November 2009

Post Acute Care Episodes

Final Report

Prepared for

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1. BACKGROUND

In 2008, the Medicare program spent $49.9 billion on post-acute care (PAC) services including skilled nursing facilities (SNFs), home health agencies (HHAs), inpatient rehabilitation facilities (IRFs), and long-term care acute hospitals (LTCHs) (Medicare Payment Advisory Committee [MedPAC], 2009). This represents an increase of 8 percent over 2007 Medicare spending on PAC; much of the increase was driven by spending on HHA and SNF (MedPAC, 2009). Given the payment silos for each provider type in the current PAC payment systems, there is little incentive for providers to work across settings to improve coordination of care and achieve efficiencies over a beneficiary's course of illness.

One idea that has recently been raised by policymakers to improve incentives for coordination and efficiency is "bundled payment." Under a bundled payment, one payment would be made per episode of care. An accountable entity (i.e., a hospital, an insurer, a PAC provider, groups of providers or other organization) would then be at risk for the care that patients receive over the episode. Recently, several Medicare bundled payment proposals have been discussed (Office of Management and Budget, 2009; Senate Finance Committee, 2009; Congressional Budget Office, 2009; MedPAC, 2008). Each proposal recommends making a bundled Medicare payment for hospital and PAC services, although the proposals differ in which PAC services are included and how many days' services are included. These proposals also vary in how the end point of a fixed episode is defined (i.e., any claim initiating within 30 days versus 30 calendar days after discharge).

The goal of the work presented here is to inform this discussion of bundled payments by providing data on the implications of different episode definitions, including difference in average program costs when one includes or excludes hospital readmissions or uses different end points for the episode. The episode definitions that we explore in this work include both fixed episodes (30, 60, or 90 days) and variable length episodes defined as ending with a gap in service use (30 day, 45 day, or 60 day gap). Average Medicare payments per episode and per service are calculated for 18 different definitions of an episode (see Table 1 for list of episode definitions). These definitions are based on analysis of Medicare claims data reflecting actual utilization patterns of acute, HHA, IRF, SNF, LTCH, and hospital outpatient department therapy services. In addition, this work explores differences in PAC payments across geographic areas in order to give more context to discussions regarding PAC use and payments nationally.

In this work, we use a beneficiary-level data file of 2006 Medicare claims constructed in prior work for the Office of the Assistant Secretary for Planning and Evaluation (ASPE) examining patterns of PAC use for Medicare beneficiaries (Gage et al., 2009). This file is unique in its ability to track beneficiary service use across settings following an index acute hospital admission. Here, we expand our analyses to explore fixed PAC episode definitions and variable length episodes defined by a gap in service use. For each of the fixed

definitions, we examine alternative methods of treating the *last* claim in an episode by including all days and dollars associated with a claim that initiates within the fixed time period rather than prorating days and dollars based on the portion of services that occur within the fixed time period. Another alternative end point examined for each of the fixed and variable length episode definitions is acute hospital readmission. In total, our analyses compare the use of PAC services under 18 different PAC episode definitions. Analyses of these episodes will demonstrate the effect of different definitions as we examine options for potential payment bundles based on episodes of care.

Each of the alternative episode definitions is compared on:

- Percentage of beneficiaries with a claim for specific settings of PAC,
- Length of stay associated with the use of specific settings of PAC, and
- Medicare payments associated with the use of specific settings of PAC.

In addition to analyzing the services included under different episode definitions, we examine variations in PAC episode payments across geographic areas. These analyses are presented at the national and state levels, as well as at the level of the core-based statistical area (CBSA), which includes both metropolitan and micropolitan areas. In order to allow for comparison of Medicare payments across these geographic areas, we standardized the PAC payments to remove payment variation related to geography including wage differences and urban/rural location, as well as other policy considerations that affect payments such as indirect medical education (IME) and disproportionate share hospital (DSH) payments. By comparing standardized payments, we can learn more about differences in patterns of use in the absence of payment adjustments.

The next sections of this report describe the data sources, methods, and key findings from this set of analyses. Section 2 discusses the alternative episode definitions and methods for standardizing payments. Section 3 presents the results of the analyses decomposing the use of PAC services under the alternative episode definitions including percentage of beneficiaries using each PAC service and their corresponding lengths of stay and Medicare payments under each of the definitions. This section also presents the results of the geographic benchmarking analysis. Section 4 includes a discussion of the implications of these results for bundled payment policy.

2. POST-ACUTE CARE EPISODE DEFINITIONS

2.1 Data Source

The primary data source for this study was 2006 Medicare claims data. These data provided information on utilization and Medicare payments associated with acute hospital discharges and subsequent PAC. The 2006 Medicare claims files were used to track patterns of PAC use, including PAC service mix, length of stay, payment, and acute hospital readmission rates. The Medicare claims files were used to build episodes of acute plus PAC using inpatient acute care,[1] IRF, LTCH, SNF, HHA, and hospital outpatient therapy claims. Physician services during index acute hospitalizations were also included in the analysis.

Each of the index acute hospital claims were run through the Centers for Medicare & Medicaid Services (CMS) Medical Severity Grouper (MS-DRG) version 25.0 to generate an MS-DRG for each claim. Analyses were performed at the MS-DRG level rather than the level of the diagnosis-related group (DRG) in order to mirror current Medicare payment policy following the adoption of the MS-DRG in Fiscal Year 2008 (FY2008).

2.2 Episode Definitions

Defining the Start of an Episode

The initiating event for a PAC episode in our analysis is an index acute hospital stay in 2006. We define an index acute hospital stay as an acute hospital admission following a 60 day period without the use of acute, LTCH, IRF, SNF, or HHA services. Therefore, although all index acute hospitalizations took place in 2006, we also used data from the last quarter of 2005 to impose our episode construction criteria. The study sample was limited to live discharges from index acute hospitalizations. Beneficiaries were defined as PAC users based on discharge to SNFs, IRFs, or LTCHs within 5 days of discharge from the index acute hospitalization or discharge to HHAs or hospital outpatient therapy within 14 days of discharge from the index acute hospitalization. Our data file included 310,629 live index acute hospital discharges, and 109,236 of these beneficiaries were defined as PAC users (35.2 percent).

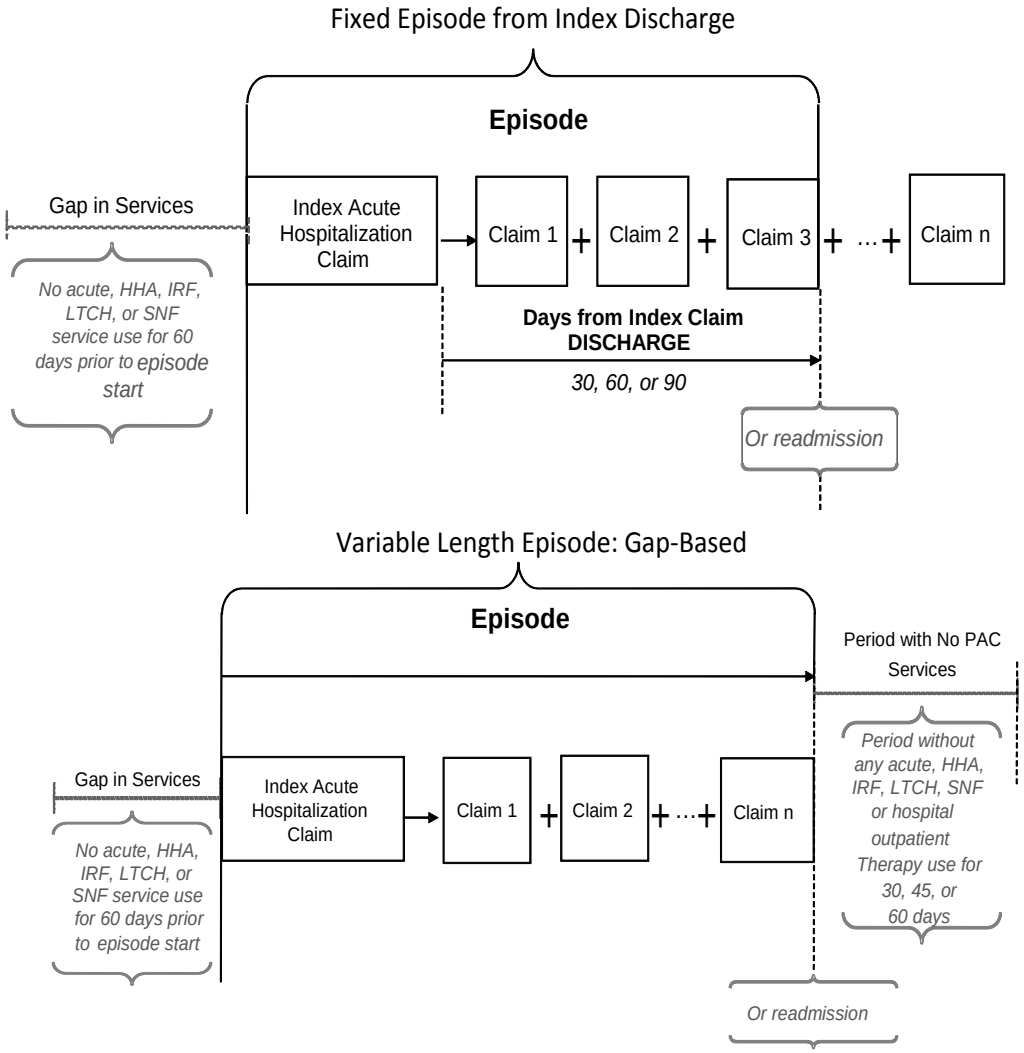
Alternative Episode Definitions

In this analysis, we explore differences in the composition of PAC episodes using 18 different episode definitions. These episode definitions fall into two broad categories: fixed episodes and variable length episodes. Fixed episodes are calculated based on claims that occur within fixed windows of time following index acute hospital discharge. Our analysis of fixed episode definitions included 30 day, 60 day, or 90 day periods following acute hospital discharge. In contrast, variable length episodes included all claims prior to a gap of X days

[1] Inpatient acute claims included both prospective payment system (PPS) and critical access hospital (CAH) claims.

with no acute or PAC service use (including LTCHs, SNFs, IRFs, HHAs, and hospital outpatient therapy). Our analyses included an examination of variable length episode definitions defined by a 30 day, 45 day, or 60 day gap in service use. An alternative end point to each of the episode definitions is acute hospital readmission. Figure 1 provides a schematic of the differences between the fixed and variable length episode definitions.

