

THIRD EVALUATION REPORT

TECHNICAL APPENDICES

Next Generation Accountable Care Organization Model Evaluation

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Appendix A: List of 2016, 2017, and 2018 Cohort NGACOs

Exhibit A.1. The 2016, 2017, and 2018 Cohort NGACOs

NGACO Organization Name	NGACO Abbreviated Name	Financial Responsibility in PY3 (2018)	
		Yes	No
2016 Cohort			
Accountable Care Coalition of Southeast Texas, Inc.	ACCST	■	
Beacon Health, LLC§	Beacon		■
Bellin Health DBA Physician Partners, Ltd. (PPL)	Bellin	■	
Cornerstone Health Enablement Strategic Solutions, LLC	CHESS	■	
Deaconess Care Integration	Deaconess	■	
Henry Ford Physician Accountable Care Organization	Henry Ford	■	
Lifepoint Accountable Care Organization, LLC	Optum	■	
MemorialCare Regional ACO, LLC§	MemorialCare		■
OSF Healthcare System§§	OSF		■
Park Nicollet Health Services	Park Nicollet	■	
Pioneer Valley Accountable Care, LLC	Pioneer Valley	■	
Prospect ACO CA, LLC§§	Prospect		■
Steward Integrated Care Network, Inc.	Steward	■	
ThedaCare ACO LLC	ThedaCare	■	
Triad HealthCare Network, LLC	Triad	■	
Trinity Health ACO, Inc.	Trinity	■	
UniPhy ACO LLC§	UniPhy		■
UnityPoint Accountable Care	UnityPoint	■	
2017 Cohort			
Accountable Care Coalition of Chesapeake, LLC§	ACCC		■
Accountable Care Options, LLC	Accountable Care Options	■	
Allina Integrated Medical Network§	Allina		■
APA ACO, Inc.	APA	■	
Arizona Care Network, LLC	Arizona	■	
Atrius Health, Inc.	Atrius	■	
Bronx Accountable Healthcare Network IPA, Inc. (Montefiore)	Bronx	■	
Carilion Clinic Medicare Shared Savings Company, LLC	Carilion	■	
Dartmouth-Hitchcock Health	Dartmouth-Hitchcock	■	
Fairview Health Services§	Fairview		■
HCP ACO California, LLC	HCP	■	
Hill Physicians Medical Group	Hill	■	
Indiana University Health	Indiana U	■	
Integra Community Care Network LLC	Integra	■	
KentuckyOne Health Partners, LLC§	KentuckyOne		■
Michigan Pioneer ACO, LLC	MPACO	■	

NGACO Organization Name	NGACO Abbreviated Name	Financial Responsibility in PY3 (2018)	
		Yes	No
Monarch Health Plan§	Monarch		■
National ACO LLC	NatACO	■	
Northwest Momentum Health Partners	NW Momentum	■	
Partners Community Physicians Organization	Partners	■	
Premier Health ACO of Ohio§	Premier		■
ProHealth Solutions, LLC	ProHealth	■	
Prospect ACO Northeast, LLC	ProspectNE	■	
Heritage California ACO (Regal Medical Group)	RHeritage	■	
Sharp HealthCare ACO - II, LLC§	Sharp		■
St. Luke's Clinic Coordinated Care, LTD	St. Luke's	■	
UNC Senior Alliance, LLC	UNC	■	
UT Southwestern Accountable Care Network	UTSW	■	
2018 Cohort			
Accountable Care Coalition of TN	ACC of TN	■	
Best Care Collaborative	Best Care Collab	■	
CareMount ACO	CareMount	■	
Central Utah Clinic (Revere Health)	Central Utah	■	
Connected Care of Southeastern Massachusetts (South Shore Physician-Hospital Organization, Inc.)	Connected Care	■	
CoxHealth Accountable Care, LLC	CoxHealth	■	
Franciscan Missionaries of Our Lady Health System Clinical Network, LLC	Franciscan	■	
Mary Washington Health Alliance LLC	Mary Washington	■	
NECQA Accountable Care, Inc.	NECQA	■	
North Jersey Health Alliance LLC (Mission Health Coordinated Care)	North Jersey	■	
Primaria ACO, LLC	Primaria	■	
Primary Care Alliance	Primary Care Alliance	■	
Reliance Next Gen ACO, LLC	Reliance	■	
Reliant Medical Group, Inc.	Reliant	■	
Torrance Memorial Integrated Physicians, LLC	Torrance	■	
UW Health ACO, Inc.	UW Health	■	

NOTES: §NGACO withdrew from the model before start of PY3, §§ ACO withdrew from the model before start of PY2. OneCare Vermont is not included in the NGACO model's evaluation reports.

Appendix B: Glossary of Acronyms and Terms

Acronym	Definition
ACO	Accountable Care Organization
ACSC	Ambulatory care-sensitive condition
A/D	Aged and disabled
AHA	American Hospital Association
AIPBP	All-inclusive population-based payment
APM	Alternative payment model
AWV	Annual wellness visit
BETOS	Berenson-Eggers Type of Service categories, used to analyze Medicare costs
BPCI	Bundled Payments for Care Initiative Model
BY	Baseline year
CAH	Critical access hospital
CAHPS	Consumer Assessment of Healthcare Providers and Systems
CCR	Coordinated care reward
CCW	Chronic Conditions Data Warehouse
CJR	Comprehensive Joint Replacement Model
CPC, CPC+	Comprehensive Primary Care Model, Comprehensive Primary Care Plus Model
DID	Difference-in-differences (study design)
DME	Durable medical equipment
DRG	Diagnosis-related group
E&M	Evaluation and management visit (hospital outpatient and/or office visit)
ED	Emergency department
EDB	Enrollment data base
EHR	Electronic health record
ESRD	End-stage renal disease
FAI	Financial Alignment Initiative Model
FFS	Medicare fee-for-service
FQHC	Federally qualified health center
GEM	Generalized equivalence mapping
GLM	Generalized linear model
GPCI	Geographic pricing cost index
GPRO	Group Practice Reporting Option
HCC	Hierarchical condition category (risk score)
HHA	Home health agency
HHI	Herfindahl-Hirschman Index
HICN	Health insurance claims number (Medicare beneficiary identification)
HIE	Health information exchange
HRR	Hospital referral region
HS	Hospice
IAH	Independence at Home Model
ICD	International classification of diseases
IDN	Integrated delivery network
IDR	Integrated Data Repository
IDS	Integrated delivery (health) system

Acronym	Definition
IP	Inpatient
IRF	Inpatient rehabilitation facility
ISP	Infrastructure payments
IT	Information technology, health information technology (HIT)
LLP	Limited liability partnership
LTCH	Long-term care hospital
MAPCP	Multi-Payer Advanced Primary Care Practice Model
MBSF	Master Beneficiary Summary File
MDE	Minimum detectable effect
MDM	Master data management
MD-PPAS	Medicare Data on Provider Practice and Specialty
MIPAA	Medicare Improvements for Patients and Providers Act of 2008
SSP	Medicare Shared Savings Program
MU	Meaningful use
NGACO	Next Generation Accountable Care Organization
NPI	National provider identifier
NPPES	National Plan and Provider Enumeration System
OCM	Oncology Care Model
PB	Provider-based determination
PBP	Population-based payment
PBPM	Per beneficiary per month
PECOS	Provider Enrollment, Claim, and Ownership System
PQRS	Physician Quality Reporting System
PY	Performance year
QEM	Qualified evaluation and management visit
RHC	Rural health clinic
RIF	Medicare Research Identifiable Files
SNF	Skilled nursing facility
TIN	Tax identification number
VM	Value modifier payment adjustment
VRDC	Virtual Research Data Center
ZCTA	ZIP code tabulation area

Appendix C: List of Evaluation Questions

Question Number	Research Question	Evaluated in Report 3	To be Evaluated in Future Reports
Features			
1	Which NGACO organizational features (e.g., approaches to governance, delivery structure, NGACO-provider relationships and types of provider contracts, care management approach, characteristics of infrastructure) are important determinants of participation in the model, selection of model features, and eventual success or failure in the model? How do the organizational features of NGACOs affect the likelihood of success or failure?	■	■
1a	Which organizational features of NGACOs are important determinants of the model features selected, and success or failure for model tracks, such as risk arrangement, payment mechanism, or benefit enhancements?	■	■
1b	What important organizational adaptations did NGACOs make between startup and exit from the model or model closeout?	■	■
Features			
2	In what ways do NGACOs undergo financial, organizational, and care delivery transformation as a result of participating in the NGACO model?	■	■
2a	For organizations that participated in the Pioneer ACO model or the SSP prior to the NGACO model, in what ways has financial, organizational, and care delivery transformation in the NGACO model differed from the changes made under the previous model or program?	■	■
2b	Which features of the NGACO model, Pioneer ACO model, or SSP can be linked to differences in financial, organizational, and care delivery transformation between the NGACO and earlier models?	■	■
2c	How does the NGACO model impact care delivery practices such as care coordination and patient-centeredness?		■
Features			
3	What incentive and accountability structures do NGACOs use to influence the quality, cost, and utilization of health services provided to aligned beneficiary populations? In what ways do the approaches used evolve over the duration of the model?	■	■
3a	Which approaches used by NGACOs are associated with improved coordination of care relative to health care delivered in FFS Medicare or other points of comparison?		■
3b	What specific arrangements or features (e.g., communication protocol between providers, individualized care plan, diabetes management education) of their care management programs do NGACOs consider essential or critical for improving care and managing the utilization and cost of aligned populations? Why are these arrangements considered essential?	■	■
3c	Are there key features of NGACO care management programs that are common across one or more NGACOs in the model? Are there features of NGACO care management programs that are different across NGACOs?	■	■
3d	What changes in NGACO care management programs occurred over the duration of the model that affected quality, experience of care, expenditures, or beneficiary engagement and activation?		■
Features			
4	How do participating and preferred providers of NGACOs affect the likelihood of an NGACO's success or failure in the model?		■

Question Number	Research Question	Evaluated in Report 3	To be Evaluated in Future Reports
Impact			
5	How does the model affect the cost of health services provided to NGACO beneficiaries relative to comparable beneficiaries in FFS Medicare (those in usual care or in SSP ACOs)? What are the net savings from the model, after accounting for shared savings payments made by CMS to ACOs?	■	■
5a	What are the effects of the model on Medicare expenditures overall as well as components of expenditures (e.g., inpatient, outpatient, physician, skilled nursing facility, home health, hospice, durable medical equipment)? To what extent can observed effects be attributed to model features (e.g., risk arrangements chosen), characteristics of NGACOs, NGACO providers, aligned beneficiary populations, or other characteristics?	■	■
5b	To what extent are changes in cost attributable to changes in the delivery of unnecessary care, preventable episodes of care (e.g., readmissions due to inpatient medical errors, ambulatory care sensitive inpatient admissions)?	■	■
5c	What cost savings can be attributed to the care management features identified in questions #3a-#3d?		■
Impact			
6	How does the model affect utilization among model beneficiaries relative to comparable beneficiaries in FFS Medicare, both overall and for different types of utilization (e.g., readmissions, frequency and use of post-acute care services, pattern of physician visits)?	■	■
Impact			
7	How does the model impact the quality of care experienced by patients relative to comparable patients in FFS Medicare? Quality of care may include, but is not limited to, measures reflecting appropriateness, effectiveness, timeliness of care, safety, patient clinical and functional outcomes, risk of hospital acquired conditions, readmissions, preventable hospitalizations, or ambulatory care sensitive condition admissions.	■	■
Impact			
8	How does the model affect the use of arrangements or interventions designed to improve patient engagement with their providers and management of their own medical care relative to comparable beneficiaries in FFS Medicare?	■	■
8a	In what ways do participant NGACOs use the model's benefit enhancement features (including voluntary alignment) and what are the effects of these features on beneficiary engagement and adherence?	■	■
8b	How does the model impact beneficiaries' knowledge and comprehension about their health care and health? Are beneficiaries aware when they are aligned with an NGACO?		■
Impact			
9	How does the model affect patient access to health services relative to comparable patients in FFS Medicare?		■
Impact			
10	How does the model affect provider experience and incentives in the delivery of care?	■	■
10a	To what extent are NGACOs and their constituent physician practices using financial (such as change in compensation, bonuses, etc.) or non-financial arrangements (such as practice changes that will improve time management, etc.) with individual clinicians to create incentives for greater efficiency in the delivery of care or improvements in the quality of care?	■	■
10b	Does the model create a context for physician practices that is financially sustainable? Why or why not?		■

Question Number	Research Question	Evaluated in Report 3	To be Evaluated in Future Reports
10c	What kinds of challenges does the model introduce for individual clinicians practicing medicine?		■
Impact			
11	What unintended behavioral responses not otherwise examined are elicited from NGACOs, hospitals, physicians, and beneficiaries given the incentives provided through the model?	■	■
Variation/Replicability			
12	What factors are associated with the pattern of results seen?	■	■
12a	Characteristics of model features chosen by participants: <ul style="list-style-type: none"> ■ Risk track selected by the NGACO ■ Payment mechanism ■ Benefits enhancements ■ Other model features, such as the share of beneficiaries aligned via voluntary alignment 	■	■
12b	Characteristics of the NGACOs' organization and relationship with providers <ul style="list-style-type: none"> i. Organizational history prior to participating in the NGACO model, including prior experience in ACO-like arrangements such as risk-based contracts, value-based reimbursement, or Medicare Advantage Ownership (e.g., independent, health system), type of control (e.g., for-profit, not-for-profit, public) and organizational model (e.g., independent practice association, integrated hospital system, physician hospital organization) Health information technology infrastructure, extent of interoperability, and the extent to which claims, lab results, utilization and other clinical data is readily translated into actionable information for use by NGACO staff, providers and beneficiaries Characteristics of the NGACOs' arrangements with and approach to managing providers including business relationships with network physicians and physician organizations Characteristics of NGACO workforce, structure and relationship with parent organization 	■	■
12c	Characteristics of the NGACOs' health care delivery system <ul style="list-style-type: none"> ii. Size (i.e. number of physicians or beneficiaries), range of services included across the care continuum Degree to which providers in the NGACO are vertically integrated Arrangements facilitating coordination of health services by providers Model-specific interventions used to implement their chosen strategies for delivering care (e.g., use of waivers under the model, care coordination interventions) Relationships with community-based organizations 		■
12d	Characteristics of NGACOs' aligned patient populations <ul style="list-style-type: none"> iii. Clinical conditions, functional status, health status Socioeconomic status Demographic attributes Characteristics of vulnerable patient subgroup populations (impoverished patients, beneficiaries with 3 or more chronic conditions, dual eligible beneficiaries) 		■

Question Number	Research Question	Evaluated in Report 3	To be Evaluated in Future Reports
12e	Characteristics of the NGACOs' service area or market iv. Variation in health care utilization due to small area variation and per capita spending levels within the market Penetration in the market by NGACOs, managed care arrangements, Medicare Advantage plans, or other CMS models and Programs Degree of rurality of areas included in the NGACO's market Nature of competition, market structure and collaborative-ness among provider organizations in the NGACO's market Overall market structure of insurers within the market and the extent to which that structure promotes care coordination Regulatory conditions, such as state policy incentives		■
12f	Characteristics of the comparison group or population used in the evaluation v. Demographic, socioeconomic, and clinical characteristics of beneficiaries included in comparison populations Organization and characteristics of providers in the comparison group Degree to which the comparison population's market is penetrated by other federal ACO models or Programs, managed care payers, Medicare Advantage plans, or other non-ACO CMS models or Programs		■
Variation/Replicability			
13	To what degree are the observed impacts of the model replicable?		■
13a	What are the key factors that moderate the replicability of the model's observed impacts?		■
13b	Are these factors primarily considerations specific to an NGACO's patient population, its organizational characteristics, attributes of its participating providers, its market, the comparison group used or some other aspect?		■
13c	What are the opportunities for the NGACO model to spread other Medicare regions and patient populations?		■
Motivation/Challenges			
14	What were the motivating factors for participating in the NGACO model and reasons for withdrawing from the model?	■	■
14a	What are the reasons motivating physicians and other clinicians to participate in the model?	■	■
14b	What role, if any, do the benefit enhancements available under the model play in motivating clinician participation?	■	■
14c	To what extent can the motivation of participating institutional providers be attributed to the potential for financial gains, capacity improvement, or other factors?		■
14d	Among NGACOs that cease to participate, what are the reasons for their decision?		■
14e	For physicians or institutional providers who cease to participate, what are the reasons for their decision?		■
Motivation/Challenges			
15	To what degree did NGACOs implement interventions as planned, and what important challenges or opportunities did NGACOs face that resulted in a change from their original plans?	■	■
15a	What are the barriers, if any, to implementation?	■	■
15b	From the NGACO's perspective, what were the primary drivers of organizational and operational change in the NGACO, specifically its approaches to contracting and management of providers, quality improvement and care management, and patient engagement and adherence?	■	■

Question Number	Research Question	Evaluated in Report 3	To be Evaluated in Future Reports
Motivation/Challenges			
16	To what degree are challenges to success and sustainability cited by former participants in the Pioneer ACO Model or the SSP (i.e., turnover in ACO aligned beneficiary populations over time, cash flow for the NGACO, the financial predictability of the prospective benchmark) also experienced in the NGACO model? Are any observed barriers resolved or mitigated? If yes, how?		■

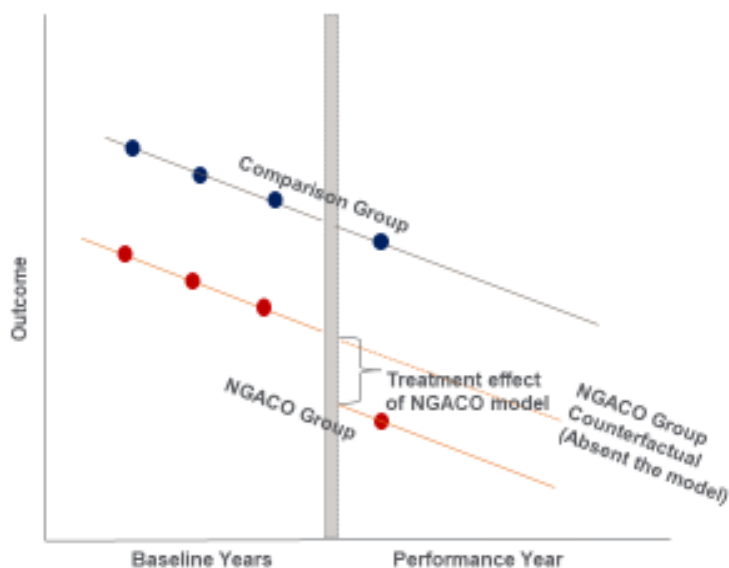
Appendix D: Quantitative Methods and Analysis

Study Design for Assessing Impact for the NGACO Model

Difference-in-Differences (DID) Design

Using the DID design, we assessed the impact of the NGACO model in PY1, PY2 and PY3. As shown in Exhibit D.1, the design compares differences in outcomes for the NGACO and propensity-score-weighted comparison beneficiaries (residing in the same markets) in a performance year against differences in outcomes for the NGACO and comparison groups in three preceding baseline years (BY1, BY2, BY3) for each cohort. A separate comparison group in the baseline period is created for each performance year by identifying beneficiaries who would be eligible for alignment with an NGACO had their care mainly been with NGACO providers. The comparison group and the NGACO group's baseline are used to establish what would have happened to the NGACO beneficiaries in a performance year in the absence of the NGACO model. The NGACO model's treatment effect is estimated relative to this treated counterfactual. The DID design assumes that time-varying and time-invariant, unobservable factors affect the treatment and **comparison group** similarly. If observed characteristics between the NGACO and comparison groups are correlated with unobserved characteristics between the two groups, using propensity-score weights mitigates biases that may result from observed and unobserved differences influencing outcomes between the two groups. A key assumption of our DID design is that changes in outcomes from the baseline years to **performance year** would have been similar in the NGACO and comparison group in the absence of the NGACO model. We test the assumption of parallel trends across the baseline years by comparing the NGACO group's trend in BY1 to BY3 against the trend in the comparison group for all outcomes and note where the assumptions passed and failed for each cohort and model-wide.

Exhibit D.1. Use of DID to Estimate the NGACO Model’s Treatment Effect for Each Cohort



Performance and Baseline Years

As discussed, the analysis employed a DID design to examine changes in outcomes for the NGACO and comparison group beneficiaries in PY1, PY2, PY3 relative to three preceding baseline years (BY1, BY2, BY3, with the third year being the most remote relative to the PY) for each cohort. Exhibit D.2 shows calendar years (CY) as they correlate with performance years and baseline years for three NGACO cohorts.

Exhibit D.2. Baseline Years and Performance Years for 2016, 2017, and 2018 NGACO and Comparison Group Cohorts

Performance Year	NGACO and Comparison Group	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
PY1 (CY 2016)	2016 Cohort	BY3	BY2	BY1	PY1	-	-
PY2 (CY 2017)	2016 Cohort	BY3	BY2	BY1	-	PY2	-
	2017 Cohort	-	BY3	BY2	BY1	PY2	-
PY3 (CY 2018)	2016 Cohort	BY3	BY2	BY1	-	-	PY3
	2017 Cohort	-	BY3	BY2	BY1	-	PY3
	2018 Cohort	-	-	BY3	BY2	BY1	PY3

NOTE: CY = calendar year (January 1 through December 31).

Defining NGACO and Comparison Groups

Exhibit D.3 summarizes how the NGACO and comparison groups are defined for performance years and baseline years in the Third Evaluation Report. For each performance year and its respective baseline years, NGACO beneficiaries and comparison beneficiaries were *prospectively attributed* to the performance-year NGACO providers or providers unaffiliated with any Medicare ACO, respectively.

Exhibit D.3. Summary of NGACO and Comparison Groups in Baseline Years and Performance Years

	Baseline Years	Performance Years
NGACO Group		
All NGACO-aligned FFS beneficiaries	Beneficiaries residing in NGACO market areas in the baseline years prospectively attributed to NGACO participating providers in a given performance year using the model's alignment rules, and aligned for at least 30 days in the year	Beneficiaries prospectively attributed to NGACO participating providers in a given performance year using the model's alignment rules, situated in NGACO market areas, and aligned for at least 30 days in the year
Comparison Group		
Alignment-eligible FFS beneficiaries in NGACO markets not aligned with NGACOs	Beneficiaries residing in NGACO market areas in the baseline years prospectively attributed to providers unaffiliated with any Medicare ACO during the baseline year using NGACO model alignment rules and aligned for at least 30 days in the year	Beneficiaries residing in NGACO market areas prospectively attributed to providers unaffiliated with any Medicare ACO during the performance year using NGACO model alignment rules and aligned for at least 30 days in the year

Alignment Approach

We followed the NGACO model's alignment algorithm to prospectively attribute beneficiaries to the NGACO and comparison groups in our analyses.¹ We use the term *prospective attribution* because the NGACO model's alignment for a performance year and baseline years is based on Medicare claims from a *preceding* 24-month alignment period. We used the alignment algorithm to attribute beneficiaries to an NGACO's participating providers or to non-NGACO providers in each baseline or performance year based on providers who rendered the largest share of dollars for beneficiaries' qualifying evaluation and management (QEM) visits in the alignment period.²

¹ A full description of the alignment algorithm is available from: RTI International. Next Generation ACO Model Benchmarking Methods (Appendix A). December 15, 2015. Available at <https://innovation.cms.gov/Files/x/nextgenaco-methodology.pdf>.

² QEM codes consist of the following: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99339, 99340, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99490, G0402, G0438, G0439.

Exhibit D.4. Alignment Periods for the Third Performance Year Evaluation

Performance Year	Cohort	Period Type	CY 2013	CY 2014	CY 2015	CY 2016	CY 2017	CY 2018
PY3 (CY 2018)	2016 Cohort		BY3	BY2	BY1	-	-	PY3
		Alignment Period	July 1, 2010 – June 30, 2012	July 1, 2011 – June 30, 2013	July 1, 2012 – June 30, 2014	-	-	July 1, 2015 – June 30, 2017
	2017 Cohort		-	BY3	BY2	BY1	-	PY3
		Alignment Period	-	July 1, 2011 – June 30, 2013	July 1, 2012 – June 30, 2014	July 1, 2013 – June 30, 2015	-	July 1, 2015 – June 30, 2017
	2018 Cohort		-	-	BY3	BY2	BY1	PY3
		Alignment Period	-	-	July 1, 2012 – June 30, 2014	July 1, 2013 – June 30, 2015	July 1, 2014 – June 30, 2016	July 1, 2015 – June 30, 2017

NOTES: The alignment periods were applied to the NGACO and comparison group. CY = calendar year (January 1 through December 31). BY= base year; PY = performance year

We used the following seven steps to implement the alignment algorithm:

1. We identified alignment-eligible NGACO participating providers in PY3 and alignment-eligible non-NGACO providers in each BY or PY. The former set of providers were identified from the participating provider file used by the program analysis contractor for alignment. Alignment-eligible providers in PY3 were identified as practitioners within practices or, in the case of federally qualified health centers, rural health clinics, and critical access hospitals, practitioners within facilities.³ In defining the baseline providers, we identified the alignment-eligible providers by combinations of tax identification number (TIN) and national provider identifier (NPI) or CMS certification number (CCN) and NPI for the 2018 cohort. However, to define the baseline for the second year of the 2016 and 2017 cohorts, we identified the alignment-eligible providers by NPI alone to more comprehensively capture their practitioners’ performance over time (because TIN-NPI and CCN-NPI combinations can change over time). Alignment-eligible practitioners had selected primary care or specialist designations.⁴ Alignment for the comparison group in each cohort mirrored the approach used for the NGACO group.
2. We identified alignment-eligible beneficiaries at the beginning of each BY or PY using the enrollment database. Alignment-eligible beneficiaries had to: (1) be alive; (2) be covered by Medicare Parts A and B; (3) not be in a Medicare Advantage or other Medicare managed care plan; (4) not have Medicare as their secondary payer; (5) reside in the United States; and (6) have at least one paid claim for a QEM service during the two-year alignment period.

³ Federally qualified health centers, rural health clinics, and critical access hospitals were identified based on billing codes 77, 71, and 85, respectively, on outpatient claims. Practitioners billing through CAHs included those that receive payment from Medicare through the Optional Payment Method, where the CAH bills for facility and professional outpatient services to Medicare when physicians or practitioners reassign billing rights to them.

⁴ Primary care practitioners included those with specialty codes 01, 08, 11, 37, 38, 50, 89, and 97. Specialists included those with specialty codes 06, 12, 13, 16, 23, 25, 26, 27, 29, 39, 46, 70, 79, 82, 83, 84, 86, 90, and 98.

3. For all alignment-eligible beneficiaries in the BY and PY, we used Medicare claims to determine the total allowable charges for all QEM services received from the collection of providers composing each NGACO or non-NGACO provider during the alignment period. Charges from the earliest alignment year were weighted by one-third, and those in the recent alignment year were weighted by two-thirds to obtain the total weighted allowable charges for each alignment-eligible beneficiary.
4. We aligned each eligible beneficiary to the collection of providers composing an NGACO or group of non-NGACO providers according to the NGACO model's alignment rules based on the percentage of the beneficiary's weighted allowable charges for QEM services over the alignment period. The alignment rules give precedence to primary care specialists over other selected specialists and used the degree to which QEMs were most recent to break ties regarding which collection of providers the beneficiary should be aligned to.
5. We attributed voluntarily aligned beneficiaries to the NGACO in the PY.⁵ Voluntarily aligned beneficiaries were also aligned with the NGACOs in the BYs if they were deemed to be alignment-eligible at the beginning of those years.⁶ Voluntary alignment took precedence over claims alignment.
6. We checked the match between our aligned beneficiaries and the NGACO program analysis contractor's list of prospectively aligned beneficiaries in PY3. For our analysis, we retained NGACO PY2 beneficiaries who matched with the program analysis contractor's prospectively aligned beneficiary list in PY3. We had a match rate of 98 percent with the program analysis contractor's prospectively aligned population.

⁵ The proportion of NGACO voluntarily aligned beneficiaries was 0.61 percent for PY3 (0 percent for the 2018 cohort, 0.52 percent for the 2017 cohort, and 1.12 percent for the 2016 cohort), 1.03 percent for PY2 (0.62 percent for the 2017 cohort and 1.67 percent for the 2016 cohort), and 0.67 percent for PY1 (for the 2016 cohort).

⁶ The following proportion of 2016 cohort NGACO PY3 beneficiaries were voluntarily aligned in baseline years: 1.10 percent for BY1, 1.02 percent for BY2, and 0.95 percent for BY3. The following proportion of the 2017 cohort NGACO PY3 beneficiaries were voluntarily aligned in baseline years: 0.51 percent for BY1, 0.52 percent for BY2, and 0.53 percent for BY3.

7. Per the NGACO model's alignment rules, aligned NGACO beneficiaries are excluded from the model over the course of the performance year if events such as enrollment in a Medicare managed care plan or loss of part A or B coverage occurs.⁷ We excluded NGACO and comparison beneficiaries based on the NGACO model's exclusion criteria to determine their duration of alignment with the NGACO or comparison group in each BY or PY. A beneficiary was aligned with an NGACO or comparison group for all months of a baseline or performance year until he or she met an exclusion criterion. In PYs, we also excluded beneficiaries identified by the program analysis contractor for exclusion from the model on a quarterly basis under the model's alignment rules.⁸ We restricted NGACO and comparison beneficiaries to those in hospital referral regions (HRRs) containing 1% or more of PY NGACO aligned beneficiaries. Beneficiaries who met exclusion criteria were retained in our evaluation from the beginning of the year until the date they met an exclusion criterion.⁹ We identified the date a beneficiary's alignment ended for the year (alignment end date) either as his or her date of exclusion from alignment or the last day of the calendar year. For each BY or PY, a beneficiary was aligned with the NGACO or comparison group from the first day of the year until the alignment end date. We had a match rate of over 92 percent of the final population used by the program analysis contractor for financial reconciliation in PY3.¹⁰

NGACO and Comparison Group Providers

In the following section, we describe the providers used for determining aligned NGACO and comparison beneficiaries in PYs and BYs for the 2016, 2017, and 2018 cohorts.

2016, 2017, and 2018 NGACO Cohort Providers in PY3. We identified providers participating in the 2016, 2017, and 2018 NGACO cohorts in PY3 (2018) using the participating provider alignment file from the program analysis contractor.¹¹ Preferred providers were not used for alignment.¹² Participating providers were required to be practitioners (i.e., identified by NPIs) with primary care or specialist

⁷ A beneficiary was deemed aligned with the NGACO or comparison group during the performance year or baseline year from the beginning of the year until he or she had: (1) died; (2) had Medicare as a secondary payer during any month of a performance year or baseline year; (3) lost Medicare Part A or Part B during any month of a performance year or baseline year; (4) transitioned to Medicare Advantage or other managed care plan during any month of a performance year or baseline year; (5) resided in a non-U.S. location during any month of a performance year or baseline year; or (6) was aligned to another Medicare shared-savings initiative in the performance year. Prior to financial reconciliation, the program analysis contractor excludes NGACO-aligned beneficiaries who moved outside of an NGACO's extended service area during a performance year or received a majority of QEM services from a provider located outside of an NGACO's extended service area during a performance year. For the evaluation, we do not apply the latter exclusions to the NGACO or comparison group in the performance year or baseline year.

⁸ The program analysis contractor shares lists of excluded beneficiaries on a quarterly basis with NGACOs to inform them of the beneficiary population that the ACOs are responsible for, so that the ACOs can suitably target their care coordination and care management efforts. Under the model, ACOs do not have any financial responsibility for excluded beneficiaries. Therefore, beneficiaries excluded by the program analysis contractor were also excluded from the evaluation beyond their date of exclusion.

⁹ In contrast, the program analysis contractor excluded such beneficiaries from financial calculations for the year.

¹⁰ This discrepancy is likely due to differences in timing of enrollment information and claims used for quarterly exclusions by the program analysis contractor and for the evaluation.

¹¹ The participating provider alignment file differs from the complete list of NGACO participating providers active during the PY. The latter list includes participating providers added by the NGACO during the PY.

¹² Preferred providers, who are practitioners or facilities, contribute to the NGACO's goals by extending its network of providers to coordinate and furnish value-based care for its aligned beneficiaries. Preferred providers may elect to render benefit enhancements for aligned beneficiaries. They may also elect population-based payment arrangements with their NGACO.

designations, according to the model's alignment rules in PY2, within either NGACO practices (as determined by TINs) or federally qualified health centers, rural health clinics, or critical access hospitals delivering outpatient services (i.e., identified by CCNs). The complete set of NGACO participating providers for alignment in PY3 was identified by their TIN-NPI and CCN-NPI combinations for the 50 NGACOs with financial liability for shared savings in 2018.

- For the 13 NGACOs in the 2016 cohort, and 21 NGACOs in the 2017 cohort, we defined participating providers in PY3 as providers retained by the NGACOs from PY2, plus new providers who joined the NGACOs before the start of PY3.
- For the 16 NGACOs in the 2018 cohort, we defined participating providers in PY3 as providers who joined these NGACOs before the start of PY3, their first year in the model.

2016, 2017, and 2018 NGACO Cohort Providers in the Baseline Period. We identified the group of providers to align beneficiaries to NGACOs during the baseline period from all identifiable alignment eligible participating providers in PY3. Since the baseline period varied by cohort, the set of providers used to align beneficiaries during the baseline period varied as follows:

- For the 2016 and 2017 cohorts, we used alignment eligible participating providers in PY3 to align beneficiaries to the cohort's baseline years (2013-2015 for the 2016 cohort, and 2014-2016 for the 2017 cohort). This approach places greater emphasis on the baseline performance of individual practitioners participating in PY3 (the third and second model years for the 2016 and 2017 cohorts respectively) than the practice associations that were present under NGACO; practitioner-practice combinations (TIN-NPIs and CCN-NPIs) observed in later performance years are less likely to be observed in the baseline years.
- For the 2018 cohort, we identified participating providers in the baseline years as participating practitioners within participating practices (TIN-NPIs and CCN-NPIs) in PY3.

2016, 2017, and 2018 Cohort Comparison Group Providers in PY3. For the 2016, 2017, and 2018 cohorts, the comparison group of providers in PY3 included providers who were not affiliated with any Medicare ACO in the given year. Providers who left the NGACO model after PY1 and PY2 are eligible for inclusion in the comparison group in subsequent years.

2016, 2017, and 2018 Cohort Comparison Group Providers in the Baseline Period. Comparison group providers in the baseline years comprised providers who were not NGACO providers in PY3, as well as providers who were not in Medicare ACOs in the respective baseline years. As with the performance years, the comparison group in the baseline years may include providers who formerly or subsequently participated in a Medicare ACO.¹³ We assume that once providers leave a Medicare ACO and return to usual FFS Medicare, they are valid representatives of the comparison group.

¹³ Providers who subsequently became NGACO providers in the PY were excluded from the comparison group providers.

NGACO Market Areas for Evaluation of the Model

For the purpose of this evaluation, we defined an NGACO’s market area as the collection of hospital referral regions (HRRs) where one percent or more of an NGACO’s aligned population of beneficiaries resided in the PY.¹⁴ By defining the NGACOs’ market areas using HRRs, we examine of the impact of the NGACO model in market areas where NGACOs have a meaningful footprint, using a sizable comparison group of non-NGACO beneficiaries in the same markets. HRRs have been used to define markets in prior ACO evaluations.¹⁵ Exhibit D.5 lists and enumerates the HRRs that comprise the markets for the 50 NGACOs in PY3. We limited our evaluation to NGACO and comparison group beneficiaries located in these market areas. To ensure that comparison beneficiaries drawn from the same markets were similar to NGACO beneficiaries, we propensity score weighted them on observed demographics, disease burden, and ZIP code-level community characteristics, as discussed in the section on propensity score weighting.

Exhibit D.5. NGACO’s Market Areas for Evaluation of the Model in PY3

NGACO	# of HRRs in the Market Area	State and City of HRRs Comprising the Market Area
2016 Cohort		
ACCST	2	TX: Beaumont, Houston
Bellin	3	MI: Marquette; WI: Appleton, Green Bay
CHESS	4 ^a	NC: Charlotte, Greensboro, Hickory, Winston-Salem
Deaconess	5 ^a	IN: Evansville, Indianapolis; KY: Louisville, Owensboro, Paducah
Henry Ford	6 ^a	MI: Ann Arbor, Dearborn, Detroit, Flint, Pontiac, Royal Oak
Park Nicollet	2	MN: Minneapolis, St. Paul
Pioneer Valley	4 ^a	CT: Hartford; MA: Boston, Springfield, Worcester
Steward	7 ^a	FL: Orlando; MA: Boston, Worcester; NH: Manchester; OH: Youngstown; PA: Allentown; RI: Providence
ThedaCare	5 ^a	WI: Appleton, Green Bay, Marshfield, Milwaukee, Neenah
Triad	3	NC: Durham, Greensboro, Winston-Salem
Trinity	14 ^a	IL: Blue Island, Chicago, Hinsdale, Joliet, Melrose Park; MI: Grand Rapids, Muskegon; NJ: Camden, Hackensack, Morristown, New Brunswick, Newark; OH: Columbus; PA: Philadelphia
UniPhy	5 ^a	FL: Fort Lauderdale, Jacksonville, Miami, Ocala, Orlando
UnityPoint	10 ^a	IA: Cedar Rapids, Davenport, Des Moines, Dubuque, Iowa City, Sioux City, Waterloo; IL: Peoria, Springfield; MO: Columbia

¹⁴ Hospital referral regions are Medicare FFS markets representing catchment areas around tertiary medical centers.

¹⁵ McWilliams, J. Michael, Michael E. Chernew, Bruce E. Landon, and Aaron L. Schwartz. "Performance differences in year 1 of pioneer accountable care organizations." *New England Journal of Medicine* 372, no. 20 (2015): 1927-1936. McWilliams, J. Michael, Laura A. Hatfield, Michael E. Chernew, Bruce E. Landon, and Aaron L. Schwartz. "Early performance of accountable care organizations in Medicare." *New England Journal of Medicine* 374, no. 24 (2016): 2357-2366.

NGACO	# of HRRs in the Market Area	State and City of HRRs Comprising the Market Area
2017 Cohort		
Accountable Care Options	2	FL: Fort Lauderdale, Miami
APA	6 ^a	CA: Los Angeles, Orange County, San Bernardino; TX: Dallas; WA: Seattle, Tacoma
Arizona	3	AZ: Mesa, Phoenix, Sun City
Atrius	4	MA: Boston, Worcester; NH: Manchester; RI: Providence
Bronx	7 ^a	NJ: Hackensack, Ridgewood; NY: Albany, Bronx, East Long Island, Manhattan, White Plains
Carilion	5	NC: Durham, Winston-Salem; VA: Charlottesville, Lynchburg, Roanoke
Dartmouth-Hitchcock	3	MA: Boston; NH: Lebanon, Manchester
HCP	4 ^a	CA: Los Angeles, Orange County, San Bernardino, Ventura
Hill	8 ^a	CA: Alameda County, Contra Costa County, Modesto, Sacramento, San Francisco, San Jose, San Mateo County, Stockton
Indiana U	4 ^a	IN: Indianapolis, Lafayette, Muncie; KY: Louisville
Integra	2	MA: Boston; RI: Providence
MPACO	5	MI: Ann Arbor, Dearborn, Detroit, Pontiac, Royal Oak
NatACO	10 ^a	CA: Los Angeles, Modesto, Orange County, Sacramento, San Bernardino; NV: Reno; PA: Philadelphia; TN: Chattanooga, Jackson, Nashville
NW Momentum	3	WA: Olympia, Seattle, Tacoma
Partners	8 ^a	MA: Boston, Springfield, Worcester; ME: Portland; NH: Lebanon, Manchester; NY: Albany; RI: Providence
ProHealth	2	WI: Madison, Milwaukee
ProspectNE	3	CT: Hartford, New Haven; RI: Providence
RHeritage	7	CA: Bakersfield, Los Angeles, Palm Springs/Rancho Mira, San Bernardino, San Diego, San Luis Obispo, Ventura
St. Luke's	2	ID: Boise; UT: Salt Lake City
UNC	4	NC: Durham, Greensboro, Hickory, Raleigh
UTSW	3 ^a	TX: Dallas, Fort Worth, Tyler
2018 Cohort		
ACC of TN	2	TN: Johnson City, Knoxville
Best Care Collab	4	FL: Fort Lauderdale, Fort Myers, Orlando, Sarasota
CareMount	4	CT: Hartford, New Haven; NY: Albany, White Plains
Central Utah	4	NV: Las Vegas; UT: Ogden, Provo, Salt Lake City
Connected Care	2	MA: Boston; RI: Providence
CoxHealth	1	MO: Springfield
Franciscan	4	LA: Baton Rouge, Lafayette, Monroe, Shreveport
Mary Washington	3	VA: Arlington, Charlottesville, Richmond
NECQA	4	MA: Boston, Worcester; NH: Manchester; RI: Providence
North Jersey	7	NJ: Camden, Hackensack, Morristown, New Brunswick, Newark, Paterson, Ridgewood
Primary Care Alliance	2	FL: Ocala, Orlando
Primaria	2	IN: Indianapolis, Muncie
Reliance	6	MI: Ann Arbor, Dearborn, Detroit, Pontiac, Royal Oak; OH: Toledo
Reliant	5	CT: Hartford; MA: Boston, Springfield, Worcester; RI: Providence

NGACO	# of HRRs in the Market Area	State and City of HRRs Comprising the Market Area
Torrance	2	CA: Los Angeles, Orange County
UW Health	2	WI: Madison, Milwaukee

NOTES: ^a Denotes a change in hospital referral region (HRR) assignment from PY2 to PY3: UniPhy no longer includes Ocala, FL; CHES added Charlotte, NC; Deaconess added Paducah and Louisville, KY; Henry Ford no longer includes Flint, MI; Pioneer Valley no longer includes Boston, MA; Steward added Orlando, FL, Youngstown OH, and Allentown PA; ThedaCare added Milwaukee, WI; Trinity no longer includes Grand Rapids, MI and added Muskegon, MI; UnityPoint no longer includes Dubuque, IL and Columbia, MO; APA no longer includes Ventura, CA, and added Dallas, TX, Seattle and Tacoma, WA; Bronx added Albany and East Long Island, NY; HCP added Ventura, CA; Hill added Modesto, CA; Indiana U added Louisville, KY; NatACO no longer includes Phoenix, AZ, Boulder, Denver, CO, Memphis, TN, and added Modesto, Sacramento, San Bernardino, CA, Reno, NV, and Chattanooga, TN; Partners added Portland, ME, Lebanon, NH, and Albany, NY; USTW no longer includes Tyler, TX.

Other Considerations

In constructing the analytic data set, we included several binary indicator variables that flag certain characteristics of beneficiaries related to participation in Medicare initiatives in baseline and performance years. These variables include the following:

- Participation in other CMMI initiatives:** For both the comparison and NGACO groups, we identified whether these beneficiaries participated in other concurrent CMMI shared-savings initiatives [Comprehensive Primary Care Plus (CPC+), Comprehensive Primary Care (CPC), Financial Alignment Initiative (FAI), Independence at Home (IAH), and Multi-Payer Advanced Primary Care Practice (MAPCP)] and episodic initiatives (Bundled Payments for Care Improvement, Oncology Care Model, Comprehensive Joint Replacement). In this report, we present descriptive statistics on participation for both the 2016 and 2017 cohorts. We include covariates in our regression models to adjust for participation in other concurrent CMMI shared-savings initiatives but do not regression adjust for episodic initiatives.
- Access to care from providers:** To ensure that comparison beneficiaries had similar access to care as the beneficiaries in the NGACO group, we defined a measure of access to providers as the number of alignment-eligible providers per 1,000 population located within 10 miles of a beneficiary’s ZIP code. This variable was included in our propensity score model, discussed below.
- Additional beneficiary exclusions:** We applied the following inclusion and exclusion criteria to beneficiaries in the NGACO and comparison groups in each year. Beneficiaries were required to be 18 years or older and must have been aligned with the group for at least one month in the year.

Data Sources

Exhibit D.6 shows the data used for the construction of the NGACO and comparison groups.

Exhibit D.6. Analytic File Construction: Data Sources and Rationale

Data (Years)	Rationale	Source(s)
NGACO participating provider alignment file (2018)	Align Medicare beneficiaries to an NGACO or comparison group based on allocation of the total allowable QEM charges during the alignment period.	CMS
NGACO participating and preferred provider lists (2018)	Used to identify participating and preferred providers. The final participating provider list included providers in alignment file who were active in PY, but also included providers added in PY. Preferred providers in lists were excluded from the non-ACO providers to which comparison beneficiaries were attributed.	CMS
Providers in SSP (2013-2018), Pioneer (2013-2016) and NGACOs (2016-2017)	Used to exclude comparison beneficiaries who were prospectively aligned to other Medicare ACO providers during base years or performance year	CMS
NGACO attributed and excluded beneficiary lists (2018)	Identify the beneficiaries who were either aligned with an NGACO provider or who were excluded because of model exclusion criteria.	CMS
Beneficiaries in other Medicare shared savings initiatives (2013–2018)	Identify the beneficiaries in other Medicare shared savings initiatives. We flagged beneficiaries in other shared savings initiatives in the comparison group attributed to non-NGACO providers. Beneficiaries in Pioneer ACOs or Comprehensive ESRD Care initiatives were excluded from the comparison group.	CMS
Beneficiaries in SSP, Pioneer, and NGACOs (2013-2018)	Used to calculate Medicare ACO penetration rate in HRR.	CMS
Medicare beneficiary summary and claims files (2010–2018)	Identify the NGACO and comparison group beneficiaries, their characteristics, and outcomes including spending, utilization, and quality. Also used to calculate Medicare Advantage and ACO penetration rate in HRR.	CMS
Provider Enrollment, Chain, and Ownership System; National Plan and Provider Enumeration System; and Medicare Data on Provider Practice and Specialty (2012–2017)	Identify individual providers (by NPIs) associated with practices (by TINs) and their specialties. Also used to compute measures of provider density by ZIP code and market competition (physician practice HHI and alignment-eligible providers per 1,000 population in HRR).	CMS
AHA survey data (2012–2017)	Calculate hospital competition in market (HHI) and acute care hospital beds per 1,000 population in HRR.	AHA
American Community Survey (2012–2017)	Identify the sociodemographic characteristics of communities (ZIP code tabulation area) where NGACO and comparison beneficiaries reside.	Census Bureau
Dartmouth Atlas ZIP code-HRR crosswalks (2012–2017)	Identify markets (HRRs) in relation to ZIP codes where NGACO and comparison beneficiaries reside.	Dartmouth Institute
ZIP code-ZIP code tabulation area crosswalks (2015–2018)	Link beneficiary ZIP code with community characteristics, which is at ZIP code tabulation area level (earlier versions of the crosswalks are not available).	HRSA

NOTES: AHA = American Hospital Association; HRR = hospital referral region; HRSA = Health Resources and Services Administration; HHI = Herfindahl-Hirschman Index.

