NORC at the University of Chicago

# Technical Appendices for Fourth Evaluation Report

# Next Generation Accountable Care Organization (NGACO) Model Evaluation

**October 2021**

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# Appendix A: Quantitative Methods and Analysis

## Study Design for Assessing Impact for the NGACO Model

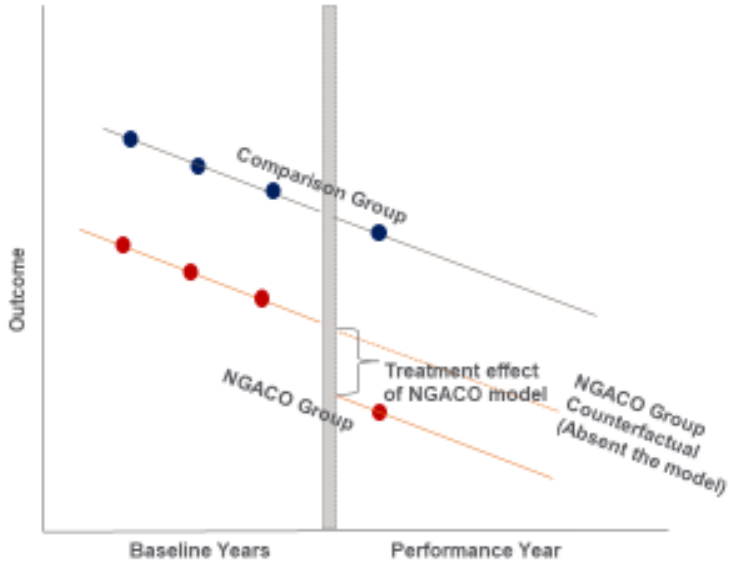
### Difference-in-Differences (DID) Design

We used a DID design to assess the impact of the NGACO model in its first four performance years (PY1, PY2, PY3, and PY4). As shown in **Exhibit A.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 been mainly 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 given performance year in the absence of the NGACO model.
- The NGACO model's treatment effect is estimated relative to this untreated 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 mitigate biases that may result from observed and unobserved differences influencing outcomes between the two groups. A key assumption of our DID design is that of parallel trends, namely, that changes in outcomes from the baseline years to the performance year would have been similar in the NGACO and comparison group in the absence of the NGACO model. We test this assumption 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, noting where the assumptions passed and failed for each cohort and model-wide.

## Exhibit A.1. Use of DID to Estimate the NGACO Model's Treatment Effect




### Performance and Baseline Years

Our analysis used a DID design to examine changes in outcomes for the NGACO and comparison group beneficiaries in PY1, PY2, PY3, and PY4 relative to three preceding baseline years (BY1, BY2, BY3,) for each cohort; for each cohort, BY3 is the earliest year prior to the PY. **Exhibit A.2** shows calendar years (CY) as they correlate with PYs and BYs for each NGACO cohort.

## Exhibit A.2. Calendar Years that Correspond to BYs and PYs for the 2016, 2017, and 2018 Cohorts

| Performance Year | NGACO and Comparison Group | CY 2013 | CY 2014 | CY 2015 | CY 2016 | CY 2017 | CY 2018 | CY 2019 |
|---|---|---|---|---|---|---|---|---|
| **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** | - |
| **PY4 (CY 2019)** | 2016 Cohort | **BY3** | **BY2** | **BY1** | - | - | - | **PY4** |
| | 2017 Cohort | - | **BY3** | **BY2** | **BY1** | - | - | **PY4** |
| | 2018 Cohort | - | - | **BY3** | **BY2** | **BY1** | - | **PY4** |

**NOTES:** CY = calendar year (January 1 through December 31); BY= baseline year; PY = performance year.

## Defining NGACO and Comparison Groups

For the purpose of our Fourth Evaluation Report, NGACO beneficiaries and comparison beneficiaries were *prospectively attributed* to the performance-year NGACO providers (treatment group) or providers unaffiliated with any Medicare ACO (comparison group), for each performance and its respective baseline year. See **Exhibit A.3** for summary definitions.

**Exhibit A.3.** NGACO and Comparison Groups Defined, in BYs and PYs

| | 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 non-NGACO providers 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 non-NGACO providers during the performance year using NGACO model alignment rules and aligned for at least 30 days in the year |

**NOTES**: Non-NGACO providers were defined as excluding NGACO participating providers, NGACO preferred providers, and providers in SSP and Pioneer ACOs in the respective years.

## Alignment Approach

We used final action claims and followed the NGACO model's alignment algorithm to prospectively attribute beneficiaries to either NGACO or comparison groups in our analyses.[1] The term *prospective attribution* indicates that the NGACO model's alignment for a given PY and BYs is based on Medicare claims from a *preceding* 24-month alignment period. The alignment algorithm was used to attribute beneficiaries to an NGACO's participating providers or to non-NGACO providers in each BY or PY, based on providers that were rendered the largest share of dollars for beneficiaries' qualifying evaluation and management (QEM) visits in the alignment period;[2] see **Exhibit A.4**.

[1] A full description of the alignment algorithm is available from: RTI International. Next Generation ACO Model Calculation of the Performance Year Benchmark: Performance Years 2019 and 2020. September, 2018. Available at https://innovation.cms.gov/files/x/nextgenaco-benchmarkmethodology-py4.pdf

[2] QEM codes comprised 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 A.4. Alignment Periods for the Model Evaluation, PY4

| | Cohort | Period Type | CY 2013 | CY 2014 | CY 2015 | CY 2016 | CY 2017 | CY 2018 | CY 2019 |
|---|---|---|---|---|---|---|---|---|---|
| **PY4 (CY 2019)** | **2016 Cohort** | | **BY3** | **BY2** | **BY1** | **–** | **–** | **–** | **PY4** |
| | | **Alignment Period** | July 1, 2010 – June 30, 2012 | July 1, 2011 – June 30, 2013 | July 1, 2012 – June 30, 2014 | – | – | – | July 1, 2016 – June 30, 2018 |
| | **2017 Cohort** | | **–** | **BY3** | **BY2** | **BY1** | **–** | **–** | **PY4** |
| | | **Alignment Period** | – | July 1, 2011 – June 30, 2013 | July 1, 2012 – June 30, 2014 | July 1, 2013 – June 30, 2015 | **–** | – | July 1, 2016 – June 30, 2018 |
| | **2018 Cohort** | | **–** | **–** | **BY3** | **BY2** | **BY1** | **–** | **PY4** |
| | | **Alignment Period** | – | – | July 1, 2012 – June 30, 2014 | July 1, 2013 – June 30, 2015 | July 1, 2014 – June 30, 2016 | – | July 1, 2016 – June 30, 2018 |

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

We used the following eight steps to implement the alignment for NGACO and comparison beneficiaries in each base and performance year:

1. **Identify Alignment-Eligible NGACO and Non-NGACO Providers.** We identified alignment-eligible NGACO participating providers in PY4 and alignment-eligible non-NGACO providers in each BY or PY. The former were identified from the participating provider file that the program analysis contractor uses for alignment. Alignment-eligible providers in PY4 were identified as practitioners within practices or—in the case of federally qualified health centers (FQHCs), rural health clinics (RHCs), and critical access hospitals (CAHs)—practitioners within facilities.[3] To define the baseline providers for all cohorts, we identified the alignment-eligible providers by National Provider Identifier (NPI) alone, to capture their practitioners' performance over time; the NPI is a more comprehensive way to identify providers, as TIN-NPI and CCN-NPI combinations can change over time. Alignment-eligible practitioners have select primary care or specialist designations.[4] Alignment for the comparison group in each cohort mirrored the approach used for the NGACO group.

[3] Federally qualified health centers, rural health clinics, and critical access hospitals (CAHs) 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.

2. **Identify Alignment-Eligible Beneficiaries.** We identified alignment-eligible beneficiaries at the beginning of each BY or PY using the Medicare 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 qualified evaluation & management (QEM) service during the two year alignment period.
3. **Calculate Allowable Charges For All Alignment-Eligible Beneficiaries.** 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. **Align Beneficiaries To NGACO and Non-NGACO Providers Using Claims-Based NGACO Alignment Algorithm.** 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 use the most recent QEMs to break ties when weighted charges are equal across two or more collections of providers for a beneficiary.
5. **Align Beneficiaries Via Voluntary Alignment.** We attributed voluntarily aligned beneficiaries to NGACOs 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. **Assess Results of Prospective Alignment Replication Using Final Action Claims Against NGACO Model's Prospective Beneficiary Alignment Lists.** We checked the match between our aligned beneficiaries and the NGACO program analysis contractor's list of prospectively aligned beneficiaries in each PY. We retained NGACO beneficiaries who matched with the program analysis contractor's prospectively aligned beneficiary list in a given PY. We had a match rate of 99 percent with the program analysis contractor's prospectively aligned population.

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[5] The proportion of NGACO voluntarily aligned beneficiaries was 0.52 percent for PY4 (0.06 percent for the 2018 cohort, 0.72 percent for the 2017 cohort, and 0.54 percent for the 2016 cohort), 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 proportions of 2016 cohort NGACO PY4 beneficiaries were voluntarily aligned in baseline years: 0.4 percent for BY3, 0.43 percent for BY2, and 0.46 percent for BY1.

The following proportions of the 2017 cohort NGACO PY4 beneficiaries were voluntarily aligned in baseline years: 0.55 percent for BY3, 0.60 percent for BY2, and 0.63 percent for BY1.

The following proportions of the 2018 cohort NGACO PY4 beneficiaries were voluntarily aligned in baseline years: 0.05 percent for BY3, 0.05 percent for BY2, and 0.06 percent for BY1.

7. **Apply Base or Performance Year Model Exclusions to Replicated Prospective Alignment Lists for NGACO and Comparison Groups.** Per the NGACO model's alignment rules, aligned NGACO beneficiaries were excluded from the model over the course of the PY if a beneficiary enrolled in a Medicare managed care plan or lost part A or B coverage and other reasons.[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 to the NGACO or comparison group for all months of a BY or PY until he or she met an exclusion criterion.[8] In PYs, we also excluded beneficiaries identified by the program analysis contractor for exclusion from the model under the model's alignment rules.[9] The date a beneficiary's alignment ended for the year (alignment end date) was either his or her date of exclusion from alignment or the last day of the BY or PY. We restricted NGACO and comparison beneficiaries to those in hospital referral regions (HRRs) containing 1 percent or more of a PY's NGACO-aligned beneficiaries.
8. **Compare Evaluation Alignment Replication Against NGACO Performance Year Alignment.** We had a match rate of 98 percent of the final population used by the program analysis contractor for financial reconciliation in PY4.[10] **Exhibit A.5** shows the match rate between model aligned beneficiaries and the evaluation aligned beneficiaries for all performance years.

[7] A beneficiary was deemed aligned to the NGACO or comparison group from the start of a performance year or baseline year until he or she: (1) died; (2) had Medicare as a secondary payer during any month; (3) lost Medicare Part A or B during any month; (4) transitioned to Medicare Advantage or a managed care plan during any month; (5) resided in a non-U.S. location during any month; or (6) was aligned to another Medicare shared-savings initiative. 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 excludes such beneficiaries from financial calculations for performance years.

[9] The program analysis contractor shares lists of excluded beneficiaries 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.

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

**Exhibit A.5.** Alignment Periods for Model Evaluation, PY4

| | Before evaluation exclusion criteria | | | | After evaluation exclusion criteria | |
|---|---|---|---|---|---|---|
| | Model prospectively aligned beneficiaries | Evaluation prospectively aligned beneficiaries | Matching beneficiaries | % evaluation aligned beneficiaries matching model's alignment | # evaluation aligned beneficiaries matching model's alignment | % evaluation aligned beneficiaries matching model's alignment |
| **PY4** | 1,613,267 | 1,978,604 | 1,594,669 | 98.8% | 1,179,390 | 98.0% |
| **PY3** | 1,738,749 | 1,742,705 | 1,700,105 | 97.8% | 1,387,227 | 96.9% |
| **PY2** | 1,476,681 | 1,679,915 | 1,458,556 | 98.8% | 1,155,039 | 93.7% |
| **PY1** | 612,935 | 807,799 | 604,383 | 98.6% | 445,444 | 93.3% |

**NOTES:** Inclusion criteria are beneficiaries who are aligned during the performance year for at least 30 days.

NGACO and Comparison Group Providers Used to Determine Beneficiary Alignment

**2016, 2017, and 2018 NGACO Cohort Providers Used for Alignment in PYs.** We identified participating providers used for PY alignment in the 2016, 2017, and 2018 NGACO cohorts using the participating provider alignment file from the program analysis contractor.[11] Participating providers are practitioners (i.e., identified by NPIs) with primary care or specialist designations per the model's alignment rules in a PY, within either NGACO practices (as determined by TINs), FQHCs, RHCs, or CAHs delivering outpatient services (i.e., identified by CCNs). The complete set of NGACO participating providers for alignment in a given PY uses the TIN-NPI and CCN-NPI combinations for the NGACOs with financial liability for shared savings in the PY.

- For the 12 NGACOs in the 2016 cohort, and 15 NGACOs in the 2017 cohort, and 14 NGACOs in the 2018 cohort, we defined participating providers in PY4 as providers retained by the NGACOs from PY3, plus new providers who joined the NGACOs before the start of PY4.

**2016, 2017, and 2018 NGACO Cohort Providers Used for Alignment in the Base Years.**[12] The providers used to align NGACO beneficiaries during the base period of a given PY included all alignment eligible NGACO participating providers listed for the PY in question. However, because TINs may change over time, and these changes are more likely the further a BY is from its PY, we used NPIs and not TIN-NPI or CCN-NPI combinations to align beneficiaries during all BYs. Since the baseline period varied by cohort, the set of providers used to align beneficiaries during the baseline period varied as follows:

[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] For the first PY of each cohort, the baseline was set to TIN-NPI and CCN-NPI. For subsequent PYs, the baseline was set to NPIs.

- For all cohorts, we used alignment eligible participating providers identified by NPIs in a PY to align beneficiaries to the cohort's baseline years (2013-2015 for the 2016 cohort, 2014-2016 for the 2017 cohort, and 2015-2017 for the 2018 cohort). This approach may place greater emphasis on the performance of individual practitioners in the baseline, while emphasizing practice associations during a PY.

**2016, 2017, and 2018 Cohort Comparison Group Providers Used for Alignment in a PY.** For the 2016, 2017, and 2018 cohorts, the comparison group of providers used for alignment in a PY included all non-NGACO providers in a given year[13]. Providers who joined and left the NGACO model in a preceding PY are eligible for inclusion in the comparison group in subsequent PYs. As with the NGACO group alignment in the PY, comparison group beneficiary alignment was implemented using TIN-NPIs and CCN-NPIs.

**2016, 2017, and 2018 Cohort Comparison Group Providers Used for Alignment in the Base Years.** Comparison group providers used to align beneficiaries to the comparison group in the baseline years included alignment eligible providers who were not NGACO providers in the corresponding PY, and who were not in a Medicare ACO in the respective baseline years. Base year comparison group beneficiary alignment was implemented using NPIs rather than TIN-NPIs or CCN-NPIs for the reasons noted previously. As with the performance years, the comparison group in the baseline years may include providers who formerly or subsequently participated in a Medicare ACO. [14] We assume that once providers leave a Medicare ACO and return to usual FFS Medicare, they are valid representatives of the comparison group.

### 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 HRRs where one percent or more of an NGACO's aligned population of beneficiaries resided in the PY.[15] 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.[16] **Exhibit A.6** lists and enumerates the HRRs that comprise the markets for the 41 NGACOs in PY4. 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.

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[13] Non-NGACO providers excluded NGACO participating providers, NGACO preferred providers, and providers in SSP and Pioneer ACOs in the respective years

[14] Providers who subsequently became NGACO providers in the PY were excluded from the comparison group providers.

[15] Hospital referral regions are Medicare FFS markets representing catchment areas around tertiary medical centers.

[16] 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.

**Exhibit A.6.** NGACO's Market Areas for Model Evaluation, PY4

| 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 | NC: Charlotte, Greensboro, Hickory, Winston-Salem |
| Deaconess | 3[a] | IN: Evansville, Indianapolis; KY: Louisville |
| Henry Ford | 6 | MI: Ann Arbor, Dearborn, Detroit, Flint, Pontiac, Royal Oak |
| Park Nicollet | 2 | MN: Minneapolis, St. Paul |
| Pioneer Valley | 4 | CT: Hartford; MA: Boston, Springfield, Worcester |
| Steward | 8[a] | FL: Orlando; MA: Boston, Worcester; NH: Manchester; OH: Youngstown; PA: Allentown; RI: Providence; UT: Salt Lake City |
| ThedaCare | 5 | WI: Appleton, Green Bay, Marshfield, Milwaukee, Neenah |
| Triad | 3 | NC: Durham, Greensboro, Winston-Salem |
| Trinity | 12[a] | IL: Blue Island, Chicago, Hinsdale, Joliet, Melrose Park; MI: Grand Rapids, Muskegon; NJ: Hackensack, Morristown, New Brunswick, Newark; OH: Columbus |
| UnityPoint | 10 | IA: Cedar Rapids, Davenport, Des Moines, Dubuque, Iowa City, Sioux City, Waterloo; IL: Peoria, Springfield; MO: Columbia |
| **2017 Cohort** | | |
| Accountable Care Options | 2 | FL: Fort Lauderdale, Miami |
| APA | 7[a] | CA: Los Angeles, Orange County, San Bernardino, San Francisco, San Mateo County; WA: Seattle, Tacoma |
| Arizona | 3 | AZ: Mesa, Phoenix, Sun City |
| Atrius | 4 | MA: Boston, Worcester; NH: Manchester; RI: Providence |
| Bronx | 7 | NJ: Hackensack, Ridgewood; NY: Albany, Bronx, East Long Island, Manhattan, White Plains |
| Carilion | 5 | NC: Durham, Winston-Salem; VA: Charlottesville, Lynchburg, Roanoke |
| HCP | 3[a] | CA: Los Angeles, Orange County, San Bernardino |
| Indiana U | 6[a] | IL: Urbana; IN: Indianapolis, Lafayette, Muncie, Terre Haute; KY: Louisville |
| Northwest | 4[a] | WA: Olympia, Seattle, Spokane, Tacoma |
| 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 |

| NGACO | # of HRRs in the Market Area | State and City of HRRs Comprising the Market Area |
|---|---|---|
| UNC | 4 | NC: Durham, Greensboro, Hickory, Raleigh |
| UTSW | 3 | TX: Dallas, Fort Worth, Tyler |
| **2018 Cohort** | | |
| ACC of TN | 2 | TN: Johnson City, Knoxville |
| Best Care Collab | 1[a] | FL: Fort Myers |
| CareMount | 4 | CT: Hartford, New Haven; NY: Albany, White Plains |
| Central Utah | 4 | NV: Las Vegas; UT: Ogden, Provo, Salt Lake City |
| CoxHealth | 2[a] | AR: Springdale; MO: Springfield |
| Franciscan | 5[a] | LA: Baton Rouge, Lafayette, Monroe, Shreveport, Slidell |
| Mary Washington | 3 | VA: Arlington, Charlottesville, Richmond |
| NECQA | 4 | MA: Boston, Worcester; NH: Manchester; RI: Providence |
| Primary Care Alliance | 2 | FL: Ocala, Orlando |
| Primiaria | 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 |
| 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 PY3: Deaconess no longer includes Owensboro and Paducah, KY; Steward added Salt Lake City, UT; Trinity no longer includes Camden, NJ and Philadelphia, PA; APA added San Francisco, San Mateo County, CA, and no longer includes Dallas, TX; HCP no longer includes Ventura, CA; Indiana U added Urbana, IL and Terre Haute, IN; Northwest added Spokane, WA; Best Care Collab no longer includes Fort Lauderdale, Orlando, Sarasota, FL; CoxHealth added Springdale, AR; Franciscan added Slidell, LA.

### 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 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 all three cohorts in PY4. 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 as well as the regression models used in the evaluation, as 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 A.7** shows the data used for the construction of the NGACO and comparison groups.

**Exhibit A.7.** Analytic File Construction: Data Sources and Rationale

| Data (Years) | Rationale | Source(s) |
|---|---|---|
| NGACO participating provider alignment file (2019) | 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 (2019) | 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 (2013-2017, 2019), 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 (2019) | 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 (2013–2019) | Used to identify beneficiaries in other Medicare shared savings initiatives in the NGACO or comparison group. Beneficiaries in Pioneer ACOs or Comprehensive ESRD Care initiatives were excluded from the comparison group. | CMS |
| Beneficiaries in SSP, Pioneer, and NGACOs (2013-2019) | Used to calculate Medicare ACO penetration rate in HRR. | CMS |
| Medicare beneficiary summary and claims files (2010–2019) | 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 | 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 | CMS |

| Data (Years) | Rationale | Source(s) |
|---|---|---|
| Provider Practice and Specialty (2012–2017) | market competition (physician practice HHI and alignment-eligible providers per 1,000 population in HRR). | |
| AHA survey data (2012–2018) | Calculate hospital competition in market (HHI) and acute care hospital beds per 1,000 population in HRR. Hospitals from the same system within same HRR are considered as one market sharing entity when calculating the HHI. | AHA |
| American Community Survey (2012–2018) | Identify the sociodemographic characteristics of communities (ZIP code tabulation area) where NGACO and comparison beneficiaries reside. | Census Bureau |
| Dartmouth Atlas ZIP code-HRR crosswalks (2012–2018) | Identify markets (HRRs) in relation to ZIP codes where NGACO and comparison beneficiaries reside. | Dartmouth Institute |
| ZIP code-ZIP code tabulation area crosswalks (2015–2019) | 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.[17] 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

[17] 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.

chronic or potentially disabling conditions the beneficiary had in the preceding year.[18] 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.[19] 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[20]) of the beneficiary's ZIP code.
- **Market characteristics** included indicator variables for HRRs within which the beneficiaries reside.

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, while allowing us to assess the average treatment effect on the treated.[21, 22] 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 i'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.[23] Second, covariates in the propensity

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[18] 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 .

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

[20] For neighborhood socioeconomic characteristics, we included quintile indicators instead of the continuous format of those variables in the model estimating propensity score. These variables were still included in continuous format as for the covariate balance check and DID models.

[21] 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. After estimating propensity scores, we empirically tested various propensity score matching and weighting methods to assess how they balanced the NGACO and comparison groups on the observed covariates, to assess the average treatment effect on the treated.

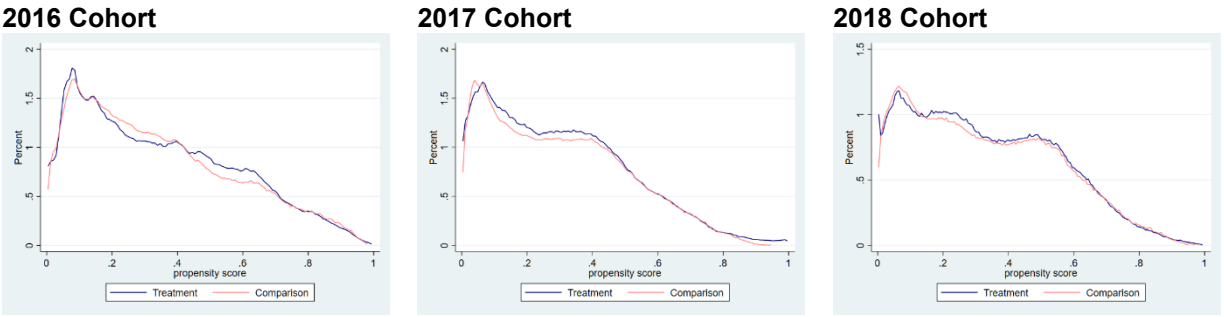
[22] Stuart EA. Matching methods for causal inference: A review and a look forward. *Stat Sci.* 2010;25(1):1; Hirano K, Imbens GW, Ridder G. Efficient estimation of average treatment effects using the estimated propensity score. *Econometrica.* 2003;71(4):1161–1189.