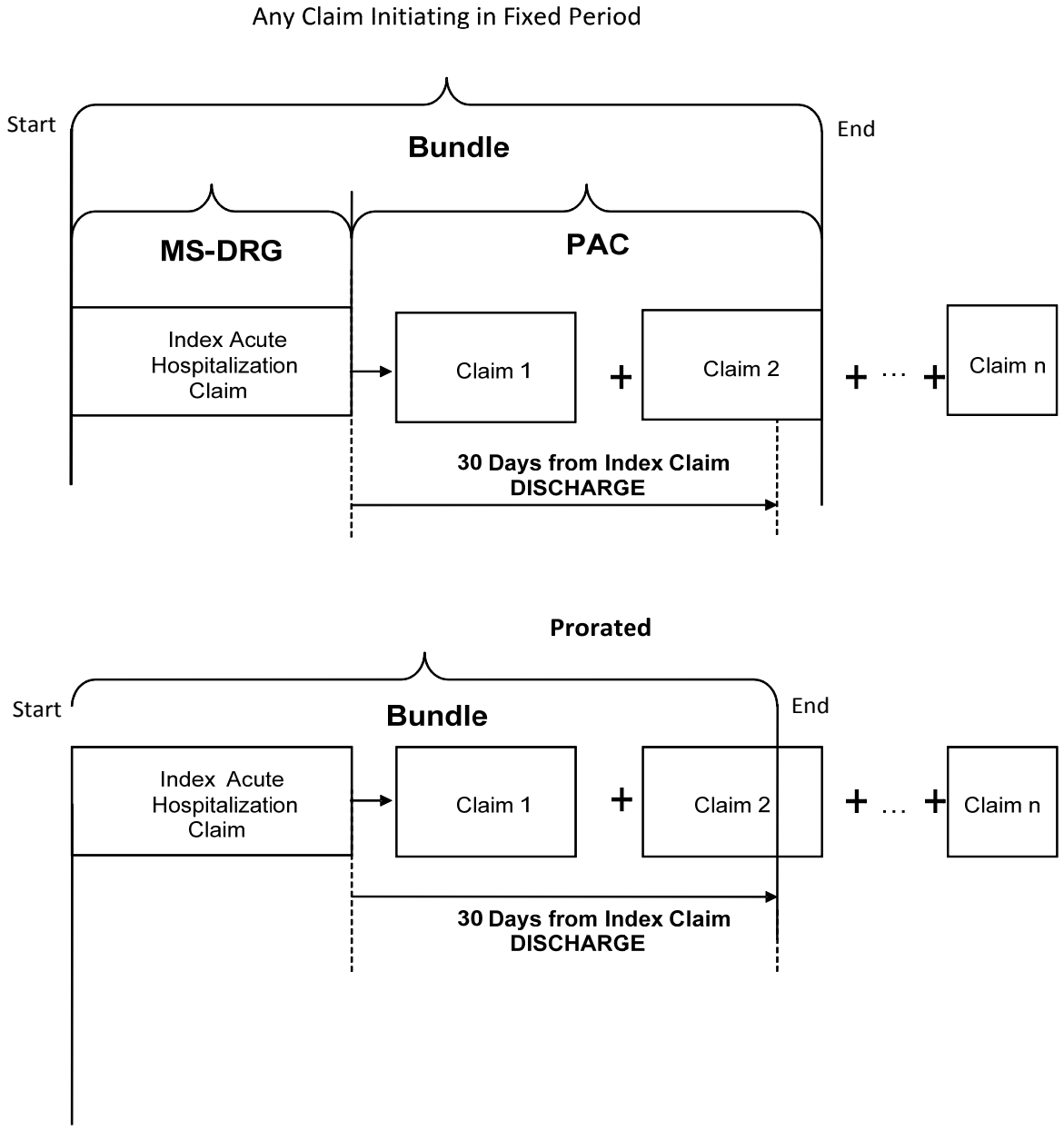
Figure 1. Fixed versus Variable Length Episodes



Our analyses considered two methods for defining the end point of fixed episodes. The first method allows any claim initiating within a fixed period to be included in the episode definition. For example, using this method, the entirety of a 60 day home health claim initiating 25 days after acute hospital discharge would be included in the 30 day fixed

episode definition. In the second method, we prorated claims so that only PAC days within 30 days of hospital discharge (and their associated dollars) were included in the episode definition. Using the example of the 60 day home health claim initiating 25 days after acute hospital discharge, under the prorated methodology, only visits occurring during the first 5 days of the home health claim (up to day 30 after acute hospital discharge) would be included in the 30 day fixed episode definition. Medicare payments per visit were estimated by dividing the total claim Medicare payment amount by the total number of visits on the claim. Similarly, in the case of inpatient PAC claims, dollars per day were calculated by dividing the total Medicare payment amount on the claim by the length of stay. Figure 2 provides a schematic of the differences between methods of defining the end points in fixed episodes.

Figure 2. Defining End Points of Fixed Episodes



Each of the episode definitions was examined in order to learn more about the percentage of beneficiaries using services under each of the definitions and the corresponding length of stay and payments for different PAC services. Payments were calculated for three different denominators: payments per service user, payments per PAC user, and payments per hospital discharge to demonstrate the differences in mean payments across different beneficiary samples.

- Payments per service user indicate the mean Medicare payments for those beneficiaries who use the specific PAC service (average payments per SNF admission for those who had a SNF admission).
- Payments per PAC user indicate the mean Medicare payments across all beneficiaries who use any PAC, regardless of whether or not they use a specific PAC service.
- Payments per hospital discharge indicate the mean Medicare payments across all beneficiaries with an index acute hospital stay, regardless of whether they use a PAC service.

Table 1 describes each of the episode definitions and shows the mean episode payments per index acute hospital discharge and per PAC user for the 18 different definitions included in our analyses. In addition to the data presented in this report, episode analyses were also conducted at the MS-DRG level for each of the episode definitions. We restrict the tables included here to the most frequent or high-cost MS-DRGs, but this analysis demonstrates the difference in expected use and cost for different types of conditions, particularly between those admitted to the hospital for medical versus surgical treatments.

Geographic Benchmarking Analysis

The goal of the geographic benchmarking analysis is to look at the differences in PAC payments across different levels of geography to learn more about differences in patterns of PAC utilization as they relate to differences in the local availability of providers and practice patterns across the country. Analyses were conducted at national, state, and CBSA levels. Mean PAC payments and percentiles of PAC payments were calculated per index acute hospital discharge and per PAC user.

In conducting the geographic benchmarking analysis, we standardized payments to remove the effects of payment adjustments caused by geography or other policy considerations. By standardizing the payments, we remove payments related to wage adjustments, IME, and DSH payments. Our approach to standardizing payments included using base rate payments and case-mix weights as published in the *Federal Register* and applying those to our claims using the case-mix weight variables in the standard analytic files. We applied rates and weights according to the payment policies in place for each payment system corresponding to the type of PAC service and the claim date. The methods used to standardize payments were:

- Acute hospital standardized payment = base rate * DRG weight

- IRF standardized payment = base rate * case-mix group (CMG) weight
- LTCH standardized payment = base rate * LTCH DRG weight
- HHA standardized payment = base rate * home health resource group (HHRG) weight
- SNF standardized payment = per diem * resource utilization group (RUG) weight * days
- Hospital outpatient therapy standardized payment = physician fee schedule amount[2] * units

[2] Because there is no national physician fee schedule, state-level physician fee schedule amounts were used in this calculation. RTI selected one state, Kansas (although any state could have been selected), for the purposes of this analysis and applied Kansas rates to all hospital outpatient therapy claims. By applying the rates from one state to all of the data, we were able to achieve the goal of understanding levels of utilization in the absence of wage adjustments and other geographic differences in payments.