Propensity Score Weighting

Because beneficiaries in our evaluation were not randomized to the NGACO and comparison groups, we used propensity score methods to ensure that the beneficiaries in the two groups were similar in their

observed characteristics.¹⁶ This mitigates biases arising from differences in observed characteristics of NGACO and comparison beneficiaries. The propensity score is the predicted probability of a beneficiary being in the NGACO group in a year, conditional on a set of characteristics observed at the beginning of that year. We describe our approach to estimating propensity scores for beneficiaries in the NGACO and comparison groups in each baseline and performance year. The observed characteristics we considered for the propensity score included beneficiaries' demographic characteristics and disease burden as well as their community characteristics (ZIP code) and market (HRR) variables. For each NGACO and each baseline or performance year, we estimated propensity scores for beneficiaries in the NGACO and corresponding comparison group. We used logit models to predict the probability of a beneficiary being in the NGACO group (propensity score) based on the following characteristics:

- **Beneficiary characteristics** in the reference year (baseline or performance year) included age, gender, race/ethnicity (white, black, Hispanic, Asian, other), disability, end-stage renal disease status, Medicaid dual-eligibility, Part D coverage, number of months aligned with the NGACO or comparison group in the year, death in the year, and disease burden at the end of the prior year. We defined a beneficiary's disease burden using 62 chronic condition indicators available on the Master Beneficiary Summary File in the Chronic Conditions Data Warehouse Virtual Data Research Center. These included 27 common chronic conditions and 35 other chronic or potentially disabling conditions the beneficiary had in the preceding year.¹⁷ We did not use the hierarchical condition category risk score to measure a beneficiary's disease burden because it is more susceptible to changes in provider coding practices than the chronic condition indicators.¹⁸ We did not include utilization and cost in the reference or prior year, as these outcomes were assessed in our analysis of impacts of NGACO incentives; their inclusion would be expected to attenuate effects or dampen impacts.
- **Community characteristics** variables captured attributes measured at the ZIP code level. These variables included rurality, density of providers within 10 miles per 1,000 population, and neighborhood socioeconomic characteristics (percentage of people living below the poverty line, percentage with high school and college education, and median income) of the beneficiary's ZIP code.
- **Market characteristics** included indicator variables for HRRs within which the beneficiaries reside.

After estimating propensity scores, we empirically tested various propensity score matching (one-to-one and one-to-many, both without and with replacement) and weighting methods to assess how they balanced the NGACO and comparison groups on the observed covariates, while allowing us to assess the

¹⁶ Austin PC. An introduction to propensity score methods for reducing the effects of confounding in observational studies. *Multivariate Behav Res.* 2011;46(3):399–424.

¹⁷ CMS Chronic Condition Data Warehouse. *Chronic Condition Algorithms*. Available at: <https://www.ccwdata.org/documents/10280/19139421/ccw-chronic-condition-algorithms.pdf>; CMS Chronic Condition Data Warehouse. *Other Chronic or Potentially Disability Condition Algorithms*. Available at: <https://www.ccwdata.org/documents/10280/19139421/other-condition-algorithms.pdf>.

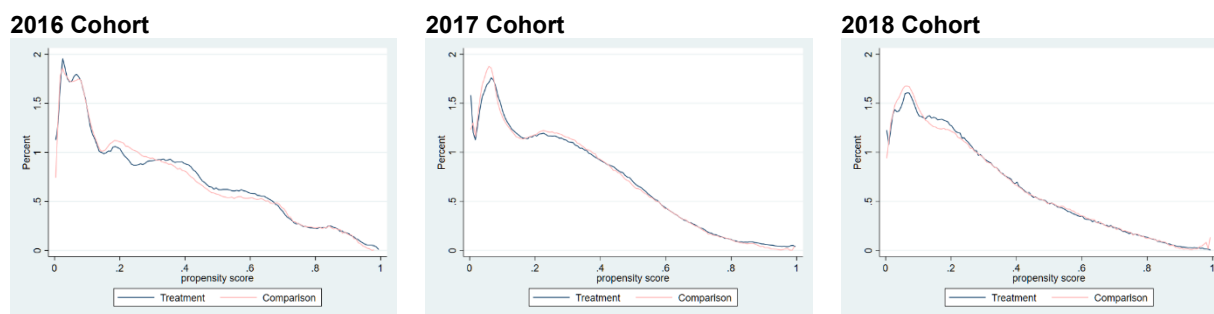
¹⁸ RTI International. *Evaluation of the CMS-HCC Risk Adjustment Model Final Report*. 2011 Available at: https://www.cms.gov/Medicare/HealthPlans/MedicareAdvgtgSpecRateStats/downloads/evaluation_risk_adj_model_2011.pdf.

average treatment effect on the treated.¹⁹ Weighting the comparison beneficiaries by the odds of the propensity score offered the best covariate balance for each NGACO across a performance year and its baseline years.²⁰ NGACO beneficiaries were assigned a weight of one, while the comparison beneficiaries were assigned weights of $PS_i/(1-PS_i)$, where PS_i is the beneficiary’s propensity score.

Finally, we implemented additional checks of our results to assess the impact of weighting the comparison group by odds of the propensity score. First, because comparison beneficiaries with large weights could inordinately influence our results, we confirmed that a very small proportion of comparison group beneficiaries had large weights.²¹ Second, covariates in the propensity score model were included in the DID models to obtain accurate impact estimates if the former were potentially mis-specified.²²

Exhibit D.7 shows graphs of the common support in the estimated propensity scores for the respective cohort’s treatment (NGACO=blue line) and comparison group (red line) in PY3. Specifically, the x-axis in each graph is the propensity score (range from zero to one), and y-axis is the percent of beneficiaries who received the corresponding propensity score.

Exhibit D.7. Common Support of the Propensity Score in PY3 and Baseline Years by Cohort



Measures of Spending, Utilization, and Quality

Exhibit D.8 details definitions for the 23 claims-based outcome measures for which we assess the NGACO model’s impacts in the Third Evaluation Report. They are total Medicare spending, eight categories of Medicare spending by care setting and service, 11 utilization measures, and three quality-of-care measures.

¹⁹ Stuart EA. Matching methods for causal inference: A review and a look forward. *Stat Sci.* 2010;25(1):1; Hirano K, Imbens GW, Ridder G. Efficient estimation of average treatment effects using the estimated propensity score. *Econometrica.* 2003;71(4):1161–1189.

²⁰ We assessed covariate balance by looking at standardized differences for the covariates before and after matching or weighting. The method that yielded the lowest standardized difference of means across all covariates, with standardized differences <0.25 for all covariates, was considered to offer the best covariate balance.

²¹ Less than 0.1 percent of the comparison beneficiaries had weight greater than three.

²² Bang H, Robins JM. Doubly robust estimation in missing data and causal inference models. *Biometrics.* 2005;61(4):962–973.

Exhibit D.8. Definitions for Claims-Based Outcome Measures Assessed Using Difference-in-Differences Design

Measure	Definition
Medicare Spending^a	
Total Medicare Parts A and B spending per beneficiary per year (PBPY)	Total Medicare Parts A and B spending PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amounts on Parts A and B claims from the start of the performance year (PY) until the end of the PY or until the end date for the beneficiary's alignment (i.e., until she or he was excluded because of alignment exclusion criteria), for the treatment or comparison group.
Medicare spending on acute care inpatient hospitals PBPY	Total Medicare spending on acute care inpatient hospitals PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on facility claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group. Spending on Part B professional services in this setting is excluded.
Medicare spending on skilled nursing facility (SNF) PBPY	Total Medicare spending on SNFs, including swing beds PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on SNF claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group. Spending on Part B professional services in this setting is excluded.
Medicare spending on other post-acute care facilities PBPY	Total Medicare spending on other inpatient, post-acute care facilities (long-term care hospitals and inpatient rehabilitation hospitals) PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on facility claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group. Spending on Part B professional services in these settings is excluded.
Medicare spending on outpatient facilities PBPY	Total Medicare spending for outpatient facilities (including hospital outpatient department, emergency department (ED), federally qualified health centers, and rural health centers) PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on facility claims from the start of the year until the end of the year or until the date the beneficiary remained aligned with the treatment or comparison group. Spending on Part B professional services in these settings is excluded.
Medicare spending on physician and professional services PBPY	Total Medicare Part B professional spending PBPY aligned to either the NGACO or comparison group. Includes spending for physician and non-physician professional services and ancillary services, including ambulance, anesthesia, labs, imaging, and drugs administered in physician offices. Spending includes Medicare paid amount on Part B claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group.
Medicare spending on home health services PBPY	Total Medicare spending on home health services PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on home health services claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group. Spending on Part B professional services in the home setting is excluded.
Medicare spending on hospice PBPY	Total Medicare spending on hospice services PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on hospice claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned to the treatment or comparison group. Spending on Part B professional services is excluded.
Medicare spending on durable medical equipment PBPY	Total Medicare spending on durable medical equipment PBPY aligned to either the NGACO or comparison group. Spending includes Medicare paid amount on durable medical equipment claims from the start of the year until the end of the year or until the last day the beneficiary remained aligned with the treatment or comparison group.

Measure	Definition
Utilization	
Acute care hospital stays per 1,000 beneficiaries per year (BPY)	Number of acute care hospital stays per 1,000 BPY aligned to either the NGACO or comparison group. Stays that included transfers between facilities were counted as one stay. All stays occurring between the start of the year and the end of the year, or the end date of the beneficiary's alignment to the treatment or comparison group during the performance year, are included in the measure.
SNF stays per 1,000 BPY	Number of SNF stays per 1,000 BPY aligned to either the NGACO or comparison group. All SNF stays that began between the start of the year and the end of the year, or the end date of the beneficiary's alignment to the treatment or comparison group during the performance year, are counted towards the measure.
SNF days per 1,000 BPY	Number of SNF days per 1,000 BPY aligned to either the NGACO or comparison group. All SNF days that began between the start of the year and the end of the year, or the end date of the beneficiary's alignment to the treatment or comparison group, are counted towards the measure.
Emergency department (ED) visits (including observation stays) per 1,000 BPY	Number of ED visits, including observational stays, per 1,000 BPY aligned to either the NGACO or comparison group. Visits that included transfers between facilities were counted as one visit. ED visits resulting in hospital stays were excluded. All ED visits, including observational stays, occurring between the start of the year and the end of the year, or to the end date of a beneficiary's alignment to the treatment or comparison group, are included in the measure.
Evaluation and management (E&M) visits (excluding visits in acute care hospital and ED) per 1,000 BPY	Number of nonhospital E&M visits from primary care or specialist providers per 1,000 BPY aligned to either the NGACO or comparison group (defined by Berenson-Eggers Type of Service or BETOS codes for E&M visits, which include M1A, M1B, M4A, M4B, M5A, M5B, M5C, M5D, M6; E&M visits in acute care hospitals and EDs are excluded). All E&M visits occurring between the start of the year and the end of the year, or the end date of a beneficiary's alignment to the treatment or comparison group, are included in the measure.
Procedures per 1,000 BPY	Count of procedures per 1,000 BPY aligned to either the NGACO or comparison group. This rate was computed as the number of claims with BETOS codes on carrier and outpatient claims with code "PXX", occurring between the beneficiary's alignment start and end dates in each year.
Tests per 1,000 BPY	Count of tests per 1,000 BPY aligned to either the NGACO or comparison group. These were computed as the number of claims with BETOS codes on carrier and outpatient claims with code "TXX", occurring between the beneficiary's alignment start and end dates in each year.
Imaging Services per 1,000 BPY	Count of imaging per 1,000 BPY aligned to either the NGACO or comparison group. These were computed as the number of claims with BETOS codes on carrier and outpatient claims with code "IXX", occurring between the beneficiary's alignment start and end dates in each year.
Beneficiaries with Annual Wellness Visit (AWV) per 1,000 BPY	Number of beneficiaries with an AWV in the year, per 1,000 beneficiaries aligned to either the NGACO or comparison group. This measure reflects the likelihood of beneficiaries receiving an AWV visit in the year. AWV codes on Medicare claims include G0438 (for the initial visit) and G0439 (for subsequent visits). Annual wellness visits can be included in the E&M visit count.
Home health episodes per 1,000 BPY	Number of episodes of home health for a beneficiary during the period aligned to either the NGACO/comparison group. Episodes include sum of <i>60-day home health episodes, as well as home health episodes with low-utilization payment adjustments and partial episode payment adjustments</i> . All episodes that began between the start of the year and the end of the year, or the end date of a beneficiary's alignment to the treatment or comparison group during the year, are included in the measure.
Home health visits per 1,000 BPY	Number of home health visits per 1,000 beneficiaries aligned with an NGACO or comparison group. The number of home health visits for <i>physical/occupational/speech therapy, skilled nursing, and medical social services and from home health aides</i> were identified based on lines with revenue center codes 420–449 and 550–599. All visits that began between the start of the year and the end of the year, or the end date of a beneficiary's alignment to the treatment or comparison group during the year, are included in the measure.

Quality of Care	
Beneficiaries with hospitalizations for Ambulatory Care Sensitive Conditions (ACSC) per 1,000 BPY	Number of beneficiaries with one or more ACSC acute care hospitalizations in the year, per 1,000 beneficiaries aligned to either the NGACO or comparison group. This measure reflects the likelihood of beneficiaries being hospitalized for ACSCs during the year. ACSC hospitalizations include diabetes short-term complications, diabetes long-term complications, chronic obstructive pulmonary disease or asthma in older adults, hypertension, heart failure, dehydration, bacterial pneumonia, urinary tract infection, uncontrolled diabetes, asthma in younger adults, and lower-extremity amputation among patients with diabetes. ^b
Beneficiaries with unplanned 30-day readmissions per 1,000 eligible BPY	Number of beneficiaries with one or more occurrences of unplanned hospital readmissions within 30 days of discharge in the year, per 1,000 eligible beneficiaries aligned to either the NGACO or comparison group. This measure reflects the likelihood of beneficiaries having unplanned readmissions in the year. We used CMS's risk-standardized all condition readmission measure for NGACOs to identify eligible hospitalizations and unplanned readmissions. ^c The beneficiaries eligible for this measure were NGACO or comparison beneficiaries with the one or more eligible hospitalizations in the year.
Beneficiaries with hospital readmissions from SNF, per 1,000 eligible BPY	Number of beneficiaries with one or more occurrences of unplanned hospital readmissions within 30 days of admission to SNF in the year (immediately after a preceding hospitalization), per 1,000 eligible beneficiaries aligned with an NGACO or comparison group. The measure reflects the likelihood of beneficiaries having unplanned 30-day readmissions following a SNF stay during the year. We used CMS's SNF Readmission Measure to identify eligible SNF admissions and unplanned readmissions occurring within 30 days of SNF admission. ^d Beneficiaries eligible for this measure were NGACO and comparison beneficiaries with one or more eligible SNF admissions in the year.

NOTES: ^a All Medicare spending is expressed in 2018 dollars and is based on Medicare paid amounts on claims; we do not exclude any outlier payments nor do we use standardized payments. Our models adjust for health, demographic, and market characteristics. For providers in NGACOs that opted for population-based payments or all-inclusive-population-based-payments, we used the actual amount Medicare would have paid for services absent the population-based payments. Findings were consistent to sensitivity analyses that excluded payments above the 99th percentile.

^b Agency for Healthcare Research and Quality. Prevention Quality Overall Composite Technical Specifications. *Prevention Quality Indicator 90*, Version 6.0, 2016. Available at: http://www.qualityindicators.ahrq.gov/Downloads/Modules/PQI/V60-ICD09/TechSpecs/PQI_90_Prevention_Quality_Overall_Composite.pdf; For claims prior to October 1, 2015, with ICD-9 codes, we used Version 5.0 of *Prevention Quality Indicator 90*. For claims after October 1, 2015 with ICD-10 codes, we used Version 6.0 of *Prevention Quality Indicator 90*.

^c Centers for Medicare & Medicaid Services. *A Blueprint for the CMS Measures Management System, ACO #8: Risk-Standardized All Condition Readmission*. Version 1.0, 2012. Available at: <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharesavingsprogram/Downloads/Measure-ACO-8-Readmission.pdf>.

^d Smith L, West S, Coots L, Ingber M, Reilly K, Feng Z, Etlinger A, et al. Skilled nursing facility readmission measure (SNFRM) NQF# 2510: All-cause risk-standardized readmission measure. Waltham, MA: RTI International; 2015. Available at: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/NursingHomeQualityInits/Downloads/SNFRM-Technical-Report-3252015.pdf>.

BETOS = Berenson-Eggers Type of Service; BPY = beneficiaries per year; E&M = evaluation and management; ED = emergency department; PBPY = per beneficiary per year; SNF = skilled nursing facility.

Analytic Approach to Estimate Impacts of the NGACO Model

Exhibit D.9 summarizes the models used for the 23 claims-based outcome measures for the 2016, 2017, and 2018 cohorts (50 NGACOs) in PY3. Outcome measures for spending and utilization were modeled as continuous variables, using generalized linear models (GLMs). For outcomes where more than 20 percent of the sample had zero values, we used two-part models with a probit or logit model to assess the likelihood of a nonzero outcome and GLM to assess levels of the outcome for those with nonzero outcomes. For outcome variables modeled with GLMs, we determined the appropriate distributional form using a modified Park test.²³ This test examined the empirical relationship between the mean and the variance to ascertain the appropriate distribution. One utilization measure (beneficiaries with AWW) and three quality-of-care measures were modeled as binary measures.²⁴

Exhibit D.9. Models Used for Specific Outcome Measures

Outcome Measure	Model Used
Spending	
Total Medicare spending	GLM: Gamma distribution and log link
Physician services spending	GLM: Poisson distribution and log link
Outpatient facility spending Acute care hospital facility spending Other post-acute care facility spending Home health spending	TPM: first part probit; second part GLM with gamma distribution and log link
SNF, hospice care and durable medical equipment spending	TPM: first part probit; second part GLM with Poisson distribution and log link
Utilization	
Acute care hospital admissions ED visits including observation stays SNF days SNF stays Home health visits Home health episodes	TPM: first part logit; second part GLM with negative binomial distribution and log link
E&M visits (excluding inpatient hospital and ED)	GLM; Poisson distribution and log link
Procedures Tests Imaging	GLM; negative binomial distribution and log link
Beneficiaries with Annual Wellness Visit	Logit
Quality of Care	
Beneficiaries with ACS hospitalizations Beneficiaries with unplanned 30-day readmissions Beneficiaries with unplanned 30-day SNF readmissions	Logit

NOTES: E&M = evaluation and management; ED = emergency department; GLM = generalized linear model; SNF = skilled nursing facility; TPM = two-part model.

²³ Manning W, Mullahy J. Estimating log models: To transform or not to transform? *J Health Econ.* 2001;20:461–494.

²⁴ A Medicare beneficiary is eligible for a single wellness visit annually, so this utilization measure was modeled as a binary variable. For ambulatory care sensitive condition hospitalizations, unplanned 30-day readmissions, and unplanned 30-day SNF readmissions, few beneficiaries had events, and fewer had more than one event. We chose to model these as binary measures, whether or not the beneficiary had the event during the year.

Difference-in-Differences (DID) Regression Models for Estimating impacts in PY3 and cumulatively as of PY3. We estimated impacts using DID regression models for the 2016, 2017, and 2018 cohorts separately in PY3. We also ran separate DID regression models for each NGACO in PY3 to obtain impact estimates for the spending, utilization, and quality of care outcomes. The model-wide impact in PY3 was calculated by weighting the impact estimates for the three cohorts by their respective proportion of NGACO beneficiaries in the year. The cumulative model-wide impact as of PY3 was calculated by weighting the impact estimates for the 2016 cohort in PY1, 2016 and 2017 cohorts in PY2, and 2016, 2017 and 2018 cohorts in PY3 by the proportion of NGACO beneficiaries in each year and each cohort. Aggregating impact estimates in this way assumes statistical independence between NGACO cohorts and performance years. We similarly calculated cumulative impacts for 2016 and 2017 cohort NGACOs as of PY3 for total spending, by weighting their impact estimates for each performance year by the respective proportion of beneficiaries a cohort had in each year.

We report impact estimates in a performance year in percentage terms as increases or decreases of outcomes for NGACOs relative to their counterfactual absent the model. While all outcomes are at the beneficiary level, we describe impacts as relative increases or decreases for NGACOs, as the intervention was at the NGACO level. We report three sets of impact estimates for PY3: 1) model-wide; 2) for the three cohorts; and 3) for each NGACO. We also report three sets of cumulative impact estimates as of PY3: 1) model-wide; 2) for 2016 and 2017 cohorts; and 3) for NGACOs in the 2016 and 2017 cohorts that were active as of PY3.

Equation D.1 shows the general specification of the DID model that we used to estimate impacts of the NGACO model in a given performance year.

Equation D.1: DID model for estimating impact in a given performance year, controlling for beneficiary demographic, clinical, and community characteristics, with year and hospital referral region (HRR) fixed effects.

$$g [E(Y_{ijkt})] = \beta_0 + \beta_1 NGACO_j + \delta_1 BY2_t + \delta_2 BY1_t + \delta_3 PY_t + \theta_1 NGACO_j * PY_t + YBENE_{ijkt} + \lambda Community_{jkt} + \Pi HRR_k$$

Wherein:

- Y is the outcome for the i^{th} beneficiary in NGACO or comparison group j , in market k , in year t . We model Y with appropriate distributional form and link function g , based on the spending, utilization, or quality-of-care outcome, as discussed below.
- β_0 is the intercept.
- $NGACO_j$ is the binary indicator for being in the NGACO group in either performance years or baseline years. It is set to the value of one if the beneficiary is aligned with an NGACO PY3 provider. The coefficient β_1 captures the mean of the difference between the NGACO and comparison group that is constant over time.
- $BY2$, $BY1$, and PY are fixed effects for each year (with $BY3$ as reference) whose coefficients (δ_1 , δ_2 , δ_3) capture changes in the NGACO and comparison group over time.

- Coefficient θ_1 is the DID estimate for $NGACO_j * PY_t$, the binary indicator for being in the NGACO group in a given performance year of the NGACO model. The θ_1 coefficient is the impact of NGACO model on its providers' beneficiaries. Because most NGACOs previously participated in the SSP or the Pioneer ACO Model, this estimate should be interpreted as the marginal effect of the NGACO model over prior Medicare ACO models.
- *BENE* and *Community* are sets of beneficiary and community characteristics with coefficient sets γ and λ , respectively (as discussed below).
- *HRR* is a fixed effect for each HRR with coefficient vector Π , to control for differences across markets.²⁵

Because we are interested in estimating the average treatment effect for the NGACO group, our models included weights for the comparison to make it comparable to the NGACO group on the beneficiary and market-level covariates specified below.

We provide details below of the estimation of the cohort-level models based on Equation D.1. All models were estimated using Stata 16.²⁶

Cohort-level models. Impacts at the cohort level were estimated as follows:

- **Beneficiary-level covariates** included age, gender, race/ethnicity, disability, end-stage renal disease status, dual-eligibility, Part D coverage, number of months of alignment in the year, death in the year, and disease burden at the end of the preceding year (using indicators for 62 chronic conditions). We also included the square of months aligned because outcomes could increase nonlinearly based on the number of months a beneficiary was aligned with the NGACO or with a comparison group in a given baseline or performance year. We also included variables that accounted for NGACO and comparison beneficiaries' participation in other shared-savings CMMI initiatives during the baseline years and performance year. These initiatives included CPC+, CPC, FAI, IAH, and MAPCP.²⁷
- **Community-level covariates** included number of alignment-eligible providers within 10 miles per 1,000 population, percent of population in poverty, percent of population with a college education, and urban/rural status based on beneficiary ZIP code.
- **Market-level covariates** included indicators for each HRR.

²⁵ Our models were robust to controlling for differences across markets over time using HRR and year interactions.

²⁶ StataCorp. 2019. *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LP.

²⁷ We excluded variables that captured participation of NGACO and comparison beneficiaries in overlapping episodic CMMI initiatives (Oncology Care Model, Comprehensive Bundle Payments for Care Improvement, and Comprehensive Joint Replacement) because they were indicative of care that could take place based on certain health needs, so their inclusion resulted in the failure of parallel trends for total spending for one or more cohorts. We also did not flag beneficiaries in the comparison group who were assigned to Shared Savings Program ACOs because NGACO alignment rules disallowed NGACO beneficiaries from also being assigned to other ACOs and resulted in the failure of parallel trends for total spending for one or more cohorts.

- We clustered standard errors at the level of the NGACO’s market for the treatment and comparison groups, respectively, because outcomes could be correlated within these clusters.²⁸

Model for each NGACO: NGACO-level models included the beneficiary and community covariates used in the cohort-level model, with the exception that we used a summary variable for disease burden (number of chronic conditions out of 62) and binary variables for the 10 conditions most expensive to Medicare.²⁹ In prior analyses, we examined the effects of this altered specification of chronic conditions in the pooled model to understand the impact of not including all 62 conditions at the NGACO level. Using the total count of all 62 conditions and binary variables for the 10 chronic conditions changed the DID estimate for total Medicare spending in the pooled analysis by about $-\$0.10$ annually, or less than $-\$0.01$ per beneficiary per month (PBPM). In the models for each NGACO, we estimated robust standard errors.³⁰

Post-estimation calculations. We performed the following four post-estimation calculations:

- Because we used nonlinear models for the outcome variables, we employed the approach suggested by Puhani (2012) to express the DID theta coefficient in Equation D.1 as the estimated outcome for the treated NGACO group relative to its expected outcome absent the treatment.³¹ We calculated these results using post-estimation predictions, computing the marginal effect for all treated beneficiaries and subtracting the marginal effect for these beneficiaries with the DID interaction term set to zero.³² We computed confidence intervals using the delta method.³³
- We expressed the estimated impact as a percentage of the expected outcome for the NGACO group in a given performance year absent the model. We computed the percentage change from the DID coefficient for outcomes estimated with log-linear models.³⁴ For outcomes estimated with two-part and logit models, we computed the predicted level of outcomes for NGACO beneficiaries in a given performance year absent NGACO incentives by summing the adjusted mean for the comparison group in that performance year and the adjusted difference between the NGACO and the comparison group in the baseline years. We obtained the latter from the average predicted and adjusted outcomes for the NGACO and comparison group in the baseline years, which we calculated post-estimation.
- We used post-estimation marginal effects to predict the average adjusted outcomes (i.e., the conditional means) for the NGACO and comparison group in the baseline period (all baseline years)

²⁸ Bertrand M, Duflo E, Mullainathan S. How Much Should We Trust Differences-in-Differences Estimates. *Q J Econ*. 2003;119(1):249–275. Cameron AC, Miller DL. *Robust Inference with Clustered Data*. University of California, Department of Economics; 2010. Working Papers, No. 10(7).

²⁹ Erdem, Erkan, Sergio I. Prada, and Samuel C. Haffer. "Medicare payments: how much do chronic conditions matter?" *Medicare & Medicaid research review* 3, no. 2 (2013). We could not use indicator variables for all 62 chronic conditions, due to small cell sizes that limited estimation of the models.

³⁰ Wooldridge, Jeffrey M. *Econometric analysis of cross section and panel data*. MIT Press, 2010.

³¹ Puhani PA. The treatment effect, the cross difference, and the interaction term in nonlinear “difference-in-differences” models. *Econ Lett*. 2012;115(1):85–87.

³² Karaca-Mandic P, Norton EC, Dowd B. Interaction terms in nonlinear models. *Health Serv Res*. 2012;47(1pt1):255–274.

³³ Dowd BE, Greene WH, Norton EC. Computation of standard errors. *Health Serv Res*. 2014;49(2):731–750.

³⁴ For a log-linear model with a dummy variable D : $\ln[E(Y)] = a + bX + cD + \epsilon$; if D switches from 0 to 1, then the percentage impact of D on Y is $100[\exp(c) - 1]$, where c is the coefficient on the dummy variable.

and performance year. We report these for the NGACO and comparison group in Appendix J. alongside the impact estimates to understand whether the latter were driven by improved performance for the NGACO group or deteriorating performance for the comparison group or both.

- Finally, we expressed impact estimates as per beneficiary per year (PBPY) for spending outcomes and per 1,000 beneficiaries per year for utilization and quality outcomes, respectively.

Testing the assumption of parallel trends in the baseline years. A key assumption of the DID design is that the NGACO and the comparison group had similar trends in outcomes during the baseline years before the onset of the NGACO incentives. This assumption of parallel trends allows the comparison group to establish a reliable representation of the NGACO group in a given performance year in the absence of the NGACO model. We tested this assumption using Equation D.2, which extended Equation D.1 by including leading interaction terms for NGACO treatment effects in BY1 and BY2 (relative to BY3). We assessed whether the coefficient θ_2 for the leading interaction term in BY1 was significantly different from zero ($p < 0.05$). If this was significantly different, the assumption of parallel trends did not hold.

Equation D.2: DID model with leading interaction terms, controlling for beneficiary, HRR, and community characteristics

$$g[E(Y_{ijkt})] = \beta_0 + \beta_1 NGACO_j + \delta_1 BY2_t + \delta_2 BY1_t + \delta_3 PY_t + \theta_{-2} NGACO_j * BY1_t + \theta_1 NGACO_j * PY_t + \gamma BENE_{ijkt} + \Lambda Community_{jkt} + \Pi HRR_k$$

For this evaluation, we determined that the DID estimate for a performance year was valid if the trends between the NGACO and comparison group were parallel between BY1 and BY3. This condition was checked by testing whether θ_2 was statistically significant at the five percent level ($p < 0.05$). Our assumption allowed the NGACO providers and organizations to outperform or underperform on outcomes relative to the comparison group mid-baseline (BY2 vs BY3). However, the NGACO and comparison groups were required to have similar trends in the year immediately prior to start of the NGACO model in the event that the treatment group underwent any marked changes prior to start of the model.³⁵

Estimating impacts on total Medicare spending by NGACO organization type, risk level, and payment mechanism using NGACO-level impacts. For each NGACO organization type, risk level, or payment mechanism subgroup, we compiled total Medicare spending estimates from NGACOs in that subgroup that passed the baseline parallel trends test. The NGACO impact estimate for the subgroup was determined by combining NGACO-level impact estimates weighted by the proportion of the NGACO’s beneficiaries in the subgroup in PY3 or as of PY3.³⁶ Similar to the procedures used to calculate cumulative model-wide or cumulative cohort level impacts, combining NGACO level impact estimates in this way assumes statistical independence across NGACOs, PYs, or both. The same formulas used for the

³⁵ Ashenfelter O. Estimating the Effect of Training Programs on Earnings. *Rev Econ Stat.* 1978;60:47–50.

³⁶ Five NGACOs were dropped from the subgroup calculation in PY3 and eight NGACO-PYs were dropped from the subgroup calculation cumulatively as of PY3 due to failure in baseline parallel trends test for total Medicare spending.

cumulative impact calculation described above were used to combine NGACO DID estimates, DID standard errors, percentage impacts, and probability values (p-values) for individual subgroups. We adjusted all subgroup p-values for the false discovery rate of 0.1 using the Benjamini-Hochberg procedure.³⁷ The false discovery rate (FDR), defined as the expected proportion of false discoveries in multiple comparisons is used to adjust tests of significance (i.e. rejection of null hypothesis) to reduce the chance of a false positive significant result. In general, the FDR method provides more power than the familywise error rate adjustment (e.g. Bonferroni correction) and has fewer type I errors than uncorrected testing. When comparing differences among or between subgroups, we used a two-sample t-test for difference in means. In sensitivity analyses presented in Appendix I, we estimated impacts on total Medicare spending including estimates for all NGACOs irrespective of whether they *passed or failed* the parallel trends test for total spending.

Calculating the net spending impact of the NGACO Model. In addition to estimating the gross impact of the NGACO model on total Medicare Parts A and B spending, we also calculated the net spending impact of the NGACO model by accounting for shared savings or losses for NGACOs and if applicable, coordinated care reward (CCR) payments made to NGACO beneficiaries. The cumulative net spending impact of the NGACO model uses publicly available data on earned shared savings or losses across the 2016-2018 performance years and CCR payments made during the 2017 and 2018 performance years as well as cumulative gross savings impacts for the first three years of the model.

Sensitivity checks. We conducted the following sensitivity checks to assess the robustness of our estimated impacts for the 2016, 2017, and 2018 cohorts in PY3. Results from our sensitivity checks are presented in Appendix H, Exhibit H.7.

- **Main analysis:** We used a gamma distribution with log link to model total Medicare spending PBPY for the beneficiaries in our study. The gamma distribution was better at modeling the higher spenders compared with alternative distributions.³⁸ To assess the NGACOs' impact on the entirety of Medicare (Parts A and B) spending for their beneficiaries, we did not cap spending in our main analyses.
- **Sensitivity analysis 1:** We capped Medicare spending at the 99th percentile to assess the robustness of impact estimates to the possibility of random variation in the highest spenders between the NGACO and comparison groups. The model-wide impacts in PY3 for total spending were largely unchanged (Appendix H, Exhibit H.7).

Estimation of model-wide, cohort-level, and NGACO-level cumulative impacts as of PY3. To calculate the **model-wide cumulative impact estimates as of PY3** for a given outcome measure, impact estimates for each cohort and performance year were combined as an average weighted by the proportion of NGACO beneficiaries in each cohort and performance year as shown in Exhibit C.10. The standard errors for model-wide cumulative impact estimates were likewise combined as a weighted average by first converting individual standard errors into variances, combining the variances corresponding to the

³⁷ Benjamini, Yoav, and Yosef Hochberg. "Controlling the false discovery rate: a practical and powerful approach to multiple testing." *Journal of the Royal statistical society: series B (Methodological)* 57, no. 1 (1995): 289-300.

³⁸ The modified Park test showed the gamma distribution had the best fit for modeling total Medicare spending for beneficiaries in our study.

separate estimates weighted by the squared proportion of NGACO beneficiaries, then lastly the standard error of the combined variance. Separate DID regression models were estimated for each NGACO cohort in a given performance year up to PY3. The model-wide cumulative impact from PY1 to PY3 included cohort-level DID impact estimates for:

- the 2016 cohort in PY1 (18 NGACOs);
- the 2016 cohort in PY2 (16 NGACOs);
- the 2017 cohort in PY2 (28 NGACOs);
- the 2016 cohort in PY3 (13 NGACOs);
- the 2017 cohort in PY3 (21 NGACOs); and
- the 2018 cohort in PY3 (16 NGACOs).

The **cumulative impact for the 2016 cohort as of PY3** for a given outcome measure was calculated as the weighted average of the 2016 cohort’s DID impact estimates in each of the model’s first three performance years which are:

- the 2016 cohort (18 NGACOs) in PY1;
- the 2016 cohort (16 NGACOs) in PY2; and
- the 2016 cohort (13 NGACOs) in PY3.

As noted above, the standard errors associated with the cumulative impact estimate are calculated as a weighted average following a similar procedure used in calculating the model-wide cumulative impact.

The **cumulative impact for the 2017 cohort as of PY3** was calculated as the weighted average of the 2017 cohort’s DID impact estimates in PY2 and PY3 of the model. The average was weighted by the proportion of the cohort’s beneficiaries in each performance year. The cumulative impact estimate for a given outcome measure for the 2017 cohort included DID impact estimates for:

- the 2017 cohort (28 NGACOs) and each NGACO in PY2; and
- the 2017 cohort (21 NGACOs) and each NGACO in PY3.

As noted above, the standard errors associated with the cumulative impact estimate are calculated as a weighted average following a similar procedure used in calculating the model-wide cumulative impact.

The **cumulative impact for an individual NGACO as of PY3** was calculated as the weighted average of the NGACO’s DID impact estimates across every performance year the NGACO was active in the model up through PY3. Separate DID regression models were estimated for individual NGACOs in each performance year. The cumulative impact for an individual NGACO as of PY3 combines these estimates across the applicable performance years for a given NGACO weighted by the proportion of an NGACO’s beneficiaries in a given year. An NGACO belonging to the 2017 cohort could have up to two years of cumulative impact while other NGACOs in the cohort dropped out after one year. Similarly, cumulative

impacts for NGACOs in the 2016 cohort may be averaged across up to three years. The cumulative impact for a 2016 cohort NGACO in the model for three years would include:

- the NGACO’s DID impact estimate in PY1;
- the NGACO’s DID impact estimate in PY2; and
- the NGACO’s DID impact estimate in PY3.

Standard errors are calculated as a weighted average of the standard errors associated with DID impacts in each performance year included in an NGACO’s cumulative impact. As is done in determining standard errors for the model-wide cumulative impact, standard errors for individual performance year estimates are first converted to variances and weighted by the squared proportion of NGACO beneficiaries in a given performance year.

In calculating the cumulative estimates:

- We assumed that DID estimates for cohorts or NGACOs in different performance years were statistically independent. It also assumes that the impact estimates of different cohorts or NGACOs within the same performance year are independent. This assumption was reasonable given that different cohorts or NGACOs had different participating providers and aligned beneficiaries in each performance year and its associated baseline years.
- Impact estimates were calculated and reported in PBPY, aggregate, and percentage terms to facilitate interpretation and comparisons. The regression models were also used to calculate conditional means for the NGACO and comparison groups in BYs and PY(s).
- The significance of cumulative impact estimates was tested by determining the two-sided p-value based on the normal cumulative distribution function z-score:

$$z - score = \frac{x - \mu}{\sigma}$$

where X is the cumulative DID estimate, μ is zero, and σ is the standard error of the cumulative DID estimate.

Cumulative impacts for outcomes where any of the contributing impact estimates were uninterpretable due to failure of parallel trends were considered uninterpretable and are not reported.

Exhibit D.10. Treatment Group Sizes and Their Contributions to the Cumulative Impact Estimates

	Total Number of Beneficiary Years	Number of Beneficiary Years (proportion)					
		2016 Cohort in PY1	2016 Cohort in PY2	2017 Cohort in PY2	2016 Cohort in PY3	2017 Cohort in PY3	2018 Cohort in PY3
Model-Wide cumulatively as of PY3	1,709,394	477,179 (0.1535)	477,426 (0.1536)	754,789 (0.2428)	459,603 (0.1478)	652,244 (0.2098)	287,551 (0.0925)
Model-Wide in PY3	1,399,398	-	-	-	459,603 (0.3284)	652,244 (0.4661)	287,551 (0.2055)

	Total Number of Beneficiary Years	Number of Beneficiary Years (proportion)					
		2016 Cohort in PY1	2016 Cohort in PY2	2017 Cohort in PY2	2016 Cohort in PY3	2017 Cohort in PY3	2018 Cohort in PY3
2016 Cohort cumulatively as of PY3	1,414,208	477,179 (0.3374)	477,426 (0.3376)	-	459,603 (0.3250)	-	-
2017 Cohort cumulatively as of PY3	1,407,033	-	-	754,789 (0.5364)	-	652,244 (0.4636)	-

Assessment of Leakage for NGACO group, Direct Spillover for Comparison Group, and Degree of Care from SSP providers for Both Groups

In this section, we describe our approach to measuring patterns of care in the performance years for NGACO and comparison beneficiaries. These patterns of care constructs include *leakage* for NGACO group, *direct spillover* for comparison group, and *degree of care from SSP providers* for both groups. While these constructs can be operationalized in different ways, we defined and measured them as noted to better understand the patterns of care for NGACO and comparison beneficiaries:

- Leakage of NGACO beneficiaries to non-NGACO providers: We define leakage as the extent to which NGACO beneficiaries in a performance year received care outside of the NGACO to which they were aligned; that is, if they obtained services from providers other than participating or preferred providers in the NGACO to which they were aligned. We measured the numerator as FFS payments for all Part A and carrier services furnished to NGACO beneficiaries by providers outside their aligned NGACO. We measured the denominator as total FFS payments for all Part A and carrier services furnished to NGACO beneficiaries by all providers.³⁹ Leakage was defined for all cohorts and NGACOs in the performance years.
- Direct spillover from NGACO participating providers to the comparison group: We define direct spillover for the comparison group as the extent to which comparison beneficiaries in a performance year received care from NGACO participating providers. We measured the numerator as FFS payments for all Part B carrier services furnished to comparison beneficiaries by any NGACO participating provider. We measured the denominator as FFS payments for all Part B carrier services furnished to comparison beneficiaries by all providers.³⁹ Spillover is defined for all cohorts' and NGACOs' comparison groups in the performance years.
- Degree of care from SSP providers to NGACO and comparison beneficiaries: We define degree of care from SSP providers as the extent to which an NGACO or comparison beneficiary in a performance year received care from SSP providers. We defined the numerator as total FFS payments for all Part B carrier services furnished to NGACO or comparison beneficiaries by any SSP provider. We defined the denominator as total FFS payments for Part B carrier services furnished to NGACO

³⁹ NGACO providers electing population based payments (PBP) or all-inclusive-population-based-payments (AIPBP) have FFS claims with payments reduced by a fixed amount. Calculation of numerators and denominators for these measures utilized full FFS payment amounts that would have been paid under typical Medicare FFS instead of the reduced fees paid under PBP or AIPBP.

or comparison beneficiaries by all providers.³⁹ SSP spillover is defined for all cohorts and NGACOs and their respective comparison groups in the performance years.

To create these measures, we used the extract of Part A and carrier research identifiable files (RIF) used to create the claims-based outcome measures for CY2016 through CY2018. We extracted claims for beneficiaries in the NGACO and comparison groups using beneficiary identifiers and identified instances of care delivered by NGACO, non-NGACO or SSP providers using NPIs and referencing NGACO or SSP provider lists for CY2018. Comparison beneficiaries were weighted using the PS weights and all beneficiaries were limited to those residing in NGACO market areas. These measures were calculated for each beneficiary and then were aggregated to the NGACO-, cohort- or model-levels where we reported the mean and 95% confidence intervals.

Appendix E: Qualitative Methods and Analysis

Exhibit E.1. Qualitative Data Sources for the Third Evaluation Report

Source	Description	Cohort	Data Collection Timeline	Number of NGACOs and Participants	Limitations and Notes
Model documents	Model documents, including applications, waiver requests, websites.	All	Ongoing	N/A	N/A
Baseline telephone interviews⁴⁰	60–90 minute semi-structured baseline telephone interviews with members of NGACO leadership	2016	Mar. – Apr. 2017	16 NGACOs, 60 Participants	We did not conduct interviews with 2016 cohort NGACOs that had withdrawn from the model within the 2016 performance year (WakeMed, OSF, and Prospect).
		2017	Jun. – Oct. 2017	28 NGACOs, 91 Participants	N/A
		2018	Feb. – Mar. 2019	14 NGACOs, 39 Participants	We did not conduct interviews with the 2018 cohort NGACOs that had withdrawn from the model within the 2018 performance year (OneCare VT).
Virtual site visits	60–90 minute virtual (telephonic) site visits including semi-structured interviews with members of NGACO leadership and care management staff	2016	Jan. – May 2018	10 NGACOs, 71 Participants	We did not conduct a virtual site visit with Optum, which exited from the model on 3/24/2018. We conducted virtual site visit with Beacon Health LLC, which exited the model as of 12/31/2017. We conducted a virtual site visit with leadership and data management staff at MemorialCare, which exited the model as of 3/19/2018.
		2017	Nov. 2018 – Feb. 2019	13 NGACOs, 68 Participants	We did not conduct virtual site visits with seven NGACOs that withdrew from the model as of 12/31/2017 (Monarch, Premier), 2/28/2018 (Sharp Health, KentuckyOne, Fairview), or 3/30/2018 (ACCC, Allina). We conducted virtual site visits with Dartmouth-Hitchcock and Integra, which exited the model as of 2/28/2019.

⁴⁰ The qualitative baseline interviews were distinct from the close-ended NGACO leadership survey. Baseline interviews informed development and refinement of the NGACO leadership survey instrument.

Source	Description	Cohort	Data Collection Timeline	Number of NGACOs and Participants	Limitations and Notes
		2018	Sept. – Oct. 2019	13 NGACOs, 71 Participants	We did not conduct a virtual site visit with North Jersey Health Alliance, as they opted not to participate.
In-person site visits	In-person site visits including semi-structured interviews with NGACO leadership, care management, data analytics/health IT staff, SNF partners, members of governance boards, among others. Interviews were 60–90 minutes.	2016	Feb. – Apr. 2018	7 NGACOs, 140 Participants	We visited the following NGACOs in-person: <ul style="list-style-type: none"> ■ Deaconess ■ Henry Ford Health System ■ Steward (exited the model) ■ Triad ■ UniPhy (exited the model as of 2/28/19) ■ Unity Point
		2017	Sept.– Dec. 2018	7 NGACOs, 171 Participants	We visited the following NGACOs in person: <ul style="list-style-type: none"> ■ Arizona Care Network ■ Bronx ■ Indiana ■ Northwest Momentum ■ Partners (exited the model as of 2/28/2019) ■ UNC ■ UT Southwestern
		2018	N/A	N/A	N/A
Exit Interviews	60–90 minute semi-structured exit interviews with NGNGACO leadership	2016	N/A	N/A	N/A
		2017	Nov. 2018	3 NGACOs, 12 participants	We conducted virtual exit interviews with MPACO, Hill Physicians, and National ACO.
		2018	Oct. 2019	1 NGACO, 6 participants	We conducted an exit interview with Connected Care of SE Massachusetts.

Model documents. We conducted a standardized review of the model applications from the 2016, 2017, and 2018 NGACO cohorts. We developed a standardized instrument in Excel to catalog the information that the NGACOs had provided in their applications. Please see Appendix F of the First Annual Report for further detail on document review and abstraction tools.

Baseline telephone interviews. We conducted 90-minute semi-structured telephone interviews with leadership from each NGACO in the 2016, 2017, and 2018 cohorts (N=58). The purpose of these initial interviews was to understand NGACO characteristics and the combinations of factors related to design and implementation, as well as to provide additional detail to the questions included in the NGACO implementation, beneficiary, and provider surveys. A three-person team conducted each interview. A senior member of the team led each discussion; the second person took high-level notes and confirmed that all key points were covered, and a third staff member took transcript-style notes. Please see Appendix F of the First Annual Report for further detail on interview guides that were used during the baseline telephone interviews and each research domain addressed therein. We made minor revisions to the 2016

or 2017 cohort guide for the 2018 cohort's baseline interviews, and these changes did not notably affect baseline data collection.

Virtual site visits and in-person site visits. The purpose of virtual and in-person site visits was to obtain updates about NGACO features and context as well as to understand NGACO implementation, care management offerings, and data analytics capacity. Interviews also provided additional detail to the questions included in the NGACO implementation, beneficiary, and provider surveys. A three-person team conducted each virtual or in-person site visit. A senior member of the team led each discussion; the second person took high-level notes and confirmed that all key points were covered, and a third staff member took transcript-style notes.

- For every **virtual site visit**, we conducted at least two separate 60-90 minute interviews. We use the term virtual site visit to indicate multiple telephonic interviews with a set of diverse NGACO staff at a distinct phase of data collection. Across all cohorts, one interview was with care management staff and one interview was with health analytics or informatics staff. Virtual site visits for the 2016 and 2017 cohorts also included an interview with NGACO leadership. For the 2018 cohort, virtual site visits did not include an interview with NGACO leadership due to the proximity to the baseline interviews. For some NGACOs that exited the model, we only conducted one 30-60 minute exit interview with NGACO leadership. (See Exhibit E.1. for details on NGACO interviews.)
- **In-person site visits** afforded us opportunities to speak with a wider range of NGACO leadership and staff including data analytics staff, frontline care management staff, NGACO governance board members, participating providers, and where applicable, representatives from institutional participating or preferred providers such as hospitals, SNFs, or community partners. We did not conduct in-person site visits with the 2018 cohort.

