LEWINGROUP®

CMS Bundled Payments for Care Improvement Advanced Model: Year 2 Evaluation Report

Prepared for:

CMS

Submitted by:

The Lewin Group, Inc. with our partners
Abt Associates, GDIT, and Telligen

March 2021

CMS Bundled Payments for Care Improvement Advanced Model: Year 2 Evaluation Annual Report

The Lewin Group

With our partners Abt Associates, GDIT, and Telligen

Authors:

Laura Dummit, Amanda Tripp, Sarah Bergman, Reed Cammarota, Rahul Chander, Timothy Collins, Gina Gerding, Raina Kelly, Grecia Marrufo, Ian Morrall, Kelsey Roberts, Ellen Tan, Andrea Hassol, Catherine Hersey, Caroline Kupersmith, Caroline Logan, Sharmini Radakrishnan, Matt Trombley, Becky Blystone, Christine LaRocca, Maria Joseph-King, Colleen Kummet

Lewin's address:

3160 Fairview Park Dr., Suite 600, Falls Church, VA 22042

Federal Project Officer:

Daver Kahvecioglu
Division of Data, Research, and Analytic Methods (DRAM)
Research and Rapid Cycle Evaluation Group (RREG),
Center for Medicare & Medicaid Innovation (CMMI),
Centers for Medicare & Medicaid Services (CMS)

This project was funded by the Centers for Medicare & Medicaid Services under contract no. HHSM-500-2014-000331 Task Order 75FCMC18F0089.

Table of Contents

List of Appendices

Executive Summary

A. Introduction

The Center for Medicare & Medicaid Innovation (CMMI) in the Centers for Medicare & Medicaid Services (CMS) launched the Bundled Payments for Care Improvement Advanced (BPCI Advanced) model, an Advanced Alternative Payment Model (Advanced APM), to test whether linking Medicare payments for an episode of care can reduce Medicare expenditures while improving quality of care. It builds upon the experience and results of the BPCI model, which was active from October 2013 to September 2018. The BPCI Advanced model began in October 2018 and will extend through December 2023.

BPCI Advanced is a voluntary model in which a participant enters into an agreement with CMS and is held accountable for performance on quality measures and episode payments for its chosen clinical episodes. A BPCI Advanced participant may be a hospital, physician group practice (PGP), or other eligible entity. Participants may be a convener participant (convener), which has at least one hospital or PGP downstream episode initiator (EI). A convener bears financial risk on behalf of its EIs and often provides services intended to help their EIs succeed in the model. Alternatively, a hospital or PGP may be a non-convener participant that bears financial risk for itself. Participants could join the model in Model Year 1, (beginning October 2018) when there were 32 clinical episodes or Model Year 3 (beginning January 2020) when there were 34 clinical episodes.

A BPCI Advanced inpatient episode begins with a hospitalization in which the discharge is categorized in the Medicare Severity-Diagnosis Related Group (MS-DRG) for one of the participant's selected clinical episodes and extends for 90-days post-discharge. An outpatient episode begins with a hospital outpatient procedure that is identified by a Healthcare Common Procedure Coding System (HCPCS) code for one of the participant's selected clinical episodes and extends for 90-days after the procedure. The EI is either the hospital where the discharge or procedure occurred or the PGP for the attending or operating clinician.

At the end of each performance period, episode payments for each EI and their clinical episodes are compared to a target price. If episode payments are above the applicable target price, the participant may owe CMS a reconciliation payment. Conversely, if episode payments are below the target price, the participant may receive a reconciliation payment from CMS. Target prices are calculated for each combination of EI, clinical episode, and hospital where the episode was initiated. Target prices are based on historical episode payments for the hospital where the episode was initiated, updated based on spending levels and trends of the hospital's peers and adjusted for patient case mix. For PGP EIs, the target price incorporates PGP-specific patient case mix and adjustments for differences between PGP and hospital historical payments. Target prices are discounted 3%, which is intended to be Medicare savings under the model.

This annual report provides a formative evaluation of the BPCI Advanced Model from its beginning on October 1, 2018. We describe the BPCI Advanced participants and EIs; their participation decisions, including their choices of clinical episodes; and the reach of the model through Model Year 3 (2020). We estimate the impact of the model on total payments, utilization, and quality; changes in patient-reported functional status; and Medicare program

savings, although because of data lags, these estimates only reflect the experience during the first 10 months of the model.

Exhibit ES.1: Annual Report Components and Model Years Reflected in Report

Component	Model Years 1&2	Model Year 3
Participation Decisions	•	•
Reach of the Model	•	•
Clinical Episode Selection	•	•
Patient-Reported Functional Status	•	
Impact of the Model	•	
Medicare Program Savings	•	

Since the analyses for this report were conducted, CMS has made substantive changes to the BPCI Advanced model. For Model Year 4, CMS adjusted its calculation of the target price to include a realized trend adjustment, remove the PGP offset, and add risk adjustments for the major joint replacement of the lower extremity clinical episode. CMS also requires participants to select clinical episode service line groupings and participate in all clinical episodes in the service line grouping that meet minimum volume thresholds. Adjustments were also made to the episode overlap methodology and quality measures were added. These changes were made, in part, based on analyses included in this report. Further, in response to the public health emergency due to COVID-19, CMS offered participants options to retroactively eliminate risk or exclude episodes with COVID-19 diagnoses from Model Year 3 reconciliation.[1] These changes are not reflected in the analyses in this report, but will be addressed in future evaluation reports.

B. Results

1. What is the reach of BPCI Advanced?

The number of providers participating in the BPCI Advanced model expanded over its first three Model Years. In Model Years 1, 2, or 3, 33% of eligible hospitals (1,084), and 1,166 PGPs participated in at least one clinical episode. The proportion of eligible hospitals that participated in Model Years 1, 2, or 3 increased by 11 percentage points (pp) relative to hospital participation in Model Years 1 and 2. This expansion was due in part to increased participation among rural and safety net hospitals. Among PGPs, participation increased from 580 EIs in Model Years 1 and 2 to 1,031 EIs in Model Year 3.

In Model Years 1 and 2, approximately 14% of BPCI Advanced eligible Medicare FFS inpatient discharges and outpatient procedures occurred at a hospital participating in BPCI Advanced and an additional 9% were attributed to a PGP EI that was participating in the given clinical episode. During the same period, 24% of eligible clinicians, that is attending or operating physicians on at least one BPCI Advanced eligible episode, were aligned with BPCI Advanced clinical episodes by billing Medicare through a participant.

[1] Updates to the model design and reconciliation process can be viewed on the CMS BPCI Advanced website at https://innovation.cms.gov/innovation-models/bpci-advanced/participant-resources

2. What are the characteristics of BPCI Advanced and the providers and organizations that chose to participate in the model?

As of January 1, 2020, which corresponded to the start of Model Year 3, 92 conveners and 602 non-convener participants that represented 1,010 hospital EIs and 1,031 PGP EIs participated in BPCI Advanced. Over 70%, or 1,439, of EIs participated as downstream EIs under one of the 92 conveners. More than 35% of EIs participated under one of the five conveners with the largest number of EIs.

BPCI Advanced hospital EIs were larger and more likely to be located in urban and more competitive markets compared to hospitals that did not participate. Hospital EIs were dispersed across and within the four census regions, although 40% were located in the South. Compared to non-participating hospitals, BPCI Advanced EIs were more likely to be non-profit, larger, and part of a health system. BPCI Advanced hospital EIs were also more likely to have participated in BPCI and have experience in the Medicare Shared Savings Program (MSSP), Next Generation (Next Gen) Accountable Care Organization (ACO) Model, or Pioneer ACO Model.

Nearly half of 1,031 BPCI Advanced PGPs (defined by tax identification numbers) participating in Model Year 3 did not exist as PGPs prior to BPCI Advanced. Further, more than one-third of all Model Year 3 PGPs did not bill for any Medicare services during Model Years 1 and 2. Compared to Model Years 1 and 2 participants, PGPs participating in Model Year 3 were smaller, as indicated by the number of clinicians and had fewer annual discharges and procedures for BPCI Advanced clinical episodes.

3. What were the participation decisions and how were they made?

EIs and conveners described joining BPCI Advanced to achieve financial success, understand their data to drive care transformation, and strengthen partnerships with physicians and hospitals. Interviewees also wanted to build on previous experiences with other Medicare initiatives (e.g., BPCI Initiative and Medicare ACOs) and commercial value-based payment (VBP) contracts and gain experience that could be applied to future opportunities.

The majority of EIs participated in BPCI Advanced with a convener. Conveners often provided data analysis, performance management, and administrative services. Some conveners provided case management services, managed post-acute care (PAC) networks, or offered specific clinical tools to support care coordination. EIs that joined the model without a convener said that they wanted to build in-house capacity, with an eye towards future models. Some non-convener participant EIs also cited cost as a reason for not partnering with a convener.

In Model Year 3, hospital EIs participated in an average of five clinical episodes and PGP EIs participated in an average of eight clinical episodes. EIs reported analyzing historical utilization patterns and patient volume to select clinical episodes. Some considered their partnerships with post-acute care and other providers or prior care redesign activities in their clinical episode selection decisions. Three medical clinical episodes (sepsis, cardiac arrhythmia, and acute myocardial infarction) were the most commonly selected clinical episodes for both hospital and PGP EIs in Model Year 3.

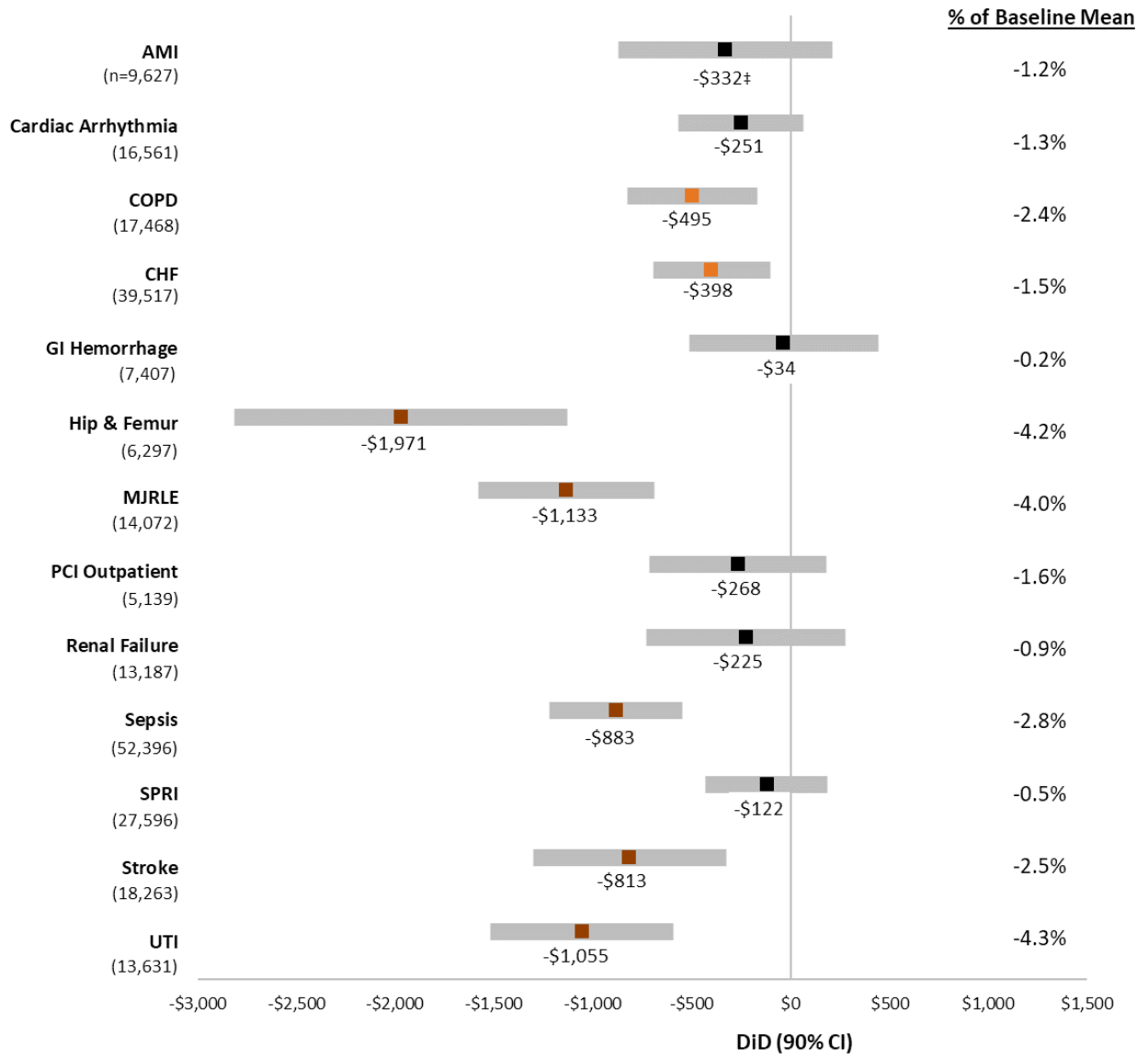
Participants said they focused on reducing hospital readmissions and PAC utilization, and improving care management. Many described specific care process changes such as starting discharge planning earlier during a hospital stay and improving coordination between the hospital staff and PAC providers. EIs often described building on care redesign initiatives that predated BPCI Advanced, such as efforts to reduce hospital readmissions, quality improvement activities for patients with specific diagnoses, or changes related to participation in other Medicare payment initiatives.

4. What is the impact of BPCI Advanced on episode payments, utilization, and quality of care for Medicare beneficiaries?

In the first 10 months of the model, BPCI Advanced hospitals reduced total allowed episode payments in seven (of 13 studied) clinical episodes, relative to the comparison group.[2] The estimated reduction in total payments ranged from $1,971 (hip and femur) to $398 (congestive heart failure) (Exhibit ES.2). When expressed as a percent of the baseline allowed episode payments, estimated reductions in total payments ranged from 4.3% (urinary tract infection) to 1.5% (congestive heart failure). Hospital EIs achieved reductions in total payments by reducing skilled nursing facility (SNF) and inpatient rehabilitation facility (IRF) payments.

[2] The impact analyses were limited to 13 clinical episodes that were sufficiently powered to detect differences and only those initiated by hospital EIs.

Exhibit ES.2: Impact of BPCI Advanced on Total Payments by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence intervals of the DiD estimate. This payment outcome is standardized to remove the effect of geographic and other payment adjustments. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence).

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

There was no indication that BPCI Advanced affected quality of care in participating hospitals, as measured by readmission rates. Mortality rate, however, differed between comparison and BPCI Advanced hospitals for three clinical episodes. The mortality rate decreased in renal failure and urinary tract infection (UTI) episodes by approximately 1 pp relative to a comparison group. For simple pneumonia and respiratory infections (SPRI) episodes, the mortality rate increased by 1 pp, relative to a comparison group.

We surveyed beneficiaries in BPCI Advanced episodes and beneficiaries in a comparison group about the change in their functional status from before to after the episode. One of seven measures of functional status suggested small, less favorable changes for BPCI Advanced respondents with hospital-attributed episodes. When considering all measures, however, there was little consistent evidence that respondents with episodes initiated at a BPCI Advanced hospital had less favorable changes in functional status than comparison respondents. There was no consistent evidence supporting more or less favorable outcomes between respondents with BPCI Advanced PGP episodes and comparison respondents in changes in functional status. There was no relationship between BPCI Advanced and care experience and satisfaction with care measures among respondents with episodes attributed to hospitals or PGPs. Considering the totality of the survey data, we cannot conclude that BPCI Advanced respondents had different changes in functional status than comparison respondents.

5. Did BPCI Advanced result in net savings to Medicare?

After accounting for reconciliation payments, the BPCI Advanced model resulted in an estimated loss of $158.6 million to Medicare during its first 10 months for the 13 clinical episodes and hospital EIs evaluated in this report.[3] Considering the variation of the payment estimates, the estimated loss to Medicare ranged from $62.5 million to $254.7 million (90% confidence interval). This net loss is equivalent to a per-episode loss to Medicare of $761, or approximately 2.4% percent of average historical episode payments.

Exhibit ES.3: BPCI Advanced did not Result in Net Savings to Medicare for 13 Clinical Episodes, Hospital EIs, October 1, 2018 – August 3, 2019

Note: The estimate of the change in non-standardized payments is based on difference-in-differences (DiD) models of standardized Medicare paid amounts for 13 clinical episodes. Net savings to Medicare is the estimated change in non-standardized payments minus reconciliation payments for the 13 clinical episodes.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 or later and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 or later and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers and CMS reconciliation data from the same period.

[3] Net reconciliation payments include performance-based payments from CMS or repayments to CMS. These estimates do not include 19 hospital CEs, or any PGP related results.

C. Discussion and Conclusion

The BPCI Advanced model was designed to encourage broad, diverse participation from providers and increase the likelihood of achieving savings relative to previous bundled payment models. As discussed in the first annual report, there was greater hospital and PGP participation in BPCI Advanced than in BPCI. In Model Year 3, when new participants could join the model, the reach of BPCI Advanced extended further.

Hospital EIs were successful in reducing Medicare payments for seven of the 13 largest clinical episodes during the first 10 months of the model. The reductions in total payments were due to reductions in SNF and IRF payments. These findings are consistent with EIs' care redesign strategies to reduce PAC use and earlier BPCI results. At the same time, there are few indications in claims or beneficiary survey data that BPCI Advanced affected quality of care, either positively or negatively.

Despite the early success of the model in reducing episode payments, after accounting for net reconciliation payments, BPCI Advanced resulted in Medicare program losses in the first 10 months of the model. This suggests that the target prices, which are the mechanism for determining the level of reconciliation payments, may not have accurately reflected what payments would have been absent the model. At the same time, the target prices and the opportunity to receive reconciliation payments, are a key feature of this voluntary model intended to encourage provider participation in the model. To help improve the accuracy of the target prices while maintaining the opportunity to receive reconciliation payments, CMS revised its target price methodology for Model Year 4.

This evaluation has limitations. The estimates of the impact of BPCI Advanced on episode payments and Medicare program savings are based on discharges or procedures in 13 clinical episodes initiated at participating hospitals. The 13 clinical episodes evaluated account for approximately 90% of BPCI Advanced episodes attributed to hospital EIs. The remaining clinical episodes attributed to hospital EIs were excluded due to insufficient sample size. Impact estimates for PGP initiated episodes are not included in these results. There are a number of methodological challenges to creating a counterfactual for PGP EIs, which require further investigation. In future reports we will expand the number of clinical episodes and include PGP initiated episodes.

Our primary analytic approach is dependent on a matched comparison group that is similar to participants on observable factors related to participation decisions. For most clinical episodes, our matched comparison group met our diagnostic thresholds for a close match. For select clinical episodes, the comparison providers were not as close a match as we would like, even after multiple attempts to improve the match. In some instances, there were differences in baseline trends of outcomes, which raises questions about a key assumption for the validity of the difference-in-differences design. As a result, and as noted, the results for some outcomes for specific clinical episodes may be biased.

The evaluation of BPCI Advanced will continue to expand and be refined. Future reports will incorporate more experience under the model and a broader set of EIs and clinical episodes. The additional data will allow more in-depth analyses of particular participant characteristics and beneficiary sub-populations. We will also evaluate how the model changes over time, participant responses to those changes, and whether BPCI Advanced achieves its stated objectives.

I. Introduction

The Bundled Payments for Care Improvement Advanced (BPCI Advanced) Model is designed to test whether linking Medicare provider payments for an episode of care can reduce Medicare expenditures while improving quality of care. The Center for Medicare & Medicaid Innovation (CMMI) in the Centers for Medicare & Medicaid Services (CMS) launched BPCI Advanced in October 2018 and the model will continue through December 2023.[4]

The Lewin Group, with our partners Abt Associates, Inc., GDIT, and Telligen, is under contract to CMS to conduct an independent evaluation of the impact of BPCI Advanced. This second annual report focuses on the reach of the model; the providers and organizations participating in the model and their participation decisions; the impact of the model on episode payments, utilization, and quality of care for Medicare beneficiaries; and Medicare savings.

A. The BPCI Advanced Model

BPCI Advanced is a voluntary model in which participants entered into agreements with CMS to be held accountable for quality measures and total Medicare fee-for-service (FFS) payments, with some exclusions, for clinical episodes they selected.[5] If total payments for the clinical episode are below the target price, the participant may receive reconciliation payments from CMS. Conversely, if total payments for the clinical episode are above the target price, the participant may owe reconciliation payments to CMS.[6] Thus, participants have financial incentives to ensure that providers deliver care efficiently during the entire episode, which begins with a triggering hospitalization or outpatient procedure and ends 90 days after discharge or completion of the procedure. Exhibit 1 highlights key components of the model.

BPCI Advanced was based on the Bundled Payments for Care Improvement Initiative (BPCI) and incorporates lessons learned, primarily from Model 2.[7] BPCI, one of CMMI's previous bundled payment approaches, comprised four models and ended on September 30, 2018.

[4] See **Appendix A** for a glossary of terms and abbreviations used in this report.
[5] Centers for Medicare & Medicaid Services (2019, June 28). BPCI Advanced. Retrieved from https://innovation.cms.gov/initiatives/bpci-advanced.
[6] See the CMS BPCI Advanced website for additional information on the reconciliation specifications: https://innovation.cms.gov/media/document/bpciadvanced-my1-2-reconcilation-specs and https://innovation.cms.gov/media/document/bpciadvanced-my3-reconcilation-specs
[7] See the CMS BPCI website for additional information on the initiative and annual reports: https://innovation.cms.gov/innovation-models/bundled-payments.

