of service; and (2) beneficiary-level summary data was defined using all beneficiaries where at least one claim (across all episodes) indicated the corresponding site of service. For variables that can vary within a hospice episode (e.g., level of care, visits, and payment), only days that matched the specific site of service are included in the tabulation.

For discharge status, the "died in hospice" category includes beneficiaries who were enrolled in hospice as of 12/31/2011 and died sometime in 2012 (this occurred 14%-16% across the four columns). We note that some of these beneficiaries may have subsequently been discharged from hospice in 2012 before dying. Additionally, "Average number of days until death" excludes the small number of beneficiaries whose reported date of death pre-dated their last hospice day.

The "Visits per day per episode" results reflect the average visits per day within each episode, averaged across all episodes. Similarly, the "Spending per day per episode" results reflect the average spending per day within each episode, averaged across all episodes.

Table A.1: Descriptive Statistics on Hospice Utilization for 2011

Data item	All episodes	Patient home	Nursing home	Assisted living
Beneficiary demographics				
Age as of 1st day of episode				
<65	5.50%	6.62%	3.89%	1.41%
65–<75	16.14%	19.57%	10.40%	5.62%
75–<85	31.02%	32.84%	28.41%	24.72%
85+	47.34%	40.96%	57.30%	68.25%
Gender				
Male	40.31%	43.85%	32.91%	30.02%
Female	59.69%	56.15%	67.09%	69.98%
Race/ethnicity				
White, non-Hispanic	87.44%	85.86%	88.39%	94.85%
African-American, non-Hispanic	8.35%	9.15%	8.27%	2.32%
Hispanic	1.95%	2.33%	1.42%	1.55%
Other, non-Hispanic	2.26%	2.67%	1.91%	1.28%
Disease and comorbidities				
Principal diagnosis on the first day of the episode				
“Lung & other chest cavity cancer”	7.93%	10.70%	3.68%	2.60%
“Colorectal cancer”	2.67%	3.49%	1.54%	1.17%
“Alzheimer’s”	5.00%	4.12%	7.56%	8.82%
“Non-Alzheimer’s dementia”	11.30%	7.64%	19.01%	20.53%
“Cerebrovascular accident”	4.77%	3.16%	5.14%	3.04%
“Congestive heart failure”	7.53%	8.06%	6.96%	7.45%
“Other heart disease”	5.46%	5.88%	4.60%	5.76%
“Non-infectious respiratory disease”	6.74%	8.07%	5.44%	4.72%
“Failure to thrive—adult”	6.36%	5.30%	9.36%	10.05%
“Debility NOS”	11.99%	10.36%	16.28%	20.72%
“Parkinson & other degenerative”	2.20%	2.39%	2.59%	2.44%
“Pneumonias and other lung diseases”	2.34%	1.50%	1.20%	0.86%
“HIV/AIDS”	0.07%	0.08%	0.07%	0.03%
“Chronic liver disease”	1.17%	1.29%	0.78%	0.40%
“Chronic kidney disease”	2.37%	1.87%	2.19%	1.13%

Data item	All episodes	Patient home	Nursing home	Assisted living
Other	22.09%	26.08%	13.61%	10.29%
Principal diagnosis on the first day of the episode was cancer vs. non-cancer				
Cancer	28.66%	37.47%	15.07%	11.51%
Non-cancer	71.34%	62.53%	84.93%	88.49%
Comorbidities per episode (highest number of comorbidities over the time period examined)				
1 diagnosis	75.42%	73.11%	77.13%	77.67%
2 diagnoses	7.77%	8.27%	7.37%	7.68%
3 diagnoses	4.61%	5.05%	4.05%	4.27%
4+ diagnoses	12.20%	13.57%	11.45%	10.38%
Medicare/Medicaid Dual eligibility status				
Dual eligible	7.28%	5.48%	16.00%	4.92%
Not dual-eligible	92.72%	94.52%	84.00%	95.08%
Medicare Advantage enrollment status				
FFS enrollee (one month prior to election)	76.19%	73.65%	81.46%	74.52%
MA enrollee (one month prior to election)	23.81%	26.35%	18.54%	25.48%
Hospice provider characteristics as of 1st day of episode				
Tax status				
For-profit	43.94%	42.69%	52.66%	54.04%
Non-profit	46.17%	47.43%	37.02%	37.40%
Government	9.89%	9.88%	10.32%	8.56%
Ownership status				
Freestanding	75.17%	73.01%	79.93%	81.09%
Hospital	10.17%	10.82%	7.76%	5.99%
SNF	0.18%	0.09%	0.45%	0.10%
HHA	14.48%	16.07%	11.87%	12.82%
Census regions				
Northeast	15.61%	14.56%	18.06%	10.53%
Midwest	23.34%	19.50%	32.37%	20.44%
South	41.43%	43.75%	35.41%	36.04%
West	19.61%	22.19%	14.16%	32.98%
Census divisions				
New England	4.51%	3.99%	6.24%	2.52%