The interview guides for virtual and in-person site visit interviews were organized into modules of questions that addressed each research domain. For each interview, we tailored guides based on specific roles of individuals being interviewed, as well as information we obtained from review of documents and previous interviews. Exhibits E.2 through E.4 include interview guide templates for three of the groups that we interviewed across all NGACOs. Whether telephonically or in-person, interview groups included:

- Leadership (i.e., executive management) (Exhibit E.2): Individuals in this category included, but were not limited to, NGACO executive directors, chief medical officers, chief financial officer, and chief medical information officers.
- Care management staff (Exhibit E.3): This included individuals overseeing NGACO care management initiatives, including but not limited to, directors of care coordination, care management program managers, directors of clinical information, quality improvement coordinators, and directors of clinical integration.
- Health informatics/ analytics staff (Exhibit E.4): This included staff such as the director of analytics, chief information officer, information systems managers, directors of data analytics and development, directors of population health analytics, clinical integration analytics coordinators, and technical implementation leads.

For all in-person site visits and a few virtual site visits, we developed and used additional interview protocol templates for other types of stakeholders, e.g., frontline care management staff. Exhibit E.5 provides an overview of topics covered with individuals in various other roles.

- Exiters: leadership of NGACOs leaving the NGACO model
- Care management staff: frontline staff who deliver care management services to NGACO beneficiaries, including care managers and care coordinators
- Data management/Health IT staff: data analysts
- Governance board members: consumer representatives or physician NGACO board members.
- Medical director/physician: participating physicians
- SNF/post-acute care partner: preferred provider representatives involved with coordinating with NGACO care management or delivering services to NGACO beneficiaries, including waiver implementation
- Telemedicine management: individuals involved in implementing telemedicine as part of NGACO activities including waiver implementation

Exhibit E.2. Site Visit Leadership (i.e., Executive Management) Interview Guide (2016 and 2017)

Section	Questions/Probes
Background Information	<ul style="list-style-type: none"> ■ Could you please each describe your role(s) at [organization/NGACO name]? <ul style="list-style-type: none"> ● Are you an employee of the NGACO directly or employed/contracted by a practice or health system? ● How long have you worked with the NGACO?
Updates and Recent Changes	<ul style="list-style-type: none"> ■ Have there been any major changes or developments in your NGACO since we last spoke]? <ul style="list-style-type: none"> ● Organizational changes? ● Programmatic changes? ● Other changes? ■ What prompted these changes in your organization? ■ Could you tell us about any consultants you have engaged, and for what purpose? ■ We know you are currently using [80%/100%] risk arrangement – Are you planning to or have you already made any changes to the risk arrangement in the coming year? Why or why not? ■ We know you are currently using [FFS/PBP/AIPBP]. Are you currently planning to make or have you already made any changes to your payment mechanism in the coming year? <ul style="list-style-type: none"> ● [If selected infrastructure payment] How are you using the infrastructure payment?
Local Health Care Market	<ul style="list-style-type: none"> ■ Can you describe/ characterize your state / local insurance and hospital markets? <ul style="list-style-type: none"> ● How would you describe your market share? ● What is the impact of Medicare Advantage in your market and for your health system? ● Have there been any changes recently that have affected your NGACO’s ability to attract and retain physicians? ● Are there any particular characteristics of your market that influence where the beneficiaries aligned to your NGACO seek care? ■ How do other local Medicare or commercial ACOs create competition for your NGACO?
Provider Networks and Relationships	<ul style="list-style-type: none"> ■ What has been your approach to building your physician network in terms of recruitment, participation criteria or intended composition of the network? <ul style="list-style-type: none"> ● Size ● Geography ● Inclusion of specialists

Section	Questions/Probes
	<ul style="list-style-type: none"> ● Employed/independent of network ● Consideration of quality, efficiency, accessibility of providers ● Type of EHR (or more generally, interoperability of health information systems) ■ How has your network changed since you started in Next Gen, if at all? <ul style="list-style-type: none"> ● Have any providers decided to leave the network of the NGACO? Why do you think they chose to leave? ● Have you let any providers go from the network or NGACO? If so, why did you chose to let them go? ● Which types of providers is the NGACO adding, if any? For example, specific types of specialists? ● How, if at all, do you expect these network changes to affect your performance? ■ Could you tell us about your relationships with the hospitals in your network? <ul style="list-style-type: none"> ● Approximately how many are in it? ● Are they participating or preferred? ● What is your relationship like in terms of referrals, notification of admissions or discharges, etc.? ■ How important was it for you to bring hospitals into your network? ■ Can you tell us about the SNF market in your area? <ul style="list-style-type: none"> ● How have you approached building and maintaining your SNF network? ● How do you decide which SNFs to include in your network? ● Does your NGACO own SNFs that are in your network? ● Approximately how many SNFs do you admit to? Has this amount met your needs? ● To what extent have you tried to influence quality of care and length of stay? How so? ● Do you share savings/ risks with SNFs in your network? ● What are some challenges in working with the SNFs? ■ How settled are you on your provider network to date? What additional changes do you anticipate making, if any?
<p>Provider Incentives and Engagement</p>	<ul style="list-style-type: none"> ■ Could you please describe the incentive structure you have for participating physicians, including arrangements for shared savings/losses, compensation based on quality measures, and bonuses? <ul style="list-style-type: none"> ● Do your incentives vary according to whether they are participating or preferred providers? If so, how? ● How do they vary by type of physician, i.e., primary care, specialty care? ● Do they vary based on whether they are employed by the organization hosting the NGACO or whether they are contracted or independent? ■ Of all the quality measures that your NGACO collects, do you have any efforts to engage providers on particular quality measures? <ul style="list-style-type: none"> ● Which measures are they? ● Could you describe your efforts? ■ Of the various strategies for influencing provider quality of care [such as data dashboards, IT tools, financial rewards, inclusion on governing board and/or roles on committees etc.] that you currently have in place, which do you think have been most effective? Why? ■ What kinds of messages are you sending to providers about health care costs, and what do you find to be effective about communicating about cost or influencing providers' role in health care spending? ■ What have been the biggest challenges with respect to engaging providers?
<p>Patient Engagement</p>	<ul style="list-style-type: none"> ■ What has your experience been with the Annual Wellness Visit? <ul style="list-style-type: none"> ● How are you promoting it? What has been the response from beneficiaries? ● How did the Care Coordination Reward (CCR) (\$25) play into promotions of the AWW? Was it effective? Were there any challenges with using the reward? ● How have you communicated with providers about the Annual Wellness Visit? What has been the response from providers? ● Aside from the CCR, what sort of challenges have you encountered? ● What is your sense of the impact of the Annual Wellness Visit on costs, beneficiary retention, or connecting beneficiaries to care management to date?

Section	Questions/Probes
	<ul style="list-style-type: none"> ■ Did your NGACO engage in voluntary alignment this past year, and will you employ it next year? <ul style="list-style-type: none"> ● What was your goal in terms of why you were doing it and who you were targeting, and how successful was your campaign? ● Do you think CMS allowing on-line alignment (electronic voluntary alignment) in 2019 will help the voluntary alignment process? ■ Are there any other ways, besides the CCR or voluntary alignment, in which you have tried to engage beneficiaries in NGACO activities? <ul style="list-style-type: none"> ● How do you approach educating the patient about the NGACO? ● What tools do you use to engage patients about their own care? Examples could include patient portal, text reminders, automated phone calls, 24 hour phone access
Benefit Enhancement (SNF)	<ul style="list-style-type: none"> ■ Starting with the SNF 3-day rule waiver: Where are you now with implementation? <ul style="list-style-type: none"> ● How long have you been using the waiver? ● Approximately how many times or how many patients have used waiver services in the last year? ● What has gone well? What has been a challenge? ■ Is the SNF waiver meeting your expectations in terms of reducing inpatient stays or length of stays? ■ Do you have staff (e.g., a case manager) whose role, at least in part, is dedicated to overseeing the SNF waiver cases such as authorizing and/or overseeing SNF admissions? <ul style="list-style-type: none"> ● Can you describe your process for overseeing / authorizing direct SNF admissions? ● Does your process include patient screening criteria or guidelines that providers follow in determining whether to use standard SNF admission or SNF waiver admissions? What are some examples of circumstances in which the use of the waiver is appropriate? ■ How have you engaged providers around the 3-day SNF waiver? In what ways? ■ How have you engaged patients and caregivers around the 3-day SNF waiver? In what ways?
Benefit Enhancement (Home Visit)	<ul style="list-style-type: none"> ■ Where are you now with implementation of the post-discharge home visit waiver? <ul style="list-style-type: none"> ● What systems did you need to change/ processes did you need to put in place to implement? ● Who is/ will conduct the visits? ● How if at all did the changes CMS made this year to the waiver impact your implementation plans? [During 2016-2017, the post discharge follow-up waiver allowed for up to two visits in a 30-day period. Beginning in 2018, the waiver was expanded to allow up to nine visits in a 90-day period.] ● What have been the biggest challenges in implementing this waiver? ■ How, if at all, are you conducting home visits outside of the waiver? <ul style="list-style-type: none"> ● Do you plan to make any changes to the benefit enhancement options moving forward?
Benefit Enhancement (Telehealth)	<ul style="list-style-type: none"> ■ Where are you now with implementation of the telehealth waiver? <ul style="list-style-type: none"> ● What facilities are involved? ● What providers are involved? ● How, if at all, did the changes CMS made this year to the waiver affect your implementation plans? [Beginning in 2018 the waiver was expanded to allow for asynchronous telehealth visits in specialties of teleophthalmology and teledermatology] ● Approximately how many beneficiaries have you served under the waiver? ■ How, if at all, are you using telehealth outside of the waiver? ■ Do you plan to make any changes to the benefit enhancement options moving forward?
2019 New Benefit Enhancements	<ul style="list-style-type: none"> ■ Is your NGACO planning to implement any of the new benefit enhancement waivers in 2019, and if so, which ones and why those? They are: <ul style="list-style-type: none"> ● Cost Sharing Support for Part B services ● Gift Cards for Participation in a Chronic Disease Management Program ● Care Management Home Visits ■ Do you anticipate any benefits or challenges with these waivers? If so, could you please describe?

Section	Questions/Probes
Benchmark and HCC Scores	<ul style="list-style-type: none"> ■ In thinking about the NGACO model, we know how much of the performance is dependent on the benchmark. So we were wondering what your thoughts are on how CMS calculates your benchmark? ■ How do you track whether your performance is above or below the benchmark? <ul style="list-style-type: none"> ● How do you use the benchmark reports? Do they assist you in predicting future performance outcomes or profitability? How do you identify threats/opportunities to meeting the benchmark? ■ What do you do to comprehensively capture beneficiaries' disease burden or document and code HCCs? How, if at all, has that changed since joining NGACO? <ul style="list-style-type: none"> ● What is the organizations past experience with HCC documentation and coding? What tools do you use (EHR, billing software, consultants) to assist in the process?
Performance and Outcomes	<ul style="list-style-type: none"> ■ How has your performance to date in NGACO compared to your expectations? To performance in other ACO models? Why do you think that is? ■ What are your expectations for your performance in this year and beyond? ■ What do you see as the key levers your organization is using to improve performance thus far related to cost-containment or quality improvement?
Closing	<ul style="list-style-type: none"> ■ How sustainable is the NGACO model for your organization moving forward? <ul style="list-style-type: none"> ● What activities begun under NGACO do you believe will be maintained after the end of the model? ● Are there components of the model that you believe are replicable beyond current participants or during the model period? ■ What lessons learned do you have from your experience to date implementing Next Gen? ■ If you had the opportunity to make recommendations to CMS of things to continue or change in regards to the future of NG, what might you suggest? <ul style="list-style-type: none"> ● Types of support or technical assistance ● Financial model, including benchmark or risk adjustment <p>Before we finish up, are there any additional topics you would like to review or speak more about? Thank you for your time.</p>

Exhibit E.3. Care Management Director Interview Protocol

Section	Questions/Probes
Background Information	<ul style="list-style-type: none"> ■ How would you describe your role(s) at [organization/NGACO name]? <ul style="list-style-type: none"> ● What is your background and training? ● Are you an employee of the NGACO directly? ● Or are you contracted by the NGACO to oversee care management services? ● Or employed/contracted by the practice or health system? ● How long have you worked with the NGACO?
Overview of Care Management Program	<ul style="list-style-type: none"> ■ What are the primary objectives of care management services in your NGACO? ■ Could you provide an overview of the care management team? <ul style="list-style-type: none"> ● How many care managers do you supervise altogether for your NGACO? ● What training/ certifications do care managers have? What additional trainings have you provided? ● How is the team structured? For example, how many staff members are on the team? What are the types of backgrounds? ● Where do care managers work? Are they in a central office or are they embedded in any practices? Do you have care managers or other NGACO staff in the ED? In the hospital? ■ How, if at all, have you changed the care management approach or model since the beginning of the NGACO? Why did you make these changes?
Beneficiary Assignment and Risk Stratification	<ul style="list-style-type: none"> ■ How are you identifying beneficiaries for care management services? Is there a difference in how NGACO beneficiaries are identified compared to other patients? If so, please describe the similarities and differences. <ul style="list-style-type: none"> ● Are there other challenges in identifying patients? ● How are care managers assigned to particular patients? ■ Are care managers working with other patients besides those in your NGACO? <ul style="list-style-type: none"> ● About how many patients do care managers provide care management services to at any given time? ● Of those, about how many are NGACO patients? ■ How are patients stratified into different risk tiers with differing intensity levels of care management? <ul style="list-style-type: none"> ● Who or what tool is used to do the patient stratification? How quickly does stratification happen? ● What are the tiers used and how do they target care management efforts? ● How frequently are the tiers updated? ■ How useful have you found the tiering? How do you incorporate provider feedback / referrals?
Interaction with Beneficiaries and Caregivers	<ul style="list-style-type: none"> ■ Can you walk us through an example of how care managers engage patients (starting at the point that the patients are identified as needing care management)? <ul style="list-style-type: none"> ● How frequently do you interact with your patients? ● How does it vary by risk level? ■ How do care managers coordinate and communicate with patients or their caregivers directly on an ongoing basis?
Care Coordination Communication with Other Providers	<ul style="list-style-type: none"> ■ Could you please describe the care management software used by your team? <ul style="list-style-type: none"> ● How long have you or your team been working with that software? What do you think works well or how could it be improved? ● Is it integrated into electronic health records? ● Does it facilitate communication with patient care teams including physicians and other providers? ■ How do care managers coordinate and communicate with physicians or other providers? <ul style="list-style-type: none"> ● What works well? ● What are the challenges?

Section	Questions/Probes
Care Management Initiatives	<ul style="list-style-type: none"> ■ What are care managers doing to help patients to manage their own conditions? <ul style="list-style-type: none"> ● Motivational interviewing? ● Patient education? ■ How do care managers address non-medical needs of patients? <ul style="list-style-type: none"> ● What is working well? ● What has been challenging? ■ What, if any, relationships or partnerships do you have with community-based services to address patients' non-medical needs? (<i>Community services might address things like housing, income assistance, behavioral health, daycare, senior resources for independent living, transportation, etc.</i>) <ul style="list-style-type: none"> ● Who are those partnerships with? What services do they offer? ● What, if any, relationship did you or the NGACO have with these organizations prior to Next Gen? ● Have you found that patients need community services that are not available in your community? If yes, what are those services? ■ What, if any, initiatives are there that address end-of-life care? Behavioral health? ■ How do you approach care transitions? <ul style="list-style-type: none"> ● Do you have care managers in the hospital? ● Are they involved in discharge planning? If so, how? ● How, if at all, does the NGACO educate beneficiaries about preferred SNFs? ● How do they follow up post-discharge? ■ Have you seen any evidence of improvement in care transitions? ■ Does care management staff conduct home visits [apart from home visit waiver, if implementing]? If so, can you please describe the circumstances under which a member of the team would go to a patient's home.
Working with Skilled Nursing Facilities	<ul style="list-style-type: none"> ■ Can you tell us about the NGACO's SNF network? <ul style="list-style-type: none"> ● Approximately how many SNFs do you work with? ● Does the NGACO have preferred SNFs? ■ Can you tell us about your relationships with SNFs at the leadership/ managerial level? <ul style="list-style-type: none"> ● How do you communicate about shared goals? How does this vary across your SNF network? ● What about performance on quality measures, or utilization or cost outcomes? ■ How are you working with SNFs to influence patient care? <ul style="list-style-type: none"> ● Do you have NGACO staff assigned to particular SNFs? How do care managers communicate with SNF staff? ● Do you have required treatment protocols and/or performance measures (for example, length of stay, targeted readmission rates, pressure ulcer prevention) ● Do you educate staff? ■ How do you track beneficiaries' progress when they are in the SNF? <ul style="list-style-type: none"> ● Do NGACO care managers / providers know when a patient is discharged from a SNF? ● How, if at all, are they involved in discharge planning? ■ Can you tell us about how you electronically exchange information with SNFs? <ul style="list-style-type: none"> ● What EHR access does SNF staff have? What access does the NGACO have to SNF records? ● How are NGACOs notified about patient admissions to SNFs?

Section	Questions/Probes
	<ul style="list-style-type: none"> ■ How if at all are you involved at the point of discharge from the SNF? <ul style="list-style-type: none"> ● Are there triggers for NGACO PCP or care manager follow up once a patient is discharged from a SNF? ● Do PCPs/care managers receive discharge summaries from SNFs? ■ Can you tell us about your relationships with SNFs at the leadership/ managerial level? <ul style="list-style-type: none"> ● How do you communicate about shared goals? How does this vary across your SNF network? ● What about performance on quality measures, or utilization or cost outcomes? ■ What are some challenges in working with SNFs? What kinds of solutions has your team developed to overcome these issues?
Benefit Enhancements (SNF)	<ul style="list-style-type: none"> ■ How is the care management team involved in admitting patients directly to SNFs through the 3-day SNF waiver? <ul style="list-style-type: none"> ● Approximately how many patients have you admitted? What are some of the scenarios in which direct SNF admission is appropriate? ● Can you provide an example of when direct admission to a SNF would be appropriate? ● Who oversees / authorizes direct SNF admissions? ● Does your process include patient screening criteria or guidelines to determine whether to directly admit patients? ■ What are some challenges in working with or using the SNF waiver? <ul style="list-style-type: none"> ● How are you or your team working to overcome the challenges?
Benefit Enhancements (Telehealth)	<ul style="list-style-type: none"> ■ How, if at all, are care managers involved in the implementation of the telehealth waiver, or directing patients to telehealth services covered under the waiver? ■ How, if at all, do you make beneficiaries aware of this service? What have the responses been from beneficiaries?
Benefit Enhancements (Home Visit)	<ul style="list-style-type: none"> ■ How, if at all, are care managers involved in the implementation of the home visits waiver? <ul style="list-style-type: none"> ● To what extent have care managers used the waiver to provide services to Next Gen patients? ■ Are these visits useful for managing patients' care after discharge from the hospital?
Perceptions of Patient Experience	<ul style="list-style-type: none"> ■ Based on your experience with NGACO beneficiaries, to what extent do they understand the NGACO or their inclusion in it? <ul style="list-style-type: none"> ● Did their understanding/lack of understanding affect your ability to do what you are supposed to do? ■ Do they know that the care management services they are receiving are offered through the NGACO or do they think they are from their doctor's office?
Impact of Care Management	<ul style="list-style-type: none"> ■ Has the NGACO asked you to focus on any particular quality measures (i.e., medication reconciliation, falls screening, or other at-risk population or preventive care measures)? If so, can you talk about the work you are doing on that? ■ To what extent do you think that care management under the NGACO is impacting: <ul style="list-style-type: none"> ● Patient self-management? ● Quality of care? ● Readmissions? ED visits? ● Health outcomes? ■ What aspects of the NGACO's care management activities have the biggest impact on outcomes?

Section	Questions/Probes
Care Transitions and Post-acute Care	<ul style="list-style-type: none"> ■ What is your approach to transitions of care? <ul style="list-style-type: none"> ● Does the NGACO have care managers in the hospital? ● How, if at all, are NGACO care managers involved in discharge planning? ● Do NGACO care managers have access to or receive discharge summaries? ● How do NGACO care managers follow up with patients post-discharge? How does this vary by discharge to home, SNF, or long-term care? ■ How if at all are you (as an NGACO/org) been involved in decisions regarding whether a patient should go home or to rehab or a SNF? How, if at all, has your involvement (or the process) changed? ■ Do NGACO staff members conduct home visits? If so, what are the circumstances under which a member of the team would go to a patient's home? <ul style="list-style-type: none"> ● For patients who transition to home with home health, how do care managers communicate with home health staff? ■ What, if any, differences are there in services you provide for NGACO patients compared with other patients?
Closing	<ul style="list-style-type: none"> ■ From your perspective, what have been the NGACO's biggest successes or challenges implementing care management for its patients? <ul style="list-style-type: none"> ● Is there anything specific to the NGACO model? ■ What are lessons learned or recommendations from your experience to date implementing care management under the NGACO model? ■ What are the major activities you anticipate undertaking in the next year?

Exhibit E.4. Health Informatics/Analytics

Section	Questions/Probes
Introductions	<ul style="list-style-type: none"> ■ How would you describe your professional role(s) in the NGACO?
NGACO EHR and HIE Systems	<ul style="list-style-type: none"> ■ Can you provide an overview of the EHR systems in use across the NGACO's provider network? <ul style="list-style-type: none"> ● How many different EMR / EHR systems are used across the network? ● What sort of variation is there in terms of the robustness of these systems? Do the EHRs have flags for identifying NGACO beneficiaries at the point of care? ■ Can you tell us about the systems in place to share patient information with post-acute care providers, including SNFs and home health agencies? <ul style="list-style-type: none"> ● How are data exchanged electronically? ● What information do NGACO providers and NGACO care managers get in terms of admissions, discharges, and transfers? ● Have you developed any new health IT solutions for the implementation or management of the NGACO model? ■ What types of performance data does the NGACO share with providers? <ul style="list-style-type: none"> ● Where are you getting the data – EHRs, claims, others? ● In what formats do you share these data (e.g., dashboards, printouts)? ● How frequently are reports generated? ● Have you received any feedback about reports from providers? Do you have a sense of how they are being used? ● What, if any, challenges or barriers have you encountered and how have you overcome them?

Section	Questions/Probes
Population Management	<ul style="list-style-type: none"> ■ Can you tell us about the system(s) you use for population health management? <ul style="list-style-type: none"> ● What aspects of data management and analytics are performed solely in-house and what is contracted out? ● What off-the-shelf systems do you use? What, if any, systems have you built in house? ● Do you have a data warehouse or a disease registry to support your population health activities? ● What diseases/conditions are you currently monitoring and tracking among the NGACO population? ■ Can you tell us about your approach to risk stratification and HCC coding? What types of claims data and EHR data are you using? <ul style="list-style-type: none"> ● What has worked well? What challenges have you encountered?
Closing	<ul style="list-style-type: none"> ■ What features of your health IT system do you think have been critical to your performance? Please explain? ■ What do you see as the main HIT or data analytic areas in need of improvement?

Exhibit E.5. Other Interview Types and Topics

Section	Interview Topics
Exit Interview	<ul style="list-style-type: none"> ■ Why NGACO withdrew from the model (e.g., logic of decision, market influences) ■ Financial modeling ■ Activities related to clinician relationships, support and clinical process improvement ■ Annual wellness visit experience ■ Benefit enhancements ■ Next steps after model (e.g., continuation of activities, benefits from NGACO participation, lessons learned)
Care Manager (Frontline Staff)	<ul style="list-style-type: none"> ■ Training and preparation ■ Beneficiary and caregiver engagement ■ Experience on care teams [e.g., with care managers, staff, outpatient, physicians, SNFs] ■ Benefit enhancement implementation ■ Perceived impact of NGACO on patients and outcomes
Data Management*/ Health IT Staff	<ul style="list-style-type: none"> ■ Changes to HIT infrastructure and capacity ■ Interoperability and data sharing within the NGACO and with external providers; HIEs ■ Data analytics for population health management ■ Data analytics for performance monitoring
Governance Board Consumer Representative	<ul style="list-style-type: none"> ■ Background on joining NGACO governance board ■ Governance board activities ■ Impressions of NGACO performance ■ Provider choice (and leakage) ■ Patient engagement
Governance Board Member (Physician)	<ul style="list-style-type: none"> ■ Background on joining NGACO governance structure ■ Background on experience with NGACO or value-based programs ■ Governance board activities ■ Provider incentives and engagement ■ Beneficiary engagement ■ NGACO performance and outcomes

Section	Interview Topics
Medical Director/Physician	<ul style="list-style-type: none"> ■ Engagement and incentives [financial, nonfinancial] ■ Performance connected to metrics and reporting ■ Changes in how physicians provide care [e.g., benefit enhancements, clinical decision support tools] ■ Experience with communication via HIT and more generally with care management staff ■ Perceived impact of NGACO on patients and outcomes
SNF Partner	<ul style="list-style-type: none"> ■ NGACO relationship with SNF ■ Workflow and communication with NGACO providers ■ 3-day SNF waiver ■ E.H.R. and interoperability ■ NGACO performance and outcomes
Telemedicine Management	<ul style="list-style-type: none"> ■ Telemedicine background at NGACO ■ Provider engagement ■ Beneficiary engagement ■ E.H.R. systems and provider dashboard ■ Benefit enhancement implementation

NOTE: *Data management interviews took place as part of the 2016 cohort virtual site visits.

Analytic Methods

Analysis of qualitative data uses a thematic approach. We coded data into categories based on the key evaluation domains—the features of participant NGACOs and their providers, the impacts of the model, variations in model impacts, and motivation and challenges in implementation. Our coding and analysis focused on identifying existing and emergent themes. Existing themes are topics derived from the study’s research questions and categories, and emergent themes arise out of discussions with NGACO leaders, staff, and beneficiaries. For example, under a code for organizational features, we may create emergent sub-codes of approaches to care, workforce models, or beneficiary engagement methods. A thorough qualitative understanding of the financial, organizational, and programmatic features of the NGACOs will help to identify key variables for quantitative analysis, and contribute to mixed-methods analysis of NGACO performance.

Coding Approach and Analysis. Our evaluation team started with the systematic review of the NGACO applications and model documents such as NGACO websites and information from CMS.gov (e.g., request for NGACO applications, NGACO FAQs, annual wellness visit information). Information gathered through the review of applications informed the development of qualitative interview guides and analysis plans. A senior team member prepared an initial codebook for the analysis of qualitative interviews, including the categories and themes (i.e. codes), their definitions, an example of the code applied, and source. We used NVivo software (QSR International Pty Ltd., Melbourne, Australia) to code the interviews. Our approach to coding is both inductive and deductive from the outset, including the following steps:

1. Develop and define analytic categories, based on our research question and the salient analytic dimensions (e.g., NGACO-funded infrastructure and personnel).
2. Operationalize the research question and model-based analytic dimensions in the codebook, which provide clear and concise guidelines for categorizing all qualitative data collected. The codebook contained 46 codes and was organized into eight families (example codes provided below):
 - Context: Federal CMS regulatory environment, market competition and consolidation
 - NGACO organizational characteristics: Motivation to participate, organizational structure and background, governance
 - Provider networks and management: Physicians, hospitals, SNFs, incentives, other engagement strategies
 - Aligned beneficiary characteristics: Demographics, leakage, churn
 - Model features: Alignment/attribution, benchmark, payment mechanism, risk-sharing arrangement, 3-day SNF waiver, telehealth waiver, post-discharge home visit waiver, annual wellness visit
 - Model implementation: Care management, care transitions, beneficiary engagement, data analytics, health IT/EHRs, workforce
 - Outcomes: Utilization, cost/spending, quality, shared savings/losses, drivers of performance, sustainability
 - Cross-codes: Successes/facilitators, challenges/barriers
3. Qualitative team refinements to the initial version of the codebook to ensure strong inter-coder reliability. Testing of inter-coder reliability involved multiple staff coding samples of the same text using an initial codebook. We have revised the codebook and refined code definitions as needed to assure consistency across staff coding styles.
4. Following qualitative best practices, the codebook is routinely reviewed and refined when we start to code newly collected data to take into account the complexity of the data, changes to the NGACO model, and implementation experience. This ensured the codebook matched data generated from interviews. Qualitative team staff collectively reviewed coded results and revised the codebook on an iterative basis. For example, during one review, we noted that we needed to create four codes to accurately capture data about provider networks (e.g., physicians, hospitals, SNFs, other entities). Similarly, we may start with specific codes for perceptions of model effectiveness (e.g., emergency room [ER] visits, readmissions, costs) but find too much overlap between the codes to make a meaningful distinction. Evaluation team members, which included technical advisors at the University of Minnesota, assisted in reviewing and coding data to enhance the analysis and concordance of the results.

Over the span of the evaluation, the team used the most current version of the codebook to code the collected data. Team members continued to flag coding ambiguities and develop new codes as needed. The team met regularly to address such issues and to continue to refine the codebook. A senior team member monitored inter-coder reliability to validate the qualitative results. Using NVivo's Compare query tool, inter-coder reliability was calculated as the percent agreement between the first and second coder on coded text segments.

Finally, interpretation of qualitative data findings for each question is an ongoing process. Beginning with the analysis for this report, a team of qualitative experts evaluated coded data to identify emerging themes. In this way, we interpreted qualitative data findings in a systematically iterative manner by exploring themes across NGACOs. Analysis involved reviewing findings by codes and across codes to qualitatively describe the interrelationship between organizational characteristics, history, implementation, and performance.

Coding and extraction. To systematically identify themes from in-person and virtual site visits conducted for the 2018 performance year, we developed matrices of themes of interest based on an analysis of 2016 and 2017 cohort coded data (including fields for emergent themes). These matrices included the following domains: market-level characteristics; beneficiary characteristics; organizational characteristics; outcomes; provider/network characteristics; provider network formation (individual practitioners); and provider engagement (individual practitioners). By using consistent matrices for all NGACOs, we could analyze a consistent set of data across the 2016, 2017, and 2018 cohorts. As a specific example, we coded virtual and in-person site visit transcripts for the 2017 cohort using a limited codebook of seven codes that were focused on beneficiary engagement (e.g., leakage, AWWs) and provider networks and engagement (e.g., 3-Day SNF rule waiver, SNF engagement, physician engagement, physician networks, SNF networks, etc.). Senior analysts reviewed coded data and transcripts generated from site visits they had attended; this enabled them to accurately contextualize data points. They reviewed data under appropriate codes and synthesized data into succinct points in the qualitative matrices to enable aggregation of data across the 2016 and 2017 cohorts. As a supplement to the coded data, senior analysts read site visit transcripts and extracted data on any themes that were not readily available via the coded data, placing synthesized data points into the matrices. Senior staff members iteratively reviewed analyses to ensure accuracy of interpretation.

Appendix F: Survey Methods and Analysis

NORC implemented three types of surveys over the course of the evaluation: the NGACO leadership survey, physician survey, and beneficiary survey. In 2019, NORC conducted the third round of the **NGACO Leadership Survey**. This survey includes questions that address multiple constructs from the conceptual framework, including 12 domains related to model features, implementation experience, as well as sustainability and replicability.

Overview of the NGACO Leadership Survey

NGACO Leadership Survey. This survey is one of the key data sources for tracking the experience of each NGACO’s leadership team with the model and their implementation of it. It complements and builds on the baseline leadership interviews by systematically asking NGACOs to provide detailed responses to questions that might have been discussed generally in the interviews, or that were not asked of every NGACO. It also seeks new information on topics of importance to our conceptual framework of the NGACO model.

- **Timing.** This survey has been conducted annually, with an abbreviated survey being administered to the 2016 and 2017 cohorts in Round 3, please see Exhibit F.1 below.
- **Population.** Census of NGACO leadership and administrators.
- **Mode.** Web, with emailed invitation letter. NORC and CMMI sent reminder emails and followed up by telephone with non-respondents as necessary.
- **Length.** On average, about one hour for all respondents at any given NGACO.
- **Questionnaire sources.** American Hospital Association’s Survey of Care Systems and Payment, National Survey of ACOs, qualitative research, and previous telephone interviews.
- **Special segments.** Special segments may include NGACOs that opt to implement or discontinue model features and benefit enhancements during the course of the evaluation, depending on findings from other data sources.

Exhibit F.1. Timing of NGACO Surveys

Timing	2016 Cohort	2017 Cohort	2018 Cohort
Sep.-Nov. 2017	Leadership Survey		
Mar.-Oct. 2018	Clinician Survey Beneficiary Survey*	Leadership Survey Clinician Survey Beneficiary Survey	
May-Aug. 2019	Abbreviated Leadership Survey	Abbreviated Leadership Survey	Leadership Survey

NOTE: *Details and planned methodology for the Beneficiary Survey are provided in Appendix E of the Technical Appendices accompanying the First Annual Report: <https://innovation.cms.gov/Files/reports/nextgenaco-firstannrpt-techapp.pdf>

Key Measures

Exhibit F.2 provides the full list of domains and the research questions addressed by NORC’s NGACO Leadership Survey.

Exhibit F.2. Survey Domains and Associated Research Questions

Source	Conceptual Framework	Domains	Research Questions
NGACO Leadership Survey	Model Features	Governance and Organizational Structure	1, 12.b.ii
		Past Experience	1.a., 2.a, 12.b.i
		Finances and Management	1.b, 9.b
		Workforce	12.b.v.
	Implementation Experience	Performance Monitoring	10.a
		Beneficiary Engagement	8, 15b
		Care Improvement Efforts	2.c, 3, 3.a, 3.b, 3.c., 3.d, 7.c, 9.c, 12.c, 12.c.i, 12.c.iii, 12.c.iv, 12.c.v, 12.d.iv
		Provider Engagement	12.b, 12.c.ii
		Health IT	12.b.iii
		Benefit Enhancement Waivers	1, 1.a, 1.b, 1.c, 2, 2.a, 2.b
	Sustainability and replicability	Benefit Enhancement Waivers - Challenges	12.a
		Other Challenges/Successes	15, 15.a, 16

The Round One Leadership questionnaire was drafted after a review of the applications from the 2016 NGACO cohort, which provided the backbone for both the focus and the content of all qualitative and survey instruments, and related protocols. Using information gathered from the data reviews and from the initial telephone interviews completed with the 2016 NGACO cohort, NORC prepared draft survey questions. For example, content provided by NGACO staff during phone interviews with members of NORC’s qualitative data collection team, was incorporated into the initial versions of each of the Leadership and Physician Surveys. In addition, data from other secondary sources, including high quality surveys and reports with similar goals, prompted identification of new questions and fine-tuning of existing ones.

For Round Three of the survey, NORC incorporated information gleaned from additional rounds of the qualitative interviews as well as data analysis of the Round One and Round Two results. NORC offered an abbreviated version of the questionnaire to the 2016 and 2017 cohorts so that questions were not repeated on data that was not likely to change. For example, the 2016 and 2017 cohorts were not asked about their governing board.

The third round of the leadership survey was administered using Qualtrics survey software. Qualtrics is an online survey platform with advanced functionality. Since the Leadership survey did not require coordination with an interview function, Qualtrics was a more efficient and streamlined approach. Respondents were sent a unique link that they could click on directly to enter the survey.

Usability testing was completed after the initial computer programming was finished (more information about the programming and fielding methodology is provided below). Usability testing ensures that each question is asked in the correct order and of the right population.

Fielding Methods

NGACO Leadership Survey. Round One of the NGACO leadership survey was fielded from September 3, 2017 to November 20, 2017. NORC’s survey team routinely monitored completion rates to reduce accidental or inadvertent non-responses due to timing or distraction. Approximately three weeks after the survey went live via a url emailed to all participants, NORC sent follow-up emails to sites from which there had been no response, or an incomplete response, to encourage participation. In a final effort, NORC, with agreement from CMMI, called the NGACOs directly, and CMMI reached out to the non-responders. Fourteen NGACOs completed the survey and one partially completed it out of the 17 NGACOs in the 2016 cohort that were liable for shared savings or losses during the 2017 performance year.

Round Two was fielded from July 13, 2018 to October 5, 2018. As with the Round One survey, NORC sent follow up emails and made phone calls to non-respondents to encourage participation. CMMI also prompted non-respondents. All 28 NGACOs in the 2017 class completed the survey even though seven had exited by early 2018.

Round Three was fielded from May 20, 2019 to August 29, 2019. As with Rounds One and Two, NORC and CMMI sent follow up emails and made phone calls to non-respondents to encourage participation. See Exhibit F.3 for summary of survey rounds by cohort and Exhibit F.4 for completion rates for leadership survey domains by round and cohort

Exhibit F.3. NGACO Participation in Leadership Survey

	Round 1: Sept 3 to Nov 20, 2017	Round 2: July 13 to Oct 5, 2018	Round 3: May 20 to August 29, 2019
2016 Cohort	16 out of 17	NA	13 out of 13
2017 Cohort	NA	28 out of 28	19 out of 20
2018 Cohort	NA	NA	15 out of 16

Survey Completion Rate among Respondents by Round and NGACO Cohort

Exhibit F.4. Leadership Survey Completion Rate

	Number of Questionnaire Items by Round	Round 1: 2016 Cohort	Round 2: 2017 Cohort	Round 3: 2016 and 2017 Cohort	Round 3: 2018 Cohort
Governance and Organizational Structure	Round 1: 5 Round 2: 4 Round 3: 3	94.6%	96.0%	NA	95.5%

	Number of Questionnaire Items by Round	Round 1: 2016 Cohort	Round 2: 2017 Cohort	Round 3: 2016 and 2017 Cohort	Round 3: 2018 Cohort
Past Experience	Round 1: 3 Round 2: 4 Round 3: 1	80.2%	88.8%	NA	97.3%
Finances and Management	Round 1: 2 Round 2: 5 Round 3: 3	93.8%	83.2%	95.8%	95.0%
Workforce	Round 1: 3 Round 2: 5 Round 3: 2	84.4%	91.4%	96.9%	100%
Performance Monitoring	Round 1: 3 Round 2: 3 Round 3: 4	90.4%	90.9%	85.3%	84.1%
Beneficiary Engagement	Round 1: 3 Round 2: 5 Round 3: 3	93.8%	92.9%	100%	94.3%
Care Improvement Efforts	Round 1: 16 Round 2: 8 Round 3: 9	89.9%	82.9%	93.0%	91.6%
Provider Engagement	Round 1: 10 Round 2: 7 Round 3: 7	89.8%	88.1%	96.4%	89.3%
Health IT	Round 1: 13 Round 2: 9 Round 3: 7	85.0%	92.4%	94.5%	93.8%
Benefit Enhancement Waivers	Round 1: 8 Round 2: 4 Round 3:	84.5%	92.9%	99.6%	99.1%
Other Challenges/Successes	Round 1: 8 Round 2: 3 Round 3:	87.5%	95.7%	NA	94.0%

Analytic Methods

Recoding and Cleaning. The collected raw data were recoded and cleaned to produce final analytic files. Responses flagged by the quality assurance process were reviewed to assess their appropriateness and completeness.

Overview of the NGACO Clinician Survey

NGACO Clinician Survey. The goal of this survey was to measure physician’s experience of the NGACO model and their implementation of it.

- **Timing.** The survey was conducted April-August 2018. See Exhibit F.1.
- **Population.** Sample of NGACO physicians that were participating or preferred providers aligned with NG ACOs in the 2016 and 2017.

- **Mode.** Web, with emailed invitation letter. NORC and CMMI sent reminder emails and letters and followed up by telephone with non-respondents as necessary.
- **Length.** On average, about twenty minutes for all physicians.
- **Questionnaire sources.** Health Affairs Physician Survey⁴¹, National Survey of Small and Medium-Sized Physician Practices, National Study of Physician Organizations.

Key Measures

Exhibit F.5 provides the full list of domains and the research questions addressed by NORC’s NGACO Clinician Survey.

Exhibit F.5. Survey Domains and Associated Research Questions

Source	Conceptual Framework	Domains	Sub-Domains	Source	Research Questions
Clinician Perceptions and Experience Survey	Motivation for participation	Motivating factors for ACO participation	Align to value-based care; Provide better care to patients; competitive pressure; financial opportunities	Clinician Perceptions and Experience Survey	14a; 14c; 4b
	Motivation for participation	Perceptions about model features	Improve care; Reduce costs; incentivize PACs/providers to participate or align; incentivize beneficiaries to align; improve beneficiary satisfaction	Clinician Perceptions and Experience Survey	14b; 4b; 8a
	Clinician perceptions	Organization structure	Governance structure	Clinician Perceptions and Experience Survey	1; 1a; 1c; 2; 2a; 2b
	Clinician perceptions	Organization structure	Contracting and management	Clinician Perceptions and Experience Survey	1; 1b; 1c; 2; 2a; 2b; 3; 10b
	Clinician perceptions	Performance monitoring	Performance monitoring	Clinician Perceptions and Experience Survey	2; 2a; 2b; 3
	Clinician perceptions	Performance monitoring	Clarity and focus of incentive structure	Clinician Perceptions and Experience Survey	3; 10; 10a; 10b
	Clinician perceptions	HIT and data monitoring	HIT infrastructure for care management; Clinical information exchange; Patient tracking, data monitoring and sharing	Clinician Perceptions and Experience Survey	2; 2a; 2b

⁴¹ Claudia L. Schur and Janet P. Sutton, Physicians in Medicare ACOs Offer Mixed Views of Model for Health Care Cost and Quality, Health Affairs 36, no. 4 (2017): 649-654

Source	Conceptual Framework	Domains	Sub-Domains	Source	Research Questions
	Clinician Implementation Experience	Model features Implementation experience	Perceptions about implementation of model features	Clinician Perceptions and Experience Survey	4; 4b
	Clinician Implementation Experience	Care delivery approaches	Implementation of Patient-focused care, Care management activities, Care coordination and transitions of care activities	Clinician Perceptions and Experience Survey	3a; 3b; 3d; 4; 4b; 5c; 6b; 7d
	Clinician Implementation Experience	Care delivery approaches	Use of quality improvement methods	Clinician Perceptions and Experience Survey	3a; 3c; 4; 4b
	Sustainability and replicability	Implementation challenges and barriers	Perceived challenges related to physician engagement and buy-in, building workable governance structure, legal and regulatory structures, management information systems, accessing start-up capital, maintaining common culture, data analytics, performance monitoring	Clinician Perceptions and Experience Survey	14e; 15; 10; 10a; 10b; 10c; 12b
	Sustainability and replicability	Implementation Facilitators	Perceived facilitators related to prior experience, presence of physician champions, market structure, collaboration and cooperation across providers, HIE infrastructure	Clinician Perceptions and Experience Survey	14e; 15; 4; 10, 10a, 10b; 12b

Usability testing was completed after the initial computer programming was finished (more information about the programming and fielding methodology is provided below). Usability testing ensures that each question is asked in the correct order and of the right population.

Fielding Methods

NGACO Clinician Survey. The NGACO clinician survey was fielded one-time only from April 4, 2018-August 10, 2018. ACOs provided contact information for the physicians on a rolling basis. We sent physician names to our data vendor, IQVIA for help matching email addresses in instances where the email was missing. The list of names was divided into two waves of sample release, with the first wave released April 4 and the second wave released June 6. NORC’s survey team routinely monitored completion rates to reduce accidental or inadvertent non-responses due to timing or distraction. NORC sent reminder emails once a week, placed prompting telephone calls, and mailed a printed reminder letter. Once an ACO met the target of 60 physician completes NORC stopped follow up to the physicians aligned with that ACO.

Exhibit F.6. NGACO Participation in Clinician Survey

	Fielded on April 4, 2018-August 10, 2018
2016 Cohort	16 out of 16
2017 Cohort	28 out of 28
2018 Cohort	NA

Exhibit F.7. Clinician Survey Completion Rate

Domain	Number of Questionnaire Items	2016 & 2017 Cohorts (N = 3,207)
Participant Information	3	97%
Organizational Structure – Physician’s Relationship to the ACO	6	95%
Motivating Factors for ACO Participation – Physician Engagement	2	91%
Awareness	1	94%
Performance Data	4	83%
Changes since Starting Participation in the Next Generation ACO Model	2	85%
Health Information Technology (IT) and Data Monitoring - Current Activities	4	76%
Care Delivery Approaches	3	88%
Implementation Experience _ Benefit Enhancements	6	94%
Annual Wellness Visit	3	91%
Supplemental Track	2	98%

Analytic Methods

Recoding and Cleaning. The collected raw data were recoded and cleaned to produce final analytic files. Responses flagged by the quality assurance process were reviewed to assess their appropriateness and completeness.

Weighting. To adjust for non-response and to make the respondents more representative of the target population, a weighting routine with four steps was implemented. First, base weights were constructed according to the probability of selection. Second, an adjustment was made for cases for which contact information was not available. In this step a logistic regression model was fit using data from the sampling frame to predict the probability of each sampled case having contact information available. Five weighting classes were constructed and the weights of sampled cases without contact information were distributed to sampled cases with contact information according to their weighting class.

A similar step was performed to account for nonresponse of the sampled cases with contact information. The weights of non-respondents with contact information were distributed to respondents through weighting classes defined by a logistic regression model built on available frame data.

Finally, the weights of the respondents were calibrated to agree with known population totals of participating physicians for each of the following post-data collection strata: organization type, risk selection, payment mechanism, and rurality.

The calibration step was performed iteratively using a ranking and weight trimming algorithm which alternately adjusted the respondents' weights to agree with control totals for each post-strata until convergence was achieved and then trimmed weights so as to not exceed a specified extreme threshold. After each adjustment step (contact adjustment, non-response adjustment, calibration) the adjustment factors for relevant cases were analyzed to ensure that the variance of estimates would not be significantly affected. This, along with the weight trimming step, helped to reduce variability in the final estimates of the parameters of interest. For the clinician survey, given the small population size, a finite population correction for each strata was used in the calculation of population estimates in order to appropriately report the standard errors of the estimates.