Exhibit 1: Key Components of BPCI Advanced

Defining Characteristics

- Voluntary model
- Retrospective reconciliation with a 90-day post-anchor stay/anchor procedure episode length
- Hospitals and physician group practices (PGPs) can initiate episodes
- In Model Year 3, there were 30 inpatient, 3 outpatient, and 1 multi-setting clinical episodes
- Is an Advanced Alternative Payment Model (APM)

Target Prices

- Preliminary target prices were made available to applicants before they made participation decisions
- Hospital target prices were based on hospital historical payments, case mix, peer group historical payments, and a prospective peer group trend factor, discounted by 3%
- PGP target prices were hospital target prices adjusted for PGP-specific patient case mix and differences between PGP and hospital historical payments, discounted by 3%

Entry and Withdrawal Rules

- Two opportunities for participants and episode initiators (EIs) to join the model
- In Model Year 3, participants could make changes to clinical episode and EI selections. In Model Year 4, participants could make clinical episode service line group selections and withdraw EIs
- Participants had a one-time opportunity to retroactively withdraw from clinical episodes, withdraw EIs, or terminate their participation in the model on or before March 1, 2019, without financial accountability
- Participants can terminate participation in the model with 90-days advance written notice

Source: Centers for Medicare & Medicaid Services (2020, May 5). BPCI Advanced. Retrieved from https://innovation.cms.gov/initiatives/bpci-advanced; Centers for Medicare & Medicaid Services (2019, September). Model Overview Fact Sheet – Model Year 3 (MY3). Retrieved from https://innovation.cms.gov/files/fact-sheet/bpciadvanced-my3-modeloverviewfs.pdf; Centers for Medicare & Medicaid Services (2019, September 14). Bundled Payments for Care Improvement Advanced Amended and Restated Participation Agreement. Retrieved from https://innovation.cms.gov/files/x/bpciadvanced-my3-am-restated-participation-agmt.pdf

1. Participants and Episode Initiators

Each BPCI Advanced participant, which may be a hospital, physician group practice (PGP), or other eligible entity, enters into an agreement with CMS to be held accountable for performance on quality measures and episode payments relative to target prices. If episode payments are above the applicable target price on average, the participant may owe CMS a reconciliation payment. Conversely, if its episode payments are below the target prices on average, the participant may receive a reconciliation payment from CMS. Participants are expected to coordinate care across the providers involved in an episode to reduce utilization and payments and improve the quality of patient care.

Participants may be either a convener participant (convener) or a non-convener participant. A convener has at least one downstream episode initiator (EI), which is a hospital or a PGP. A convener bears financial risk on behalf of its downstream EIs and often provides services (e.g., data analysis, guidance on clinical episode selection, or case management services) intended to help EIs succeed in the model. A convener may have multiple participation agreements with CMS but an EI can only initiate clinical episodes under one agreement. A non-convener participant is a hospital or PGP EI that bears financial risk only for itself.

2. BPCI Advanced Episodes

A BPCI Advanced episode begins with a hospitalization or procedure at a hospital EI or when the attending or operating clinician for the hospitalization or procedure is a member of a PGP EI. Inpatient episodes start when a Medicare beneficiary is admitted to a hospital (anchor stay) and the resulting Medicare Severity-Diagnosis Related Group (MS-DRG) for the discharge is in one of the participating EI's selected clinical episodes. Outpatient episodes begin when a beneficiary has an outpatient procedure (anchor procedure) in a hospital outpatient setting that is identified by a Healthcare Common Procedure Coding System (HCPCS) code in the participating EI's selected clinical episodes. All Medicare-covered items and professional services, with certain exclusions, furnished during the anchor stay or the anchor procedure plus the 90 days after are included in the episode.[8]

In Model Year 3, there were changes to the clinical episodes that were included in the model. Bariatric surgery, inflammatory bowel disease, and seizures clinical episodes were added. Additionally, one new spinal fusion clinical episode, cervical spinal fusion, replaced three clinical episodes, combined anterior posterior spinal fusion, and spinal fusion (non-cervical). A transcatheter aortic valve replacement clinical episode was carved out of the original cardiac valve clinical episode. Further, the major joint replacement of the lower extremity (MJRLE) clinical episode was expanded to include total knee arthroplasty procedures performed in the hospital outpatient department in addition to the inpatient procedures. (See **Appendix B** for a list of the BPCI Advanced clinical episodes and associated MS-DRGs and HCPCS codes.)

3. Target Prices and Reconciliation

CMS calculates a BPCI Advanced target price for each EI, hospital, and clinical episode. A hospital EI's target price reflects its historical Medicare FFS episode payments during the baseline period, adjusted for its patient mix and its payments relative to national historical payments, which are updated based on the spending trends of its hospital peers.[9] A PGP EIs target price is based on the target price of the hospital where the hospitalization or procedure occurred, adjusted for PGP-specific case mix and efficiency. Because a PGP may initiate episodes in different hospitals, it may have different target prices for the same clinical episode, depending on where the episode was initiated. For Model Years 1 through 3, the target price incorporates a 3% discount, which is intended to be Medicare savings under the model.

The target price calculation method was designed to support participation from a broad range of providers by accounting for variation in episode payments and factors that contribute to payment differences that are beyond providers' control. The use of hospital-specific historical payments, adjusted for peer group levels, peer group trends, and case mix, is to encourage participation from a variety of providers, including those with historically high and those with historically low episode payments. The peer adjustments recognize that underlying costs and episode spending

[8] Limited claims during the one day prior to the anchor hospitalization were included to capture all associated payments. Centers for Medicare & Medicaid Services (2019, August). Clinical Episode Construction – Model Years 1 and 2. Retrieved from https://innovation.cms.gov/files/x/bpciadvanced-episodecreationspecs-yr1-2.pdf

[9] The target price baseline period for Model Years 1 and 2 was January 1, 2013 through December 31, 2016. For Model Year 3, it was October 1, 2014 to September 30, 2018.

trends differ across types of hospitals in different circumstances.[10] The patient case-mix adjustment accounts for variations in payments due to differences in patient needs.

The BPCI Advanced Model qualifies is an Advanced Alternative Payment Model (Advanced APM), in part, because payments are tied to performance on quality measures. BPCI Advanced uses seven claims-based quality measures to calculate each EI's Composite Quality Score (CQS) (Exhibit 2). An additional set of 23 alternate quality measures, including claims-based and registry-based measures, will be available for participants to select for clinical episodes in Model Year 4 (2021).[11] CMS calculates EI-specific quality scores for each measure at the clinical episode-level, if applicable.[12]

Exhibit 2: BPCI Advanced Quality Measures

Measure	Applicable Clinical Episodes
All-cause Hospital Readmission Measure	All clinical episodes
Advance Care Plan	All clinical episodes
CMS Patient Safety Indicators 90 (CMS PSI 90)	All inpatient clinical episodes
Hospital-Level Risk-Standardized Complication Rate (RSCR) Following Elective Primary Total Hip Arthroplasty (THA) and/or Total Knee Arthroplasty (TKA)	Double joint replacement of the lower extremity (DJRLE); major joint replacement of the lower extremity (MJRLE)
Hospital 30-Day, All-Cause, Risk-Standardized Mortality Rate (RSMR) Following Coronary Artery Bypass Graft Surgery (CABG)	CABG
Excess Days in Acute Care after Hospitalization for Acute Myocardial Infarction (AMI)	AMI
Perioperative Care: Selection of Prophylactic Antibiotic: First or Second Generation Cephalosporin	Back and neck except spinal fusion (inpatient and outpatient); bariatric surgery; CABG; cardiac valve; DJRLE; hip and femur procedures except major joint; lower extremity and humerus procedure except hip, foot, femur; major bowel procedure; MJRLE; major joint replacement of the upper extremity; spinal fusion

Source: Centers for Medicare & Medicaid Services (n.d.). Quality Measures Correlation to Clinical Episodes Model Year 1, 2, 3. Retrieved from https://innovation.cms.gov/files/x/bpci-advanced-qualmsrcorrclinepi-modelyrs1-3.pdf.

Under the model, providers and suppliers continue to receive Medicare FFS payments for providing Medicare-covered items and services. At the end of each performance period, CMS compares episode payments with the target price for each EI for each of its clinical episodes. When a participant's FFS payments, aggregated across all of its EIs and clinical episodes, are below its target amount, the participant will receive a Net Payment Reconciliation Amount (NPRA). When the aggregated FFS payments are above the target amount, the participant will owe a repayment

[10] Centers for Medicare & Medicaid Services (2018, June). Pricing Methodology for Clinicians and Administrators. Retrieved from https://innovation.cms.gov/Files/slides/bpciadvanced-wc-pricingmethodology-clinadmin.pdf.

[11] Centers for Medicare & Medicaid Services (2020, August). Quality Measures Fact Sheet. Retrieved from https://innovation.cms.gov/media/document/bpci-advanced-my4-all-fact-sheets

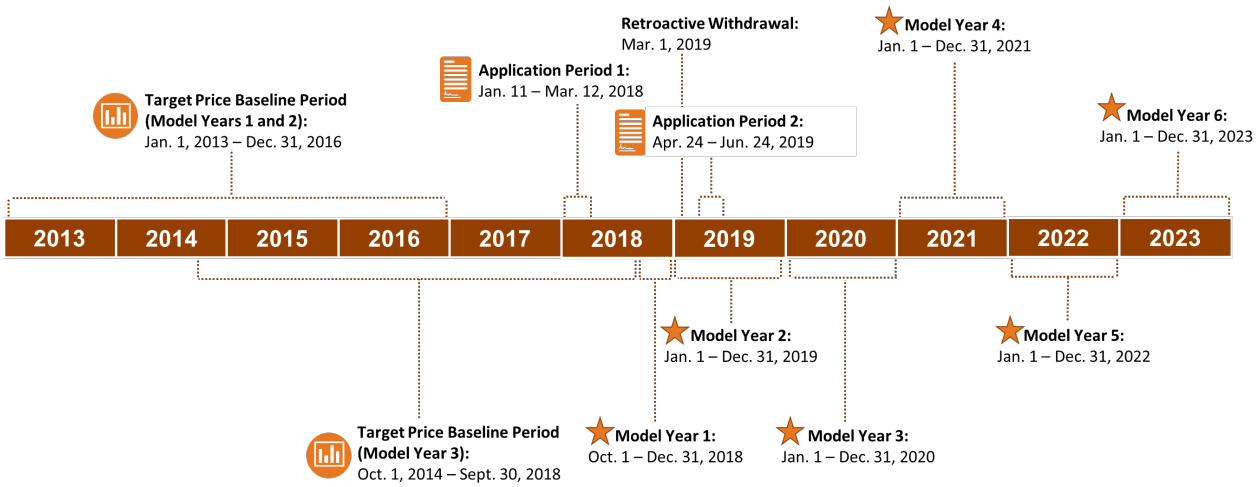
[12] Centers for Medicare & Medicaid Services (2019, April 18). Bundled Payments for Care Improvement Advanced: Request for Applications (RFA) for Participation Beginning Model Year 3. Retrieved from https://innovation.cms.gov/files/x/bpciadvanced-my3-rfa.pdf

amount to CMS.[13] The NPRA or the repayment amount includes adjustments for the EI's CQS, and for the stop-loss or stop-gain limits of the BPCI Advanced Model.[14] Throughout the report, we refer to NPRA and repayment amount collectively as "reconciliation payments."

4. Model Timeline

The BPCI Advanced Model extends for more than five years: Model Year 1 began October 1, 2018 and Model Year 6 ends December 31, 2023 (Exhibit 3). The target prices for Model Years 1 and 2 are based on historical payments from 2013 through 2016 (target price baseline period). In Model Year 3, the target price baseline period is October 1, 2014 to September 30, 2018. The baseline period will continue to shift forward for future Model Years so that target prices will incorporate episode payments achieved under the model. The first cohort of participants began participation at the start of Model Year 1 and continued past the retroactive withdrawal period; the second cohort began participation at the start of Model Year 3. Exhibit 4 includes additional details on the application, termination, and retroactive withdrawal processes.

Exhibit 3: BPCI Advanced Timeline through Model Year 6



Source: Centers for Medicare & Medicaid Services (2018, April). BPCI Advanced Model Timeline. Retrieved from https://innovation.cms.gov/Files/x/bpci-advanced-timeline.pdf and Centers for Medicare & Medicaid Services. Pricing Methodology: Frequently Asked Questions (FAQ). Retrieved from https://innovation.cms.gov/Files/x/bpciadvanced-my3-pm-faqs.pdf.

[13] The reconciliation amount has a 20% stop loss/gain applied at the EI level.
[14] The CQS adjustment amount cannot change the NPRA or repayment amount by more than 10%.

Exhibit 4: BPCI Advanced Application Process, Participation Decisions, and Retroactive Withdrawal

Application Process

- Applicants provided lists of potential EIs.
- Potential EIs could be listed on multiple applications (e.g., with various convener applicants or as non-convener applicants), however, when the model began, each EI could only participate under one applicant arrangement.
- Applicants received up to three years of baseline claims data and preliminary target prices for clinical episodes with sufficient baseline period volume.

Participation Decisions

- Participants were required to identify, prior to the model year starting, their chosen EIs and clinical episodes.
- Participants also notified CMS whether they expected to use available payment policy waivers (e.g., waiving the three-day hospital stay for skilled nursing facility coverage) or financial arrangements (e.g., sharing NPRA) that could be protected under specific waivers of fraud and abuse laws issued for the model.

Retroactive Withdrawal

- Participants had a one-time opportunity to retroactively withdraw from clinical episodes, withdraw EIs, or terminate their participation in the model on or before March 1, 2019.
- Participants that took advantage of the retroactive withdrawal were not financially accountable for withdrawn downstream EIs' clinical episodes or their own clinical episodes initiated prior to their withdrawal. Participants and EIs that retroactively withdrew could reapply for Model Year 3.

Note: Hospital EIs must have had at least 41 episodes in the baseline period to be eligible to participate in a particular clinical episode. PGP EIs' discharges or procedures are BPCI Advanced episodes only if the hospital where the inpatient stay or procedure took place had sufficient baseline volume in that clinical episode (at least 41 episodes).

Source: Centers for Medicare & Medicaid Services (2019, June). Application Process: Frequently Asked Questions (FAQ) – Update June 2019. Retrieved from https://innovation.cms.gov/Files/x/bpciadvanced-my3-app-faqs.pdf.; Centers for Medicare & Medicaid Services (2019, September). General Frequently Asked Questions (FAQ) – Update September 2019. Retrieved from https://innovation.cms.gov/files/x/bpciadvanced-general-faq.pdf.; Centers for Medicare & Medicaid Services (2020, January 1). Notice of Amended Waivers of Certain Fraud and Abuse Laws in Connection with the Bundled Payments for Care Improvement Advanced Model. Retrieved from https://www.cms.gov/files/document/notice-amended-waivers-certain-fraud-and-abuse-laws-connection-bundled-payments-care-improvement.pdf.

B. Research Questions

This annual report provides an early evaluation of the BPCI Advanced Model since its beginning on October 1, 2018, through January 1, 2020.[15] We describe the reach of the model; the BPCI Advanced participants and EIs; their participation decisions, including their choices of clinical episodes; the impact of the model on episode payments, utilization, and quality of care for Medicare beneficiaries; and Medicare savings. Four major research questions provided the framework for our analytic approach.

[15] Note that some analyses in this evaluation report do not incorporate data through January 1, 2020 because data were not available.

Research Questions

- What is the reach of BPCI Advanced?
- What are the characteristics of BPCI Advanced and the providers and organizations that chose to participate in the model?
- What were the participation decisions and how were they made?
- What is the impact of BPCI Advanced on episode payments, utilization, and quality of care for Medicare beneficiaries?

1. What is the reach of BPCI Advanced?

We evaluated the BPCI Advanced Model's potential influence or "reach" by examining the proportion of eligible hospitals and clinicians that ever participated in the model and the proportion of eligible discharges and procedures at participating hospitals or by participating PGPs. We relied on the CMS BPCI Advanced database to identify BPCI Advanced hospital and PGP EIs and the clinical episodes in which they participated, the CMS Provider of Services (POS) and Inpatient Prospective Payment System (IPPS) files to identify all eligible hospitals, and Medicare FFS claims to identify eligible clinicians, discharges, and procedures.

2. What are the characteristics of BPCI Advanced and the providers and organizations that chose to participate in the model?

To understand the organizations and providers that participate in BPCI Advanced, we compiled information on the number and type of BPCI Advanced participants, EIs, and non-participating providers, as well as the characteristics of the EIs' health care markets. We relied on data from multiple sources including the CMS BPCI Advanced and BPCI databases, Medicare claims, POS files, Area Health Resource Files (AHRF), and other secondary sources.

3. What were the participation decisions and how were they made?

We used mixed methods to understand model participation decisions and how they were made. Qualitative data collected from site visits and telephone interviews with BPCI Advanced conveners and EIs provided insights into why and how providers and organizations participated in BPCI Advanced. In particular, we evaluated reasons for joining BPCI Advanced, selection of clinical episodes, approaches to care redesign and NPRA sharing, and clinicians' and Medicare beneficiaries' awareness of the model. We complemented the qualitative information with an analysis of data from the CMS BPCI Advanced database to identify patterns in clinical episode selection across all hospital and PGP EIs.

4. What is the impact of BPCI Advanced on episode payments, utilization, and quality of care for Medicare beneficiaries?

We estimated the impact of BPCI Advanced on episode payments, utilization of services, and quality of care for Medicare beneficiaries. Medicare claims and enrollment data were used to construct clinical episodes for patients attributed to BPCI Advanced participating EIs (BPCI Advanced population) and matched comparison providers. We conducted a beneficiary survey to explore differences in patient care experiences and functional outcomes between Medicare beneficiaries cared for by BPCI Advanced providers and similar beneficiaries whose providers did not participate in BPCI Advanced.

We also estimated Medicare program savings due to BPCI Advanced for selected clinical episodes, based on the estimated changes in Medicare FFS episode payments adjusted by reconciliation payments made to or received from model participants.

C. Data Sources and Outcomes

This evaluation relied on multiple secondary and primary data sources to construct samples, determine outcomes, and supplement the quantitative results with qualitative insights. We used provider-level data sources, including the CMS BPCI Advanced database, POS files, and Medicare Provider Enrollment, Chain, and Ownership System (PECOS) to identify and describe BPCI Advanced participant providers and select comparison providers. Medicare claims and enrollment data were used to construct clinical episodes for beneficiaries at BPCI Advanced-participating sites and at matched comparison providers. We also used claims and patient assessment data to create outcome measures and beneficiary risk factors associated with the outcomes.

We also collected primary data for this evaluation. We conducted one wave of a beneficiary survey to explore differences in patient care experiences and functional outcomes between Medicare beneficiaries cared for by BPCI Advanced providers and similar beneficiaries whose providers did not participate in BPCI Advanced. We conducted 11 site visits with BPCI Advanced providers; led 45 telephone interviews with key leaders of BPCI Advanced participants and EIs; and organized two clinical expert network meetings. See **Appendix C** for more information on our secondary and primary data sources.

II. Results

A. BPCI Advanced Reach

To understand the breadth of BPCI Advanced participation, we calculated the proportion of eligible hospitals and the unique count of PGPs that ever participated in the model during Model Years 1, 2, or 3. We also evaluated how many hospital discharges and outpatient procedures were attributed to model participants during Model Years 1 and 2, as well as the number of clinicians who generated these discharges and outpatient procedures (data for Model Year 3 were not available). For further details of our methodology, see **Appendix C.**

1. Key Findings

The Reach of BPCI Advanced

- In Model Years 1, 2, and 3, 33% of eligible hospitals participated in the model; a total of 1,166 PGPs participated in the model.
- Approximately 23% of BPCI Advanced eligible discharges and outpatient procedures were at a BPCI Advanced hospital EI or were attributed to a BPCI Advanced PGP EI during Model Years 1 and 2.
- During Model Years 1 and 2, 24% of eligible clinicians participated in the model.

2. Hospitals and PGPs

Hospital participation in BPCI Advanced has grown. During the first three Model Years, 1,084 (33%) eligible hospitals participated in at least one clinical episode in BPCI Advanced.[16] The proportion of eligible hospitals that ever participated in the model during Model Years 1, 2, or 3 increased 11 percentage points (pp) relative to hospital participation in Model Years 1 and 2 (Exhibit 5). The reach among rural and safety net hospitals also expanded. Approximately 15% of eligible rural hospitals and 26% of eligible safety net hospitals participated in BPCI Advanced during Model Years 1, 2, or 3, which were increases of 6 pp and 5 pp respectively compared to Model Years 1 and 2.

Participant Definitions

- Eligible hospitals that ever participated in at least one clinical episode during Model Years 1, 2, or 3.
- Unique PGPs that ever participated in at least one clinical episode during Model Years 1, 2, or 3.

[16] Eligible hospitals met BPCI Advanced inclusion criteria, except for the clinical episode volume criterion (for more detail see **Appendix C**). Hospitals were limited to those that were eligible for BPCI Advanced in Model Year 3.

Exhibit 5: Cumulative Participation in BPCI Advanced Among Eligible Hospitals, Model Years 1, 2 or 3

Hospital Type	BPCI Advanced Eligible Hospitals[a]	BPCI Advanced Hospital EIs Model Years 1 and 2		BPCI Advanced Hospital EIs Model Years 1, 2, or 3	
		N	%	N	%
All Hospitals	3,248	715	22%	1,084	33%
Rural Hospitals	763	70	9%	116	15%
Safety Net Hospitals	225	48	21%	58	26%

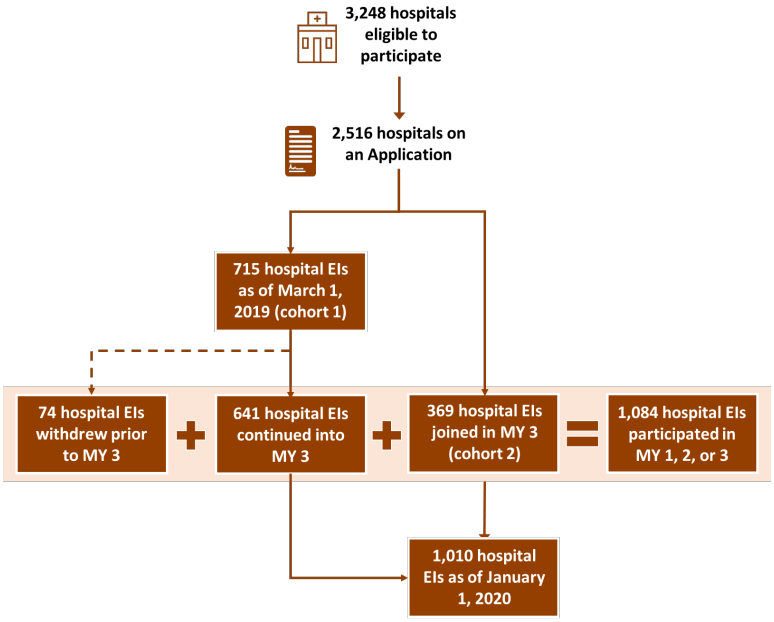
Note: Safety net hospitals are those with a disproportionate share of 60% or greater as of the 2017 IPPS file. Eligible hospitals met BPCI Advanced inclusion criteria, except for the clinical episode volume criterion (**Appendix C**). Hospitals are limited to those that were eligible for BPCI Advanced in Model Year 3. EIs = episode initiators.

[a] The number of BPCI Advanced eligible hospitals as of January 1, 2020.