Table 1. Medicare PAC Episode Payments per Index Acute Hospital Discharge and per PAC User, by Episode Definition

Episode Definition	Per Index Acute Hospital Discharge[1] (N = 310,629)					Per PAC User[2] (N = 109,236)				
	Mean Index Acute Hospital Payment	Mean Physician Payment During Index Acute Hospital[3]	Mean PAC Payment[4]	Mean Index Acute Hospital + PAC Payment[5]	Mean Total Episode Payment[6]	Mean Index Acute Hospital Payment	Mean Physician Payment During Index Acute Hospital[3]	Mean PAC Payment[4]	Mean Index Acute Hospital + PAC Payment[5]	Mean Total Episode Payment[6]
A. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge	$8,287	$1,117	$4,592	$12,879	$13,996	$10,297	$1,531	$9,907	$20,205	$21,735
B. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,717	$11,004	$12,121	$10,297	$1,531	$7,591	$17,888	$19,419
C. 30 Day Fixed Following Hospital Discharge (prorated)	$8,287	$1,117	$3,585	$11,872	$12,989	$10,297	$1,531	$7,576	$17,873	$19,404
D. 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,066	$10,354	$11,471	$10,297	$1,531	$5,819	$16,116	$17,647
E. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge	$8,287	$1,117	$6,020	$14,307	$15,424	$10,297	$1,531	$11,827	$22,124	$23,655
F. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,847	$11,134	$12,252	$10,297	$1,531	$7,885	$18,182	$19,713
G. 60 Day Fixed Following Hospital Discharge (prorated)	$8,287	$1,117	$5,451	$13,738	$14,856	$10,297	$1,531	$10,703	$21,000	$22,531
H. 60 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,592	$10,879	$11,996	$10,297	$1,531	$7,216	$17,513	$19,043
I. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge	$8,287	$1,117	$7,063	$15,350	$16,467	$10,297	$1,531	$13,300	$23,598	$25,128
J. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,936	$11,223	$12,340	$10,297	$1,531	$8,092	$18,389	$19,920
K. 90 Day Fixed Following Hospital Discharge (prorated)	$8,287	$1,117	$6,728	$15,015	$16,133	$10,297	$1,531	$12,661	$22,958	$24,489

(continued)

Table 1. Medicare PAC Episode Payments, per Index Acute Hospital Discharge and per PAC User by Episode Definition (continued)

Episode Definition	Per Index Acute Hospital Discharge[1] (N = 310,629)					Per PAC User[2] (N = 109,236)				
	Mean Index Acute Hospital Payment	Mean Physician Payment During Index Acute Hospital[3]	Mean PAC Payment[4]	Mean Index Acute Hospital + PAC Payment[5]	Mean Total Episode Payment[6]	Mean Index Acute Hospital Payment	Mean Physician Payment During Index Acute Hospital[3]	Mean PAC Payment[4]	Mean Index Acute Hospital + PAC Payment[5]	Mean Total Episode Payment[6]
L. 90 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,812	$11,099	$12,216	$10,297	$1,531	$7,774	$18,071	$19,602
M. 30 Day Variable Length Episode	$8,287	$1,117	$6,522	$14,809	$15,926	$10,297	$1,531	$14,348	$24,645	$26,175
N. 30 Day Variable Length Episode Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,958	$11,246	$12,363	$10,297	$1,531	$8,256	$18,553	$20,084
O. 45 Day Variable Length Episode	$8,287	$1,117	$7,267	$15,554	$16,672	$10,297	$1,531	$15,269	$25,566	$27,097
P. 45 Day Variable Length Episode Excluding Acute Hospital Readmissions	$8,287	$1,117	$2,990	$11,277	$12,395	$10,297	$1,531	$8,301	$18,598	$20,129
Q. 60 Day Variable Length Episode	$8,287	$1,117	$7,844	$16,131	$17,248	$10,297	$1,531	$16,058	$26,355	$27,886
R. 60 Day Variable Length Episode Excluding Acute Hospital Readmissions	$8,287	$1,117	$3,013	$11,300	$12,417	$10,297	$1,531	$8,337	$18,635	$20,165

NOTES:

1. Index acute hospitalizations are defined as hospital admissions following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use. Note that per hospital discharge calculations include use of acute and PAC services for beneficiaries who do not meet the criteria of PAC user (use of institutional PAC service within 5 days of acute discharge or HHA or hospital outpatient therapy within 14 days of acute hospital discharge). This includes acute hospital readmissions for non-PAC users.
2. PAC users are defined as beneficiaries discharged to SNFs, IRFs, or LTCHs within 5 days of discharge from an index acute hospitalization or who are discharged to HHAs or hospital outpatient therapy within 14 days of discharge from an index acute hospitalization. An index acute hospitalization is defined as a hospital admission following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use.
3. Physician services are defined as separately billable Part B physician services rendered during the acute hospital stay.
4. PAC includes Medicare payments for SNF, IRF, LTCH, HHA, and hospital outpatient therapy. Note that acute hospital readmissions are also included in PAC payments for episode definitions A, C, E, G, I, K, M, O, and Q.
5. Mean Index Acute Hospital + PAC Payment includes index acute hospital payment and PAC payment.
6. Total episode payment includes index acute hospital, physician services during the index acute hospital stay, and PAC.
7. Total payments columns may not equal the sum of components reported here because of rounding to the nearest dollar.

SOURCE: RTI Analysis of 2006 Medicare claims 5% sample (MM2Y234)

3. RESULTS

Table 1 gives an overview of Medicare payments for index acute admissions and PAC episodes per index acute hospital discharge and per PAC user for each of the 18 alternative episode definitions included in our analysis. Mean index acute hospital payments were $8,287 per index acute hospital discharge versus $10,297 per PAC user. Index acute hospital payments per PAC user were likely higher because of the increased severity of illness associated with beneficiaries discharged to PAC care. Similarly, payments for physician services during the index hospital stay were also slightly higher for PAC users compared with all index acute hospital discharges ($1,531 versus $1,117). Payments for index acute hospital claims and physician payments during the index acute hospital claim did not vary across the PAC episode definitions.

Differences in mean PAC payments across episode definitions demonstrate the effect that each definition has on the number and types of services included in a PAC episode. The mean PAC episode payment differs whether the episode definition is applied to all hospital discharges regardless of PAC use (i.e., per index acute hospital discharge) or to beneficiaries who are discharged from an acute hospital and use Medicare PAC services (i.e., per PAC user). Within Episode Definition A (30 Day Fixed), the mean PAC payment per index acute hospital discharge is $4,592 compared with $9,907 per PAC user. The choice of denominator impacts the mean PAC episode payment across the 18 episode definitions examined in this project.

The inclusion or exclusion of acute hospital readmissions and subsequent PAC services in the episode and corresponding bundled payment is an important policy consideration. In Episode Definition A (30 Day Fixed), mean PAC payments per PAC user were $9,907. In contrast, in Episode Definition B (30 Day Fixed Excluding Readmissions), mean PAC payments per PAC user decreased to $7,591 because the episode definition excluded readmissions and any PAC use subsequent to a readmission.

The decision to allow all services initiated within a specified episode time frame to complete versus calculating a prorated end point of an episode affects the services included in the episode definition and the corresponding bundled payment level. Episode Definition C (30 Day Fixed [prorated]) shows the effect of prorating the payments included in the episode definition, rather than allowing any claim initiating within the fixed period to be part of the episode as in Episode Definition A (30 Day Fixed). Mean PAC payments per PAC user under Episode Definition C (30 Day Fixed [prorated]) were $7,576. In general, less restrictive episode definitions were longer and were associated with higher PAC payments. For example, in the variable length Episode Definition Q (60 Day Variable Length), the mean PAC payment per PAC user was $16,058.

When looking at the mean index acute hospital plus PAC payment and the mean total episode payment, it is clear that payments for the index acute hospital stay make up a high proportion of total payment. For example, in Episode Definition A (30 Day Fixed), 47 percent of mean total episode payments per PAC user are attributable to the index acute hospital stay. The proportion of total episode payments attributable to the index acute hospital stay decreases as the episode length increases. In Episode Definition E (60 Day Fixed), 44 percent of mean total episode payments per PAC user are attributable to the index acute hospital stay.

Table 2 provides more detail on the length of stay associated with the index acute stay and the PAC episode across episode definitions for beneficiaries who used PAC (i.e., N = 109, 236). The mean length of stay in the index acute hospital was 6.8 days. Mean PAC length of stay was defined as the difference between the admission date on the first PAC episode claim and the discharge date on the last PAC episode claim in the episode (or the date of the last day in the fixed window in the case of prorated episodes). PAC episode length of stay varied significantly across episode definitions. PAC length of stay for Episode Definition A (30 Day Fixed) was 37.6 days compared with 24.3 days for Episode Definition C (30 Day Fixed [prorated]). In looking at Episode Definition M (30 Day Variable Length), the episode length of stay was significantly longer at 61.4 days, reflecting the inclusion of PAC services occurring after the 30 day fixed period. In Episode Definition Q (60 Day Variable Length), PAC length of stay was even longer at 74.7 days. The differences between the 30 day and 60 day variable length episodes reflect the additional services occurring after a 30 day gap in services but prior to a 60 day gap in services. Similar patterns were observed for total episode length of stay. Note that total episode length of stay was calculated as the difference between the admission date on the index acute hospital claim and the discharge date on the last PAC episode claim in the episode (or the last date in the fixed period in the case of prorated episodes).

In addition to looking at PAC episodes broadly, our analyses took a more detailed look at the composition of PAC episodes under the different episode definitions. Specifically, **Table 3** shows the percentage of beneficiaries with at least one claim for each type of PAC service, the mean length of stay per service type, and the mean payments per service type for beneficiaries discharged to PAC. In Episode Definition A (30 Day Fixed), 53.1 percent of beneficiaries discharged to PAC had at least one HHA claim during their PAC episode and these beneficiaries had an average of 15.9 HHA visits and mean Medicare HHA payments of $2,582. In contrast, in looking at longer episode definitions, we see that a higher proportion of beneficiaries have at least one HHA claim during their episode. For example, in Episode Definition E (60 Day Fixed), 58.0 percent of beneficiaries had at least one HHA claim associated with a mean of 16.8 visits and $2,704 in Medicare payments, and in Episode Definition I (90 Day Fixed), 59.8 percent of beneficiaries had at least one HHA claim associated with a mean of 19.2 visits and $3,047 in Medicare payments.