Appendix G: Exhibits to Support Chapter 2

Exhibit G.1. Model Features of NGACOs in Performance Year 3

NGACO	Full Performance Risk (100%)	Cap on Savings (Loss)	Payment Mechanism	Benefit Enhancements Implementation Status		
				3-Day Post-Discharge SNF Waiver	Post-Discharge Home Visit Waiver	Telehealth Waiver
2016 Cohort						
ACCST	■	10	PBP	○	●	○
Bellin		15	FFS	●	●	○
CHESS	■	5	FFS+ISP	●	○	○
Deaconess	■	5	FFS	●	●	○
Henry Ford		5	FFS+ISP	●	○	●
Park Nicollet		15	FFS	●	○	–
Pioneer Valley		5	FFS+ISP	X	–	○
Steward	■	6.5	PBP	●	○	○
ThedaCare		5	FFS	○	–	◇
Triad	■	5	PBP	○	○	○
Trinity		5.5	FFS+ISP	●	–	○
UniPhy	■	6.5	PBP	–	–	–
UnityPoint (Iowa)	■	10	PBP	●	●	○
2017 Cohort						
Accountable Care Options	■	15	PBP	●	●	○
APA		5	AI PBP	●	○	○
Arizona		5	PBP	○	X	○
Atrius	■	7	FFS+ISP	●	–	●
Bronx	■	10	FFS+ISP	●	–	○
Carilion	■	5.0	FFS	–	○	○
Dartmouth-Hitchcock		5	FFS	●	–	X
HCP	■	5	FFS	–	–	–
Hill	■	5	FFS+ISP	X	–	–
Indiana U	■	5	FFS	●	○	–
Integra		5	PBP	●	●	○
MPACO	■	5	FFS+ISP			
NatACO		5	PBP			
NW Momentum		5	FFS+ISP	●	○	○
Partners		9	FFS	●	X	●
ProHealth		5	FFS+ISP	●	–	–

NGACO	Full Performance Risk (100%)	Cap on Savings (Loss)	Payment Mechanism	Benefit Enhancements Implementation Status		
				3-Day Post-Discharge SNF Waiver	Post-Discharge Home Visit Waiver	Telehealth Waiver
ProspectNE		5	FFS+ISP	●	○	○
RHeritage		5	FFS	●	●	●
St. Luke's	■	10	PBP	X	-	●
UNC	■	5	FFS+ISP	●	-	●
UTSW	■	15	PBP	●	○	○
2018 Cohort						
ACC of Tennessee		5.0	FFS	●	-	○
Best Care Collaborative	■	10	FFS+ISP	●	X	X
CareMount Health Solutions		15	FFS	●	○	○
Central Utah Clinic		5	FFS	○	○	○
Connected Care of SE Mass	■	15	FFS	●	○	○
CoxHealth Accountable Care	■	15	FFS+ISP	●	○	○
Franciscan Missionaries	■	15	FFS+ISP	-	-	-
Mary Washington Health Alliance	■	5	PBP	○	-	○
NEQCA Accountable Care	■	5	FFS+ISP	○	-	-
North Jersey Health Alliance	■	15	FFS+ISP	X	X	X
Primaria	■	5	FFS	●	○	-
Primary Care Alliance	■	10	FFS	●	○	○
Reliance NextGen ACO		5	FFS	●	○	○
Reliant Medical Group	■	5	FFS+ISP	●	○	○
Torrance Memorial Integrated Physicians		5	FFS	○	○	○
UW Health ACO		5	FFS	●	●	○

NOTES: FFS = fee-for-service. PBP = reduced fee-for-service spending with population-based payments (PBP). AIPBP = All-inclusive population-based payments. FFS+ISP = FFS plus infrastructure payment. For benefit enhancements, ● = fully implemented; ○ = planning to or in the process of implementing, - = not planning to implement; X = discontinued implementation; ◇ = NGACO leader did not know status; blank = no response.
 SOURCE: Data collected in NORC NGACO Leadership Survey.

Appendix H: Exhibits to Support Chapter 4

Exhibit H.1. Descriptive Characteristics of the 2016 Cohort's NGACO-Aligned and Propensity Score-Weighted Comparison Beneficiaries

Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Number of beneficiaries	1350300	1338762	459603	452799	-
Total person-months	15558916	15546376	5299792	5261904	-
Variables Included in Propensity Score Models					
Mean months of alignment (±SD)	11.5 ± 1.9	11.6 ± 1.8	11.5 ± 1.9	11.6 ± 1.8	0.000
Mean Age (years ± SD)	73.0 ± 12.6	73.1 ± 12.7	73.2 ± 11.8	73.2 ± 11.9	-0.013
Gender (%)					
Male	41.7	41.7	42.3	42.4	-0.137
Race/Ethnicity (%)					
White	85.4	85.8	84.7	85.0	-0.004
Black	7.5	7.3	7.4	7.2	-0.024
Hispanic	4.6	4.4	4.3	4.2	-0.022
Asian	1.1	1.2	1.4	1.4	-0.005
Other	1.3	1.3	2.3	2.2	0.055
Disability/ESRD (%)					
Disability	16.2	16.1	14.3	14.1	0.061
ESRD	1.1	1.1	1.0	1.0	-0.029
Coverage (%)					
Any dual eligibility	21.4	21.6	19.0	19.2	-0.053
Any Part D coverage	71.7	72.2	77.8	78.6	-0.248*
Chronic Conditions					
Mean no. of chronic conditions (± SD)	5.1 ± 3.5	5.1 ± 3.6	5.6 ± 3.8	5.6 ± 3.8	-0.002
Alzheimer's/dementia (%)	8.8	9.2	8.7	9.2	-0.118
Chronic kidney disease (%)	16.9	17.1	25.5	25.8	-0.068
COPD (%)	11.3	11.4	11.8	11.9	0.004
Congestive heart failure (%)	13.2	13.4	13.1	13.3	-0.041
Diabetes (%)	29.3	29.1	28.3	28.1	0.034
Ischemic heart disease (%)	28.4	28.5	26.4	26.7	-0.165
Depression (%)	18.2	18.3	20.5	20.6	0.155
RA/OA (%)	32.1	32.2	35.5	35.5	0.048
Stroke/TIA (%)	3.6	3.6	3.6	3.7	-0.029
Cancer (%)	8.9	9.1	9.4	9.6	-0.020
Mortality (%)					
Death in reference period	4.2	4.9	3.8	4.7	-0.197**
Community Characteristics					
Median income (\$ ± SD)	57925.1 ± 22685.6	58237.6 ± 23612.3	63642.8 ± 24842.8	63916.9 ± 25651.1	38.546
Below poverty line (% ± SD)	13.3 ± 8.7	13.1 ± 8.5	12.5 ± 8.1	12.3 ± 8.0	-0.012
Bachelor's degree or higher (% ± SD)	28.1 ± 15.6	28.3 ± 16.0	30.7 ± 16.0	30.8 ± 16.3	0.136***
Rurality (%)	19.9	20.1	18.6	19.2	-0.374***

Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD) ‡	1.9 ± 1.0	1.9 ± 1.1	2.3 ± 1.2	2.3 ± 1.3	0.016***
Variables Excluded from Propensity Score and Regression Models ±					
HRR Characteristics					
ACO penetration rate (% ± SD)	25.2 ± 16.1	25.4 ± 16.3	42.2 ± 11.7	42.3 ± 11.7	0.075*
Medicare Advantage penetration rate (% ± SD)	28.2 ± 13.2	28.4 ± 13.3	35.1 ± 13.5	35.5 ± 13.6	-0.252***
Hospital HHI (± SD)	2615.4 ± 1517.9	2647.9 ± 1544.8	3201.5 ± 1772.9	3262.0 ± 1827.8	-27.938***
Practice HHI (± SD)	442.9 ± 414.7	444.3 ± 414.0	524.9 ± 452.6	522.4 ± 451.3	3.936***
Hospital beds (per 1,000 ± SD)	2.7 ± 0.6	2.7 ± 0.6	2.6 ± 0.6	2.6 ± 0.6	0.003*
Alignment-eligible providers (per 1,000 population ± SD)	1.4 ± 0.3	1.4 ± 0.3	1.9 ± 0.5	1.9 ± 0.5	0.003*
Participation in Medicare ACOs (%)					
NGACO	0.0	0.0	100.0	0.0	-
Pioneer/SSP ACO	53.1	12.2	0.0	8.9	-
Participation in Other CMMI Initiatives (%)					
Financial Alignment Demonstration	0.0	0.0	0.0	0.0	-
Independence at Home	0.0	0.1	0.0	0.0	-
Comprehensive Primary Care (including CPC+)	0.9	0.6	0.0	7.7	-
Multi-payer Advanced Primary Care	0.0	0.0	0.0	0.0	-
Participation in Episodic CMS Initiatives (%)					
Bundled Payments for Care Improvement (BPCI) Initiative	0.6	0.5	2.1	1.8	-
Comprehensive Care for Joint Replacement (CJR) Model	0.0	0.0	0.0	0.1	-
Oncology Care Model	0.0	0.0	2.3	2.5	-

NOTES: p<0.1* p<0.05**, p<0.01***. † Where the relative change is less than 0.1, we do not denote statistical significance. COPD = chronic obstructive pulmonary disease; ESRD = end-stage renal disease; HHI = Herfindahl-Hirschman Index, a measure of the degree of market concentration or competition (higher HHI means more concentrated market, while lower HHI means more competitive market). The denominator for ACO penetration rate is the number of Medicare FFS beneficiaries with Part A and B coverage; the denominator for the MA penetration rate is total number of Medicare beneficiaries with Part A and B coverage. SSP = Medicare Shared Savings Program; OA = osteoarthritis; RA = rheumatoid arthritis; SD = standard deviation; TIA = transient ischemic attack. Community characteristics are at the ZIP code level. ‡ Alignment eligible providers per 1,000 persons based on the total population (not restricted to the Medicare population ± These HRR characteristics are not included in propensity score or DID regression models; rather, we account for changes in these HRR characteristics over time by including HRR fixed effects along with year fixed effects, in our PS and DID analysis. HRR characteristics are weighted to the proportion of NGACO and comparison beneficiaries in the HRRs in the BYs and PY.

SOURCE: NORC analysis of Medicare enrollment and claims data, 2013-2018 and ancillary data.

Exhibit H.2. Descriptive Characteristics of the 2017 Cohort's NGACO-Aligned and Propensity Score-Weighted Comparison Beneficiaries

Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Number of beneficiaries	1945751	1928391	652244	646601	-
Total person-months	22455232	22461520	7545721	7534886	-
Variables Included in Propensity Score Models					
Mean months of alignment (±SD)	11.5 ± 1.8	11.6 ± 1.7	11.6 ± 1.8	11.7 ± 1.7	0.023***
Mean Age (years ± SD)	73.3 ± 11.8	73.3 ± 11.9	73.8 ± 11.0	73.9 ± 11.1	-0.066**
Gender (%)					
Male	41.6	41.7	42.0	42.1	-0.020
Race/Ethnicity (%)					
White	76.6	77.4	77.9	78.4	0.218**
Black	8.1	8.0	7.1	6.9	0.136**
Hispanic	7.2	6.9	6.4	6.2	-0.076
Asian	5.9	5.6	5.6	5.6	-0.271***
Other	2.2	2.1	3.0	3.0	-0.007
Disability/ESRD (%)					
Disability	14.2	14.0	11.7	11.4	0.120*
ESRD	1.2	1.2	1.1	1.1	0.019
Coverage (%)					
Any dual eligibility	24.7	24.3	20.6	20.6	-0.324***
Any Part D coverage	74.1	74.7	77.9	78.8	-0.305***
Chronic Conditions					
Mean no. of chronic conditions (± SD)	5.3 ± 3.7	5.3 ± 3.7	5.6 ± 3.8	5.7 ± 3.9	-0.008
Alzheimer's/dementia (%)	9.5	9.8	9.6	9.9	-0.100
Chronic kidney disease (%)	19.4	19.5	26.5	26.7	-0.086
COPD (%)	10.7	10.7	10.9	11.0	-0.097
Congestive heart failure (%)	13.7	13.9	13.0	13.3	-0.124*
Diabetes (%)	30.3	30.1	29.3	29.2	-0.088
Ischemic heart disease (%)	28.4	28.5	27.5	27.7	-0.103
Depression (%)	18.4	18.5	19.5	19.6	0.053
RA/OA (%)	33.6	33.6	36.7	36.8	-0.101
Stroke/TIA (%)	3.7	3.7	3.6	3.7	-0.030
Cancer (%)	9.3	9.4	9.9	10.0	0.007
Mortality (%)					
Death in reference period	3.8	4.4	3.6	4.3	-0.101*
Community Characteristics					
Median income (\$ ± SD)	64680.4 ± 26888.1	65500.9 ± 29127.5	71609.3 ± 29390.4	72669.2 ± 32152.7	-239.339**
Below poverty line (% ± SD)	13.8 ± 9.2	13.7 ± 9.4	12.5 ± 8.3	12.3 ± 8.4	0.088***
Bachelor's degree or higher (% ± SD)	34.2 ± 18.0	34.6 ± 18.9	36.8 ± 18.3	37.1 ± 19.5	0.052
Rurality (%)	12.2	12.5	11.8	12.1	-0.077
Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD)‡	2.0 ± 1.2	2.0 ± 1.2	2.2 ± 1.3	2.2 ± 1.3	0.016***
Variables Excluded from Propensity Score and Regression Models ±					
HRR Characteristics					
ACO penetration rate (% ± SD)	28.7 ± 14.6	28.7 ± 14.6	38.9 ± 13.7	39.0 ± 13.7	0.076**

Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Medicare Advantage penetration rate (% ± SD)	31.9 ± 12.8	31.8 ± 12.8	35.5 ± 12.2	35.5 ± 12.2	-0.123***
Hospital HHI (± SD)	2114.4 ± 1577.4	2124.4 ± 1582.6	2264.2 ± 1579.0	2270.8 ± 1587.6	3.251
Practice HHI (± SD)	311.5 ± 326.3	313.6 ± 327.3	339.7 ± 355.1	338.4 ± 351.9	3.427***
Hospital beds (per 1,000 ± SD)	2.4 ± 0.6	2.4 ± 0.6	2.3 ± 0.7	2.3 ± 0.7	-0.000
Alignment-eligible providers (per 1,000 population ± SD)	1.5 ± 0.4	1.5 ± 0.4	1.9 ± 0.6	1.9 ± 0.6	0.004**
Participation in Medicare ACOs (%)					
NGACO	0.0	0.0	100.0	0.0	-
Pioneer/SSP ACO	55.1	12.0	0.0	8.6	-
Participation in Other CMMI Initiatives (%)					
Financial Alignment Demonstration	0.1	0.1	0.0	0.1	-
Independence at Home	0.1	0.1	0.0	0.0	-
Comprehensive Primary Care (including CPC+)	0.0	0.5	0.0	1.9	-
Multi-payer Advanced Primary Care	0.0	0.0	0.0	0.0	-
Participation in Episodic CMS Initiatives (%)					
Bundled Payments for Care Improvement (BPCI) Initiative	1.0	1.2	1.3	1.6	-
Comprehensive Care for Joint Replacement (CJR) Model	0.1	0.1	0.0	0.2	-
Oncology Care Model	0.7	0.7	2.5	2.7	-

NOTES: p<0.1* p<0.05**, p<0.01***. † Where the relative change is less than 0.1, we do not denote statistical significance COPD = chronic obstructive pulmonary disease; ESRD = end-stage renal disease; HHI = Herfindahl-Hirschman Index, a measure of the degree of market concentration or competition (higher HHI means more concentrated market, while lower HHI means more competitive market). The denominator for ACO penetration rate is the number of Medicare FFS beneficiaries with Part A and B coverage; the denominator for the MA penetration rate is total number of Medicare beneficiaries with Part A and B coverage. SSP = Medicare Shared Savings Program; OA = osteoarthritis; RA = rheumatoid arthritis; SD = standard deviation; TIA = transient ischemic attack. Community characteristics are at the ZIP code level. ‡ Alignment eligible providers per 1,000 persons based on the total population (not restricted to the Medicare population). ± These HRR characteristics are not included in propensity score or DID regression models; rather, we account for changes in these HRR characteristics over time by including HRR fixed effects along with year fixed effects, in our PS and DID analysis.

SOURCE: NORC analysis of Medicare enrollment and claims data, 2013-2018 and ancillary data.

Exhibit H.3. Descriptive Characteristics of the 2018 Cohort's NGACO-Aligned and Propensity Score-Weighted Comparison Beneficiaries

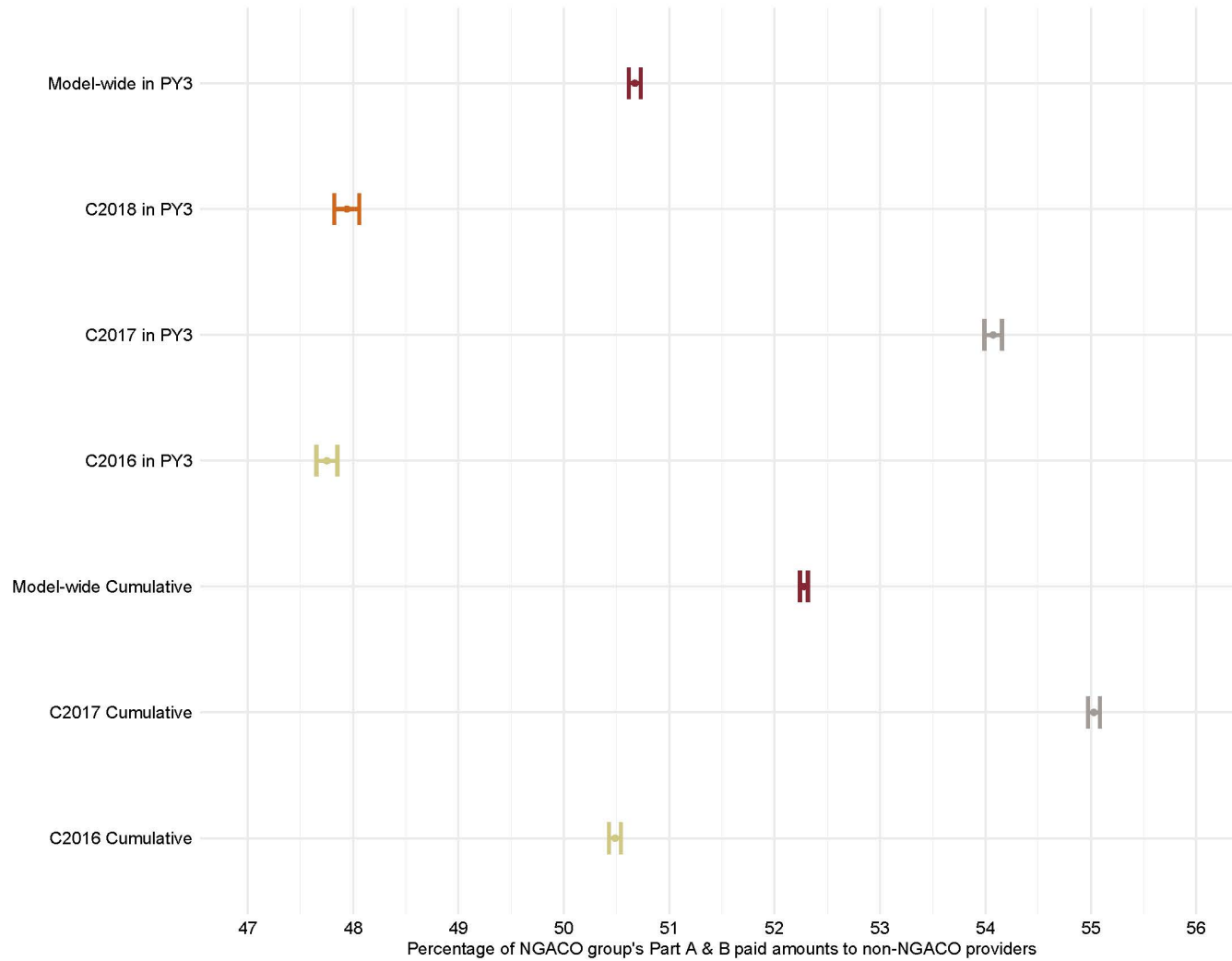
Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Number of beneficiaries	773762	775939	287551	286918	-
Total person-months	8970956	9042067	3331389	3343926	-
Variables Included in Propensity Score Models					
Mean months of alignment (±SD)	11.6 ± 1.7	11.7 ± 1.7	11.6 ± 1.8	11.7 ± 1.7	-0.010
Mean Age (years ± SD)	74.0 ± 11.1	74.0 ± 11.2	74.1 ± 10.7	74.1 ± 10.9	0.021
Gender (%)					
Male	42.4	42.5	42.4	42.6	-0.054
Race/Ethnicity (%)					
White	87.4	87.5	87.2	87.3	-0.008
Black	5.7	5.7	5.5	5.4	0.041
Hispanic	2.6	2.6	2.6	2.5	0.007
Asian	2.2	2.1	2.1	2.1	-0.031
Other	2.1	2.1	2.6	2.6	-0.009
Disability/ESRD (%)					
Disability	11.7	11.5	10.8	10.5	0.021
ESRD	0.8	0.8	0.8	0.8	-0.013
Coverage (%)					
Any dual eligibility	15.4	15.5	14.5	14.6	-0.020
Any Part D coverage	73.4	73.9	75.9	76.7	-0.190
Chronic Conditions					
Mean no. of chronic conditions (± SD)	5.2 ± 3.6	5.2 ± 3.6	5.5 ± 3.7	5.5 ± 3.8	-0.003
Alzheimer's/dementia (%)	8.5	8.7	8.6	8.9	-0.053
Chronic kidney disease (%)	19.8	19.9	24.6	24.8	-0.089
COPD (%)	10.7	10.8	11.0	11.1	-0.055
Congestive heart failure (%)	12.7	13.0	12.7	13.0	-0.012
Diabetes (%)	27.9	27.9	27.3	27.2	0.073
Ischemic heart disease (%)	28.4	28.7	27.8	28.1	-0.075
Depression (%)	17.6	17.6	18.7	18.8	0.021
RA/OA (%)	33.5	33.4	35.2	35.1	0.008
Stroke/TIA (%)	3.8	3.9	3.6	3.7	-0.002
Cancer (%)	9.7	9.8	10.0	10.0	-0.003
Mortality (%)					
Death in reference period	3.9	4.4	3.7	4.3	-0.124*
Community Characteristics					
Median income (\$ ± SD)	67183.9 ± 26965.2	67501.7 ± 29077.0	71401.7 ± 27616.1	72024.3 ± 30036.2	-304.784***
Below poverty line (% ± SD)	11.8 ± 8.3	11.8 ± 8.6	11.2 ± 7.8	11.1 ± 7.8	0.112***
Bachelor's degree or higher (% ± SD)	35.0 ± 16.6	34.9 ± 17.7	36.4 ± 16.6	36.6 ± 17.8	-0.235***
Rurality (%)	8.3	8.7	8.2	8.6	-0.023
Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD)‡	2.2 ± 1.3	2.2 ± 1.3	2.3 ± 1.3	2.3 ± 1.3	0.007
Variables Excluded from Propensity Score and Regression Models ±					
HRR Characteristics					
ACO penetration rate (% ± SD)	31.1 ± 14.3	31.1 ± 14.2	37.4 ± 15.4	37.4 ± 15.4	-0.073

Characteristics	Baseline Years		PY3		Differential Change
	NGACO	Comparison	NGACO	Comparison	
Medicare Advantage penetration rate (% ± SD)	31.9 ± 9.7	31.8 ± 9.7	34.5 ± 9.4	34.5 ± 9.4	-0.048
Hospital HHI (± SD)	2199.5 ± 1289.9	2194.8 ± 1286.9	2304.4 ± 1238.0	2310.1 ± 1238.7	-10.375**
Practice HHI (± SD)	465.1 ± 536.7	462.9 ± 535.2	486.5 ± 552.0	490.2 ± 558.1	-5.854**
Hospital beds (per 1,000 ± SD)	2.4 ± 0.5	2.4 ± 0.5	2.4 ± 0.5	2.4 ± 0.5	0.003*
Alignment-eligible providers (per 1,000 population ± SD)	1.7 ± 0.5	1.7 ± 0.5	2.0 ± 0.6	2.0 ± 0.6	0.002
Participation in Medicare ACOs (%)					
NGACO	0.0	0.0	100.0	0.0	-
Pioneer/SSP ACO	48.6	10.8	0.0	9.5	-
Participation in Other CMMI Initiatives (%)					
Financial Alignment Demonstration	0.0	0.0	0.0	0.0	-
Independence at Home	0.0	0.0	0.0	0.0	-
Comprehensive Primary Care (including CPC+)	1.3	3.1	0.0	5.2	-
Multi-payer Advanced Primary Care	0.0	0.0	0.0	0.0	-
Participation in Episodic CMS Initiatives (%)					
Bundled Payments for Care Improvement (BPCI) Initiative	2.1	1.6	1.7	1.5	-
Comprehensive Care for Joint Replacement (CJR) Model	0.3	0.3	0.1	0.3	-
Oncology Care Model	1.8	1.9	2.4	2.6	-

NOTES: p<0.1* p<0.05**, p<0.01***. † Where the relative change is less than 0.1, we do not denote statistical significance COPD = chronic obstructive pulmonary disease; ESRD = end-stage renal disease; HHI = Herfindahl-Hirschman Index, a measure of the degree of market concentration or competition (higher HHI means more concentrated market, while lower HHI means more competitive market). The denominator for ACO penetration rate is the number of Medicare FFS beneficiaries with Part A and B coverage; the denominator for the MA penetration rate is total number of Medicare beneficiaries with Part A and B coverage. SSP = Medicare Shared Savings Program; OA = osteoarthritis; RA = rheumatoid arthritis; SD = standard deviation; TIA = transient ischemic attack. Community characteristics are at the ZIP code level. ‡ Alignment eligible providers per 1,000 persons based on the total population (not restricted to the Medicare population). ± These HRR characteristics are not included in propensity score or DID regression models; rather, we account for changes in these HRR characteristics over time by including HRR fixed effects along with year fixed effects, in our PS and DID analysis.

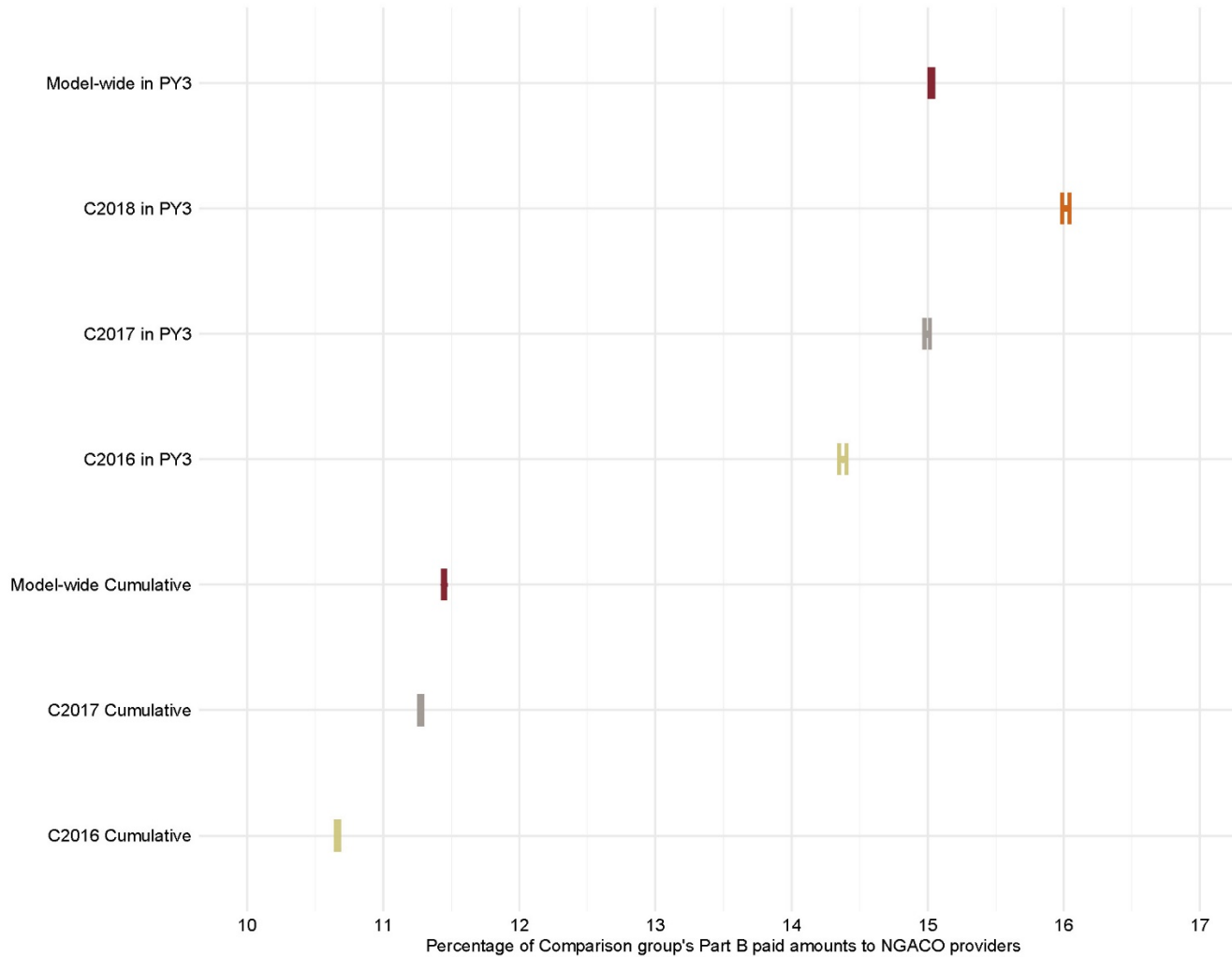
SOURCE: NORC analysis of Medicare enrollment and claims data, 2013-2018 and ancillary data.

Exhibit H.4. Leakage for NGACO Group Cumulatively as of PY3 and in PY3, Model-Wide and for Cohorts, Mean, and 95% Confidence Interval



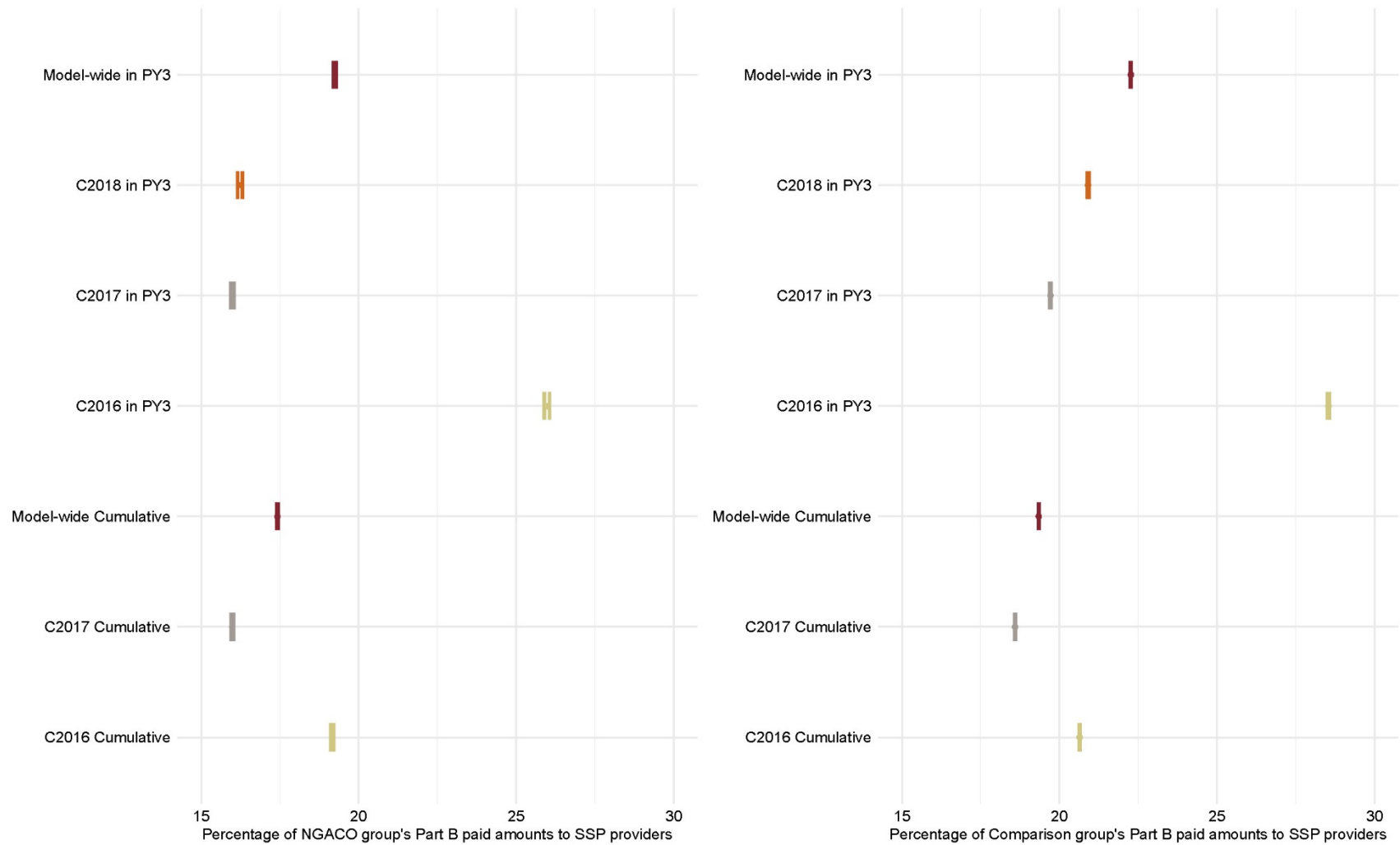
NOTE: We measure leakage as percentage of NGACO beneficiaries' Medicare Parts A & B paid amounts in the performance year(s) to providers outside their NGACO.

Exhibit H.5. Direct Spillover on Comparison Group from NGACO providers cumulatively as of PY3 and in PY3, Model-Wide and for Cohorts, Mean and 95% Confidence Interval



NOTE: We measure direct spillover as the percentage of the comparison group beneficiaries' Medicare Part B paid amounts in the performance year(s) to NGACO participating providers.

Exhibit H.6. Degree of Care from SSP Providers for NGACO and Comparison Groups Cumulatively as of PY3 and in PY3, Model-Wide and for Cohorts, Mean, and 95% Confidence Interval



NOTE: We measure degree of care from SSP providers as the percentage of the NGACO and comparison group beneficiaries' Medicare Part B paid amounts in the performance years to SSP providers.

Exhibit H.7. Sensitivity Analysis of NGACO Model Net Spending Impact: Including Proportionate Shared Savings Payments to Comparison Group SSP Beneficiaries in Performance Years, Cumulatively and in PY3

Total Medicare Parts A and B Spending	Cumulative Impact in PY1, PY2, and PY3 (2016-2018)			Impact in PY3 (2018)			
	Model-Wide PY1, PY2, PY3	2016 Cohort PY1, PY2, PY3	2017 Cohort PY2, PY3	Model-Wide	2016 Cohort	2017 Cohort	2018 Cohort
Estimated Net Impact After Accounting for NGACO Shared Savings and CCR Payouts in PYs: Main Analysis							
PBPY estimate	\$37.80	\$125.51 ***	-\$58.40	\$8.51	\$168.49 *	-\$134.49	\$77.15
PBPY 95% confidence interval	-21.10, 96.69	43.00, 208.01	-156.01, 39.22	-92.06, 109.07	-1.90, 338.87	-306.77, 37.80	-35.21, 189.50
Aggregate estimate	\$117.51M	\$177.49M ***	-\$82.17M	\$11.90M	\$77.44M *	-\$87.72M	\$22.18M
Aggregate 95% confidence interval	-65.59M, 300.60M	60.81M, 294.17M	-219.52M, 55.18 M	-128.82M, 152.63M	-0.87M, 155.75M	-200.1M, 24.65M	-10.13M, 54.49M
Percentage impact	0.28	0.98	-0.41	0.06	1.30	-1.05	0.55
Less Shared Savings payouts for SSP Beneficiaries in Comparison Group in PYs							
Shared Savings Paid out for SSP Beneficiaries in Comparison Group in PYs	\$30.73M	\$13.30M	\$13.38M	\$16.80M	\$4.86M	-\$7.90M	\$4.04M
Estimated Net Impact After Also Accounting for Shared Savings payouts for SSP Beneficiaries in Comparison Group in PYs: Sensitivity Analysis							
PBPY estimate	\$27.92	\$116.10 ***	-\$67.91	-\$3.50	\$157.91 *	-\$146.61 *	\$63.11
PBPY 95% confidence interval	-30.98, 86.81	33.59, 198.61	-165.52, 29.70	-104.06, 97.06	-12.47, 328.29	-318.89, 25.67	-49.25, 175.47
Aggregate estimate	\$86.79M	\$164.19M ***	-\$95.51M	-\$4,899,965	\$72.58M *	-\$95.62M *	\$18.15M
Aggregate 95% confidence interval	-96.30M, 269.88M	47.51M, 280.87M	-232.90M, 41.80M	-145.63M, 135.83M	-5.73M, 150.88M	-208.00M, 16.75M	-14.16M, 50.46M
Percentage impact	0.21	0.91	-0.49	-0.03	1.21	-1.03	0.48

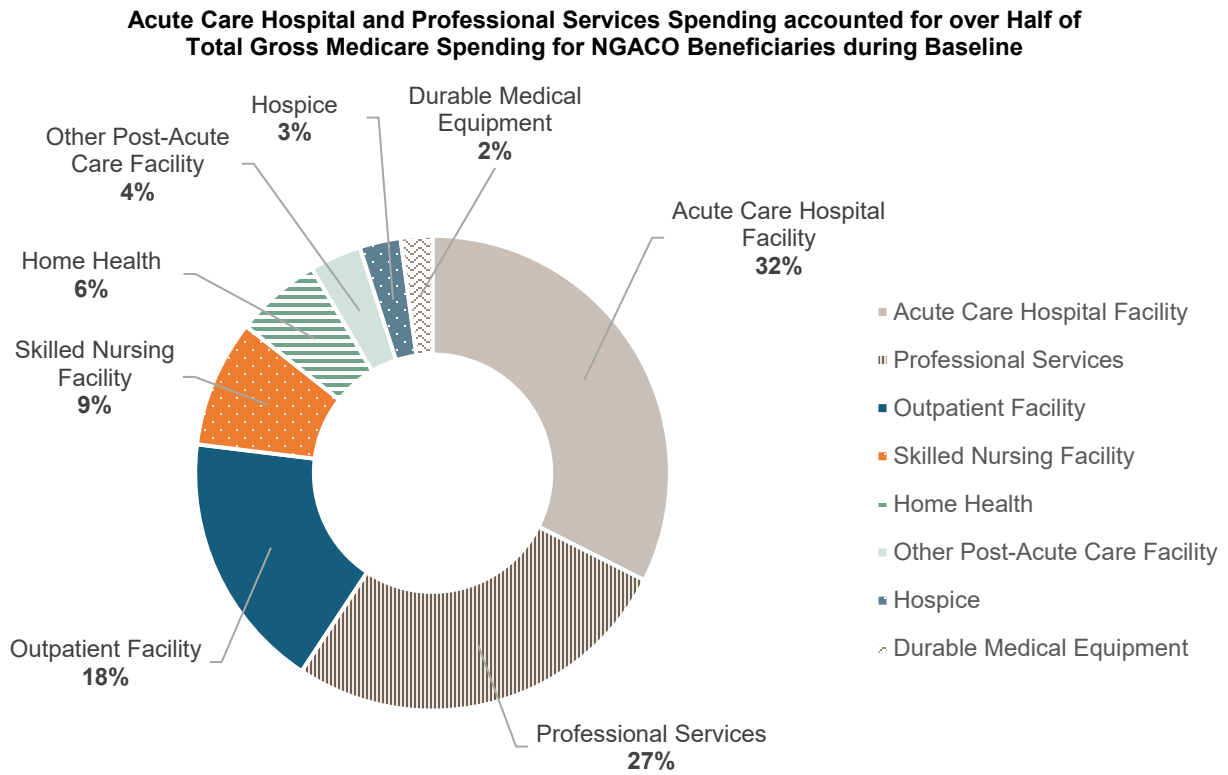
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Estimated net impact is the impact on Medicare spending after considering CMS’s shared savings and coordinate care reward (CCR) payouts in the performance years. Significant impacts at the p<0.1 level appear in **bold** in shaded cells. Unfavorable estimates are shaded in orange. PBPY estimate is the impact estimate per beneficiary per year. Aggregate estimate is impact estimate for all aligned beneficiaries in performance year(s). Percentage impact is relative to expected average Medicare spending for NGACO beneficiaries in performance year(s) absent the model.

Exhibit H.8. Sensitivity Analysis: Impact in PY3 after Truncating Total Gross Medicare Spending at 99th Percentile

Total Gross Medicare Spending	N = 1,399,398			N = 459,603			N = 652,244			N = 287,551		
	Model-Wide Impact in PY3			2016 Cohort in PY3			2017 Cohort in PY3			2018 Cohort in PY3		
	BPY Estimate (\$)	95% CI	% Impact	BPY Estimate (\$)	95% CI	% Impact	BPY Estimate (\$)	95% CI	% Impact	BPY Estimate (\$)	95% CI	% Impact
Uncapped: Main Analysis	-159.40***	-259.96, -58.84	-1.23	-101.35	-271.73, 69.04	-0.82	-191.69**	-363.97, -19.40	-1.39	-178.96***	-291.32, -66.61	-1.46
Capped at 99th percentile: Sensitivity Analysis	-149.25 ***	-232.89, -65.89	-1.22	-133.55*	-280.78, 13.69	-1.15	-147.99**	-288.84, -7.14	-1.15	-177.21***	-267.87, -86.55	-1.53

NOTES: 95% confidence intervals (CI) DID percentage impact presented. Percentage impact relative to expected average spending for NGACO beneficiaries absent the model. BPY = per beneficiary per year. Both analyses use a gamma log link. Uncapped analysis assesses the impact over the entire distribution of spenders; analysis capped at 99th percentile reduces the influence of the highest-spending beneficiaries. The 99th percentile was calculated for each year.

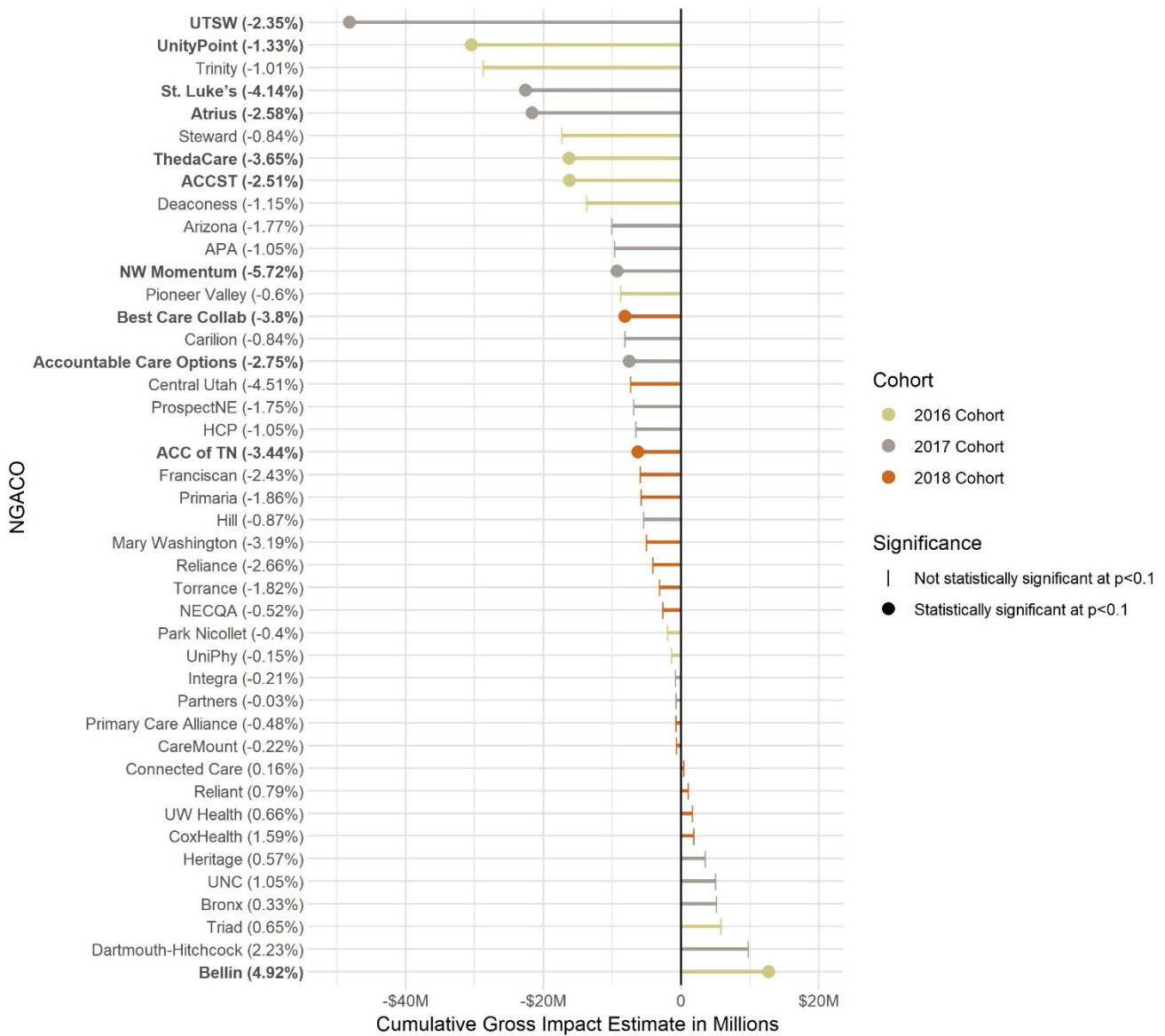
Exhibit H.9. Breakout of NGACO Group's Total Medicare Gross Spending in Baseline Years for PY3, Across Care Settings



NOTES: Baseline spending includes unadjusted gross Medicare Parts A & B spending for the 50 NGACOs participating in PY3, whose baseline years varied by cohort between 2013 and 2017. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B.