[23] Less than 0.11 percent of the comparison beneficiaries had weight greater than three.

score model were included in the DID models to obtain accurate impact estimates if the former were potentially mis-specified.[24]

**Exhibit A.8** 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 PY4. 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 A.8.** Common Support of the Propensity Score by Cohort, Baseline Years and PY4




## Measures of Spending, Utilization, and Quality

**Exhibit A.9** details definitions for the 23 claims-based outcome measures for which we assess the NGACO model's impacts in the Fourth Evaluation Report. Measures include total Medicare spending, eight categories of Medicare spending by care setting and service, eleven utilization measures, and three quality of care measures.

**Exhibit A.9.** Definitions for Claims-Based Outcome Measures Assessed Using DID 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. |

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

| Measure | Definition |
|---|---|
| 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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. |
| **Utilization** | |
| Acute care hospital stays per 1,000 beneficiaries per year (BPY) | Number of acute care hospital stays per 1,000 BPY for beneficiaries 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. |

| Measure | Definition |
|---|---|
| SNF stays per 1,000 BPY | Number of SNF stays per 1,000 BPY for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 for beneficiaries 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 per 1,000 BPY for a beneficiary during the period aligned to either the NGACO/comparison group. Episodes include sum of *60-day home health episodes, as well as home health episodes with low-utilization payment adjustments and partial episode payment adjustments*. 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. |

| Measure | Definition |
|---|---|
| Home health visits per 1,000 BPY | Number of home health visits per 1,000 beneficiaries for beneficiaries aligned to either the NGACO or comparison group. The number of home health visits for *physical/occupational/speech therapy, skilled nursing, and medical social services and from home health aides* 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 for 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 2019 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. 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.

[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/sharedsavingsprogram/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.

## Analytic Approach to Estimate Impacts of the NGACO Model

Exhibit A.10 summarizes the models used for the 23 claims-based outcome measures for the 2016, 2017, and 2018 cohorts (41 NGACOs) in PY4. 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.[25] This test examined the empirical relationship between the mean and the variance to ascertain the appropriate distribution. One utilization measure (beneficiaries with an Annual Wellness Visit) and the three quality of care measures were modeled as binary measures.[26]

**Exhibit A.10.** 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<br>Acute care hospital facility spending<br>Other post-acute care facility spending<br>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<br>ED visits including observation stays<br>SNF days<br>SNF stays<br>Home health visits<br>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 |

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

[26] 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.

| Outcome Measure | Model Used |
|---|---|
| Procedures<br>Tests<br>Imaging | GLM; negative binomial distribution and log link |
| Beneficiaries with Annual Wellness Visit | Logit |
| **Quality of Care** | |
| Beneficiaries with ACS hospitalizations<br>Beneficiaries with unplanned 30-day readmissions<br>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; ACS = Ambulatory Care Sensitive; TPM = two-part model.

**Difference-in-Differences (DID) Regression Models for Estimating impacts in PY4 and cumulatively as of PY4.** We estimated impacts using DID regression models for the 2016, 2017, and 2018 cohorts separately in PY4. We also ran separate DID regression models for each NGACO in PY4 to obtain impact estimates for the spending, utilization, and quality of care outcomes relative to an individual ACO's comparison group. The model-wide impact in PY4 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 PY4 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 and in PY4 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 each NGACO as of PY4 for total spending, by weighting their impact estimates for each performance year by the respective proportion of beneficiaries a cohort had in each year. Because we expect treatment effects to vary by PY for the three cohorts that started the model in different years, our approach of estimating model-wide impacts cumulatively and in each PY using separate DID regression models for each cohort in a PY is justified.[27]

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 PY4: 1) model-wide, 2) for each of the three cohorts, and 3) for each NGACO. We also report three sets of cumulative impact estimates as of PY4: 1) model-wide; 2) for 2016, 2017, and 2018 cohorts; and 3) for NGACOs in the 2016, 2017, and 2018 cohorts that were active as of PY4.

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

[27] The alternative of pooling cohorts or PYs and running two-way fixed effects DID models has been shown to yield biased estimates when there is differential treatment timing and treatment effects vary by time. For more please see Goodman-Bacon, Andrew. "Difference-in-differences with variation in treatment timing." *Journal of Econometrics* (2021).

Equation A.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.

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

Wherein:

- $Y_{ijkt}$ 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.
- $\beta_0$ 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 PY provider in a given PY. The coefficient $\beta_1$ 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 ($\delta_1$, $\delta_2$, $\delta_3$) capture changes in the NGACO and comparison group over time.
- Coefficient $\theta_1$ 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 $\theta_1$ 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 $\Upsilon$ and $\Lambda$, respectively (as discussed below).
- $HRR$ is a fixed effect for each HRR with coefficient vector $\Pi$, to control for differences across markets.[28]

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 A.1. All models were estimated using Stata 16.[29]

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

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

[29] StataCorp. 2019. *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LP.

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.[30]

- **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. We clustered standard errors at the level of the NGACO's market for the treatment and comparison groups, because outcomes could be correlated within these clusters.[31]

**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)[32] and binary variables for the 10 conditions most expensive to Medicare.[33,34] In the models for each NGACO, we estimated robust standard errors.[35]

**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 A.1 as the estimated outcome for the treated NGACO group relative to its expected outcome absent the treatment.[36] We calculated these results using post-estimation predictions, computing the marginal effect for all treated beneficiaries and subtracting the marginal effect for these

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[30] 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.

[31] 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).

[32] We could not use indicator variables for all 62 chronic conditions, due to small cell sizes that limited estimation of the models.

[33] 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).

[34] In prior analyses, we examined the effects of this altered specification of chronic conditions in the cohort 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 cohort-level analysis by about -$0.10 *annually*, or less than -$0.01 per beneficiary per month (PBPM).

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

[36] 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.

beneficiaries with the DID interaction term set to zero.[37] We computed confidence intervals using the delta method.[38]

- 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.[39] 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) and performance year. We report these for the NGACO and comparison group in Appendix H 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 A.2**, which extended Equation A.1 by including leading interaction terms for NGACO treatment effects in BY1 and BY2 (relative to BY3). We assessed whether the coefficient $\theta_{-2}$ 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 A.2: DID model with leading interaction terms, controlling for beneficiary, HRR, and community characteristics

$$g\left[E\left(Y_{ijkt}\right)\right] = \beta_0 + \beta_1 NGACO_j + \delta_1 BY2_t + \delta_2 BY1_t + \delta_3 PY_t + \theta_{-1} NGACO_j * BY2_t + \theta_{-2} NGACO_j * BY1_t + \theta_1 NGACO_j * PY_t + \Upsilon BENE_{ijkt} + \Lambda Community_{jkt} + \Pi HRR_k$$

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

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

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

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

condition was checked by testing whether $\theta_{-2}$ was statistically different from zero 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 at 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.[40]

**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 2016-2019 performance years and CCR payments made during the 2017 and 2018 performance years as well as cumulative gross savings impacts for the four years of the model.

As a sensitivity check, we also calculated the net spending impact of the NGACO model by accounting for shared savings payouts to both NGACO and comparison groups in performance and baseline years. Model-wide and cohort-level results from this alternative approach to estimating net impacts are found in Appendix D, Exhibits D.4-D.7.

**Sensitivity Check.** We conducted the following sensitivity check to assess the robustness of our estimated impacts for the 2016, 2017, and 2018 cohorts in PY4. Results from our sensitivity checks are presented in Appendix D, Exhibit D.8.

- **Main analysis:** Our main analysis for gross spending impact included payment adjustments under the Merit-based Incentive Payment System (MIPS) in PY4 from total Medicare spending outcome. Because we excluded payment bonuses for Advanced Alternate Payment Models (AAPMs) in PY4 in the estimation of net spending impact, we conducted a sensitivity check to affirm that our gross spending impact estimates were robust to excluding MIPS payment adjustments
- **Sensitivity analysis:** We excluded payment adjustments under the Merit-based Incentive Payment System (MIPS) from the total Medicare spending outcome in PY4 to verify that our gross spending impacts were not affected these quality payment adjustment. There were no differences in the PY4 cohort-level and model-wide gross impacts when we excluded the MIPS payment adjustments (Appendix D, Exhibit D.8).

**Estimation of Model-wide, Cohort-level, and NGACO-level Cumulative Impacts as of PY4.** In **Exhibit A.11**, we summarize how we estimated cumulative impacts model-wide and for each cohort as of PY4, by combining the impact estimates for cohorts of NGACOs across PY1-PY4. To calculate the model-wide cumulative impact estimates as of PY4 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 A.12**. The standard errors for model-wide cumulative impact estimates were likewise combined as a weighted average by first converting individual standard errors into variances,

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

combining the variances corresponding to the 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 PY4.

The **cumulative impact for each cohort as of PY4** for a given outcome measure was calculated as the weighted average of that cohort's DID impact estimates in all of the model's performance years in which that cohort was active. 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.

**Exhibit A.11.** Estimation of Cumulative and Performance Year Impacts, Model-wide and for Cohorts

| Cumulative Impact | PY4 Impact | PY3 Impact | PY2 Impact | PY1 Impact |
|---|---|---|---|---|
| **Model-wide: 153 NGACO-years** | Model-wide: 41 NGACOs | Model-wide: 50 NGACOs | Model-wide: 44 NGACOs | Model-wide: 18 NGACOs |
| **2016 Cohort: 59 NGACO-years** | 2016 Cohort: 12 NGACOs | 2016 Cohort: 13 NGACOs | 2016 Cohort: 16 NGACOs | 2016 Cohort: 18 NGACOs |
| **2017 Cohort: 64 NGACO-years** | 2017 Cohort: 15 NGACOs | 2017 Cohort: 21 NGACOs | 2017 Cohort: 28 NGACOs | |
| **2018 Cohort: 30 NGACO-years** | 2018 Cohort: 14 NGACOs | 2018 Cohort: 16 NGACOs | | |

The **cumulative impact for an individual NGACO as of PY4** 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 PY4. Separate DID regression models were estimated for individual NGACOs in each performance year. The cumulative impact for an individual NGACO as of PY4 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. For instance, an NGACO belonging to the 2016 cohort could have up to four years of cumulative impact, and fewer if the NGACO dropped out after one or more PYs. Similarly, an NGACO in the 2017 cohort could have up to three years of cumulative impact, and an NGACO in the 2018 cohort could have up to two years of cumulative impact.

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, then converted back to standard error from the combined variance.

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. Conditional means for the NGACO and comparison groups in BYs and PY(s) were calculated in the same way as impact estimates.
- 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 $\mathrm{x}$ is the cumulative DID estimate, $\mu$ is zero, and $\sigma$ 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 A.11 presents the treatment group sizes for all cohorts and years, and their proportional contribution to the cumulative impact estimates.

**Exhibit A.12.** Treatment Group Sizes and Their Contributions to the Cumulative Impact Estimates

| | Total Number of Beneficiary Years | Number of Beneficiary Years (Proportion) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2016 Cohort, PY1 | 2016 Cohort, PY2 | 2017 Cohort, PY2 | 2016 Cohort, PY3 | 2017 Cohort, PY3 | 2018 Cohort, PY3 | 2016 Cohort, PY4 | 2017 Cohort, PY4 | 2018 Cohort, PY4 |
| **Model-Wide cumulatively, as of PY4** | 4,312,249 | 477,179 (0.1107) | 477,426 (0.1107) | 754,789 (0.1750) | 459,603 (0.1066) | 652,244 (0.1513) | 287,551 (0.0667) | 470,657 (0.1091) | 484,152 (0.1123) | 248,648 (0.0577) |
| **Model-Wide in PY4** | 1,203,457 | - | - | - | - | - | - | 470,657 (0.3911) | 484,152 (0.4023) | 248,648 (0.2066) |
| **2016 Cohort cumulatively, as of PY4** | 1,884,865 | 477,179 (0.2532) | 477,426 (0.2533) | - | 459,603 (0.2438) | - | - | 470,657 (0.2497) | - | - |
| **2017 Cohort cumulatively, as of PY4** | 1,891,185 | - | - | 754,789 (0.3991) | - | 652,244 (0.3449) | - | - | 484,152 (0.2560) | - |
| **2018 Cohort cumulatively as of PY4** | 536,199 | - | - | - | - | - | 287,551 (0.5363) | - | - | 248,648 (0.4637) |

**Estimating Impacts on Total Medicare Spending for Subgroups of Beneficiaries.** We also applied the DID framework to estimate the model's impact for total gross Medicare spending

among subgroups of beneficiaries in the 2016, 2017, and 2018 cohorts, separately in each PY. Selected beneficiary subgroups included:

- **Subgroups of beneficiaries with multiple chronic conditions:** Three categories; beneficiaries with 8 or more conditions, those with 3-7 conditions, and those with 0-2 conditions.
- **Subgroups of beneficiaries based on hospitalizations in the preceding year:** Two categories; beneficiaries with hospitalization in prior year, and those with no hospitalizations in the prior year.
- **Subgroups based on race and ethnicity:** Three categories**;** White non-Hispanic beneficiaries, Black non-Hispanic beneficiaries, and others.
- **Subgroups based on dual eligibility:** Two categories; beneficiaries dually eligible for Medicare & Medicaid, and those in Medicare only (non-duals)

We used **Equation A.3** to assess treatment effects for beneficiary categories in a subgroup set. The original treatment effect $NGACO_j * PY_t$ specified in D.1 was split into $NGACO_j * PY_t * Subgroup_m$ for *m* beneficiary categories in a subgroup. We also included two-way interaction terms between subgroup and NGACO group indicator (to control for baseline differences between NGACO and comparators for the beneficiary categories), and between subgroup and PY indicator (to control for differences between the performance and baseline periods for the beneficiary categories). We used the approach developed by Puhani (2012) to estimate the marginal NGACO treatment effect for the beneficiary categories in a subgroup, relative to the treated counterfactual. Conditional means for NGACO and comparison group in BY period and PY, and the percentage of impact (impact relative to the counterfactual) for beneficiary categories in a subgroup were estimated as well. We tested whether trends in outcomes between NGACO and comparison group were parallel between BY1 and BY3 for each beneficiary category in a subgroup. Finally, we calculated the model-wide impacts in PY4 and cumulative impacts of PY4 for each subgroup, using methods described previously.

Equation A.3: DID model for 3-benefciary categories subgroup, controlling for beneficiary, HRR, and community characteristics

$$g\left[E\left(Y_{imjkt}\right)\right] = \beta_0 + \beta_1 NGACO_j + \delta_1 BY2_t + \delta_2 BY1_t + \delta_3 PY_t + \tau_1 Subgroup_1 + \tau_2 Subgroup_2 + \varphi_1 NGACO_j * Subgroup_1 + \varphi_2 NGACO_j * Subgroup_2 + \omega_1 PY_t * Subgroup_1 + \omega_2 PY_t * Subgroup_2 + \theta_1 NGACO_j * PY_t * Subgroup_1 + \theta_2 NGACO_j * PY_t * Subgroup_2 + \theta_3 NGACO_j * PY_t * Subgroup_3 + \Upsilon BENE_{imjkt} + \Lambda Community_{jkt} + \Pi HRR_k$$

Wherein: $Y_{ijkt}$ is the outcome for the $i^{th}$ beneficiary in subgroup *m* in NGACO or comparison group *j*, in market *k*, in year *t*. $\theta_m$ is the coefficient of the DID estimate for $m^{th}$ beneficiary category in the subgroup.

**Assessing Variation in NGACOs' Gross Spending Impacts Explained by Characteristics of Their Markets, Organizations, Providers, Beneficiaries, Election of Model Features, and Overlap with other CMMI initiatives.** We used random effects meta-regression to assess the variation in NGACOs' impacts explained by selected characteristics listed in **Exhibit A.13**. The dependent variable was the DID estimate for total gross Medicare spending for an NGACO in a PY (all

adjusted to 2019 dollars) and the explanatory variables were factors that may impact the magnitude of the DID effects. The random effects model assumes two types of variations: variation which comes from sampling error within each ACO-PY and variation from the "true" effect (i.e., between-study variation). Each ACO-PY estimate were weighted by the precision of their estimated effects (i.e., inverse of its variance). We used meta-regression $R^2$ statistic to measure the percentage of between-study variation in NGACO impacts explained by the set of covariates in the model. We performed meta-regressions including covariates in each domain in separate models, and included covariates from all domains in a comprehensive model.

**Exhibit A.13.** Domains and Explanatory Variables Included in Meta-regression to Assess Variation in NGACOs' Gross Medicare Spending Impacts

| Domain | Variable |
|---|---|
| Market | MA penetration rate in PY |
| | Change in MA penetration rate from BY to PY |
| | ACO penetration rate in PY |
| | Change in ACO penetration rate from BY to PY |
| | Risk-adjusted per-capita Medicare spending in PY |
| | Change in risk-adjusted per-capita Medicare spending from BY to PY |
| | Hospital HHI category in PY (3-group: competitive, moderately concentrated, and highly concentrated hospital market) |
| | Change in hospital HHI from BY to PY |
| | Practice HHI category in PY (2-group: competitive, moderately concentrated) [a] |
| | Change in practice HHI from BY to PY |
| | Number of acute care hospital beds per 1,000 population in PY |
| | Change in number of acute care hospital beds per 1,000 population from BY to PY |
| | Number of alignment-eligible providers per 1,000 population in PY |
| | Change in number of alignment-eligible providers per 1,000 population from BY to PY |
| | Average number of alignment-eligible providers within 10-mile radius per 1,000 population in PY |
| | Change in average number of alignment-eligible providers within 10-mile radius per 1,000 population from BY to PY |
| Organization | Organization type (3-group: IDS/hospital system-affiliated, hospital-physician practice partnership, physician practice-affiliated) |
| | Number of years with prior Medicare ACO experience |
| | Indicator for non-for-profit organization |
| Provider | Number of primary care practitioners per 1,000 aligned beneficiaries |
| | Number of specialist practitioners per 1,000 aligned beneficiaries |
| | Short-term and CAH beds per 1,000 aligned beneficiaries |
| | SNF beds per 1,000 aligned beneficiaries |

| Domain | Variable |
|---|---|
| | Percent of participating practitioners who are not physicians |
| | Average number of years with prior experience in Medicare ACO models among participating practitioners |
| | Percent or direct spillover from NGACO participating providers to the comparison group |
| | Percent of providers electing payment reductions via PBP/AIPBP |
| | Percent of practitioners electing Part B payment reductions via PBP/AIPBP |
| | Percent of affiliated facilities electing Part A payment reductions via PBP/AIPBP |
| **Beneficiary** | Number of aligned NGACO beneficiaries |
| | Percent of aligned beneficiaries who are Black non-Hispanic |
| | Percent of aligned beneficiaries who are disabled |
| | Percent of aligned beneficiaries who are dually-eligible |
| | Average number of chronic conditions among aligned beneficiaries |
| | Average percentage of the population below 100% Federal Poverty Level in ZCTAs where NGACO beneficiaries reside |
| | Percent of aligned beneficiaries residing in rural ZIP code |
| | Percent of aligned beneficiaries' Parts A & B spending with their NGACO providers |
| **Election of Model Features** | Payment mechanism (FFS without or with MIPS, PBP/AIPBP) |
| | Risk level and risk cap category (4-group: 80% risk 5% cap, 80% risk >5% cap, 100% risk 5% cap, and 100% risk >5% cap) |
| | Risk index (created by multiplying the percent of risk level and risk cap) |
| **Overlap with Other CMMI Initiatives** | Difference in rate of beneficiary participation in CPC/CPC+ between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in FAI between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in IAH program between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in MAPCP program between NGACO and comparison group in PY vs. BY |
| | Difference rate of beneficiary participation in the MSSP or Pioneer program between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in BPCI or BPCI Advanced between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in CJR between NGACO and comparison group in PY vs. BY |
| | Difference in rate of beneficiary participation in OCM between NGACO and comparison group in PY vs. BY |

**NOTES:** [a] Markets are not highly concentrated with respect to physician practices. ACO = Accountable Care Organization; BPCI = Bundled Payments for Care Improvement; CAH = critical access hospital; CJR = Comprehensive Care for Joint Replacement; CPC = Comprehensive Primary Care; FAI = Financial Alignment Initiative; HHI = Herfindahl–Hirschman Index; IAH = Independence At Home; IDS = integrated delivery system; MA = Medicare Advantage; MAPCP = Multi-payer Advanced Primary Care Practice; MIPS = Merit-based Incentive Payment System;

MSSP = Medicare Shared Savings Program; OCM = Oncology Care Model; SNF = skilled nursing facility; ZCTA = zip code tabulation area.

**Estimating Impacts on Total Medicare Spending for Subgroups of NGACOs Based on Characteristics of Their Markets, Organizations, Providers, Beneficiaries, Election of Model Features, and Tenure in the Model.** For each subgroup of interest, 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 as of PY4.[41] 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 and PYs. The same formulas used for the 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.

For subgroups based on market characteristics, we classified NGACOs into quintiles, using a distribution that reflects all HRRs in the United States (not only HRRs where NGACOs exist). For subgroups based on the beneficiary characteristics and provider network characteristics, we classified NGACOs into quintiles, using the distribution observed among all NGACOs in the data. For organizational and provider prior ACO experience, we used thresholds in the data that reflect the clustering observed.

## Assessing Patterns of Care: Stickiness and Direct Spillover

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 ***stickiness*** for NGACO group and ***direct spillover*** for comparison group. 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:

- **Stickiness of NGACO beneficiaries to NGACO providers:** We define stickiness as the extent to which NGACO beneficiaries in a performance year received care within the NGACO they were aligned; that is, if they obtained services from 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 in 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. [42] Stickiness 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

[41] Eight NGACOs were dropped from the subgroup calculation cumulatively as of PY4 due to failure in baseline parallel trends test for total Medicare spending.

[42] NGACO providers electing population based payments (PBPs) or all-inclusive-population-based-payments (AIPBPs) 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.

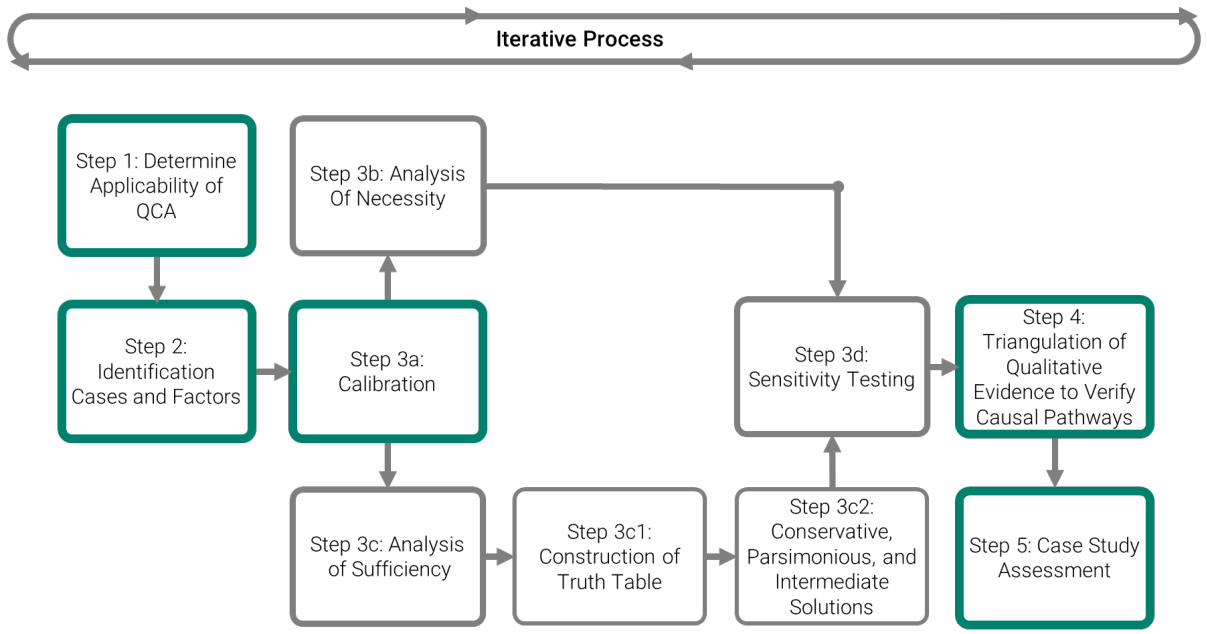
numerator as FFS payments for all Part B carrier services furnished to comparison beneficiaries by any NGACO participating provider. We measured the denominator as FFS payments for all Part B carrier services furnished to comparison beneficiaries by all providers.[39] Spillover is defined for all cohorts' and NGACOs' comparison groups in the performance years.