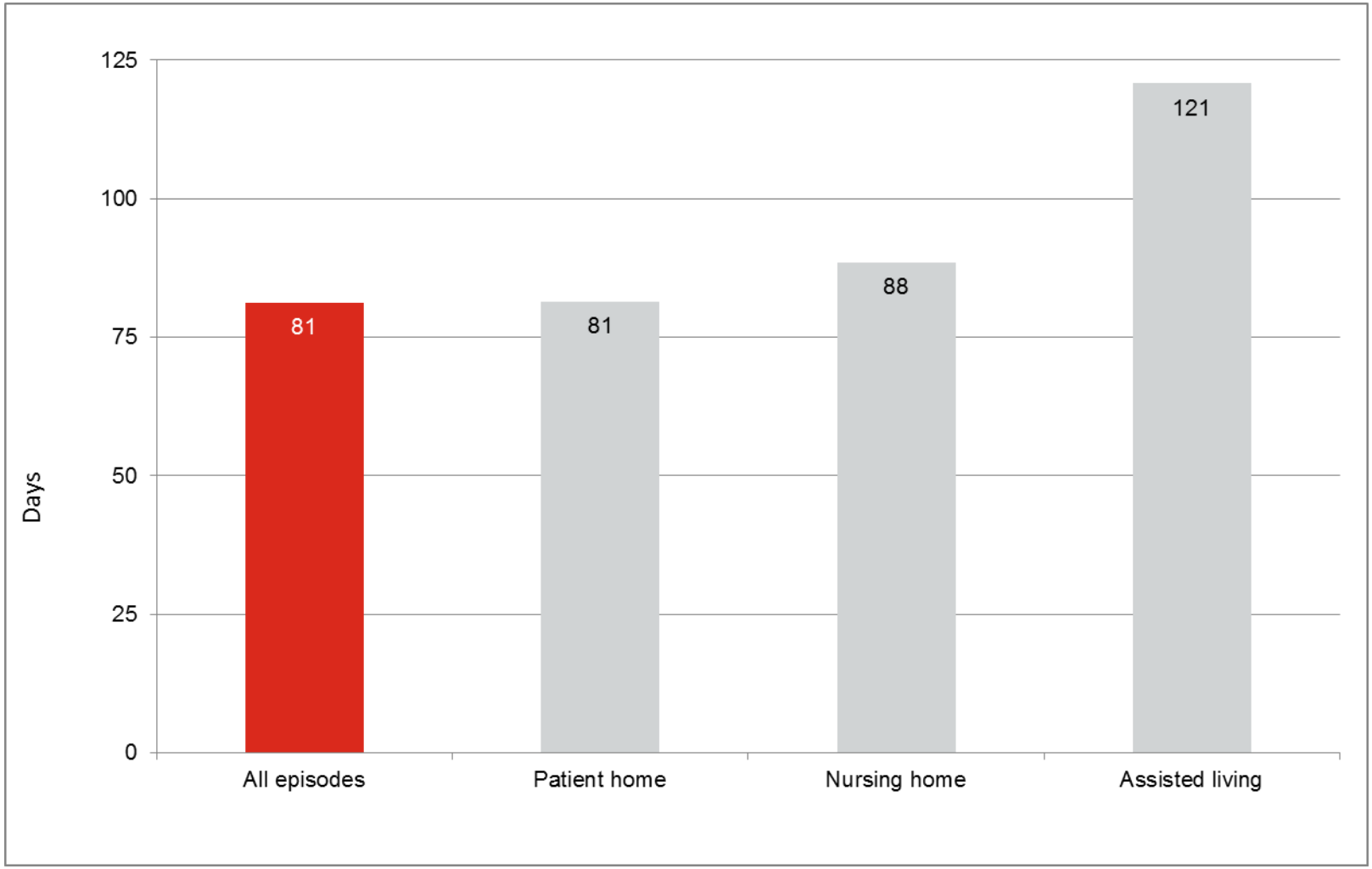
Data item	All episodes	Patient home	Nursing home	Assisted living
Middle Atlantic	11.49%	11.20%	11.84%	8.47%
South Atlantic	22.37%	22.88%	15.71%	25.47%
East North Central	16.20%	13.66%	20.02%	15.61%
East South Central	6.73%	8.14%	5.22%	2.33%
West North Central	7.20%	5.95%	12.33%	4.90%
West South Central	11.84%	11.92%	14.48%	7.65%
Mountain	7.55%	7.75%	5.43%	14.61%
Pacific	12.11%	14.51%	8.74%	18.42%
Rural/urban status				
Urban	87.51%	85.76%	87.24%	92.06%
Rural	12.49%	14.24%	12.76%	7.94%
Hospice level of care (LOC)				
Received any care (not mutually exclusive)				
Any RHC	86.45%	99.39%	92.81%	99.38%
Any CHC	6.18%	6.82%	5.14%	10.69%
Any GIP	22.27%	0.56%	6.88%	0.40%
Any IRC	3.40%	0.61%	6.52%	0.12%
LOC combinations (mutually exclusive)				
RHC only	69.70%	92.14%	82.06%	88.85%
GIP only	12.63%	0.00%	3.26%	0.00%
RHC/CHC	4.82%	6.14%	4.53%	10.05%
RHC/GIP	7.83%	0.46%	3.10%	0.34%
Other	5.03%	1.26%	7.05%	0.75%
Hospice Benefit Periods & Days				
Number of benefit periods per beneficiary (for all beneficiaries who had at a hospice episode in 2011)				
1 benefit period	60.65%	55.54%	50.59%	37.70%
2 benefit periods	11.70%	13.99%	12.52%	14.29%
3 benefit periods	5.11%	5.86%	6.07%	7.36%
4+ benefit periods	22.53%	24.60%	30.81%	40.64%
Number of days per episode among decedents				
Average number of TOTAL days per episode	81.24	81.47	88.46	120.8
Average number of RHC days per episode	79.18	81.05	87.34	119.97