Source: The BPCI Advanced evaluation team's analysis of 2013-2019 Provider of Service File, 2017 Inpatient Prospective Payment System Annual File, and CMS BPCI Advanced Database as of January 1, 2020

Among the 3,248 hospitals eligible to participate in BPCI Advanced as of January 1, 2020, 2,516, or 77%, were listed on one or more participant applications across the two application periods (Exhibit 6).[17] As of January 1, 2020, 1,010 hospital EIs participated in the model, comprised of 641 hospital EIs in the first cohort and 369 hospital EIs in the second cohort. Among first cohort participants, 74 (10%) hospital EIs withdrew from BPCI Advanced prior to the beginning of Model Year 3.

Exhibit 6: BPCI Advanced-Eligible Hospitals, Hospital Applicants, and Hospital EIs, Model Years 1, 2 and 3



Note: Eligible hospitals were defined as Inpatient Prospective Payment System (IPPS) hospitals in 2019 that existed for at least one year during the baseline period (2013 – 2017) and did not meet any of the following exclusion criteria: PPS-exempt cancer hospitals, located in Maryland, participating in the Pennsylvania Rural Health Model, participating in the Rural Community Health

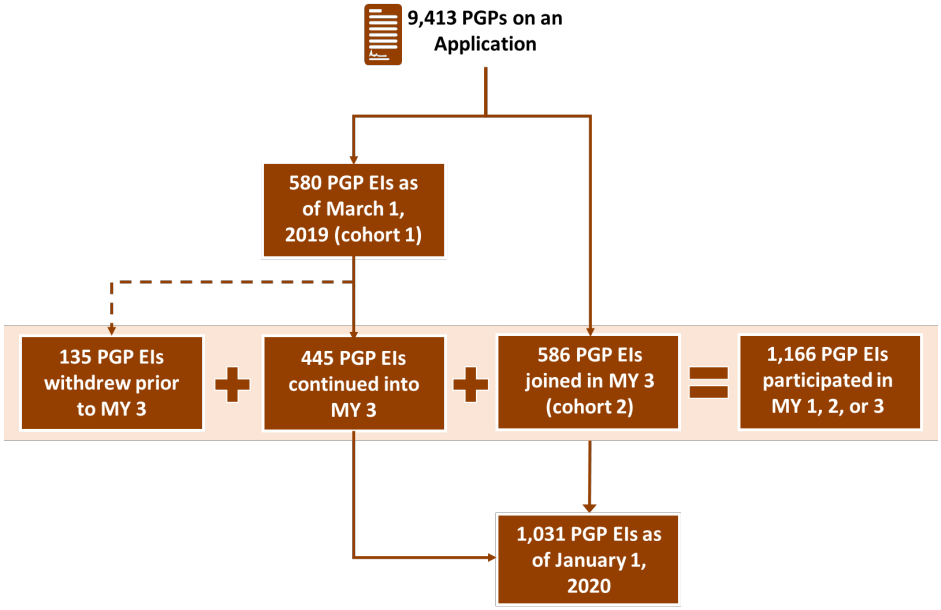
[17] EIs could be listed on more than one application but could only participate in BPCI Advanced under one participation agreement with CMS.

Demonstration, inpatient psychiatric hospitals, and critical access hospitals. In addition, hospitals had to have a minimum volume of discharges or procedures to be eligible for a given clinical episode, however, we did not apply the minimum volume criterion for this analysis so the participating hospitals as a proportion of eligible hospitals is somewhat overstated; EIs = episode initiators; MY = model year.

Source: The BPCI Advanced evaluation team's analysis of the CMS Provider of Service (POS) files from 2013 to 2017, the 2019 IPPS file, and the CMS BPCI Advanced Database as of January 1, 2020.

A total of 1,166 PGPs participated in at least one clinical episode during Model Years 1, 2, or 3. Applicants listed 9,413 unique PGPs on their BPCI Advanced applications across the two application periods (Exhibit 7).[18] As of January 1, 2020, 1,031 PGP EIs participated in the model, comprised of 445 PGP EIs in the first cohort and 586 PGP EIs in the second cohort. Among first cohort PGP EIs, 135 (23%) withdrew from BPCI Advanced prior to the beginning of Model Year 3.

Exhibit 7: BPCI Advanced PGP Applicants and PGP EIs, Model Years 1, 2, or 3



Note: EIs = episode initiators; PGP = physician group practice; MY = model year.

Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Advanced Database as of January 1, 2020.

3. Inpatient Discharges and Outpatient Procedures

Inpatient Discharges and Outpatient Procedures Definition

Eligible hospital discharges and outpatient procedures attributed to a BPCI Advanced hospital EI or PGP EI during Model Years 1 and 2.

During Model Years 1 and 2, approximately 14% of BPCI Advanced eligible Medicare FFS inpatient discharges and outpatient procedures occurred at a BPCI Advanced hospital EI and an additional 9% were attributed to a PGP EI that was participating in the given clinical episode (Exhibit 8). For hospital EIs, the proportion of eligible discharges and procedures ranged from 2% for double joint replacement of the lower extremity to 26% for sepsis. For PGP EIs, the proportion

[18] EIs could be listed on more than one application, but could only participate in BPCI Advanced under one participation agreement with CMS.

of eligible discharges and procedures ranged from 1% for major bowel procedure and for cardiac valve to 28% for MJRLE. (See **Appendix D** for proportion by clinical episode.)[19]

Exhibit 8: Proportion of Eligible Discharges and Procedures Attributed to BPCI Advanced Hospital and PGP EIs by Clinical Episode Type, October 1, 2018 – August 3, 2019

Type of Clinical Episode	Discharges/ Procedures at BPCI Advanced Eligible Hospitals	Attributed to BPCI Advanced Hospital EIs		Attributed to BPCI Advanced PGP EIs	
		N	%	N	%
Inpatient Episodes	3,266,401	469,108	14%	314,939	10%
Outpatient Episodes	186,843	12,990	7%	7,908	4%
All Episodes	3,453,244	482,098	14%	322,847	9%

Note: Eligible discharges and procedures map to Medicare Severity-Diagnosis Related Groups or Healthcare Common Procedure Coding System codes for one of the 29 inpatient or three outpatient clinical episodes in BPCI Advanced in Model Years 1 and 2 and were for Medicare beneficiaries who met the BPCI Advanced beneficiary inclusion criteria at a BPCI Advanced eligible hospital. Minimum hospital volume in the baseline period was not applied. See **Appendix C** for additional details on inclusion criteria. After accounting for the overlap of PGP discharges at BPCI Advanced hospitals, BPCI Advanced represents 23% of eligible discharges. EIs = episode initiators; PGP = physician group practice.

Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

4. Clinicians

Participating Clinician Definition

Eligible attending or operating clinicians at BPCI Advanced hospitals or part of a BPCI Advanced PGP EI in Model Years 1 and 2.

Approximately one-quarter of clinicians with eligible episodes were involved in BPCI Advanced either because they were the attending or operating clinician billing to the PGP EI or they were the attending or operating clinician at the hospital EI for a hospital-attributed episode (Exhibit 9).[20] The proportion varied by clinical episode, from 1% for cardiac defibrillator procedures to 21% for congestive heart failure discharges (see **Appendix D**).[21]

[19] Note that the proportions cannot be combined because some PGP-attributed episodes were initiated at BPCI Advanced hospitals.

[20] We only included discharges or procedures in which the BPCI Advanced hospital or PGP EIs were participating.

[21] The proportion of clinicians that participated in a given clinical episode is lower than the proportion of clinicians that participated in any clinical episode because the latter is the sum of unique clinicians participating across all clinical episodes over the sum of unique clinicians that were eligible across all clinical episodes.

Exhibit 9: Proportion of Clinicians with Eligible Episodes Ever Participating in BPCI Advanced by Inpatient, Outpatient, and All Clinical Episodes, October 1, 2018 – August 3, 2019

Episode Type	Number of Attending/ Operating Clinicians	Clinicians Who Participated in BPCI Advanced	
		N	%
Eligible Inpatient Episodes	237,731	56,800	24%
Eligible Outpatient Episodes	26,515	1,593	6%
All Eligible Episodes	239,229	57,190	24%

Note: Eligible episodes include discharges and procedures that map to Medicare Severity-Diagnosis Related Groups or Healthcare Common Procedure Coding System codes for one of the 29 inpatient or three outpatient episodes in BPCI Advanced in Model Years 1 and 2. The number of attending or operating clinicians is a unique count of clinicians who treated Medicare beneficiaries who met the BPCI Advanced beneficiary inclusion criteria at a BPCI Advanced eligible hospital. Minimum hospital volume in the target price baseline period was not applied. The sum of attending/operating clinicians for eligible inpatient and outpatient episodes does not equal the number of attending/operating clinicians for all eligible episodes because the latter is a unique count across all clinical episodes and counts clinicians with eligible inpatient and outpatient episodes only once.

Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

B. BPCI Advanced Participants and Episode Initiators

To understand the types of providers and organizations that were participating in the model, we examined characteristics of participants and EIs during the target price baseline period and Model Years 1 through 3. The following analyses focus on participants and EIs that were participating in the model as of January 1, 2020.

1. Key Findings

BPCI Advanced Participants and EIs

- As of January 1, 2020, 694 convener and non-convener participants that represented 1,010 hospital EIs and 1,031 PGP EIs partcipated in BPCI Advanced. Over 35% of EIs were participating as downstream EIs under one of the five largest conveners.
- BPCI Advanced hospital EIs were larger and more likely to be located in urban and more competitive markets than hospitals that did not participate.
- Nearly half of BPCI Advanced PGPs were operating under TINs that did not exist in the baseline period.

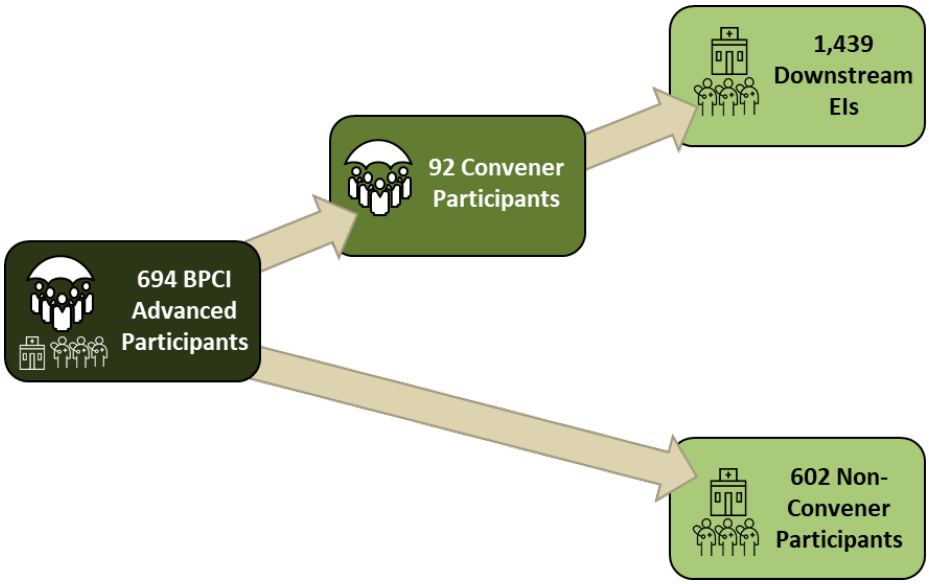
2. Convener and Non-convener Participants

As of January 1, 2020, there were 694 participants in BPCI Advanced. In Model Year 3, 92 conveners and 602 non-convener participants participated in the model (Exhibit 10).[22] There were 1,010 hospital and 1,031 PGP EIs. Over 70%, or 1,439, of EIs in Model Year 3 participated as downstream EIs under one of the 92 conveners. Over a third of the conveners (32 of the 92) were in the second cohort. The five largest conveners, based on number of EIs, accounted for 35% of all EIs. Non-convener participants in Model Year 3 comprised 183 hospital EIs and 419 PGP EIs.

An In-depth Look: Notable Changes between Model Years 1 and 2 and Model Year 3

- The number of unique participants increased from 334 to 694. The increase was driven by an influx of non-convener participants. In particular, the number of non-convener PGPs more than tripled.
- The proportion of participating hospitals and PGPs that were downstream EIs under a convener declined 10 pp (81% to 71%).
- The top five conveners were less dominant; the proportion of EIs that were participating under one of the five largest conveners declined from 41% to 35%.

Exhibit 10: BPCI Advanced Participants by Participant Type, Model Year 3



Note: The count of BPCI Advanced participants refers to the number of unique entities participating as a convener or non-convener participant, meaning conveners with more than one signed participation agreement with CMS were counted only one time. In total, 1,707 participation agreements were signed with CMS as of January 1, 2020. There were four episode-initiating conveners that were included in the count of downstream EIs. EIs = episode initiators.

Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Advanced Database for all participants in BPCI Advanced as of January 1, 2020.

Among downstream EIs, most participated under one of the 14 non-provider conveners (Exhibit 11). A large share of the remaining downstream hospital EIs participated under conveners that were health systems, whereas the remaining downstream PGP EIs were more likely to participate under conveners that were PGPs or health plans.

[22] This count refers to the number of unique entities that are participating as a convener or non-convener participant in BPCI Advanced. In total, 1,707 participation agreements were signed with CMS as of January 1, 2020, which indicates that many entities participated in BPCI Advanced under multiple agreements.

Exhibit 11: BPCI Advanced Participants and EIs by Convener Type, Model Year 3

Participant Type	Convener Type	Number of Participants	Percent of BPCI Advanced EIs (N = 2,041)	Percent of BPCI Advanced Hospital EIs (N = 1,010)	Percent of BPCI Advanced PGP EIs (N = 1,031)
Conveners	Non-provider	14	38%	38%	37%
	Health Care System	26	10%	19%	0%
	Integrated Delivery Health System	9	5%	9%	1%
	Physician Group Practice	5	4%	0%	7%
	Health Plan	3	4%	0%	7%
	Accountable Care Organization	12	4%	7%	0%
	Acute Care Hospital	12	3%	3%	3%
	Clinically Integrated Network	6	2%	4%	1%
	Management Services Organization	5	1%	1%	2%
Non-conveners	Non-convener	602	29%	18%	41%

Note BPCI Advanced conveners were categorized into one of the nine convener types based on information in their model application. Integrated delivery health system: a network of health care facilities under a parent holding company. Management services organization: an organization that provides specific services, such as claims administration, project management, provider relations, or data analysis, to a health system. Non-provider: an entity that does not furnish Medicare services. EIs = episode initiators; PGP = physician group practice.

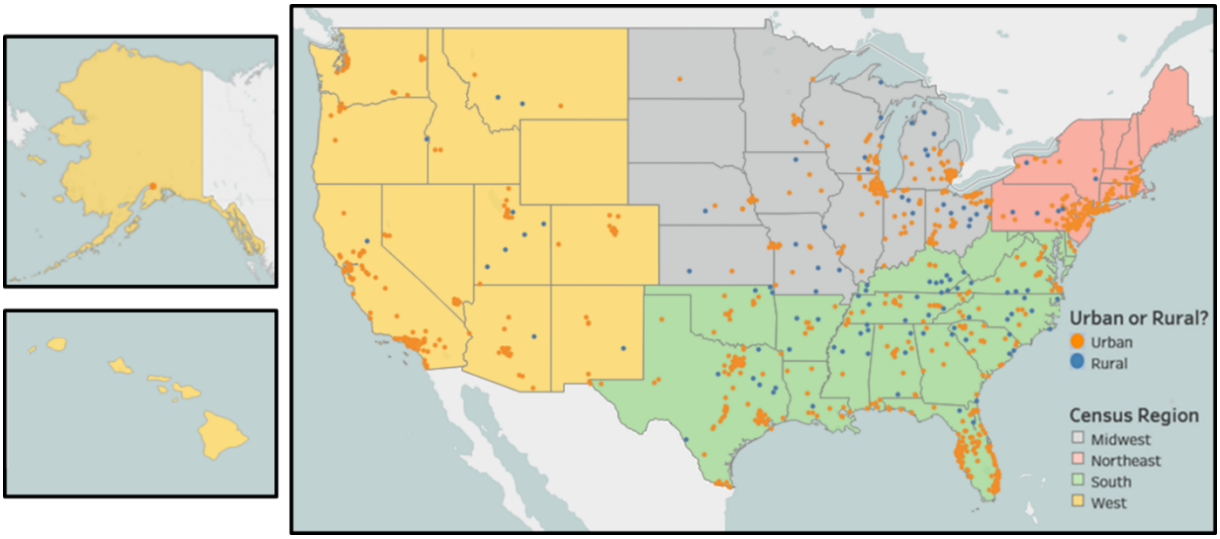
Source: The BPCI Advanced evaluation team's analysis of the CMS BPCI Advanced Database, January, 1, 2020.

3. Episode Initiators: Hospitals and Physician Group Practices

a. Participating Hospitals

As of January 1, 2020, there were 1,010 hospital EIs participating in the model. Hospital EIs were dispersed across and within the four census regions, although they tended to cluster in the most populated areas and 40% were located in the South (Exhibit 12).

Exhibit 12: Urban and Rural Hospital Participating in BPCI Advanced by Census Regions, Model Year 3



Source: The BPCI Advanced evaluation team's analysis of the 2019 Provider of Service (POS) file and the CMS BPCI Advanced Database as of January 1, 2020.

BPCI Advanced EIs differed from non-participating hospitals across hospital and market characteristics (Exhibits 13a and 13b). Compared to non-participating hospitals, BPCI Advanced EIs were more likely to be non-profit (69% vs. 56%) and larger, as reflected in a higher bed count (324 vs. 204). Additionally, participating EIs had more discharges and procedures for the BPCI Advanced clinical episode MS-DRGs (2,223 vs. 1,228) and HCPCS codes (113 vs. 59). BPCI Advanced hospitals were also more likely to be part of a health system (95% vs. 67%) and be located in an urban area (89% vs. 71%). BPCI Advanced EIs were located in markets with larger populations (3,725,432 vs. 2,534,358) and greater market competition, as indicated by the Herfindahl index (0.23 vs. 0.36). Compared to non-participating hospitals, BPCI Advanced hospital EIs were also more likely to have participated in BPCI (27% vs. 7%) and have experience in the Medicare Shared Savings Program (MSSP), Next Generation (Next Gen) Accountable Care Organization (ACO) Model, or Pioneer ACO Model.

An In-depth Look: Comparing BPCI Advanced Hospital EIs in the First and Second Cohorts

BPCI Advanced hospital EIs looked more similar to non-participating hospitals in Model Year 3 because of the influx of hospitals that joined the model. To understand if there were differences between the first and second cohorts of hospital EIs, we compared the characteristics of hospitals in the two groups. In general, compared to the first cohort, hospital EIs in the second cohort were:

- More likely to be in the South census region
- Less likely to be for-profit or part of a health system
- Smaller, as indicated by a lower bed count and fewer discharges and procedures for the BPCI Advanced clinical episode MS-DRGs and HCPCS codes
- Located in markets with smaller populations, with less market competition

For detailed results, see **Appendix E.**

BPCI Advanced hospital EIs and non-participating hospitals were similar with respect to census region, disproportionate share percentage (29% vs. 28%), and Medicare Advantage (MA) penetration (32% vs. 31%).

Exhibit 13a: Characteristics of BPCI Advanced Hospital EIs and Non-participating Hospitals, Model Year 3

Domain	Characteristic	BPCI Advanced Hospital EIs (N = 1,010)	BPCI Advanced Hospital EIs (%)	Non-participating Hospitals (N = 2,238)	Non-participating Hospitals (%)
Census Region***	Midwest	245	24%	499	22%
	Northeast	151	15%	337	15%
	South	408	40%	939	42%
	West	206	20%	413	18%
	Puerto Rico	0	0%	50	2%
Urban/Rural***	Urban	902	89%	1,583	71%
	Rural	108	11%	655	29%
Ownership***	For Profit	256	25%	529	24%
	Government	62	6%	448	20%
	Non-profit	692	69%	1,261	56%
Academic Medical Center**	Yes	54	5%	78	3%
Part of Health System***	Yes	957	95%	1,498	67%
Experience in BPCI Initiative***	Yes	269	27%	167	7%
Participation in MSSP, Next Gen, or Pioneer ACO Initiatives***	Yes	87	9%	134	6%

Note: Appendix E includes the test statistic and p-value for each chi-squared test. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and variable definitions. Values for categorical variables are for the 2017. If data for 2017 was not available, we used the most recent available data between 2013 and 2016. Market characteristics are calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. ACO = Accountable Care Organization; EIs = episode initiators; MSSP = Medicare Shared Savings Program.

** Indicates significance at the 5% level for the chi-squared test of difference in proportions.

*** Indicates significance at the 1% level for the chi-squared test of difference in proportions.

***Source*:** The BPCI Advanced evaluation team's analysis of the 2017 Agency for Healthcare Research and Quality (AHRQ) Hospital Linkage File, Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, 2019 CMS Inpatient Prospective Payment System (IPPS) file, 2020 Master Data Management (MDM) provider file, CMS BPCI Database, and the CMS BPCI Advanced Database as of January 1, 2020.

Exhibit 13b: Characteristics of BPCI Advanced Hospital EIs and Non-participating Hospitals, Model Year 3

Characteristic	BPCI Advanced Hospital EIs (mean)	Non-participating Hospitals (mean)
Bed Count***	324	204
Resident to Bed Ratio***	0.08	0.06
Medicare Days Percent***	40%	46%
Disproportionate Share Percent	29%	28%
Total Discharges for BPCI Advanced MS-DRGs***	2,223	1,228

Characteristic	BPCI Advanced Hospital EIs (mean)	Non-participating Hospitals (mean)
Total Procedures for BPCI Advanced HCPCS Codes* **	113	59
Market Population* **	3,725,432	2,534,358
Per Capita Personal Income* **	$46,417	$44,762
SNF Beds per 10,000* **	51	56
Medicare Advantage Penetration **	32%	31%
Hospital Market Share for BPCI Advanced MS-DRGs & HCPCS Codes* **	21%	27%
Herfindahl Index* **	0.23	0.36

Note: Data from 1,010 BPCI Advanced hospital EIs and 2,238 non-participating hospitals. **Appendix E** shows the test statistic and p-value for each t-test. **Appendix C** contains the BPCI Advanced hospital eligibility criteria and variable definitions. **Appendix B** contains the MS-DRGs and HCPCS codes that trigger each BPCI Advanced clinical episode. Values for numeric variables were averaged for all years between 2013 and 2017 that data were available. Market characteristics are calculated for the Core-Based Statistical Area (CBSA) in which the hospital is located. EIs = episode initiators; HCPCS = Healthcare Common Procedure Coding System; MS-DRGs = Medicare Severity-Diagnosis Related Groups; SNF = skilled nursing facility.