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. We extracted claims for beneficiaries in the NGACO and comparison groups using beneficiary identifiers and identified instances of care delivered by NGACO or non-NGACO using NPIs and referencing NGACO provider lists for CY2019. Comparison beneficiaries were weighted using the propensity score 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 B: Qualitative Comparative Analysis Methods and Analysis

Our evaluation used a comparative case study method—fuzzy set Qualitative Comparative Analysis (fsQCA)—to systematically group the NGACOs based on their shared contextual and structural characteristics and uncover causal pathways that led to the reduction of Medicare spending during the model's first four performance years (PYs). The fsQCA methodology comprises five iterative steps described in this Appendix, from our rationale for answering evaluation questions using QCA, through identification of contextual and structural factors and causal pathways, to integrating qualitative and quantitative data to validate our results and write up case studies; see **Exhibit B.1** below for a visual depiction of this process.

**Exhibit B.1.** fsQCA Analytic Process




Adapted from *Qualitative Comparative Analysis in Mixed Methods Research and Evaluation*, Kahwati and Lane, 2020

## Step 1. Determine Applicability of the QCA Method to Explain Impact of the NGACO Model

The QCA method is a useful method to understand the multiple ways that NGACO model implementation can affect spending, with the expectation that no single factor is likely to explain

findings. To use the QCA method, the subject being studied must meet three criteria, related to the characteristics of equifinality, conjunctural causation, and asymmetric causation.[43] In **Exhibit B.2** below, we define the three criteria and justify the applicability of each to our evaluation of the NGACO model.

**Exhibit B.2.** Applicability of fsQCA: NGACO Model Implementation Meets the Three Criteria

| Criteria | Justification |
|---|---|
| **Equifinality:** Multiple, mutually non-exclusive explanations of the phenomenon exist. | NGACOs in each PY can use a range of strategies to achieve an overall spending reduction. The policy environment, characteristics of the health care and insurance market, and organizational characteristics can influence choice of implementation strategy. |
| **Conjunctural causation:** The effect of a causal factor is likely to unfold only in combination with other factors. | Given the many stakeholders involved and the complex nature of the implementation approaches, it is unlikely that a single factor can determine outcomes. |
| **Asymmetric causation:** When the outcome occurs when a factor is present, it is not necessarily the case that the absence of that factor means the outcome will not occur. | NGACOs in each PY face several barriers to implementing the model. The absence of an implementation barrier does not automatically result in implementation and program effectiveness. |

## Step 2. Identification of Cases and Factors

An NGACO Performance Year (NGACO-PY) was the unit of analysis in this assessment. Each year of participation in the model offers NGACOs an opportunity to select model features and implement strategies to reduce Medicare spending. Considering each NGACO-PY as a distinct case allowed us to account for the dynamic nature of participation in the model. This approach also allowed us to systematically assess how the NGACOs strategies and outcomes evolved over time. The analysis includes all 153 NGACO-PY (henceforth, we refer to each NGACO-PY case as NGACO), which accounts for all NGACOs participating in the model through PY4.

Overall spending reduction (i.e., cumulative gross impact reduction in Medicare Part A and Part B spending in performance years 1-4) was the outcome measure for this analysis. We anchored the causal pathways based on the key contextual and structural factors presented in **Exhibit B.3**.

[43] Schneider, Carsten Q., and Claudius Wagemann. Set-theoretic methods for the social sciences: A guide to qualitative comparative analysis. Cambridge University Press, 2012.

**Exhibit B.3.** Selection of Cases, based on Factors and Hypotheses

| Factor (Acronym) | Description | Rationale |
|---|---|---|
| Higher baseline spending in the market (↑MARKSPEND) | Total standardized, risk-adjusted, per-capita Medicare Parts A & B spending in NGACO market at baseline | Total standardized, risk-adjusted, per-capita Medicare Parts A & B spending in NGACO market at baseline |
| Physician practice ACO (PHYSNLED) | ACO is affiliated with a Physician Practice | ACO is affiliated with a Physician Practice |
| More aligned beneficiaries (↑ACOBENE) | Number of beneficiaries aligned to the NGACO-PY | Number of beneficiaries aligned to the NGACO-PY |
| More ACO experience (↑ACOEXP) | Number of years of Medicare ACO experience (inclusive of NGACO-PY experience) | Number of years of Medicare ACO experience (inclusive of NGACO-PY experience) |
| Higher risk selection (↑ACORISK) | Index of level of risk assumed by NGACO-PY: Risk Selection (80/100%) * Risk Cap (5-15%) | Index of level of risk assumed by NGACO-PY: Risk Selection (80/100%) * Risk Cap (5-15%) |
| More chronic conditions (↑BENECC) | Mean number of chronic conditions among aligned beneficiary population | Mean number of chronic conditions among aligned beneficiary population |
| Fewer dually eligible beneficiaries (↓BENEDUAL) | Percent of dual eligible beneficiaries in the ACO beneficiaries | Percent of dual eligible beneficiaries in the ACO beneficiaries |
| Higher baseline spending in the market (↑MARKSPEND) | Total standardized, risk-adjusted, per-capita Medicare Parts A & B spending in NGACO market at baseline | Total standardized, risk-adjusted, per-capita Medicare Parts A & B spending in NGACO market at baseline |

The evaluation's theory of change (Exhibit 1.6) posits that these key factors are associated with Medicare spending outcomes. Specifically, these explanatory factors capture the contextual settings in which the NGACOs operate; and the resources, capacity, and opportunities that the NGACOs may leverage across different contexts to achieve outcomes in the model. Peer-reviewed literature, results from exploratory bivariate and subgroup analyses, case-level insights, data availability, and priorities identified by CMMI also influenced the selection of the factors.

## Step 3. Identification of Causal Pathways

Identification of causal pathways is an iterative process and involves multiple analytic steps. Below, we describe the purpose and process involved in each analytic step.

### Step 3.a. Calibration – Rescaling Factors for fsQCA

The fsQCA method accommodates inclusion of continuous and ratio scale variables in the analysis, thereby maximizing the available information. The likelihood of an NGACO belonging to a group of NGACOs with a shared factor (e.g., NGACOs with prior Medicare ACO experience) or a causal pathway is measured on a scale ranging from 0 to 1. We rescaled the outcome factor as well as all the factors that are on a continuous and ratio scale using a logistic transformation function. We set specific inclusion, crossover, and exclusion thresholds based on the distributions of each of the factors and the outcome to determine the shape of the logistic transformation function. The shape of the distribution informed the choice of thresholds. For most factors, the

5th, 50th, and 95th percentiles served as the thresholds. **Exhibit B.4** documents the approach we employed to set the thresholds for the factors. We strived to preserve the original shape of the distribution in the rescaled factors. Appendix G, Exhibit G.7 presents the cut points for each of the factors and the outcome.

**Exhibit B.4.** Data Calibration: Rescaling Factor and Outcome Values for Analysis

| Calibration Type | Threshold | Factor(s) |
|---|---|---|
| Binary | NA | Physician practice ACO |
| Higher values are favorable; Lower values are unfavorable | 95th percentile for inclusion; median for crossover; 5th percentile for exclusion | Higher baseline spending; More aligned beneficiaries; More ACO experience; More chronic conditions |
| Lower values are favorable; Higher values are unfavorable | 5th percentile for inclusion; median for crossover; 95th percentile for exclusion | Fewer dually eligible beneficiaries |
| Higher values are favorable; Lower values are unfavorable; Minimum value set to 0* | 95th percentile after minimum removed for inclusion; median after minimum removed for crossover; 5th percentile after minimum removed for exclusion; minimum value set to 0 | Higher risk selection |
| Outcome | For purposes of QCA – "success" will include NGACO-PYs where: 1) overall spending reduction is statistically insignificant; and 2) that fail the parallel trends test as long as the magnitude of their reduction is greater than the NGACO-PY with the smallest, statistically significant overall spending reduction. | NGACO-PY reduced Medicare spending |

NOTES: * The calibration of higher risk selection was skewed so that the inclusion and crossover points were overlapping because many NGACO-PYs chose the lowest risk selection (80/100%) * Risk Cap (5-15%). To account for this, we removed the lowest value, setting the value to 0 for the calibration and applying the 95th and 5th percentile calibration rules to the remaining values.

We conducted sensitivity testing to assess whether the key findings were robust to alternate threshold values of the transformation function; findings should not change based on threshold decisions. See discussion below (Step 5.d) for more information about our sensitivity analysis.

### Step 3.b. Analysis of Necessity

We conducted an analysis of necessity to assess whether the presence of a specific contextual and structural factor is necessary to reduce Medicare spending. We determined whether a factor is necessary[44] by assessing the likelihood of a factor being present in a group of NGACOs that are likely to have achieved reduction in Medicare spending. We calculated two measures of necessity:

[44] A factor is necessary if its presence is required for the desired outcome to occur. However, the presence of the factor does not guarantee the outcome. In other words, a necessary factor may not be sufficient; other factors may be required. In complex social systems, a combination of several factors is usually required to produce an outcome.

necessity-consistency[45] and necessity-coverage.[46] Below, we describe how these measures are constructed and interpreted.

- Necessity-consistency score. This score measures the degree to which the presence of the outcome signifies the presence of an explanatory factor.[47,48] In our analysis, the presence or absence of most factors or outcome was not binary; for this reason, we applied the following formula to calculate necessity-consistency:

$$\frac{\sum_{i=1}^{i}[Min(X_i, Y_i)]}{\sum_{i=1}^{i} Y_i}$$

  where *X* represents the calibrated value for the factor and *Y* is the calibrated value for the outcome for the *i*th case (NGACO-PY).

- Necessity-coverage score. We used the necessity-coverage score to measure the degree of relevance of a necessary factor.[49] For this score, we applied the following formula:

$$\frac{\sum_{i=1}^{i}[Min(X_i, Y_i)]}{\sum_{i=1}^{i} X_i}$$

  where *X* represents the calibrated value for the factor and *Y* is the calibrated value for the outcome for the *i*th case (NGACO-PY).

**Exhibit B.5** presents the necessity-consistency and necessity-coverage scores for each explanatory factor. As expected, none of the factors have a necessity-consistency score that is high enough to be deemed necessary to achieve an overall reduction in spending. However, the results indicate that higher baseline market spending and a smaller proportion of beneficiaries with dual eligibility in the aligned beneficiary population may be relatively important factors.

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[45] The *necessity-consistency score* represents the average of the degree to which the calibrated value of the factor is less than the calibrated value of the outcome across all NGACO-PYs. The higher the necessity-consistency score, the more necessary a factor is for the outcome to occur, and a score greater than 0.9 is generally considered the minimum threshold to interpret a factor as being necessary.

[46] The *necessity-coverage score* represents the average of the degree to which the calibrated value of the outcome is less than the calibrated value of a necessary factor across all NGACO-PYs.

47 Rihoux & Ragin (2008), Kahwati & Kane (2020)

[48] The necessity-consistency score answers the question: of the NGACO-PYs that achieved overall reduction in spending, what proportion also had the explanatory factor of interest? Factors with necessity-consistency scores closer to 1 indicate that the explanatory factor is needed to achieve an overall reduction in Medicare spending.

[49] A higher necessity-coverage score indicates that presence of the necessary factor more often results in the outcome. A necessity-coverage score should only be interpreted for factors deemed as necessary based on the necessity-consistency score and supporting qualitative evidence.

**Exhibit B.5.** Analysis of Necessity: Consistency and Coverage Scores

| Factor | Necessity-Consistency Score | Necessity-Coverage Score |
|---|---|---|
| Higher baseline market spending (BY) | 0.63 | 0.84 |
| NGACO organizational affiliation (type) is a physician practice (BY) | 0.33 | 0.66 |
| More ACO experience (BY) | 0.57 | 0.79 |
| More aligned beneficiaries (PY) | 0.52 | 0.81 |
| Fewer beneficiaries with chronic conditions (PY) | 0.58 | 0.81 |
| Smaller proportion of duals (PY) | 0.66 | 0.84 |
| Higher risk selection (PY) | 0.32 | 0.76 |

### Step 3.c. Analysis of Sufficiency

We conducted an analysis of sufficiency to identify casual pathways comprising combinations of contextual and structural characteristics that are sufficient for achieving reduction in Medicare spending. There were three steps in analysis: (1) constructing a `truth table' that arrays specific combinations of factors (possible causal pathways) by row; (2) application of the Quine–McCluskey algorithm—a logical minimization technique—to the truth table data to derive our final, simplified set of causal pathways; and (3) sensitivity testing to assess the robustness of the findings.

#### *Step 3.c.1. Construction of the Truth Table*

First, we constructed a truth table that included a row for every possible combination of the seven key contextual and structural factors. Since our analysis included seven factors, the truth table consisted of $2^7$ or 128 rows. **Exhibit B.6** depicts the table, with a row for each combination of factors associated with at least one case (NGACO-PY).[50]

Next, we assigned NGACOs to each of the truth table rows based on the likelihood of the NGACOs having the combination of the key factors represented in each row of the truth table. We used the following formula to determine the truth table row that best represented a given NGACO-PY's spending pattern:

$$\boldsymbol{Z_i = Min(\uparrow MARKSPEND_i, PHYSNLED_i, \uparrow ACOBENE_i, \uparrow ACOEXP_i, \uparrow ACORISK_i, \uparrow BENECC_i, \downarrow BENEDUAL_i)}$$

where the value *Z* represented the minimum of the calibrated values across factors for the $i^{th}$ NGACO-PY. NGACO-PYs were assigned to the row with the highest *Z* score.

[50] Truth Tables rows that had no cases were removed from this table for brevity.

**Exhibit B.6.** Analysis of Sufficiency: Truth Table

| ↑MARKSPEND | ↑ACORISK | PHYSNLED | ↑BENECC | ↓BENEDUAL | ↑ACOEXP | ↑ACOBENE | Suff. For Outcome | # Cases | Consistency Score | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0.9911 | Optum (2016) |
| 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 0.9906 | Primaria (2018, 2019) |
| 1 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 0.9897 | Atrius (2017) |
| 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0.9883 | Monarch (2017) |
| 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 4 | 0.9869 | Accountable Care Options (2018, 2019); ACCST (2019); Primary Care Alliance (2019) |
| 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0.9795 | Optum (2017) |
| 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 0.9765 | Atrius(2018, 2019) |
| 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0.9725 | ACCST (2018) |
| 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 3 | 0.9725 | ACC of TN (2019); Accountable Care Options (2017); Primary Care Alliance (2018) |
| 0 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0.9718 | CareMount (2018) |
| 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 0.9708 | ACC of TN (2018); ACCST (2017) |
| 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0.9708 | ACCST (2016) |
| 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0.9656 | CareMount (2019) |
| 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0.9650 | CHESS (2016) |
| 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 4 | 0.9528 | Arizona (2019); Deaconess (2019); Trinity (2018, 2019) |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0.9506 | HCP (2017); Hill (2017) |
| 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 3 | 0.9452 | CHESS (2019); Indiana U (2019); Steward (2019) |
| 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0.9375 | Triad (2019) |
| 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0.9299 | Torrance (2019) |
| 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0.9290 | St. Luke's (2019) |
| 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0.9283 | Indiana U (2018) |
| 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0.9281 | HCP (2018) |

| ↑MARKSPEND | ↑ACORISK | PHYSNLED | ↑BENECC | ↓BENEDUAL | ↑ACOEXP | ↑ACOBENE | Suff. For Outcome | # Cases | Consistency Score | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 0.9249 | NatACO (2017); UniPhy (2017) |
| 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 2 | 0.9208 | ACCC (2017); UniPhy (2016) |
| 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0.9154 | Triad (2017); UNC (2019) |
| 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 3 | 0.9138 | Pioneer Valley (2017, 2018); UNC (2018) |
| 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 | 0.9108 | Carilion (2019); UnityPoint (2018, 2019); UW Health (2019) |
| 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0.9100 | MPACO (2018) |
| 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 0.9057 | CHESS (2018); Steward (2016, 2017, 2018) |
| 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 2 | 0.9045 | Partners (2018); Pioneer Valley (2019) |
| 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 0.9016 | Arizona (2018) |
| 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0.8983 | Integra (2017, 2018) |
| 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 4 | 0.8979 | Best Care Collab (2018); Franciscan (2018, 2019); Mary Washington (2019) |
| 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0.8950 | ProHealth (2018, 2019) |
| 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 7 | 0.8872 | APA (2017); Bronx (2017); Hill (2018); NatACO (2018); NECQA (2018, 2019); RHeritage (2017) |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 0.8864 | Prospect (2016); ProspectNE (2017, 2018, 2019) |
| 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 0.8851 | UnityPoint (2016, 2017); UW Health (2018) |
| 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0.8825 | North Jersey (2018) |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 0.8823 | Connected Care (2018); CoxHealth (2019); NW Momentum (2017, 2018, 2019); ProHealth (2017); UNC (2017) |

| ↑MARKSPEND | ↑ACORISK | PHYSNLED | ↑BENECC | ↓BENEDUAL | ↑ACOEXP | ↑ACOBENE | Suff. For Outcome | # Cases | Consistency Score | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0.8805 | RHeritage (2018) |
| 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0.8711 | Carilion (2017) |
| 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 0.8697 | Central Utah (2018, 2019) |
| 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0.8692 | Partners (2017); Pioneer Valley (2016); Sharp (2017) |
| 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 0.8672 | Arizona (2017); OSF (2016); Trinity (2016, 2017) |
| 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 0.8664 | Deaconess (2016, 2018); Henry Ford (2017, 2018, 2019); Indiana U (2017) |
| 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 0.8643 | Reliance (2018, 2019); UniPhy (2018) |
| 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0.8640 | Allina (2017); Triad (2016) |
| 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 0.8620 | Henry Ford (2016); MemorialCare (2016, 2017); Premier (2017); Torrance (2018) |
| 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 0.8602 | Carilion (2018) |
| 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 0.8561 | UTSW (2017, 2018, 2019) |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 5 | 0.8552 | Dartmouth-Hitchcock (2018); Park Nicollet (2018, 2019); ThedaCare (2018, 2019) |
| 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0.8396 | RHeritage (2019) |
| 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0.8379 | Best Care Collab (2019) |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0.8350 | Beacon (2016, 2017); Dartmouth-Hitchcock (2017); Fairview (2017); Park Nicollet (2016, 2017); ThedaCare (2016, 2017) |
| 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0.8286 | St. Luke's (2017, 2018) |
| 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0.8251 | Triad (2018) |
| 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0.8141 | KentuckyOne (2017) |
| 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0.8100 | MPACO (2017) |
| 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0.7947 | Reliant (2018, 2019) |

| ↑MARKSPEND | ↑ACORISK | PHYSNLED | ↑BENECC | ↓BENEDUAL | ↑ACOEXP | ↑ACOBENE | Suff. For Outcome | # Cases | Consistency Score | Cases |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0.7784 | CHESS (2017); Mary Washington (2018); |
| 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 5 | 0.7783 | APA (2018, 2019); Bronx (2018, 2019); HCP (2019) |
| 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0.7714 | Deaconess (2017) |
| 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0.7685 | Bellin (2016, 2017); CoxHealth (2018) |
| 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0.7456 | Bellin (2019) |
| 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.7362 | Bellin (2018) |

**NOTE:** The truth table contains only rows associated with at least one case (NGACP-PY). Logical remainders (rows without associated cases) were removed for brevity.

Finally, we calculated the *sufficiency-consistency score*, which represented the average of the degree to which the calibrated value of the outcome is less than the calibrated value of the combination of factors across all NGACO-PYs. All 153 NGACO-PYs were used to calculate a sufficiency score for each row, rather than counting only the NGACO-PYs listed in a given row. We used the following formula to calculate the sufficiency-consistency score:

$$\frac{\sum_{i=1}^{i}[Min(Z_i, Y_i)]}{\sum_{i=1}^{i} Z_i}$$

where *Z* was derived using the formula presented earlier and *Y* represented the calibrated score for the outcome.

Higher sufficiency-consistency scores identified the rows (combinations of factors) more likely to result in an overall spending reduction. For the analysis, we assigned a threshold of 0.9[51] to identify which rows were sufficient for producing a reduction in Medicare Parts A and B gross spending.

*Step 3.c.2. Conservative, Parsimonious, and Intermediate Solutions*

We applied the Quine–McCluskey algorithm—a logical minimization technique—to the truth table data to derive our final, simplified set of causal pathways, using pairwise matching of similar conjunctions[52]. Before performing the algorithm, we prepared two solutions—called conservative[53] and parsimonious[54]—to set boundaries for the minimization procedure and inform our approach to assessing truth table rows without content (logical remainders). See **Exhibit B.10** for results.

Next, we derived the intermediate solution – a solution set lies between those identified in the conservative and parsimonious solutions. The algorithm used to generate the intermediate solution was bounded by a set of "directional expectations"[55,56] for how logical remainders were integrated during the minimization process. For this analysis, we assumed that more ACO experience cannot minimize the likelihood of achieving overall spending reduction. We did not

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[51] A sufficiency-consistency score greater than 0.9 is generally considered the minimum threshold required to interpret a pathway as being sufficient for producing the outcome.

[52] In set theory, a *conjunction* indicates a combining of sets using the operator AND.

[53] The conservative solution is based only on truth table rows for which data are available. This solution is based on the most restrictive set of assumptions because the algorithm is not allowed to make logical assumptions about the logical remainders based on available data. As a result, the conservative solution generally identifies pathways that are more complex, with the potential to include all factors.

[54] The parsimonious solution incorporates all logical remainders when identifying pathways. The algorithm uses logical remainders to act as "simplifying assumptions," to reduce the number of factors and operators in the subsequent pathways identified. There are no restrictions on the assumptions that the algorithm can make to derive the simplest possible solution. As a result, the parsimonious solution generates the simplest pathways (of the three minimizations) that cover the most cases. However, if no constraints are set, the algorithm tends to make assumptions that are unlikely to be true.

[55] A directional expectation refers to assumptions about whether the presence or absence of a factor will result in an outcome.

[56] These directional expectations are set based on empirical evidence and case-level knowledge.

assume any other directional causal associations, given the potential of the other factors to serve both as facilitators and barriers, depending on the context. The pathways comprising the intermediate solution are presented in **Exhibit B.7**.