Data item	All episodes	Patient home	Nursing home	Assisted living
Average number of CHC days per episode	0.34	0.37	0.26	0.8
Average number of GIP days per episode	1.51	0.02	0.46	0.02
Average number of IRC days per episode	0.21	0.03	0.4	0.01
Median number of TOTAL days per episode	20	27	20	48
Median number of RHC days per episode	18	26	19	48
Median number of CHC days per episode	0	0	0	0
Median number of GIP days per episode	0	0	0	0
Median number of IRC days per episode	0	0	0	0
Number of days per episode (categories), not restricted to decedents				
1–3 days	13.52%	9.54%	12.92%	6.38%
4–7 days	13.78%	10.96%	14.63%	7.81%
8–10 days	6.4%	6.06%	6.49%	4.41%
11–14 days	5.88%	6.22%	5.52%	4.48%
15–30 days	13.1%	15.37%	12.48%	12.18%
31–60 days	11.87%	14.57%	10.97%	13.60%
61–90 days	7.61%	8.9%	7.25%	9.83%
91–180 days	11.58%	12.88%	11.70%	16.63%
181+ days	16.26%	15.5%	18.04%	24.69%
Hospice Discharge Status at beneficiary level				
Died in hospice	82.8%	78.9%	79.5%	72.1%
Alive and in hospice as of 12/31/2011	7.6%	8.1%	9.0%	13.3%
Discharged from hospice—Alive after discharge	4.2%	5.2%	4.9%	6.6%
Discharged from hospice—Died after discharge	5.4%	7.9%	6.6%	8.0%
Average number of days until death	136	127	152	160
Hospice Visits				
Visits per episode				
Average number of PART A VISITS	72.38	55.79	70.51	92.52
Average number of PART A PHYSICIAN/NP VISITS	1.18	0.57	0.38	0.83
Average number of PART A PER DIEM VISITS	71.20	55.21	70.13	91.69
Average number of PART A PER DIEM SKILLED NURSING VISITS	30.53	23.65	24.43	34.66