Table 2. Medicare PAC Episode Payments and Utilization per PAC User, by Episode Definition

Episode Definition	PAC Users[1] (N = 109,236)					
	Index Acute Hospital[2]		PAC[3]		Total Episode[4]	
	Mean Payment	Mean Length of Stay (days)	Mean Payment	Mean Length of Stay[5] (days)	Mean Payment	Mean Length of Stay[6] (days)
A. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge	$10,297	6.8	$9,907	37.6	$21,735	45.5
B. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$10,297	6.8	$7,591	35.6	$19,419	43.5
C. 30 Day Fixed Following Hospital Discharge (prorated)	$10,297	6.8	$7,576	24.3	$19,404	32.3
D. 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$10,297	6.8	$5,819	22.2	$17,647	30.1
E. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge	$10,297	6.8	$11,827	45.6	$23,655	53.5
F. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$10,297	6.8	$7,885	39.9	$19,713	47.8
G. 60 Day Fixed Following Hospital Discharge (prorated)	$10,297	6.8	$10,703	39.7	$22,531	47.6
H. 60 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$10,297	6.8	$7,216	33.6	$19,043	41.5
I. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge	$10,297	6.8	$13,300	55.6	$25,128	63.5
J. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge Excluding Acute Hospital Readmissions	$10,297	6.8	$8,092	44.6	$19,920	52.5
K. 90 Day Fixed Following Hospital Discharge (prorated)	$10,297	6.8	$12,661	51.0	$24,489	58.9
L. 90 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	$10,297	6.8	$7,774	39.6	$19,602	47.5
M. 30 Day Variable Episode	$10,297	6.8	$14,348	61.4	$26,175	69.3
N. 30 Day Variable Episode Excluding Acute Hospital Readmissions	$10,297	6.8	$8,256	47.6	$20,084	55.5
O. 45 Day Variable Episode	$10,297	6.8	$15,629	68.2	$27,097	76.1
P. 45 Day Variable Episode Excluding Acute Hospital Readmissions	$10,297	6.8	$8,301	49.3	$20,129	57.2
Q. 60 Day Variable Episode	$10,297	6.8	$16,058	74.7	$27,886	82.6
R. 60 Day Variable Episode Excluding Acute Hospital Readmissions	$10,297	6.8	$8,337	50.8	$20,165	58.7

(continued)

Table 2. Medicare PAC Episode Payments and Utilization per PAC User, by Episode Definition (continued)

NOTES:

1. PAC users are defined as beneficiaries discharged to SNFs, IRFs, or LTCHs within 5 days of discharge from an index acute hospitalization or who are discharged to HHAs or hospital outpatient therapy within 14 days of discharge from an index acute hospitalization. An index acute hospitalization is defined as a hospital admission following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use.
2. Index acute hospitalizations are defined as hospital admissions following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use.
3. PAC includes Medicare payments for SNF, IRF, LTCH, HHA, and hospital outpatient therapy. Note that acute hospital readmissions are also included in PAC payments for episode definitions A, C, E, G, I, K, M, O, and Q.
4. Total episode payment and length of stay include index acute hospital, physician services during index acute hospital, and PAC.
5. PAC length of stay is defined as the difference between the admission date on the first PAC episode claim and the discharge date on the last PAC episode claim.
6. For some beneficiaries there may be a gap in service use between the discharge date on the index acute hospital claim and the admission date on the first PAC episode claim.
7. Total payments columns may not equal the sum of components reported here because of rounding to the nearest dollar.

SOURCE: RTI Analysis of 2006 Medicare claims 5% sample (MM2Y234)

Table 3. Medicare PAC Episode Payments and Utilization for PAC Users, by Service Type, by Episode Definition

Episode Definition	PAC Users[1] (N = 109,236)																		
	HHA				IRF			SNF			LTCH			Hospital Outpatient Therapy			Acute Hospital Readmissions		
	Percentage with Claim	Mean Visits	Mean Length of Stay (days)	Mean Payment per Service User	Percentage with Claim	Mean Length of Stay (days)	Mean Payment per Service User	Percentage with Claim	Mean Length of Stay (days)	Mean Payment per Service User	Percentage with Claim	Mean Length of Stay (days)	Mean Payment per Service User	Percentage with Claim	Mean Units of Service[2]	Mean Payment per Service User	Percentage with Claim	Mean Length of Stay (days)	Mean Payment per Service User
A. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge	53.1	15.9	34.7	$2,582	10.9	13.0	$15,330	44.6	31.6	$9,682	2.3	29.0	$36,098	15.1	19.9	$610	15.5	7.7	$10,482
B. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions	52.2	15.8	34.5	$2,568	10.6	12.5	$14,714	43.4	28.8	$8,870	2.1	28.4	$35,523	14.8	19.9	$604	–	–	–
C. 30 Day Fixed Following Hospital Discharge (prorated)	53.1	10.4	20.5	$1,801	10.9	12.5	$14,839	44.6	19.9	$6,499	2.3	21.8	$27,541	15.1	14.2	$462	15.5	6.4	$9,043
D. 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	52.2	10.0	19.2	$1,755	10.6	12.2	$14,435	43.4	19.1	$6,238	2.1	22.2	$28,231	14.8	14.2	$457	–	–	–
E. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge	58.0	16.8	36.0	$2,704	11.2	13.3	$15,652	45.9	34.3	$10,375	2.5	30.1	$37,100	19.2	26.9	$778	23.0	8.4	$11,610
F. 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge Excluding Acute Hospital Readmissions	55.9	16.3	35.2	$2,649	10.7	12.5	$14,771	43.7	29.3	$8,990	2.1	28.5	$35,583	18.3	26.7	$759	–	–	–
G. 60 Day Fixed Following Hospital Discharge (prorated)	58.0	14.9	31.9	$2,455	11.2	13.1	$15,474	45.9	28.5	$8,872	2.5	26.8	$33,524	19.2	23.3	$689	23.0	7.8	$10,901
H. 60 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	55.9	13.8	28.4	$2,315	10.7	12.4	$14,674	43.7	25.6	$8,057	2.1	26.3	$33,276	18.3	23.3	$675	–	–	–
I. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge	59.8	19.2	42.3	$3,047	11.4	13.5	$15,861	46.6	35.9	$10,791	2.6	30.9	$37,521	21.5	30.9	$883	27.8	9.0	$12,438
J. 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge Excluding Acute Hospital Readmissions	56.9	17.8	39.1	$2,851	10.7	12.6	$14,786	43.8	29.4	$9,029	2.1	28.9	$35,776	19.9	30.2	$851	–	–	–
K. 90 Day Fixed Following Hospital Discharge (prorated)	59.8	17.3	37.5	$2,797	11.4	13.4	$15,737	46.6	33.6	$10,179	2.6	28.7	$35,462	21.5	28.9	$827	27.8	8.6	$11,994
L. 90 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions	56.9	15.3	32.0	$2,536	10.7	12.5	$14,716	43.8	28.6	$8,828	2.1	27.2	$34,241	19.9	28.4	$800	–	–	–
M. 30 Day Variable Length Episode	60.2	23.1	51.6	$3,525	11.5	13.7	$16,070	46.9	37.1	$11,126	2.8	32.0	$38,250	22.0	39.8	$1,127	27.3	10.5	$14,136
N. 30 Day Variable Length Episode Excluding Acute Hospital Readmissions	57.0	19.7	44.2	$3,087	10.7	12.6	$14,806	43.8	29.4	$9,033	2.1	29.0	$35,803	19.6	35.4	$973	–	–	–
O. 45 Day Variable Length Episode	60.6	24.6	55.4	$3,734	11.6	13.8	$16,181	47.4	37.6	$11,269	2.8	32.2	$38,398	23.3	41.3	$1,188	29.6	11.0	$14,942
P. 45 Day Variable Length Episode Excluding Acute Hospital Readmissions	57.2	19.9	44.9	$3,123	10.7	12.6	$14,810	43.8	29.5	$9,036	2.1	29.0	$35,801	20.4	36.3	$1,000	–	–	–
Q. 60 Day Variable Length Episode	60.9	25.9	58.3	$3,912	11.7	13.9	$16,290	47.8	38.0	$11,404	2.9	32.5	$38,583	24.2	42.3	$1,224	31.5	11.4	$15,513
R. 60 Day Variable Length Episode Excluding Acute Hospital Readmissions	57.3	20.1	45.4	$3,156	10.7	12.6	$14,814	43.8	29.5	$9,041	2.1	29.0	$35,802	20.9	36.9	$1,021	–	–	–

NOTES:

1. PAC users are defined as beneficiaries discharged to SNFs, IRFs, or LTCHs within 5 days of discharge from an index acute hospitalization, or who are discharged to HHAs or hospital outpatient therapy within 14 days of discharge from an index acute hospitalization. An index acute hospitalization is defined as a hospital admission following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use.

2. Units of service are as reported on the outpatient department claim.

SOURCE: RTI Analysis of 2006 Medicare claims 5% sample (MM2Y234)

The percentage of beneficiaries using services and the level of utilization and payments associated with services increase when we increase fixed periods or increase the variable length gap periods, indicating that PAC service use for some beneficiaries extends over long periods of time and may include multiple settings of care. This is particularly the case for SNF, HHA, and hospital outpatient therapy, which are PAC services that often have long lengths of stay and may occur as a second or third site of PAC for those discharged to another PAC setting immediately after discharge from the acute hospital. The 30 day variable length Episode Definition M shows even higher utilization of HHA; 60.2 percent of beneficiaries had at least one HHA claim associated with a mean of 23.1 visits and $3,525 in Medicare payments. When we compare the mean SNF length of stay under Episode Definition A (30 Day Fixed) with that under Episode Definition C (30 Day Fixed [prorated]), we see that the mean length of stay decreases from 31.6 days to 19.9 days, indicating the effect of the method of handling the last claim in the episode on the services included versus excluded from different definitions.