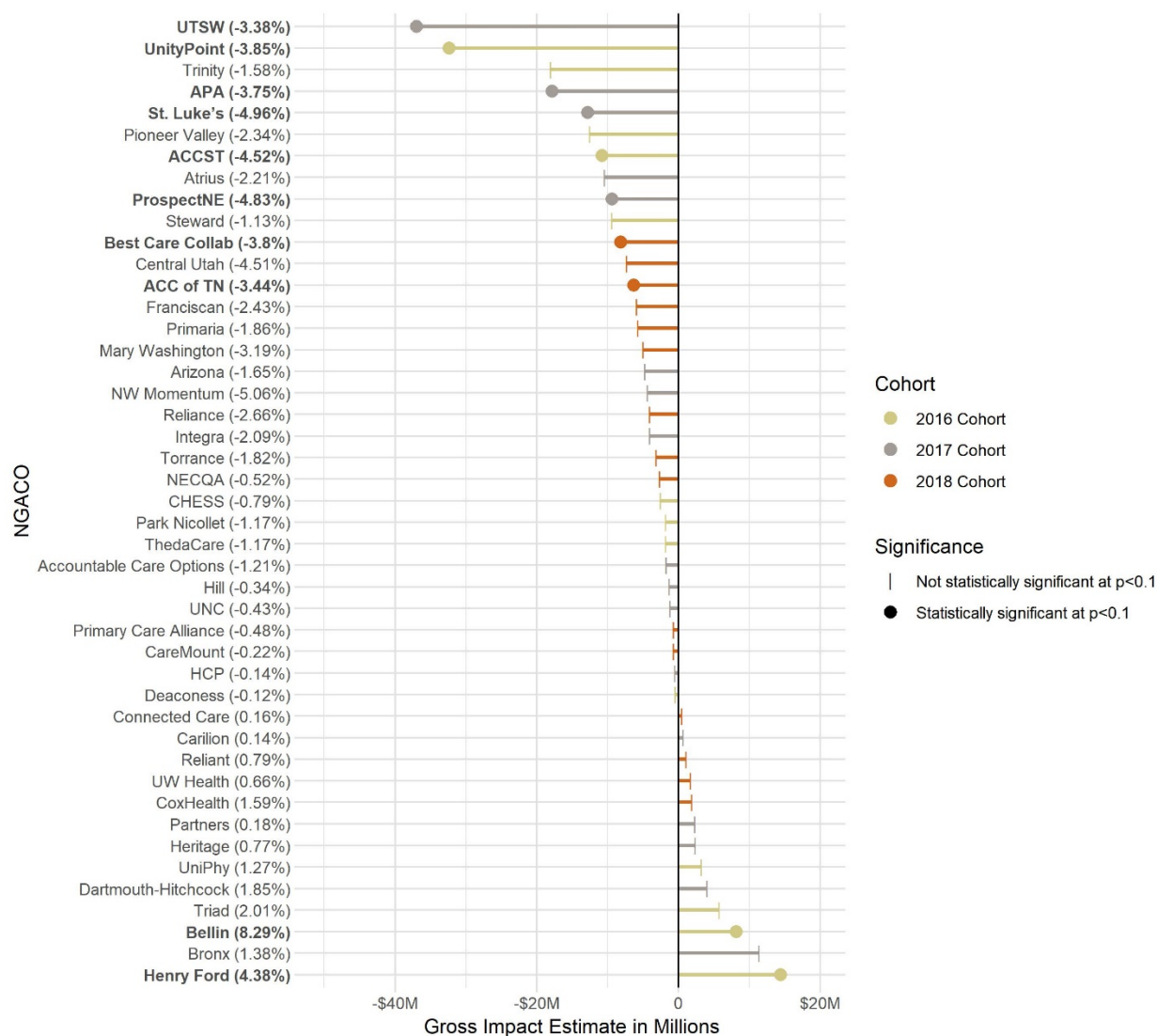
Appendix I: Exhibits to Support Chapter 5

Exhibit I.1. Cumulative Impacts on Aggregate Gross Medicare Spending through PY3 (in Millions), by NGACO



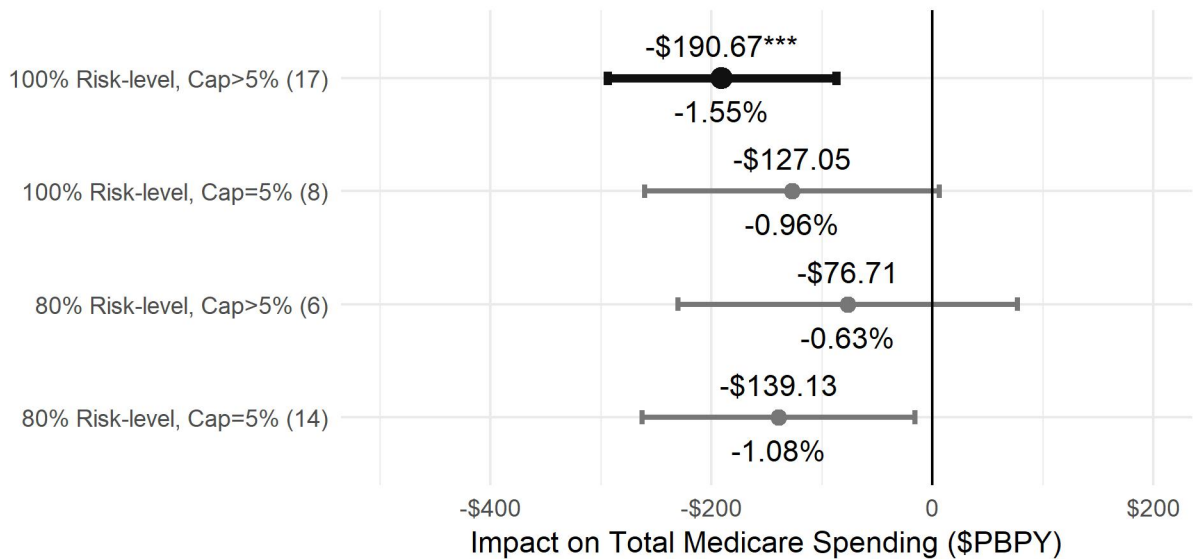
NOTES: Cumulative aggregate impact estimates as of PY3 for gross Medicare spending displayed for 13 NGACOs from 2016 cohort (in olive), 21 NGACOs from 2017 cohort (in gray), and 16 NGACOs from 2018 cohort (in orange) that were active in PY3. Impact estimates to the left of the zero line denote NGACOs with reductions in aggregate gross Medicare spending, and those to the right denote NGACOs with increases in aggregate gross Medicare spending. Cumulative aggregate estimate for an NGACO is the impact estimate for all aligned beneficiaries across all its performance year(s). NGACOs ordered in increasing order of their impact estimates, with those reducing spending on top and those increasing spending at the bottom. Bolded impact estimates statistically significant at p<0.1. Impact estimates with § and dashed lines are uninterpretable due to failure of parallel trends assumption. NGACO names that significantly reduced/increased spending are bolded.

Exhibit I.2. Impact on PY3 Aggregate Gross Medicare Spending (in Millions), by NGACO



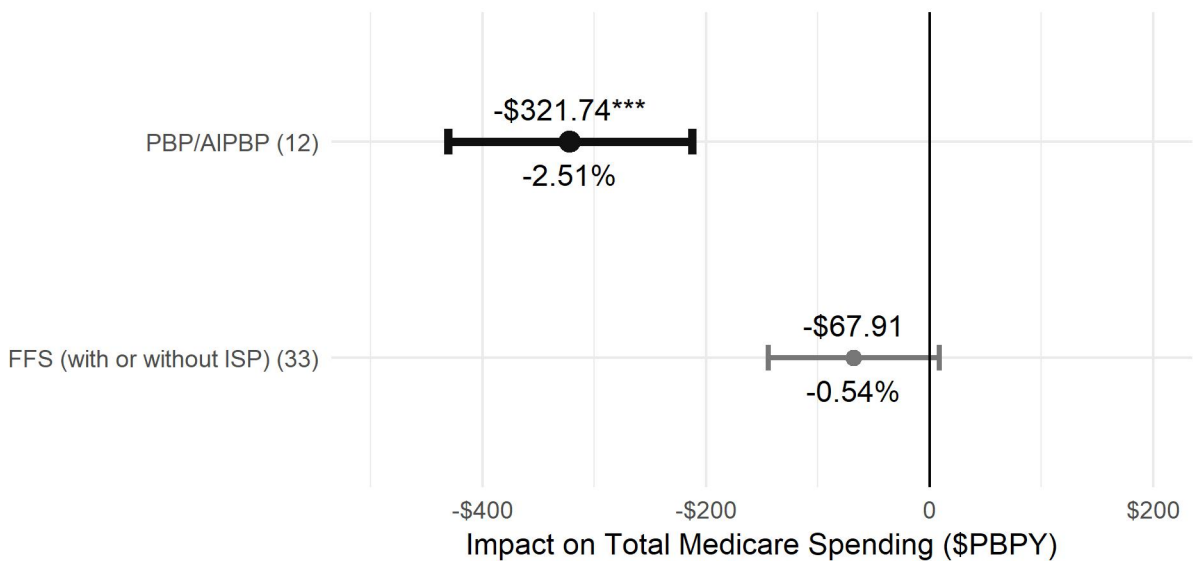
NOTES: Aggregate impact estimates in PY3 for gross Medicare spending displayed for 2016 cohort NGACOs (13) in olive, 2017 cohort NGACOs (21) in gray, and 2018 cohort NGACOs (16) in orange. Aggregate estimate for an NGACO is the impact estimate for all aligned beneficiaries in PY3. NGACOs ordered in increasing order of their impact estimates, with those reducing spending on top and those increasing spending at the bottom. Bolded impact estimates statistically significant at $p < 0.1$. Impact estimates with § and dashed line are uninterpretable due to failure of parallel trends assumption. Aggregate impact estimates to the left of the zero line denote NGACOs with reductions in aggregate gross Medicare spending, and those to the right denote NGACOs with increases in aggregate gross Medicare spending. NGACO names that significantly reduced/increased spending are bolded.

Exhibit I.3. Impacts on Medicare Spending in PY3 for NGACO Risk Selection Subgroups, Excluding NGACOs that Failed Tests for Parallel Trends



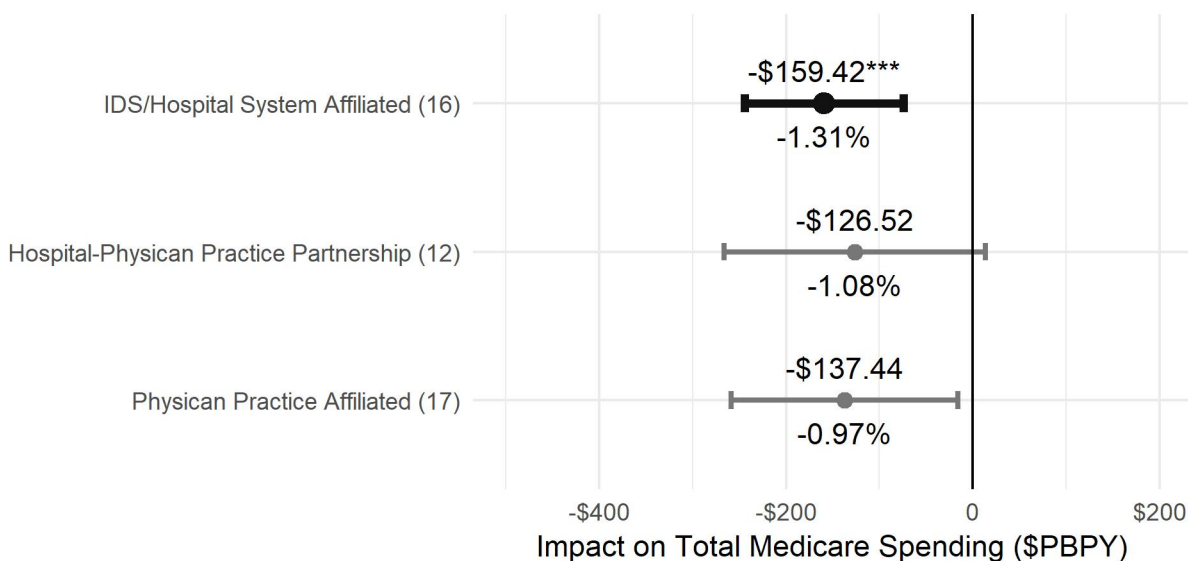
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending PBPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for 45 NGACOs in PY3, excluding the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.4. Impacts on Medicare Spending in PY3 for NGACO Payment Mechanism Subgroups, Excluding NGACOs that Failed Tests for Parallel Trends



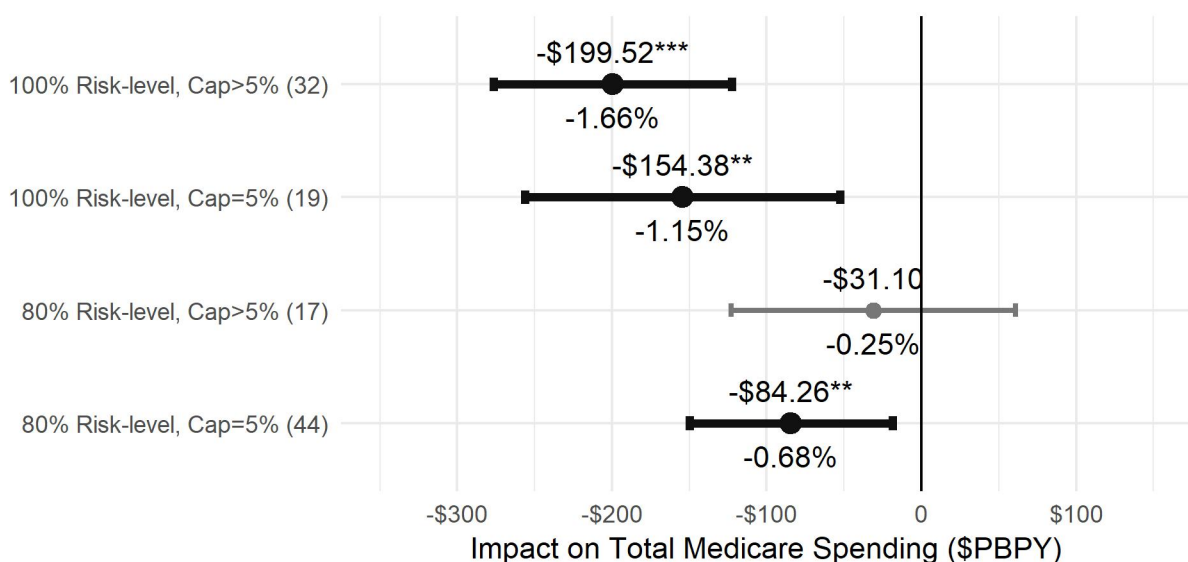
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending PBPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for 45 NGACOs in PY3, excluding the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.5. Impacts on Medicare Spending in PY3 for NGACO Organization Type Subgroups, Excluding NGACOs that Failed Tests for Parallel Trends



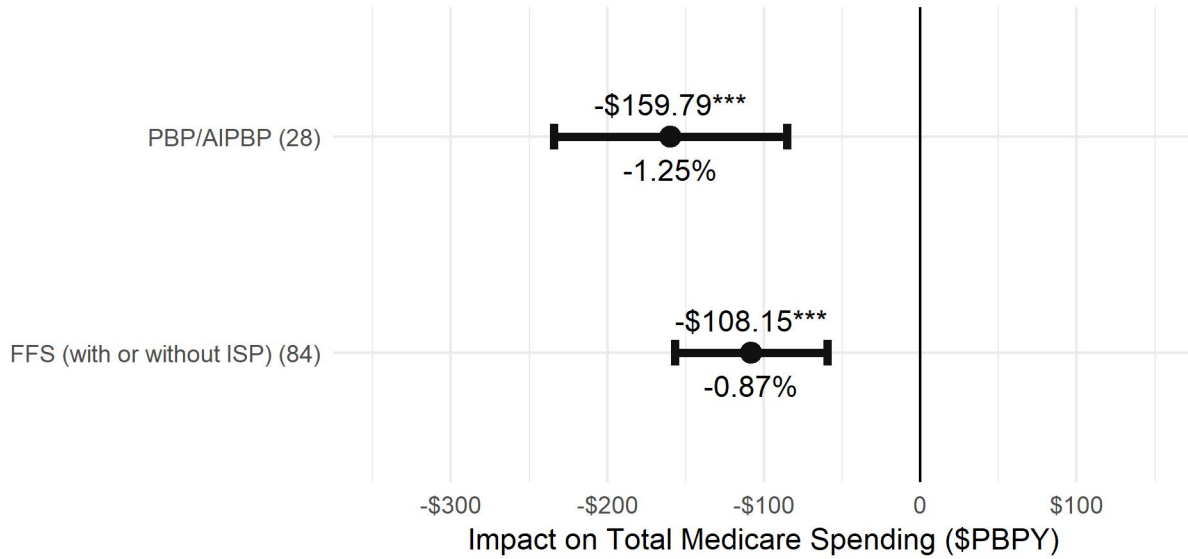
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending BPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for 45 NGACOs in PY3, excluding the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.6. Impacts on Medicare Spending for NGACO Risk Selection Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends, PY1-PY3



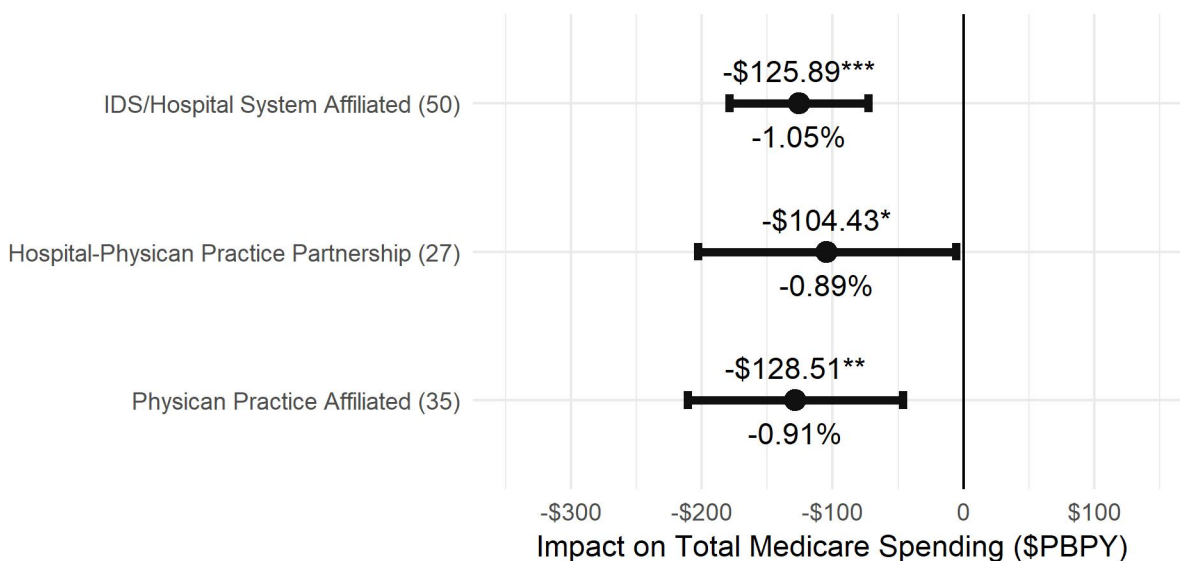
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending Per Beneficiary Per Year, cumulatively as of PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 112 NGACO- Performance Years, including the eight that failed the parallel trends test for total Medicare spending.

Exhibit I.7. Impacts on Medicare Spending for NGACO Payment Mechanism Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends, PY1-PY3



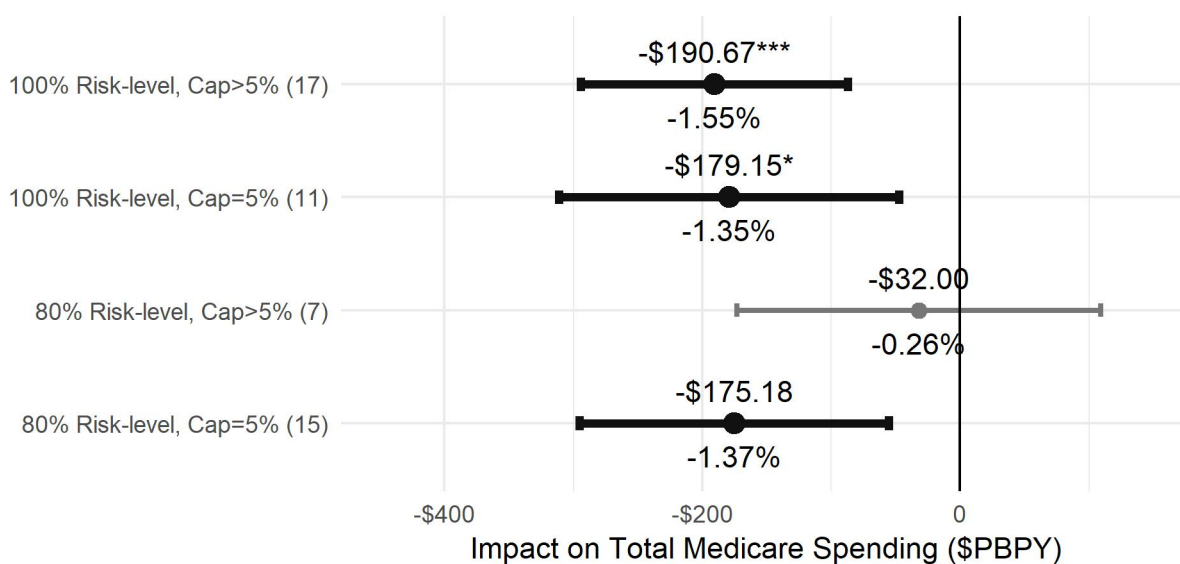
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 95% confidence intervals displayed for NGACO subgroups on gross Medicare spending Per Beneficiary Per Year, cumulatively as of PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 112 NGACO- Performance Years, including the eight that failed the parallel trends test for total Medicare spending.

Exhibit I.8. Impacts on Medicare Spending for NGACO Organization Type Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends, PY1-PY3



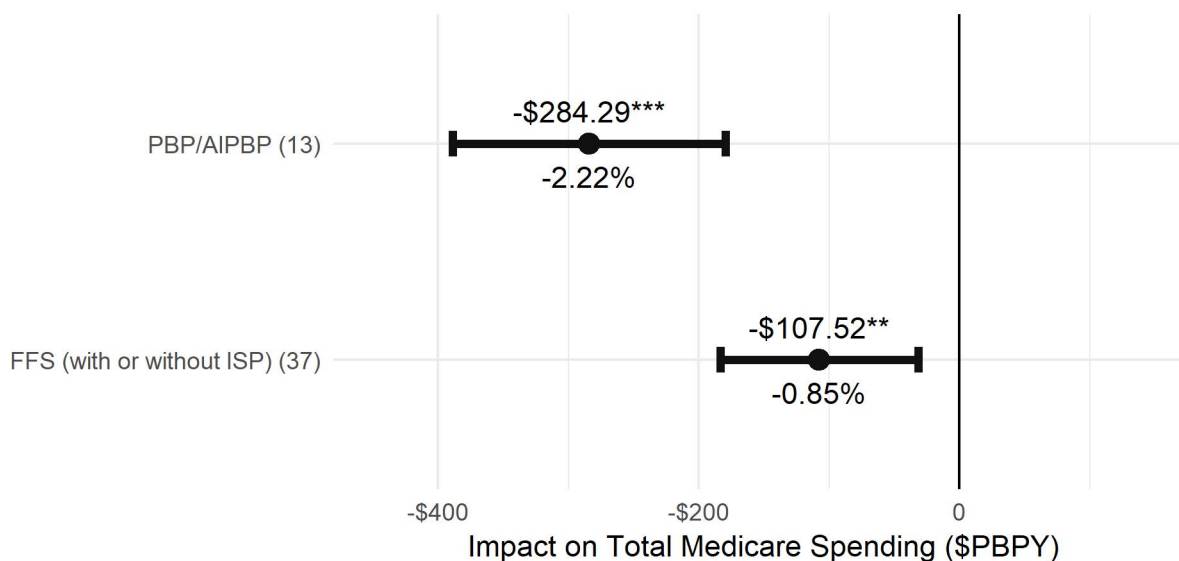
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending Per Beneficiary Per Year, cumulatively as of PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 112 NGACO- Performance Years, including the eight that failed the parallel trends test for total Medicare spending.

Exhibit I.9. Impacts on Medicare Spending in PY3 for NGACO Risk Selection Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends



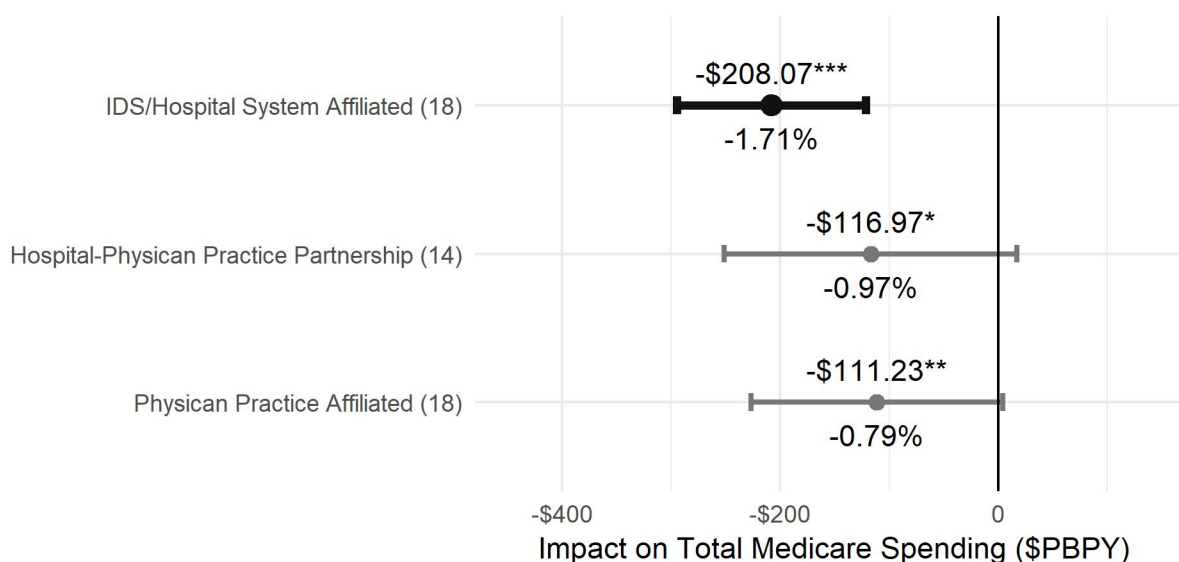
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending PBPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 50 NGACOs in PY3, including the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.10. Impacts on Medicare Spending in PY3 for NGACO Payment Mechanism Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends



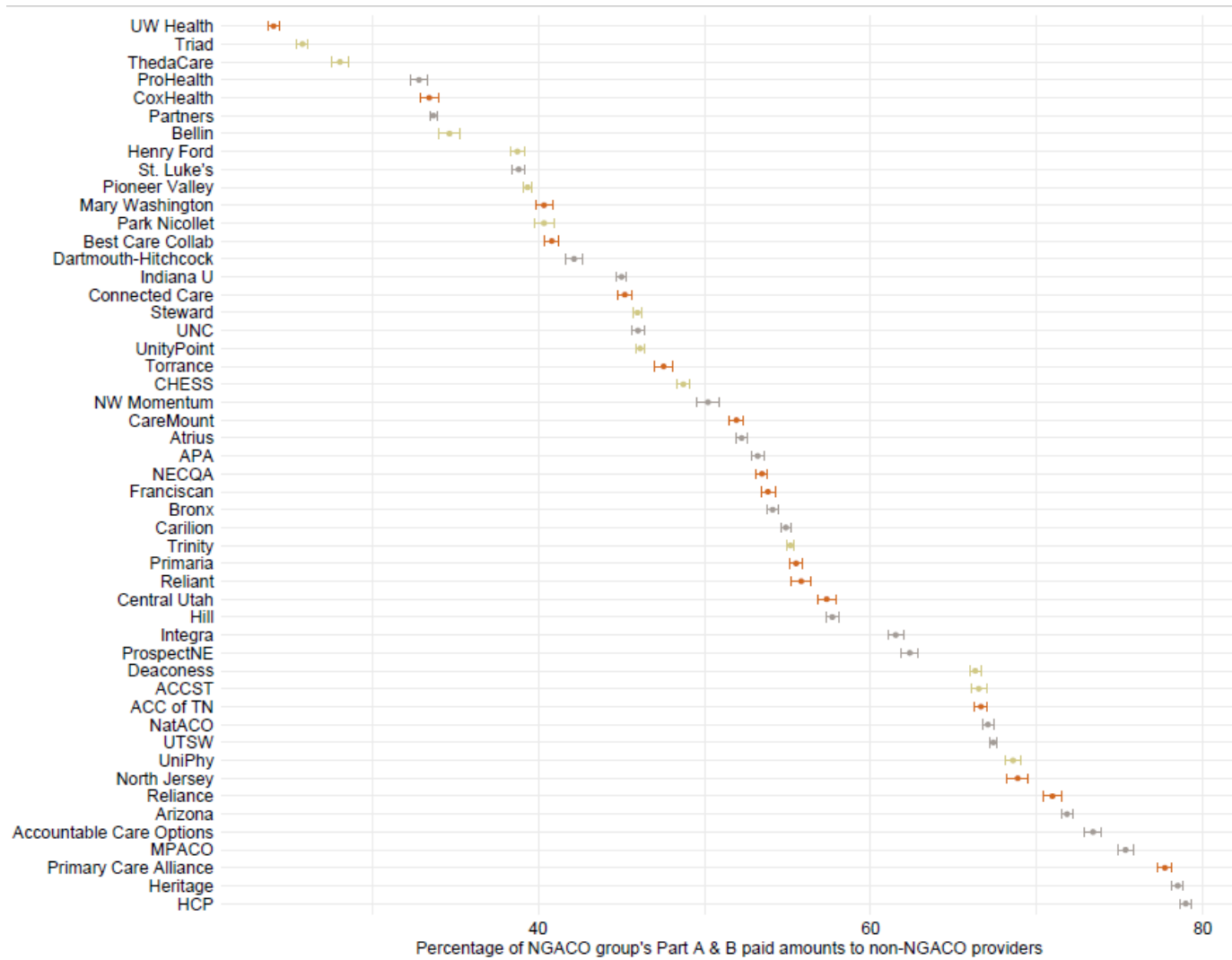
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending PBPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 50 NGACOs in PY3, including the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.11. Impacts on Medicare Spending in PY3 for NGACO Organization Type Subgroups, Sensitivity Test Including NGACOs that Failed Tests for Parallel Trends



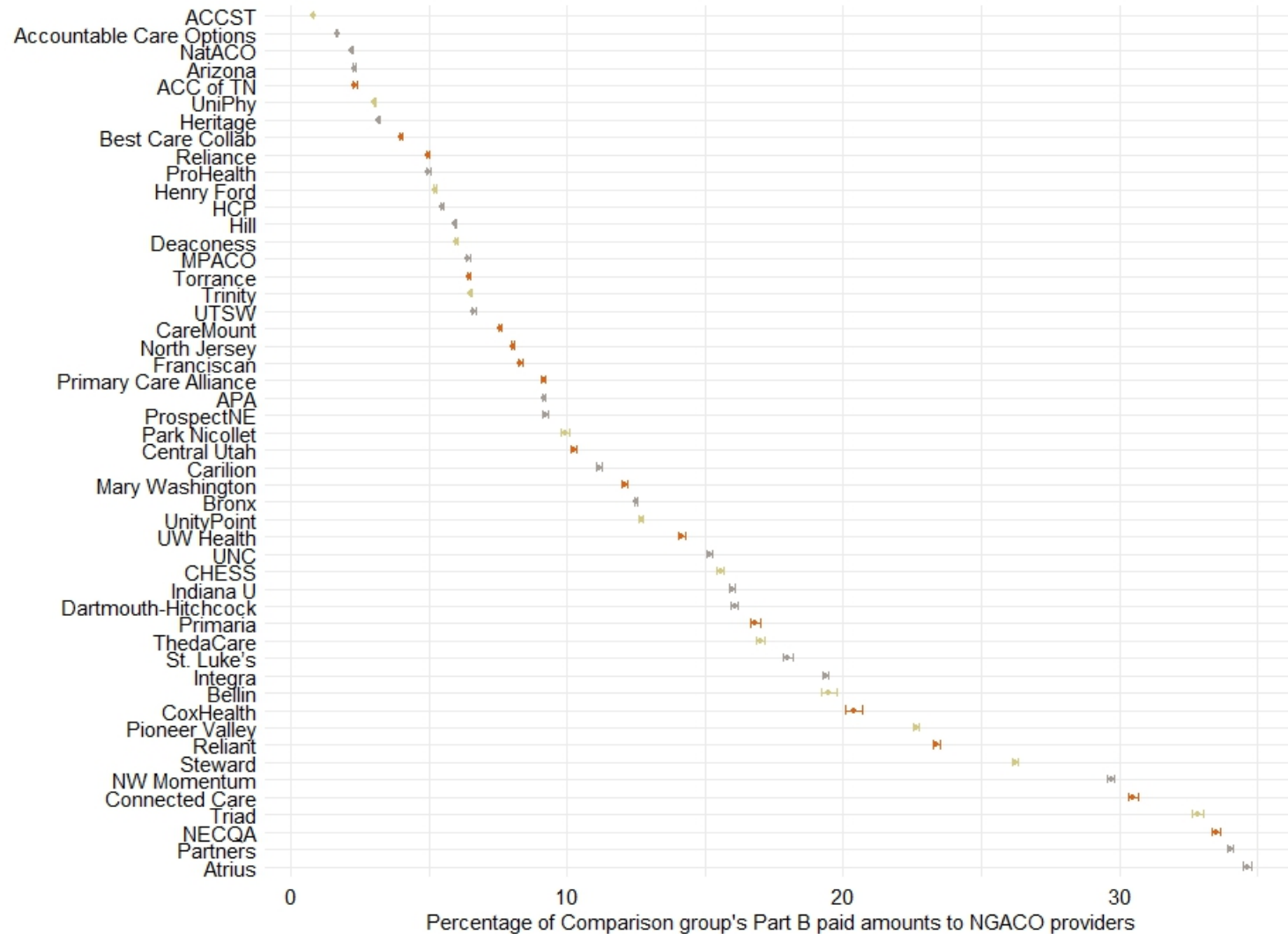
NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates and 90% confidence intervals displayed for NGACO subgroups on gross Medicare spending PBPY in PY3. Estimates with p values <0.1 level are bolded. All p values for subgroups are adjusted for false discovery rate using the Benjamini-Hochberg procedure. The chart includes total spending impacts for all 50 NGACOs in PY3, including the five NGACOs that failed the parallel trends test for total Medicare spending.

Exhibit I.12. Leakage for NGACO Group in PY3, by NGACO



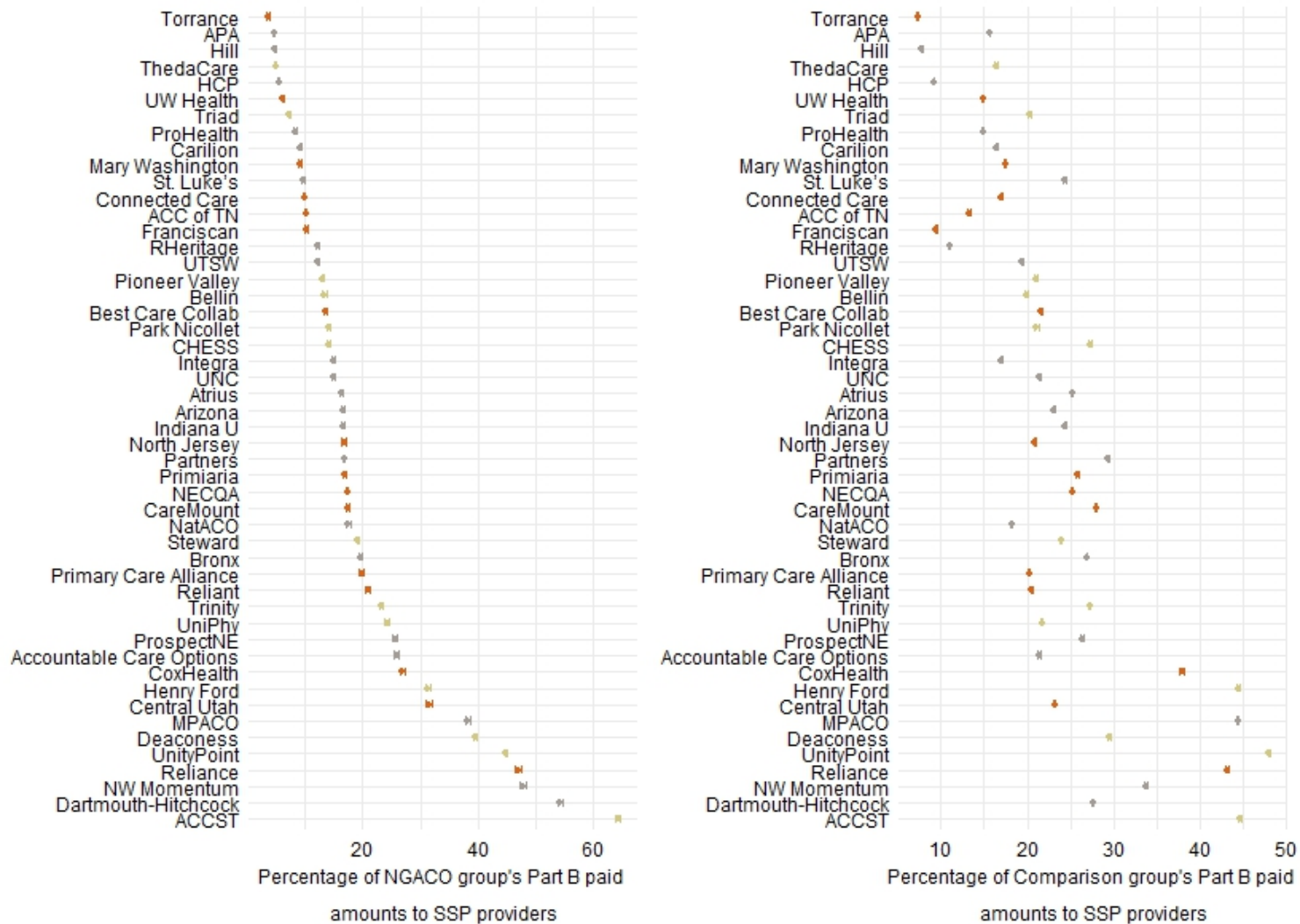
NOTE: We measure leakage as percentage of NGACO beneficiaries' Medicare Parts A & B paid amounts in the performance year(s) to providers outside their NGACO.

Exhibit I.13. Direct Spillover on Comparison Group from NGACO Providers Cumulatively in PY3, by NGACO



NOTE: We measure direct spillover as the percentage of the comparison group beneficiaries' Medicare Part B paid amounts in the performance year(s) to NGACO participating providers

Exhibit I.14. Degree of Care from SSP Providers for NGACO and Comparison Groups in PY3, by NGACO

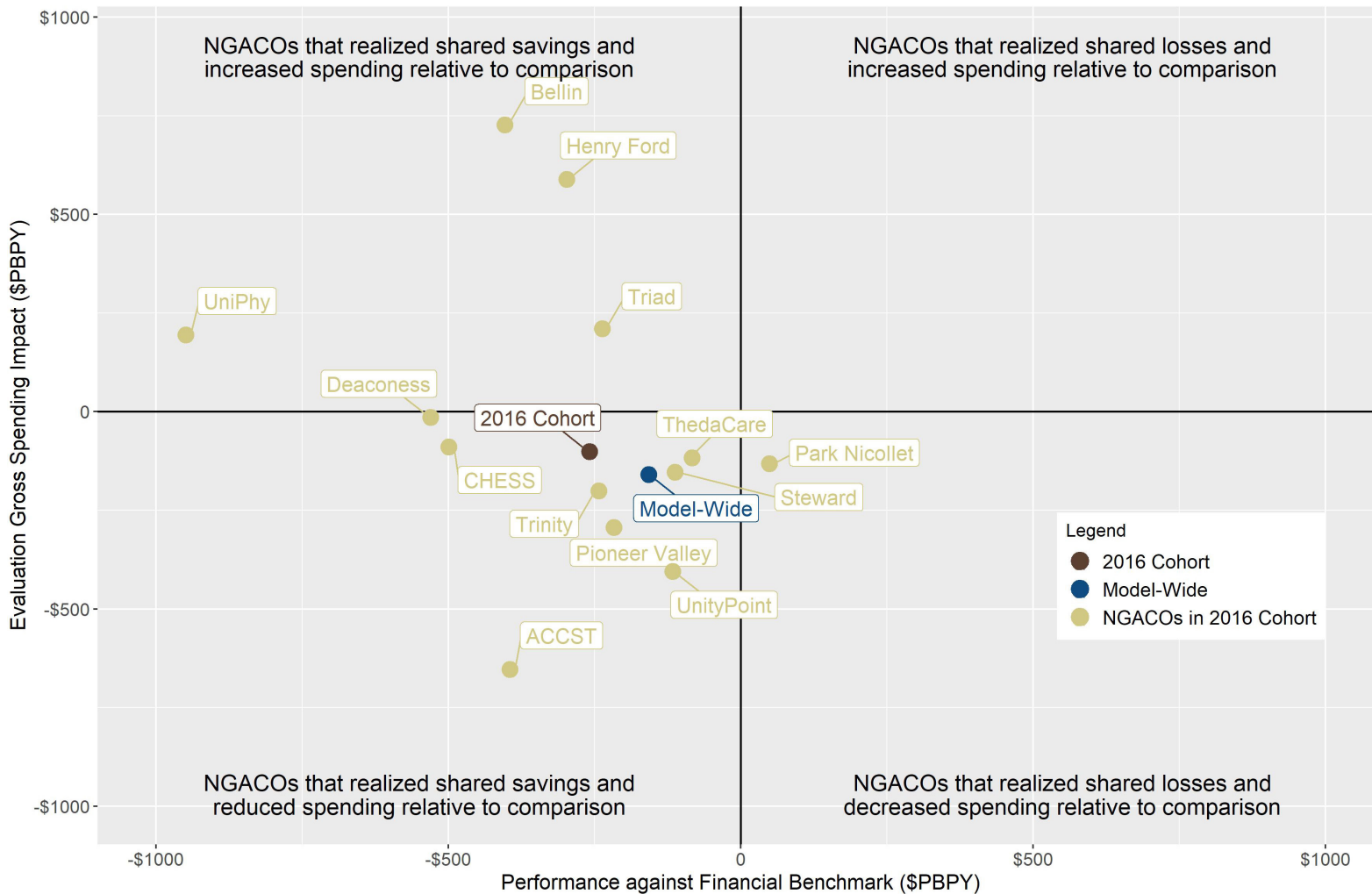


NOTE: We measure degree of care from SSP providers as the percentage of the NGACO and comparison group beneficiaries' Medicare Part B paid amounts in the performance years to SSP providers.

The following sets of “quadrant charts” illustrate the differences across cohorts in the consistency of findings between the evaluation and the model’s financial benchmark performance.

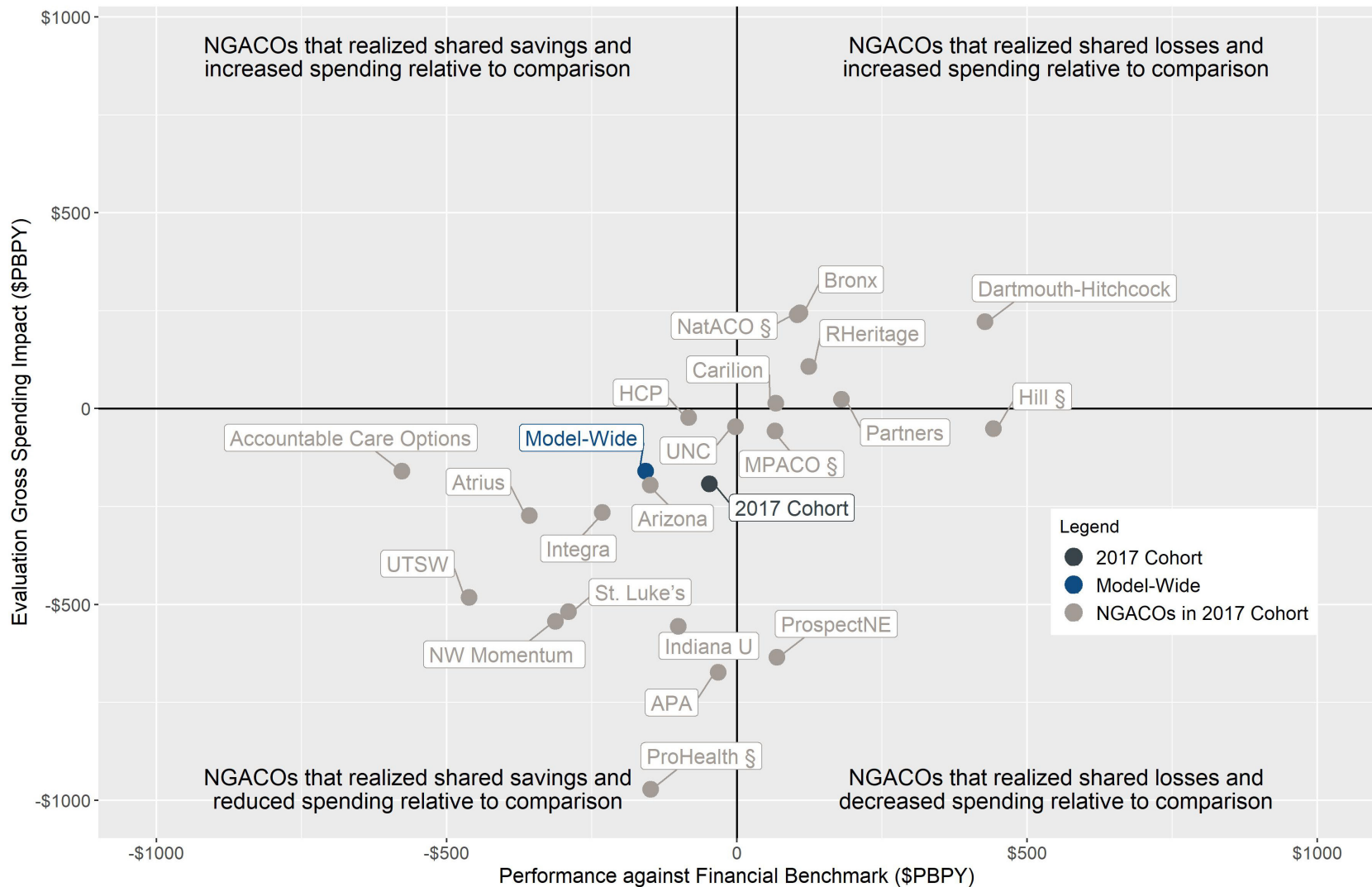
- The upper right quadrant shows NGACOs that increased spending relative to both the benchmark and the comparison group.
- The upper left quadrant shows NGACOs that decreased spending relative to the benchmark but increased spending relative to the comparison group.
- The lower right quadrant shows NGACOs that increased spending relative to the benchmark but decreased spending relative the comparison group.
- Finally, the lower left quadrant is the desired performance, where NGACOs achieved a decrease in spending relative to both the benchmark and the comparison group.