Data item	All episodes	Patient home	Nursing home	Assisted living
Average number of PART A PER DIEM HOME HEALTH AIDE VISITS	34.84	26.31	39.4	49.19
Average number of PART A PER DIEM SOCIAL SERVICE VISITS	5.73	5.15	6.25	7.75
Average number of PART A PER DIEM THERAPY VISITS (physical, speech, occupational)	0.09	0.11	0.06	0.09
Median number of PART A VISITS	21	20	20	40
Median number of PART A PHYSICIAN/NP VISITS	0	0	0	0
Median number of PART A PER DIEM VISITS	20	20	20	40
Median number of PART A PER DIEM SKILLED NURSING VISITS	11	11	9	18
Median number of PART A PER DIEM HOME HEALTH AIDE VISITS	4	3	7	15
Median number of PART A PER DIEM SOCIAL SERVICE VISITS	2	2	2	4
Median number of PART A PER DIEM THERAPY VISITS (physical, speech, occupational)	0	0	0	0
Visits per day per episode				
Average number of PART A VISITS	1.56	0.82	0.90	0.86
Average number of PART A PHYSICIAN/NP VISITS	0.06	0.01	0.01	0.01
Average number of PART A PER DIEM VISITS	1.5	0.81	0.89	0.85
Average number of PART A PER DIEM SKILLED NURSING VISITS	0.89	0.47	0.45	0.44
Average number of PART A PER DIEM HOME HEALTH AIDE VISITS	0.48	0.24	0.32	0.31
Average number of PART A PER DIEM SOCIAL SERVICE VISITS	0.13	0.1	0.12	0.1
Average number of PART A PER DIEM THERAPY VISITS (physical, speech, occupational)	0	0	0	0
Median number of PART A VISITS	0.76	0.67	0.75	0.71
Median number of PART A PHYSICIAN/NP VISITS	0	0	0	0
Median number of PART A PER DIEM VISITS	0.73	0.67	0.75	0.7