The results in Table 3 indicate that there are smaller changes in the percentages of beneficiaries using services—as well as the associated length of stay and payments—for IRF and LTCH services under each of the different episode definitions. IRF and LTCH are generally the first sites of PAC for beneficiaries who use these services, compared with SNF, HHA, and hospital outpatient therapy, which may be the first site of care for beneficiaries but may also be later sites of PAC care for beneficiaries using LTCH or IRF immediately after discharge from their index acute hospitalizations. The percentage of beneficiaries with at least one IRF claim varies from 10.6 percent to 11.7 percent across definitions; however, in the case of hospital outpatient therapy, the percentage of beneficiaries with at least one claim varies from 14.8 percent in Episode Definition D (30 Day Fixed Excluding Readmissions [prorated]), the most restrictive episode definition in the analysis, to 24.2 percent under Episode Definition Q (60 Day Variable Length), the least restrictive episode definition in the analysis. Similarly, the percentage of beneficiaries with acute hospital readmissions varies significantly by episode definition. Under Episode Definition A (30 Day Fixed) and Episode Definition C (30 Day Fixed [prorated]), 15.5 percent of beneficiaries have at least one acute hospital readmission compared with 31.5 percent in Episode Definition Q (60 Day Variable Length).[3] Note that Episode Definition Q (60 Day Variable Length) is the least restrictive episode definition in the analysis and therefore includes the greatest amount of PAC service use.

[3] The percentage of beneficiaries with an acute readmission does not vary from Episode Definition A (30 Day Fixed) to Episode Definition C (30 Day Fixed [prorated]) because these episode definitions vary only in the method of handling the last claim in the episode. Similarly, the percent of beneficiaries with an acute readmission does not vary between Episode Definition E (60 Day Fixed) and Episode Definition G (60 Day Fixed [prorated]) or between Episode Definition I (90 Day Fixed) and Episode Definition K (90 Day Fixed [prorated]).

Another way of understanding payments per PAC service under alternative definitions of episodes of care is to look at three different payment calculations: (1) Payments per service user, (2) payments per PAC user, and (3) payments per index acute hospital discharge. **Table 4** presents these calculations for each of the components of PAC episodes for each of the four 30 day episode definitions, Episode Definition A (30 Day Fixed), Episode Definition B (30 Day Fixed Excluding Readmissions), Episode Definition C (30 Day Fixed [prorated]), and Episode Definition D (30 Day Fixed Excluding Readmissions [prorated]). Looking at the data in this way demonstrates the differences in mean payments depending on the sample for which payments are averaged. Using LTCH as an example, we see that the mean payment per beneficiary using LTCH services under Episode Definition A (30 Day Fixed) is $36,098. When LTCH payments are averaged across all beneficiaries using PAC, which includes beneficiaries using LTCH as well as beneficiaries not using LTCHs during their PAC episodes, the mean payments drop to $831. This large decrease in mean payments across the two samples is because only a very small proportion of beneficiaries discharged to PAC have LTCHs as part of their PAC episode (2.3 percent). The proportion of beneficiaries discharged to LTCHs also varies significantly across the country because of differences in the supply of LTCHs in different parts of the country. When LTCH payments are averaged over all index acute hospital discharges (including both PAC users and beneficiaries not using PAC), the mean payment is $292. Similar patterns are observed across the 30 day fixed episode options. LTCH provides one example of the differences in the availability and use of a service that differs across the three payment calculations. Differences in the payment calculations show similar patterns across service types, but the magnitude of the differences are less than in the example of LTCHs due to the more frequent use of other PAC services. For example, a much higher proportion of beneficiaries use HHA as part of their PAC episode. More than 53 percent of beneficiaries in Episode Definition A (30 Day Fixed) use HHA during their episode, mean payments per service user are $2,582; mean payments per PAC user are $1,371; and mean payments per index acute hospital discharge are $524.

The results presented here also include a series of bar charts that visually demonstrate some of the results shown in earlier tables. **Figure 3** compares mean PAC service payments per PAC user across each of the four 30 day fixed episode definitions, Episode Definition A (30 Day Fixed), Episode Definition B (30 Day Fixed Excluding Readmissions), Episode Definition C (30 Day Fixed [prorated]), and Episode Definition D (30 Day Fixed Excluding Readmissions [prorated]). This figure highlights the effect of excluding acute hospital readmissions from the episode definitions as in Episode Definitions B and D. Here we also see that the services most affected by prorating the last claim in the period rather than including anything initiating within the fixed period are SNF and HHA. Mean SNF payments decrease 32.9 percent from $4,320 in Episode Definition A (30 Day Fixed) to $2,900 in

Table 4. Mean Payment per Service User, per PAC User, and per Index Acute Hospital Discharge, by 30 Day Episode Definition

	Episode Definition							
	A. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge				B. 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions			
PAC Service	% PAC Users with Claim	Mean Payment per Service User[1]	Mean Payment per PAC User[2] (N = 109,236)	Mean Payment per Index Acute Hospital Discharge[3] (N = 310,629)	% PAC Users with Claim	Mean Payment per Service User[1]	Mean Payment per PAC User[2] (N = 109,236)	Mean Payment per Index Acute Hospital Discharge[3] (N = 310,629)
Total Episode[4]	100	$21,735	$21,735	$13,996	100	$19,419	$19,419	$12,121
PAC Only	100	$9,907	$9,907	$4,592	100	$7,591	$7,591	$2,717
Index Hospitalization	100	$10,297	$10,297	$8,287	100	$10,297	$10,297	$8,287
Physician Services during Index Hospitalization[5]	98.7	$1,551	$1,531	$1,117	98.7	$1,551	$1,531	$1,117
SNF	44.6	$9,682	$4,320	$1,597	43.4	$8,870	$3,851	$1,374
HHA	53.1	$2,582	$1,371	$524	52.2	$2,568	$1,340	$489
IRF	10.9	$15,330	$1,668	$614	10.6	$14,714	$1,562	$552
LTCH	2.3	$36,098	$831	$311	2.1	$35,523	$750	$265
HOPD[6]	15.1	$610	$92	$38	14.8	$604	$89	$36
Readmission	15.5	$10,482	$1,625	$1,507	N/A	N/A	N/A	N/A

(continued)

Table 4 Mean Payment per Service User, per PAC User, and per Index Acute Hospital Discharge, by 30 Day Episode Definition (continued)

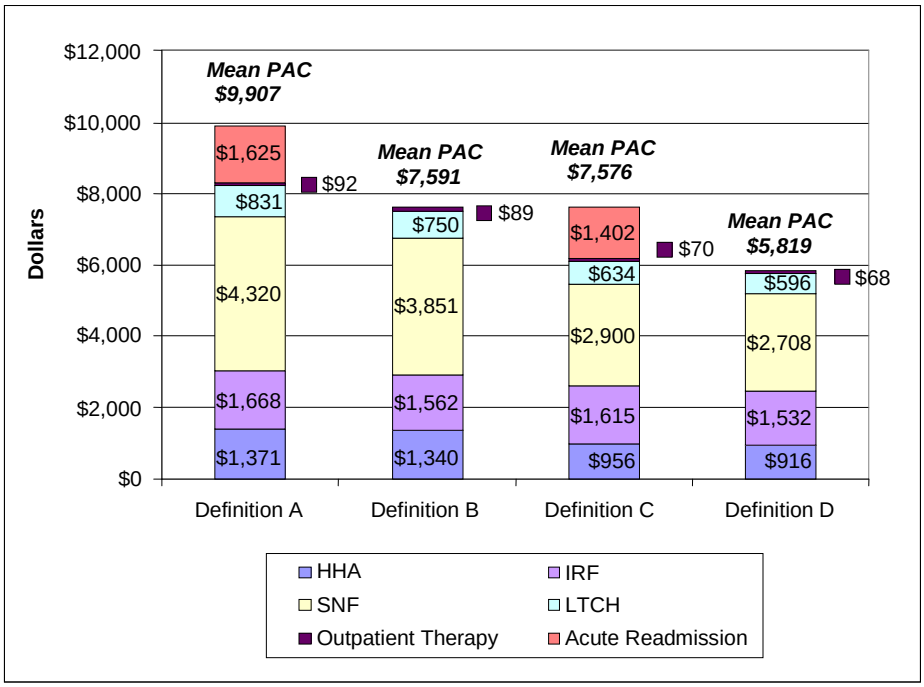
	Episode Definition							
	C. 30 Day Fixed Following Hospital Discharge (prorated)				D. 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions			
PAC Service	% PAC Users with Claim	Mean Payment per Service User[1]	Mean Payment per PAC User[2] (N = 109,236)	Mean Payment per Index Acute Hospital Discharge[3] (N = 310,629)	% PAC Users with Claim	Mean Payment per Service User[1]	Mean Payment per PAC User[2] (N = 109,236)	Mean Payment per Index Acute Hospital Discharge[3] (N = 310,629)
Total Episode[4]	100	$19,404	$19,404	$12,989	100	$17,647	$17,647	$11,471
PAC Only	100	$7,576	$7,576	$3,585	100	$5,819	$5,819	$2,066
Index Hospitalization	100	$10,297	$10,297	$8,287	100	$10,297	$10,297	$8,287
Physician Services during Index Hospitalization[5]	98.7	$1,551	$1,531	$1,117	98.7	$1,551	$1,531	$1,117
SNF	44.6	$6,499	$2,900	$1,057	43.4	$6,238	$2,708	$961
HHA	53.1	$1,801	$956	$352	52.2	$1,755	$916	$327
IRF	10.9	$14,839	$1,615	$589	10.6	$14,435	$1,532	$541
LTCH	2.3	$27,541	$634	$231	2.1	$28,231	$596	$211
HOPD[6]	15.1	$462	$70	$28	14.8	$457	$68	$26
Readmission	15.5	$9,043	$1,402	$1,328	N/A	N/A	N/A	N/A

NOTES:

1. Service users are defined as beneficiaries with at least one claim for the service within the time period of the episode definition.
2. PAC users are defined as beneficiaries discharged to SNFs, IRFs, or LTCHs within 5 days of discharge from the index acute hospitalization or who are discharged to HHAs or hospital outpatient therapy within 14 days of discharge from the index acute hospitalization
3. Index acute hospitalizations are defined as hospital admissions following a 60 day period without acute, LTCH, SNF, IRF, or HHA service use. The study sample is limited to live discharges from index acute hospitalizations. Note that per hospital discharge calculations include use of acute and PAC services for beneficiaries who do not meet the criteria of PAC user (use of institutional PAC service within 5 days of acute discharge or HHA or hospital outpatient therapy within 14 days of acute hospital discharge). This includes acute hospital readmissions for non-PAC users.
4. Total episode payment includes index acute hospital payment, physician payment during the index acute hospital stay, and payment for SNF, IRF, LTCH, HHA, and hospital outpatient therapy. Note that acute hospital readmissions are also included in PAC payments for Episode Definitions A and C.
5. Physician services are defined as separately billable Part B physician services rendered during the acute hospital stay.
6. HOPD = hospital outpatient department.
7. Note that total payments may not equal the sum of components reported here because of rounding to the nearest dollar.