## Exhibit B.7. Analysis of Sufficiency: Intermediate Solution

| Pathway | Sufficiency-Consistency Score | Sufficiency-Coverage Score | NGACO-PYs | Interim Pathway Label |
|---|---|---|---|---|
| ↑ MARKSPEND & PHYSNLED & ↑BENECC & ↓ACORISK | 0.882 | 0.127 | NatACO (2017); UniPhy (2016, 2017); ACCC (2017); ACC of TN (2018); ACCST (2017, 2018); Optum (2017) | A |
| ↑ MARKSPEND & PHYSNLED & ↑ACOBENE & ↓ACORISK | 0.904 | 0.110 | Monarch (2017); Atrius (2017, 2018, 2019); ACCC (2017); UniPhy (2016); Optum (2017) | B |
| ↑ MARKSPEND & ↑BENECC & ↑ACOEXP & ↓ACORISK | 0.933 | 0.294 | MPACO (2018); CHESS (2019); Indiana U (2019); Steward (2019); Torrance (2019); Arizona (2019); Deaconess (2019); Trinity (2018, 2019); ACCST (2018) | C |
| ↑ MARKSPEND & ↑ACOEXP & ↑ACOBENE & ↓ACORISK | 0.932 | 0.296 | Indiana U (2018, 2019); St. Luke's (2019); CHESS (2019); Steward (2019); Arizona (2019); Deaconess (2019); Trinity (2018, 2019); Atrius (2018, 2019) | D |
| NONPHYSNLED & ↑BENECC & ↑ACOBENE & ↓ACORISK | 0.881 | 0.229 | Pioneer Valley (2017, 2018, 2019); UNC (2018, 2019); Partners (2018); Triad (2017, 2019); CHESS (2018, 2019); Steward (2016, 2017, 2018, 2019); Indiana U (2019); Arizona (2018, 2019); Deaconess (2019); Trinity (2018, 2019) | E |
| ↑ MARKSPEND & PHYSNLED & ↓BENECC & ↓BENEDUAL & ↓ACOEXP | 0.976 | 0.092 | ACCST (2016); Atrius (2017); CHESS (2016); Optum (2016) | F |
| ↑ MARKSPEND & PHYSNLED & ↑BENECC & ↑BENEDUAL & ↑ACOBENE | 0.900 | 0.090 | ACCC (2017); UniPhy (2016); Primaria (2018, 2019) | G |
| ↑ MARKSPEND & PHYSNLED & ↑BENECC ↓BENEDUAL & ↓ACOBENE | 0.962 | 0.146 | ACC of TN (2018, 2019); ACCST (2017, 2018, 2019); Accountable Care Options (2017, 2018, 2019); Primary Care Alliance (2018, 2019) | H |
| ↓ MARKSPEND & PHYSNLED & ↓BENECC & ↑BENEDUAL & ↓ACOBENE & ↓ACORISK | 0.917 | 0.082 | HCP (2017, 2018); Hill (2017) | I |
| NONPHYSNLED & ↓BENEDUAL & ↑ACOEXP & ↑ACOBENE & ↓ACORISK | 0.922 | 0.213 | Carilion (2019); UnityPoint (2018, 2019); UW Health (2019); Triad (2019); St. Luke's (2019); Arizona (2019); Deaconess (2019); Trinity (2018, 2019) | J |
| ↓BENECC & ↓BENEDUAL & ↑ACOEXP & ↑ACOBENE & ↓ACORISK | 0.932 | 0.276 | Carilion (2019); UnityPoint (2018, 2019); UW Health (2019); CareMount (2018); St. Luke's (2019); Atrius (2018, 2019) | K |
| ↓ MARKSPEND & PHYSNLED & ↓BENECC & ↓BENEDUAL & ↑ACOEXP & ↓ACORISK | 0.950 | 0.078 | CareMount (2019, 2018) | L |
| ↓ MARKSPEND & PHYSNLED & ↓BENECC & ↑ACOEXP & ↓ACOBENE & ↓ACORISK | 0.939 | 0.081 | HCP (2018); CareMount (2019) | M |
| ↑ MARKSPEND & PHYSNLED & ↑BENECC & ↓ACORISK | 0.882 | 0.127 | NatACO (2017); UniPhy (2016, 2017); ACCC (2017); ACC of TN (2018); ACCST (2017, 2018); Optum (2017) | N |

We utilized case level data to validate the pathways for each NGACO. To facilitate interpretation of the identified causal pathways, we stratified the pathways based on relatively more exogenous factors that are likely to influence the NGACOs implementation approach—the efficiency of the health care spending in the NGACOs' markets and their organizational affiliation. We employed a factorization function in R to further group the pathways based on common factors that were present across pathways. Some NGACOs met the criteria to be included in more than one pathway. We used qualitative evidence to resolve such overlaps and assigned each NGACO to a specific pathway. **Exhibit B.8** presents the results of this stratification. It also presents which of the original pathways comprised each of the final pathways.

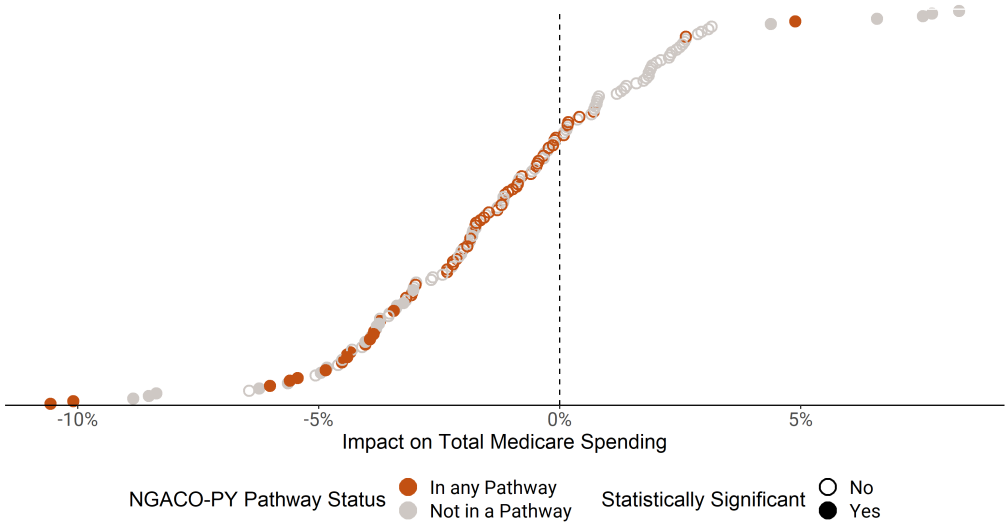
**Exhibit B.8.** Potential Pathways Identified by the Intermediate Solution

| Context | Organizational Affiliation (Type) | Structure | Attributed Beneficiary Population | Risk Level | Final Pathway | Interim Pathway Label |
|---|---|---|---|---|---|---|
| Markets with Higher Medicare Spending in the BY (↑ MARKSPEND) | Physician practice-led ACOs (PHYSNLED) | More aligned beneficiaries (↑ACOBENE) | Fewer chronic conditions (↓BENECC) AND Fewer dually eligible beneficiaries (↓BENEDUAL) | ACO takes on less risk (↓ACORISK) | 1 | A, B, G, N |
| | | | More chronic conditions (↑BENECC) OR More dually eligible beneficiaries (↑BENEDUAL) | | | |
| | | | More chronic conditions (↑BENECC) AND More dually eligible beneficiaries (↑BENEDUAL) | Agnostic of risk level (ACORISK) | | |
| | | Fewer aligned beneficiaries (↓ACOBENE) | More chronic conditions (↑BENECC) AND Fewer dually eligible beneficiaries (↓BENEDUAL) | Agnostic of risk level (ACORISK) | 2 | F, H |
| | | Less Experience (↓ACOEXP) | Fewer chronic conditions (↓BENECC) AND Fewer dually eligible beneficiaries (↓BENEDUAL) | | | |
| | | Fewer aligned beneficiaries (↓ACOBENE) AND Less Experience (↓ACOEXP) | More chronic conditions (↑BENECC) AND More dually eligible beneficiaries (↑BENEDUAL) | | | |
| | IDS / Hospital / PHP ACOs (NONPHYSNLED) | More ACO experience (↑ACOEXP) | More chronic conditions (↑BENECC) | ACO takes on less risk (↓ACORISK) | 3 | C, D |
| | | More aligned beneficiaries (↑ACOBENE) | More chronic conditions (↑BENECC) | | | |

| Context | Organizational Affiliation (Type) | Structure | Attributed Beneficiary Population | Risk Level | Final Pathway | Interim Pathway Label |
|---|---|---|---|---|---|---|
| | | More ACO experience (↑ACOEXP) AND More aligned beneficiaries (↑ACOBENE) | More chronic conditions (↑BENECC) AND More dually eligible beneficiaries (↑BENEDUAL) | | | |
| | | | More chronic conditions (↑BENECC) | | | |
| Markets with Lower Medicare Spending in the BY (↓ MARKSPEND) | Physician practice-led ACOs (PHYSNLED) | Fewer aligned beneficiaries (↓ACOBENE) | More chronic conditions (↑BENECC) AND More dually eligible beneficiaries (↑BENEDUAL) | ACO takes on less risk (↓ACORISK) | 4 | I, L, M |
| | | More ACO experience (↑ACOEXP) | Fewer chronic conditions (↓BENECC) AND Fewer dually eligible beneficiaries (↓BENEDUAL) | | | |
| | IDS / Hospital / PHP ACOs (NONPHYSNLED) | More aligned beneficiaries (↑ACOBENE) | More chronic conditions (↑BENECC) | ACO takes on less risk (↓ACORISK) | 5 | E, J, K |
| | | More ACO experience (↑ACOEXP) AND More aligned beneficiaries (↑ACOBENE) | Fewer dually eligible beneficiaries (↓BENEDUAL) | | | |

Once an NGACO was assigned to a pathway, we conducted detailed case-level reviews to validate the pathway assignment (e.g., supporting qualitative evidence that the ACO perceived the market as high-spending, which informed care delivery; presence of programs targeting high-risk beneficiaries and social needs if the pathway indicated beneficiaries were dually eligible and high risk). If an NGACO could be assigned to multiple pathways, we assessed the case-level information to select the pathway that best fit the qualitative and quantitative data. As shown in Exhibit B.9, the five causal pathways account for almost half of the NGACOs that reduced spending. About 10 percent of the NGACOs in the causal pathways had spending increases. This was expected because we set the Sufficiency inclusion threshold to 0.9. We do not recommend generalizing findings from this analysis because the causal pathways only account for a subset of NGACOs that reduced spending.

**Exhibit B.9.** Distribution of NGACO-PYs, Identified Pathway Coverage and Statistical Significance in Total Medicare Parts A and B Gross Spending




**SOURCE:** NORC analysis of claims data.
NOTE: Each symbol represents one NGACO Performance Year. Colors depict cases covered by a causal pathway based on whether their combination of characteristics was identified (set of causal factors) by the fsQCA algorithm. Fill (hollow vs. filled) identifies NGACO-PYs that significantly reduced or increased total Parts A and B Medicare spending.

After we validated the pathway assignments for each NGACO in this analysis, we used an iterative process to identify discrete themes that could inform the variety of strategies that NGACOs have employed (e.g., related to NGACO environment [i.e., market], NGACO structure and resources, and care delivery approach). We described specific examples from NGACO-PYs to illustrate the variety of strategies to reduce spending that may exist within a given pathway.

### Step 3.d. Sensitivity Testing

To test the robustness of the results to alternate specifications, we analyzed necessity and sufficiency using alternate calibration approaches and choice of meta-factors. Appendix Exhibit B.10 presents the results of the necessity and sufficiency analysis, which remained largely unchanged, with the exception of the sensitivity test that involved the exclusion of NGACOs with DID gross spending impact estimates that failed the parallel trends test.

We performed the following sensitivity tests (see **Exhibit B.10** below for a summary of sensitivity test findings.):

- *Proxy substitution*, to determine whether the exchange of variables that represent similar factors would change the analysis. We replaced key variables from the original analysis with their next closest proxies in our data.
- *Manual calibration modifications*, to demonstrate the robustness of the outcome and the appropriateness of calibration cutoffs for these variables. This analysis was performed on the outcome measure (percent impact of total Medicare cost of care); based on the results of this analysis, the coverage of 30 more NGACO-PY performance years was added, as well as a greater number of pathways comprising key factors.

- *Manual QCA modification*, to explore whether the QCA analysis itself was sensitive to minor adjustments in the code.

## Exhibit B.10. Sensitivity Analysis Approaches and Implications

| Sensitivity Analysis | Original Approach | Sensitivity Change | Implications of Analysis |
|---|---|---|---|
| Proxy Substitution | Proxy for NGACO-PY size: Number of aligned beneficiaries | Proxy for NGACO-PY size: Number of participating and preferred providers in network | No pathways for hospital-affiliated ACOs<br>No pathways for ACOs in low spending markets |
| | Proxy for Medicare ACO years of experience including NGACO-PY years of experience | Proxy for years of Medicare ACO years of experience excluding NGACO-PY years of experience | N/A |
| | Disease burden determined by mean number of chronic conditions (MCC) | Disease burden determined by hierarchical condition category (HCC) risk score | No pathways for NGACO-PYs in low spending markets |
| Calibration | Calibration of % impact of total Medicare cost of care:<br>Inclusion > -7%; Crossover = 50th percentile; Exclusion < 4% | Calibration of % impact of total Medicare cost of care:<br>Inclusion set at the first NGACO-PY that reduced spending, passed the parallel trends test, and was statistically significant<br>Crossover = 0%, Exclusion set at the first NGACO-PY that increased spending, passed the parallel trends test, and was statistically significant | Analysis resulted in an increase in 30 more NGACO-PYs covered and an increase in the number of pathways with the following characteristics: high baseline spending, low baseline spending, physician practice-affiliated NGACO-PYs, hospital-affiliated NGACO-PYs, and more or less economies of scale. |
| | Minimum risk index set to 0 for calibration. For the remaining ACOs, calibration of risk index was based on the below information:<br>Inclusion > 15%; Crossover = 8%; Exclusion < 5% | Risk index set to crisp set*:<br>< 5% is 0; >= 5% is 1 | N/A |
| | Calibration of MCC/aligned beneficiary:<br>Inclusion > 6.91; Crossover = 5.42; Exclusion < 4.59 | Calibration of MCC/aligned beneficiary:<br>Inclusion > 6.91; Crossover = 4; Exclusion < 2 | No pathways for hospital affiliated NGACO-PYs<br>No pathways for NGACO-PYs in low spending markets |
| QCA Analysis Code Modification | Minimum number of cases needed to be present: 1 | Minimum number of cases needed to be present: 2 | No pathways for hospital-affiliated NGACO-PYs |
| | Minimum inclusion score: 0.9 | Minimum inclusion score: 0.89 | No pathways for hospital-affiliated NGACO-PYs |
| | | Minimum inclusion score: 0.91 | No pathways for hospital-affiliated NGACO-PYs<br>No pathways for ACOs in low spending markets |
| | Intermediate solution | Conservative solution | N/A |
| | Intermediate solution | Parsimonious solution | No pathways for hospital-affiliated NGACO-PYs |

**NOTE:** * Crisp set is QCA for binary data, where the data are entirely included or excluded from a set.

## Step 4. Integration of Quantitative and Qualitative Data to Validate and Interpret Causal Pathways

After identifying the causal pathways, we analyzed and synthesized quantitative, qualitative, and programmatic data to identify other shared contextual, structural, and implementation factors of the NGACOs in each causal pathway. First, we assessed whether the patterns in Medicare spending by service area (e.g., hospital-based, post-acute, professional services) for NGACOs in the pathway differed when compared to other NGACOs. We utilized qualitative data to identify implementation strategies employed by the NGACOs in the pathway that may have led to the observed patterns in Medicare spending by service area. Next, we descriptively assessed how other contextual and structural factors of the NGACOs in the causal pathway, such as the competitiveness of the health care market, and characteristics of the NGACO provider network, differed when compared to other NGACOs. Using case-level information, we assessed how these factors may have influenced the provider engagement and care management strategies employed by these NGACOs.

Qualitative and programmatic data were used to verify and support the pathways: using an iterative, consensus-building process, we reviewed qualitative evidence to identify potential contextual, structural, and implementation strategies that affected spending in each pathway. For each NGACO-PY associated with a QCA pathway, we reviewed qualitative data collected during baseline interviews, site visits, and virtual site visits with the NGACOs conducted between March 2017 and March 2019. We extracted qualitative data in the following categories:

- NGACOs' perception of their market environment and competition
- NGACOs' perceptions of beneficiary characteristics and needs
- NGACO organizational type (affiliation) and structure
- Reasoning behind risk-level selection
- Past value-based, Medicare Advantage (MA), or ACO experience (commercial, Medicare, and/or Medicaid)
- An overview of care management provided by the NGACO; description of NGACO provider networks (individual practitioners and facilities)
- Evidence of NGACOs leveraging economies of scale (e.g., health information technology [HIT] infrastructure, or replicating or applying existing processes and resources to the NGACO model)
- NGACO leadership perceptions of sustainability or possibility of success in the model

## Step 5. Case Study Assessment

Our final step in QCA developed illustrative case studies, further leveraging our qualitative data to explore selected cases in each pathway. We used the information sources outlined in Step 4 (i.e., baseline/second-round interview transcripts, site visit summaries, profiles based on application data, and exit interviews [when applicable]). Data were analyzed through a collaborative case selection process, with findings deliberated among qualitative leads and in consultation with mixed-methods and quantitative teams. Case selection was based on availability of qualitative information (i.e., the number of data sources for a particular NGACO); whether case information balanced cross-cutting insights about NGACOs and the NGACO's unique features, so as to exclude extreme outlier cases; and the richness of available information concerning the QCA

pathways and factors of interest. NGACOs that exited the model were excluded from the case selection process.

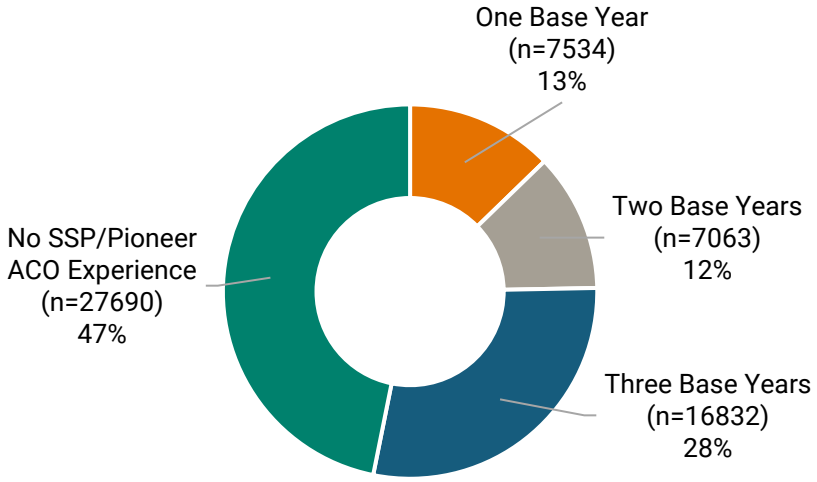
Once we selected one to two cases per pathway, qualitative data were reviewed and synthesized to develop an illustrative narrative for specific NGACOs. All case studies were organized into the following sections: Market Context, NGACO Structure, and Care Delivery. Within this structure, each case study describes and highlights qualitative themes relevant to that NGACO's corresponding pathway. As appropriate, we incorporated narrative mentions of key quantitative outcomes that supported thematic discussion.

# Appendix C: Exhibits to Support Chapter 1

This Appendix presents supplemental exhibits that offer detailed descriptions of provider networks, organizational and provider characteristics, NGACO-aligned beneficiaries, and NGACO model features selected. The exhibits support the summary-level descriptions presented in Chapter 1 and are as follows:

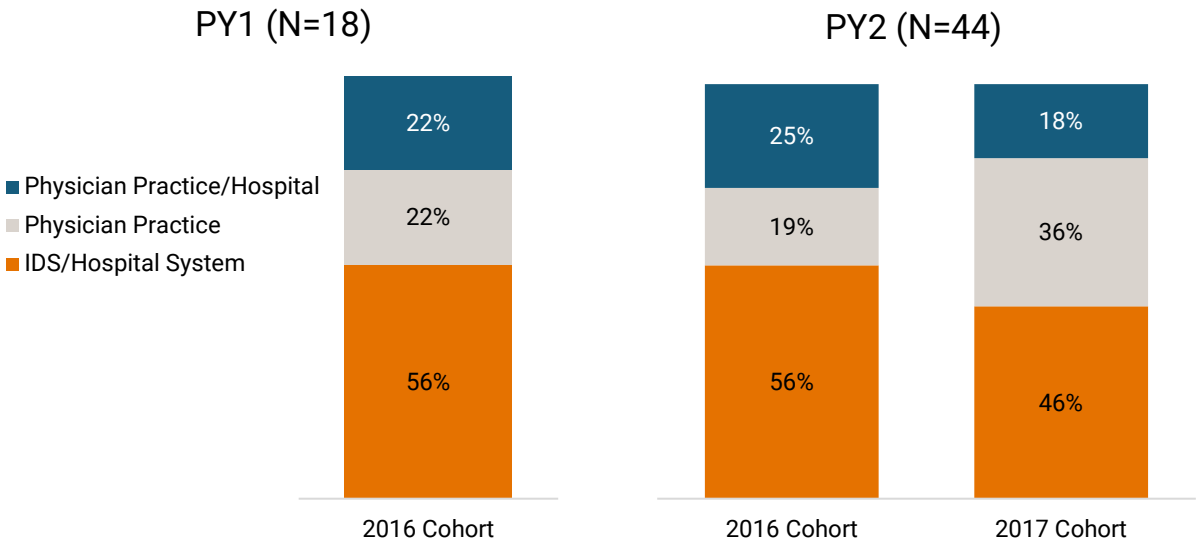
- Provider (practitioner) network characteristics
  - Prior experience of participating practitioners with Medicare ACOs, model-wide, PY4 (**Exhibit C.1**)
  - NGACO organizational affiliation by cohort and PY (**Exhibit C.2**)
  - Practitioners per NGACO by NGCO organizational affiliation, model-wide, PY1 – PY4 (**Exhibit C.3**)
  - Preferred provider network characteristics, model-wide, PY1 – PY4 (**Exhibit C.4**)
  - Provider network characteristics by cohort, PY1 – PY4 (**Exhibit C.5**)
- Provider (facilities) network characteristics, PY1 – PY4
  - For 2016 cohort (**Exhibit C.9**), 2017 cohort (**Exhibit C.10**), and 2018 cohort (**Exhibit C.11**)
  - By NGACO organizational affiliation: IDS/hospital system (**Exhibit C.12**), physician practice (**Exhibit C.13**), and physician practice/hospice (**Exhibit C.14**)
- Average number of aligned beneficiaries per NGACO, PY1 - PY4 (**Exhibit C.15**)
- NGACO model features selected, PY1 - PY4
  - For 2016 cohort (**Exhibit C.16**), 2017 cohort (**Exhibit C.17**), and 2018 cohort (**Exhibit C.18**)
  - By NGACO organizational affiliation: IDS/hospital system (**Exhibit C.19**), physician practice (**Exhibit C.20**), and physician practice/hospital (**Exhibit C.21**)

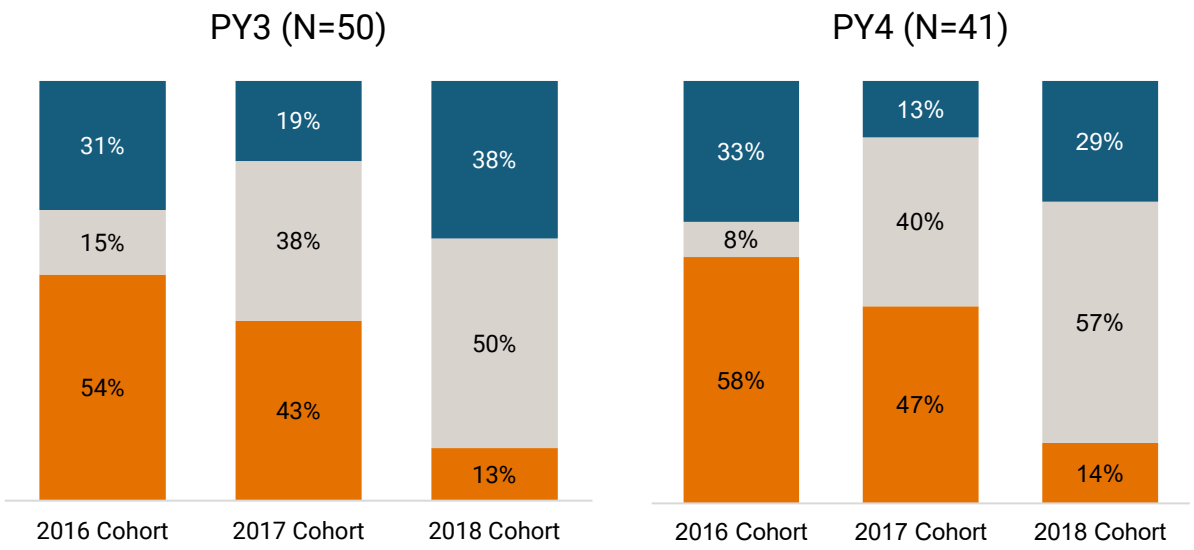
## Exhibit C.1. Provider Networks: In PY4, More than Half of Participating Practitioners Had Prior Experience in Pioneer or Shared Savings Program ACOs




**SOURCE**: PY4 NGACO participating provider list linked to historical Shared Savings Program and Pioneer ACO participating provider lists (2013-2019) from CMS via National Provider Identifier (NPI). BYs for 2016 cohort are 2013-2015, BYs for 2017 cohort are 2014-2016, and BYs for 2018 cohort are 2015-2017.