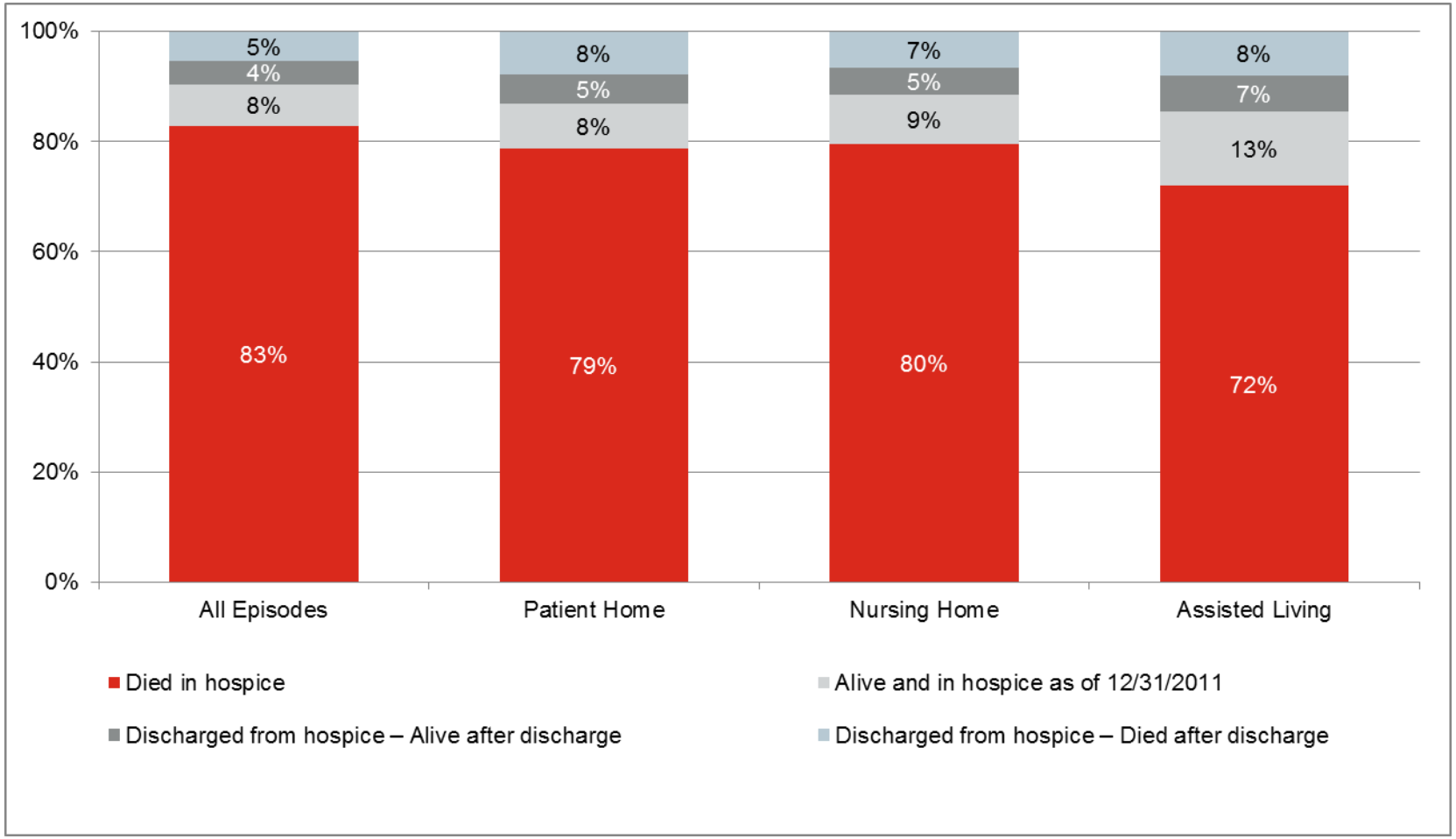
Data item	All episodes	Patient home	Nursing home	Assisted living
Median number of PART A PER DIEM SKILLED NURSING VISITS	0.33	0.32	0.3	0.29
Median number of PART A PER DIEM HOME HEALTH AIDE VISITS	0.25	0.19	0.28	0.28
Median number of PART A PER DIEM SOCIAL SERVICE VISITS	0.07	0.06	0.07	0.06
Median number of PART A PER DIEM THERAPY VISITS (physical, speech, occupational)	0	0	0	0