**Indicates significance at the 5% level for the pooled t-test of difference in means

*** Indicates significance at the 1% level for the pooled t-test of difference in means

Source: The BPCI Advanced evaluation team's analysis of the Area Health Resource File (AHRF) from 2013 to 2017, CMS Provider of Service (POS) files from 2013 to 2017, CMS Inpatient Prospective Payment System (IPPS) files from 2013 to 2019, 2017 Inpatient Quality Reporting (IQR) Measures, Part A Medicare claims from 2013 to 2017, and the CMS BPCI Advanced Database as of January 1, 2020.

We also compared the hospital and market characteristics of BPCI Advanced hospital EIs, BPCI hospital EIs, and all eligible hospitals. Compared to BPCI hospitals, BPCI Advanced hospitals more closely resembled all eligible hospitals on 15 of the 19 characteristics we examined. For more detail, see **Appendix E**.

An In-depth Look: Notable Changes in Participating PGPs between Model Years 1 & 2 and Model Year 3

- The proportion of PGP EIs that did not exist in the target price baseline increased from 28% to 47%
- Compared to Model Years 1 and 2, PGPs participating in Model Year 3 were smaller, as indicated by lower median number of:
  - Unique clinicians associated with the TIN
  - Annual discharges and procedures for BPCI Advanced clinical episodes
  - Hospitals where the PGP EIs had discharges or procedures for the BPCI Advanced clinical episodes

b. Participating PGPs

The ability to track the PGPs, which are identified by a unique Tax Identification Number (TIN), that are participating in BPCI Advanced as EIs is complicated by several factors. First, PGPs can apply for and receive a new TIN at any time. Second, clinicians can submit Medicare claims through any TIN to which they have reassigned their Medicare billing rights. Further, clinicians associated with multiple TINs may submit Medicare claims for anchor stays or procedures to a TIN that was in BPCI Advanced or one that was not, which would determine whether or not that beneficiary would be in a BPCI Advanced episode. As a result, the clinician composition of the BPCI Advanced participating PGPs can be quite fluid. The characteristics of the BPCI Advanced PGP EIs presented here are based on the TINs to which the clinicians billed for BPCI Advanced episodes.

Many BPCI Advanced PGPs were not in existence during the target price baseline period.[23] Of the 1,031 PGPs participating in BPCI Advanced as of January 1, 2020, 47% of the TINs did not exist in the target price baseline period. The majority of the PGPs with no target price baseline data (341 of the 486) joined BPCI Advanced in the second cohort. The results presented here reflect the characteristics of the PGPs that existed during the baseline and billed services during the intervention period. Therefore, the results may not be representative of the characteristics of BPCI Advanced PGP EIs.

To better understand the make-up of BPCI Advanced PGPs, we evaluated the billing patterns of the participating clinicians in Model Years 1 and 2. In 373 of 1,031 BPCI Advanced PGPs, none of the clinicians submitted claims for any Medicare services through the PGP's TIN during Model Years 1 and 2.[24] The unique count of BPCI Advanced PGPs, therefore, overstates the number of PGPs actively participating in the model. In addition, more than one-third of clinicians participating in BPCI Advanced submitted claims for episodes under non-participating PGP TINs as well as under participating PGP TINs (Exhibit 14).

We examined billing patterns of clinicians based on the universe of hospital discharges and outpatient procedures that met BPCI Advanced inclusion criteria. There were 580 PGP EIs participating in Model Years 1 and 2, but only 500 PGP EIs had attributed episodes. More than 80% of the 500 PGP EIs included clinicians billing to both a BPCI Advanced PGP and non-BPCI Advanced PGP for the same clinical episode. At the clinician level, 37% of the 10,677 clinicians billed to both BPCI Advanced and non-participating PGPs for the same clinical episode.[25] This means that a given anchor stay or procedure triggered a BPCI Advanced episode depending on whether or not the clinician submitted the Medicare claim through the TIN associated with a BPCI Advanced participating PGP or another TIN that was not associated with BPCI Advanced.

Exhibit 14: PGP Billing Patterns among BPCI Advanced Clinicians in the First Cohort, October 1, 2018 – August 3, 2019

	Total	Clinicians that Billed to BPCI Advanced and Non-BPCI Advanced PGPs	
		N	%
PGP EIs with episodes	500	405	81%
Clinicians with attributed episodes	10,677	3,975	37%

Note: There were 580 PGP EIs in Model Years 1 and 2, but only 500 had attributed hospital discharges or outpatient procedures between October 1, 2018 and October 3, 2019. Episodes are hospital discharges or outpatient procedures that meet BPCI Advanced episode inclusion criteria, but had not yet been attributed to an EI. PGP = physician group practice; EIs = episode initiators.

Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

[23] The target price baseline period for Model Years 1 and 2 was January 1, 2013-December 31, 2016. The target price baseline period for Model Year 3 was October 1, 2014-September 30, 2018.

[24] Data for Model Year 3 were not available. Therefore, this analysis includes hospital discharges and outpatient procedures with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019.

[25] A clinician was considered to be participating in BPCI Advanced if the clinician had at least one BPCI Advanced PGP episode.

To provide some context about participating PGPs, we compared characteristics of PGPs that participated in BPCI Advanced with those that participated in BPCI. BPCI Advanced PGPs were smaller than BPCI PGPs, as measured by median number of clinicians and volume of discharges associated with inpatient clinical episode MS-DRGs. Conversely, BPCI Advanced PGPs had a higher volume of procedures associated with outpatient clinical episode HCPCS codes. The distribution of clinician specialties differed between BPCI Advanced and BPCI PGPs, with BPCI Advanced PGPs including more clinicians with surgical specialties than BPCI PGPs and fewer clinicians specializing in primary care. For more detail, see **Appendix E**.

C. BPCI Advanced Participation Decisions

We used a mixed methods approach to understand model participation decisions and how they were made. We conducted key informant interviews and site visits to learn about the reasons conveners and EIs participated in BPCI Advanced, how they selected clinical episodes, their approaches to care redesign, and clinicians' and Medicare beneficiaries' awareness of the model. We also conducted descriptive quantitative analyses to summarize clinical episode selection across EIs. The qualitative findings that were presented in the first annual report are described as "insights reported previously."[26] See **Appendix C** for additional details on samples, interview topics, and analysis methodology.

[26] Dummit L, et al. (June 2020). CMS Bundled Payments for Care Improvement Advanced Model: Year 1 Evaluation Annual Report. https://innovation.cms.gov/data-and-reports/2020/bpciadvanced-firstannevalrpt

1. Key Findings

BPCI Advanced Participation Decisions Key Findings

- On average, hospital EIs participated in five clinical episodes and PGP EIs participated in eight clinical episodes. In Model Year 3, medical clinical episodes were more frequently selected than surgical clinical episodes for both hospital and PGP EIs.
- EIs and conveners joined BPCI Advanced to achieve financial gains and drive care transformation. Many wanted to build on past success in other initiatives, or gain experience that could be applicable to future initiatives.
- Many EIs relied on conveners to analyze data, monitor performance, or manage the administrative requirements of participation. These EIs often felt they could not be successful in the model without a convener. Many health systems participating in the model served as conveners or played similar roles.
- Interviewees reported analyzing historical utilization patterns and patient volume to select clinical episodes. Some also considered the strength of their partnerships with post-acute care and other providers, or prior care redesign activities for specific clinical conditions.
- Among EIs engaged in NPRA sharing, the most common reason for doing so was to incentivize physician engagement. Other EIs chose not to implement NPRA sharing because they felt it was not necessary to drive care transformation or was overly burdensome.
- EIs typically focused their care redesign efforts on reducing hospital readmissions and post-acute care utilization. In addition, care redesign for planned surgical procedures often included pre-admission patient education and starting the discharge planning process prior to the procedure.
- Most EIs reported that even though many clinicians were aware of and generally engaged in care redesign activities related to BPCI Advanced, few would be able to describe the details of the model.

2. Entry Decisions

Findings Reported Previously: Entry Decision Insights

- Many EIs engaged conveners or consultants to aid in their decision to participate in BPCI Advanced. Some EIs indicated they would not have been able to join without the support of a convener.
- Conveners and EIs analyzed preliminary target prices, historical patient volume, and claims data to inform BPCI Advanced participation decisions. Some EIs expressed concern that their previous efficiencies contributed to lower target prices, making it difficult to achieve additional savings and succeed in the model.
- Some EIs also considered broader institutional factors such as their ongoing care redesign activities, partnerships with post-acute care providers, and physician engagement in their decision to participate in BPCI Advanced.
- For the majority of EIs interviewed, the fact that BPCI Advanced is an Advanced APM under the Quality Payment Program was not a factor in their decision to participate.
- Some organizations submitted multiple applications to understand the most advantageous way to participate in the model.

a. Joining the Model

EIs and conveners described joining BPCI Advanced to achieve financial success, understand their data to drive care transformation, and strengthen partnerships with physicians and hospitals. Interviewees also wanted to build on previous experiences with other Medicare initiatives (e.g., BPCI and Medicare ACOs) and commercial value-based payment contracts and gain experience that could be applied to future opportunities. Exhibit 15 summarizes the commonly cited reasons for joining the model.

Exhibit 15: Commonly Described Reasons to Join the BPCI Advanced Model

Achieve Financial Success

Understand Data

- EIs expected CMS data would inform care redesign and help them understand their performance relative to peers.
- The post-discharge period was descibed as a "black hole" for data before model participation.

Build on Past Experiences

- EIs developed provider relationships, established PAC networks, hired new staff, invested in electronic health records (EHRs), and redesigned patient care for other initiatives.

Strengthen Partnerships

Drive Care Transformation

Gain New Experience

- BPCI Advanced was viewed as a valuable learning experience that could be applied to other future Medicare initiatives, and contracts with commercial payers.

Source: The BPCI Advanced evaluation team's analysis of site visits and interviews, 2019-2020.

As in Model Years 1 and 2, PGPs in Model Year 3 created new TINs for participation in BPCI Advanced (see Participating PGPs section for additional details). An interviewee from a PGP EI that considered but decided not to create a new TIN for BPCI Advanced, described general advantages and challenges associated with establishing new TINs. One advantage included greater flexibility to enter or leave payer contracts as needed for business reasons. The interviewee indicated that operational complexity can be reduced when a contract is "all-in," that is, when all of the physicians billing under that TIN are by definition participating in the model. As a result, creating a new TIN specifically for that contract could decrease administrative

issues. The interviewee noted that challenges with creating new TINs included the administrative burden of updating existing contracts or creating new contracts and uncertainty about whether a TIN with no prior billing history could participate in BPCI Advanced (despite this being an allowable practice per model rules).

b. Conveners and Consultants

Findings Reported Previously: Convener and Consultant Insights

- Conveners used historical patient volume, PAC utilization, and CMS target prices to identify potential EIs with which to partner.
- When selecting a convener, EIs typically considered conveners' data analysis capabilities, relationship with CMS, and ability to manage post-acute care.
- Some EIs engaged consultants to support data analytics in BPCI Advanced: at times this was in addition to working with a convener.

The majority of EIs participated in BPCI Advanced with a convener (see Convener and Non-convener Participants section). Many EIs that participated with a convener felt that they would not be successful without one. EIs told us they relied on their conveners to analyze data, monitor performance, and manage the administrative requirements of model participation. Some also relied on conveners for case management services or to manage post-acute care (PAC) networks. Most conveners we interviewed also offered EIs specific clinical tools to support care coordination, such as tools that predict the most appropriate discharge destination or assess readmission risk. A small number of conveners we interviewed formed preferred PAC provider networks on behalf of EIs and actively monitored patients in the post-discharge period.

Many health systems served as conveners, or played a similar role, by providing data analysis and administrative functions, and supporting care redesign activities. Often health system leaders made BPCI Advanced entry decisions on behalf of the hospitals or PGPs in their system. For example, one interviewee from a large national health system described analyzing market characteristics and the ongoing care redesign activities of hospitals across their system when determining which hospitals would participate in BPCI Advanced. In many health systems, care redesign strategies were implemented from the top down and the most successful changes were spread across the health system's EIs.

> *"We had resources already in place and it would have been great to [have the convener] augment those resources, but . . . the amounts they were charging and looking to share was not reasonable."*
>
> – BPCI Advanced PGP interviewee

Non-convener participant EIs said that they joined the model without a convener to build in-house capacity, with an eye towards future models. This was especially true for health systems with multiple hospitals participating in the model. Some non-convener participant EIs also cited cost as a reason for not partnering with a convener. A few EIs explained that after participating in BPCI with a convener, they had developed sufficient internal capabilities to be successful in BPCI Advanced without one.

Many EIs engaged consultants to support their work in BPCI Advanced, with or without the involvement of a convener. Most often, consultants provided analytic support and helped EIs interpret data on episode costs and utilization. For EIs partnering with both a convener and consultants, the relationships with consultants often pre-dated BPCI Advanced or consultants

provided analytic support on other initiatives in addition to BPCI Advanced. In some instances, EIs partnered with consultants that also served as conveners to other EIs participating in the model.

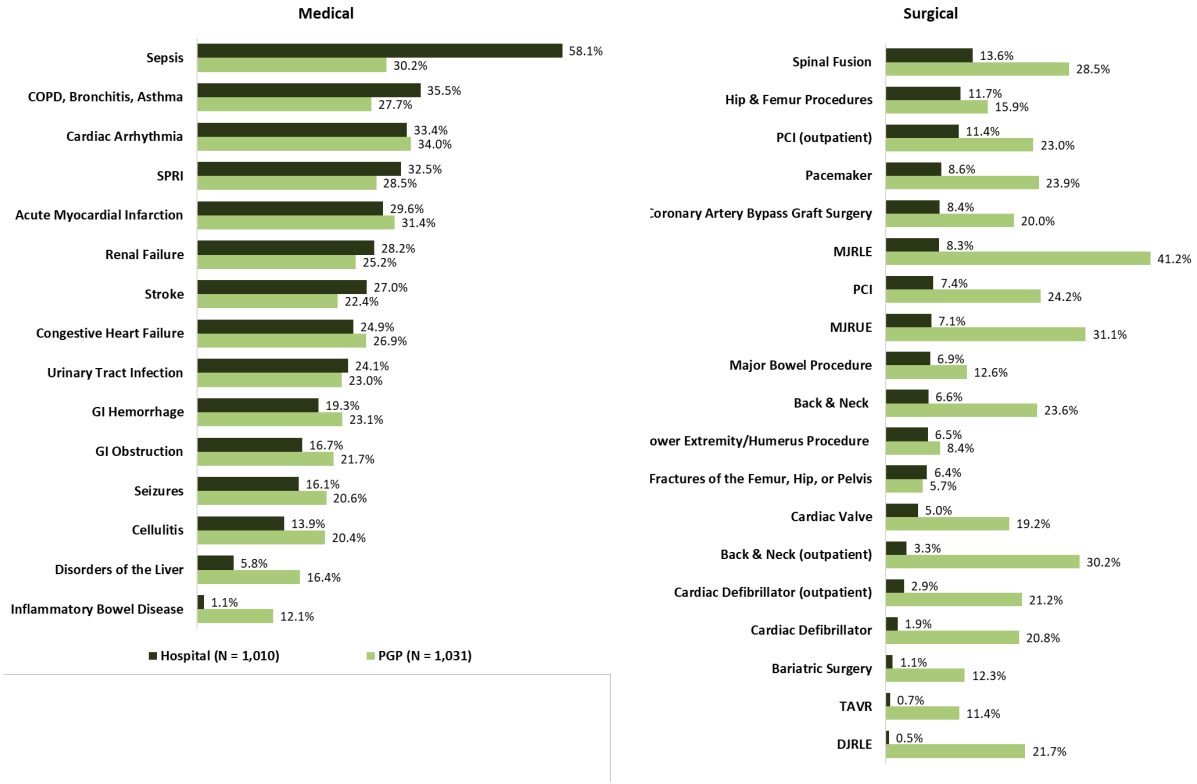
c. Clinical Episode Selection

Findings Reported Previously: Clinical Episode Selection Insights

- EIs and conveners analyzed preliminary target prices, historical patient volume, and claims data to select clinical episodes in which to participate.
- Some EIs also considered contextual factors such as pre-existing care redesign initiatives or the level of engagement of specific physician groups.
- In general, participants avoided episodes with low historical patient volume. Interviewees suggested that in a low volume episode, a single high-cost patient could disproportionately influence the average cost and reduce NPRA.

EIs in Model Year 3 were more likely to participate in medical clinical episodes than surgical ones (Exhibit 16).[27] PGP EIs were more likely than hospital EIs to participate in surgical clinical episodes. The majority of EIs selected few clinical episodes for participation and no EIs chose to participate in all 34 clinical episodes (Exhibit 17).

Exhibit 16: Medical and Surgical Clinical Episode Selections by EI Type, Model Year 3



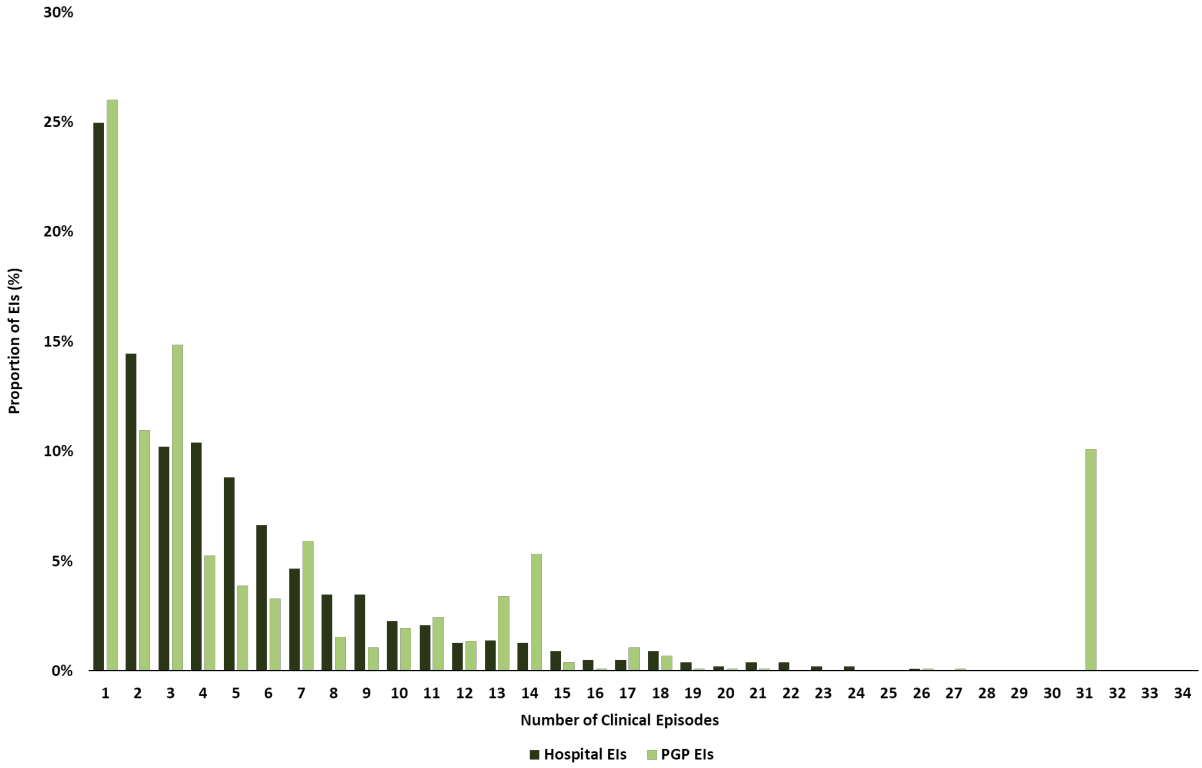
Note: Back & Neck = back & neck except spinal fusion; COPD = chronic obstructive pulmonary disease; Disorders of the Liver = disorders of liver except malignancy, cirrhosis, or alcoholic hepatitis; DJRLE = double joint replacement of the lower extremity; EIs = episode initiators; GI = gastrointestinal; Hip & Femur Procedures = hip & femur procedures except major joint; Lower

[27] We evaluated the proportion of EIs participating in each CE, and the average of that proportion across medical and surgical CEs. The numerator is the sum of EIs participating across CEs, and denominator is the total number of EI-CE combinations.

Extremity/Humerus Procedure = lower extremity and humerus procedure except hip, foot, femur; MJRLE = major joint replacement of the lower extremity; MJRUE = major joint replacement of the upper extremity; PCI = percutaneous coronary intervention; PGPs = physician group practices; SPRI = simple pneumonia and respiratory infections; TAVR = transcatheter aortic valve replacement.

Source: BPCI Advanced evaluation team's analysis of CMS BPCI Advanced Database, as of January 1, 2020.

Exhibit 17: Number of Clinical Episodes Selected by Proportion of BPCI Advanced Hospital and PGP EIs, Model Year 3



Note: EIs = episode initiators; PGP = physician group practice.

***Source*:** BPCI Advanced evaluation team's analysis of CMS BPCI Advanced Database, as of January 1, 2020.

On average, BPCI Advanced EIs participated in six clinical episodes. Approximately 25% of hospital EIs were participating in only one clinical episode and 60% were participating in fewer than five. Similarly, 26% of PGP EIs were participating in one clinical episode and 57% were participating in fewer than five. Model Year 3 was the last year new EIs could join the model, so participants may have strategically selected a few clinical episodes to have limited risk and retain the option to add clinical episodes in Model Year 4. This strategy was mentioned on a few site visits, including one to a hospital EI where interviewees said they viewed their clinical

The Most Popular Clinical Episodes in Model Year 3

For **hospital EIs** the most commonly selected clinical episodes were:

- Sepsis
- Chronic obstructive, pulmonary disease, bronchitis, and asthma
- Cardiac arrhythmia
- Simple pneumonia and respiratory infections
- Acute myocardial infarction

In contrast, for **PGP EIs**, the most commonly selected clinical episodes were:

- Major joint replacement of the lower extremity
- Cardiac arrhythmia
- Acute myocardial infarction
- Major joint replacement of the upper extremity
- Sepsis
- Back and neck except spinal fusion (outpatient)

episode selection as a "*placeholder program*" because they chose to participate in one low-volume clinical episode for Model Year 3 to preserve the option of broader participation in later years.