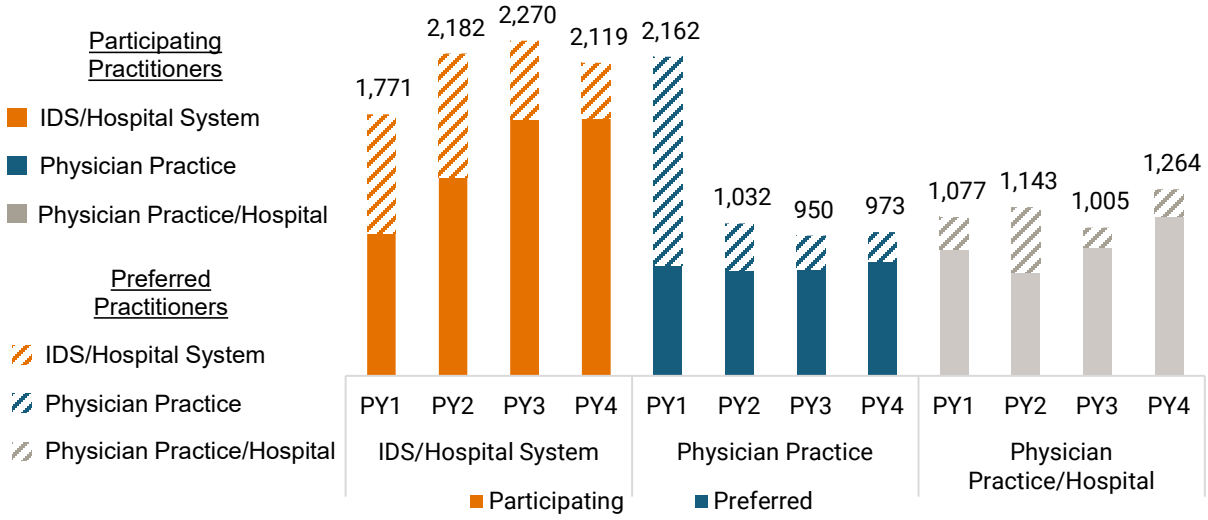
## Exhibit C.2. NGACO Organizational Affiliation by Cohort and PY





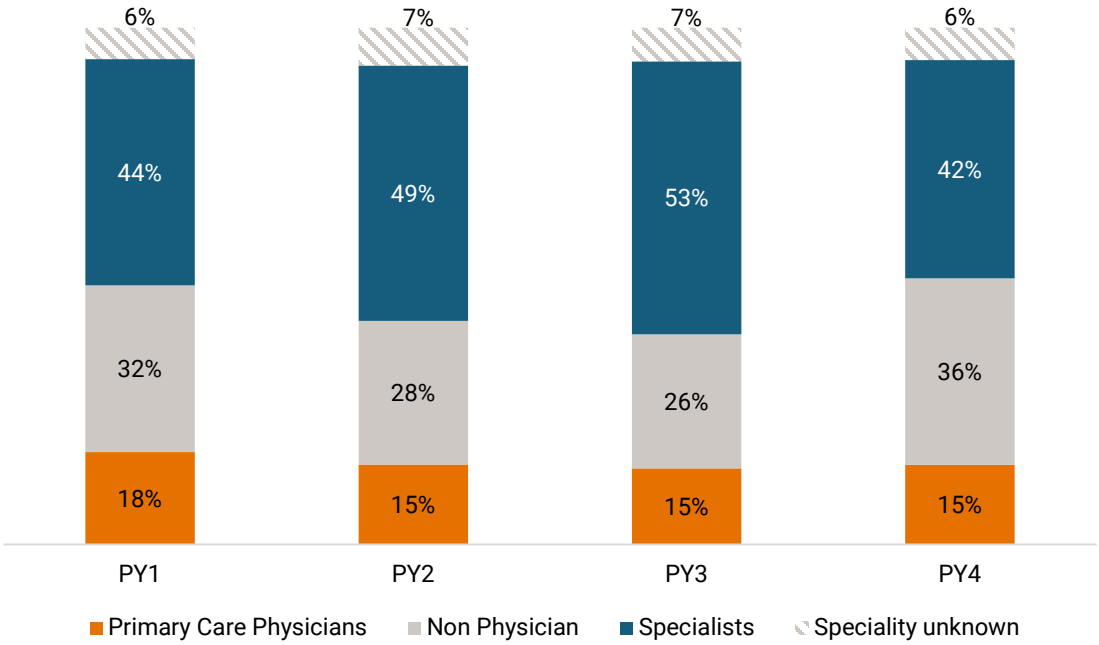

**SOURCE:** NORC analysis of NGACO qualitative and provider data.

## Exhibit C.3. Practitioners per NGACO by NGACO Organizational Affiliation, Model-wide, PY1 – PY4




**SOURCE:** NORC analysis of NGACO provider data. Practitioners include participating and preferred practitioners.

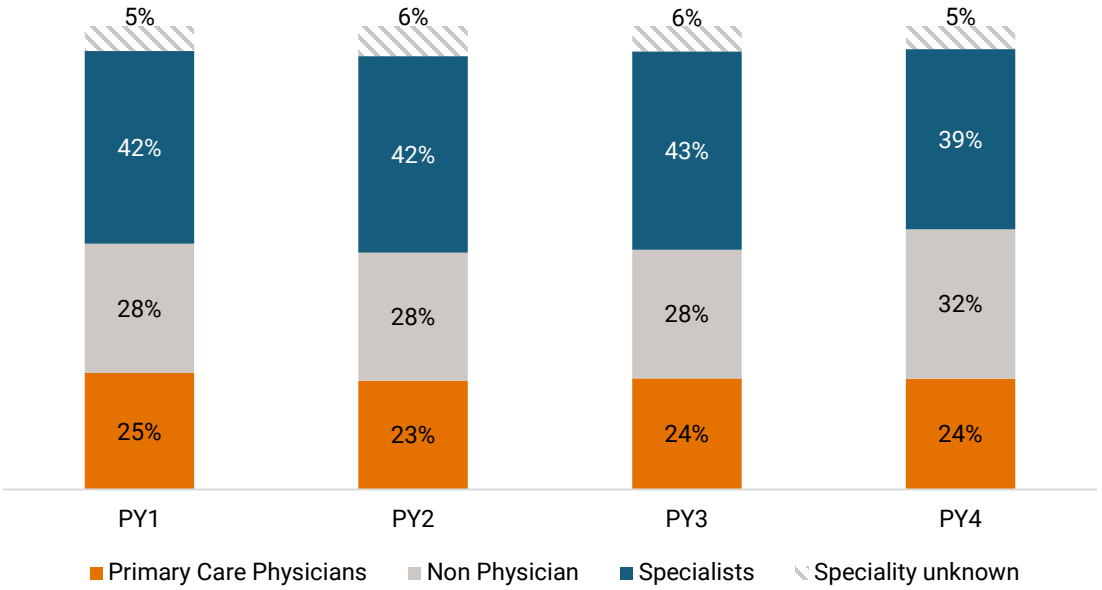
## Exhibit C.4. Preferred Provider Network Characteristics, Model-wide, PY1-PY4




**NOTES:** Specialists include medical/surgical specialty, obstetrics/gynecology, hospital-based specialty, and psychiatry. Unknown denotes practitioner specialty unidentified.

**SOURCE:** NORC analysis of NGACO provider data linked to CMS provider files. Medicare Data on Physician and Physician Specialties (MD-PPAS) categories were used to group the taxonomy code for individual practitioners reported on the National Plan and Provider Enumeration System into the broad specialty classification provided in CMS MD-PPAS documentation. See Appendix A for more information.

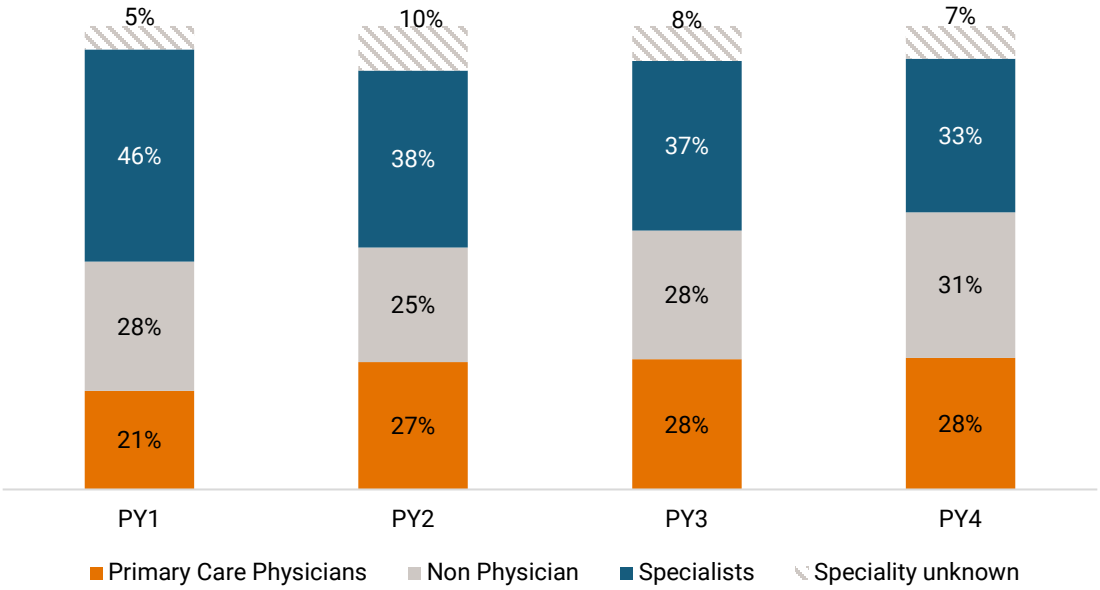
## Exhibit C.5. Provider Network Characteristics for NGACOs Affiliated with IDS/Hospital System, PY1-PY4




**NOTES:** Specialists include medical/surgical specialty, obstetrics/gynecology, hospital-based specialty, and psychiatry. Unknown denotes practitioner specialty unidentified.

**SOURCE:** NORC analysis of NGACO provider data linked to CMS provider files. Medicare Data on Physician and Physician Specialties (MD-PPAS) categories were used to group the taxonomy code for individual practitioners reported on the National Plan and Provider Enumeration System into the broad specialty classification provided in CMS MD-PPAS documentation. See Appendix A for more information.

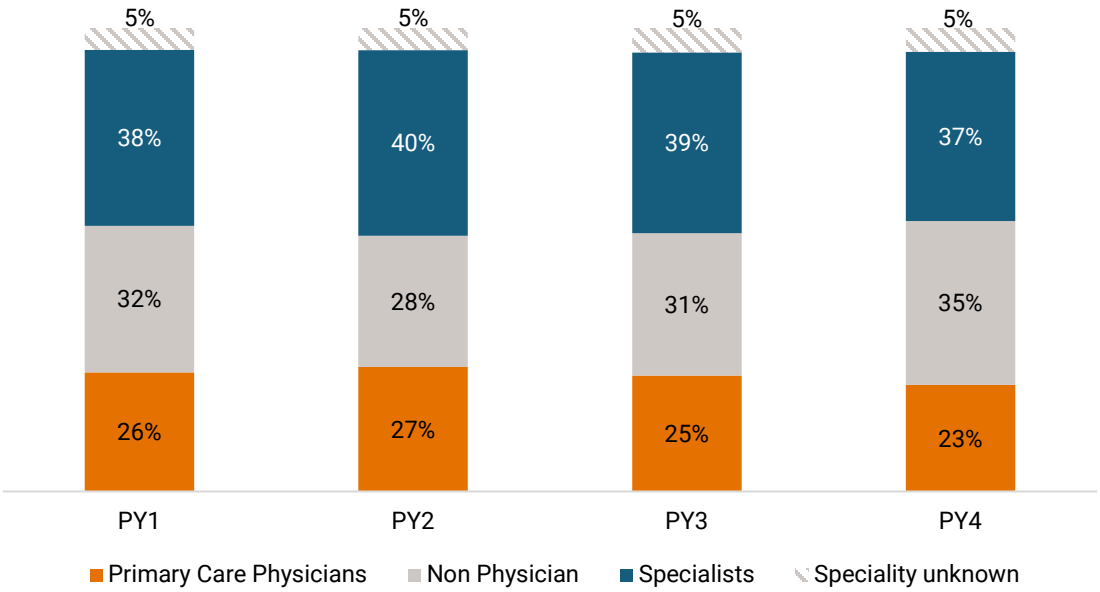
**Exhibit C.6.** Provider Network Characteristics for NGACOs Affiliated with Physician Practice, PY1-PY4




**NOTES:** Specialists include medical/surgical specialty, obstetrics/gynecology, hospital-based specialty, and psychiatry. Unknown denotes practitioner specialty unidentified.

**SOURCE:** NORC analysis of NGACO provider data linked to CMS provider files. Medicare Data on Physician and Physician Specialties (MD-PPAS) categories were used to group the taxonomy code for individual practitioners reported on the National Plan and Provider Enumeration System into the broad specialty classification provided in CMS MD-PPAS documentation. See Appendix A for more information.

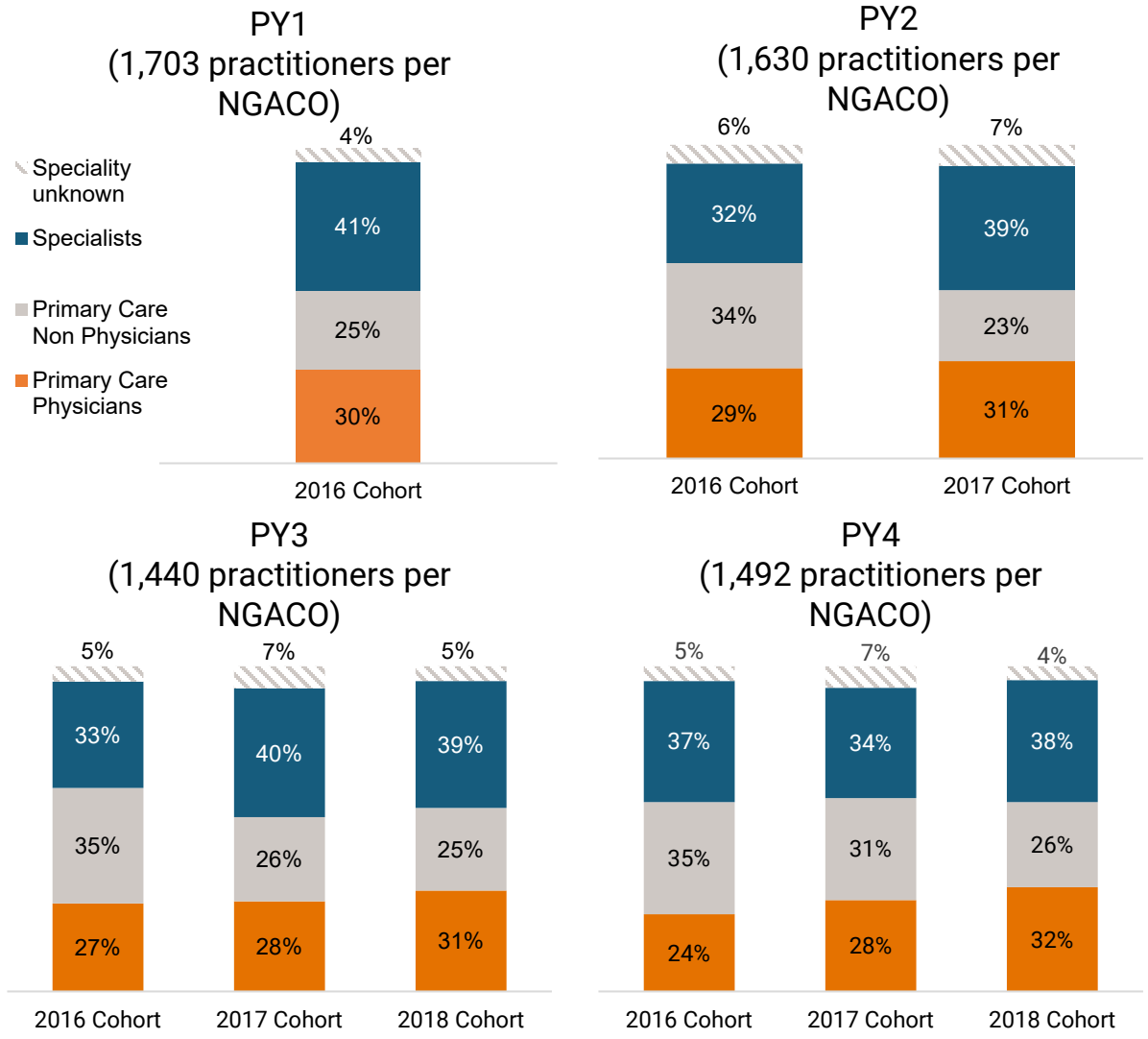
## Exhibit C.7. Provider Network Characteristics for NGACOs Affiliated with Physician Practice/Hospital, PY1-PY4




**NOTES:** Specialists include medical/surgical specialty, obstetrics/gynecology, hospital-based specialty, and psychiatry. Unknown denotes practitioner specialty unidentified.

**SOURCE:** NORC analysis of NGACO provider data linked to CMS provider files. Medicare Data on Physician and Physician Specialties (MD-PPAS) categories were used to group the taxonomy code for individual practitioners reported on the National Plan and Provider Enumeration System into the broad specialty classification provided in CMS MD-PPAS documentation. See Appendix A for more information.

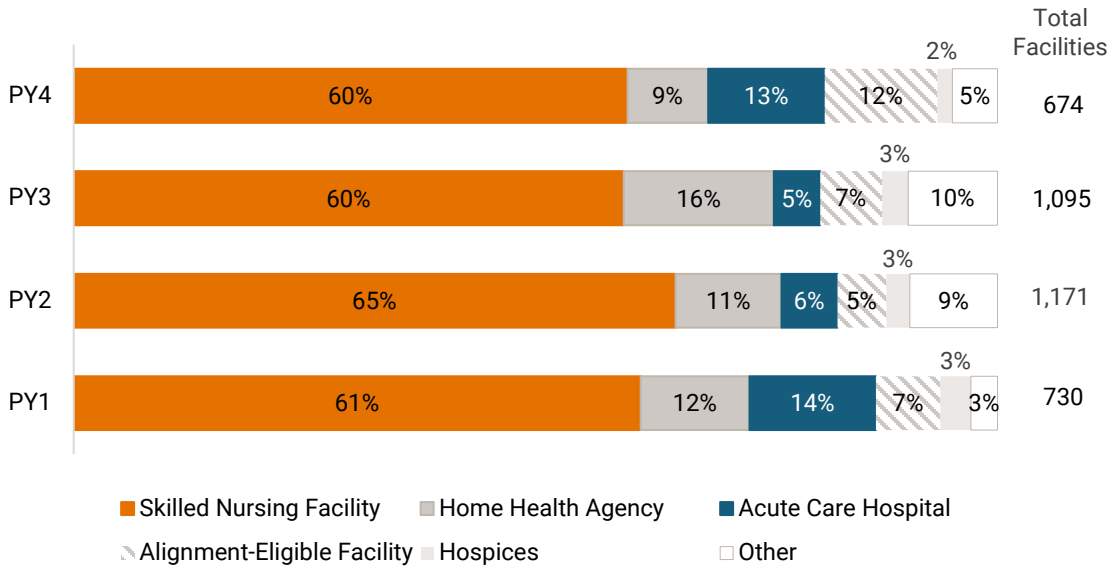
**Exhibit C.8.** Provider (Practitioners) Network Characteristics by Cohort, PY1 – PY4




**NOTES:** Primary Care = MD-PPAS; Non-physicians = MD-PPAS; Specialists = includes MD-PPAS medical/surgical specialty, obstetrics/gynecology, hospital-based specialty, and psychiatry; Unknown = practitioner specialty unidentified.

**SOURCE**: NORC analysis of administrative and claims data. MD-PPAS categories were used to group the taxonomy code for individual practitioners reported on the National Plan and Provider Enumeration System into the broad specialty classification provided in CMS MD-PPAS documentation. See Appendix A for more information.

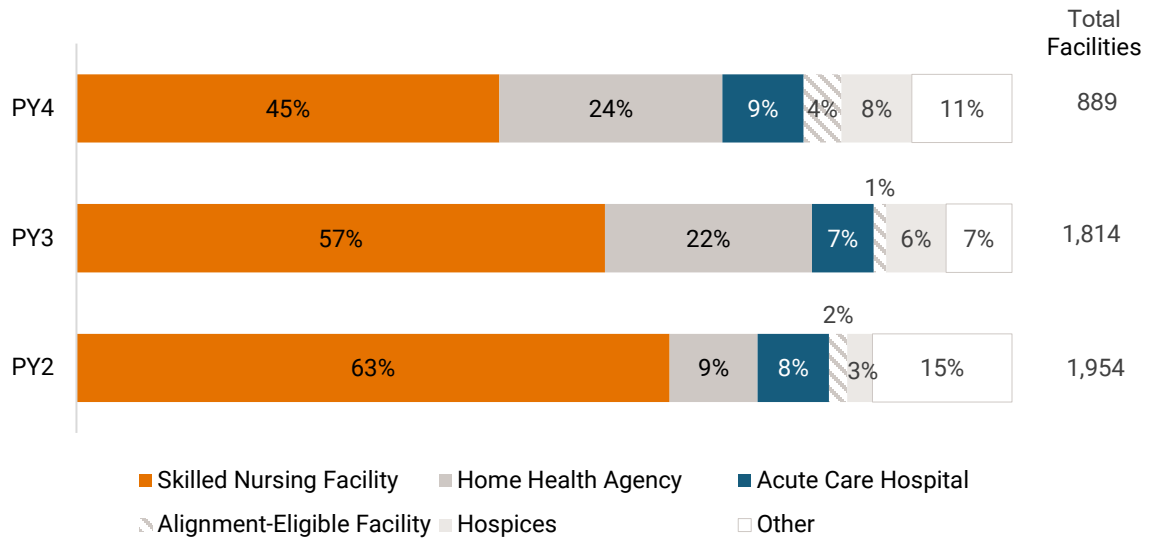
## Exhibit C.9. Provider (Facilities) Network Characteristics, 2016 Cohort, PY1 – PY4




**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally-Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.

**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each PY. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identified the institution type by the third digit of the CCN. See Appendix A for more information.

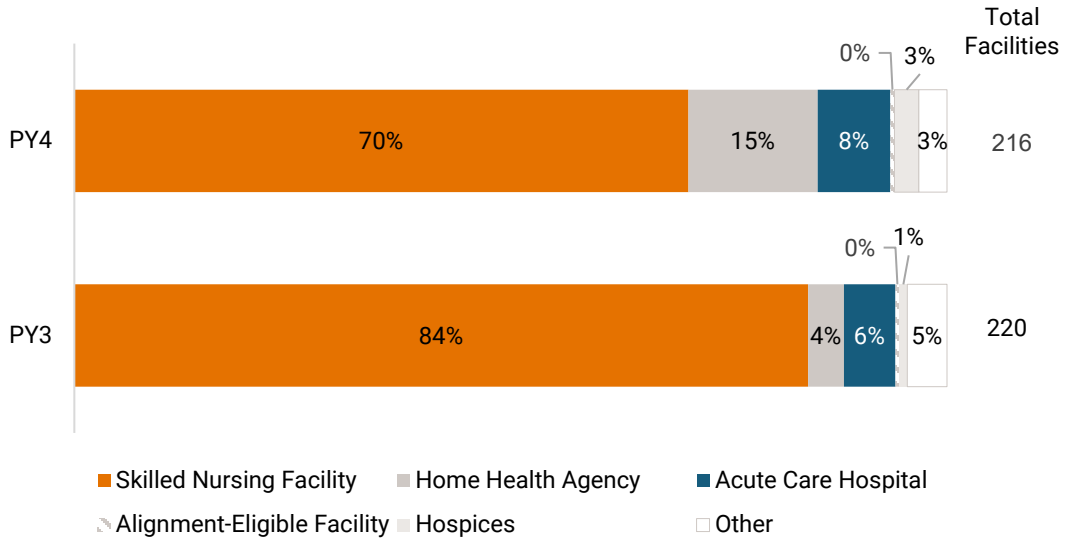
## Exhibit C.10. Provider (Facilities) Network Characteristics, 2017 Cohort, PY1 – PY4




**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.

**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each PY. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identified the institution type by the third digit of the CCN. See Appendix A for more information.