SOURCE: RTI Analysis of 2006 Medicare claims 5% sample (MM2Y175 and MM2Y177)

Figure 3. PAC Payments per PAC User—30 Day Fixed Episode Definitions, All MS-DRGs



Definition A: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge

Definition B: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition C: 30 Day Fixed Following Hospital Discharge (prorated)

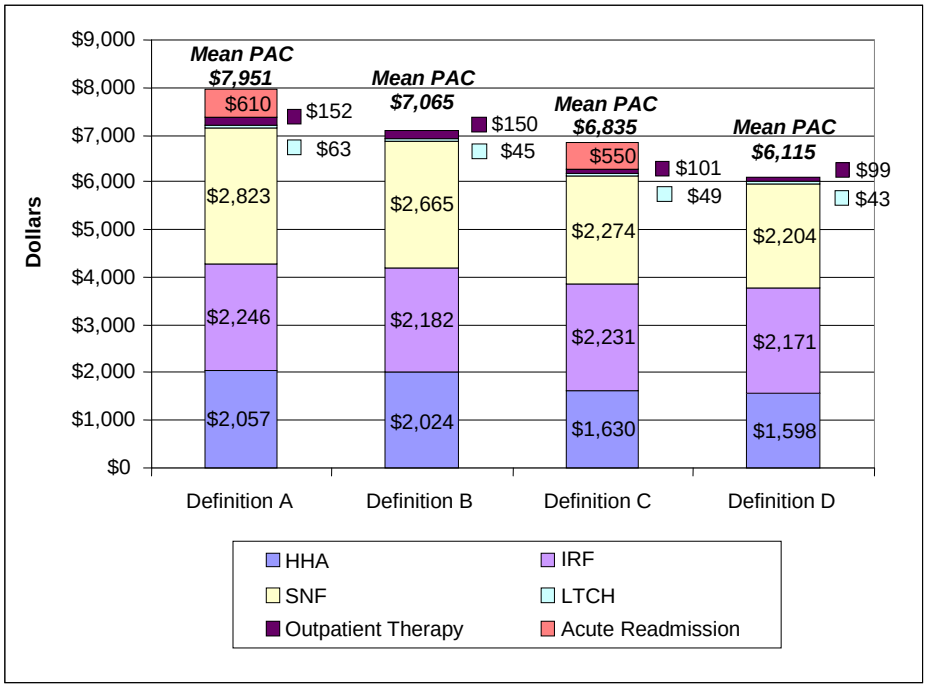
Definition D: 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions

NOTE: Total payments may not equal the sum of components reported here because of rounding to nearest dollar.

Episode Definition C (30 Day Fixed [prorated]), and HHA payments decrease 30.3 percent from $1,371 in Episode Definition A (30 Day Fixed) to $956 in Episode Definition C (30 Day Fixed [prorated]). Service use for other PAC services changes less across the episode definitions. As discussed earlier, the mean payment for IRF changes very little across the 30 day definitions, 3.2 percent decrease between Episode Definition A (30 Day Fixed) and Episode Definition C (30 Day Fixed [prorated]) due to the fact that IRF is generally the first site of care for those who use this service and the fact that the average IRF length of stay is two weeks, less than the shortest fixed period examined here.

The examination of alternative episode definitions also included MS-DRG specific analysis in order to learn more about differential effects of definitions across different medical and surgical cases. In **Figures 4** and **5**, we show the composition of episodes of care across the four 30 day fixed Episode Definitions A, B, C, and D for MS-DRG 470, major joint replacement or reattachment of lower extremity without a major complication or comorbidity, and MS-DRG 194, simple pneumonia and pleurisy with a complication or comorbidity. These two MS-DRGs are the most frequent MS-DRGs for beneficiaries discharged to PAC; together, they account for 15.7 percent of all PAC users. The results indicate important differences in medical versus surgical MS-DRGs. For example, much of the difference in mean episode payments across definitions for MS-DRG 194 appears to be driven by readmissions. Because a smaller proportion of beneficiaries in MS-DRG 470 have readmissions, we see smaller differences in mean episode payments across the definitions. It is important to note the exclusion of acute hospital readmissions encompasses both the

Figure 4. PAC Payments per PAC User—30 Day Fixed Episode Definitions, MS-DRG 470, Major Joint Replacement or Reattachment of Lower Extremity without Major Complication or Comorbidity



Definition A: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge

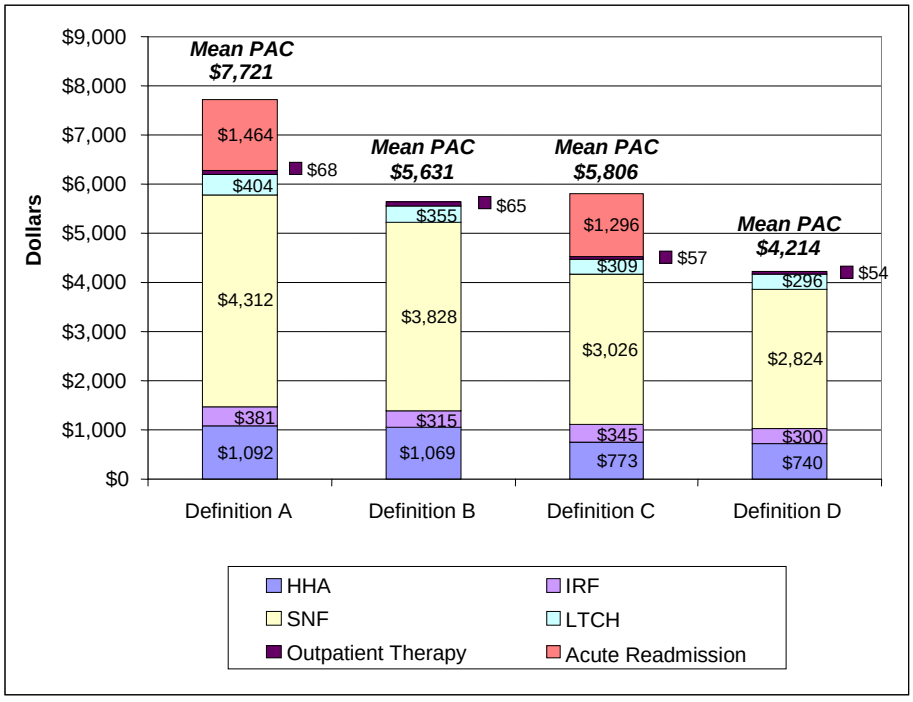
Definition B: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition C: 30 Day Fixed Following Hospital Discharge (prorated)

Definition D: 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions

NOTE: Total payments may not equal the sum of components reported here because of rounding to nearest dollar.

Figure 5. PAC Payments per PAC User—30 Day Fixed Episode Definitions, MS-DRG 194, Simple Pneumonia and Pleurisy with Complication or Comorbidity



Definition A: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge

Definition B: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition C: 30 Day Fixed Following Hospital Discharge (prorated)

Definition D: 30 Day Fixed Following Hospital Discharge (prorated) Excluding Acute Hospital Readmissions

NOTE: Total payments may not equal the sum of components reported here because of rounding to nearest dollar.