Three medical clinical episodes (sepsis, cardiac arrhythmia, and acute myocardial infarction) were among the most commonly selected clinical episodes for both hospital and PGP EIs in Model Year 3. Over half of hospital EIs participated in sepsis and over a third participated in the chronic obstructive pulmonary disease, bronchitis, and asthma clinical episodes.

An In-depth Look: Comparing Clinical Episode Selection in the First Two Model Years to Model Year 3

On January 1, 2020, hospitals and PGPs could join the model and the hospitals and PGPs in the first cohort could change their clinical episode selection. Among EIs in the first cohort, 88% of hospitals and 84% of PGPs removed or added at least one clinical episode for Model Year 3.

Clinical Episodes with the Largest Increase in Participation from Model Years 1 & 2 to Model Year 3

Hospital EIs

- Sepsis (+14 pp)
- Percutaneous coronary intervention, outpatient (+4 pp)

PGP EIs

- Double joint replacement of the lower extremity (+12 pp)
- Acute myocardial infarction (+11 pp)
- Simple pneumonia and respiratory infections (+11 pp)

Increases in clinical episode participation among hospital EIs were driven by first cohort hospital EIs adding new clinical episodes; increases in clinical episode participation among PGP EIs were driven by selection among second cohort PGP EIs.

Clinical Episodes with the Largest Decrease in Participation from Model Years 1 & 2 to Model Year 3

Hospital EIs

- Congestive heart failure (-26 pp)
- Major joint replacement of the lower extremity (-12 pp)

PGP EIs

- Major joint replacement of the lower extremity (-26 pp)
- Hip & femur procedures except major joint (-21 pp)

In general, decreases in clinical episode participation were due to first cohort EIs dropping clinical episodes.

Sepsis; cardiac arrhythmia; simple pneumonia and respiratory infections; and chronic obstructive pulmonary disease, bronchitis, and asthma remained among the most popular clinical episodes for hospital EIs in Model Year 3. For PGP EIs, major joint replacement of the lower extremity, major joint replacement of the upper extremity, and cardiac arrhythmia remained among the most popular clinical episodes in Model Year 3.

Note: pp = percentage point

> *"We had the strategy of 'throw the spaghetti against the wall, see what sticks [when it comes to episode selection.]"*
> – BPCI Advanced PGP EI interviewee

Through site visits and interviews, we gained insights into the adjustments that participants made to their clinical episode selections after the first two years of the model. Some EIs started with many clinical episodes and dropped those that were unsuccessful. When deciding whether to drop clinical episodes, interviewees said that they valued the data CMS provided and the ability to analyze utilization patterns within a clinical episode. Some also considered factors such as the strength of their partnerships with PAC providers, along with more objective financial indicators. Rather than starting with many clinical episodes and dropping some, a few EIs described the opposite approach; these EIs started with just a few clinical episodes where success seemed most likely, and added more over time.

Some BPCI Advanced EIs also participated in other Medicare initiatives such as Medicare ACOs, the Comprehensive Care for Joint Replacement Model (CJR), or BPCI, and their experience influenced BPCI Advanced clinical episode selection. For example, some hospital EIs with experience in CJR selected other orthopedic surgery episodes for BPCI Advanced, because the care redesign and staffing strategies they used for CJR were directly transferable. Other CJR hospital participants wanted to gain new experience in BPCI Advanced and focused on medical episodes where they saw opportunities for savings. The impact of prior participation in the BPCI initiative on episode selection varied. Some EIs kept the same episodes to build on prior care redesign, while others selected different episodes for BPCI Advanced where they saw new opportunities for earning NPRA.

At times, multiple EIs worked in the same hospital ("co-located EIs"), such as a hospital EI whose hospitalists were participating as a PGP EI. We learned from interviews and site visits that this situation influenced clinical episode selection because the model precedence rules first assign a clinical episode to a PGP EI's attending physician, then to a PGP EI's operating physician, before assigning it to a participating hospital EI. Hospital EIs could lose episode volume when co-located PGPs participate in the same clinical episodes. The relationships between co-located EIs varied; some hospitals described the coordination with their co-located PGP EI as "*minimal*." For example, some hospital EIs described large, independent PGPs being approached by other conveners to participate in BPCI Advanced, without any coordination with the hospital. However, we also learned that some co-located EIs coordinated to ensure they selected different clinical episodes to avoid competition. One hospital EI explained that participating in the same cardiac episodes as its co-located PGP EI had fostered a new level of engagement and partnership between them when they agreed to divide any reconciliation amounts received for their cardiac episodes, regardless of attribution to the PGP or the hospital.

3. Net Payment Reconciliation Amount (NPRA) Sharing

Findings Reported Previously: NPRA Sharing Insights

- Many EIs were actively considering establishing NPRA sharing arrangements with providers, but only a few EIs we interviewed had already done so.
- Some EIs indicated that NPRA sharing was not necessary to engage providers and others saw these arrangements as too complex to be worth the effort.
- EIs that had established NPRA sharing arrangements with providers anticipated that this would motivate engagement in care redesign activities.

> *"Obviously if we're asking them to take downside risk which is not historically something they've done; it's got to be attractive."*
>
> – BPCI Advanced hospital EI interviewee

There were a variety of strategies and ways that NPRA sharing arrangements between EIs and conveners and with individual physicians were established. Most commonly, conveners we interviewed had arrangements to split NPRA "*fifty-fifty*" with EIs, although some conveners reported taking a greater share of any losses. Some PGP EI interviewees that were non-convener participants described splitting NPRA evenly among physicians, but the PGP EI took on a greater proportion of any losses. One hospital EI interviewee reported that after consulting with their PGP

partners, they entered into a financial arrangement where they shared the gains equally, but the hospital took a greater share of any losses (75%).

> *"The dollars aren't going to be that big for any one doctor anyway; it isn't going to change their tax bracket."*
> – BPCI Advanced hospital EI interviewee

As described in the first annual report, EIs anticipated that sharing NPRA with PGPs or individual physicians would incentivize collaboration and engagement in care redesign activities. One PGP EI stated that NPRA sharing creates additional incentive by giving physicians specific targets. A few EIs felt that NPRA sharing created unnecessary *"noise"* and that they had successfully improved performance on key indicators just by sharing performance data. Others felt that NPRA sharing offered minimal financial incentives to physicians and therefore would have little influence on physician engagement.

Some EIs reported that establishing NPRA sharing arrangements was overly burdensome. This was particularly true among EIs participating in medical episodes, who said that given the complexity of care and number of physicians involved in treating a patient, determining the relative share of gains per physician would be extremely complicated.

4. Care Redesign Strategies

Participants most often focused care redesign efforts on reducing hospital readmissions and PAC utilization. Many described specific care process changes such as starting discharge planning earlier during a hospital stay and improving coordination between the hospital staff and PAC providers. Conveners often worked with EIs on care redesign approaches. Conveners described offering clinical decision support tools that predict readmission risk or identify appropriate PAC setting, in-person or telephonic case management services, and development and management of a PAC preferred provider network.

> *"Under MSSP [Medicare ACO program], we hired and trained new care coordination staff and folks to help reprogram workflows. Now the population health team has over 60 dedicated people supporting all of the initiatives, mostly around Medicare risk [including BPCI Advanced]."*
> – BPCI Advanced hospital EI interviewee

EIs often described building on care redesign initiatives that predated BPCI Advanced, such as efforts to reduce hospital readmissions, quality improvement activities for patients with specific diagnoses, or changes related to participation in other Medicare payment initiatives. An EI participating in the sepsis clinical episode explained that they decided to participate in sepsis because four hospitals in their health system already had a care redesign initiative related to sepsis. Some EIs built on investments, such as new staff, which could be applied to BPCI Advanced. Others focused on extending relationships with PAC providers that began as part of their earlier Medicare ACO participation and previously designed processes to monitor patients during the post-discharge period.

> *"Basically, it's about coordination of care before the [planned procedure], in person. The NP [nurse practitioner] will see them in their home, contact the PCP [primary care physician] or other specialists. She also determines where the patient is going afterwards and that gets communicated to the provider. The patient gets coached about their responsibilities at the same time."*
>
> – BPCI Advanced PGP interviewee

Many EIs differentiated their care redesign approach for planned surgical procedures from that of other episodes. For planned surgical procedures, EIs focused on pre-admission patient education or a pre-admission consult with a care coordinator or nurse. EIs mentioned using the pre-admission period to begin discharge planning by identifying which patients would need to go to a skilled nursing facility (SNF) and which facilities would be appropriate for discharge. For unplanned medical episodes, several EIs explained that their care redesign strategies focused on using standardized clinical pathways during the hospital stay, ensuring appropriate follow-up, and connecting patients with community resources.

One PGP EI described delaying staged cardiac procedures until after the end of the episode to reduce episode payments. Interviewees at this PGP described using electronic health record flags and case reviews to notify physicians and schedulers of potential BPCI Advanced patients. Staged procedures were delayed only if this was determined to be "*medically appropriate*."[28]

For EIs that were part of a health system, interviewees said that the health system often implemented care redesign strategies from the top-down, with tailored approaches for each hospital in the system. A health system representative described how experience in BPCI, patient characteristics, and PAC utilization patterns in various markets informed the care redesign for each hospital in the system. For example, one hospital's market included a patient population with significant social needs, so its care redesign focused on connecting patients to community resources to support discharge to home. Another hospital's market had historically high long-term care hospital (LTCH) use and the health system interviewees indicated that reducing LTCH use was their top care redesign priority.

> *"Social determinants of health is something that we need to address better. . . in addition to the SDOH questionnaire [given to patients] we need to understand [which] community-based organizations are willing to help patients in the right way."*
>
> – BPCI Advanced hospital EI interviewee

EIs most commonly said the goals of care redesign were to reduce PAC utilization and improve patient care management after the procedure or hospital discharge. One EI described PAC utilization as *"the most dominant lever."* EIs used strategies such as shifting the discharge destination from a SNF to home when possible, shortening the remaining SNF stays, and improving coordination with PAC providers. Many did this through creating or maintaining a preferred PAC provider network. A few EIs were beginning to work on new processes to help patients address social needs and connect them to community-based resources to better shift discharge destination from a SNF to home. Hospital and PGP EIs also described focusing on other goals such as improving care

[28] Delaying services to reduce episode payments may be an unintended consequence of care redesign activities under an episode-based payment approach. To mitigate unintended consequences under BPCI Advanced, participants are monitored during the 30 days after a clinical episode ends for indications that they may be shifting services outside of the episode period.

transitions and discharge planning. One common strategy to improve care transitions was to standardize clinical pathways during the inpatient stay.

The majority of EIs we interviewed were not regularly using the available BPCI Advanced waivers, citing administrative burden and confusion as the reasons. Only a few EIs mentioned using program rule waivers of certain Medicare requirements regarding telehealth, home visits, and the three-day inpatient hospital stay requirement for SNF coverage. Among EIs that used waivers, most reported that they were just starting to determine how the Medicare flexibilities could best support patient care. One EI described their wavier activities in Model Years 1 and 2 as not yet "*firing on all cylinders"* but anticipated using waivers more in the future. Only one EI interviewee used the post-discharge home visit waiver regularly. This PGP was using the waiver to support a nurse practitioner making home visits to patients. None of the EIs we interviewed discussed providing beneficiary incentives.

5. Clinician and Beneficiary Awareness

> *"Our hospital must provide the patient with a BPCI letter to inform them they're in the bundle, but most patients won't really understand what that means, or even remember a month later."*
>
> – BPCI Advanced hospital EI interviewee

EIs described varying degress of clinician awareness of and engagement in BPCI Advanced. A few hospital and PGP EIs reported that clinicians were aware and highly engaged in BPCI Advanced, while a few others felt that clinicians had little knowledge of the model and were minimally engaged. Most EIs suggested that clinicians were aware of care redesign activities related to BPCI Advanced and generally engaged, but likely would not know the details of the model or the term "BPCI Advanced."

Participants are required to share the CMS beneficiary notification letter for the model with their patients. They vary, however, in when that letter is provided to the patient and whether they provide additional education about the model at the same time. EI interviewees often said that patients may be aware they are receiving enhanced services – but anticipated few would be able to name "BPCI Advanced" or recall this information after the fact.

D. Impact of BPCI Advanced

This section presents the BPCI Advanced impact estimates on payments, utilization, quality, and the mix of patients for hospital-initiated episodes with anchor stays ending or procedures from October 1, 2018 through August 3, 2019. This section also presents patient care experiences and functional outcomes from the survey of beneficiaries with episodes initiated in July and August 2019.

The analyses used a difference-in-differences (DiD) design to estimate the differential change in payment, utilization, and quality outcomes between a baseline and an intervention period for beneficiaries who received services from BPCI Advanced hospital EIs relative to beneficiaries who received services from a matched comparison group of non-participating hospitals.[29] This approach controlled for health care service use before the hospitalization or procedure,

[29] The baseline period for the difference-in-difference analyses included episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017.

beneficiary, market, and provider differences between BPCI Advanced and comparison episodes, and eliminated biases from time invariant differences between the BPCI Advanced and comparison episodes.

We constructed comparison groups for 13 clinical episodes that had sufficient sample size for meaningful analysis. The episodes in these 13 clinical episodes represent approximately 90% of all episodes initiated by hospital EIs during the first ten months of the model. We conducted sensitivity tests for key quality and payment outcomes. For further details of our DiD methodology, see **Appendix C.**

For the beneficiary survey, we used a cross-sectional regression approach to estimate differences in self-reported outcomes between respondents attributed to BPCI Advanced hospital or PGP EIs, and respondents attributed to a matched comparison group. We sampled beneficiaries from all 32 clinical episodes available in Model Years 1 and 2, separately for beneficiaries attributed to hospital EIs and to PGP EIs. We risk-adjusted the estimated differences between the BPCI Advanced and comparison respondents for beneficiary, hospital, and area characteristics. We identified differences between BPCI Advanced and comparison respondents, but because the survey data were only collected during the intervention period, we cannot determine whether any differences were pre-existing or caused by BPCI Advanced. Detail on the survey measures, sample selection, weighting, risk-adjustment, and strata-level results are provided in **Appendix C**.

1. Key Findings

Impact of BPCI Advanced

- BPCI Advanced hospital EIs reduced total allowed payments per episode in seven (of 13 evaluated) clinical episodes, primarily by reducing SNF and inpatient rehabilitation facility (IRF) payments.
- The mortality rate decreased for renal failure and urinary tract infection (UTI) clinical episodes, but increased for simple pneumonia and respiratory infections (SPRI). The relative increase in mortality rate for SPRI clinical episodes was not due to outlier hospital values, changes in post-acute care use, or changes in patient mix.
- Beneficiary survey results suggest that, in aggregate, self-reported change in functional status from before to after the episode did not differ between BPCI Advanced and comparison respondents for hospital-attributed or PGP-attributed episodes.
- There were no differences in self-reported experience or satisfaction with care between BPCI Advanced and comparison respondents for hospital-attributed or PGP-attributed episodes.

2. Payment, Utilization, Quality, and Patient Mix

a. Sample characteristics

We had sufficient sample size for risk adjustment for 13 clinical episodes initiated by hospital EIs (Exhibit 18). The number of BPCI Advanced hospital EIs included in the analysis ranged from 51 to 320 per clinical episode, and the number of episodes ranged from 1,968 to 52,396 across the clinical episodes, from the beginning of BPCI Advanced on October 1, 2018 through August 3, 2019.

Exhibit 18: Matched BPCI Advanced Hospitals Included in the BPCI Advanced Impact Estimates, October 1, 2018 – August 3, 2019

Clinical Episode	BPCI Advanced Participating Hospitals	Matched BPCI Advanced Hospitals	Matched Intervention Episodes
AMI	227	205	9,627
Cardiac Arrhythmia	287	256	16,561
COPD, Bronchitis, Asthma	239	218	17,468
CHF	368	320	39,517
GI Hemorrhage	139	122	7,407
Hip & Femur Procedures	145	123	6,297
MJRLE	145	128	14,072
PCI (Outpatient)	52	51	5,139
Renal failure	205	179	13,187
Sepsis	316	267	52,396
SPRI	274	248	27,596
Stroke	230	225	18,263
UTI	235	207	13,631

Note: The number of matched BPCI Advanced hospitals is limited to the BPCI Advanced hospitals that were used to calculate the difference-in-differences results in the remainder of this section. See **Appendix C** for information on the methods used to determine the sample. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur Procedures = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.
Source: The BPCI Advanced evaluation team's analysis of and Medicare claims and enrollment data for episodes with anchor stay/procedure end dates from October 1, 2018 through August 3, 2019 for BPCI Advanced hospitals and the CMS BPCI Advanced Database, as of March 1, 2019.

b. Has patient mix changed under BPCI Advanced?

BPCI Advanced is intended to reward EIs that lower episode payments through care redesign and care coordination. Episode payments could decline, however, if an EI's mix of patients changed to one that required fewer or less intensive services. Alternatively, if an EI's mix of patients changed to one that required more or more intensive services, the EI might be unfairly penalized under the model. To account for the effect of patient mix on episode costs, the BPCI Advanced target pricing method incorporates risk adjustment. This may reduce incentives for participants to select healthier patients, however it does not eliminate the possibility that higher risk patients may not be treated under the model, which has implications for generalizability. To assess whether BPCI Advanced patient mix changed during the intervention, we examined claim-based patient characteristics that

are associated with higher resource use. We estimated the change in patient characteristics between the baseline and intervention period for BPCI Advanced patients relative to the change in the comparison group of patients for demographic characteristics, count of hierarchical conditions categories (HCCs – a risk measure used in Medicare's managed care program), HCC index,[30] and the utilization of care in the six months prior to the anchor hospitalization or procedure (Exhibit 19).[31] For each of the measures in Exhibit 19, a negative value indicates a decline in the resource intensity of the BPCI Advanced patients during the intervention from the baseline period relative to the comparison group. Similarly, a positive value suggests a relative increase in patient resource intensity. (Please note, impact estimates reported later in this section account for differences in patient mix, measuring only the difference in outcomes due to the model that are not due to patient mix differences.)

This analysis did not reveal any systematic changes in patient mix under BPCI Advanced for hospital EIs. Of the 13 clinical episodes evaluated, only hip and femur procedures except major joint showed evidence of small changes in patient mix in at least half of the characteristics evaluated. This clinical episode had relatively more Medicaid-eligible beneficiaries, and had relative decreases in the percent of beneficiaries aged 80 years and older, the number of HCC indicators, and the overall HCC index.

Exhibit 19: Relative Changes in Patient Mix by Clinical Episode, Hospitals, October 1 2018 – August 3, 2019

Clinical Episode Strata	Age: 80+ Years	Medicaid Eligibility	Disabled, No ESRD	Count of HCC Indicators*	HCC Index *	Home Health *	Institutional PAC*
Cardiac Arrhythmia	-1.36	-0.17	+0.36	-0.05	-0.03	-0.58	-0.73
Hip & Femur Procedures	-1.73	+1.41	-0.45	-0.09	-0.05	-0.99	+0.33
COPD, Bronchitis, Asthma	-0.69	+0.36	+1.52	-0.02	-0.01	-0.49	-0.15
PCI (outpatient)	+2.55	-0.06	-1.42	-0.02	0.00	-0.40	+0.02
AMI	-0.46	+0.32	+0.93	-0.03	-0.01	+0.15	-0.05
CHF	-0.42	+0.35	+0.02	-0.01	0.00	-0.23	+0.06
GI hemorrhage	+0.67	+0.50	+0.13	+0.05	+0.03	+0.02	+0.07
MJRLE	-0.09	-0.07	+0.27	0.00	-0.01	-0.20	+0.34
Pacemaker	+0.26	+0.09	+0.64	+0.01	+0.01	-0.96	+0.42
Renal Failure	-1.43	+2.32	+0.86	-0.06	-0.02	-0.35	-0.32
Sepsis	-0.09	+0.84	+0.37	+0.03	+0.02	+0.38	+0.30
SPRI	-0.22	-0.64	-0.33	-0.01	0.00	+0.41	+0.03

[30] The HCC index was constructed using the HCC score methodology based on a six-month lookback from the start of the episode, using v22 of CMS's 2019 Risk Score software, and 2016 (ICD-9) and 2019 (ICD-10) diagnosis to chronic condition mappings

[31] This analysis is limited by the patient characteristics available in claims data; there may be other indicators of patient-mix shifts that we do not observe.