Exhibit I.15. Evaluation’s Spending Impact and Financial Benchmark Performance for 2016 Cohort NGACOs in PY3



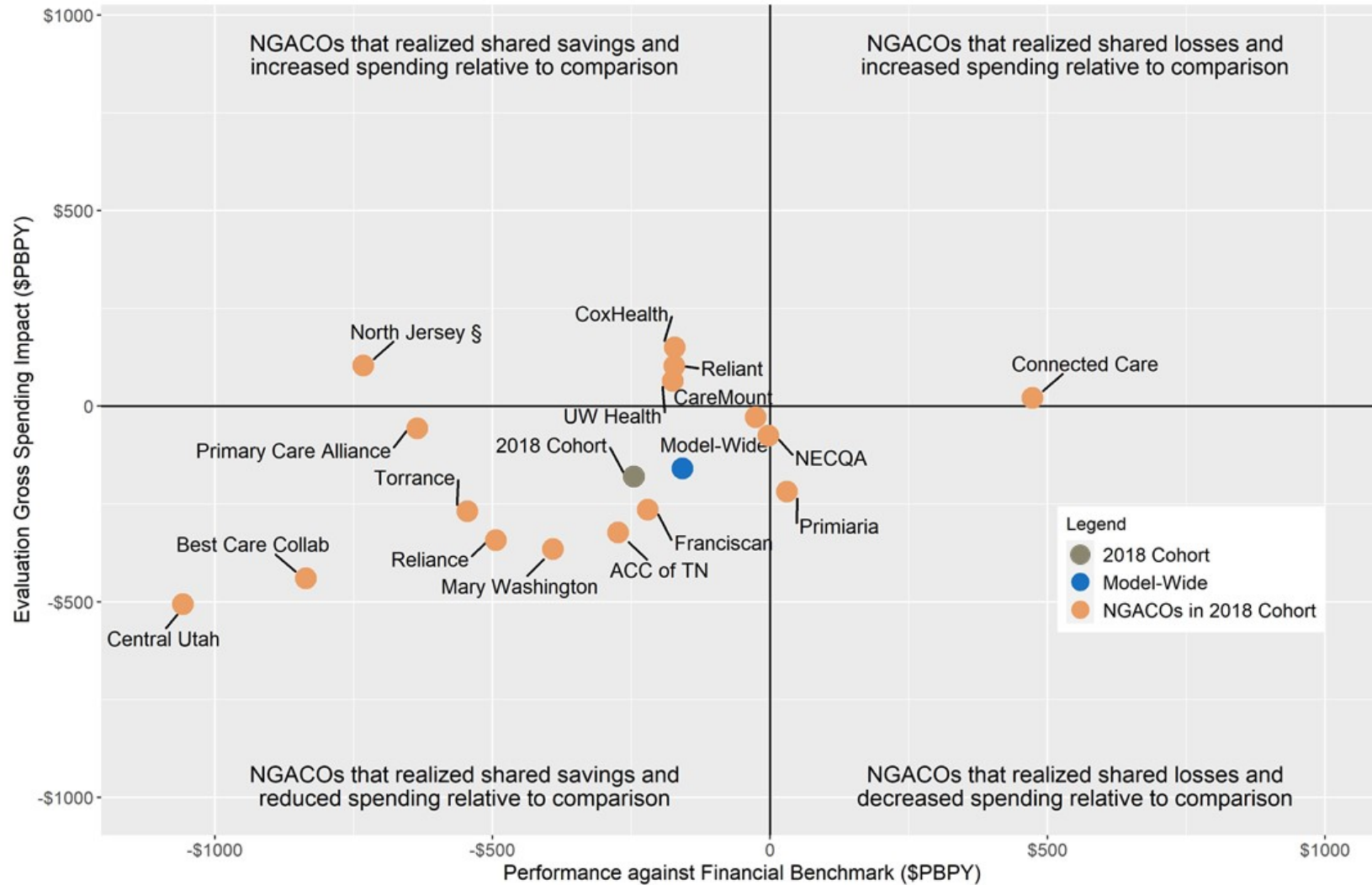
NOTES: We considered total spending impacts for 13 NGACOs in the 2016 cohort that were active in PY3. PBPY performance against financial benchmark was calculated by dividing total paid savings/shared losses by the total number of aligned beneficiaries under the evaluation in PY3. PBPY evaluation gross spending impact is the difference-in-difference impact estimate for all beneficiaries in PY3.

Exhibit I.16. Evaluation’s Spending Impact and Financial Benchmark Performance for 2017 Cohort NGACOs in PY3



NOTES: We considered total spending impacts for 21 NGACOs in the 2017 cohort that were active in PY3. PBPY performance against financial benchmark was calculated by dividing total paid savings/shared losses by the total number of aligned beneficiaries under the evaluation in PY3. PBPY evaluation gross spending impact is the difference-in-difference impact estimate for all beneficiaries in PY3. § Denotes uninterpretable impact estimate due to failure of parallel trends assumption across baseline years.

Exhibit I.17. Evaluation’s Spending Impact and Financial Benchmark Performance for 2018 Cohort NGACOs in PY3



NOTES: We considered total spending impacts for 16 NGACOs in the 2018 cohort that were active in PY3. PBPY performance against financial benchmark was calculated by dividing total paid savings/shared losses by the total number of aligned beneficiaries under the evaluation in PY3. PBPY evaluation gross spending impact is the difference-in-difference impact estimate for all beneficiaries in PY3. § Denotes uninterpretable impact estimate due to failure of parallel trends assumption across baseline years.

Appendix J: Exhibits to Support Claims Based Analysis

Appendix J includes exhibits that supported the analyses of our claims-based research presented in the Third Evaluation Report. In summary, these tables provide the difference-in-differences results model-wide and for the three cohorts in PY3 (2018), and cumulatively in PY1, PY2, and PY3 (2016, 2017, and 2018). We present impacts for spending, utilization, and quality of care results for all 23 outcome measures studied both model-wide and for all three cohorts. We also present conditional means for the base and performance years as well as aggregate estimates. This appendix is organized as follows:

- Exhibit J.1 displays the estimated cumulative impacts in PY1, PY2, and PY3, model-wide, on Medicare spending, utilization, and quality of care measures
- Exhibit J.2 displays the estimated model-wide impacts in PY3 on Medicare spending, utilization, and quality of care measures
- Exhibit J.3 – Exhibit J.5 display cohort-level estimated impacts in PY3 on Medicare spending, utilization, and quality of care measures
- Exhibit J.6 – Exhibit J.8 display cohort-level estimated cumulative impacts in PY1, PY2, and PY3, respectively, on Medicare spending, utilization, and quality of care measures
- Exhibit J.9 displays the estimated impacts in PY3 on total Medicare spending for the 2016, 2017, and 2018 cohorts, respectively
- Exhibit J.10 – J.15 display the estimated impacts of the 2016 cohort on measures of Medicare spending, utilization, and quality of care in PY3
- Exhibit J.16 – J.21 display the estimated impacts of the 2017 cohort on measures of Medicare spending, utilization, and quality of care in PY3
- Exhibit J.22 – J.27 display the estimated impacts of the 2018 cohort on measures of Medicare spending, utilization, and quality of care in PY3
- Exhibit J.28 – J.33 display the estimated cumulative impacts of the 2016 cohort on measures of Medicare spending, utilization, and quality of care in PY1, PY2, and PY3
- Exhibit J.34 – J.39 display the estimated cumulative impact of the 2017 cohort on measures of Medicare spending, utilization, and quality of care in PY2 and PY3

In each table, the DID estimate is the estimated relative change PBPY (for spending) or per 1,000 beneficiaries per year (for utilization counts and quality-of-care outcomes). The “% Impact” is the percentage impact relative to expected outcome for the NGACO group in PY(s) absent the NGACO model. The aggregate impact is the estimated relative change for all beneficiaries aligned with the NGACO in PY(s).

Spending outcomes reflect Medicare paid amounts in 2018 dollars. For providers in NGACOs that opted for population-based payments, we used the amount Medicare would have paid for these services. Medicare spending in facilities settings [outpatient, acute care hospital, SNF, other post-acute care facilities (including long-term care hospitals, inpatient rehabilitation hospitals)] excludes spending for professional services.

Exhibit J.1. Estimated Cumulative Impact Model-Wide on Medicare Spending, Utilization, and Quality of Care in PY1, PY2, PY3 (2016, 2017, 2018)

	Baseline Years		Cumulative Model-wide in PY1, PY2, and PY3 (2016, 2017, and 2018)											
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	Difference-in-Differences								Aggregate	Aggregate CI
					DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p				
Spending (\$ Per Beneficiary Per Year)														
Total gross Medicare spending (Part A and B)	13371.50	13627.05	13241.72	13609.40	-112.13 ***	↓	↓	-171.03 , -53.24	-0.87	0.000	-348,596,773 ***	-531,688,154 , -165,505,393		
Acute care hospital facility	4087.70	4106.68	4095.79	4129.90	-15.14	↑	↑	-38.89 , 8.61	-0.37	0.212	-47,064,352	-120,903,274 , 26,774,571		
Skilled nursing facility	1129.25	1149.43	1016.31	1049.87	-13.38 **	↓	↓	-26.44 , -0.32	-1.30	0.045	-41,584,393 **	-82,188,509 , -980,277		
Other post-acute care facility	447.04	436.52	411.21	413.95	-13.26 ***	↓	↓	-21.40 , -5.13	-3.12	0.001	-41,229,549 ***	-66,516,872 , -15,942,226		
Outpatient facility	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Professional services	3149.11	3158.34	3169.63	3196.13	-17.26 *	↑	↑	-37.01 , 2.49	-0.56	0.087	-53,664,310 *	-115,061,477 , 7,732,858		
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Hospice	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Durable medical equipment	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Utilization (Per 1,000 Beneficiaries Per Year)														
Acute care stays	319.58	320.30	316.24	316.53	0.43	↓	↓	-1.14 , 1.99	0.14	0.591	1,334	-4,864,578 , 4,867,245		
SNF stays	-	-	-	-	\$ -	↓	↓	\$ -	-	-	\$ -	\$ -		
SNF days	1948.90	1990.88	1705.92	1752.95	-5.05	↓	↓	-28.16 , 18.07	-0.30	0.669	-15,698	-71,874,026 , 71,842,630		
ED visits & observation stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
E&M visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Procedures	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Tests	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Imaging services	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Beneficiaries with AWW	255.47	217.18	408.61	313.54	56.78 ***	↑	↑	44.82 , 68.74	16.14	0.000	176,522 ***	-37,004,099 , 37,357,143		
Home health episodes	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		
Home health visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -		

	Baseline Years		Cumulative Model-wide in PY1, PY2, and PY3 (2016, 2017, and 2018)										
	NGACO Mean	Comparison Mean			Difference-in-Differences							Aggregate	Aggregate CI
			NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p			
Quality of Care (Per 1,000 Beneficiaries Per Year)													
Beneficiaries with ACSC hospitalizations	44.08	44.18	42.35	42.33	0.11	↓	↓	-0.33 , 0.55	0.26	0.624	339	-1,355,479 , 1,356,157	
Beneficiaries with unplanned 30-day readmissions	154.74	154.81	152.55	152.18	0.45	↓	↓	-1.06 , 1.95	0.29	0.561	230	-775,118 , 775,578	
Beneficiaries with hospital readmissions from SNF	178.52	178.04	184.89	183.16	1.25	↑	↑	-1.80 , 4.30	0.68	0.421	180	-439,063 , 439,424	

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in performance years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services include physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWV = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.2. Estimated Model-Wide Impact on Medicare Spending, Utilization, and Quality of Care in PY3 (2018)

	Baseline Years:				Model-wide in Performance Year 3:							
	2013-2017		2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total gross Medicare spending (Part A and B)	13462.61	13685.29	13406.28	13788.37	-159.40 ***	↓	↑	-259.96 , -58.84	-1.23	0.002	-223,068,451 ***	-363,793,778 , -82,343,123
Acute care hospital facility	4040.58	4057.19	4065.00	4095.43	-13.83	↑	↑	-47.94 , 20.27	-0.34	0.427	-19,359,265	-67,084,995 , 28,366,465
Skilled nursing facility	1108.36	1120.35	979.51	1011.72	-20.22 **	↓	↓	-39.30 , -1.15	-2.02	0.038	-28,300,681 **	-54,994,392 , -1,606,971
Other post-acute care facility	427.17	425.75	389.56	398.72	-10.58 *	↓	↓	-21.73 , 0.57	-2.65	0.063	-14,809,707 *	-30,414,167 , 794,752
Outpatient facility	2164.18	2203.78	2437.30	2489.23	-12.32	↑	↑	-52.71 , 28.06	-0.50	0.550	-17,243,583	-73,760,971 , 39,273,806
Professional services	3139.87	3155.10	3188.48	3241.06	-37.35 **	↑	↑	-70.95 , -3.75	-1.21	0.029	-52,264,990 **	-99,289,041 , -5,240,939
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Hospice	358.64	375.22	385.08	422.58	-20.92 ***	↑	↑	-29.46 , -12.37	-5.15	0.000	-29,271,009 ***	-41,227,332 , -17,314,686
Durable medical equipment	269.26	261.60	256.17	245.90	2.61	↓	↓	-4.01 , 9.23	1.03	0.440	3,650,197	-5,610,588 , 12,910,982
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	316.97	318.21	311.57	312.94	-0.13	↓	↓	-2.39 , 2.13	-0.04	0.910	-183	-3,167,834 , 3,167,469
SNF stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
SNF days	2154.83	2204.44	1860.78	1927.24	-16.84	↓	↓	-54.98 , 21.30	-0.90	0.387	-23,568	-53,394,489 , 53,347,352
ED visits & observation stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
E&M visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Procedures	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Tests	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Imaging services	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Beneficiaries with AWW	268.44	231.60	461.02	347.44	76.74 ***	↑	↑	55.05 , 98.43	19.97	0.000	107,392 ***	-30,247,048 , 30,461,831
Home health episodes	161.60	160.83	160.63	160.75	-0.88	↓	↓	-2.86 , 1.10	-0.54	0.385	-1,230	-2,775,231 , 2,772,771
Home health visits	-	-	-	-	\$ -	↓	↓	\$ -	-	-	\$ -	\$ -
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	44.36	44.24	41.77	41.90	-0.24	↓	↓	-0.93 , 0.45	-0.57	0.496	-335	-964,784 , 964,114
Beneficiaries with unplanned 30-day readmissions	154.87	154.85	153.42	152.63	0.77	↓	↓	-1.45 , 2.98	0.50	0.497	176	-508,362 , 508,714
Beneficiaries with hospital readmissions from SNF	179.18	178.69	188.11	184.59	3.02	↑	↑	-1.85 , 7.90	1.63	0.224	193	-311,119 , 311,506

NOTES: Difference-in-differences (DID) impact estimates significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the DID impact estimate for all beneficiaries in PY3. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWV = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.3. Estimated Impact of the 2016 Cohort on Medicare Spending, Utilization, and Quality of Care in PY3 (2018)

	Baseline Years:		2016 Cohort in Performance Year 3:									
	2013-2015		2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total gross Medicare spending (Part A and B)	12763.54	12968.39	12891.25	13197.45	-101.35	↑	↑	-271.73, 69.04	-0.82	0.244	-46,579,977	-124,888,668, 31,728,714
Acute care hospital facility	3855.50	3863.95	3786.75	3797.74	-2.55	↓	↓	-51.74, 46.65	-0.06	0.919	-1,170,520	-23,781,856, 21,440,816
Skilled nursing facility	1093.83	1100.23	865.88	904.15	-31.87	↓	↓	-76.89, 13.14	-3.55	0.165	-14,649,603	-35,339,076, 6,039,870
Other post-acute care facility	438.12	415.66	388.13	384.21	-18.54**	↓	↓	-34.37, -2.71	-4.55	0.022	-8,521,459**	-15,798,315, -1,244,602
Outpatient facility	2168.47	2223.93	2503.49	2555.84	3.11	↑	↑	-85.21, 91.42	0.12	0.945	1,428,324	-39,162,477, 42,019,125
Professional services	2905.90	2925.09	3008.18	3038.11	-10.74	↑	↑	-64.09, 42.60	-0.38	0.693	-4,938,113	-29,456,152, 19,579,926
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Hospice	349.29	354.97	361.23	402.25	-35.33***	↑	↑	-50.22, -20.44	-8.90	0.000	-16,236,913***	-23,080,634, -9,393,193
Durable medical equipment	295.01	288.25	266.74	257.85	2.14	↓	↓	-6.76, 11.04	0.81	0.638	982,642	-3,109,035, 5,074,319
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	337.03	336.36	318.70	320.03	-2.00	↓	↓	-6.05, 2.06	-0.62	0.334	-919	-2,783, 946
SNF stays	86.07	86.92	81.15	78.12	3.88**	↓	↓	0.24, 7.53	5.03	0.037	1,785**	110, 3,460
SNF days	2307.10	2327.80	1793.93	1847.67	-33.04	↓	↓	-120.22, 54.13	-1.80	0.458	-15,187	-55,253, 24,878
ED visits & observation stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
E&M visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Procedures	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Tests	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Imaging services	5341.40	5396.56	5146.81	5217.18	-15.21	↓	↓	-73.74, 43.32	-0.31	0.611	-6,991	-33,893, 19,911
Beneficiaries with AWW	209.97	188.72	501.55	354.29	126.01***	↓	↓	74.51, 177.50	33.55	0.000	57,913***	34,246, 81,579
Home health episodes	163.13	161.77	149.25	149.48	-1.58	↓	↓	-4.23, 1.07	-1.04	0.243	-726	-1,944, 492
Home health visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	47.26	47.25	42.74	43.5	-0.77	↓	↓	-2.12, 0.57	-1.77	0.260	-355	-974, 263
Beneficiaries with unplanned 30-day readmissions	157.37	155.63	152.21	151.63	-1.16	↓	↓	-5.77, 3.44	-0.75	0.621	-89	-441, 264
Beneficiaries with hospital readmissions from SNF	179.74	177.35	188.84	181.12	5.33	↑	↑	-4.72, 15.38	2.91	0.298	114	-101, 329

NOTES: Difference-in-differences (DID) impact estimate significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the DID impact estimate for all beneficiaries in PY3. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWV = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.4. Estimated Impact of the 2017 Cohort on Medicare Spending, Utilization, and Quality of Care in PY3 (2018)

	Baseline Years:		2017 Cohort in Performance Year 3:									
	2014-2016		2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total gross Medicare spending (Part A and B)	14220.46	14512.99	14015.29	14499.51	-191.69**	↓	↓	-363.97, -19.40	-1.39	0.029	-125,027,482**	-237,399,508, -12,655,45
Acute care hospital facility	4230.53	4259.68	4348.65	4378.62	-0.82	↑	↑	-58.85, 57.20	-0.01	0.978	-537,286	-38,383,129, 37,308,558
Skilled nursing facility	1127.83	1153.25	1054.39	1101.05	-21.23**	↓	↓	-42.45, -0.02	-1.97	0.050	-13,849,326**	-27,685,268, -13,384
Other post-acute care facility	429.32	435.60	392.04	409.10	-10.79	↓	↓	-30.19, 8.61	-2.67	0.276	-7,036,492	-19,691,905, 5,618,920
Outpatient facility	2165.84	2195.11	2438.40	2491.54	-23.87	↑	↑	-79.46, 31.71	-0.97	0.400	-15,570,843	-51,824,461, 20,682,776
Professional services	3259.40	3304.71	3279.79	3378.72	-53.62*	↑	↑	-112.45, 5.20	-1.67	0.074	-34,976,085*	-73,344,986, 3,392,816
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Hospice	350.37	375.69	389.38	427.13	-12.43*	↑	↑	-24.99, 0.12	-3.09	0.052	-8,108,449*	-16,297,263, 80,365
Durable medical equipment	259.35	251.31	253.35	238.83	6.49	↓	↓	-5.64, 18.61	2.63	0.294	4,231,133	-3,677,748, 12,140,014
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	301.60	304.67	306.45	307.14	2.38	↑	↑	-1.08, 5.85	0.78	0.177	1,555	-703, 3,814
SNF stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
SNF days	2059.67	2150.04	1878.98	1993.61	-24.25	↓	↓	-69.35, 20.86	-1.27	0.292	-15,815	-45,233, 13,603
ED visits & observation stays	523.93	532.97	523.13	541.48	-9.31***	↓	↑	-15.83, -2.79	-1.74	0.005	-6,071***	-10,324, -1,817
E&M visits	14443.49	14552.03	14380.36	14674.67	-185.77***	↓	↑	-280.93, -90.62	-1.32	0.000	-121,170***	-183,234, -59,106
Procedures	9886.22	9910.91	11199.71	11240.28	-15.88	↑	↑	-155.67, 123.90	-0.15	0.824	-10,359	-101,534, 80,815
Tests	27700.07	28417.54	26991.68	27950.35	-241.20	↓	↓	-559.39, 76.99	-0.93	0.137	-157,321	-364,856, 50,214
Imaging services	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Beneficiaries with AWW	271.80	241.24	423.87	340.13	53.18***	↑	↑	28.92, 77.43	14.34	0.000	34,686***	18,866, 50,506
Home health episodes	161.11	159.19	170.76	168.12	0.72	↑	↑	-2.95, 4.39	0.42	0.700	471	-1,923, 2,865
Home health visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	42.77	42.94	41.14	41.12	0.19	↓	↓	-0.81, 1.19	0.47	0.708	124	-528, 777
Beneficiaries with unplanned 30-day readmissions	155.50	156.52	155.85	154.87	2.00	↑	↓	-0.71, 4.71	1.30	0.148	213	-75, 502
Beneficiaries with hospital readmissions from SNF	42.77	42.94	41.14	41.12	0.95	↑	↑	-6.17, 8.07	0.51	0.794	28	-182, 238

NOTES: Difference-in-differences (DID) impact estimate significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the DID impact estimate for all beneficiaries in PY3. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWV = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.5. Estimated Impact of the 2018 Cohort on Medicare Spending, Utilization, and Quality of Care in PY3 (2018)

	Baseline Years:		2018 Cohort in Performance Year 3:									
	2015-2017		2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total gross Medicare spending (Part A and B)	12860.94	12953.68	12848.08	13119.79	-178.96***	↓	↑	-291.32, -66.61	-1.46	0.002	-51,460,991***	-83,769,171, -19,152,811
Acute care hospital facility	3905.55	3906.74	3866.32	3928.89	-61.39*	↓	↑	-124.96, 2.19	-1.56	0.058	-17,651,459*	-35,931,420, 628,502
Skilled nursing facility	1087.42	1077.88	991.28	981.05	0.69	↓	↓	-32.86, 34.24	0.07	0.968	198,248	-9,448,724, 9,845,221
Other post-acute care facility	404.78	419.54	386.21	398.36	2.60	↓	↓	-16.57, 21.77	0.68	0.790	748,243	-4,764,121, 6,260,607
Outpatient facility	2153.54	2191.26	2329.03	2377.54	-10.78	↑	↑	-63.78, 42.22	-0.46	0.690	-3,101,064	-18,341,313, 12,139,186
Professional services	3242.69	3183.40	3269.55	3253.21	-42.95**	↑	↑	-83.80, -2.11	-1.37	0.039	-12,350,793**	-24,095,841, -605,745
Home health	703.29	727.52	670.24	717.81	-23.34***	↓	↓	-37.44, -9.25	-3.36	0.001	-6,712,039***	-10,764,941, -2,659,137
Hospice	392.34	406.52	413.43	444.73	-17.13*	↑	↑	-35.88, 1.62	-3.97	0.073	-4,925,646*	-10,316,379, 465,086
Durable medical equipment	250.59	242.36	245.66	242.86	-5.44	↓	↑	-14.28, 3.41	-2.16	0.228	-1,563,577	-4,107,118, 979,963
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	319.76	319.89	311.80	314.78	-2.85	↓	↓	-7.05, 1.35	-0.90	0.183	-820	-2,027, 388
SNF stays	83.46	82.79	79.72	77.26	1.79	↓	↓	-0.75, 4.33	2.30	0.167	515	-216, 1,246
SNF days	2127.30	2130.66	1926.37	1903.88	25.85	↓	↓	-41.74, 93.45	1.36	0.453	7,434	-12,002, 26,870
ED visits & observation stays	551.80	561.07	541.85	552.58	-1.46	↓	↓	-11.55, 8.64	-0.26	0.778	-418	-3,322, 2,485
E&M visits	-	-	-	-	\$	-	-	\$	-	-	\$	\$
Procedures	10424.58	10228.34	11169.72	11076.06	-102.58	↑	↑	-264.48, 59.32	-0.94	0.214	-29,497	-76,053, 17,058
Tests	26877.26	26707.04	26496.94	26500.73	-174.01	↓	↓	-488.85, 140.84	-0.69	0.279	-50,036	-140,570, 40,498
Imaging services	5352.10	5277.71	5261.47	5205.81	-18.73	↓	↓	-67.16, 29.70	-0.38	0.448	-5,386	-19,312, 8,540
Beneficiaries with AWW	354.29	278.28	480.52	353.06	51.45***	↑	↑	14.81, 88.09	11.99	0.006	14,793***	4,258, 25,329
Home health episodes	160.25	163.06	155.84	162.04	-3.39***	↓	↓	-5.80, -0.98	-2.12	0.006	-975***	-1,668, -281
Home health visits	3608.80	3814.85	3450.80	3792.48	-135.64***	↓	↓	-232.33, -38.95	-3.78	0.006	-39,003***	-66,807, -11,199
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	43.31	42.38	41.66	41.09	-0.36	↓	↓	-1.58, 0.86	-0.86	0.560	-104	-454, 246
Beneficiaries with unplanned 30-day readmissions	149.34	149.75	149.87	149.17	1.11	↑	↓	-3.73, 5.95	0.75	0.652	52	-174, 278
Beneficiaries with hospital readmissions from SNF	177.40	179.22	187.00	184.90	3.93	↑	↑	-2.28, 10.14	2.15	0.214	51	-30, 132

NOTES: Difference-in-differences (DID) impact estimate significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the DID impact estimate for all beneficiaries in PY3. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWV = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.6. Estimated Cumulative Impact for 2016 Cohort on Medicare Spending, Utilization, and Quality of Care in PY1, PY2, and PY3 (2016, 2017, and 2018)

	Baseline Years:		2016 Cohort in PY1, PY2, and PY3									
	2013-2015		2016-2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total Medicare spending (Part A and B)	12808.26	13029.99	12737.46	13018.69	-59.49	↓	↓	-142.00 , 23.01	-0.48	0.158	-84,134,686	-200,814,957 , 32,545,585
Acute care hospital facility	3991.14	4003.15	3933.43	3958.26	-12.82	↓	↓	-45.79 , 20.15	-0.33	0.446	-18,125,069	-64,752,599 , 28,502,460
Skilled nursing facility	1145.99	1158.38	975.95	1010.82	-22.48 *	↓	↓	-45.42 , 0.46	-2.25	0.055	-31,789,261 *	-64,234,289 , 655,766
Other post-acute care facility	477.37	447.28	439.26	422.47	-13.30 *	↓	↓	-26.78 , 0.18	-2.94	0.053	-18,802,937 *	-37,866,604 , 260,731
Outpatient facility	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Professional services	3005.74	3001.57	3050.65	3046.49	-0.01	↑	↑	-25.49 , 25.48	-0.00	1.000	-9,857	-36,050,628 , 36,030,914
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Hospice	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Durable medical equipment	296.10	289.10	263.56	252.38	4.18	↓	↓	-2.44 , 10.80	1.61	0.215	5,917,323	-3,444,195 , 15,278,841
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	335.10	334.15	324.15	323.66	-0.46	↓	↓	-2.77 , 1.86	-0.14	0.698	-648	-3,274,722 , 3,273,426
SNF stays	80.53	81.26	76.65	74.60	2.78 ***	↓	↓	1.16 , 4.39	3.76	0.001	3,928 ***	-2,281,178 , 2,289,034
SNF days	2121.88	2143.74	1764.09	1805.15	-19.20	↓	↓	-59.66 , 21.25	-1.08	0.352	-27,157	-57,234,966 , 57,180,652
ED visits & observation stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
E&M visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Procedures	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Tests	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Imaging services	5357.91	5399.66	5180.91	5221.77	0.90	↓	↓	-27.26 , 29.06	0.02	0.950	1,272	-39,823,957 , 39,826,500
Beneficiaries with AWW	213.43	187.94	400.62	303.42	71.71 ***	↑	↑	50.48 , 92.94	21.80	0.000	101,414 ***	-29,918,257 , 30,121,085
Home health episodes	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Home health visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	45.99	46.00	43.12	43.05	0.09	↓	↓	-0.56 , 0.74	0.21	0.783	129	-921,997 , 922,256
Beneficiaries with unplanned 30-day readmissions	155.97	154.90	151.42	150.77	-0.42	↓	↓	-2.51 , 1.67	-0.28	0.694	-99	-494,947 , 494,748
Beneficiaries with hospital readmissions from SNF	178.69	176.84	182.74	180.63	0.26	↑	↑	-4.28 , 4.80	0.15	0.909	17	-299,706 , 299,740

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in performance years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWW = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.7. Estimated Cumulative Impact for 2017 Cohort on Medicare Spending, Utilization, and Quality of Care in PY2 and PY3 (2017 and 2018)

	Baseline Years:		2017 Cohort in PY2 and PY3									
	2014-2016		2017-2018		Difference-in-Differences							
	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate 95% CI
Spending (\$ Per Beneficiary Per Year)												
Total Medicare spending (Part A and B)	14041.96	14364.76	13828.99	14303.17	-151.38 ***	↓	↓	-249.00 , -53.77	-1.11	0.002	-213,001,094 ***	-350,348,643 , -75,653,545
Acute care hospital facility	4221.99	4251.60	4305.87	4343.50	-8.02	↑	↑	-46.58 , 30.54	-0.19	0.683	-11,287,823	-65,545,569 , 42,969,922
Skilled nursing facility	1120.98	1155.06	1061.99	1103.18	-7.1	↓	↓	-23.04 , 8.84	-0.66	0.382	-9,993,380	-32,419,935 , 12,433,174
Other post-acute care facility	425.20	429.17	388.13	408.57	-16.47 ***	↓	↓	-27.61 , -5.33	-4.07	0.004	-23,174,855 ***	-38,847,734 , -7,501,976
Outpatient facility	2177.99	2222.56	2364.69	2445.07	-35.81 **	↑	↑	-66.20 , -5.43	-1.49	0.021	-50,388,128 **	-93,142,835 , -7,633,421
Professional services	3274.09	3310.80	3268.80	3334.86	-29.36 *	↓	↑	-63.68 , 4.97	-0.92	0.094	-41,303,660 *	-89,601,992 , 6,994,672
Home health	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Hospice	350.58	374.02	378.74	415.46	-13.27 ***	↑	↑	-21.60 , -4.94	-3.38	0.002	-18,667,671 ***	-30,386,800 , -6,948,542
Durable medical equipment	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Utilization (Per 1,000 Beneficiaries Per Year)												
Acute care stays	303.94	306.47	309.19	309.73	1.99	↑	↑	-0.42 , 4.40	0.65	0.105	2,802	-3,388,241 , 3,393,845
SNF stays	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
SNF days	1738.58	1808.67	1602.40	1669.63	2.86	↓	↓	-24.79 , 30.51	0.18	0.839	4,025	-38,894,897 , 38,902,946
ED visits & observation stays	534.58	543.51	538.32	554.52	-7.27 ***	↑	↑	-12.18 , -2.36	-1.33	0.004	-10,228 ***	-6,915,731 , 6,895,275
E&M visits	14357.83	14421.37	14225.84	14439.77	-150.38 ***	↓	↑	-209.01 , -91.75	-1.07	0.000	-211,592 ***	-82,701,760 , 82,278,577
Procedures	9871.64	9924.46	10964.27	11003.73	13.35	↑	↑	-87.31 , 114.02	0.13	0.795	18,784	-141,619,966 , 141,657,535
Tests	27401.62	28155.76	26792.79	27646.03	-99.09	↓	↓	-290.18 , 91.99	-0.39	0.309	-139,428	-269,000,027 , 268,721,172
Imaging services	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Beneficiaries with AWW	277.52	234.07	401.95	315.63	42.87 ***	↑	↑	29.19 , 56.54	11.94	0.000	60,315 ***	-19,180,631 , 19,301,261
Home health episodes	161.41	159.29	169.54	166.59	0.83	↑	↑	-1.28 , 2.94	0.49	0.439	1,172	-2,967,242 , 2,969,585
Home health visits	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Quality of Care (Per 1,000 Beneficiaries Per Year)												
Beneficiaries with ACSC hospitalizations	42.33	42.71	41.71	41.87	0.22	↓	↓	-0.44 , 0.88	0.54	0.509	314	-929,939 , 930,567
Beneficiaries with unplanned 30-day readmissions	154.58	155.75	154.24	154.21	1.19	↓	↓	-1.18 , 3.57	0.78	0.325	277	-552,149 , 552,704
Beneficiaries with hospital readmissions from SNF	178.57	179.02	186.65	185.38	1.72	↑	↑	-3.06 , 6.49	0.93	0.481	112	-310,668 , 310,891

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at * $p < 0.1$, ** $p < 0.05$, and *** $p < 0.01$. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in performance years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. AWW = annual wellness visit; ED = emergency department; E&M = evaluation and management; SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.8. Estimated Cumulative Impact on Total Medicare Parts A & B Spending, As of PY3 (2016 and 2017 Cohorts)

		Baseline Years:		Total Spending Cumulatively as of PY3:									
		BY3-BY1		As of PY 2018		Difference-in-Differences							
NGACO Name	Aligned Beneficiaries	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate CI
2016 Cohort													
ACCST	44996	14638.21	16058.44	14210.65	15991.41	-360.54 **	↓	↓	-709.60 , -11.47	-2.51	0.043	-16,222,661 **	-31,929,001 , -516,320
Bellin	28977	9513.45	10154.95	9823.38	10025.24	439.64 ***	↑	↓	118.80 , 760.49	4.92	0.007	12,739,559 ***	3,442,358 , 22,036,760
CHESS	52347	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Deaconess	99386	11815.86	11938.20	12136.30	12395.82	-137.18	↑	↑	-465.70 , 191.33	-1.15	0.413	-13,634,149	-46,284,295 , 19,015,997
Henry Ford	69884	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Park Nicollet	41769	11155.70	11830.39	11630.61	12350.65	-45.34	↑	↑	-453.29 , 362.62	-0.40	0.828	-1,893,764	-18,933,602 , 15,146,073
Pioneer Valley	117831	12998.49	13028.20	12337.59	12441.13	-73.84	↓	↓	-363.24 , 215.57	-0.60	0.617	-8,700,474	-42,801,432 , 25,400,484
Steward	147516	14366.33	14413.30	14512.02	14675.97	-116.97	↑	↑	-336.83 , 102.89	-0.84	0.297	-17,254,628	-49,687,212 , 15,177,955
TheдаCare	44720	9918.26	10397.58	9102.63	9945.09	-363.13 *	↓	↓	-727.82 , 1.56	-3.65	0.051	-16,239,210 *	-32,548,250 , 69,830
Triad	86165	10988.33	11489.24	11291.10	11724.49	67.52	↑	↑	-332.48 , 467.52	0.65	0.741	5,818,080	-28,648,008 , 40,284,168
Trinity	225673	12811.84	12902.58	12634.62	12852.43	-127.07	↓	↓	-283.58 , 29.45	-1.01	0.112	-28,675,783	-63,997,093 , 6,645,526
UniPhy	57715	17701.91	18014.34	16151.70	16487.52	-23.4	↓	↓	-346.29 , 299.50	-0.15	0.887	-1,350,261	-19,985,918 , 17,285,395
UnityPoint	221883	10485.18	10640.41	10513.42	10805.92	-137.27 *	↑	↑	-279.63 , 5.08	-1.33	0.059	-30,458,779 *	-62,044,902 , 1,127,345
2017 Cohort													
Accountable Care Options	20656	13876.49	14593.09	13409.14	14488.93	-363.20 *	↓	↓	-749.11 , 22.72	-2.75	0.065	-7,502,179 *	-15,473,633 , 469,275
APA	50385	18519.47	19953.21	19502.46	21127.01	-190.81	↑	↑	-693.56 , 311.94	-1.05	0.457	-9,613,946	-34,945,205 , 15,717,313
Arizona	47298	12401.62	12719.85	12142.30	12671.39	-210.86	↓	↓	-519.00 , 97.27	-1.77	0.180	-9,973,373	-24,547,555 , 4,600,809
Atrius	68716	12713.53	13501.41	11741.52	12844.41	-315.00 **	↓	↓	-611.56 , -18.45	-2.58	0.037	-21,645,867 **	-42,023,678 , -1,268,056
Bronx	89068	17899.72	17855.97	17661.77	17559.91	58.1	↓	↓	-331.10 , 447.31	0.33	0.770	5,175,239	-29,490,373 , 39,840,851
Carilion	94389	10264.53	10524.81	10902.26	11248.19	-85.65	↑	↑	-296.88 , 125.58	-0.84	0.427	-8,084,674	-28,022,284 , 11,852,936
Dartmouth-Hitchcock	37515	11666.11	12214.73	12159.40	12447.52	260.48	↑	↑	-117.27 , 638.24	2.23	0.177	9,771,978	-4,399,552 , 23,943,509
HCP	41324	15306.67	15910.45	15130.30	15892.28	-158.21	↓	↓	-701.80 , 385.37	-1.05	0.568	-6,538,012	-29,001,017 , 15,924,994
Hill	40258	15141.03	15673.98	15756.34	16422.67	-133.37	↑	↑	-592.97 , 326.23	-0.87	0.570	-5,369,333	-23,871,933 , 13,133,266
Indiana U	93996	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Integra	30823	13088.94	13434.84	12686.27	13057.45	-25.3	↓	↓	-445.03 , 394.44	-0.21	0.906	-779,749	-13,717,295 , 12,157,797
MPACO	25955	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
NatACO	44833	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -

		Baseline Years:		Total Spending Cumulatively as of PY3:									
		BY3-BY1		As of PY 2018		Difference-in-Differences							
NGACO Name	Aligned Beneficiaries	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate CI
NW Momentum	15767	10794.20	10586.00	9054.56	9436.50	-590.14 *	↓	↓	-1,189.04 , 8.75	-5.72	0.053	-9,304,807 *	-18,747,590 , 137,976
Partners	184769	13768.47	14035.55	13809.58	14080.44	-3.79	↑	↑	-232.49 , 224.90	-0.03	0.974	-700,514	-42,956,079 , 41,555,051
ProHealth	31959	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
ProspectNE	29654	13568.42	13695.97	13279.33	13636.54	-229.66	↓	↓	-609.46 , 150.14	-1.75	0.236	-6,810,329	-18,072,814 , 4,452,155
RHeritage	45272	13751.25	14559.68	14398.57	15129.22	77.78	↑	↑	-275.42 , 430.99	0.57	0.666	3,521,361	-12,468,982 , 19,511,704
St. Luke's	51652	10763.42	10725.47	10450.74	10850.38	-437.60 **	↓	↑	-775.36 , -99.83	-4.14	0.011	-22,602,673 **	-40,048,919 , -5,156,428
UNC	45738	10803.07	10953.92	10874.84	10915.24	110.46	↑	↑	-218.24 , 439.16	1.05	0.510	5,052,089	-9,981,993 , 20,086,171
UTSW	144749	14464.28	14671.93	13795.07	14335.31	-332.60 ***	↓	↓	-564.39 , -100.80	-2.35	0.005	-48,142,969 ***	-81,695,574 , -14,590,364

NOTES: Cumulative difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. DID impact estimate is the dollar PBPY estimate (per beneficiary per year). \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in performance years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model.

Exhibit J.9. Estimated Impact on Total Medicare Parts A & B Spending in PY3 (2016, 2017, and 2018 Cohorts)

		Baseline Years:				Total Spending in PY3:							
		BY3-BY1		2018		Difference-in-Differences							
NGACO Name	N	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate CI
2016 Cohort													
ACCST	16549	14435.18	15935.87	14410.8	16564.67	-653.18**	↓	↑	-1252.91, -53.45	-4.52	0.033	-10,809,446**	-20,734,428, -884,465
Bellin	11191	9681.64	10258.73	10323.17	10173.23	727.03***	↑	↓	218.08, 1235.98	8.29	0.005	8,136,209***	2,440,583, 13,831,836
CHESS	28084	11609.45	11676.54	12536.49	12693	-89.42	↑	↑	-566.72, 387.88	-0.79	0.713	-2,511,354	-15,915,791, 10,893,082
Deaconess	32850	11733.95	11917.86	12014.83	12212.79	-14.05	↑	↑	-553.35, 525.26	-0.12	0.959	-461,467	-18,177,678, 17,254,744
Henry Ford	24504	14800.87	14191.93	15336.46	14138.86	588.66**	↑	↓	20.62, 1156.69	4.38	0.042	14,424,493**	505,349, 28,343,636
Park Nicollet	13724	10980.16	11720.03	11841.95	12713.91	-132.09	↑	↑	-852.90, 588.72	-1.17	0.719	-1,812,817	-11,705,228, 8,079,595
Pioneer Valley	42680	13319.71	13369.7	12131.96	12474.91	-292.97	↓	↓	-794.74, 208.80	-2.34	0.252	-12,503,837	-33,919,341, 8,911,668
Steward	61261	14028.35	14175.58	14348.41	14648.6	-152.96	↑	↑	-481.35, 175.44	-1.13	0.361	-9,370,254	-29,488,153, 10,747,645
TheDaCare	15197	10218.26	10585.25	9255.67	9739.14	-116.49	↓	↓	-772.31, 539.33	-1.17	0.728	-1,770,301	-11,736,831, 8,196,230
Triad	27289	11072.74	11597.79	11602.96	11917.2	210.81	↑	↑	-476.05, 897.66	2.01	0.547	5,752,706	-12,990,955, 24,496,367
Trinity	89690	13066.23	13075.61	12908.89	13119.22	-200.94	↓	↑	-458.79, 56.91	-1.58	0.127	-18,022,147	-41,148,535, 5,104,240
UniPhy	16663	16596.52	17429.62	16300.21	16938.35	194.96	↓	↓	-372.77, 762.69	1.27	0.501	3,248,621	-6,211,418, 12,708,661
UnityPoint	79921	10602.43	10678.91	10491.18	10972.83	-405.18***	↓	↑	-646.62, -163.73	-3.85	0.001	-32,382,127***	-51,678,560, -13,085,694
2017 Cohort													
Accountable Care Options	10715	13838.1	14714.73	13775.66	14811.71	-159.43	↓	↑	-702.21, 383.34	-1.21	0.565	-1,708,324	-7,524,171, 4,107,524
APA	26547	18146.95	19372.04	19162.5	21060.46	-672.87**	↑	↑	-1288.71, -57.04	-3.75	0.032	-17,862,809**	-34,211,408, -1,514,211
Arizona	24380	12362.99	12688.35	12108.09	12628.33	-194.88	↓	↓	-631.13, 241.38	-1.65	0.381	-4,751,084	-15,386,921, 5,884,753
Atrius	38355	12873.92	13620.26	11976.76	12995.39	-272.3	↓	↓	-668.61, 124.02	-2.21	0.178	-10,443,881	-25,644,533, 4,756,771
Bronx	46559	18248.08	18210.75	18027.28	17744.83	245.12	↓	↓	-314.77, 805.02	1.38	0.391	11,412,601	-14,655,563, 37,480,765
Carilion	47135	10211.78	10511.27	11126.22	11411.84	13.87	↑	↑	-280.32, 308.06	0.14	0.926	653,909	-13,212,655, 14,520,472
Dartmouth-Hitchcock	18161	11765.64	12187.46	12689.83	12889.12	222.52	↑	↑	-340.78, 785.81	1.85	0.439	4,041,141	-6,188,832, 14,271,114
HCP	21746	15871.77	16488.49	16039.42	16678.23	-22.09	↑	↑	-777.64, 733.46	-0.14	0.954	-480,372	-16,910,476, 15,949,731
Hill	25393	15071.85	15637.82	15872.51	16489.23	-50.74	↑	↑	-639.51, 538.02	-0.34	0.866	-1,288,459	-16,238,978, 13,662,060
Indiana U	52616	-	-	-	-	\$	-	-	\$	-	-	\$	\$
Integra	15273	13175.49	13335.72	12836.18	13261.14	-264.73	↓	↓	-870.11, 340.65	-2.09	0.391	-4,043,168	-13,289,141, 5,202,804
MPACO	12480	-	-	-	-	\$	-	-	\$	-	-	\$	\$
NatACO	28121	-	-	-	-	\$	-	-	\$	-	-	\$	\$
NW Momentum	8002	10919.77	10608.9	9359.32	9590.89	-542.44	↓	↓	-1419.66, 334.77	-5.06	0.226	-4,340,619	-11,360,104, 2,678,865
Partners	96238	13749.24	14124.16	13971.96	14322.77	24.11	↑	↑	-296.15, 344.37	0.18	0.883	2,320,084	-28,501,159, 33,141,327

		Baseline Years:				Total Spending In PY3:							
		BY3-BY1		2018		Difference-in-Differences							
NGACO Name	N	NGACO Mean	Comparison Mean	NGACO Mean	Comparison Mean	DID Estimate	NGACO Diff.	Comp Diff.	95% CI	% Impact	p	Aggregate	Aggregate CI
ProHealth	16211	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
ProspectNE	14835	13501.78	13528	12670.53	13331.29	-634.54**	↓	↓	-1156.25, -112.83	-4.83	0.017	-9,413,399**	-17,152,998, -1,673,801
RHeritage	22165	14136.42	14940.73	14959.3	15655.94	107.66	↑	↑	-393.15, 608.48	0.77	0.674	2,386,381	-8,714,215, 13,486,976
St. Luke's	24701	10631.76	10623.47	10333.6	10843.82	-518.51**	↓	↑	-987.45, -49.58	-4.96	0.03	-12,807,821**	-24,390,946, -1,224,696
UNC	25742	10789.2	10957.8	10708.04	10922.11	-45.46	↓	↓	-491.98, 401.06	-0.43	0.842	-1,170,275	-12,664,572, 10,324,022
UTSW	76869	14450.14	14611.38	13716.95	14359.35	-481.17***	↓	↓	-806.45, -155.88	-3.38	0.004	-36,986,858***	-61,991,358, -11,982,359
2018 Cohort													
ACC of TN	19469	10112.43	10125.16	9675.07	10011.14	-323.33*	↓	↓	-670.60, 23.93	-3.44	0.068	-6,295,006*	-13,055,854, 465,842
Best Care Collab	18586	12384.65	11454.35	11860.53	11370.04	-439.81*	↓	↓	-893.17, 13.54	-3.8	0.057	-8,174,339*	-16,600,406, 251,729
CareMount	22998	12864.59	12381.83	13153.61	12699.34	-28.49	↑	↑	-581.84, 524.87	-0.22	0.92	-655,171	-13,381,225, 12,070,883
Central Utah	14429	11214.79	11509.89	10898.84	11699.84	-505.89	↓	↑	-1316.68, 304.90	-4.51	0.221	-7,299,500	-18,998,393, 4,399,392
Connected Care	21822	13677.96	13344.17	13998.37	13643.3	21.28	↑	↑	-535.94, 578.51	0.16	0.94	464,469	-11,695,295, 12,624,233
CoxHealth	12449	9996.46	10405.38	9960.68	10219.56	150.04	↓	↓	-614.32, 914.41	1.59	0.7	1,867,882	-7,647,705, 11,383,468
Franciscan	22237	11255.39	12844.64	11451.45	13305.73	-265.05	↑	↑	-754.64, 224.55	-2.43	0.289	-5,893,811	-16,780,919, 4,993,296
Mary Washington	13616	11789.35	11190.45	11479.23	11245.86	-365.54	↓	↑	-926.70, 195.63	-3.19	0.202	-4,977,132	-12,617,984, 2,663,719
NECQA	34680	15000.67	14804.53	15364.06	15243.63	-75.7	↑	↑	-548.67, 397.27	-0.52	0.754	-2,625,253	-19,027,724, 13,777,218
North Jersey	8471	-	-	-	-	\$ -	-	-	\$ -	-	-	\$ -	\$ -
Primaria	26198	12077.15	12361.97	12528.63	13032.36	-218.92	↑	↑	-716.98, 279.14	-1.86	0.389	-5,735,303	-18,783,522, 7,312,916
Primary Care Alliance	12036	12325.77	13174.82	12400.01	13305.6	-56.55	↑	↑	-553.24, 440.14	-0.48	0.823	-680,610	-6,658,802, 5,297,582
Reliance	11914	13862.35	15014.67	13484.03	14978.56	-342.21	↓	↓	-872.60, 188.18	-2.66	0.206	-4,077,058	-10,396,144, 2,242,029
Reliant	10624	13529.87	15533.54	13457.21	15358.01	102.86	↓	↓	-864.25, 1069.98	0.79	0.835	1,092,827	-9,181,799, 11,367,453
Torrance	11654	15704.31	15939.6	14537.43	15041.54	-268.82	↓	↓	-962.29, 424.66	-1.82	0.447	-3,132,772	-11,214,482, 4,948,938
UW Health	26368	10389.11	9869.28	10500.56	9916.29	64.43	↑	↑	-396.52, 525.39	0.66	0.784	1,698,934	-10,455,486, 13,853,354

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. DID impact estimate is the dollar PBPY estimate (per beneficiary per year). \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Aggregate estimate is the DID impact estimate for all beneficiaries in performance years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model.