Figure A.1: Average Length of Hospice Stay: Overall and by Site of Service



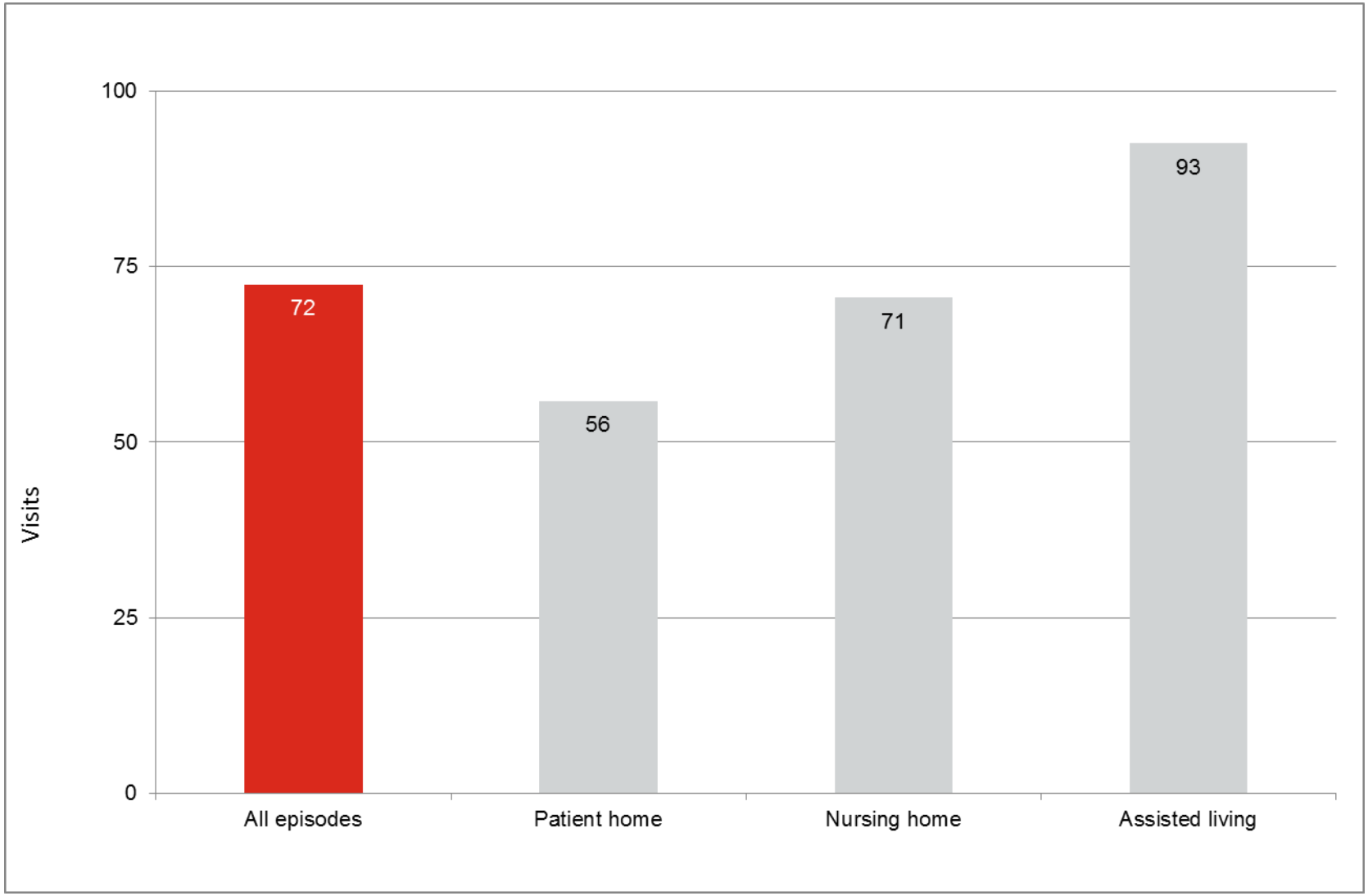
Source: 2011 Medicare hospice claims.

Figure A.2: Discharge Status of Hospice Beneficiary: Overall and by Site of Service



Source: 2011 Medicare hospice claims.