Clinical Episode Strata	Age: 80+ Years	Medicaid Eligibility	Disabled, No ESRD	Count of HCC Indicators*	HCC Index *	Home Health *	Institutional PAC*
Stroke	+0.18	-0.25	+0.14	+0.03	+0.02	-0.11	+0.02
UTI	-0.53	+0.21	+0.21	+0.04	+0.02	-0.16	+0.48

Note: DiD estimates that are significant at the 5% or 10% significance level are indicated by dark and light orange shaded cells, respectively. Categorization of resource intensity was based on statistically significant changes in patient characteristics associated with higher resource use as well as the direction and average magnitude of the estimates. ESRD = end stage renal disease; HCC = hierarchical conditions categories; PAC = post-acute care; Hip & Femur Procedures = hip and femur procedures except major joint; COPD = chronic obstructive pulmonary disease: PCI = percutaneous coronary intervention; AMI = acute myocardial infarction; CHF = congestive heart failure; GI = gastrointestinal; MJRLE = major joint replacement of the lower extremity; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

* These characteristics measure utilization of care in the six months prior to the anchor hospitalization. Count of HCCs and HCC index are based on the six months prior to the anchor hospitalization.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

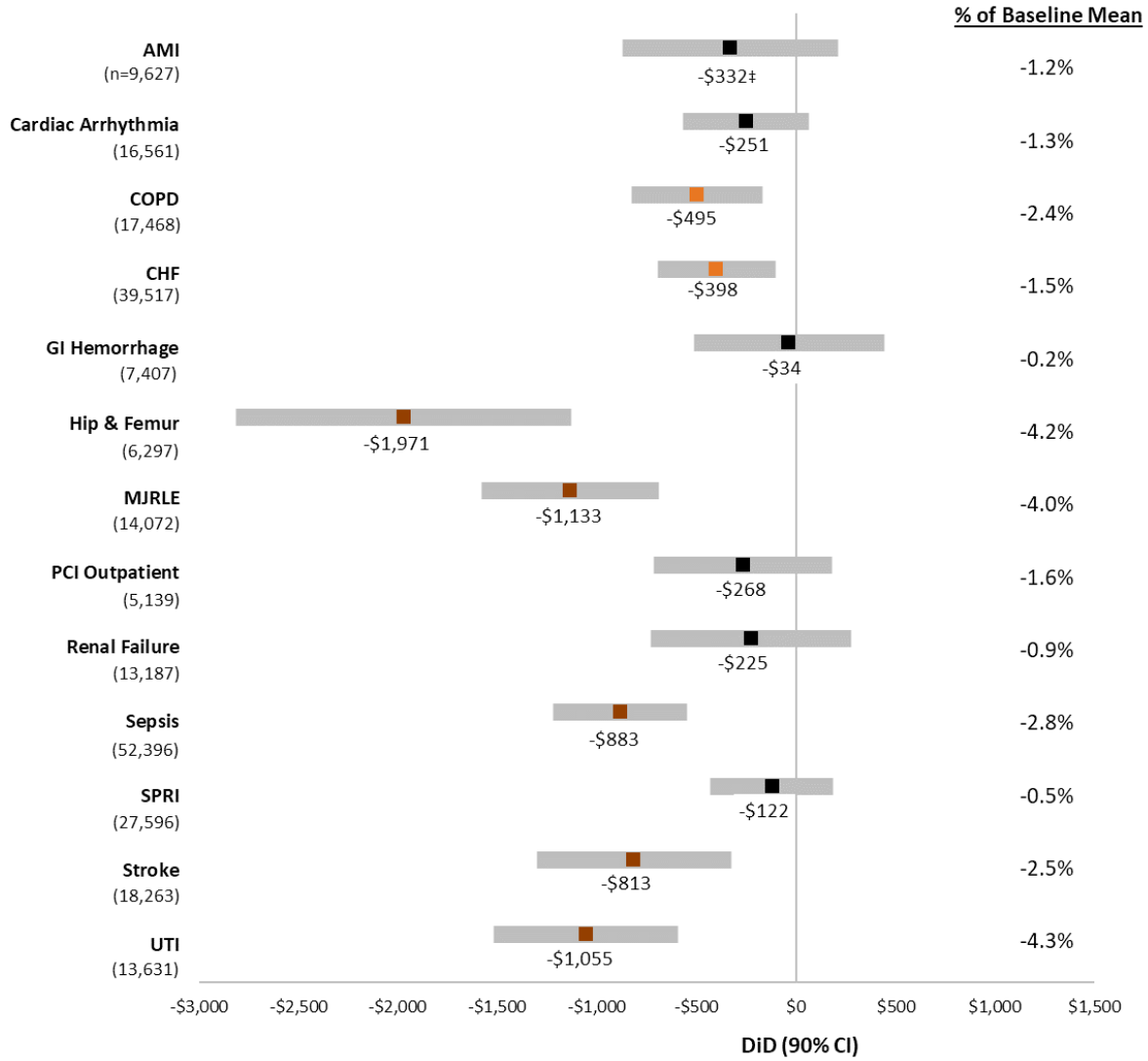
c. How have the average standardized episode payments changed under BPCI Advanced?

In the first 10 months of the model, total allowed episode payments declined from the baseline to the intervention period for BPCI Advanced participating hospitals in seven (of 13 studied) clinical episodes, relative to the comparison group (Exhibit 20).[32] The largest relative reductions occurred for hip and femur procedures except major joint (hip and femur), major joint replacement of the lower extremity (MJRLE), and urinary tract infection (UTI) episodes. BPCI Advanced hospitals reduced total payments by $1,971 ($p<0.01$, 4.2% of the baseline mean) for hip and femur episodes, by $1,133 ($p<0.01$, 4.0%) for MJRLE episodes, and by $1,055 ($p<0.01$, 4.3%) for UTI episodes, relative to comparison episodes. Total payments also declined for sepsis (-$883, $p<0.01$, 2.8%), stroke (-$813, $p<0.01$, 2.5%), COPD (-$495, $p<0.05$, 2.4%), and CHF (-$398, $p<0.05$, 1.5%) clinical episodes.[33] Detailed results of BPCI Advanced impact estimates by clinical episode are in **Appendix G.**

[32] Total allowed payments are Medicare Parts A and B program payments, which were standardized to remove geographic and other payment adjustments.

[33] These reductions were robust across multiple specifications. For sensitivity test results see **Appendix H**.

Exhibit 20: Impact of BPCI Advanced on Total Payments by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: Total payments represent Part A and B FFS payments for the episode anchor stay or procedure and the 90-day post discharge period. The estimates in this exhibit are the results of a difference-in-differences (DiD) model. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate. This payment outcome is standardized to remove the effect of geographic and other payment adjustments. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

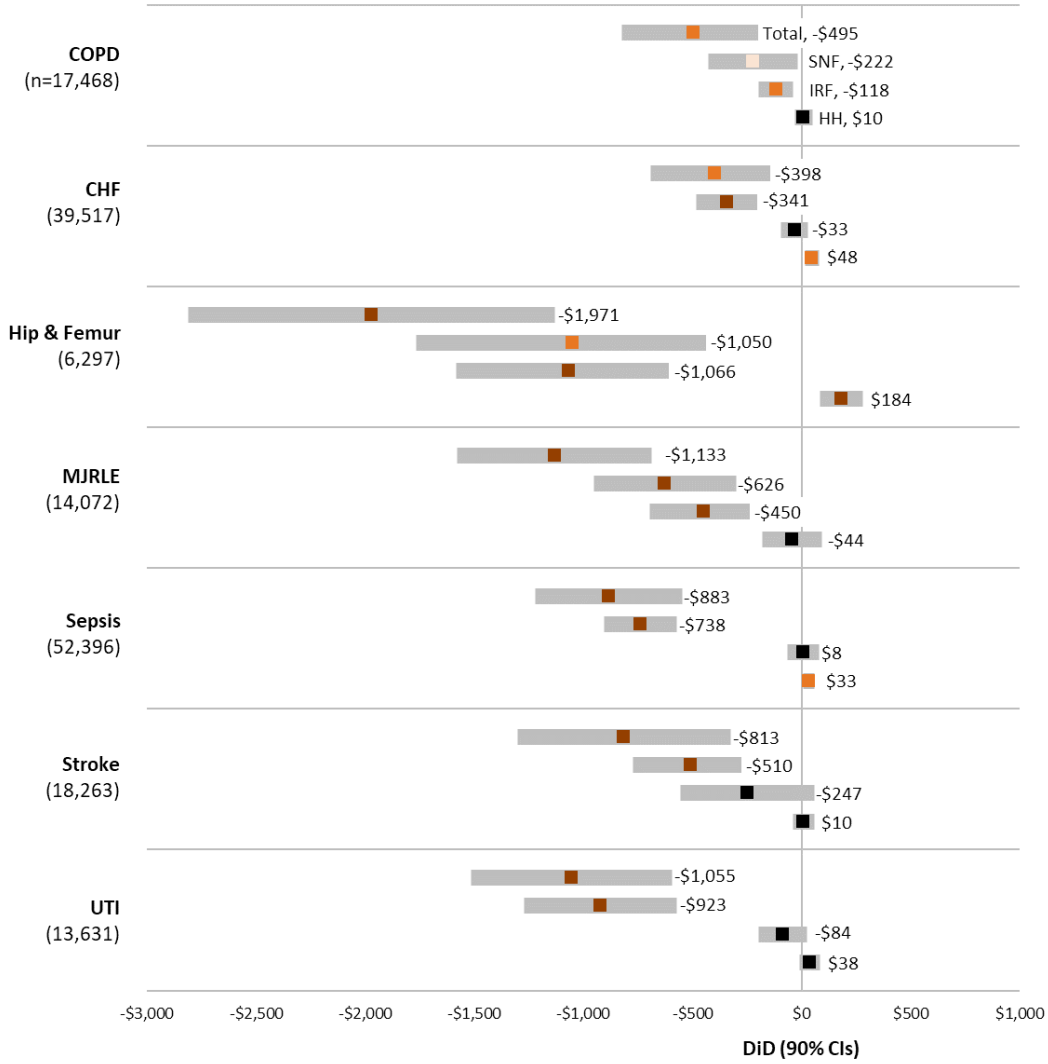
‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

For clinical episodes with statistically significant reductions in total allowed episode payments, we evaluated changes in SNF, IRF, and home health (HH) payments to understand the key drivers of the reduction in total payments. The reductions in total payments by clinical episode were due to

lower SNF and IRF payments, as shown in Exhibit 21. For hip and femur episodes, which had the largest reduction in total payments, half of the decline was due to lower SNF payments (-$1,050, p<0.05, 5.9%) and half was due to lower IRF payments (-$1,066, p<0.01, 23.4%). MJLRE and COPD episodes also had significant reductions in both SNF and IRF payments. For UTI, sepsis, stroke, and CHF, the primary contributor to the decline in total payments was reduced SNF payments. We also observed small, statistically significant increases in HH payments for the hip and femur, CHF, and sepsis clinical episodes.[34]

Exhibit 21: Impact of BPCI Advanced on SNF, IRF, and HH Payments in the 90-day PDP by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate. These payment outcomes were standardized to remove the effect of geographic and other payment adjustments. SNF = skilled nursing facility; IRF = inpatient rehabilitation facility; HH = home health; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

[34] These results are robust to alternative specifications; for sensitivity test results see **Appendix H**.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

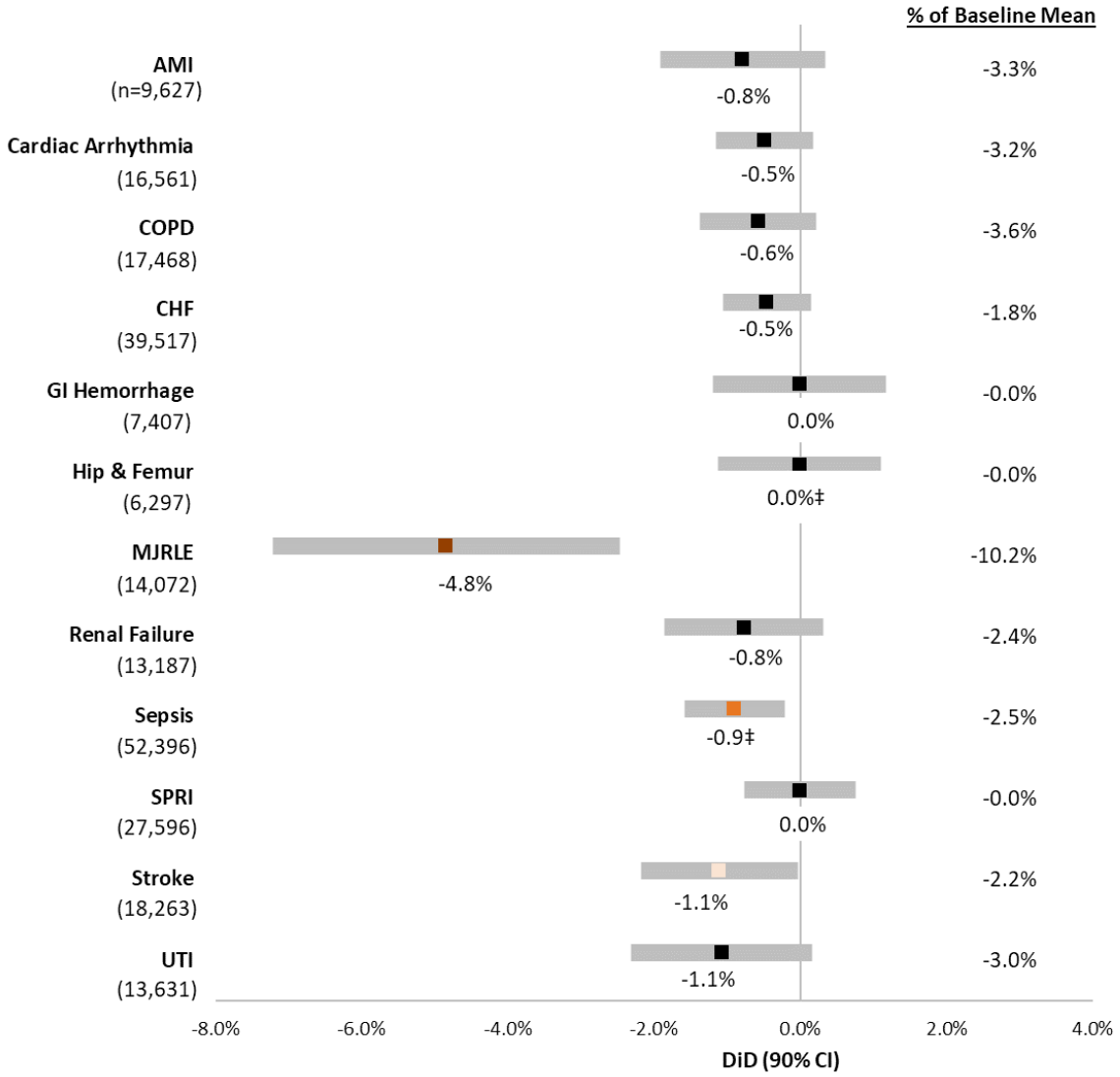
d. How has service use changed under BPCI Advanced?

We measured the impact of BPCI Advanced on two utilization measures: the proportion of episodes with a first discharge to an institutional PAC setting, and number of SNF days (among beneficiaries with at least one SNF stay). There was a statistically significant relative decline in the proportion of patients first discharged from the hospital to institutional PAC in three clinical episodes (Exhibit 22). The proportion of patients first discharged to institutional PAC declined for MJRLE episodes by 4.8 pp ($p<0.01$, 10.2%), for stroke episodes by 1.1 pp ($p<0.10$, 2.2%), and for sepsis episodes by 0.9 pp ($p<0.05$, 2.5%), relative to comparison episodes.[35]

For patients with any SNF use, there was a relative decline in the number of days in the SNF for six clinical episodes (Exhibit 23). The relative reduction in SNF days varied from 3.4 days (hip and femur, $p<0.01$, 7.5%) to 1.6 days (GI hemorrhage, $p<0.10$, 4.6%).[36] Detailed results by clinical episode are shown in **Appendix G**.

[35] These reductions were robust across multiple specifications. For sensitivity test results see **Appendix H**.
[36] These reductions were robust across multiple specifications. For sensitivity test results see **Appendix H**.

Exhibit 22: Impact of BPCI Advanced on First Discharge to Institutional PAC by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019

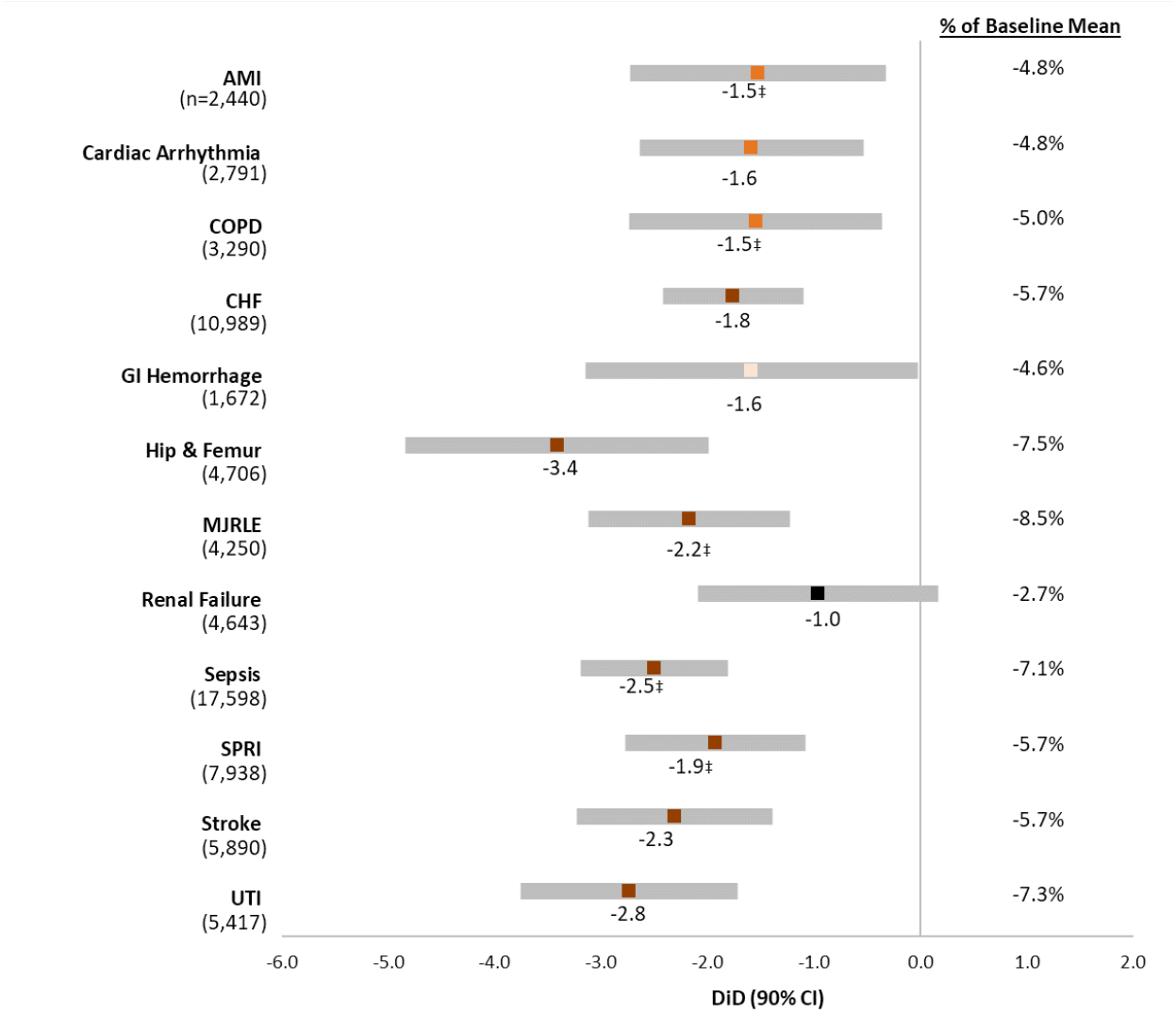


Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. The DiD estimates represent a percentage point change. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

Exhibit 23: Impact of BPCI Advanced on Number of SNF Days for SNF Users in the 90-day PDP by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate. SNF = skilled nursing facility; AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

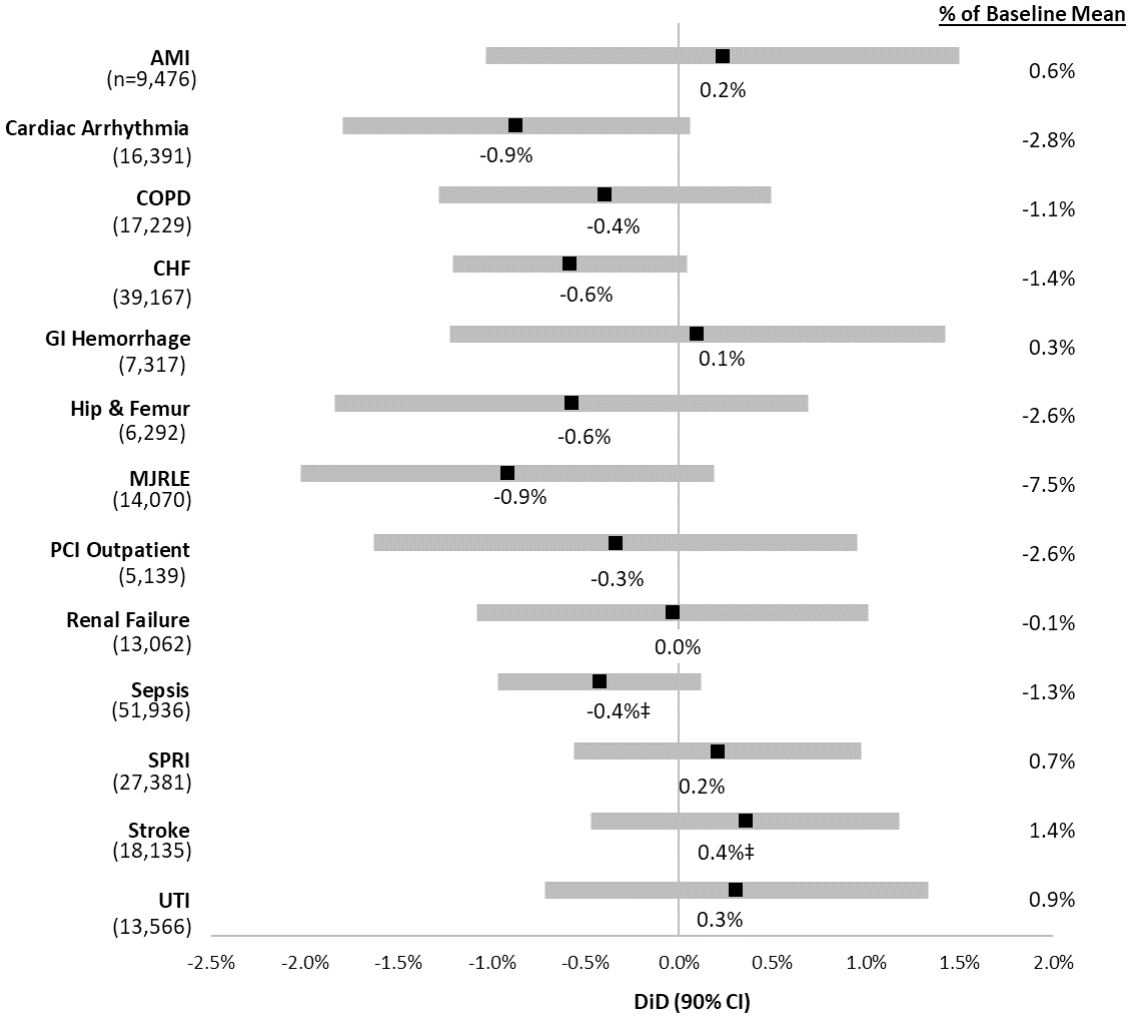
Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

e. How has quality of care changed under BPCI Advanced?

The quality of care did not change under BPCI Advanced for most hospital-initiated clinical episodes, as indicated by claims-based measures. There were no statistically significant changes in the unplanned readmission rate for any of the 13 clinical episodes (Exhibit 24). There were

statistically significant declines in the mortality rate for two clinical episodes; the mortality rate declined by 1.0 pp (p<0.10, 5.4%) for renal failure and 0.9 pp (p<0.05, 7.3%) for UTI, relative to the comparison group (Exhibit 25).[37] The mortality rate for simple pneumonia and respiratory infections (SPRI) episodes increased by 1.0 pp (p<0.01, 6.0%), relative to the comparison group. We conducted additional analyses to understand what may have been associated with the relative increase in mortality in SPRI episodes. Our investigation indicated that it was not due to differences in patient mix, changes within a specific MS-DRG, extreme values in a few hospitals, or a change in PAC use for BPCI Advanced hospitals relative to comparison hospitals.[38] We will continue to monitor and report on any changes in mortality rates and other indicators of quality of care.