Exhibit J.10. Estimated Impact of the 2016 Cohort on Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Acute Care Hospital Facility			Skilled Nursing Facility			Other Post-Acute Care Facility			Outpatient Facility		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	16549	-244.54**	-459.39, -29.69	-6.56	-41.88	-115.08, 31.33	-6.45	-79.27	-202.90, 44.36	-7.64	-193.50***	-326.08, -60.92	-7.72
Bellin	11191	-47.5	-265.70, 170.70	-1.88	173.50***	81.01, 265.99	28.25	-43.27*	-91.25, 4.70	-27.70	201.23**	0.71, 401.76	6.88
CHESS	28084	-55.33	-267.39, 156.73	-1.71	-1.67	-55.70, 52.37	-0.24	-16.07	-66.09, 33.95	-6.47	209.86***	70.91, 348.82	8.78
Deaconess	32850	§	§	-	54.01	-38.67, 146.70	5.24	4.48	-59.67, 68.63	1.04	35.67	-116.69, 188.02	1.23
Henry Ford	24504	-44.03	-273.66, 185.59	-0.88	-124.57***	-201.23, -47.92	-11.10	13.11	-49.90, 76.11	3.39	489.82***	344.43, 635.21	15.40
Park Nicollet	13724	§	§	-	-25.01	-152.29, 102.28	-2.46	75.84**	12.82, 138.86	82.79	-172.86	-415.90, 70.18	-5.82
Pioneer Valley	42680	-105.75	-358.90, 147.39	-2.28	§	§	-	-6.54	-77.80, 64.71	-1.55	21.28	-145.76, 188.33	0.79
Steward	61261	-4.3	-126.82, 118.21	-0.11	-33.14	-74.66, 8.38	-3.75	-42.28**	-78.33, -6.22	-10.20	-25.69	-97.24, 45.86	-1.15
ThedaCare	15197	79.6	-199.59, 358.79	2.70	76.23	-48.68, 201.15	10.10	-79.57	-185.35, 26.21	-44.00	108.37	-168.73, 385.47	3.82
Triad	27289	72.11	-201.99, 346.20	2.18	-26.62	-117.12, 63.88	-4.38	-74.74	-164.02, 14.54	-31.20	371.00***	163.39, 578.61	17.38
Trinity	89690	-91.79*	-200.27, 16.68	-2.20	-67.59***	-109.53, -25.64	-6.30	-29.28	-67.47, 8.90	-7.30	14.66	-62.44, 91.76	0.59
UniPhy	16663	209.18**	15.98, 402.38	5.62	49.63	-27.60, 126.87	5.82	19.07	-57.19, 95.33	3.76	-76.05	-216.20, 64.11	-3.82
UnityPoint	79921	31.01	-68.84, 130.86	1.04	-45.43**	-85.28, -5.58	-6.76	-16.56	-46.31, 13.19	-7.46	-169.94***	-231.32, -108.56	-7.02

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, emergency department, and comprehensive outpatient rehabilitation facilities. Wide-variation in the percentage impact for post-acute care facility spending for reflects wide-variation across NGACOs in baseline spending towards post-acute care facilities.

Exhibit J.11. Estimated Impact of the 2016 Cohort on Professional Services, Home Health, Hospice, and Durable Medical Equipment Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Professional Services			Home Health			Hospice			Durable Medical Equipment		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	16549	\$	\$	-	-75.55***	-130.90, -20.20	-7.32	-41.08	-106.81, 24.64	-10.80	23.7	-24.86, 72.26	7.50
Bellin	11191	330.84***	236.08, 425.60	19.72	\$	\$	-	-5.54	-73.31, 62.22	-1.90	-13.27	-59.33, 32.80	-5.27
CHESS	28084	\$	\$	-	-38.66***	-66.14, -11.19	-7.33	-33.6	-83.58, 16.38	-8.28	21.96	-11.61, 55.54	6.85
Deaconess	32850	-139.70*	-287.18, 7.77	-5.60	-17.82	-51.40, 15.77	-3.79	-78.70**	-148.37, -9.02	-23.40	\$	\$	-
Henry Ford	24504	\$	\$	-	\$	\$	-	-30.49	-81.89, 20.92	-9.41	54.66**	6.86, 102.45	17.93
Park Nicollet	13724	254.92***	108.18, 401.66	10.02	-22.5	-58.60, 13.60	-6.32	-43.46	-120.03, 33.10	-10.80	3.39	-47.52, 54.30	1.36
Pioneer Valley	42680	-88.23***	-149.45, -27.01	-3.39	\$	\$	-	-41.19	-115.21, 32.84	-12.00	-9.94	-48.20, 28.31	-3.90
Steward	61261	11.77	-42.78, 66.32	0.37	13.03	-8.32, 34.38	1.87	-28.56	-64.35, 7.23	-7.26	-3.08	-21.70, 15.53	-1.21
ThedaCare	15197	-20.01	-146.85, 106.83	-0.92	-56.63**	-100.62, -12.65	-15.10	-121.96*	-254.19, 10.27	-21.50	-12.25	-60.25, 35.75	-4.86
Triad	27289	-5.64	-114.61, 103.33	-0.21	\$	\$	-	-57.84	-142.03, 26.34	-13.50	4.97	-39.90, 49.84	1.65
Trinity	89690	-46.23	-112.22, 19.77	-1.41	-11.85	-29.13, 5.43	-1.94	-21.32	-48.81, 6.17	-6.01	-6.26	-20.27, 7.75	-2.47
UniPhy	16663	126.49*	-8.64, 261.63	2.93	\$	\$	-	-17.28	-86.61, 52.05	-3.37	24.74*	-1.37, 50.86	9.54
UnityPoint	79921	40.5	-29.93, 110.92	1.58	-18.09***	-31.12, -5.06	-6.18	-43.53***	-68.84, -18.23	-15.60	-0.2	-22.68, 22.28	-0.06

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Professional services includes physician, other professional, and ancillary services rendered under Part B.

Exhibit J.12. Estimated Impact of the 2016 Cohort on Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stay Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		Acute Care Stays			SNF Stays			SNF Days			ED Visits & Observation Stays		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACBST	16549	-19.78***	-32.29, -7.27	-6.72	-1.20	-6.45, 4.06	-2.46	-121.30	-282.85, 40.25	-8.83	\$	\$	-
Bellin	11191	-11.31	-24.79, 2.18	-5.18	22.25***	15.13, 29.36	42.24	391.43***	181.02, 601.84	28.06	20.63	-10.53, 51.79	3.72
CHESS	28084	-7.30	-17.70, 3.09	-2.49	2.57	-2.16, 7.29	3.86	-18.21	-144.28, 107.85	-1.14	\$	\$	-
Deaconess	32850	\$	\$	-	11.71***	4.71, 18.71	14.06	138.75	-71.53, 349.03	6.11	\$	\$	-
Henry Ford	24504	-11.40	-25.68, 2.89	-2.69	-4.33	-11.67, 3.01	-4.06	-230.97**	-407.02, -54.92	-9.62	\$	\$	-
Park Nicollet	13724	0.64	-18.13, 19.40	0.20	4.93	-4.65, 14.50	5.95	1.97	-219.20, 223.14	0.12	1.70	-35.77, 39.17	0.25
Pioneer Valley	42680	-21.61***	-37.37, -5.85	-6.24	\$	\$	-	\$	\$	-	3.93	-20.28, 28.14	0.65
Steward	61261	-4.08	-11.69, 3.53	-1.25	2.77	-0.83, 6.38	3.47	-63.87	-152.93, 25.20	-3.51	-4.26	-16.93, 8.42	-0.77
ThedaCare	15197	3.53	-15.74, 22.79	1.24	8.85*	-0.63, 18.32	14.12	213.44	-57.77, 484.64	13.89	\$	\$	-
Triad	27289	5.37	-14.69, 25.42	1.84	1.59	-6.18, 9.35	2.74	-28.63	-244.19, 186.93	-2.01	48.31**	6.53, 90.10	7.51
Trinity	89690	-5.29	-11.71, 1.13	-1.61	0.94	-2.26, 4.15	1.13	-117.23***	-201.34, -33.13	-5.70	-21.51***	-32.54, -10.48	-3.87
UniPhy	16663	\$	\$	-	2.45	-3.44, 8.33	3.43	137.96	-41.04, 316.97	7.36	\$	\$	-
UnityPoint	79921	2.04	-4.62, 8.71	0.76	8.69***	5.35, 12.03	12.83	19.75	-64.05, 103.56	1.39	-58.98***	-71.72, -46.25	-10.60

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. ED = emergency department; SNF = skilled nursing facility.

Exhibit J.13. Estimated Impact of the 2016 Cohort on E&M Visits, Procedures, Tests, and Imaging Services Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		E&M Visits			Procedures			Tests			Imaging Services		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
AC CST	16549	-238.10**	-430.02, -46.17	-1.84	272.11*	-13.64, 557.87	3.03	-410.95	-954.56, 132.66	-1.50	-181.90***	-316.98, -46.81	-3.18
Bellin	11191	§	§	-	869.82***	482.28, 1257.36	11.19	1570.16***	1050.59, 2089.72	8.36	275.09***	136.36, 413.82	7.00
CHESS	28084	§	§	-	-308.63***	-535.63, -81.63	-3.80	§	§	-	§	§	-
Deaconess	32850	-102.34	-290.96, 86.28	-0.87	91.60	-216.15, 399.36	1.03	-181.47	-652.04, 289.10	-0.83	137.43**	1.49, 273.36	2.78
Henry Ford	24504	§	§	-	§	§	-	§	§	-	§	§	-
Park Nicollet	13724	-571.37***	-843.05, -299.69	-5.00	-613.29***	-1010.73, -215.84	-7.42	-655.23	-1436.86, 126.41	-2.96	-103.91	-272.50, 64.68	-2.37
Pioneer Valley	42680	§	§	-	§	§	-	-556.69**	-1039.47, -73.91	-2.26	§	§	-
Steward	61261	-380.76***	-500.74, -260.78	-2.64	108.85	-65.97, 283.67	1.19	-916.87***	-1201.09, -632.66	-3.29	-13.15	-87.37, 61.07	-0.25
ThedaCare	15197	-268.48**	-507.35, -29.62	-2.65	-405.38*	-864.77, 54.02	-4.55	§	§	-	§	§	-
Triad	27289	§	§	-	79.64	-347.08, 506.37	0.94	-17.30	-700.25, 665.66	-0.08	79.42	-111.13, 269.97	1.70
Trinity	89690	§	§	-	97.41	-86.70, 281.52	0.88	§	§	-	-110.34***	-171.18, -49.49	-2.14
UniPhy	16663	-353.14***	-562.13, -144.14	-2.21	378.19*	-1.10, 757.48	3.26	-97.93	-620.95, 425.09	-0.30	-2.44	-141.79, 136.90	-0.04
UnityPoint	79921	§	§	-	-619.56***	-792.65, -446.47	-6.50	§	§	-	-80.39**	-142.40, -18.37	-1.80

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

Exhibit J.14. Estimated Impact of the 2016 Cohort on Beneficiaries with AWW, Home Health Episodes, and Home Health Visits Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with AWW			Home Health Episodes			Home Health Visits		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	16549	§	§	-	-8.93**	-15.91, -1.95	-6.72	-536.67***	-903.56, -169.77	-8.98
Bellin	11191	§	§	-	§	§	-	-174.17	-385.73, 37.38	-10.60
CHESS	28084	§	§	-	-8.69***	-14.85, -2.52	-6.64	-270.15***	-441.06, -99.25	-9.04
Deaconess	32850	§	§	-	§	§	-	-81.55	-307.38, 144.28	-2.91
Henry Ford	24504	§	§	-	§	§	-	§	§	-
Park Nicollet	13724	§	§	-	-8.53*	-17.32, 0.27	-8.92	-154.56	-361.93, 52.81	-9.08
Pioneer Valley	42680	31.51***	22.17, 40.85	9.733	§	§	-	§	§	-
Steward	61261	§	§	-	§	§	-	145.82**	7.12, 284.52	3.86
ThedaCare	15197	§	§	-	-6.26	-17.93, 5.40	-5.70	-286.87**	-561.35, -12.40	-14.70
Triad	27289	§	§	-	-1.72	-13.08, 9.64	-1.33	§	§	-
Trinity	89690	§	§	-	1.99	-1.74, 5.72	1.39	-108.99**	-207.18, -10.80	-3.72
UniPhy	16663	§	§	-	0.34	-7.04, 7.72	0.17	-67.72	-362.00, 226.56	-1.17
UnityPoint	79921	§	§	-	0.24	-3.02, 3.50	0.29	-124.18***	-217.43, -30.92	-7.30

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. AWW = annual wellness visit.

Exhibit J.15. Estimated Impact of the 2016 Cohort on Quality of Care in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Quality of Care (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with ACSC Hospitalizations			Beneficiaries with Unplanned 30-day Readmissions			Beneficiaries with Hospital Readmissions from SNF		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	16549	-6.36***	-9.57, -3.15	-16.70	-0.64	-16.83, 15.55	-0.41	-11.21	-54.43, 32.02	-5.66
Bellin	11191	-3.89*	-7.99, 0.21	-13.40	-0.06	-20.29, 20.17	-0.05	21.36	-16.50, 59.23	14.98
CHESS	28084	0.64	-2.52, 3.81	1.48	-11.91	-26.35, 2.53	-8.05	-13.93	-44.40, 16.54	-7.78
Deaconess	32850	-3.35	-7.85, 1.15	-6.69	§	§	-	19.41	-13.95, 52.77	11.55
Henry Ford	24504	-4.92***	-8.35, -1.49	-9.67	-6.01	-19.96, 7.95	-3.33	-16.19	-45.91, 13.54	-6.84
Park Nicollet	13724	3.99*	-0.34, 8.33	11.54	0.31	-22.12, 22.75	0.21	-34.68	-81.86, 12.51	-18.70
Pioneer Valley	42680	-5.97***	-10.35, -1.58	-12.20	-19.57**	-38.94, -0.20	-11.00	23.88	-13.20, 60.95	12.21
Steward	61261	1.26	-0.98, 3.50	2.35	-2.28	-11.48, 6.92	-1.33	-2.86	-20.92, 15.19	-1.43
ThedaCare	15197	0.05	-4.82, 4.91	0.15	7.47	-14.99, 29.92	7.10	0.60	-45.03, 46.22	0.50
Triad	27289	2.19	-3.35, 7.73	5.39	17.05	-7.88, 41.98	12.36	47.67**	6.53, 88.81	34.96
Trinity	89690	0.13	-1.40, 1.67	0.34	1.40	-5.80, 8.61	0.95	10.54	-3.93, 25.00	5.65
UniPhy	16663	3.29	-0.73, 7.31	5.82	-2.69	-17.73, 12.35	-1.48	-31.54*	-64.30, 1.22	-15.00
UnityPoint	79921	-1.33	-3.23, 0.58	-3.41	3.61	-5.16, 12.38	2.61	0.02	-18.10, 18.15	0.01

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. SNF = skilled nursing facility. ACSC = ambulatory care sensitive conditions.

Exhibit J.16. Estimated Impact of the 2017 Cohort on Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Acute Care Hospital Facility			Skilled Nursing Facility			Other Post-Acute Care Facility			Outpatient Facility		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	-85.53	-345.21, 174.16	-2.26	-6.61	-97.52, 84.29	-0.83	-97.79*	-200.99, 5.41	-16.50	-130.45	-294.37, 33.47	-6.08
APA	26547	-137.54	-322.48, 47.41	-3.14	-67.57*	-146.37, 11.22	-5.54	-89.31**	-166.65, -11.96	-13.30	9.69	-128.60, 147.97	0.46
Arizona	24380	\$	\$	-	-67.46***	-112.34, -22.58	-13.70	7.41	-53.83, 68.64	1.95	\$	\$	-
Atrius	38355	\$	\$	-	-10	-66.74, 46.74	-1.22	1.93	-41.13, 44.99	0.66	-87.74	-198.96, 23.47	-3.57
Bronx	46559	83.71	-136.60, 304.02	1.50	-18.11	-115.96, 79.75	-1.14	28.24	-17.67, 74.14	9.24	140.15**	4.53, 275.77	5.74
Carilion	47135	-1.09	-131.48, 129.30	-0.03	-20.74	-70.19, 28.72	-2.58	7.84	-22.15, 37.83	4.16	-25.12	-112.79, 62.55	-1.06
Dartmouth-Hitchcock	18161	423.83***	164.00, 683.66	10.67	50.67	-44.24, 145.58	5.92	41.96	-49.24, 133.16	8.71	-213.67**	-381.27, -46.08	-7.24
HCP	21746	107.01	-140.56, 354.58	2.07	\$	\$	-	41.61	-46.42, 129.65	7.56	90.32	-41.11, 221.75	3.76
Hill	25393	-10.75	-250.71, 229.21	-0.24	47.61	-42.07, 137.28	4.31	2.12	-56.92, 61.17	0.95	-53.23	-179.42, 72.97	-2.14
Indiana U	52616	88.93	-50.70, 228.55	2.45	-18.62	-80.04, 42.79	-1.85	-7.08	-46.45, 32.28	-2.68	-32.59	-172.31, 107.13	-1.10
Integra	15273	-144.44	-431.57, 142.70	-3.26	73.35	-16.12, 162.83	8.30	-93.94**	-180.91, -6.96	-29.50	-114.08	-316.53, 88.37	-4.04
MPACO	12480	\$	\$	-	-89.87*	-185.01, 5.26	-8.50	-28.05	-111.93, 55.83	-6.63	161.84**	21.24, 302.44	7.18
NatACO	28121	-14.43	-184.75, 155.89	-0.34	-65.65*	-135.14, 3.84	-6.06	66.22*	-3.17, 135.61	14.83	91.11*	-8.08, 190.31	4.47
NW Momentum	8002	-301.29	-693.13, 90.55	-8.31	-74.72	-237.89, 88.45	-8.54	16.96	-43.56, 77.47	25.76	30.46	-340.18, 401.09	1.14
Partners	96238	\$	\$	-	-4.65	-48.34, 39.04	-0.57	-5.49	-37.03, 26.05	-1.83	-46.11	-151.16, 58.93	-1.50
ProHealth	16211	\$	\$	-	-15.67	-95.68, 64.34	-2.23	\$	\$	-	-150.41*	-322.26, 21.44	-5.27
ProspectNE	14835	-74.22	-312.26, 163.83	-1.65	-149.88***	-242.11, -57.65	-12.40	-2.53	-40.23, 35.17	-1.78	-336.50***	-474.37, -198.64	-12.60
RHeritage	22165	77.57	-160.72, 315.85	1.64	-101.44*	-203.72, 0.84	-7.58	\$	\$	-	-25.42	-139.01, 88.17	-1.13
St. Luke's	24701	-26.61	-230.37, 177.16	-0.89	-103.92***	-177.40, -30.44	-19.10	-71.92**	-131.45, -12.39	-34.20	-198.11**	-395.58, -0.64	-5.82
UNC	25742	-10.09	-202.44, 182.25	-0.29	-5.6	-73.91, 62.70	-0.73	-19.25	-59.80, 21.29	-11.30	-79.51	-220.99, 61.97	-3.11
UTSW	76869	-81.66	-194.74, 31.42	-2.14	-0.84	-49.47, 47.79	-0.09	-92.11***	-150.79, -33.43	-10.10	114.83***	33.40, 196.26	4.98

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. PBPY estimate is the DID impact estimate per beneficiary per year. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, emergency department, and comprehensive outpatient rehabilitation facilities. Wide-variation in the percentage impact for post-acute care facility spending for reflects wide-variation across NGACOs in baseline spending towards post-acute care facilities.

Exhibit J.17. Estimated Impact of the 2017 Cohort on Professional Services, Home Health, Hospice, and Durable Medical Equipment Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Professional Services			Home Health			Hospice			Durable Medical Equipment		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	71.38	-82.55, 225.32	1.47	-33.99	-102.44, 34.46	-2.66	-8.87	-111.95, 94.21	-1.73	13.56	-24.95, 52.07	5.80
APA	26547	\$	\$	-	-132.85***	-196.62, -69.07	-6.33	51.32	-36.52, 139.16	7.45	\$	\$	-
Arizona	24380	86.47	-108.25, 281.18	2.02	-42.30***	-67.39, -17.22	-10.40	-41.74	-97.67, 14.20	-9.35	21.68	-13.57, 56.93	8.99
Atrius	38355	16.6	-49.18, 82.38	0.56	\$	\$	-	0.37	-47.72, 48.47	0.11	-18.34	-51.26, 14.59	-8.70
Bronx	46559	-44.01	-117.38, 29.35	-1.09	24.52**	2.02, 47.02	5.08	\$	\$	-	\$	\$	-
Carilion	47135	63.45**	1.00, 125.90	2.64	-10.48	-33.67, 12.70	-2.13	6.26	-29.99, 42.52	2.23	-8.47	-44.76, 27.83	-2.91
Dartmouth-Hitchcock	18161	176.10***	110.20, 241.99	9.08	\$	\$	-	-62.58*	-132.62, 7.47	-15.80	15.58	-14.77, 45.93	8.16
HCP	21746	-74.5	-289.87, 140.86	-1.89	-53.34*	-108.78, 2.10	-3.83	-45.34	-123.03, 32.35	-7.85	16.05	-18.74, 50.85	6.04
Hill	25393	38.32	-58.89, 135.54	1.12	5.15	-31.70, 42.00	0.71	48.21	-20.75, 117.18	11.19	10.31	-12.04, 32.66	5.45
Indiana U	52616	-297.86***	-503.41, -92.30	-10.80	-31.60***	-54.32, -8.88	-7.13	-18.05	-60.28, 24.18	-5.01	19.63	-6.32, 45.59	6.26
Integra	15273	-81.51*	-178.43, 15.41	-2.80	9.7	-45.34, 64.73	1.25	-22.67	-104.53, 59.19	-4.86	-34.79	-80.73, 11.15	-14.90
MPACO	12480	-96.31	-219.61, 26.99	-2.54	\$	\$	-	-1.45	-73.61, 70.71	-0.42	0.58	-37.61, 38.78	0.22
NatACO	28121	3.82	-70.34, 77.99	0.12	24.2	-15.61, 64.00	2.38	-12.8	-67.40, 41.79	-2.81	4.09	-14.46, 22.65	1.73
NW Momentum	8002	-149.55	-349.75, 50.66	-5.10	-5.65	-57.31, 46.02	-1.49	11.06	-90.11, 112.23	4.03	9.09	-17.65, 35.84	4.77
Partners	96238	-66.85***	-112.76, -20.95	-2.40	9.34	-13.06, 31.73	1.39	14	-17.22, 45.22	4.56	5.29	-20.07, 30.65	2.25
ProHealth	16211	\$	\$	-	-46.88***	-77.61, -16.14	-12.80	\$	\$	-	-8.87	-48.91, 31.17	-3.92
ProspectNE	14835	48.51	-57.69, 154.71	1.54	-5.27	-52.42, 41.88	-0.63	-26.55	-85.97, 32.86	-7.52	8.82	-18.94, 36.58	3.83
RHeritage	22165	96.38*	-7.39, 200.16	2.53	31.74	-21.34, 84.82	2.25	-88.19**	-166.21, -10.17	-14.20	-1.77	-33.89, 30.35	-0.59
St. Luke's	24701	-67.76*	-136.67, 1.16	-3.59	-78.85***	-122.61, -35.10	-14.40	-80.76*	-165.47, 3.94	-16.00	-20.9	-79.61, 37.80	-6.42
UNC	25742	-73.8	-195.85, 48.24	-2.72	22.97	-5.69, 51.63	4.81	-26.58	-76.74, 23.57	-7.95	-36.06*	-75.61, 3.49	-10.80
UTSW	76869	-190.73***	-268.90, -112.57	-4.92	\$	\$	-	-40.41**	-79.80, -1.02	-7.94	4.07	-26.30, 34.45	1.19

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. PBPY estimate is the DID impact estimate per beneficiary per year. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Professional services includes physician, other professional, and ancillary services rendered under Part B.

Exhibit J.18. Estimated Impact of the 2017 Cohort on Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stay Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		Acute Care Stays			SNF Stays			SNF Days			ED Visits & Observation Stays		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	-14.15*	-30.27, 1.97	-4.29	-4.24	-10.95, 2.47	-6.40	-41.38	-239.27, 156.50	-2.44	-26.34*	-54.95, 2.27	-4.52
APA	26547	-8.56*	-18.34, 1.22	-2.90	-1.72	-6.02, 2.57	-2.52	-83.67	-224.12, 56.79	-4.03	-4.35	-22.34, 13.64	-0.97
Arizona	24380	1.45	-7.86, 10.77	0.62	-3.68*	-7.53, 0.17	-8.29	-124.83***	-212.08, -37.59	-13.40	§	§	-
Atrius	38355	3.02	-6.95, 12.99	1.03	2.87	-2.03, 7.76	3.60	-10.96	-116.88, 94.97	-0.74	-23.03***	-39.73, -6.34	-4.34
Bronx	46559	15.61***	5.73, 25.50	4.77	0.7	-4.25, 5.65	0.82	24.5	-134.27, 183.28	0.98	-2.06	-18.42, 14.30	-0.48
Carilion	47135	4.2	-4.38, 12.79	1.44	-0.76	-5.03, 3.51	-1.00	89.71	-33.00, 212.42	4.65	-25.10***	-41.84, -8.36	-4.07
Dartmouth-Hitchcock	18161	30.76***	16.22, 45.31	10.63	8.21**	1.48, 14.94	11.99	131.2	-62.68, 325.08	7.46	-16.71	-43.15, 9.73	-2.68
HCP	21746	7.12	-4.40, 18.64	2.12	§	§	-	§	§	-	-5.64	-22.95, 11.68	-1.18
Hill	25393	-3.99	-13.16, 5.19	-1.65	-0.69	-5.03, 3.66	-1.14	63.1	-59.93, 186.13	4.24	-10.73	-28.47, 7.02	-2.18
Indiana U	52616	8.64*	-0.61, 17.89	2.81	1.16	-3.70, 6.01	1.34	-73.26	-217.76, 71.23	-3.27	§	§	-
Integra	15273	-9.43	-26.41, 7.56	-2.93	9.30**	0.73, 17.88	10.54	180.17**	0.29, 360.05	10.69	-64.41***	-95.31, -33.50	-10.30
MPACO	12480	§	§	-	-1.7	-10.34, 6.93	-1.71	-199.18*	-404.74, 6.38	-8.73	14.16	-17.62, 45.94	2.25
NatACO	28121	-8.23*	-17.38, 0.92	-2.72	§	§	-	-97.75	-222.92, 27.43	-5.08	-16.99**	-31.91, -2.07	-3.34
NW Momentum	8002	-5.95	-24.74, 12.84	-2.38	-4.6	-13.98, 4.78	-7.84	-124.38	-400.55, 151.78	-8.25	-28.04*	-60.90, 4.82	-5.73
Partners	96238	§	§	-	4.15**	0.70, 7.61	5.76	-10.95	-95.23, 73.32	-0.72	§	§	-
ProHealth	16211	§	§	-	§	§	-	12.43	-160.92, 185.79	0.85	-44.59***	-72.37, -16.82	-7.38
ProspectNE	14835	-7.69	-21.75, 6.37	-2.35	-1.16	-8.78, 6.47	-1.14	-218.12**	-393.55, -42.70	-9.84	-51.03***	-74.64, -27.42	-8.07
RHeritage	22165	1.18	-9.62, 11.97	0.38	-0.41	-5.69, 4.87	-0.57	-89.74	-255.17, 75.70	-4.16	8.02	-9.06, 25.09	1.66
St. Luke's	24701	4.41	-8.52, 17.35	1.85	-0.43	-5.95, 5.08	-0.93	-192.40***	-328.91, -55.89	-18.50	-18.45	-41.63, 4.74	-3.53
UNC	25742	-3.3	-15.28, 8.68	-1.07	2.41	-3.12, 7.93	3.56	-12.15	-173.48, 149.19	-0.70	-8.93	-33.27, 15.42	-1.33
UTSW	76869	-3.55	-10.87, 3.78	-1.10	2.61	-0.79, 6.02	3.69	-28.87	-133.90, 76.15	-1.49	16.08**	2.77, 29.38	2.63

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. ED = emergency department; SNF = skilled nursing facility.

Exhibit J.19. Estimated Impact of the 2017 Cohort on E&M Visits, Procedures, Tests, and Imaging Services Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		E&M Visits			Procedures			Tests			Imaging Services		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	§	§	-	33.23	-500.73, 567.20	0.21	-278.04	-884.77, 328.70	-0.85	-50.66	-214.55, 113.22	-0.80
APA	26547	§	§	-	§	§	-	§	§	-	-62.31	-168.96, 44.34	-1.15
Arizona	24380	-221.62**	-401.36, -41.88	-1.57	§	§	-	-33.71	-451.20, 383.77	-0.13	§	§	-
Atrius	38355	-465.28***	-625.64, -304.93	-3.37	-141.66	-406.84, 123.53	-1.43	-947.76***	-1337.97, -557.55	-3.77	§	§	-
Bronx	46559	-148.02	-338.30, 42.26	-0.85	497.21**	106.08, 888.34	3.46	125.47	-349.95, 600.90	0.37	-48.39	-145.91, 49.13	-0.85
Carilion	47135	§	§	-	-14.6	-188.93, 159.74	-0.20	§	§	-	-7.9	-85.28, 69.47	-0.19
Dartmouth-Hitchcock	18161	386.71***	163.49, 609.93	2.81	50.46	-221.61, 322.52	0.68	§	§	-	§	§	-
HCP	21746	176.48**	0.24, 352.72	1.30	498.58***	162.75, 834.42	4.44	445.63**	16.50, 874.77	1.67	37.41	-68.60, 143.43	0.75
Hill	25393	119.34	-29.79, 268.46	0.98	-190.66	-455.92, 74.61	-2.02	425.20**	69.78, 780.62	1.83	-123.11**	-219.02, -27.19	-2.74
Indiana U	52616	§	§	-	§	§	-	-337.80*	-679.29, 3.69	-1.45	§	§	-
Integra	15273	§	§	-	76.05	-379.35, 531.46	0.67	-1457.88***	-2071.92, -843.85	-5.45	-181.91**	-328.12, -35.70	-3.68
MPACO	12480	§	§	-	1145.52***	635.54, 1655.50	10.51	§	§	-	§	§	-
NatACO	28121	§	§	-	§	§	-	-190.59	-519.36, 138.18	-0.80	§	§	-
NW Momentum	8002	-328.65**	-620.82, -36.48	-3.02	-699.42**	-1298.79, -100.05	-6.96	-809.47**	-1521.86, -97.08	-4.33	-18.17	-208.38, 172.04	-0.44
Partners	96238	-202.72***	-343.17, -62.26	-1.32	190.91*	-27.71, 409.53	1.89	-735.73***	-1041.54, -429.91	-2.94	17.14	-58.67, 92.95	0.33
ProHealth	16211	§	§	-	§	§	-	-1895.85***	-2439.51, -1352.18	-7.80	§	§	-
ProspectNE	14835	§	§	-	-237.96	-606.71, 130.79	-2.20	-750.13***	-1255.69, -244.58	-2.72	-116.61*	-241.08, 7.86	-2.35
RHeritage	22165	§	§	-	-244.07	-578.56, 90.42	-2.02	269.9	-179.68, 719.48	1.00	111.34**	2.50, 220.18	2.15
St. Luke's	24701	-114.12	-383.45, 155.21	-0.77	-447.43***	-774.73, -120.12	-4.87	-437.63**	-863.05, -12.22	-2.27	-146.76**	-271.51, -22.01	-3.44
UNC	25742	-507.05***	-686.03, -328.06	-3.79	-158.05	-439.65, 123.56	-1.67	-722.60***	-1117.42, -327.78	-3.06	12.61	-98.21, 123.44	0.27
UTSW	76869	-319.69***	-430.17, -209.21	-2.32	-43.2	-221.30, 134.90	-0.43	§	§	-	-89.53**	-165.73, -13.34	-1.55

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

Exhibit J.20. Estimated Impact of the 2017 Cohort on Beneficiaries with AWW, Home Health Episodes, and Home Health Visits Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with AWW			Home Health Episodes			Home Health Visits		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	97.55***	87.93, 107.18	13.95	0.68	-12.82, 14.17	0.25	-647.55**	-1205.71, -89.38	-7.51
APA	26547	§	§	-	-23.81***	-31.35, -16.27	-8.71	-720.26***	-1108.86, -331.67	-6.54
Arizona	24380	§	§	-	-6.58**	-12.02, -1.14	-6.60	-256.89***	-409.19, -104.59	-12.40
Atrius	38355	§	§	-	3.56	-2.85, 9.98	2.07	§	§	-
Bronx	46559	§	§	-	10.96***	5.74, 16.18	8.74	105.96*	-16.16, 228.08	4.91
Carilion	47135	§	§	-	0.72	-4.29, 5.73	0.60	-85.7	-261.46, 90.06	-2.71
Dartmouth-Hitchcock	18161	§	§	-	4.48	-4.69, 13.65	2.76	§	§	-
HCP	21746	§	§	-	-5.2	-13.55, 3.15	-2.28	-297.22*	-607.11, 12.67	-4.50
Hill	25393	§	§	-	1.55	-4.69, 7.79	1.13	64.6	-83.94, 213.13	2.61
Indiana U	52616	§	§	-	-3.69	-8.53, 1.16	-3.51	-246.79***	-397.82, -95.75	-9.84
Integra	15273	§	§	-	-0.26	-10.70, 10.18	-0.14	-31.11	-349.62, 287.40	-0.81
MPACO	12480	-43.43***	-54.47, -32.38	-10.70	-21.34***	-32.77, -9.91	-9.50	§	§	-
NatACO	28121	§	§	-	5.24	-1.49, 11.97	2.87	117.93	-128.57, 364.44	2.25
NW Momentum	8002	§	§	-	2.2	-7.36, 11.76	2.99	39.49	-202.04, 281.01	2.58
Partners	96238	§	§	-	7.22***	2.63, 11.81	4.65	30.16	-100.63, 160.95	0.92
ProHealth	16211	96.08***	85.39, 106.76	19.06	-2.44	-9.69, 4.81	-2.60	§	§	-
ProspectNE	14835	§	§	-	1.35	-7.70, 10.40	0.74	-3.23	-312.19, 305.72	-0.07
RHeritage	22165	§	§	-	5.28	-3.12, 13.68	2.20	220.1	-68.55, 508.74	3.34
St. Luke's	24701	108.57***	97.38, 119.76	22.41	-15.99***	-24.49, -7.49	-13.50	-524.11***	-835.52, -212.69	-15.30
UNC	25742	§	§	-	13.77***	6.86, 20.68	10.80	13.49	-159.39, 186.36	0.54
UTSW	76869	§	§	-	-1.44	-5.59, 2.72	-0.94	§	§	-

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. AWW = annual wellness visit.

Exhibit J.21. Estimated Impact of the 2017 Cohort on Quality of Care in PY3 (2018)

	# of NGACO beneficiaries in PY3	Quality of Care (Per 1,000 Beneficiaries Per Year)								
		Beneficiaries with ACSC Hospitalizations			Beneficiaries with Unplanned 30-day Readmissions			Beneficiaries with Hospital Readmissions from SNF		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	10715	-3.11	-7.16, 0.94	-7.97	0.4	-19.01, 19.81	0.27	-41.17**	-81.73, -0.61	-22.90
APA	26547	-1.62	-4.54, 1.30	-3.42	1.62	-12.20, 15.44	0.92	-13.29	-41.29, 14.71	-6.21
Arizona	24380	1.3	-1.27, 3.86	4.65	16.13**	2.44, 29.82	12.29	14.18	-24.83, 53.18	7.28
Atrius	38355	1.01	-1.58, 3.60	2.62	-7.16	-19.49, 5.17	-4.80	-29.43**	-53.65, -5.20	-17.00
Bronx	46559	3.82***	0.99, 6.65	7.99	3.27	-8.67, 15.21	1.87	8.49	-14.11, 31.09	4.23
Carilion	47135	§	§	-	12.33**	1.55, 23.11	8.44	1.12	-21.76, 24.00	0.59
Dartmouth-Hitchcock	18161	2.34	-1.06, 5.74	6.54	0.15	-18.46, 18.76	0.10	23.16	-13.86, 60.19	12.02
HCP	21746	0.65	-2.19, 3.50	1.89	-13.44*	-27.30, 0.42	-8.90	-5.71	-34.17, 22.75	-2.97
Hill	25393	1.88	-0.96, 4.71	4.99	-9.47	-23.40, 4.46	-6.21	-27.85*	-56.08, 0.38	-15.40
Indiana U	52616	0.88	-1.71, 3.47	2.04	0.1	-11.35, 11.55	0.07	0.41	-21.31, 22.12	0.26
Integra	15273	§	§	-	1.68	-19.08, 22.45	0.96	28.91	-9.24, 67.07	13.86
MPACO	12480	-1.32	-6.75, 4.11	-1.78	-1.5	-19.63, 16.62	-0.70	-15.18	-50.18, 19.82	-6.31
NatACO	28121	-2.91**	-5.42, -0.39	-7.37	-4.55	-16.26, 7.16	-3.12	-23.09*	-48.57, 2.38	-13.60
NW Momentum	8002	2.7	-2.35, 7.74	11.29	27.69**	0.65, 54.74	25.53	14.91	-54.69, 84.50	9.26
Partners	96238	1.27	-0.92, 3.45	2.91	4.64	-5.00, 14.28	2.91	10.72	-7.81, 29.25	5.81
ProHealth	16211	§	§	-	0.37	-17.13, 17.86	0.26	§	§	-
ProspectNE	14835	-1.87	-5.88, 2.14	-3.81	7.8	-9.55, 25.14	4.48	1.84	-29.32, 32.99	0.88
RHeritage	22165	-1.77	-4.48, 0.93	-5.41	§	§	-	1.33	-30.19, 32.84	0.73
St. Luke's	24701	2.55	-0.88, 5.99	9.42	2.83	-15.37, 21.02	2.42	§	§	-
UNC	25742	-1.64	-4.83, 1.55	-4.22	7	-7.95, 21.95	5.13	33.59**	0.86, 66.32	18.85
UTSW	76869	-2.29**	-4.24, -0.34	-5.41	0.85	-7.75, 9.45	0.57	-2.31	-21.95, 17.33	-1.28

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. SNF = skilled nursing facility; ACSC = ambulatory care sensitive conditions.

Exhibit J.22. Estimated Impact of the 2018 Cohort on Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Acute Care Hospital Facility			Skilled Nursing Facility			Other Post-Acute Care Facility			Outpatient Facility		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	-8.01	-139.58, 123.57	-0.32	3.3	-50.02, 56.63	0.59	24.57	-23.91, 73.04	11.58	\$	\$	-
Best Care Collab	18586	-84.66	-262.20, 92.89	-2.68	29.15	-47.54, 105.83	3.38	-18.53	-101.34, 64.29	-6.18	\$	\$	-
CareMount	22998	-125.85	-409.93, 158.24	-2.65	33.72	-91.96, 159.39	2.47	30.27	-19.29, 79.84	13.64	-37.09	-193.96, 119.77	-1.55
Central Utah	14429	-52.37	-308.13, 203.39	-1.74	-35.4	-167.11, 96.32	-4.64	-10.55	-152.62, 131.51	-1.95	-90.97	-324.28, 142.34	-4.14
Connected Care	21822	-22.1	-262.14, 217.94	-0.49	85.89**	0.65, 171.13	7.45	13.53	-45.75, 72.80	4.64	-73.13	-240.16, 93.89	-2.68
CoxHealth	12449	-66.69	-380.62, 247.24	-2.33	-77.22	-192.44, 37.99	-12.80	38.69	-30.01, 107.40	22.02	226.30*	-19.01, 471.62	8.87
Franciscan	22237	-19.98	-212.32, 172.37	-0.66	-64.35	-179.22, 50.53	-7.51	49.54	-50.03, 149.12	7.44	-141.27*	-307.32, 24.79	-6.17
Mary Washington	13616	-130.34	-346.16, 85.48	-3.84	-30.61	-108.91, 47.68	-4.53	-44.41	-117.05, 28.23	-9.12	-62.86	-182.04, 56.32	-3.31
NECQA	34680	-82.44	-278.71, 113.82	-1.81	-1.84	-60.56, 56.88	-0.18	-16.65	-72.35, 39.05	-4.04	-31.47	-152.31, 89.36	-1.12
North Jersey	8471	171.95	-194.75, 538.65	3.68	\$	\$	-	-52.43	-157.73, 52.87	-10.50	-88.39	-300.25, 123.46	-3.87
Primaria	26198	-95.27	-280.98, 90.44	-2.66	-152.62***	-231.39, -73.85	-14.80	-4.8	-85.67, 76.07	-1.18	81.83	-97.79, 261.45	2.85
Primary Care Alliance	12036	-191.36**	-378.56, -4.17	-6.16	38.28	-41.12, 117.67	4.56	-29.45	-97.91, 39.02	-10.30	67.05	-28.78, 162.87	4.30
Reliance	11914	-135.1	-351.53, 81.33	-3.31	-48.94	-120.41, 22.54	-5.75	-43.15	-107.89, 21.60	-12.90	\$	\$	-
Reliant	10624	0.78	-419.50, 421.05	0.02	\$	\$	-	-3.49	-102.72, 95.73	-0.82	270.20***	81.90, 458.49	13.66
Torrance	11654	69.76	-278.27, 417.79	1.36	7.89	-146.76, 162.53	0.52	-131.67**	-247.84, -15.51	-21.50	-176.30*	-365.69, 13.09	-6.26
UW Health	26368	3.84	-192.29, 199.97	0.12	107.67***	34.40, 180.94	16.03	38.89	-22.98, 100.77	18.61	25.38	-144.96, 195.71	0.83

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. PBPY estimate is the DID impact estimate per beneficiary per year. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, emergency department, and comprehensive outpatient rehabilitation facilities. Wide-variation in the percentage impact for post-acute care facility spending for reflects wide-variation across NGACOs in baseline spending towards post-acute care facilities.

Exhibit J.23. Estimated Impact of the 2018 Cohort on Professional Services, Home Health, Hospice, and Durable Medical Equipment Spending in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Spending (\$ Per Beneficiary Per Year):											
		Professional Services			Home Health			Hospice			Durable Medical Equipment		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	-99.57	-229.42, 30.29	-3.05	\$	\$	-	21.1	-37.80, 80.01	6.39	-10.18	-64.28, 43.92	-2.70
Best Care Collab	18586	-244.84***	-429.73, -59.96	-5.30	-21.25	-67.73, 25.23	-2.59	-124.94**	-226.11, -23.76	-15.60	\$	\$	-
CareMount	22998	130.99*	-14.34, 276.32	3.53	-16.7	-48.24, 14.84	-3.58	0.97	-41.84, 43.79	0.45	11.55	-29.13, 52.22	4.80
Central Utah	14429	-69.87	-303.76, 164.02	-2.28	-147.07***	-222.05, -72.09	-15.10	-111.03**	-216.64, -5.43	-18.90	-34.1	-87.89, 19.69	-8.62
Connected Care	21822	-46.86	-125.99, 32.26	-1.53	-5.51	-47.79, 36.76	-0.62	31.91	-23.39, 87.20	9.29	-38.56	-100.82, 23.69	-18.50
CoxHealth	12449	-93.23	-255.43, 68.97	-4.47	18.34	-28.23, 64.90	5.50	6.52	-83.73, 96.77	2.10	-4.49	-91.11, 82.14	-1.19
Franciscan	22237	16.3	-76.85, 109.45	0.60	-53.49**	-100.27, -6.70	-6.59	7.98	-55.52, 71.48	1.92	-2.24	-41.29, 36.81	-0.75
Mary Washington	13616	33.77	-142.12, 209.66	0.93	11.94	-28.49, 52.37	2.20	-38.54	-96.69, 19.60	-11.40	17.56	-14.79, 49.92	7.85
NECQA	34680	-14.35	-75.91, 47.21	-0.49	1.88	-28.06, 31.82	0.25	-0.79	-45.03, 43.46	-0.21	-10.78	-38.73, 17.18	-4.83
North Jersey	8471	-2.93	-146.50, 140.64	-0.07	9.27	-30.65, 49.18	2.08	-49.12	-129.91, 31.66	-14.50	23.69	-7.96, 55.33	16.00
Primaria	26198	-119.71**	-214.95, -24.47	-4.69	-48.95***	-81.02, -16.88	-8.92	9.93	-34.99, 54.85	3.03	-0.95	-35.33, 33.43	-0.31
Primary Care Alliance	12036	8.2	-154.79, 171.19	0.18	\$	\$	-	-21.58	-84.03, 40.87	-5.36	13.49	-22.89, 49.86	4.99
Reliance	11914	-56.66	-157.19, 43.88	-1.67	-20.88	-55.59, 13.84	-3.33	-39.72	-98.61, 19.17	-11.40	\$	\$	-
Reliant	10624	59.34	-66.63, 185.31	2.16	4.74	-65.46, 74.94	0.66	-26.19	-148.24, 95.85	-6.36	11.82	-42.12, 65.76	5.39
Torrance	11654	-145.82	-322.54, 30.90	-3.26	-23.84	-98.59, 50.91	-1.76	\$	\$	-	-9.65	-55.73, 36.44	-3.15
UW Health	26368	-16.85	-83.92, 50.22	-0.98	-5	-33.26, 23.26	-1.48	-53.58	-132.71, 25.55	-8.84	-2.26	-28.97, 24.44	-1.05

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Professional services includes physician, other professional, and ancillary services rendered under Part B.