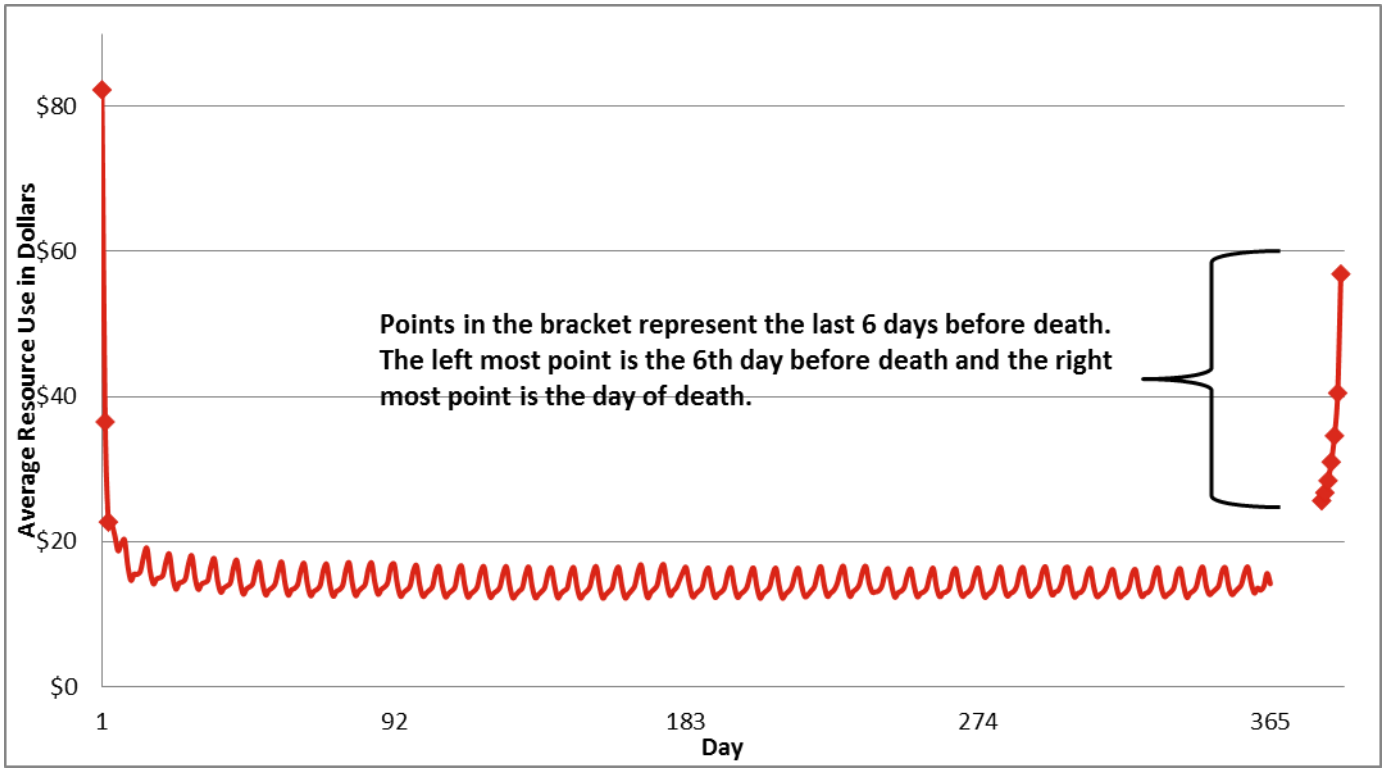
Figure A.3: Average Number of Part A Visits During Hospice Stay: Overall and by Site



Source: 2011 Medicare hospice claims.

Appendix B: Average Resource Use for Routine Home Care Days in 2011

Figure B.1: Average Resource Utilization for Routine Home Care Days in 2011 Based on when the Day Fell within a Beneficiary's Lifetime Length of Stay in Hospice



Note: "Day" represents a specific day within a beneficiary's lifetime length of stay in hospice. For example, when a beneficiary enrolls in hospice for the first time, that would be considered Day 1. Each subsequent day in hospice would be counted as an additional day (Day 2, Day 3, and so on). Since Day represents where a person is in their lifetime length of, if a beneficiary leaves the hospice benefit on his 90th day and re-enrolls 2 weeks later, the first day of re-enrollment would correspond to the 91st day. The figure is censored at 365 days so that any day that exceeded a beneficiary's 365th day in hospice was counted as occurring on the 365th day. If a beneficiary's lifetime length of hospice was 7 days or less, each of those days would only contribute to the information on the far right hand side of the graph that represents the 6 days before death. Therefore, Day 1 represents individuals who had a length of stay of at least 8 days. Day 2 represents individuals who had a length of stay of at least 9 days, and so on. If a beneficiary was still enrolled in hospice as of December 31, 2011, it was assumed that beneficiary was not in their last 6 days before death and therefore all their days would be represented on the left part of the figure. Only resource use on Routine Home Care days that occurred in 2011 are included in this figure. Data markers are only shown for days 1, 2, and 3 and each of the last 6 days before death. The rest of the points in the figure do not have markers and are simply connected by a smoothed line.

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