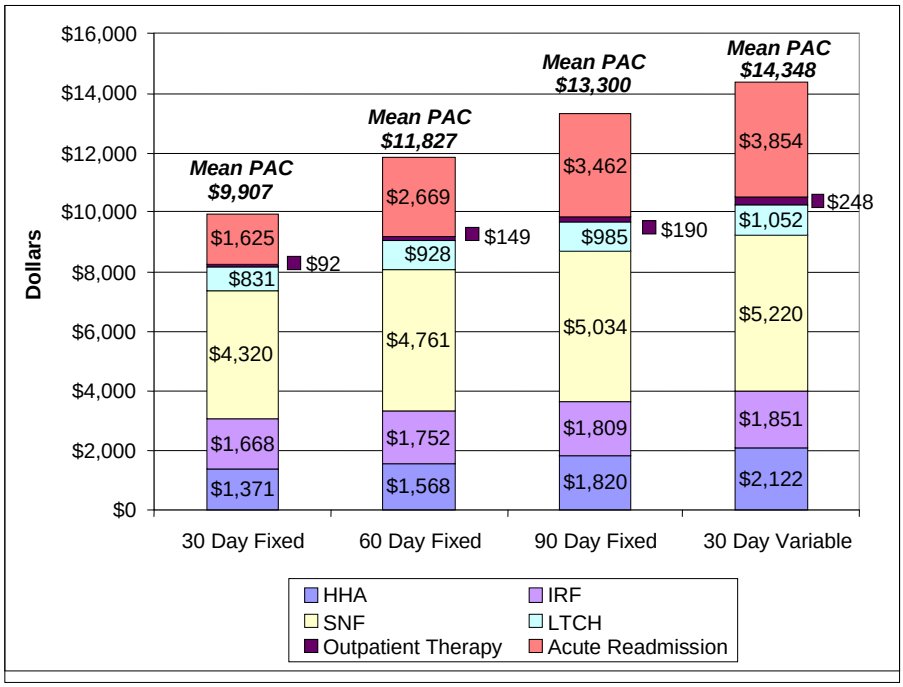
dollars associated with the acute hospital readmission and any subsequent PAC services. Of beneficiaries in MS-DRG 470, 6.2 percent have an acute hospital readmission within 30 days after discharge from their acute hospital stay compared with 16.8 percent of beneficiaries in MS-DRG 194.[4] Mean PAC payments under Episode Definition A (30 Day Fixed) were $7,951 for MS-DRG 470 compared with $7,721 for MS-DRG 194, and payments for acute hospital readmissions accounted for 7.6 percent of payments in MS-DRG 470 compared with 19 percent of payments in MS-DRG 194. The effect of prorating the last claim in the episode was less in MS-DRG 470 than in MS-DRG 194. Mean payments under Episode Definition C (30 Day Fixed [prorated]) for MS-DRG 470 were $6,835, a 14 percent decrease from payments under Episode Definition A (30 Day Fixed), and payments under the same definition for MS-DRG 194 were $5,806, a 24.8 percent decrease from payment under Episode Definition A (30 Day Fixed). The differential effect of proration may be due to the types of services used by beneficiaries in MS-DRG 470 compared with those used by beneficiaries in MS-DRG 194, particularly the difference between IRF and SNF services. For example, 19.4 percent of beneficiaries in MS-DRG 470 had an IRF claim as part of their episodes compared with 2.3 percent of beneficiaries in MS-DRG 194. While IRF services are associated with high Medicare payments, they most often occur directly following discharge from the acute hospital and the mean length of stay in IRF settings is less than 2 weeks on average. Therefore IRF services are not as likely to be affected by the proration. In contrast, a high proportion of beneficiaries in MS-DRG 194 use SNF services as part of their episode (49.9 percent), and the average length of stay in SNF is greater than 30 days; therefore, the use of SNF services is more likely to be affected by the proration.

Figures 6 and **7** provide a comparison of the fixed episode definitions allowing any claim initiating within the fixed time period (30, 60, or 90 days) to be part of the episode versus the variable length episode definition defined as ending with a 30 day gap in PAC service use. The definitions shown in Figure 6 include all PAC and readmissions, Episode Definition A (30 Day Fixed), Episode Definition E (60 Day Fixed), Episode Definition I (90 Day Fixed), and Episode Definition M (30 Day Variable Length). Figure 7 includes all services prior to a readmission,[5] Episode Definition B (30 Day Fixed Excluding Readmissions), Episode Definition F (60 Day Fixed Excluding Readmissions), Episode Definition J (90 Day Fixed Excluding Readmissions), and Episode Definition N (30 Day Variable Length Excluding Readmissions). Mean PAC payments under the fixed episode definitions increased from $9,907 under Episode Definition A (30 Day Fixed) to $11,827 under Episode Definition E (60 Day Fixed) to $13,300 under

[4] MS-DRG specific analyses were also performed as part of this work, although the complete set results by MS-DRG are not presented in this report.

[5] Episodes ending prior to an acute hospital readmission exclude the readmission and any subsequent PAC use following the readmission.

Figure 6. PAC Payments per PAC User—30 Day Fixed, 60 Day Fixed, 90 Day Fixed, and 30 Day Variable Length Episode Definitions



Definition A: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge

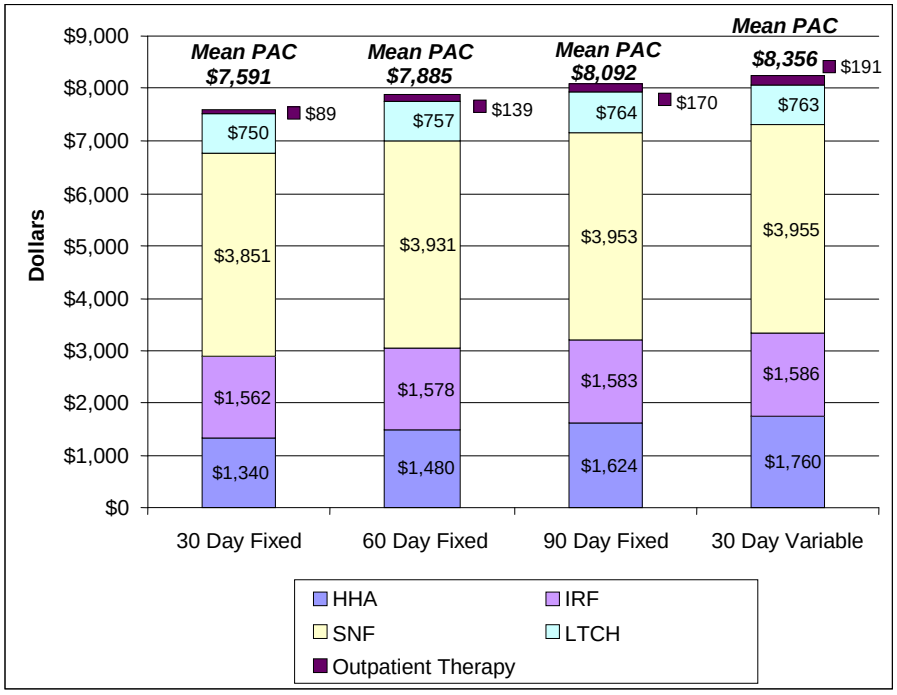
Definition E: 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge

Definition I: 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge

Definition M: 30 Day Variable Length Episode

NOTE: Total payments may not equal the sum of components reported here because of rounding to nearest dollar.

Figure 7. PAC Payments per PAC User Excluding Readmissions—30 Day Fixed, 60 Day Fixed, 90 Day Fixed, and 30 Day Variable Length Episode Definitions



Definition B: 30 Day Fixed: Any Claim Starting within 30 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition F: 60 Day Fixed: Any Claim Starting within 60 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition J: 90 Day Fixed: Any Claim Starting within 90 Days after Hospital Discharge Excluding Acute Hospital Readmissions

Definition N: 30 Day Variable Episode Excluding Acute Hospital Readmissions

NOTE: Total payments may not equal the sum of components reported here because of rounding to nearest dollar.

Episode Definition I (90 Day Fixed). The components of PAC services that changed the most across these episode definitions were SNF, HHA, and acute hospital readmissions. Mean payments for readmissions increased 64.2 percent between Episode Definition A (30 Day Fixed) and Episode Definition I (90 Day Fixed), and payment for SNF and HHA increased 10.2 percent and 14.4 percent, respectively. In looking at Figure 7, we see much smaller differences in the mean PAC payments per PAC user when episodes end with acute hospital readmissions rather than including readmissions in the episode. These results indicate that readmissions are most likely to occur within a shorter window following acute hospital discharge; therefore, the longer episode definitions that end with an acute hospital readmission do not necessarily capture many additional services. As we saw in Table 3, although there was an increase in the percentage of beneficiaries with an acute hospital readmission—15.5 percent in Episode Definition A (30 Day Fixed) to 23.0 percent in Episode Definition E (60 Day Fixed)—the increase in the proportion of beneficiaries with a readmission in Episode Definition I (90 Day Fixed) was much smaller (27.8 percent). These results show that readmissions make up a significant proportion of episode payments and lead to variation in payments across episode definitions; however, when episode definitions exclude readmissions and subsequent PAC, there is less variation in episode payment across definitions.

3.1 Geographic Benchmarking Analysis

The results of the geographic benchmarking analysis demonstrate the variation in the percentage of beneficiaries using PAC services in different parts of the country as well as differences in utilization and payments for those who do use PAC. The results of the geographic analysis are presented in **Tables 5** and **6**. Table 5 presents standardized payments at the state level for Massachusetts, New York, Oregon, and Texas. Table 6 presents the standardized payments at the CBSA level for four CBSAs: Boston, Massachusetts; Rochester, New York; Portland, Oregon; and Dallas, Texas. Each of these states and CBSAs have participating providers in the CMS Post-Acute Care Payment Reform Demonstration (PAC-PRD) and were chosen based on geographic variation and differences practice patterns and supply of PAC providers.

There is significant variation in the percentage of beneficiaries discharged to PAC across geographic areas. Massachusetts can be characterized as a "high PAC" state due to the large supply of PAC providers per beneficiary population and the large supply of LTCH providers in the state. Table 5 shows that in Massachusetts, 49 percent of beneficiaries discharged from index acute hospital stays go on to use PAC compared with 30.2 percent in Oregon, which is characterized by a lower supply of PAC providers and lower PAC use in general.[6] Mean PAC payments per PAC user were $8,003 in Massachusetts and $5,369 in

[6] Although the proportion of beneficiaries discharged to PAC is lowest in Texas of the four states shown here (29.2 percent Texas) and not an expected result given the supply of acute and PAC providers in Texas and prior work looking a utilization of services across states, this may be caused

Oregon indicating higher utilization of services within PAC episodes for PAC users in Massachusetts (mean episode length of stay of 40.5 days in Massachusetts compared with 33.5 days in Oregon). Corresponding mean PAC payments per hospital discharge were $4,601 in Massachusetts and $2,352 in Oregon, and this difference reflects both the lower proportion of discharges to PAC and the lower use of PAC among beneficiaries using PAC services in Oregon. The results for New York and Texas also provide valuable information on geographic variation. New York has very low LTCH utilization and no freestanding IRF providers. In contrast, Texas has a large supply of both of these types of providers. The results show that while PAC payments per PAC user were $7,756 in New York, PAC payments per PAC user were 41.8 percent higher in Texas ($10,999). Although mean PAC payments per PAC user differed significantly, mean PAC episode length of stay was similar in the two states (38.9 days in New York and 40.6 days in Texas), indicating significant differences in the types of services used during episodes of care of similar length.