Exhibit J.24. Estimated Impact of the 2018 Cohort on Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stay Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		Acute Care Stays			SNF Stays			SNF Days			ED Visits & Observation Stays		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	-7.10	-18.65, 4.44	-2.61	1.81	-3.25, 6.87	3.18	21.97	-126.31, 170.24	1.53	-18.82*	-38.89, 1.26	-3.65
Best Care Collab	18586	-9.33	-24.03, 5.37	-2.79	7.90**	1.29, 14.52	10.67	85.71	-95.30, 266.72	4.55	26.42**	2.71, 50.13	5.40
CareMount	22998	-5.87	-20.42, 8.68	-1.72	2.99	-4.73, 10.71	3.25	161.84	-90.93, 414.62	6.53	33.06***	10.04, 56.08	5.87
Central Utah	14429	-13.13	-30.31, 4.05	-5.38	-1.11	-8.43, 6.22	-2.02	-24.75	-231.00, 181.51	-1.85	§	§	-
Connected Care	21822	§	§	-	6.80*	-0.71, 14.31	6.41	193.00**	27.43, 358.57	9.29	-39.15***	-64.13, -14.17	-6.45
CoxHealth	12449	-15.40	-39.44, 8.64	-5.58	-7.66	-19.18, 3.86	-12.00	-155.56	-428.98, 117.86	-10.90	31.00	-10.97, 72.98	4.98
Franciscan	22237	-0.35	-14.87, 14.17	-0.12	-4.23	-11.13, 2.66	-7.00	-31.55	-292.82, 229.72	-1.62	13.22	-14.57, 41.02	2.24
Mary Washington	13616	5.61	-8.80, 20.01	1.89	1.48	-4.61, 7.56	2.80	-16.86	-194.62, 160.90	-1.20	-31.51**	-57.69, -5.33	-5.60
NECQA	34680	-4.55	-14.74, 5.63	-1.46	-2.29	-7.07, 2.49	-2.68	-33.20	-145.90, 79.49	-1.85	-1.57	-20.32, 17.19	-0.26
North Jersey	8471	13.36	-5.25, 31.98	4.29	5.96	-4.48, 16.40	5.85	§	§	-	3.40	-24.88, 31.68	0.78
Primaria	26198	2.49	-9.94, 14.92	0.81	-4.68	-10.88, 1.52	-5.75	-330.42***	-501.92, -158.92	-15.40	-29.46**	-53.07, -5.84	-4.45
Primary Care Alliance	12036	-23.38***	-36.96, -9.80	-7.65	5.18	-1.14, 11.50	7.50	120.00	-77.83, 317.82	6.31	§	§	-
Reliance	11914	-12.87	-28.52, 2.79	-3.49	-0.86	-8.79, 7.07	-0.95	-102.64	-267.40, 62.13	-5.56	§	§	-
Reliant	10624	15.46	-5.78, 36.70	5.83	§	§	-	§	§	-	50.60**	7.88, 93.32	9.07
Torrance	11654	15.62*	-1.96, 33.20	4.54	1.25	-7.51, 10.01	1.38	96.31	-180.57, 373.18	3.88	-14.77	-47.37, 17.83	-2.77
UW Health	26368	5.26	-7.72, 18.25	1.97	10.07***	4.26, 15.89	18.09	196.48**	37.43, 355.53	14.26	5.19	-19.67, 30.06	0.89

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. ED = emergency department; SNF = skilled nursing facility.

Exhibit J.25. Estimated Impact of the 2018 Cohort on E&M Visits, Procedures, Tests, and Imaging Services Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		E&M Visits			Procedures			Tests			Imaging Services		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	§	§	-	136.73	-266.30, 539.77	1.19	§	§	-	-79.62	-194.07, 34.83	-1.65
Best Care Collab	18586	-18.88	-232.15, 194.39	-0.13	-666.57***	-1069.44, -263.71	-5.14	74.14	-393.35, 541.64	0.31	-18.67	-153.77, 116.43	-0.33
CareMount	22998	-177.66*	-378.45, 23.14	-1.24	-276.95	-725.49, 171.59	-2.09	182.64	-324.62, 689.90	0.65	10.07	-114.81, 134.95	0.20
Central Utah	14429	§	§	-	-391.75	-974.65, 191.15	-3.52	-1991.38***	-2633.37, -1349.38	-9.94	§	§	-
Connected Care	21822	357.40***	-565.33, -149.46	-2.45	-4.58	-375.13, 365.98	-0.04	-1221.15***	-1680.37, -761.94	-4.69	-10.21	-133.01, 112.58	-0.21
CoxHealth	12449	§	§	-	§	§	-	171.47	-604.36, 947.29	0.82	308.12***	77.99, 538.25	6.50
Franciscan	22237	§	§	-	-56.70	-502.14, 388.74	-0.52	239.81	-214.21, 693.82	1.12	-82.27	-217.52, 52.97	-1.60
Mary Washington	13616	69.34	-139.25, 277.93	0.56	170.69	-292.75, 634.13	1.56	277.72	-227.86, 783.30	1.16	-21.84	-165.57, 121.90	-0.43
NECQA	34680	279.75***	-456.18, -103.33	-1.81	-26.00	-276.82, 224.82	-0.26	§	§	-	-26.36	-124.73, 72.01	-0.52
North Jersey	8471	37.40	-281.15, 355.95	0.25	-36.93	-898.84, 824.98	-0.25	§	§	-	25.57	-167.78, 218.92	0.48
Primaria	26198	§	§	-	-490.06***	-767.96, -212.15	-5.54	-291.92	-648.68, 64.84	-1.46	50.08	-62.79, 162.94	1.04
Primary Care Alliance	12036	141.74	-103.89, 387.37	0.88	1043.59***	569.70, 1517.48	7.88	300.13	-239.68, 839.94	0.98	§	§	-
Reliance	11914	§	§	-	§	§	-	-17.17	-544.25, 509.90	-0.06	-45.11	-186.80, 96.59	-0.83
Reliant	10624	339.96**	0.04, 679.88	2.78	585.05**	69.46, 1100.64	6.92	§	§	-	24.58	-197.56, 246.71	0.49
Torrance	11654	§	§	-	-479.63*	-1016.20, 56.94	-3.16	337.36	-260.01, 934.73	1.10	-95.26	-226.89, 36.38	-1.87
UW Health	26368	§	§	-	-43.04	-327.79, 241.71	-0.53	§	§	-	§	§	-

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

Exhibit J.26. Estimated Impact of the 2018 Cohort on Beneficiaries with AWW, Home Health Episodes, and Home Health Visits Utilization in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Utilization (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with AWW			Home Health Episodes			Home Health Visits		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	§	§	-	-3.46	-10.30, 3.39	-3.00	§	§	-
Best Care Collab	18586	59.21***	48.91, 69.51	12.33	-1.79	-12.89, 9.32	-0.84	-120.54	-423.98, 182.91	-2.58
CareMount	22998	166.80***	157.11, 176.48	43.07	-2.06	-9.22, 5.11	-1.79	-150.01	-339.99, 39.97	-6.46
Central Utah	14429	§	§	-	-19.38***	-32.33, -6.42	-11.80	-1008.79***	-1640.11, -377.47	-15.90
Connected Care	21822	§	§	-	-7.58*	-16.59, 1.44	-3.63	7.00	-225.24, 239.24	0.18
CoxHealth	12449	§	§	-	1.81	-9.86, 13.49	2.07	109.42	-209.96, 428.81	5.64
Franciscan	22237	§	§	-	-1.39	-10.10, 7.32	-0.99	-259.43	-614.30, 95.43	-4.86
Mary Washington	13616	124.09***	113.14, 135.03	38.07	0.84	-7.71, 9.39	0.65	124.53	-108.23, 357.29	4.76
NECQA	34680	38.68***	31.49, 45.88	9.50	0.34	-5.90, 6.59	0.20	36.74	-144.55, 218.04	1.00
North Jersey	8471	27.64***	14.80, 40.47	9.43	8.61*	-1.62, 18.84	7.19	48.50	-152.86, 249.86	2.54
Primaria	26198	§	§	-	§	§	-	-389.32***	-598.52, -180.12	-13.00
Primary Care Alliance	12036	-50.55***	-61.39, -39.71	-16.30	§	§	-	§	§	-
Reliance	11914	§	§	-	-5.47	-15.46, 4.53	-2.93	-114.96	-310.09, 80.17	-3.70
Reliant	10624	32.28***	16.36, 48.21	5.90	2.19	-12.20, 16.58	1.30	118.57	-291.80, 528.93	3.47
Torrance	11654	§	§	-	-0.79	-13.46, 11.88	-0.32	-122.63	-529.24, 283.99	-1.99
UW Health	26368	38.04***	32.54, 43.54	23.65	-1.01	-7.67, 5.66	-1.19	15.29	-159.05, 189.62	0.90

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. AWW = annual wellness visit.

Exhibit J.27. Estimated Impact of the 2018 Cohort on Quality of Care in PY3 (2018)

	# of NGACO Beneficiaries in PY3	Quality of Care (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with ACSC Hospitalizations			Beneficiaries with Unplanned 30-day Readmissions			Beneficiaries with Hospital Readmissions from SNF		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACC of TN	19469	-2.3	-5.61, 1.01	-6.32	5.43	-10.48, 21.35	3.96	§	§	-
Best Care Collab	18586	1.92	-1.54, 5.39	5.55	0.6	-15.66, 16.86	0.41	8.38	-25.71, 42.47	4.98
CareMount	22998	-2.46	-5.64, 0.72	-6.29	-5.68	-22.49, 11.13	-3.84	13.77	-16.31, 43.85	8.03
Central Utah	14429	§	§	-	-22.01*	-45.50, 1.49	-23.90	0.41	-37.56, 38.38	0.42
Connected Care	21822	-4.58**	-8.91, -0.24	-8.20	2.18	-13.70, 18.05	1.32	14.56	-15.37, 44.50	6.99
CoxHealth	12449	§	§	-	6.13	-26.99, 39.25	4.21	-3.42	-77.26, 70.42	-1.76
Franciscan	22237	1.43	-2.41, 5.26	3.80	9.01	-7.72, 25.75	7.09	-5.87	-55.10, 43.36	-3.57
Mary Washington	13616	3.61	-1.14, 8.36	7.09	12.85	-5.35, 31.06	8.49	-3.58	-51.16, 43.99	-1.75
NECQA	34680	-0.56	-3.71, 2.59	-1.06	-3.66	-16.34, 9.02	-2.09	-2.27	-25.77, 21.22	-1.12
North Jersey	8471	4.82*	-0.36, 9.99	10.96	§	§	-	24.64	-17.52, 66.79	12.18
Primaria	26198	0.46	-3.19, 4.12	0.95	8.65	-6.04, 23.34	5.87	14.28	-17.44, 46.01	7.65
Primary Care Alliance	12036	-3.38	-7.41, 0.66	-8.10	-24.46***	-41.46, -7.47	-17.70	3.09	-32.11, 38.28	1.85
Reliance	11914	-4.95**	-9.44, -0.47	-8.71	-7.39	-23.68, 8.90	-4.31	-12.25	-48.34, 23.83	-5.47
Reliant	10624	3.97	-1.90, 9.84	10.39	20.1	-5.34, 45.54	13.89	-28.39	-86.23, 29.44	-15.80
Torrance	11654	2.14	-1.69, 5.97	6.92	22.72**	3.27, 42.18	14.76	§	§	-
UW Health	26368	2.28	-0.79, 5.35	8.02	-6.9	-24.84, 11.03	-5.00	-11.89	-49.29, 25.50	-6.72

NOTES: Difference-in-differences (DID) impact estimate significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. SNF = skilled nursing facility; ACSC = ambulatory care sensitive conditions.

Exhibit J.28. Estimated Cumulative Impact of the 2016 Cohort on Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility Spending in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Spending (\$ Per Beneficiary Per Year):											
		Acute Care Hospital Facility			Skilled Nursing Facility			Other Post-Acute Care Facility			Outpatient Facility		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	-54.18	-187.80, 79.45	-1.46	23.01	-27.37, 73.39	3.34	-31.31	-112.65, 50.04	-2.77	\$	\$	-
Bellin	28977	-181.22***	-315.54, -46.91	-6.73	159.70***	99.21, 220.19	24.54	-48.19***	-77.12, -19.26	-27.62	72.92	-48.89, 194.73	2.63
CHESS	52347	\$	\$	-	-15.41	-53.48, 22.67	-2.28	-31.06*	-67.46, 5.34	-11.18	155.43***	64.12, 246.74	7.08
Deaconess	99386	\$	\$	-	-32.39	-92.78, 28.00	-2.76	11.94	-31.08, 54.96	2.45	1.53	-85.62, 88.69	0.06
Henry Ford	69884	-208.34***	-342.48, -74.19	-3.94	\$	\$	-	-0.82	-41.52, 39.89	-0.19	323.07***	228.90, 417.23	9.94
Park Nicollet	41769	\$	\$	-	-6.61	-77.18, 63.96	-0.68	12.09	-20.77, 44.94	11.69	-172.44***	-302.93, -41.96	-6.15
Pioneer Valley	117831	-0.46	-136.10, 135.18	-0.01	\$	\$	-	13.71	-21.63, 49.05	3.78	-41.97	-135.91, 51.98	-1.64
Steward	147516	1.67	-87.20, 90.54	0.04	-26.64*	-57.99, 4.71	-2.60	-31.00**	-56.46, -5.55	-7.35	\$	\$	-
ThedaCare	44720	-137.53*	-295.37, 20.31	-4.57	71.44*	-5.09, 147.96	8.98	-45.41	-102.27, 11.45	-27.89	-68.66	-198.05, 60.72	-2.66
Triad	86165	54.29	-94.34, 202.91	1.71	-44.11	-100.83, 12.62	-6.62	-48.27*	-103.15, 6.61	-20.61	129.63*	-23.73, 283.00	5.85
Trinity	225673	-81.42**	-152.20, -10.64	-1.92	-63.27***	-92.58, -33.97	-5.59	\$	\$	-	3.16	-40.65, 46.97	0.13
UniPhy	57715	\$	\$	-	24.76	-23.05, 72.57	2.61	23.00	-19.14, 65.15	4.56	19.84	-48.09, 87.77	1.04
UnityPoint	221883	35.43	-24.47, 95.32	1.16	-25.06*	-50.67, 0.56	-3.47	\$	\$	-	\$	\$	-

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. ED = emergency department; PBPY = per beneficiary per year. Wide-variation in the percentage impact for post-acute care facility spending for reflects wide-variation across NGACOs in baseline spending towards post-acute care facilities.

Exhibit J.29. Estimated Cumulative Impact of the 2016 Cohort on Professional Services, Home Health, Hospice, and Durable Medical Equipment Spending in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Spending (\$ Per Beneficiary Per Year):											
		Professional Services			Home Health			Hospice			Durable Medical Equipment		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	§	§	-	-51.92***	-88.03, -15.81	-4.59	-48.18**	-87.41, -8.95	-12.87	23.35	-13.51, 60.21	7.18
Bellin	28977	230.25***	164.92, 295.57	12.59	§	§	-	-13.86	-59.37, 31.65	-4.21	-7.27	-40.97, 26.44	-3.00
CHESS	52347	§	§	-	-35.89***	-55.40, -16.37	-6.83	-28.42	-62.65, 5.80	-7.55	9.58	-13.85, 33.02	3.10
Deaconess	99386	-152.70***	-232.48, -72.92	-6.00	-11.60	-32.10, 8.90	-2.38	-34.24*	-73.57, 5.10	-10.39	§	§	-
Henry Ford	69884	§	§	-	§	§	-	-11.38	-41.53, 18.78	-3.55	49.36***	23.06, 75.66	16.93
Park Nicollet	41769	168.59***	84.68, 252.51	6.48	-10.55	-31.30, 10.20	-3.03	27.35	-18.46, 73.15	7.27	-13.24	-46.71, 20.23	-5.24
Pioneer Valley	117831	-43.14**	-76.85, -9.42	-1.68	§	§	-	-27.38	-63.42, 8.66	-9.22	-6.38	-28.02, 15.27	-2.44
Steward	147516	§	§	-	12.98*	-2.27, 28.22	1.75	-17.08	-39.24, 5.09	-4.79	-0.37	-11.68, 10.93	-0.17
ThedaCare	44720	21.53	-59.53, 102.58	0.96	§	§	-	-93.72***	-163.05, -24.39	-18.08	-11.36	-39.90, 17.18	-4.64
Triad	86165	-10.11	-71.95, 51.72	-0.39	§	§	-	-57.59**	-108.08, -7.10	-13.86	10.53	-19.00, 40.06	3.60
Trinity	225673	-31.18	-69.42, 7.06	-0.94	-2.46	-13.72, 8.80	-0.40	-10.22	-27.28, 6.84	-3.10	0.49	-9.47, 10.44	0.20
UniPhy	57715	39.29	-37.76, 116.35	0.91	§	§	-	-41.16**	-81.58, -0.73	-7.34	-4.13	-22.40, 14.13	-1.44
UnityPoint	221883	29.56	-9.55, 68.66	1.16	-4.60	-12.71, 3.51	-1.50	§	§	-	-2.48	-13.85, 8.88	-0.92

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Professional services includes physician, other professional, and ancillary services rendered under Part B. BPBY = per beneficiary per year.

Exhibit J.30. Estimated Cumulative Impact of the 2016 Cohort on Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stay Utilization in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		Acute Care Stays			SNF Stays			SNF Days			ED Visits & Observation Stays		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	-7.89**	-15.61, -0.16	-2.61	0.41	-2.76, 3.57	0.85	31.34	-68.13, 130.81	2.43	§	§	-
Bellin	28977	-15.01***	-23.46, -6.57	-6.49	12.67***	8.40, 16.94	24.38	281.22***	156.82, 405.61	21.70	7.16	-12.49, 26.80	1.21
CHESS	52347	§	§	-	1.36	-1.74, 4.47	2.32	-34.96	-120.65, 50.72	-2.41	§	§	-
Deaconess	99386	§	§	-	3.56*	-0.35, 7.46	4.46	-28.24	-150.83, 94.34	-1.26	§	§	-
Henry Ford	69884	-10.99**	-19.59, -2.38	-2.48	§	§	-	§	§	-	§	§	-
Park Nicollet	41769	6.60	-3.66, 16.86	2.14	5.04**	0.13, 9.95	6.82	17.28	-95.33, 129.89	1.15	-16.29	-38.50, 5.92	-2.40
Pioneer Valley	117831	-7.35*	-15.67, 0.97	-2.25	§	§	-	§	§	-	3.27	-10.27, 16.80	0.55
Steward	147516	-2.63	-7.62, 2.37	-0.81	§	§	-	-63.80**	-121.48, -6.13	-3.57	§	§	-
ThedaCare	44720	-11.29**	-22.20, -0.38	-3.90	2.42	-2.70, 7.55	3.92	138.23*	-10.56, 287.02	9.41	§	§	-
Triad	86165	3.82	-7.42, 15.07	1.30	1.56	-2.86, 5.97	2.85	-58.95	-184.27, 66.37	-4.23	28.46**	4.67, 52.24	4.26
Trinity	225673	-3.86*	-8.00, 0.27	-1.16	§	§	-	§	§	-	-5.52	-12.67, 1.62	-0.99
UniPhy	57715	§	§	-	1.11	-2.37, 4.59	1.47	34.53	-66.68, 135.74	1.77	§	§	-
UnityPoint	221883	2.03	-1.96, 6.02	0.74	§	§	-	35.47	-13.57, 84.50	2.64	-26.61***	-34.37, -18.85	-4.70

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. ED = emergency department; SNF = skilled nursing facility.

Exhibit J.31. Estimated Cumulative Impact of the 2016 Cohort on E&M Visits, Procedures, Tests, and Imaging Services Utilization in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		E&M Visits			Procedures			Tests			Imaging Services		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	-169.94***	-283.75, -56.14	-1.31	74.35	-97.03, 245.73	0.83	-255.46	-578.67, 67.74	-0.91	-91.24**	-172.07, -10.40	-1.59
Bellin	28977	\$	\$	-	498.61***	271.60, 725.62	6.35	1,048.99***	721.99, 1,375.99	5.34	190.06***	105.26, 274.85	4.67
CHESS	52347	\$	\$	-	\$	\$	-	\$	\$	-	\$	\$	-
Deaconess	99386	\$	\$	-	-200.75**	-387.78, -13.73	-2.22	\$	\$	-	\$	\$	-
Henry Ford	69884	\$	\$	-	\$	\$	-	\$	\$	-	\$	\$	-
Park Nicollet	41769	\$	\$	-	-417.99***	-628.82, -207.15	-5.14	-55.86	-488.65, 376.92	-0.25	-55.87	-150.02, 38.29	-1.26
Pioneer Valley	117831	\$	\$	-	\$	\$	-	-345.90**	-618.13, -73.67	-1.40	\$	\$	-
Steward	147516	\$	\$	-	140.85**	30.40, 251.29	1.61	-571.04***	-760.32, -381.75	-2.02	\$	\$	-
ThedaCare	44720	\$	\$	-	-203.55	-463.12, 56.03	-2.35	\$	\$	-	\$	\$	-
Triad	86165	\$	\$	-	-95.33	-334.36, 143.70	-1.11	-47.64	-416.93, 321.64	-0.21	23.42	-84.30, 131.14	0.49
Trinity	225673	\$	\$	-	134.52**	22.73, 246.31	1.24	\$	\$	-	-39.71**	-78.39, -1.02	-0.77
UniPhy	57715	\$	\$	-	271.82***	77.01, 466.63	2.38	\$	\$	-	\$	\$	-
UnityPoint	221883	\$	\$	-	\$	\$	-	\$	\$	-	3.80	-33.37, 40.96	0.08

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

Exhibit J.32. Estimated Cumulative Impact of the 2016 Cohort on Beneficiaries with AWV, Home Health Episodes, and Home Health Visits Utilization in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with AWV			Home Health Episodes			Home Health Visits		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	\$	\$	-	-4.53**	-9.01, -0.04	-3.20	-361.78***	-601.60, -121.96	-5.57
Bellin	28977	\$	\$	-	\$	\$	-	-188.08***	-316.96, -59.20	-11.72
CHESS	52347	\$	\$	-	\$	\$	-	-283.12***	-405.39, -160.86	-9.48
Deaconess	99386	\$	\$	-	\$	\$	-	-34.05	-167.79, 99.69	-1.21
Henry Ford	69884	\$	\$	-	\$	\$	-	\$	\$	-
Park Nicollet	41769	\$	\$	-	-3.11	-7.83, 1.61	-3.53	-108.52*	-226.79, 9.74	-6.51
Pioneer Valley	117831	\$	\$	-	\$	\$	-	\$	\$	-
Steward	147516	\$	\$	-	\$	\$	-	163.94***	68.30, 259.57	4.26
ThedaCare	44720	\$	\$	-	-9.70***	-15.75, -3.65	-9.91	\$	\$	-
Triad	86165	\$	\$	-	-5.33	-11.91, 1.25	-4.10	\$	\$	-
Trinity	225673	\$	\$	-	3.45***	1.00, 5.89	2.38	\$	\$	-
UniPhy	57715	\$	\$	-	-2.53	-6.67, 1.61	-1.23	-52.56	-225.39, 120.28	-0.86
UnityPoint	221883	\$	\$	-	2.05**	0.03, 4.07	2.39	-43.74	-103.37, 15.89	-2.42

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. AWV = annual wellness visit.

Exhibit J.33. Estimated Cumulative Impact of the 2016 Cohort on Quality of Care in PY1, PY2, and PY3 (2016, 2017, and 2018)

	# of NGACO Beneficiaries as of PY3	Quality of Care (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with ACSC Hospitalizations			Beneficiaries with Unplanned 30-day Readmissions			Beneficiaries with Hospital Readmissions from SNF		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
ACCST	44996	-0.87	-2.90, 1.15	-2.22	3.80	-5.95, 13.55	2.50	-8.94	-34.76, 16.89	-4.60
Bellin	28977	-6.02***	-8.52, -3.51	-21.23	-6.34	-18.62, 5.93	-5.45	-12.02	-36.22, 12.17	-8.46
CHESS	52347	1.25	-0.92, 3.42	2.97	-8.54*	-18.61, 1.53	-5.87	-18.35*	-39.49, 2.78	-10.40
Deaconess	99386	§	§	-	§	§	-	11.39	-7.21, 29.98	6.90
Henry Ford	69884	-2.72***	-4.74, -0.69	-5.26	-1.35	-9.57, 6.88	-0.74	-2.29	-19.66, 15.08	-1.00
Park Nicollet	41769	4.17***	1.64, 6.70	11.84	-1.68	-14.61, 11.25	-1.13	-8.01	-33.33, 17.32	-4.50
Pioneer Valley	117831	-3.55***	-5.92, -1.18	-7.35	-3.28	-13.60, 7.05	-1.92	10.95	-9.16, 31.07	5.59
Steward	147516	1.18	-0.30, 2.66	2.16	0.33	-5.73, 6.39	0.19	-2.06	-13.53, 9.41	-1.02
ThedaCare	44720	-1.49	-4.27, 1.28	-4.75	-1.91	-14.95, 11.12	-1.70	-16.37	-42.21, 9.46	-13.01
Triad	86165	3.47**	0.41, 6.53	8.32	-1.51	-15.91, 12.89	-1.06	14.42	-12.14, 40.98	9.30
Trinity	225673	0.68	-0.30, 1.66	1.70	§	§	-	-0.01	-9.17, 9.15	-0.00
UniPhy	57715	§	§	-	4.92	-3.53, 13.37	2.65	3.42	-15.19, 22.03	1.54
UnityPoint	221883	-0.82	-1.96, 0.32	-2.08	0.75	-4.45, 5.94	0.54	-9.17*	-19.78, 1.44	-5.31

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. SNF = skilled nursing facility; ACSC = ambulatory care sensitive conditions.

Exhibit J.34. Estimated Cumulative Impact of the 2017 Cohort on Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility Spending in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Spending (\$ Per Beneficiary Per Year):											
		Acute Care Hospital Facility			Skilled Nursing Facility			Other Post-Acute Care Facility			Outpatient Facility		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	-236.62**	-420.43, -52.80	-6.17	-25.10	-91.02, 40.83	-3.01	-163.11***	-237.48, -88.73	-26.39	-99.42*	-209.60, 10.76	-4.81
APA	50385	-120.88	-272.37, 30.60	-2.52	-13.29	-80.44, 53.86	-0.98	-60.88**	-120.19, -1.58	-8.69	-35.53	-125.92, 54.86	-1.69
Arizona	47298	§	§	-	-76.37***	-109.18, -43.57	-15.17	10.81	-34.91, 56.53	2.72	§	§	-
Atrius	68716	§	§	-	6.58	-37.19, 50.36	0.79	-19.91	-52.72, 12.90	-6.38	-76.80*	-157.90, 4.29	-3.25
Bronx	89068	59.93	-102.11, 221.96	1.04	§	§	-	16.25	-22.80, 55.30	4.48	55.42	-40.59, 151.43	2.24
Carilion	94389	-60.64	-152.56, 31.28	-1.83	-20.58	-56.56, 15.39	-2.50	5.58	-15.93, 27.09	2.89	-36.82	-96.50, 22.85	-1.58
Dartmouth-Hitchcock	37515	389.06***	201.10, 577.02	9.70	30.94	-39.24, 101.12	3.45	-9.24	-78.07, 59.59	-1.71	-130.35**	-233.59, -27.12	-4.81
HCP	41324	47.84	-144.63, 240.32	0.90	§	§	-	6.28	-62.04, 74.60	1.08	47.33	-53.24, 147.89	2.00
Hill	40258	11.69	-172.98, 196.35	0.27	19.19	-50.85, 89.24	1.76	12.28	-33.39, 57.96	5.71	-47.69	-144.76, 49.38	-1.95
Indiana U	93996	110.63**	6.11, 215.15	3.05	21.61	-25.53, 68.75	2.05	§	§	-	18.67	-86.82, 124.16	0.65
Integra	30823	-106.40	-303.31, 90.51	-2.49	99.95***	34.71, 165.18	11.17	-90.21***	-152.81, -27.61	-28.09	§	§	-
MPACO	25955	§	§	-	§	§	-	-23.32	-82.22, 35.58	-5.38	123.80**	19.69, 227.90	5.39
NatACO	44833	-57.66	-190.30, 74.98	-1.36	-63.66**	-117.35, -9.96	-5.87	§	§	-	36.97	-36.59, 110.53	1.82
NW Momentum	15767	-285.62**	-561.68, -9.57	-7.98	-107.12*	-232.59, 18.35	-11.54	13.45	-34.22, 61.11	15.78	-108.01	-347.67, 131.65	-4.26
Partners	184769	§	§	-	§	§	-	-25.21**	-49.57, -0.85	-7.68	-44.45	-117.22, 28.32	-1.48
ProHealth	31959	§	§	-	§	§	-	§	§	-	-155.34**	-281.47, -29.21	-5.52
ProspectNE	29654	133.62	-36.80, 304.04	3.06	-71.59**	-140.51, -2.67	-5.75	-7.59	-33.86, 18.68	-5.58	-273.84***	-369.60, -178.08	-10.82
RHeritage	45272	-10.99	-179.01, 157.02	-0.23	§	§	-	§	§	-	-14.33	-98.21, 69.55	-0.67
St. Luke's	51652	-120.21*	-263.39, 22.98	-4.06	-72.49***	-123.49, -21.49	-13.67	-19.00	-64.17, 26.17	-9.04	-229.76***	-375.15, -84.37	-6.58
UNC	45738	42.53	-100.66, 185.71	1.22	22.70	-30.39, 75.80	2.95	-9.17	-41.05, 22.71	-5.07	-45.24	-148.21, 57.73	-1.80
UTSW	144749	-77.24*	-158.90, 4.43	-2.04	-6.22	-42.35, 29.90	-0.66	-83.33***	-126.22, -40.45	-9.06	68.13**	11.05, 125.21	3.06

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Other post-acute care facility includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, ED, and comprehensive outpatient rehabilitation facilities. ED = emergency department; PBPY = per beneficiary per year. Wide-variation in the percentage impact for post-acute care facility spending for reflects wide-variation across NGACOs in baseline spending towards post-acute care facilities.

Exhibit J.35. Estimated Cumulative Impact of the 2017 Cohort on Professional Services, Home Health, Hospice, and Durable Medical Equipment Spending in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Spending (\$ Per Beneficiary Per Year):											
		Professional Services			Home Health			Hospice			Durable Medical Equipment		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	\$	\$	-	-37.68	-87.89, 12.52	-2.93	-29.44	-102.26, 43.39	-5.44	16.53	-10.66, 43.73	7.36
APA	50385	\$	\$	-	-105.81***	-148.52, -63.10	-5.81	24.64	-33.25, 82.53	4.35	\$	\$	-
Arizona	47298	41.57	-77.76, 160.90	0.96	-30.75***	-49.11, -12.39	-7.62	-43.68**	-84.95, -2.40	-9.59	29.75**	2.98, 56.52	13.10
Atrius	68716	35.72	-15.83, 87.27	1.23	\$	\$	-	-15.02	-50.98, 20.94	-4.23	-16.33	-42.02, 9.37	-7.97
Bronx	89068	-33.63	-86.39, 19.14	-0.84	21.56**	3.70, 39.41	4.00	\$	\$	-	\$	\$	-
Carilion	94389	56.77***	13.74, 99.80	2.34	-0.89	-17.56, 15.77	-0.18	3.94	-21.47, 29.34	1.47	-10.76	-34.11, 12.59	-3.86
Dartmouth-Hitchcock	37515	126.80***	80.20, 173.40	6.38	\$	\$	-	-33.52	-78.52, 11.47	-9.75	7.09	-16.38, 30.57	3.59
HCP	41324	-134.47	-305.94, 37.00	-3.50	-39.10*	-78.71, 0.52	-3.03	-56.19**	-110.41, -1.98	-10.68	32.77**	5.59, 59.96	13.21
Hill	40258	8.18	-70.74, 87.09	0.23	9.93	-19.85, 39.71	1.36	45.66*	-7.92, 99.24	11.08	0.44	-15.56, 16.44	0.24
Indiana U	93996	-265.29***	-405.42, -125.17	-9.95	-19.53**	-36.32, -2.74	-4.50	-32.05*	-64.37, 0.26	-8.83	10.30	-8.90, 29.50	3.30
Integra	30823	-51.95	-117.73, 13.84	-1.81	27.72	-10.60, 66.03	3.62	14.49	-45.39, 74.38	3.23	-25.59	-56.38, 5.21	-11.88
MPACO	25955	\$	\$	-	\$	\$	-	-13.40	-61.27, 34.47	-4.22	11.87	-15.44, 39.17	4.66
NatACO	44833	-0.41	-60.90, 60.08	-0.01	7.61	-22.83, 38.06	0.75	-3.65	-44.75, 37.45	-0.81	5.61	-9.45, 20.68	2.46
NW Momentum	15767	-197.38***	-343.09, -51.68	-6.69	-1.96	-38.88, 34.96	-0.54	20.37	-50.32, 91.07	7.83	9.86	-7.30, 27.01	6.15
Partners	184769	\$	\$	-	6.68	-10.70, 24.06	0.91	11.09	-12.11, 34.29	3.52	6.61	-10.86, 24.08	3.07
ProHealth	31959	\$	\$	-	\$	\$	-	\$	\$	-	-4.98	-34.77, 24.81	-2.33
ProspectNE	29654	50.95	-19.61, 121.50	1.62	1.34	-32.20, 34.87	0.16	-20.42	-62.05, 21.21	-5.88	\$	\$	-
RHeritage	45272	73.64**	1.54, 145.73	1.94	39.46**	1.39, 77.52	3.01	-73.61***	-128.80, -18.43	-12.38	-4.29	-25.38, 16.80	-1.58
St. Luke's	51652	-81.36***	-135.54, -27.18	-4.31	-41.58***	-73.19, -9.96	-7.60	-50.46	-111.48, 10.55	-9.83	-18.38	-56.74, 19.98	-6.22
UNC	45738	\$	\$	-	47.47***	25.80, 69.14	10.04	-3.70	-43.17, 35.77	-1.10	-35.56**	-65.53, -5.58	-10.86
UTSW	144749	-129.73***	-187.96, -71.50	-3.38	\$	\$	-	-31.11**	-58.79, -3.43	-6.43	14.97	-7.64, 37.57	4.60

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Professional services includes physician, other professional, and ancillary services rendered under Part B. BPBY = per beneficiary per year.

Exhibit J.36. Estimated Cumulative Impact of the 2017 Cohort on Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stay Utilization in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		Acute Care Stays			SNF Stays			SNF Days			ED Visits & Observation Stays		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	\$	\$	-	-4.45*	-9.04, 0.15	-7.06	-58.21	-189.45, 73.03	-3.81	-33.09***	-53.49, -12.68	-5.68
APA	50385	-2.25	-9.88, 5.38	-0.72	\$	\$	-	\$	\$	-	-7.17	-19.96, 5.62	-1.66
Arizona	47298	0.08	-6.85, 7.00	0.03	-4.39***	-7.10, -1.68	-10.26	-129.29***	-189.51, -69.07	-14.69	\$	\$	-
Atrius	68716	0.99	-6.51, 8.49	0.33	2.66	-0.82, 6.15	3.60	19.85	-53.13, 92.83	1.53	-18.69***	-31.46, -5.93	-3.52
Bronx	89068	\$	\$	-	\$	\$	-	41.07	-63.26, 145.40	1.93	-1.68	-13.26, 9.91	-0.40
Carilion	94389	0.58	-5.56, 6.71	0.19	\$	\$	-	38.03	-43.32, 119.37	2.22	-10.45*	-22.39, 1.50	-1.70
Dartmouth-Hitchcock	37515	30.10***	19.93, 40.27	10.34	5.05**	0.66, 9.45	8.29	86.44	-39.99, 212.88	5.69	-10.24	-28.86, 8.38	-1.63
HCP	41324	4.06	-4.69, 12.81	1.19	\$	\$	-	\$	\$	-	-3.97	-17.09, 9.15	-0.82
Hill	40258	-0.11	-7.39, 7.17	-0.04	-0.21	-3.48, 3.07	-0.38	34.42	-54.68, 123.52	2.61	-10.30	-24.31, 3.70	-2.07
Indiana U	93996	9.02***	2.21, 15.83	2.96	2.14	-1.24, 5.53	2.77	15.00	-83.96, 113.95	0.76	\$	\$	-
Integra	30823	-2.00	-13.60, 9.60	-0.64	9.93***	4.49, 15.37	13.31	181.44***	65.63, 297.24	12.66	-28.07***	-48.89, -7.24	-4.63
MPACO	25955	\$	\$	-	\$	\$	-	\$	\$	-	19.06*	-3.43, 41.54	2.98
NatACO	44833	-11.32***	-18.60, -4.05	-3.65	\$	\$	-	-92.43**	-184.38, -0.49	-5.31	-10.64*	-23.04, 1.76	-2.08
NW Momentum	15767	-7.94	-21.66, 5.78	-3.21	-5.25	-11.74, 1.24	-9.66	-154.94	-342.88, 32.99	-11.34	-36.91***	-61.76, -12.07	-7.41
Partners	184769	\$	\$	-	\$	\$	-	20.36	-33.64, 74.36	1.53	\$	\$	-
ProHealth	31959	\$	\$	-	\$	\$	-	-34.46	-142.53, 73.62	-2.87	-27.73***	-47.35, -8.11	-4.66
ProspectNE	29654	3.73	-6.34, 13.80	1.15	2.45	-2.64, 7.53	2.69	-38.78	-156.59, 79.03	-1.98	-44.48***	-61.37, -27.60	-7.15
RHeritage	45272	0.01	-7.81, 7.84	0.00	\$	\$	-	\$	\$	-	6.34	-6.15, 18.82	1.32
St. Luke's	51652	-2.26	-11.60, 7.09	-0.93	0.64	-3.17, 4.44	1.44	-94.61**	-185.76, -3.47	-10.13	\$	\$	-
UNC	45738	3.14	-5.85, 12.13	1.02	5.55***	1.57, 9.53	9.23	70.45	-41.75, 182.65	4.72	9.53	-9.31, 28.38	1.40
UTSW	144749	-4.03	-9.35, 1.29	-1.24	2.48**	0.14, 4.81	3.89	6.53	-63.05, 76.11	0.39	9.14*	-0.63, 18.90	1.49

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. ED = emergency department; SNF = skilled nursing facility.

Exhibit J.37. Estimated Cumulative Impact of the 2017 Cohort on E&M Visits, Procedures, Tests, and Imaging Services Utilization in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):											
		E&M Visits			Procedures			Tests			Imaging Services		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	\$	\$	-	-110.44	-496.26, 275.37	-0.68	-269.78	-705.46, 165.89	-0.82	-123.81**	-239.97, -7.65	-1.95
APA	50385	\$	\$	-	\$	\$	-	\$	\$	-	\$	\$	-
Arizona	47298	-220.22***	-350.39, -90.05	-1.56	\$	\$	-	-224.43	-536.18, 87.31	-0.83	\$	\$	-
Atrius	68716	\$	\$	-	-93.54	-290.04, 102.95	-0.95	\$	\$	-	\$	\$	-
Bronx	89068	-127.85*	-262.06, 6.37	-0.74	437.06***	163.72, 710.41	3.13	\$	\$	-	-56.53	-126.96, 13.91	-1.00
Carilion	94389	\$	\$	-	2.40	-119.87, 124.67	0.03	\$	\$	-	-44.87	-100.67, 10.92	-1.03
Dartmouth-Hitchcock	37515	8.10	-151.63, 167.83	0.06	99.03	-93.07, 291.13	1.35	\$	\$	-	\$	\$	-
HCP	41324	150.77**	24.72, 276.82	1.13	501.97***	258.23, 745.71	4.61	312.41**	10.72, 614.11	1.21	27.06	-49.35, 103.47	0.56
Hill	40258	37.92	-79.72, 155.56	0.31	-203.57*	-413.30, 6.16	-2.14	\$	\$	-	-105.95***	-180.25, -31.66	-2.37
Indiana U	93996	\$	\$	-	\$	\$	-	\$	\$	-	\$	\$	-
Integra	30823	\$	\$	-	101.92	-206.75, 410.59	0.92	\$	\$	-	-146.94***	-249.81, -44.06	-2.99
MPACO	25955	\$	\$	-	480.90***	142.17, 819.64	4.34	\$	\$	-	\$	\$	-
NatACO	44833	\$	\$	-	\$	\$	-	\$	\$	-	\$	\$	-
NW Momentum	15767	-302.48***	-514.95, -90.01	-2.74	-745.40***	-1,191.04, -299.76	-7.36	-1,050.45***	-1,556.36, -544.55	-5.54	-94.11	-226.26, 38.05	-2.31
Partners	184769	-107.33**	-206.31, -8.35	-0.70	239.37***	86.74, 392.01	2.34	-661.33***	-883.88, -438.79	-2.65	14.93	-38.22, 68.08	0.29
ProHealth	31959	\$	\$	-	\$	\$	-	-1,540.33***	-1,933.18, -1,147.47	-6.30	\$	\$	-
ProspectNE	29654	\$	\$	-	-79.68	-344.83, 185.47	-0.74	-787.40***	-1,147.64, -427.15	-2.85	-35.45	-124.17, 53.26	-0.72
RHeritage	45272	\$	\$	-	-329.29***	-568.17, -90.41	-2.69	147.02	-167.18, 461.23	0.55	53.12	-23.62, 129.87	1.03
St. Luke's	51652	-403.96***	-595.99, -211.93	-2.68	-426.65***	-652.96, -200.35	-4.68	-381.93**	-682.68, -81.18	-1.99	-234.32***	-322.36, -146.29	-5.44
UNC	45738	-432.63***	-569.38, -295.88	-3.15	\$	\$	-	\$	\$	-	94.86**	10.98, 178.75	1.99
UTSW	144749	-261.82***	-341.61, -182.03	-1.89	-9.34	-137.05, 118.38	-0.09	\$	\$	-	\$	\$	-

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. \$ denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities E&M = evaluation and management.

Exhibit J.38. Estimated Cumulative Impact of the 2017 Cohort on Beneficiaries with AWV, Home Health Episodes, and Home Health Visits Utilization in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Utilization (Per 1,000 Beneficiaries Per Year):								
		Beneficiaries with AWV			Home Health Episodes			Home Health Visits		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	63.42***	56.70, 70.15	8.90	-4.90	-14.34, 4.54	-1.84	-554.91***	-958.98, -150.84	-6.52
APA	50385	§	§	-	-20.27***	-26.11, -14.42	-7.44	-503.31***	-751.63, -255.00	-5.53
Arizona	47298	§	§	-	-6.16***	-10.16, -2.15	-6.11	-193.98***	-304.48, -83.48	-9.46
Atrius	68716	§	§	-	2.95	-1.91, 7.81	1.70	§	§	-
Bronx	89068	§	§	-	9.48***	5.52, 13.45	7.00	100.88**	2.60, 199.15	4.13
Carilion	94389	§	§	-	2.79	-0.78, 6.36	2.32	-43.53	-169.81, 82.75	-1.38
Dartmouth-Hitchcock	37515	§	§	-	1.97	-4.53, 8.47	1.21	§	§	-
HCP	41324	§	§	-	§	§	-	-221.47**	-442.63, -0.30	-3.68
Hill	40258	§	§	-	0.32	-4.59, 5.22	0.23	§	§	-
Indiana U	93996	§	§	-	-2.62	-6.12, 0.88	-2.59	-180.21***	-289.89, -70.52	-7.46
Integra	30823	§	§	-	5.07	-2.23, 12.36	2.93	103.44	-120.73, 327.61	2.76
MPACO	25955	-55.10***	-62.75, -47.46	-13.79	§	§	-	§	§	-
NatACO	44833	§	§	-	2.27	-2.96, 7.51	1.23	60.44	-129.59, 250.47	1.15
NW Momentum	15767	§	§	-	1.97	-4.89, 8.82	2.71	-48.61	-221.89, 124.67	-3.19
Partners	184769	§	§	-	§	§	-	30.95	-69.58, 131.47	0.87
ProHealth	31959	§	§	-	-0.07	-5.25, 5.11	-0.07	§	§	-
ProspectNE	29654	§	§	-	3.29	-3.13, 9.72	1.83	19.99	-199.60, 239.57	0.45
RHeritage	45272	§	§	-	0.84	-5.25, 6.93	0.36	§	§	-
St. Luke's	51652	66.65***	58.74, 74.55	14.53	-12.02***	-18.07, -5.96	-10.18	-287.36***	-505.91, -68.81	-8.55
UNC	45738	§	§	-	17.98***	12.76, 23.20	14.16	162.14**	31.04, 293.24	6.52

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. AWV = annual wellness visit.

Exhibit J.39. Estimated Cumulative Impact of the 2017 Cohort on Quality of Care in PY2 and PY3 (2017 and 2018)

	# of NGACO Beneficiaries as of PY3	Quality of Care (Per 1,000 Beneficiaries Per Year:								
		Beneficiaries with ACSC Hospitalizations			Beneficiaries with Unplanned 30-day Readmissions			Beneficiaries with Hospital Readmissions from SNF		
		DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact	DID Estimate	95% CI	% Impact
Accountable Care Options	20656	§	§	-	-2.81	-16.70, 11.08	-1.91	-38.55**	-67.96, -9.14	-21.25
APA	50385	§	§	-	0.52	-9.59, 10.64	0.29	2.23	-18.48, 22.94	1.00
Arizona	47298	1.02	-0.88, 2.93	3.57	9.18*	-0.77, 19.13	7.02	8.45	-19.31, 36.21	4.49
Atrius	68716	0.80	-1.08, 2.69	2.13	-2.58	-11.76, 6.60	-1.74	-14.35	-32.23, 3.54	-8.29
Bronx	89068	2.64**	0.62, 4.66	5.64	-0.11	-8.74, 8.52	-0.06	9.06	-7.25, 25.37	4.57
Carilion	94389	§	§	-	9.70**	2.12, 17.29	6.70	3.49	-12.57, 19.55	1.87
Dartmouth-Hitchcock	37515	3.67***	1.27, 6.07	10.28	5.91	-6.80, 18.63	3.92	11.29	-15.04, 37.62	5.98
HCP	41324	§	§	-	-8.69*	-19.01, 1.63	-5.89	-4.29	-25.57, 16.99	-2.29
Hill	40258	2.65**	0.41, 4.89	6.88	-4.28	-15.19, 6.64	-2.81	-12.00	-34.66, 10.66	-6.39
Indiana U	93996	§	§	-	0.13	-8.25, 8.51	0.09	§	§	-
Integra	30823	§	§	-	-6.04	-20.24, 8.17	-3.57	1.00	-24.99, 27.00	0.51
MPACO	25955	-0.61	-4.39, 3.18	-0.83	-3.20	-15.92, 9.52	-1.49	-18.42	-43.70, 6.85	-7.45
NatACO	44833	-3.22***	-5.33, -1.11	-7.08	-5.42	-14.56, 3.72	-3.44	-13.35	-33.12, 6.41	-7.18
NW Momentum	15767	-0.17	-3.99, 3.66	-0.66	11.80	-7.99, 31.59	10.55	9.24	-41.97, 60.45	5.34
Partners	184769	§	§	-	§	§	-	§	§	-
ProHealth	31959	§	§	-	0.72	-11.52, 12.96	0.51	§	§	-
ProspectNE	29654	-0.46	-3.38, 2.46	-0.91	3.69	-8.33, 15.70	2.15	-12.02	-33.14, 9.10	-5.94
RHeritage	45272	-1.38	-3.38, 0.61	-4.05	§	§	-	15.45	-7.26, 38.17	8.14
St. Luke's	51652	0.65	-2.01, 3.32	2.25	-1.07	-14.42, 12.28	-0.91	§	§	-
UNC	45738	0.61	-1.73, 2.96	1.60	11.05**	0.23, 21.87	8.15	25.95**	2.56, 49.33	15.07
UTSW	144749	§	§	-	-4.22	-10.43, 1.99	-2.81	-5.66	-20.17, 8.85	-3.05

NOTES: Cumulative difference-in-differences (DID) impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. § denotes uninterpretable impact estimate due to failure of parallel trends assumption across base years. Percentage impact is relative to expected average outcome for NGACO beneficiaries in performance years absent the model. SNF = skilled nursing facility; ACSC = ambulatory care sensitive conditions.