Exhibit 24: Impact of BPCI Advanced on Readmission Rate in the 90-day PDP by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. The DiD estimates represent a percentage point change. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate. AMI = acute myocardial

[37] These reductions were robust across multiple specifications. For sensitivity test results see **Appendix H**.

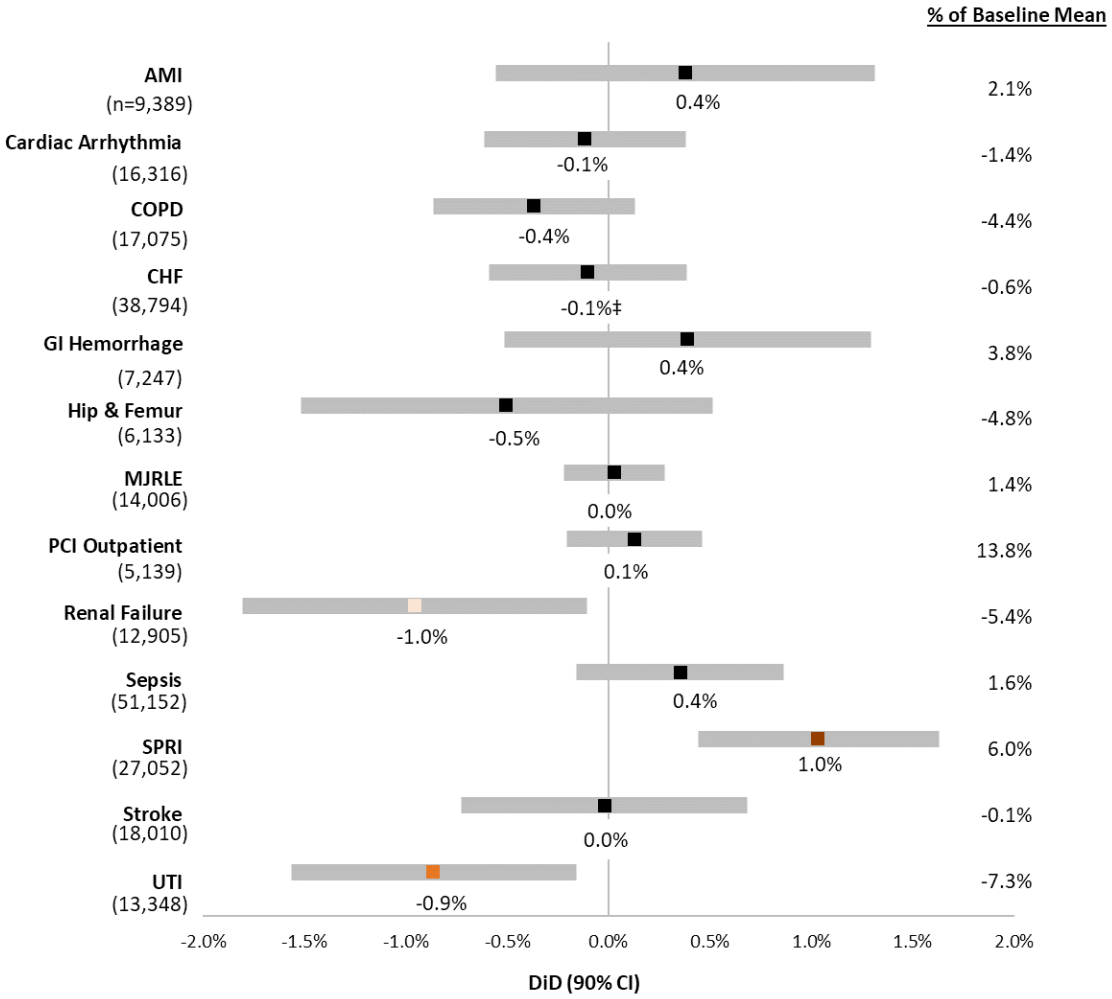
[38] Outcomes presented represent episodes for beneficiaries with anchor stays or procedures on or before August 3, 2019, prior to the public health emergency due to COVID-19.

infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

Exhibit 25: Impact of BPCI Advanced on 90-day Mortality by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: The estimates in this exhibit are the results of a difference-in-differences (DiD) model. The DiD estimate represents a percentage point change. DiD estimates that are significant at the 1%, 5%, or 10% significance level are indicated by brown, medium orange, and light orange squares, respectively. The grey bars indicate the 90% confidence interval of the DiD estimate. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

‡ We rejected the null hypothesis that BPCI Advanced and matched comparison hospitals had parallel trends for this outcome (with 90% confidence). See Appendix I for parallel trends test results.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers.

3. Patient Functional Status and Health Care Experience

a. Survey Response Rates

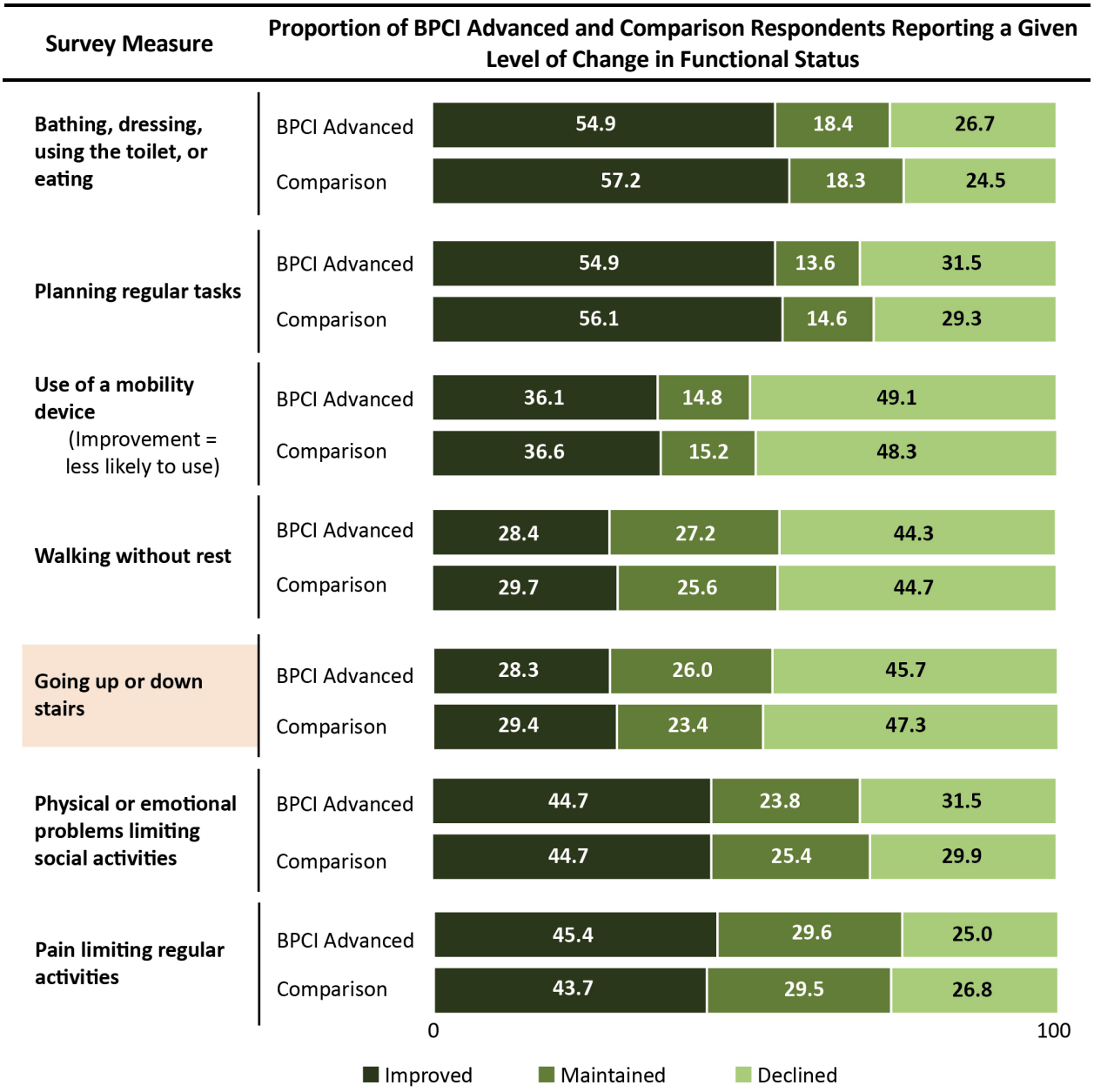
The beneficiary survey response rate was 36% among BPCI Advanced beneficiaries attributed to hospitals and 41% among those attributed to PGPs. Corresponding response rates for the comparison group were 38% and 41%, respectively. The difference in response rates between BPCI Advanced and comparison respondents were -1.8 pp ($p<0.01$) and 0.4 pp (not statistically significant) for hospitals and PGPs, respectively. Response rates varied considerably for each participant group and EI type, ranging from 27% to 64%. Non-response and sampling weights were applied to all observations.

The survey results for beneficiaries whose episodes were attributed to hospitals are based on 3,745 BPCI Advanced and 3,929 comparison responses. Results for beneficiaries whose episodes were attributed to PGPs are based on 2,524 BPCI Advanced and 2,502 comparison responses.

b. Hospital Strata

There was no evidence that BPCI Advanced respondents attributed to hospitals differed from comparison respondents in self-reported changes in functional status from before to after the episode (Exhibit 26). Differences in improvement between the two groups varied by measure. BPCI Advanced respondents indicated less improvement for bathing, dressing, using the toilet, or eating (-2.2pp), and more improvement for pain limited regular activities (1.7pp) (Additional detail provided in **Appendix J)**. Differences were statistically significant for only one of seven measures, going up or down stairs ($p<0.10$). The point estimates indicate that fewer BPCI Advanced respondents reported improvements in functional status (-1.1pp) and fewer reported declines (-1.6pp), suggesting no true difference in outcomes, on average.

Exhibit 26: BPCI Advanced and Comparison Respondents Reported Similar Changes in Functional Status, Hospital EIs, July 2019-August 2019

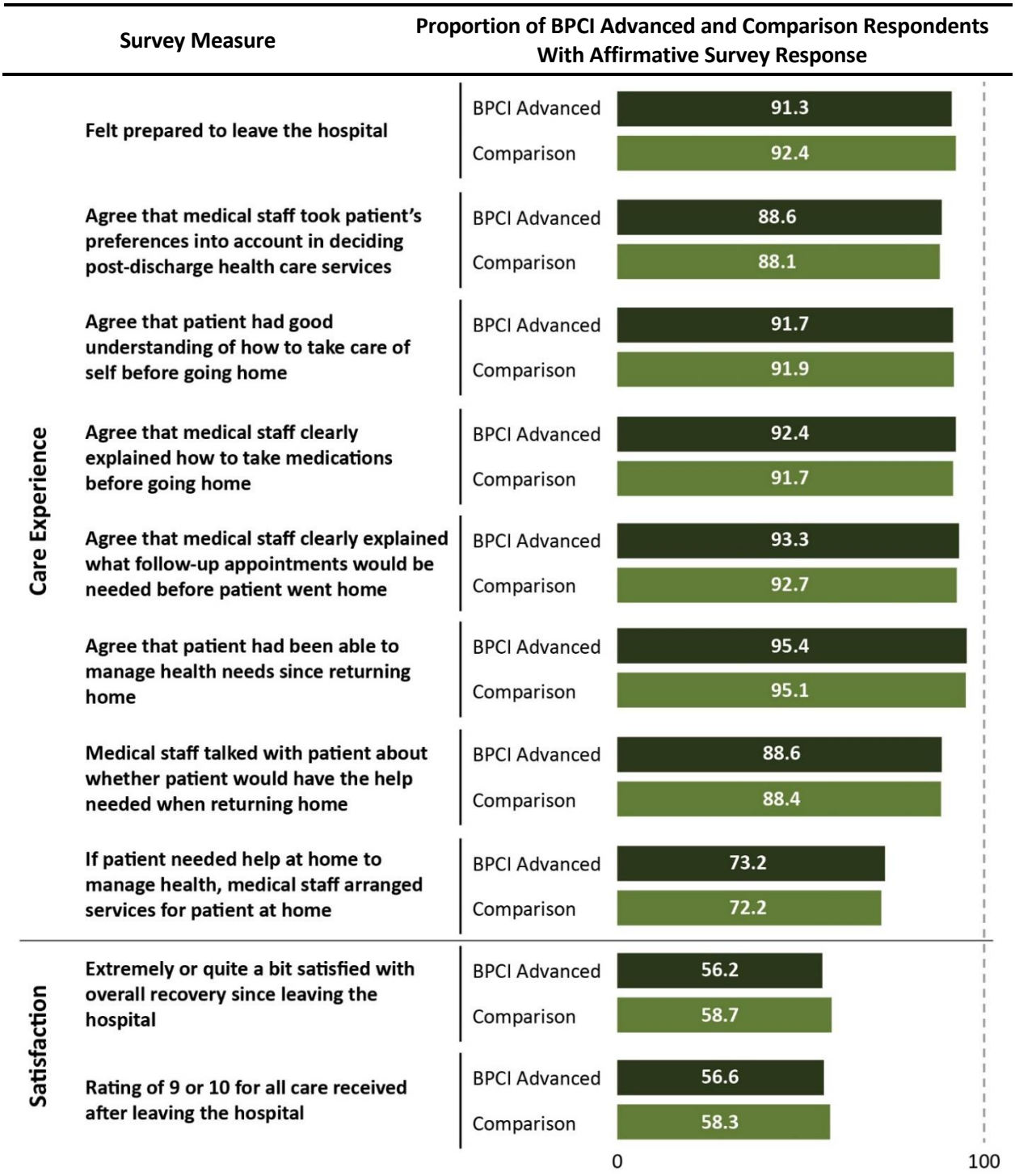


Note: The estimates in this exhibit are the result of a cross-sectional, multinomial logistic regression risk adjustment model for trinary indicators. All responses were weighted for non-response and sampling design. Estimates were based on 3,745 BPCI Advanced survey respondents and 3,929 comparison survey respondents across all 32 clinical episodes. Results are reported in percentage point terms. Differences significant at the 1%, 5% or 10% level are shaded brown, medium, and light orange, respectively.

Source: The BPCI Advanced evaluation team's analysis of BPCI Advanced beneficiary survey responses for hospital discharges or outpatient procedures that occurred in July or August 2019.

We found no evidence of a relationship between BPCI Advanced and care experience and satisfaction with care measures among respondents with episodes attributed to hospitals (Exhibit 27). Differences between BPCI Advanced and comparison respondents in the eight measures of care experience were small in magnitude and none were statistically significant. Differences in the two measures of satisfaction were likewise small and insignificant.

Exhibit 27: BPCI Advanced and Comparison Respondents Reported Similar Care Experience and Satisfaction with Care, Hospital EIs, July 2019-August 2019



Note: The estimates in this exhibit are the result of a cross-sectional logistic regression risk adjustment model for binary indicators. All responses were weighted for non-response and sampling design. Estimates were based on 3,745 BPCI Advanced survey respondents and 3,929 comparison survey respondents across all 32 clinical episodes. Results are reported in percentage point terms. No differences were statistically significant.

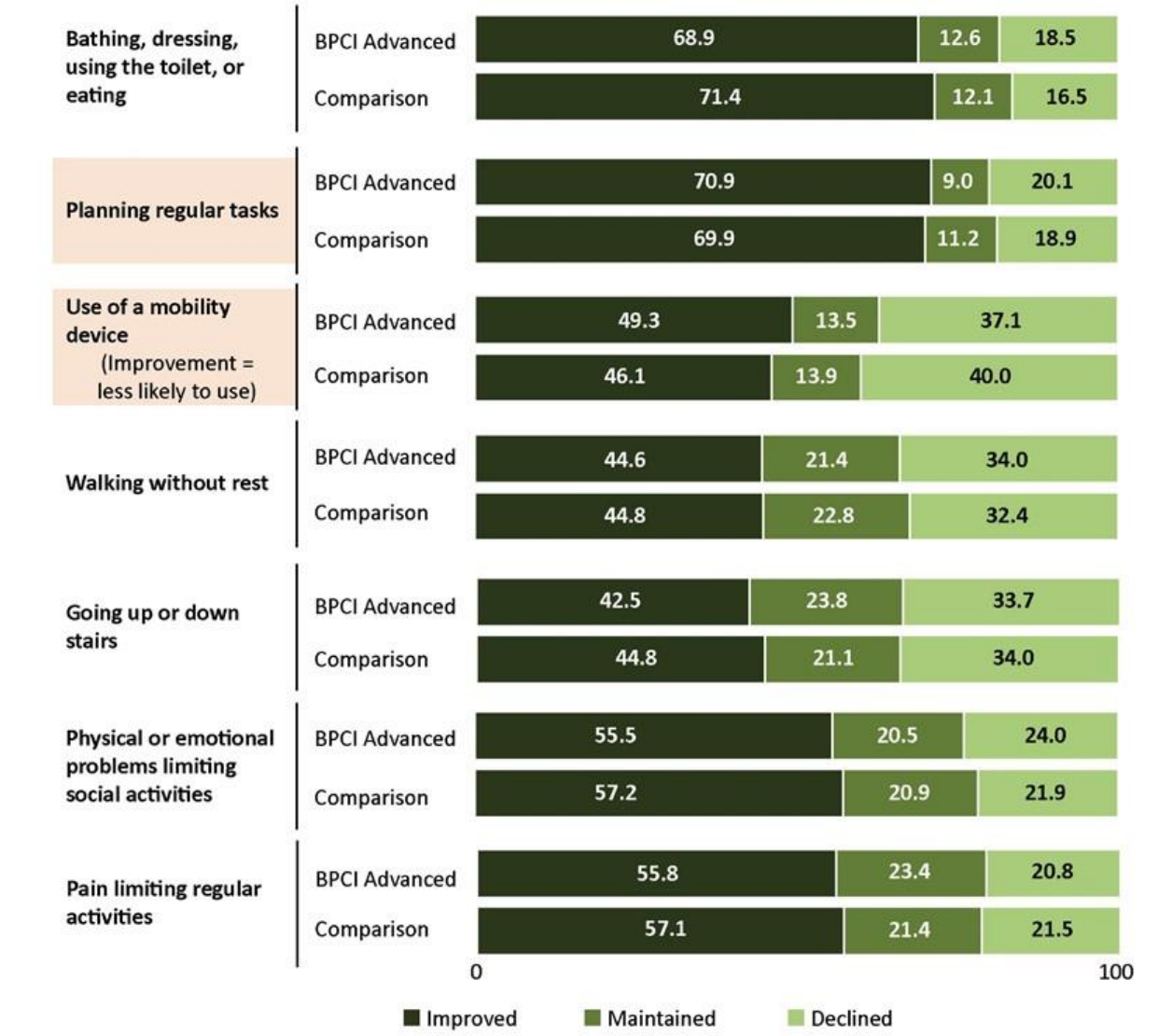
Source: The BPCI Advanced evaluation team's analysis of BPCI Advanced beneficiary survey responses for hospital discharges or outpatient procedures that occurred in July or August 2019.

Results for the 11 clinical subgroups we analyzed support our conclusion that BPCI Advanced respondents did not have better or worse changes in functional status than comparison respondents, on average, and did not report different care experience or satisfaction. These results are shown in **Appendix J**.

c. PGP Strata

Among respondents attributed to PGPs, there was little evidence that BPCI Advanced was associated with self-reported improvement or decline in functional status from before to after the episode (Exhibit 28). The estimated difference in the rate of improvement in dependence on a mobility device (3.2pp; p<010) indicates more favorable changes for BPCI Advanced respondents. Differences in planning regular tasks were also statistically significant (p<0.10), but were ambiguous in direction, indicating both higher rates of improvement (1.0 pp) and higher rates of decline (1.2 pp) among BPCI Advanced respondents relative to comparison respondents. BPCI Advanced respondents reported lower rates of improvement for the other five functional status measures, ranging between -2.5pp (bathing, dressing, using the toilet, or eating) and -0.2 pp (walking without rest), but these differences were not statistically significant (**Appendix J**). Given the lack of consistent evidence supporting more or less favorable outcomes among BPCI Advanced respondents attributed to PGPs, we cannot conclude that they had different changes in functional status than comparison respondents.