Similar results can be seen at the CBSA level (Table 6). In Boston, 48.9 percent of beneficiaries were discharged to PAC compared with 33.0 percent in Portland. Mean PAC payments per PAC user were $8,168 in Boston and $5,598 in Portland. Mean PAC payments per PAC user in Boston were slightly higher than in Massachusetts overall, which may indicate differences in practice patterns and use of services in urban Boston compared with other parts of the state. Although the mean PAC payment per PAC user was lower in Rochester ($6,242) than in New York State overall ($7,756), the proportion of beneficiaries discharged to PAC was higher in Rochester (47.5 percent) compared with New York State overall (39.4 percent). Findings indicating differences between the CBSA level and the state level highlight the importance of understanding current PAC utilization patterns in different geographic areas when thinking about PAC payment reform options.

by the sample of beneficiaries in the analysis (beneficiaries with an index acute hospital stay following a period of 60 days without acute or PAC service use) or by differences in the types of beneficiaries using acute services in Texas.

Table 5. PAC Standardized Payments by State, Episode Definition A—30 Day Fixed: Any Claim Starting within 30 Days

	Massachusetts 49.0% of Index Acute Hospital Discharges Using PAC			New York 39.4% of Index Acute Hospital Discharges Using PAC		
Percentile	Mean PAC Payment per Hospital Discharge (N = 7,105)	Mean PAC Payment per PAC User (N = 3,482)	Mean PAC LOS[1] per PAC User	Mean PAC Payment per Hospital Discharge (N = 18,299)	Mean PAC Payment per PAC User (N = 7,202)	Mean PAC LOS per PAC User
95th	$22,114	$29,090	84.0	$18,874	$25,672	90.0
90th	$14,143	$20,798	74.0	$11,833	$19,649	71.0
75th	$5,359	$9,670	57.0	$4,305	$9,764	53.0
50th	$1,226	$4,347	37.0	$0	$4,203	33.0
25th	$0	$1,910	22.0	$0	$1,910	19.0
Mean	$4,601	$8,003	40.5	$3,823	$7,756	38.9

	Oregon 30.2% of Index Acute Hospital Discharges Using PAC			Texas 29.2% of Index Acute Hospital Discharges Using PAC		
Percentile	Mean PAC Payment per Hospital Discharge (N = 2,434)	Mean PAC Payment per PAC User (N = 734)	Mean PAC LOS per PAC User	Mean PAC Payment Per Hospital Discharge (N = 21,325)	Mean PAC Payment per PAC User (N = 6,233)	Mean PAC LOS per PAC User
95th	$12,018	$18,986	71.0	$23,351	$36,062	79.0
90th	$6,856	$12,473	60.0	$13,587	$28,186	68.0
75th	$2,316	$6,677	47.0	$4,502	$14,851	60.0
50th	$0	$3,422	31.0	$0	$4,635	38.0
25th	$0	$1,687	17.0	$0	$2,316	22.0
Mean	$2,352	$5,369	33.5	$4,305	$10,999	40.6

1. LOS = length of stay.

Table 6. PAC Standardized Payments by CBSA, Episode Definition A—30 Day Fixed: Any Claim Starting within 30 Days

Percentile	Boston, Massachusetts 48.9% of Index Acute Hospital Discharges Using PAC: Mean PAC Payment per Hospital Discharge (N = 4,840)	Mean PAC Payment per PAC User (N = 2,369)	Mean PAC LOS[1] per PAC User	Rochester, New York 47.5% of Index Acute Hospital Discharges Using PAC: Mean PAC Payment per Hospital Discharge (N = 790)	Mean PAC Payment per PAC User (N = 375)	Mean PAC LOS per PAC User
95th	$22,526	$29,697	83.0	$16,348	$23,826	84.0
90th	$13,733	$21,123	72.0	$9,393	$15,713	62.0
75th	$5,429	$9,705	56.0	$4,252	$7,025	47.0
50th	$1,446	$4,538	36.0	$222	$3,678	32.0
25th	$0	$1,910	22.0	$0	$1,854	18.0
Mean	$4,654	$8,168	39.9	$3,496	$6,242	36.5

Percentile	Portland, Oregon 33.0% of Index Acute Hospital Discharges Using PAC: Mean PAC Payment per Hospital Discharge (N = 1,038)	Mean PAC Payment per PAC User (N = 343)	Mean PAC LOS per PAC User	Dallas, Texas 29.4% of Index Acute Hospital Discharges Using PAC: Mean PAC Payment per Hospital Discharge (N = 4,327)	Mean PAC Payment per PAC User (N = 1,273)	Mean PAC LOS per PAC User
95th	$12,956	$21,776	68.0	$24,337	$35,500	80.0
90th	$8,293	$15,002	60.0	$14,990	$27,917	69.0
75th	$3,540	$6,378	43.0	$4,546	$16,676	60.0
50th	$0	$3,918	31.0	$0	$5,025	37.0
25th	$0	$1,743	19.0	$0	$3,356	23.0
Mean	$2,512	$5,598	32.7	$4,460	$11,570	40.5

1. LOS = length of stay.

4. DISCUSSION

4.1 Conclusions and Implications of the Findings

The analyses presented in this report demonstrate the effects of alternative episode definitions in terms of episode costs and composition. In summary, varying the episode definition affects

- The number of beneficiaries we see using different PAC services,
- The types of PAC services included in an episode, and
- The levels of utilization and payment for different PAC services during an episode.

Our results indicate that the PAC services that are most highly sensitive to episode definition are SNF and HHA because these services are characterized by longer average lengths of stay. In addition, although these services may be the first sites of care for some beneficiaries following discharge from the acute hospital, they may also be later sites of PAC for beneficiaries discharged to other settings (e.g., IRFs or LTCHs) following their index acute hospital stays. Differences in the utilization and payment amounts per episode are sensitive to the definition of fixed end points (i.e., allowing any claim initiating within a period to be part of an episode versus prorating the dollars associated with the claim based on the days within the fixed window). Allowing any claim to initiate within a fixed period of time will capture continued service use. In contrast, prorating only captures a portion of actual service use (and costs) within the bundle.

The results of this work also highlight differences in the cost and composition of PAC episodes depending on whether acute hospital readmissions and subsequent PAC are included in the definition or whether episodes end with an acute hospital readmission. Mean PAC episode payments including acute hospital readmissions and subsequent PAC are substantially higher than when readmissions are excluded because of the high costs of readmission and the relatively high rate of readmission across beneficiaries discharged from acute hospital stays.

Differences in PAC payments by geography are another important consideration emerging from this work. The results show that there is significant variation in the percentage of beneficiaries using PAC services in different parts of the country. For those who do use any type of PAC service, there is significant variation in the types and levels of care they receive. This has implications for potential bundled payment policy: at what level would a bundled payment be made? Would a bundled payment be made based on discharge from an acute hospital? Or would it be made based on beneficiaries discharged to PAC? As shown in the tables, the average payment per discharge is substantially lower than the average payment per PAC user or service user. Further, the average payment per LTCH is substantially higher than average payments for IRFs, SNFs, or HHAs. These differences have

implications for access to appropriate services. These decisions are further complicated by the differences in services available in a local area. Average costs would vary tremendously depending on which types of services are available and used. The research shows that some of this variation can be predicted by type of index hospital condition. Still, within conditions, utilization varies depending on the services that are available in a local area. Bundling payments that are averaged on different size denominators may further influence the availability of these services in less populated areas.

4.2 Next Steps

Over the next year, ASPE and RTI will continue to work on episodes of care for Medicare beneficiaries. While past research has used only 2006 data, work in the coming year will create a longitudinal file using additional years of Medicare claims data. The data file will have the ability to follow Medicare beneficiaries across time to account for multiple episodes over time, rather than just the first episode per year. RTI will also increase the claims sample by using 30 percent Medicare data, allowing for greater statistical power at the MS-DRG level at different geographical levels. This project will analyze both hospital-initiated episodes and PAC episodes initiating in HHAs, IRFs, or LTCHs. This work will be important for understanding the implications of bundled payments for more chronic populations.

A second effort that ASPE and RTI have under way involves examining the landscape of formal and informal organizational relationships between acute care and PAC providers. This work will help us to understand the extent to which the health care communities create formal and informal delivery networks. Our analysis will build on our earlier work (Gage et al., 2009), examining the extent to which PAC use is affected by the hospital owning a PAC provider, having a hospital-based unit, or being a freestanding provider under common ownership with the hospital, as well as the differences between the chain-based PAC providers and those belonging to formal integrated delivery systems. The goal of this work will be to use CMS data sources and the PAC referral patterns observed in the claims data to learn more about existing formal and informal organizational relationships between PAC providers and the potential for providers to establish relationships under a bundled payment system. Both of these projects will highlight issues to consider that are related to the implementation of PAC bundled payment.

A third project that ASPE and RTI will work on over the next year explores methods to risk-adjust PAC episodes. This work represents the next step in ASPE's work to learn more about episodes of PAC and potential bundled payment options. This work is also the next step in collaboration with CMS to inform PAC-PRD. In this project, RTI will construct episodes for beneficiary participants in PAC-PRD, using methodologies developed under previous phases of this collaboration. This phase of the collaboration will develop and model the impact of alternative risk adjusters for predicting payment and outcomes across episode-based bundled payment options using the Continuity Assessment Record and Evaluation (CARE)

Tool variables, a uniform assessment instrument developed and collected in the PAC-PRD. Prediction models, episodes, and corresponding bundled payments will be constructed using CARE data from acute hospital discharges and PAC admissions.

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