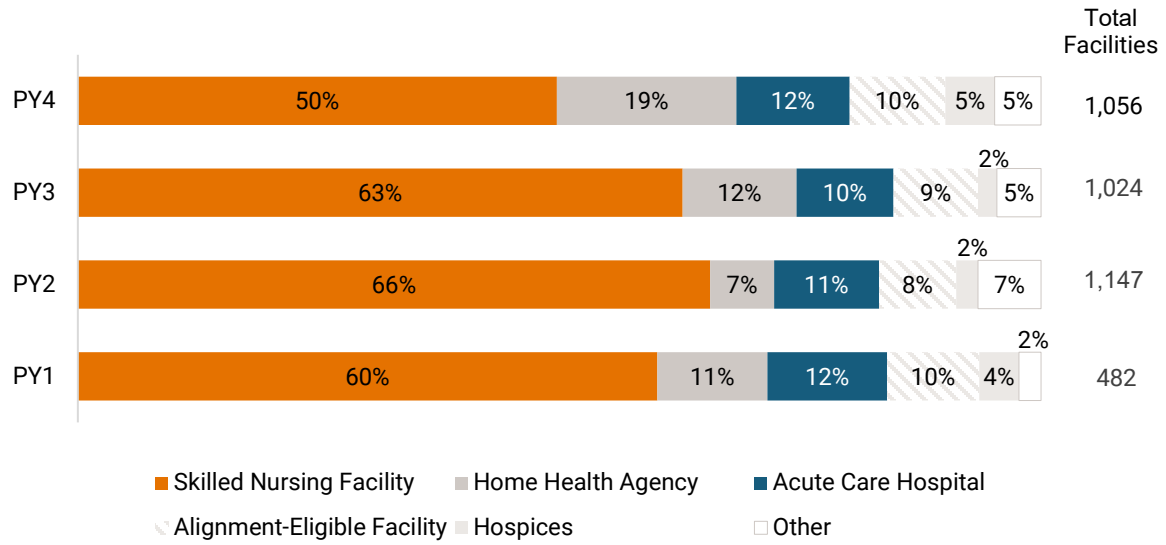
## Exhibit C.11. Provider (Facilities) Network Characteristics, 2018 Cohort, PY1 – PY4




**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.

**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each performance year. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identified the institution type by the third digit of the CCN. See Appendix A for more information.

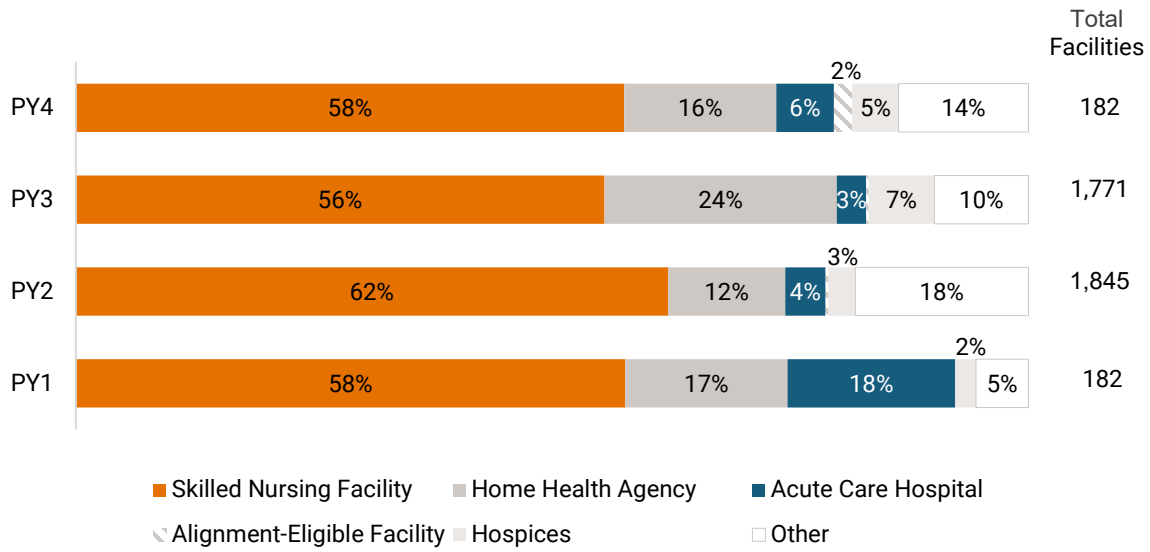
## Exhibit C.12. Provider (Facilities) Network Characteristics for NGACOs Affiliated with IDS/Hospital System, PY1 – PY4




**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.

**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each performance year. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identified the institution type by the third digit of the CCN. See Appendix A for more information.

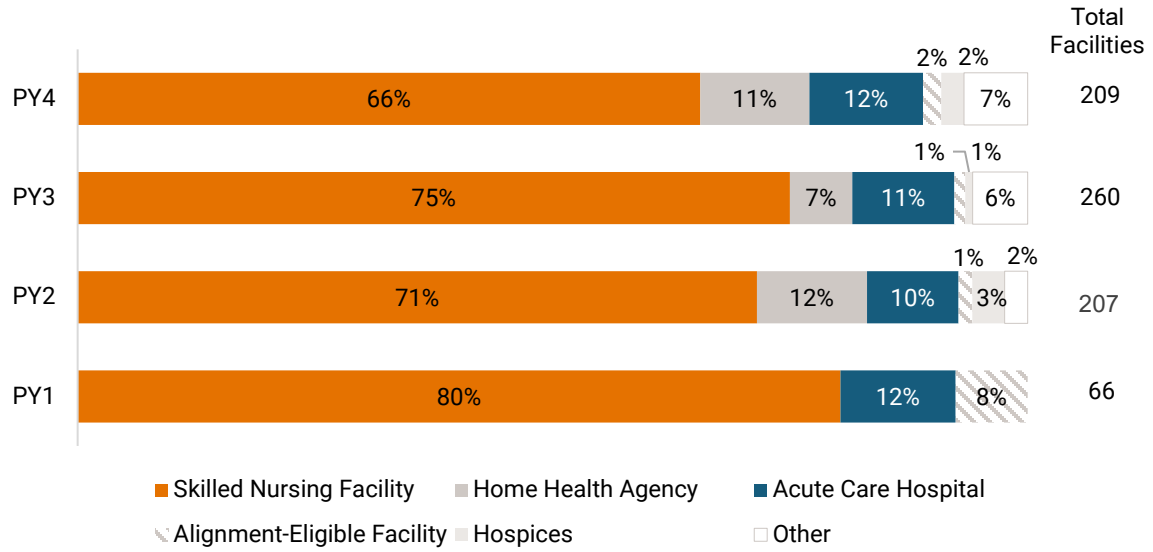
## Exhibit C.13. Provider (Facilities) Network Characteristics for NGACOs Affiliated with Physician Practice, PY1 – PY4




**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.

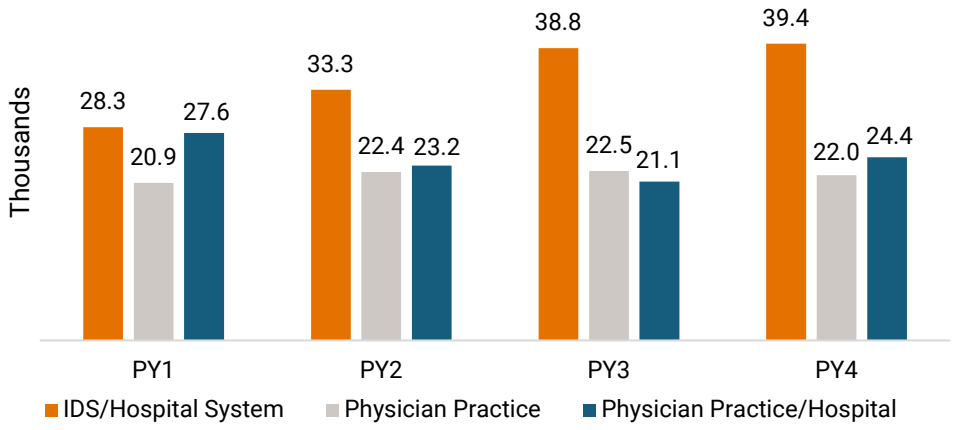
**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each performance year. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identify the institution type by the third digit of the CCN. See Appendix A for more information.

## Exhibit C.14. Provider (Facilities) Network Characteristics for NGACOs Affiliated with Physician Practice/Hospital, PY1 – PY4



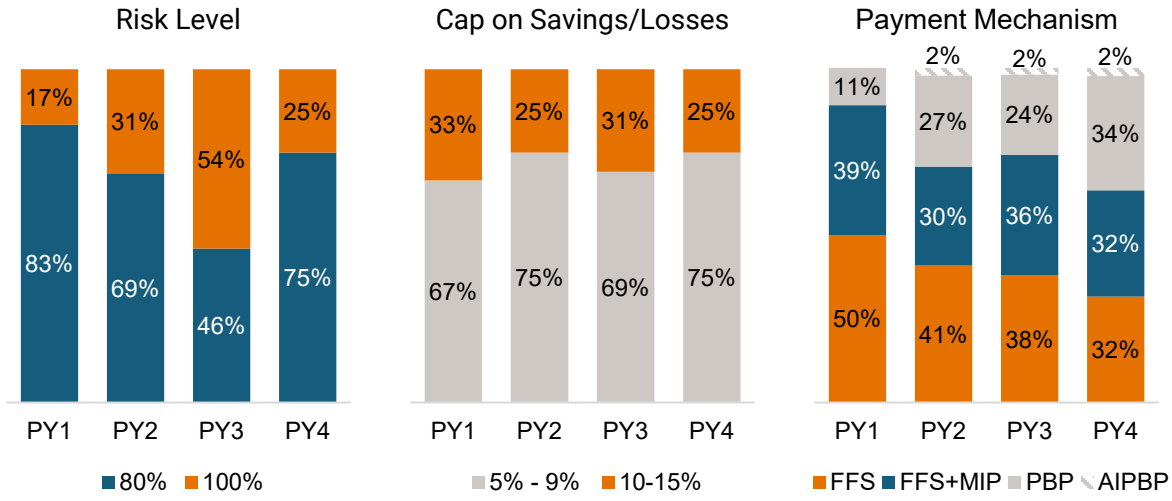

**NOTES:** Alignment-eligible facilities are defined as Critical Access Hospitals billing professional services for outpatient care, Federally Qualified Health Centers, and Rural Health Clinics; SNF=Skilled Nursing Facility; Other=all other facility types.
**SOURCE**: NORC analysis of administrative and claims data for PY4 (2019). We used multiple data sources to summarize provider characteristics. We identified participating institutions using their taxpayer identification number (TIN), national provider identifiers, and/or their CMS Certification Number (CCN) at the beginning of each performance year. For participating institutions in the NGACO model, we obtained data from CMS that were compiled by the NGACO program analysis contractor. We linked these data on participating institutions to multiple CMS provider datasets and identify the institution type by the third digit of the CCN. See Appendix A for more information.

## Exhibit C.15. Average Number of Aligned Beneficiaries per NGACO, PY1 – PY4



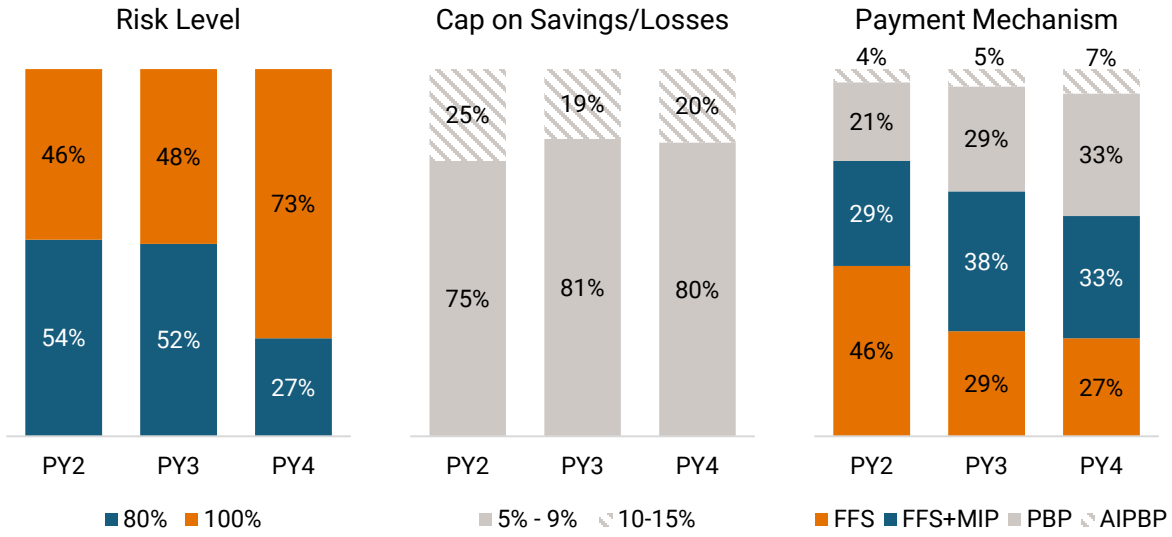

**SOURCE:** NORC analysis of NGACO model beneficiary data.

## Exhibit C.16. NGACO Model Features Selected, 2016 Cohort, PY1 – PY4



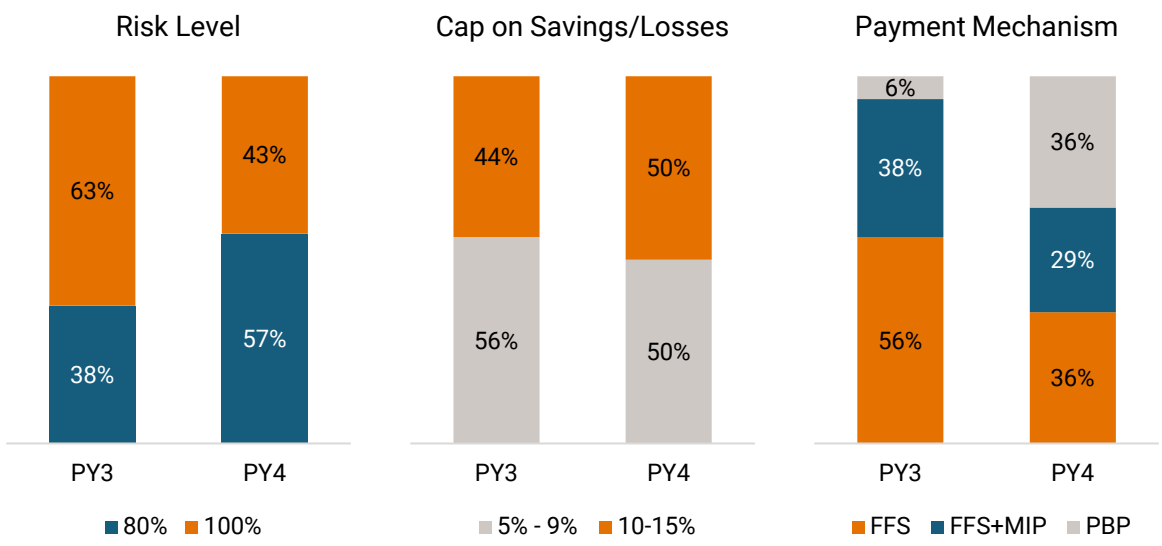

**NOTES:** FFS = fee-for-service; FFS+MIP=FFS and monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

## Exhibit C.17. NGACO Model Features Selected, 2017 Cohort, PY1 – PY4



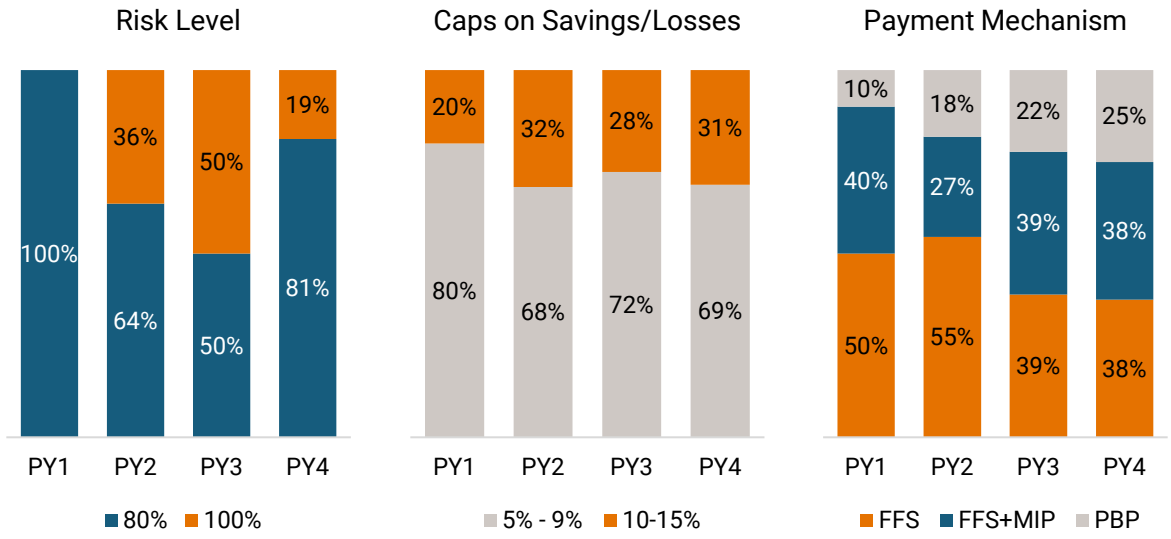

**NOTES:** FFS = fee-for-service; FFS and MIP=FFS & monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

## Exhibit C.18. NGACO Model Features Selected, 2018 Cohort, PY1 – PY4



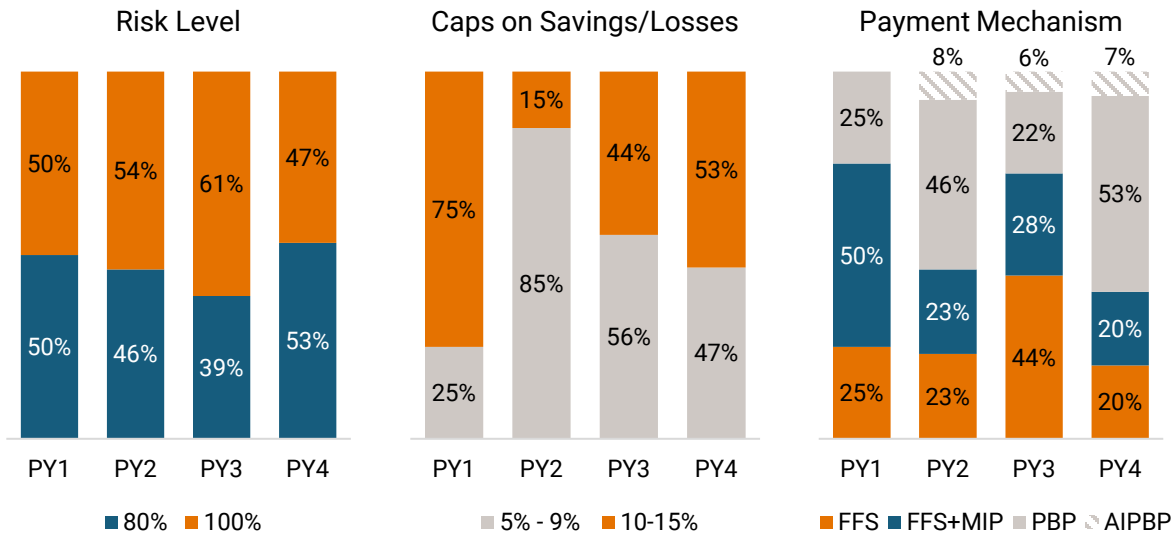

**NOTES:** FFS = fee-for-service; FFS and MIP=FFS & monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

## Exhibit C.19. Model Features Selected for NGACOs Affiliated with IDS/Hospital System, PY1–PY4



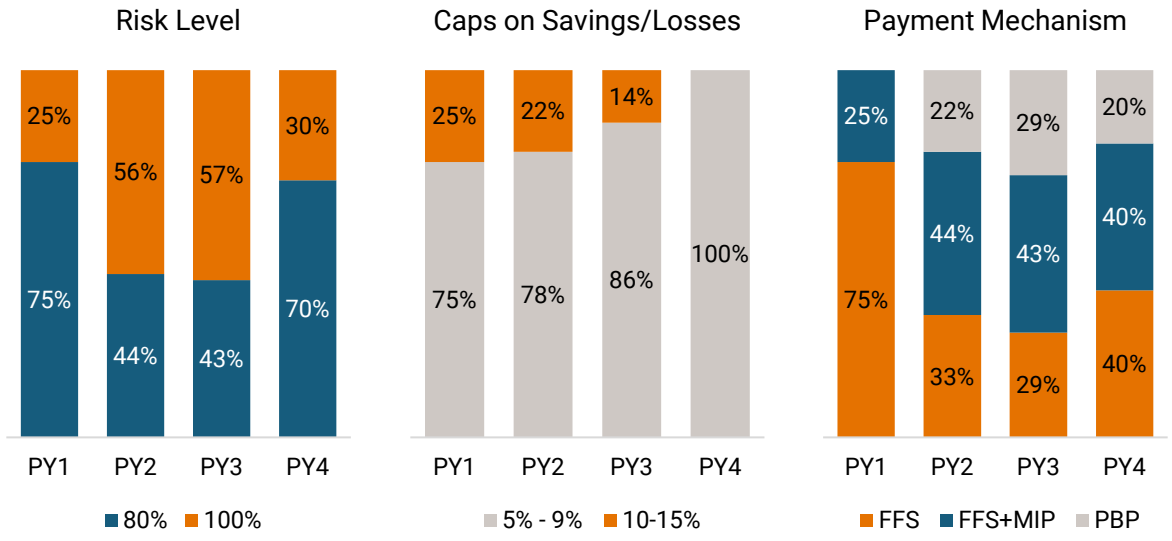

**NOTES:** FFS = fee-for-service; FFS and MIP=FFS & monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

## Exhibit C.20. Model Features Selected for NGACOs Affiliated with Physician Practice, PY1–PY4




**NOTES:** FFS = fee-for-service; FFS and MIP=FFS & monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

## Exhibit C.21. Model Features Selected for NGACOs Affiliated with Physician Practice/Hospital, PY1–PY4




**NOTES:** FFS = fee-for-service; FFS and MIP=FFS & monthly infrastructure payments; PBP = population-based payment; AIPBP = all-inclusive PBP.
**SOURCE:** NORC's analysis of NGACO model programmatic data.