Exhibit 28: BPCI Advanced and Comparison Respondents Reported Similar Changes in Functional Status, PGP EIs, July 2019-August 2019

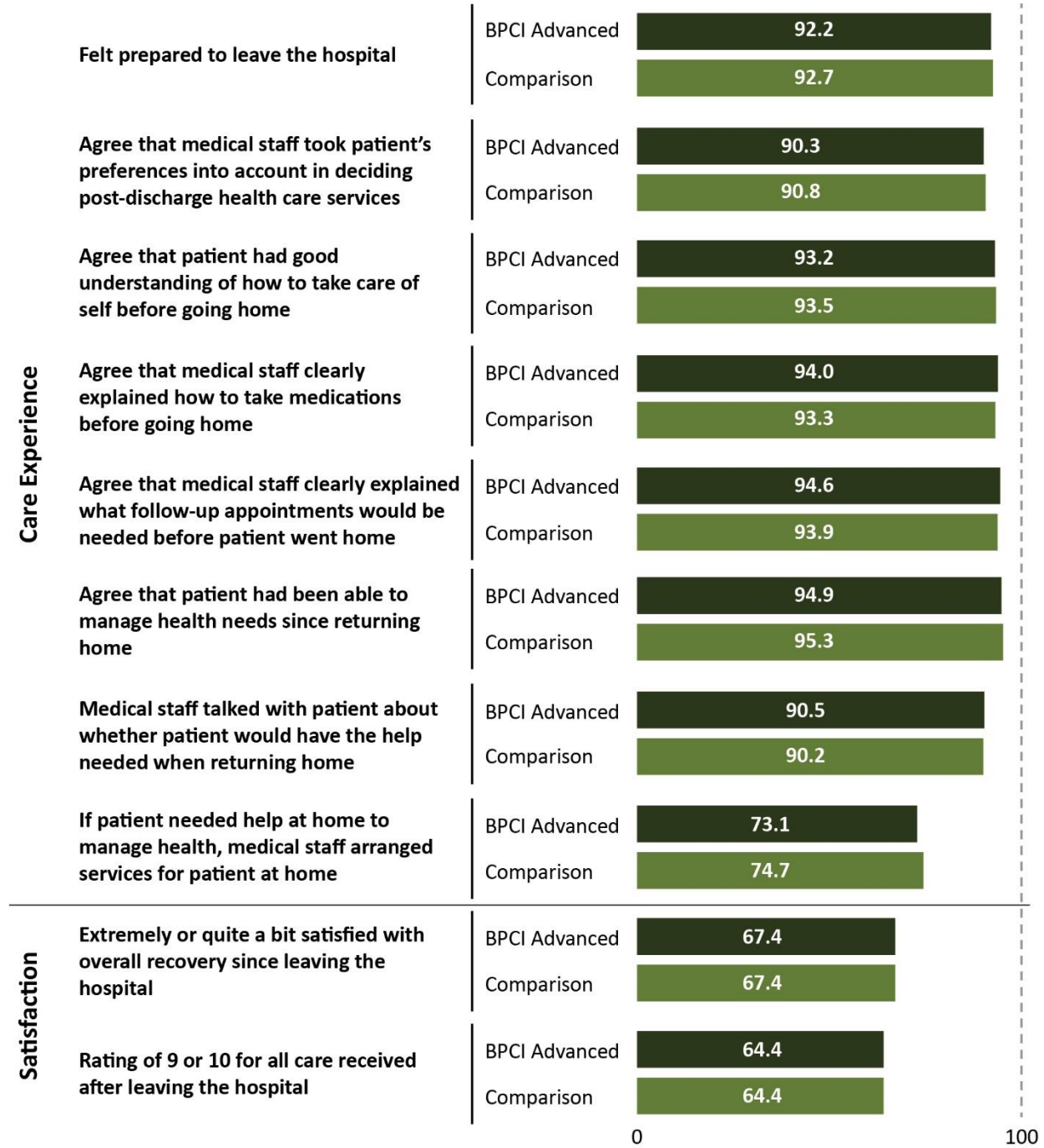


Note: The estimates in this exhibit are the result of a cross-sectional, multinomial logistic regression risk adjustment model for trinary indicators. All responses were weighted for non-response and sampling design. Estimates were based on 2,524 BPCI Advanced survey respondents and 2,502 comparison survey respondents representing all 32 clinical episodes. Results are reported in percentage point terms. Differences significant at the 1%, 5% or 10% level are shaded brown, medium, and light orange, respectively.

Source: The BPCI Advanced evaluation team's analysis of BPCI Advanced beneficiary survey responses for hospital discharges or outpatient procedures that occurred in July or August 2019.

We found no evidence of a relationship between BPCI Advanced and measures of care experience and satisfaction with care (Exhibit 29) among respondents with episodes attributed to PGPs. Differences between BPCI Advanced and comparison respondents in the eight measures of care experience ranged from -1.7 pp (medical staff arranged services for you to manage care at home) to 0.8 pp (medical staff clearly explained how to take medications). No difference was statistically significant.

Exhibit 29: BPCI Advanced and Comparison Respondents Reported Similar Care Experience and Satisfaction with Care, PGP EIs, July 2019-August 2019



Note: The estimates in this **exhibit** are the result of a cross-sectional logistic regression risk adjustment model for binary indicators. All responses were weighted for non-response and sampling design. Estimates were based on 2,524 BPCI Advanced survey respondents and 2,502 comparison survey respondents representing all 32 clinical episodes. Results are reported in percentage point terms. No differences were statistically significant.

Source: The BPCI Advanced evaluation team's analysis of BPCI Advanced beneficiary survey responses hospital discharges or outpatient procedures that occurred in July or August 2019.

Results among the six clinical subgroups we analyzed support our conclusion of no differences between BPCI Advanced and comparison PGP respondents in the aggregate analysis. Results for the subgroups we analyzed are available in **Appendix J**.

E. Medicare Program Savings

This section presents the estimated Medicare program savings for hospital participants in the first 10 months of the model. We calculated net Medicare savings (or losses) for each of the 13 clinical episodes for which we conducted impact estimates. For each clinical episode, net Medicare savings was defined as the change in non-standardized payments, net reconciliation payments paid to participants.

The change in non-standardized payments per clinical episode was calculated by converting impact estimates from a DiD model, which estimated the change in per-episode standardized Medicare paid amounts during the inpatient stay and 90-days post discharge, into non-standardized payments and then multiplying by the number of intervention episodes (October 1, 2018 – August 3, 2019).[39] Clinical episode reconciliation payments were calculated using performance period 1 and performance period 2 episodes with anchor end dates on or before August 3, 2019 for the 13 CEs evaluated.

Total model net Medicare savings was calculated by summing the respective 13 clinical episode components. We present net savings to Medicare aggregated across the 13 clinical episodes, and net savings per episode. See **Appendix C** for additional details on the definitions and calculations of net savings.

1. Key Findings

Net Medicare Spending

- After accounting for reconciliation payments, the BPCI Advanced Model resulted in an estimated loss of $158.6 million to Medicare for hospital participants in the 13 clinical episodes analyzed (90% of hospital EI episode volume) in the first 10 months of the model.
- The largest losses occurred for CHF and sepsis episodes, with estimated losses of $65.1 million and $57.4 million respectively.

2. Results

BPCI Advanced hospital participants reduced total payments in seven of 13 clinical episodes. When aggregated across all episodes, the change in total payments resulted in an estimated $134.6 million reduction in non-standardized payments (Exhibit 30). However, after accounting for $293.3 million in reconciliation payments made to hospital participants for the 13 clinical episodes, the BPCI Advanced Model resulted in an estimated loss of $158.6 million to Medicare. This net loss is equivalent to $761 per episode, or approximately 2.4% percent of average historical episode

[39] Non-standardized Medicare paid amounts reflect actual Medicare payments, as they include adjustments for wages, practice expenses, and other initiatives (e.g., medical education).

payments. As a result, during this period for this set of clinical episodes, the model did not achieve the savings intended by the 3% reduction in expenditures incorporated into the calculation of the target prices. For detailed results by clinical episode, see **Appendix K**.

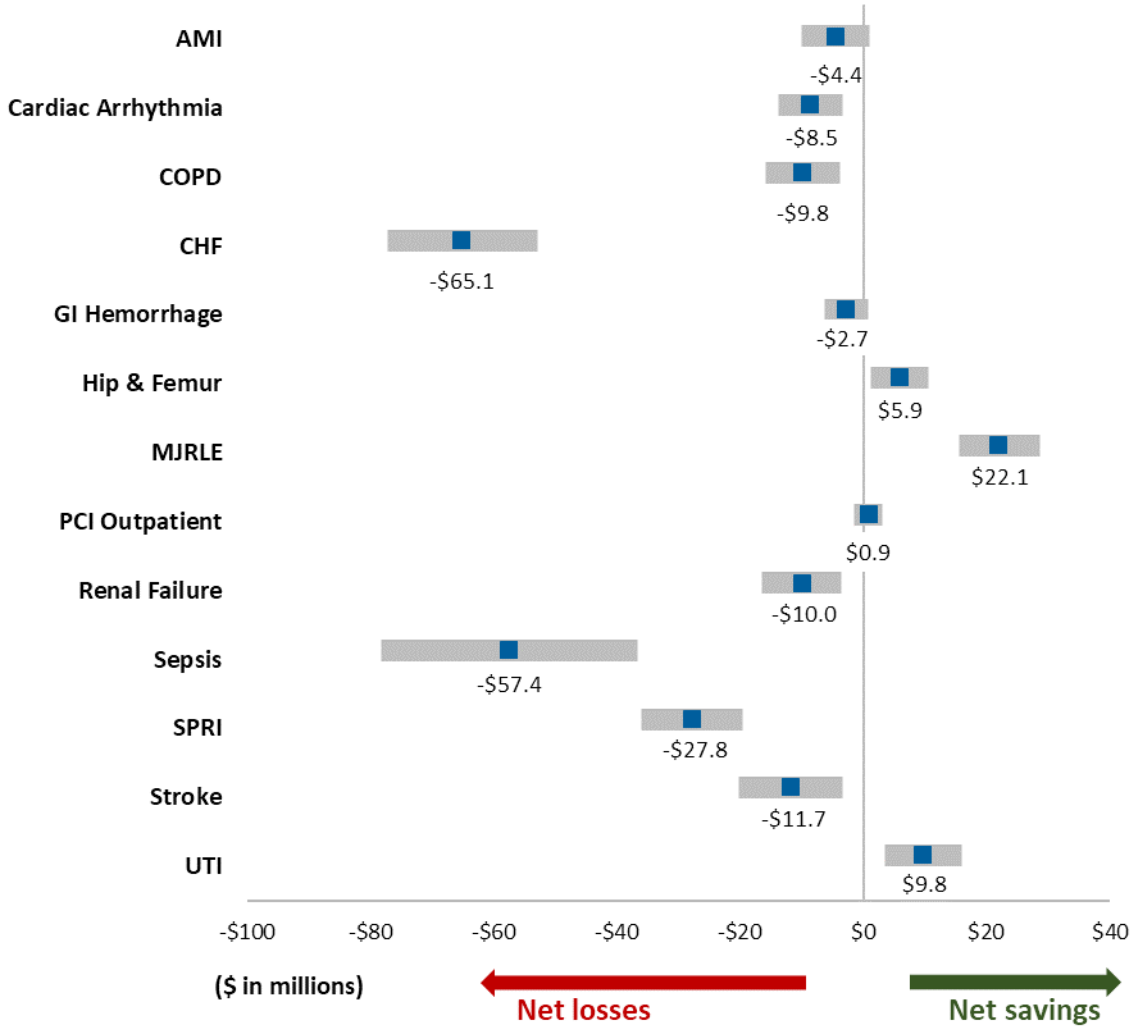
Exhibit 30: Medicare Savings, Hospital EIs, October 1, 2018 – August 3, 2019

Note: The estimated change in non-standardized payments is based on difference-in-differences (DiD) models of standardized Medicare paid amounts for 13 clinical episodes which account for 90% of all episodes initiated by hospital EIs. Net savings to Medicare is the estimated change in non-standardized payments plus reconciliation payments. Horizontal black bars indicate ranges calculated from the summation of 90% confidence intervals from the DiD models. EI=episode initiator.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers and CMS reconciliation data from the same period.

Net Medicare program savings or losses varied by clinical episode (Exhibit 31). Medicare achieved net savings for three clinical episodes. Under BPCI Advanced, Medicare achieved net savings from hospitals participating in MJRLE episodes of $22.1 million, UTI episodes of $9.8 million, and hip and femur of $5.9 million. These three clinical episodes also had the largest reductions in standardized payments per episode and reconciliation payments for these clinical episodes were smaller than the reductions in payments. The largest losses to Medicare were for CHF ($65.1 million), sepsis ($57.4 million), and SPRI ($27.8 million) episodes. Episode payments for CHF and sepsis declined under the model, however, reconciliation payments for these clinical episodes were larger and resulted in Medicare losses.

Exhibit 31: Medicare Savings by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



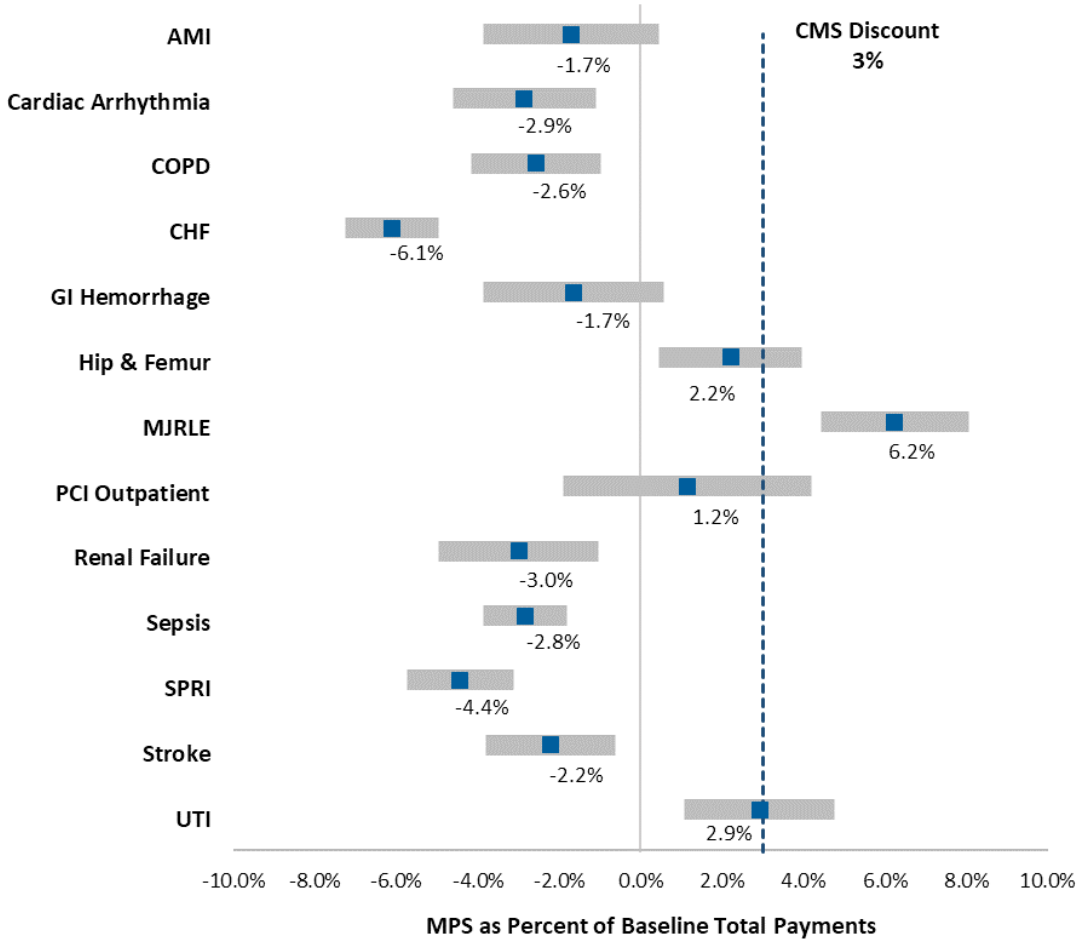
Note: For a given clinical episode, net savings to Medicare is the difference between the change in non-standardized payments and reconciliation payments. Horizontal grey bars indicate ranges calculated from 90% confidence intervals from the DiD models. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers and CMS reconciliation data from the same period.

BPCI Advanced is intended to achieve Medicare savings equal to 3% of what episode payments would have been absent the model. CMS discounts the clinical episode benchmark price by 3% to calculate the target price, which is compared to actual episode payments to determine reconciliation amounts. We compared net changes in Medicare episode payments per clinical episode as a percent of historical episode payments with the 3% discount to assess whether the model achieved this financial goal. The MJRLE clinical episode had net savings that exceeded the 3% discount (Exhibit 32). For three clinical episodes (UTI, hip and femur and outpatient PCI)

there were net savings to Medicare, but the savings was likely below the 3% goal. The remaining nine clinical episode resulted in net losses to Medicare.

Exhibit 32: Medicare Savings as a Percent of Historical Episode Payments by Clinical Episode, Hospital EIs, October 1, 2018 – August 3, 2019



Note: For a given clinical episode, net savings to Medicare is the difference between the change in non-standardized payments and reconciliation payments, calculated as a percent of average historical episode payments. Horizontal grey bars indicate ranges calculated from 90% confidence intervals from the DiD models. The vertical dashed line reflects the CMS discount factored in the target price calculations. AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease; CHF = congestive heart failure; GI = gastrointestinal; Hip & Femur = hip and femur procedures except major joint; MJRLE = major joint replacement of the lower extremity; MPS = Medicare program savings; PCI = percutaneous coronary intervention; SPRI = simple pneumonia and respiratory infections; UTI = urinary tract infection.

Source: The BPCI Advanced evaluation team's analysis of Medicare claims and enrollment data for episodes with anchor stays/procedures that began April 1, 2013 and ended on or before December 31, 2017 (baseline period) and episodes with anchor stays/procedures that began October 1, 2018 and ended on or before August 3, 2019 (intervention period) for BPCI Advanced EIs and matched comparison providers and CMS reconciliation data from the same period.

III. Discussion and Conclusion

A. Discussion

The BPCI Advanced Model tests whether linking Medicare provider payments for an episode of care can reduce Medicare expenditures while improving quality of care. BPCI Advanced builds on the lessons learned from earlier bundled payment models, primarily BPCI Model 2. Its refined payment approach is intended to expand provider participation as well as increase the likelihood that the Medicare program will achieve savings. Further, performance on select quality metrics adjusts reconciliation payments, so that BPCI Advanced qualifies as an APM, which may further boost participation. The quality adjustment is also intended to reinforce the intent of the model to maintain or improve quality of care.

Over the first three Model Years, the reach of BPCI Advanced grew. There was greater hospital and PGP participation in BPCI Advanced than in BPCI. Its reach increased further when additional participants were allowed to join in Model Year 3. One-third of eligible hospitals and one-quarter of eligible clinicians participated in Model Years 1, 2 or 3. Participants reported joining BPCI Advanced to achieve financial gains and drive care transformation. Many wanted to build on past success in other initiatives, or gain experience that could be applicable to future initiatives. The fact that BPCI Advanced is an Advanced APM under the Quality Payment Program, however, did not affect participation decision.

The majority of EIs participated under a convener. Conveners and EIs considered preliminary target prices, historical patient volume, and claims data in selecting clinical episodes for participation. They used the historical data to identify the clinical episodes where they had higher baseline episode payments, which would increase the likelihood that they would achieve NPRA. Many EIs mentioned that their success in the model was the result of the services, management, and tools provided by the convener. PGP representatives we interviewed discussed their strategies for selecting which TIN to use for billing under BPCI Advanced or the creation of new TINs to use under the model to improve their opportunities for receiving NPRA. More than half of PGP TINs did not exist prior to BPCI Advanced and in Model Year 3 one-third of PGP TINS had not billed Medicare in the first two Model Years. Even though broader participation may result in PGP participants being more similar to all PGPs, these strategic billing practices under the model will make it more difficult to generalize BPCI Advanced results to a broader range of PGPs.

During its first 10 months, the BPCI Advanced Model was successful in achieving episode payment reductions in seven of the 13 clinical episodes for hospital EIs. The decline was due to a relative reduction in institutional post-acute care payments. Fewer beneficiaries in BPCI Advanced episodes were first discharged to institutional PAC and for those discharged to a SNF, the intensity of care decreased. These findings are consistent with EIs' care redesign strategies to reduce PAC use. BPCI Advanced hospital representatives also reported that their prior participation in BPCI helped them achieve their early success in BPCI Advanced.

In addition to reducing episode payments, BPCI Advanced is intended to improve or maintain quality of care. We found few indications that quality of care or beneficiary functional status changed for beneficiaries with episodes attributed to hospital EIs. There were no differences in readmission rates across the 13 clinical episodes. For two clinical episodes, there was a relative

decline in the mortality rate for BPCI Advanced episodes and for one clinical episode there was a relative increase. There were no differences in satisfaction, care experience, or self-reported aggregate change in functional status. Overall, it did not appear that BPCI Advanced respondents reported any differences in change in functional status relative to comparison beneficiaries. We will continue to evaluate all evidence about relative changes in quality and functional status under BPCI Advanced.

Despite the reduction in episode payments in seven clinical episodes, after accounting for reconciliation payments, BPCI Advanced resulted in net Medicare program losses during its first 10 months. For the 13 clinical episodes attributed to hospital EIs that we examined, which accounted for approximately 90% of episodes aligned with hospital EIs, Medicare spending was $159 million higher than it would have been absent the model. This is equivalent to 2.4% higher than expected, given historical spending, indicating that BPCI Advanced did not achieve the 3% reduction in baseline spending envisioned in model design.

These results may indicate that the target prices were too high and did not accurately reflect what episode payments would have been absent the model. Because BPCI Advanced is a voluntary model, CMS provided potential participants preliminary target prices to support their decisions about joining. This information allowed providers to make strategic decisions about participation and clinical episode selection. As a result, providers chose to participate and chose clinical episodes where they saw opportunities to earn reconciliation payments. Accounting for this selection into the model and selection among clinical episodes by changing target prices, however, may affect model participation. The opportunity for participants to earn reconciliation payments is a key model feature intended to support participation. Any changes to target prices or the reconciliation process to improve the chances for Medicare savings, therefore, may affect participation in the model.

B. Limitations

The estimates of the impact of BPCI Advanced on episode payments and Medicare program savings reflect 13 clinical episodes and only episodes attributed to hospital EIs. This was due to inadequate sample size for the remaining clinical episodes and challenges in creating appropriate comparison groups for PGPs. Nevertheless, these clinical episodes account for approximately 90% of episodes for BPCI Advanced hospital EIs. In future reports we will expand the number of clinical episodes for which we conduct impact estimates and include impact estimates for PGP initiated episodes.

Our impact estimates are based on a difference-in-differences design, which is dependent on a matched comparison group that is similar to BPCI Advanced providers on key factors expected to influence their decision to participate in the model. A key assumption of this design is parallel trends for a given outcome measure in the baseline period. We evaluated parallel trends in the baseline for each clinical episode and outcome measure, and rejected the null hypothesis that there were parallel trends at the $p<0.10$ level for 16 of 99 (or 16%) outcomes which may indicate that these estimated outcomes are biased.[40]

[40] Because we tested the null hypothesis that there were parallel trends at the 10% significance level, this proportion is above the 10% that would be observed by chance alone. See Appendix I for parallel trends test results.

Our analysis of the beneficiary survey identified differences between BPCI Advanced and comparison respondents, but because the survey data were only collected during the intervention period, we cannot determine whether any differences were pre-existing or caused by BPCI Advanced.

Our conclusion that BPCI Advanced resulted in losses to Medicare in the first 10 months of the model is based on several assumptions. Because of our method for accounting for overlap in episodes, the number of episodes we used was higher than the number of episodes used to determine reconciliation payments. As a result, our estimates of program losses may be too low.

C. Conclusion

The BPCI Advanced Model has built on lessons learned from previous bundled payment models. It has been successful in expanding the providers that are participating and was quick to achieve reductions in episode payments for several hospital-initiated clinical episodes without any decline in quality of care. Despite this promising beginning, however, BPCI Advanced resulted in net losses to Medicare. Beginning in Model Year 4, CMS implemented significant changes to the target pricing methodology and clinical episode definition, which are intended to correct target prices that are too high and better account for selection into the model. Future evaluation reports will explore whether these changes affect Medicare program savings due to the model, while continuing to appeal to a range of providers.