# Appendix D: Exhibits to Support Chapter 2

This Appendix presents supplemental exhibits that provide descriptive characteristics of NGACO-aligned and comparison group beneficiaries, sensitivity analyses, estimated impacts on gross Medicare spending by beneficiary subgroups and by care settings, and patterns of care. The exhibits support the summary discussion of model impacts on spending, utilization, and quality of care presented in Chapter 2 and are as follows:

- Descriptive Characteristics of NGACO-Aligned and Propensity Score-Weighted Comparison Beneficiaries, for 2016 Cohort (**Exhibit D.1**), 2017 Cohort (**Exhibit D.2**), and 2018 Cohort (**Exhibit D.3**)
- Sensitivity Analyses
  - Net Impact of the NGACO Model on Medicare Spending, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)—Plot (**Exhibit D.4**) and Heat Map (**Exhibit D.5**)
  - Net Impact of the NGACO Model on Medicare Spending by Cohort, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)—Plot (**Exhibit D.6**) and Heat Map (**Exhibit D.7**)
  - Estimated Impacts on Gross Medicare Spending after Excluding MIPS Adjustments, Model-Wide and by Cohort, PY4 (**Exhibit D.8**)
- Estimated Impacts on Gross Medicare Spending by Beneficiary Subgroups, Cumulatively as of PY4 and in PY4 (**Exhibit D.9**)
- Percentage of Total Gross Medicare Spending by Care Setting in BY(s), for NGACOs in the Model in PY4 (**Exhibit D.10**)
- Patterns of Care
  - NGACO Stickiness (Mean), Model-Wide and by Cohort, in PY4 and Cumulative (**Exhibit D.11**)
  - NGACO Direct Spillover (Mean) on Comparison Group from NGACO providers, Model-Wide and for Cohorts, in PY4 and Cumulative (**Exhibit D.12**)
- Estimated Impacts
  - Number of Beneficiaries with Evaluation and Management Visits, Cumulative and PY4 Only (**Exhibit D.13**)
  - Procedures, Tests, and Imaging Services, Cumulative and PY4 only (**Exhibit D.14**)
  - Home Health Spending, Episodes, and Visits, Cumulative and PY4 only (**Exhibit D.15**)
  - Durable Medical Equipment Spending, Cumulative and PY4 only (**Exhibit D.16**)

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

| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| Number of beneficiaries | 1479468 | 1469407 | 470657 | 464962 | - |
| Total person-months | 17060840 | 17066010 | 5478075 | 5421443 | - |
| **Variables Included in Propensity Score Models** | | | | | |
| Mean months of alignment (±SD) | 11.5 ± 1.9 | 11.6 ± 1.8 | 11.6 ± 1.6 | 11.7 ± 1.7 | 0.062*** |
| Mean age (years ± SD) | 73.0 ± 12.5 | 73.0 ± 12.7 | 73.4 ± 11.5 | 73.4 ± 11.7 | 0.114*** |
| **Gender (%)** | | | | | |
| Male | 41.9 | 41.9 | 42.6 | 42.6 | -0.011 |
| **Race/Ethnicity (%)** | | | | | |
| White | 87.1 | 87.4 | 86.5 | 86.7 | 0.044 |
| Black | 6.8 | 6.7 | 6.2 | 6.2 | -0.024 |
| Hispanic | 3.7 | 3.5 | 3.4 | 3.3 | -0.071 |
| Asian | 1.1 | 1.1 | 1.3 | 1.3 | 0.002 |
| Other | 1.3 | 1.3 | 2.5 | 2.5 | 0.050 |
| **Disability/ESRD (%)** | | | | | |
| Disability | 16.2 | 16.2 | 13.1 | 13.3 | -0.266** |
| ESRD | 1.0 | 1.1 | 0.9 | 0.9 | 0.003 |
| **Coverage (%)** | | | | | |
| Any dual eligibility | 20.6 | 20.9 | 17.9 | 18.2 | -0.165 |
| Any Part D coverage | 71.0 | 71.5 | 78.7 | 79.1 | 0.133 |
| **Chronic Conditions** | | | | | |
| Mean no. of chronic conditions (± SD) | 5.0 ± 3.5 | 5.1 ± 3.5 | 5.7 ± 3.8 | 5.7 ± 3.8 | 0.008 |
| Alzheimer's/dementia (%) | 8.5 | 8.9 | 8.5 | 8.9 | -0.105 |
| Chronic kidney disease (%) | 16.8 | 17.1 | 25.6 | 25.9 | -0.015 |
| COPD (%) | 11.3 | 11.4 | 11.9 | 12.0 | 0.024 |
| Congestive heart failure (%) | 13.0 | 13.2 | 13.2 | 13.5 | -0.021 |
| Diabetes (%) | 28.7 | 28.5 | 27.6 | 27.4 | 0.065 |
| Ischemic heart disease (%) | 27.8 | 27.8 | 25.8 | 25.9 | -0.032 |
| Depression (%) | 18.1 | 18.3 | 21.1 | 21.4 | -0.055 |
| RA/OA (%) | 32.1 | 32.2 | 36.0 | 35.9 | 0.179 |
| Stroke/TIA (%) | 3.6 | 3.6 | 3.5 | 3.6 | 0.016 |
| Cancer (%) | 9.0 | 9.1 | 9.7 | 9.8 | 0.108 |
| **Mortality (%)** | | | | | |
| Death in reference period | 4.2 | 4.9 | 3.8 | 4.5 | 0.071 |
| **Community Characteristics** | | | | | |
| Median income ($ ± SD) | 57135.5 ± 21813.5 | 57153.6 ± 21653.1 | 65877.3 ± 25168.5 | 65344.2 ± 24439.6 | 551.094*** |
| Below poverty line (% ± SD) | 13.3 ± 8.5 | 13.2 ± 8.5 | 12.0 ± 7.7 | 12.0 ± 7.6 | -0.024 |
| Bachelor's degree or higher (% ± SD) | 16.7 | 17.0 | 15.2 | 15.4 | 0.166 |
| Rurality (%) | 19.5 | 19.6 | 19.1 | 19.5 | -0.266** |
| Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD)‡ | 1.9 ± 1.0 | 1.9 ± 1.1 | 2.4 ± 1.3 | 2.4 ± 1.4 | 0.008** |

| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| **Variables Excluded from Propensity Score and Regression Models** | | | | | |
| **HRR Characteristics** | | | | | |
| ACO penetration rate (% ± SD) | 25.1 ± 16.3 | 25.2 ± 16.5 | 46.9 ± 9.5 | 46.8 ± 9.6 | 0.098 |
| Medicare Advantage penetration rate (% ± SD) | 28.3 ± 12.6 | 28.5 ± 12.7 | 36.5 ± 13.4 | 37.0 ± 13.5 | -0.123 |
| Hospital HHI (± SD) | 2617.1 ± 1455.6 | 2662.2 ± 1483.5 | 3281.6 ± 1656.8 | 3348.0 ± 1700.9 | 1.359 |
| Practice HHI (± SD) | 472.7 ± 500.1 | 475.3 ± 500.5 | 573.4 ± 537.5 | 572.0 ± 526.0 | 4.456 |
| Hospital beds (per 1,000 ± SD) | 2.7 ± 0.7 | 2.7 ± 0.7 | 2.6 ± 0.7 | 2.6 ± 0.7 | 0.000 |
| Alignment-eligible providers (per 1,000 population ± SD) | 1.4 ± 0.4 | 1.4 ± 0.3 | 2.0 ± 0.5 | 2.0 ± 0.5 | 0.004 |
| **Participation in Medicare ACOs (%)** | | | | | |
| NGACO | 0.0 | 0.0 | 100.0 | 0.0 | - |
| Pioneer/SSP ACO | 51.9 | 12.1 | 0.0 | 12.9 | - |
| **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 | 0.1 | - |
| Comprehensive Primary Care Classic or Plus | 0.7 | 0.3 | 0.0 | 5.9 | - |
| 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 | 0.6 | 0.5 | 0.6 | 2.4 | - |
| Comprehensive Care for Joint Replacement (CJR) Model | 0.0 | 0.0 | 0.0 | 0.1 | - |
| Oncology Care Model | 0.0 | 0.0 | 0.5 | 0.6 | - |

**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 Medicare Advantage 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) Specified HRR characteristics are not included in propensity score (PS) 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, 2013-2019 and ancillary data.

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

| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| Number of beneficiaries | 1604647 | 1590924 | 484152 | 486772 | - |
| Total person-months | 18483874 | 18515070 | 5643375 | 5690325 | - |
| **Variables Included in Propensity Score Models** | | | | | |
| Mean months of alignment (±SD) | 11.5 ± 1.9 | 11.6 ± 1.8 | 11.7 ± 1.6 | 11.7 ± 1.6 | 0.085*** |
| Mean age (years ± SD) | 73.3 ± 11.7 | 73.3 ± 11.8 | 74.1 ± 10.6 | 74.1 ± 10.7 | 0.005 |
| **Gender (%)** | | | | | |
| Male | 41.9 | 42.1 | 42.0 | 42.2 | 0.011 |
| **Race/Ethnicity (%)** | | | | | |
| White | 76.1 | 76.7 | 77.4 | 77.5 | 0.493*** |
| Black | 8.1 | 8.2 | 6.7 | 6.8 | 0.032 |
| Hispanic | 7.3 | 7.0 | 6.4 | 6.3 | -0.245*** |
| Asian | 6.4 | 6.0 | 6.5 | 6.5 | -0.307*** |
| Other | 2.0 | 2.0 | 3.0 | 3.0 | 0.028 |
| **Disability/ESRD (%)** | | | | | |
| Disability | 13.7 | 13.8 | 9.9 | 10.1 | -0.060 |
| ESRD | 1.3 | 1.4 | 1.0 | 1.1 | 0.033 |
| **Coverage (%)** | | | | | |
| Any dual eligibility | 24.2 | 24.1 | 19.5 | 19.7 | -0.295*** |
| Any Part D coverage | 73.7 | 74.3 | 77.7 | 78.3 | 0.051 |
| **Chronic Conditions** | | | | | |
| Mean no. of chronic conditions (± SD) | 5.2 ± 3.7 | 5.3 ± 3.7 | 5.7 ± 3.8 | 5.7 ± 3.9 | 0.007 |
| Alzheimer's/dementia (%) | 9.7 | 9.9 | 9.5 | 9.7 | 0.034 |
| Chronic kidney disease (%) | 19.6 | 19.7 | 27.6 | 27.8 | -0.071 |
| COPD (%) | 10.7 | 10.8 | 10.9 | 11.0 | -0.018 |
| Congestive heart failure (%) | 13.6 | 13.8 | 13.1 | 13.3 | 0.031 |
| Diabetes (%) | 31.1 | 31.0 | 30.0 | 30.1 | -0.118 |
| Ischemic heart disease (%) | 29.1 | 29.2 | 27.9 | 27.9 | 0.053 |
| Depression (%) | 17.7 | 17.9 | 19.3 | 19.4 | 0.104 |
| RA/OA (%) | 33.7 | 33.6 | 37.3 | 37.2 | -0.104 |
| Stroke/TIA (%) | 3.7 | 3.7 | 3.4 | 3.5 | 0.022 |
| Cancer (%) | 9.0 | 9.1 | 9.8 | 9.8 | 0.043 |
| **Mortality (%)** | | | | | |
| Death in reference period | 3.9 | 4.5 | 3.5 | 4.0 | 0.147** |
| **Community Characteristics** | | | | | |
| Median income ($ ± SD) | 61469.9 ± 25042.6 | 61231.2 ± 24762.2 | 70429.4 ± 28525.5 | 69932.3 ± 27673.8 | 258.467*** |
| Below poverty line (% ± SD) | 14.3 ± 8.8 | 14.2 ± 8.8 | 12.5 ± 7.8 | 12.4 ± 7.7 | 0.072*** |
| Bachelor's degree or higher (% ± SD) | 15.4 | 15.5 | 14.6 | 14.6 | 0.083 |
| Rurality (%) | 13.7 | 14.3 | 13.1 | 13.5 | 0.091 |
| Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD)‡ | 1.8 ± 1.1 | 1.8 ± 1.1 | 2.1 ± 1.3 | 2.1 ± 1.4 | 0.005 |

| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| **Variables Excluded from Propensity Score and Regression Models** | | | | | |
| **HRR Characteristics** | | | | | |
| ACO penetration rate (% ± SD) | 26.8 ± 12.1 | 26.8 ± 12.2 | 39.8 ± 12.3 | 39.8 ± 12.3 | 0.098 |
| Medicare Advantage penetration rate (% ± SD) | 33.5 ± 12.7 | 33.4 ± 12.7 | 39.3 ± 12.3 | 39.3 ± 12.3 | -0.123 |
| Hospital HHI (± SD) | 2290.1 ± 1738.4 | 2322.7 ± 1763.9 | 2464.1 ± 1751.6 | 2482.1 ± 1754.9 | 1.359 |
| Practice HHI (± SD) | 329.5 ± 353.3 | 334.4 ± 359 | 358.5 ± 391.4 | 360.0 ± 391.0 | 4.456 |
| Hospital beds (per 1,000 ± SD) | 2.4 ± 0.6 | 2.4 ± 0.6 | 2.4 ± 0.8 | 2.4 ± 0.8 | 0.000 |
| Alignment-eligible providers (per 1,000 population ± SD) | 1.3 ± 0.3 | 1.3 ± 0.3 | 1.8 ± 0.5 | 1.8 ± 0.5 | 0.004 |
| **Participation in Medicare ACOs (%)** | | | | | |
| NGACO | 0.0 | 0.0 | 100.0 | 0.0 | - |
| Pioneer/SSP ACO | 52.5 | 13.0 | 0.0 | 11.3 | - |
| **Participation in Other CMMI Initiatives (%)** | | | | | |
| Financial Alignment Demonstration | 0.2 | 0.2 | 0.0 | 0.1 | - |
| Independence at Home | 0.1 | 0.2 | 0.0 | 0.2 | - |
| Comprehensive Primary Care Classic or Plus | 0.0 | 0.8 | 0.0 | 1.4 | - |
| 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 | 0.9 | 1.0 | 0.3 | 1.9 | - |
| Comprehensive Care for Joint Replacement (CJR) Model | 0.1 | 0.1 | 0.0 | 0.2 | - |
| Oncology Care Model | 0.2 | 0.2 | 0.9 | 0.9 | - |

**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 Medicare Advantage 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). Specified HRR characteristics are not included in propensity score (PS) 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, 2014-2019 and ancillary data.

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

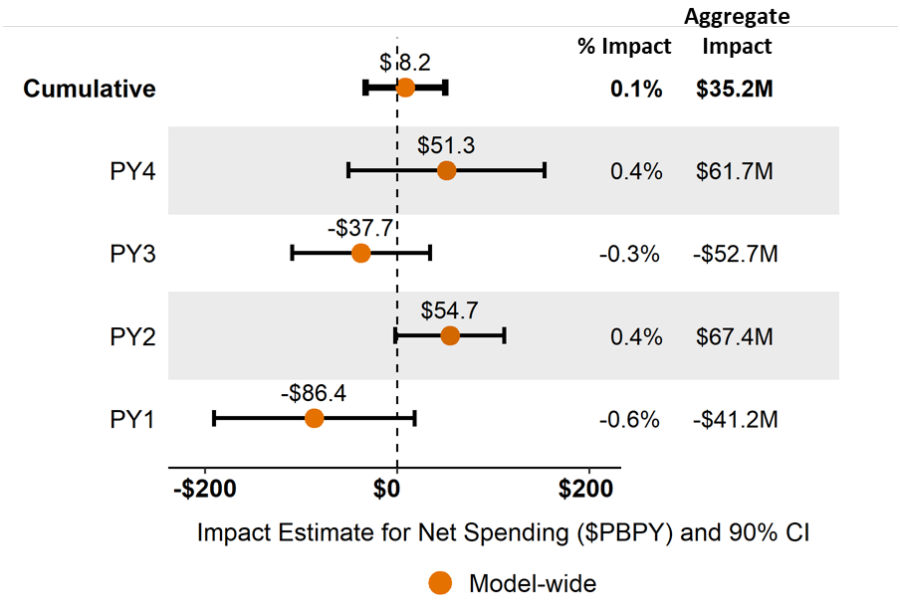
| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| Number of beneficiaries | 887415 | 884946 | 248648 | 248611 | - |
| Total person-months | 10281751 | 10305834 | 2901385 | 2904958 | - |
| **Variables Included in Propensity Score Models** | | | | | |
| Mean months of alignment (±SD) | 11.6 ± 1.8 | 11.6 ± 1.7 | 11.7 ± 1.5 | 11.7 ± 1.6 | 0.043*** |
| Mean age (years ± SD) | 73.6 ± 11.4 | 73.6 ± 11.5 | 74.2 ± 10.6 | 74.1 ± 10.8 | 0.092** |
| **Gender (%)** | | | | | |
| Male | 42.7 | 42.8 | 42.4 | 42.7 | -0.002 |
| **Race/Ethnicity (%)** | | | | | |
| White | 86.9 | 86.8 | 87.0 | 86.8 | 0.001 |
| Black | 6.1 | 6.3 | 5.6 | 5.8 | -0.001 |
| Hispanic | 2.7 | 2.7 | 2.3 | 2.3 | 0.000 |
| Asian | 2.2 | 2.2 | 2.2 | 2.2 | 0.000 |
| Other | 2.1 | 2.0 | 2.9 | 2.9 | 0.000 |
| **Disability/ESRD (%)** | | | | | |
| Disability | 12.9 | 12.8 | 10.1 | 10.2 | -0.002* |
| ESRD | 0.9 | 0.9 | 0.7 | 0.7 | 0.000 |
| **Coverage (%)** | | | | | |
| Any dual eligibility | 16.9 | 17.1 | 14.4 | 14.8 | -0.001 |
| Any Part D coverage | 73.1 | 73.7 | 76.2 | 76.6 | 0.002 |
| **Chronic Conditions** | | | | | |
| Mean no. of chronic conditions (± SD) | 5.2 ± 3.6 | 5.3 ± 3.7 | 5.6 ± 3.7 | 5.7 ± 3.8 | -0.003 |
| Alzheimer's/dementia (%) | 8.5 | 8.7 | 8.5 | 8.9 | -0.001 |
| Chronic kidney disease (%) | 20.2 | 20.3 | 25.7 | 25.9 | -0.001 |
| COPD (%) | 11.1 | 11.3 | 11.2 | 11.4 | 0.000 |
| Congestive heart failure (%) | 12.7 | 13.0 | 12.9 | 13.2 | 0.000 |
| Diabetes (%) | 28.2 | 28.2 | 27.0 | 27.1 | 0.000 |
| Ischemic heart disease (%) | 28.5 | 28.8 | 27.7 | 28.1 | -0.001 |
| Depression (%) | 18.1 | 18.3 | 20.1 | 20.3 | -0.001 |
| RA/OA (%) | 33.6 | 33.6 | 35.9 | 35.8 | 0.001 |
| Stroke/TIA (%) | 3.8 | 3.9 | 3.6 | 3.7 | 0.000 |
| Cancer (%) | 9.6 | 9.6 | 10.1 | 10.2 | 0.000 |
| **Mortality (%)** | | | | | |
| Death in reference period | 3.9 | 4.5 | 3.6 | 4.1 | 0.001 |
| **Community Characteristics** | | | | | |
| Median income ($ ± SD) | 65335.9 ± 27284.2 | 64760.2 ± 26395.3 | 71064.2 ± 28432.5 | 70806.1 ± 27645.3 | -317.615*** |
| Below poverty line (% ± SD) | 12.4 ± 8.4 | 12.5 ± 8.6 | 11.5 ± 7.8 | 11.4 ± 7.7 | 0.192*** |
| Bachelor's degree or higher (% ± SD) | 15.5 | 15.6 | 15.0 | 14.9 | 0.001 |
| Rurality (%) | 10.8 | 11.4 | 11.4 | 11.6 | 0.003*** |
| Alignment-eligible providers within 10-mile radius of beneficiary ZIP code (per 1,000 population ± SD)‡ | 2.2 ± 1.3 | 2.2 ± 1.4 | 2.5 ± 1.5 | 2.5 ± 1.5 | 0.009 |

| Characteristics | Baseline Years | | PY4 | | Differential Change |
|---|---|---|---|---|---|
| | NGACO | Comparison | NGACO | Comparison | |
| **Variables Excluded from Propensity Score and Regression Models** | | | | | |
| **HRR Characteristics** | | | | | |
| ACO penetration rate (% ± SD) | 31.8 ± 14.2 | 31.7 ± 14.2 | 40.8 ± 14.2 | 40.9 ± 14.2 | 0.098 |
| Medicare Advantage penetration rate (% ± SD) | 31.9 ± 9.6 | 31.9 ± 9.6 | 37.5 ± 10.0 | 37.5 ± 10.0 | -0.123 |
| Hospital HHI (± SD) | 2129.1 ± 1212.2 | 2133.7 ± 1216.7 | 2390.2 ± 1237.3 | 2387.9 ± 1236.9 | 1.359 |
| Practice HHI (± SD) | 462.8 ± 513.5 | 465.8 ± 521.4 | 533.2 ± 609.9 | 532.9 ± 612.0 | 4.456 |
| Hospital beds (per 1,000 ± SD) | 2.4 ± 0.5 | 2.4 ± 0.5 | 2.4 ± 0.5 | 2.4 ± 0.5 | 0.000 |
| Alignment-eligible providers (per 1,000 population ± SD) | 1.7 ± 0.5 | 1.7 ± 0.5 | 2.0 ± 0.6 | 2.0 ± 0.6 | 0.004 |
| **Participation in Medicare ACOs (%)** | | | | | |
| NGACO | 0.0 | 0.0 | 100.0 | 0.0 | - |
| Pioneer/SSP ACO | 48.8 | 11.5 | 0.0 | 12.0 | - |
| **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 | 0.1 | - |
| Comprehensive Primary Care Classic or Plus | 1.2 | 3.1 | 0.0 | 5.7 | - |
| 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 | 1.9 | 1.5 | 0.4 | 1.8 | - |
| Comprehensive Care for Joint Replacement (CJR) Model | 0.3 | 0.3 | 0.0 | 0.3 | - |
| Oncology Care Model | 0.4 | 0.3 | 0.6 | 0.6 | - |

**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 Medicare Advantage 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). Specified HRR characteristics are not included in propensity score (PS) 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, 2014-2019 and ancillary data.

**Exhibit D.4.** Sensitivity Analysis (Plot): Net Impact of the NGACO Model on Medicare Spending, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)




**NOTES:** Estimated impacts per beneficiary per year (PBPY) significant at *p<0.1, **p<0.05, and ***p<0.01. Net spending impact in the sensitivity analysis is the sum of the gross impact in Exhibit 2.1 and CMS's *incremental* payout to NGACOs for shared savings in the performance years. The *incremental* payout accounts for shared savings payouts in the performance and baseline years to NGACOs and comparison groups, as well as payout of Coordinated Care Reward to the NGACO group in the performance years. We show 90% confidence intervals (CIs) as bars around the estimates Mode-wide impact in each performance year reflects the impacts for NGACOs and providers that were active in the model in the performance year. Cumulative impact is the summary impact from PY1 through PY4 of the model. PBPY estimate is the impact estimate per beneficiary per year. Aggregate estimate is impact estimate for all aligned beneficiaries in performance year(s).
**SOURCE:** NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

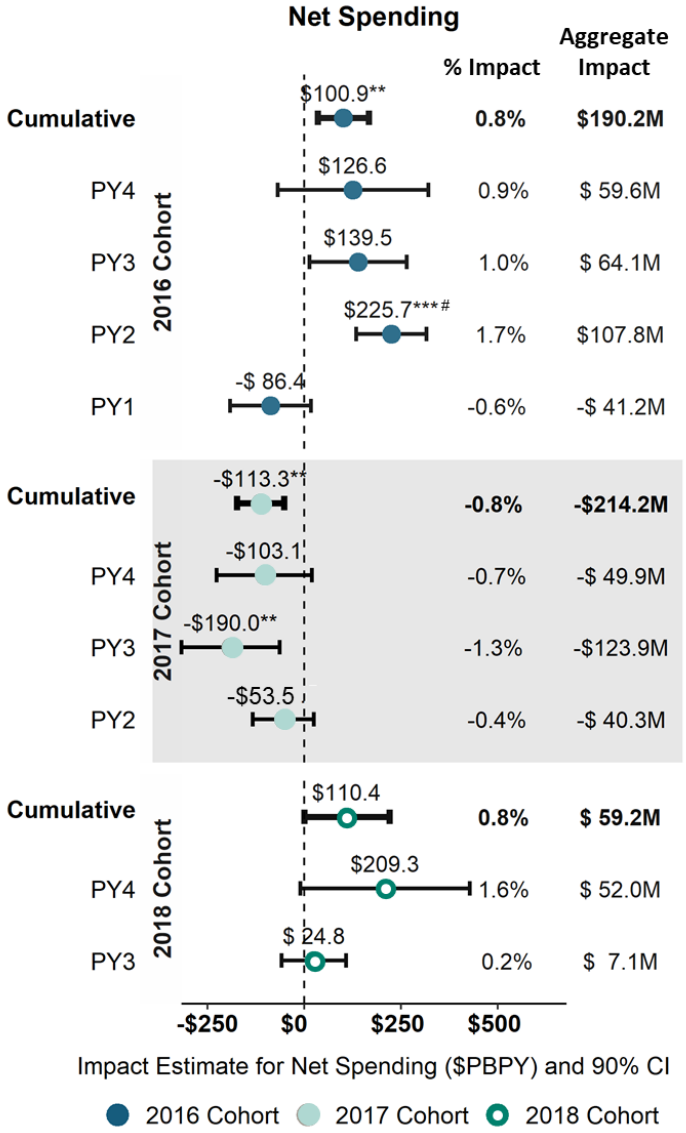
**Exhibit D.5.** Sensitivity Analysis (Heat Map): Net Impact of the NGACO Model on Medicare Spending, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)

| | Number of Beneficiaries [N] | Gross Impact Estimate | | Shared Savings Payouts from CMS | | | | | | Net Impact Estimate | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) | To NGACO Group PYs ($ PBPY) [1] | To NGACO Group BYs ($ PBPY) [2] | To Comparison group PYs ($ PBPY) [3] | To Comparison group BYs ($ PBPY) [4] | Incremental Payout to NGACOs ($ PBPY) [5=1-2-3+4] | Incremental Payout to NGACOs Aggregate ($ in Millions) [5xN] | Estimate PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) |
| **Cumulative** | 4,312,249 | -154.65 (-204, -105.3)*** | -666.89 (-879.68, -454.1)*** | 210.92 | 47.69 | 10.70 | 10.28 | 162.81 | 702.08 | 8.16 (-41.18, 57.51) | 35.19 (-177.59, 247.99) |
| **PY4** | 1,203,457 | -257.85 (-379.57, -136.13)*** | -310.31 (-456.8, -163.83)*** | 359.63 | 50.27 | 12.22 | 11.99 | 309.13 | 372.03 | 51.28 (-70.44, 173.00) | 61.71 (-84.77, 208.20) |
| **PY3** | 1,399,398 | -163.05 (-248.58, -77.52)*** | -228.17 (-347.87, -108.48)*** | 171.75 | 45.05 | 12.28 | 10.98 | 125.40 | 175.48 | -37.65 (-123.19, 47.88) | -52.69 (-172.39, 67.00) |
| **PY2** | 1,232,215 | -52.29 (-119.73, 15.15) | -64.43 (-147.53, 18.67) | 159.06 | 52.92 | 7.94 | 8.80 | 106.99 | 131.84 | 54.7 (-12.74, 122.14) | 67.4 (-15.69, 150.50) |
| **PY1** | 477,179 | -134.06 (-258.36, -9.76)* | -63.97 (-123.28, -4.66)* | 84.70 | 35.42 | 9.34 | 7.73 | 47.68 | 22.75 | -86.38 (-210.68, 37.92) | -41.22 (-100.53, 18.10) |

**NOTES:** Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Estimated gross impact is the DID estimate. Cumulative impact is the summary impact from PY1 through PY4 of the model. Estimated net impact in the sensitivity check is the gross impact less the CMS's incremental payout to NGACOs for shared savings in in the performance year. The *incremental* payout accounts for shared savings payouts in the performance and baseline years to NGACOs and comparison groups, as well as payout of Coordinated Care Reward to the NGACO group in the performance years. Shared savings payments include payouts to NGACOs, Pioneer ACOs, and Shared Savings program ACOs, apportioned to beneficiaries in the NGACO and comparison groups. Significant impacts at the p<0.1 level appear in shaded cells. Favorable impact estimates are shaded in green. PBPY estimate is the impact estimate per beneficiary per year. Aggregate estimate is impact estimate for all aligned beneficiaries in performance year(s). Cumulatively as of PY4 the model served 2,422,423 unique beneficiaries across 4,312,249 beneficiary-years.

**SOURCE:** NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

**Exhibit D.6.** Sensitivity Analysis: Net Impact of the NGACO Model on Medicare Spending by Cohort, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)




**NOTES:** Estimated impacts per beneficiary per year (PBPY) significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Estimated net spending impact in the sensitivity analysis is the sum of the gross impact in Exhibit 2.1 and CMS's *incremental* payout to NGACOs for shared savings in the performance years. The *incremental* payout accounts for shared savings payouts in the performance and baseline years to NGACOs and comparison groups, as well as payout of Coordinated Care Reward to the NGACO group in the performance years. We show 90% confidence intervals (CIs) as bars around the estimates. Impact for the cohorts in each performance year reflect impacts for their NGACOs and providers that were active in the model in the performance year. Cumulative impact is the summary impact from PY1 through PY4 of the model.

**SOURCE:** NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

**Exhibit D.7.** Sensitivity Analysis (Heat Map): Net Impact of the NGACO Model on Medicare Spending by Cohort, Cumulative and by PY, Considering Shared Savings Payouts in PY(s) and BY(s)

| | | Gross Impact Estimate | | Shared Savings Payouts from CMS | | | | | | Net Impact Estimate | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) | To NGACO Group PYs ($ PBPY) [1] | To NGACO Group BYs ($ PBPY) [2] | To Comparison group PYs ($ PBPY) [3] | To Comparison group BYs ($ PBPY) [4] | Incremental Payout to NGACOs ($ PBPY) [5=1-2-3+4] | Incremental Payout to NGACOs Aggregate ($ in Millions) [5xN] | Estimate PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) |
| **2016 Cohort** | | | | | | | | | | | |
| **Cumulative** | 1,884,865 | -82.67 (-161.62, -3.72)* | -155.82 (-304.64, -7.01)* | 218.42 | 35.35 | 9.52 | 10.04 | 183.59 | 346.05 | 100.92 (21.97, 179.88)** | 190.23 (41.41, 339.04)** |
| **PY4** | 470,657 | -148.21 (-380.13, 83.71) | -69.76 (-178.91, 39.4) | 306.13 | 32.88 | 9.20 | 10.79 | 274.83 | 129.35 | 126.62 (-105.30, 358.55) | 59.6 (-49.56, 168.75) |
| **PY3** | 459,603 | -103.67 (-253.40, 46.07) | -47.65 (-116.46, 21.17) | 276.00 | 32.85 | 10.82 | 10.81 | 243.14 | 111.75 | 139.48 (-10.26, 289.21) | 64.1 (-4.72, 132.92) |
| **PY2** | 477,426 | 53.53 (-54.49, 161.55) | 25.56 (-26.02, 77.13) | 210.16 | 40.11 | 8.77 | 10.88 | 172.17 | 82.20 | 225.69 (117.67, 333.71)***# | 107.75 (56.18, 159.32)***# |
| **PY1** | 477,179 | -134.06 (-258.36, -9.76)* | -63.97 (-123.28, -4.66)* | 84.70 | 35.42 | 9.34 | 7.73 | 47.68 | 22.75 | -86.38 (-210.68, 37.92) | -41.22 (-100.53, 18.10) |
| **2017 Cohort** | | | | | | | | | | | |
| **Cumulative** | 1,891,185 | -204.12 (-276.49, -131.75)*** | -386.03 (-522.90, -249.16)*** | 147.71 | 56.14 | 11.00 | 10.29 | 90.86 | 171.84 | -113.26 (-185.63, -40.88)** | -214.19 (-351.06, -77.31)** |
| **PY4** | 484,152 | -347.35 (-493.74, -200.96)*** | -168.17 (-239.05, -97.29)*** | 300.59 | 54.51 | 14.70 | 12.82 | 244.20 | 118.23 | -103.15 (-249.54, 43.25) | -49.94 (-120.81, 20.94) |
| **PY3** | 652,244 | -196.07 (-347.49, -44.65)** | -127.89 (-226.65, -29.12)** | 58.51 | 51.70 | 12.40 | 11.67 | 6.09 | 3.70 | -189.98 (-341.40, -38.57)** | -123.92 (-222.68, -25.15)** |

| | N | Gross Impact Estimate | | Shared Savings Payouts from CMS | | | | | | Net Impact Estimate | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) | To NGACO Group PYs ($ PBPY) [1] | To NGACO Group BYs ($ PBPY) [2] | To Comparison group PYs ($ PBPY) [3] | To Comparison group BYs ($ PBPY) [4] | Incremental Payout to NGACOs ($ PBPY) [5=1-2-3+4] | Incremental Payout to NGACOs Aggregate ($ in Millions) [5xN] | Estimate PBPY ($) (95% CI) | Aggregate ($ in Millions) (95% CI) |
| **PY2** | 754,789 | -119.22 (-213.52, -24.92)** | -89.98 (-161.16, -18.81)** | 126.74 | 61.03 | 7.42 | 7.49 | 65.77 | 49.64 | -53.45 (-147.75, 40.85) | -40.34 (-111.52, 30.83) |
| **2018 Cohort** | | | | | | | | | | | |
| **Cumulative** | 536,199 | -233.17 (-364.76, -101.58)*** | -125.03 (-195.58, -54.47)*** | 407.53 | 61.29 | 13.77 | 11.06 | 343.53 | 184.20 | 110.36 (-21.22, 241.95) | 59.18 (-11.38, 129.73) |
| **PY4** | 248,648 | -291.14 (-552.67, -29.61)* | -72.39 (-137.42, -7.36)* | 575.87 | 74.95 | 13.09 | 12.64 | 500.47 | 124.44 | 209.33 (-52.2, 470.86) | 52.05 (-12.98, 117.08) |
| **PY3** | 287,551 | -183.05 (-282.31, -83.79)*** | -52.64 (-81.18, -24.09)*** | 261.96 | 49.47 | 14.36 | 9.69 | 207.83 | 59.76 | 24.78 (-74.48, 124.04) | 7.13 (-21.42, 35.67) |

**NOTES:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Estimated gross impact is the DID estimate. Cumulative impact is the summary impact from PY1 through PY4 of the model. Estimated net impact in the sensitivity check is the gross impact less the CMS's incremental payout to NGACOs for shared savings in in the performance year. The *incremental* payout accounts for shared savings payouts in the performance and baseline years to NGACOs and comparison groups, as well as payout of Coordinated Care Reward to the NGACO group in the performance years. Shared savings payments include payouts to NGACOs, Pioneer ACOs, and Shared Savings program ACOs, apportioned to beneficiaries in the NGACO and comparison groups. Significant impacts at the p<0.1 level appear in shaded cells. Favorable impact estimates are shaded in green, and unfavorable estimates are shaded in orange. PBPY estimate is the impact estimate per beneficiary per year, for the respective cohorts. Aggregate estimate is impact estimate for all aligned beneficiaries in performance year(s), for the respective cohorts. Cumulatively as of PY4 the 2016, 2017 and 2018 cohorts served 913,645, 1,123,441, and 382,313 unique beneficiaries respectively.
**SOURCE:** NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

**Exhibit D.8.** Sensitivity Analysis: Estimated Impacts on Gross Medicare Spending after Excluding MIPS Adjustments, Model-Wide and by Cohort, PY4

| Total Gross Medicare Spending | N = 1,203,457 | | | N = 470,657 | | | N = 484,152 | | | N = 248,648 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model-Wide Impact in PY4 | | | 2016 Cohort in PY4 | | | 2017 Cohort in PY4 | | | 2018 Cohort in PY4 | | |
| | PBPY Estimate ($) | 95% CI | % Impact | PBPY Estimate ($) | 95% CI | % Impact | PBPY Estimate ($) | 95% CI | % Impact | PBPY Estimate ($) | 95% CI | % Impact |
| **Including MIPS Adjustments: Main Analysis** | -257.85*** | -402.02, -113.68 | -1.96 | -148.21 | -424.59, 128.17 | -1.19 | -347.35*** | -522.44, -172.25 | -2.46 | -291.14* | -602.54, 20.26 | -2.34 |
| **Excluding MIPS Adjustments: Sensitivity Analysis** | -257.45*** | -401.59, -113.31 | -1.96 | -146.92 | -423.09, 129.24 | -1.18 | -345.74*** | -520.32, -171.17 | -2.45 | -294.74* | -607.63, 18.14 | -2.37 |

**NOTES:** 95% confidence intervals (CI) DID percentage impact presented. Percentage impact relative to expected average spending for NGACO beneficiaries absent the model. PBPY = per beneficiary per year.
**SOURCE:** NORC analysis of NGACO and comparison group enrollment and claims data.

## Exhibit D.9. Estimated Impacts on Gross Medicare Spending by Beneficiary Subgroups, Cumulatively as of PY4 and in PY4

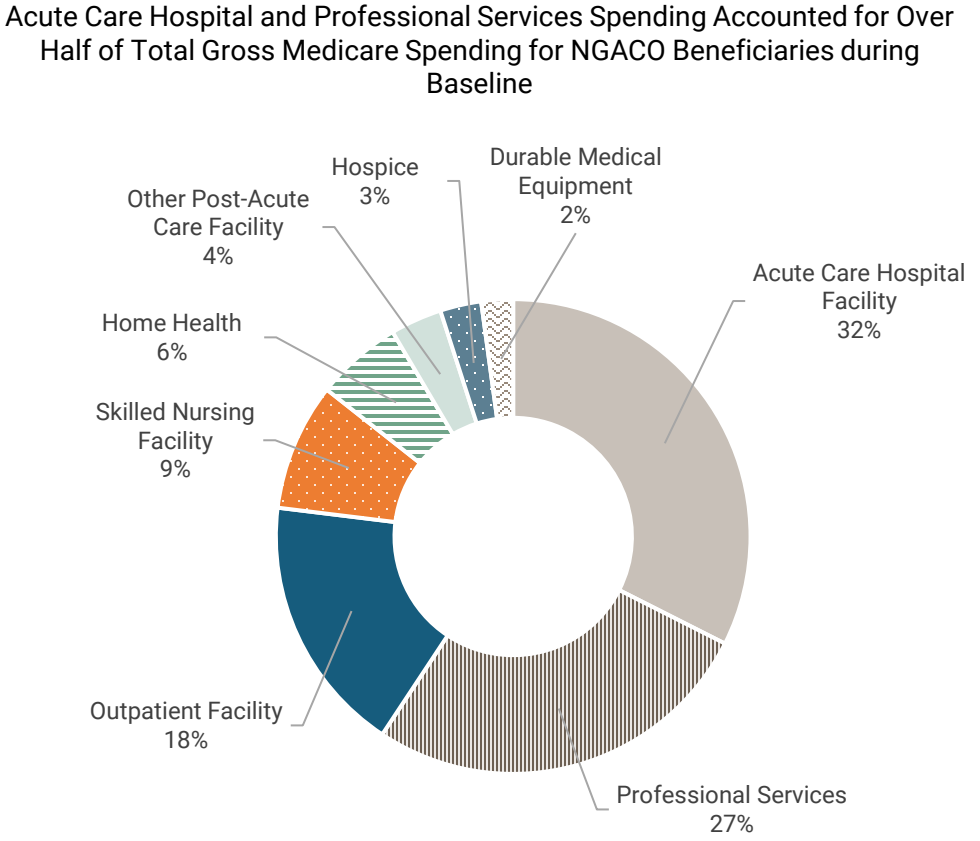
| Cumulatively as of PY4 | | Baseline Years BY3-BY1 | | Total Spending Cumulatively as of PY4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | As of PY4 | | Difference-in-Differences | | | | | |
| Subgroup | Aligned Beneficiaries | NGACO Mean | Comparison Mean | NGACO Mean | Comparison Mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% CI | % Impact | p |
| 8+ Chronic Conditions | 1,096,598 | 31,769.8 | 31,875.4 | 29,274.8 | 29,836.5 | -456.1 | -2,495.0 | -2,038.9 | -625.0, -287.2 | -1.53 | ***# |
| 3-7 Chronic Conditions | 2,257,962 | 9,218.1 | 9,435.9 | 8,695.1 | 9,007.0 | -94.2 | -523.1 | -428.9 | -138.8, -49.6 | -1.07 | ***# |
| 0-2 Chronic Conditions | 957,689 | 4,423.9 | 4,531.4 | 4,219.1 | 4,388.5 | -61.9 | -204.8 | -142.9 | -105.5, -18.3 | -1.45 | *** |
| White, non-Hispanic | 3,552,269 | 13,053.1 | 13,274.3 | 12,289.7 | 12,686.6 | -175.8 | -763.4 | -587.7 | -237.1, -114.4 | -1.41 | ***# |
| Black, non-Hispanic | 292,778 | 18,636.9 | 19,033.6 | 17,299.3 | 17,623.4 | 72.6 | -1,337.6 | -1,410.2 | -212.8, 358.0 | 0.42 | NS |
| Other§ | 467,202 | 13,425.3 | 13,841.1 | 12,708.1 | 13,180.2 | -56.3§ | -717.3 | -660.9 | -191.2, 78.7 | -0.44 | NS |
| Hosp. In Prior Year | 712,679 | 35,997.5 | 36,491.2 | 33,752.1 | 34,655.3 | -409.6 | -2,245.5 | -1,835.9 | -679.5, -139.7 | -1.20 | ***# |
| No Hosp. In Prior Year§ | 3,599,570 | 9,155.0 | 9,330.7 | 8,722.6 | 8,998.5 | -100.2§ | -432.4 | -332.2 | -138.6, -61.8 | -1.14 | ***# |
| Non-Duals | 3,497,093 | 11,725.8 | 11,974.8 | 11,099.7 | 11,479.4 | -130.6 | -626.1 | -495.5 | -183.9, -77.3 | -1.16 | ***# |
| Duals§ | 815,156 | 21,949.0 | 22,160.0 | 20,214.8 | 20,646.5 | -220.7 | -1,734.2 | -1,513.5 | -452.7, 11.4 | -1.08 | * |

| In PY4 only | | Baseline Years BY3-BY1 | | Total Spending in PY4 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | PY4 | | Difference-in-Differences | | | | | |
| Subgroup | Aligned Beneficiaries | NGACO Mean | Comparison Mean | NGACO Mean | Comparison Mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% CI | % Impact | p |
| 8+ Chronic Conditions | 324,898 | 32,085.0 | 32,232.4 | 29,315.9 | 30,218.4 | -755.2 | -2,769.2 | -2,013.9 | -1168.9, -341.6 | -2.51 | ***# |
| 3-7 Chronic Conditions | 628,876 | 9,382.0 | 9,599.5 | 8,739.8 | 9,141.4 | -184.1 | -642.2 | -458.1 | -299.5, -68.7 | -2.06 | ***# |
| 0-2 Chronic Conditions | 249,683 | 4,526.7 | 4,624.1 | 4,318.2 | 4,487.0 | -71.3 | -208.4 | -137.2 | -147.8, 5.2 | -1.62 | * |
| White, non-Hispanic | 998,343 | 13,410.8 | 13,607.7 | 12,500.6 | 12,995.8 | -298.3 | -910.2 | -611.9 | -449.8, -146.8 | -2.33 | ***# |
| Black, non-Hispanic | 75,731 | 18,919.9 | 19,338.5 | 17,487.5 | 18,034.1 | -128.0 | -1,432.4 | -1,304.4 | -787.3, 531.4 | -0.73 | NS |
| Other | 129,383 | 13,269.8 | 13,849.8 | 12,556.1 | 13,119.4 | 16.6 | -713.7 | -730.4 | -188.3, 221.5 | 0.13 | NS |
| Hosp. In Prior Year | 194,470 | 35,797.4 | 36,232.6 | 33,538.4 | 34,318.1 | -344.5 | -2,259.0 | -1,914.5 | -1010.2, 321.1 | -1.02 | NS |
| No Hosp. In Prior Year | 1,008,987 | 9,131.6 | 9,299.8 | 8,634.7 | 8,991.1 | -188.2 | -496.9 | -308.7 | -274.7, -101.7 | -2.13 | ***# |
| Non-Duals | 989,008 | 11,707.8 | 11,934.7 | 10,974.1 | 11,446.1 | -245.1 | -733.7 | -488.6 | -373.3, -117.0 | -2.19 | ***# |
| Duals | 214,449 | 21,899.0 | 22,181.9 | 20,058.4 | 20,509.1 | -167.9 | -1,840.6 | -1,672.8 | -565.6, 229.9 | -0.83 | NS |

**NOTES**: §Subgroups that did not have a parallel baseline for at least one class in one PY. ***#p<0.005, ***p<0.01, **p<0.05, *p<0.1, NS = not statistically significant at 0.1 level. Model-wide cumulative results as of PY4 for each subgroup were calculated by weighting estimates for each cohort in each PY (i.e. 4 PYs for 2016 cohort, 3 PYs for 2017 cohort, and 2 PYs for 2018). Model-wide results in PY4 for each subgroup calculated by weighting estimates for each cohort in PY4. For each cohort in each PY, four models were run for each beneficiary subgroup (chronic conditions, race/ethnicity, acute care hospitalization in prior year, and status of dual-eligibility) separately. DID estimates, as well as conditional means for the NGACO and comparison group means in BY and PY reported. % impact was magnitude of the DID estimate relative to the counterfactual (i.e. NGACO group in PY in absent of treatment).

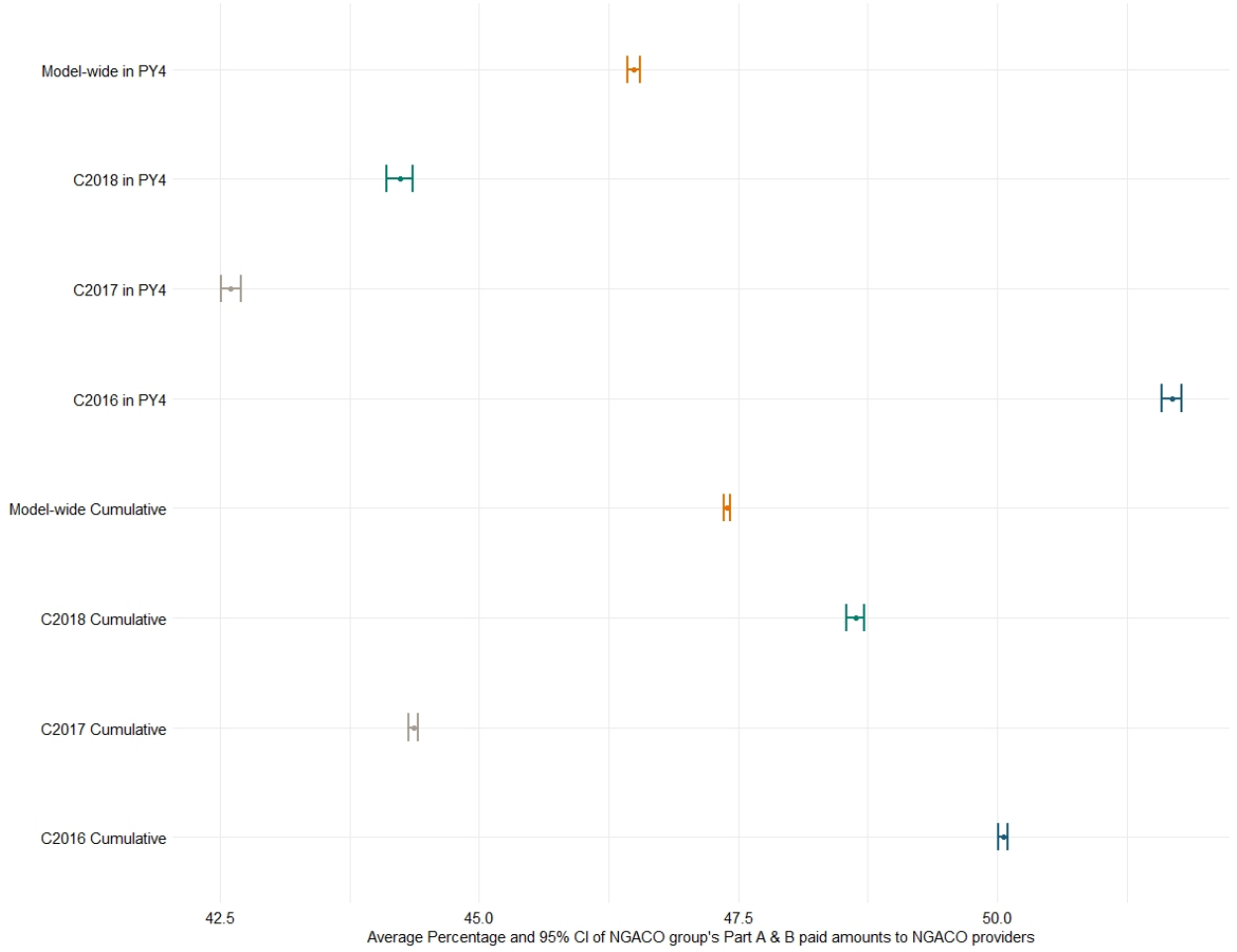
**SOURCE:** NORC analysis of NGACO and comparison group enrollment and claims data.

**Exhibit D.10.** Percentage of Total Gross Medicare Spending by Care Setting in BY(s), for NGACOs in the Model in PY4



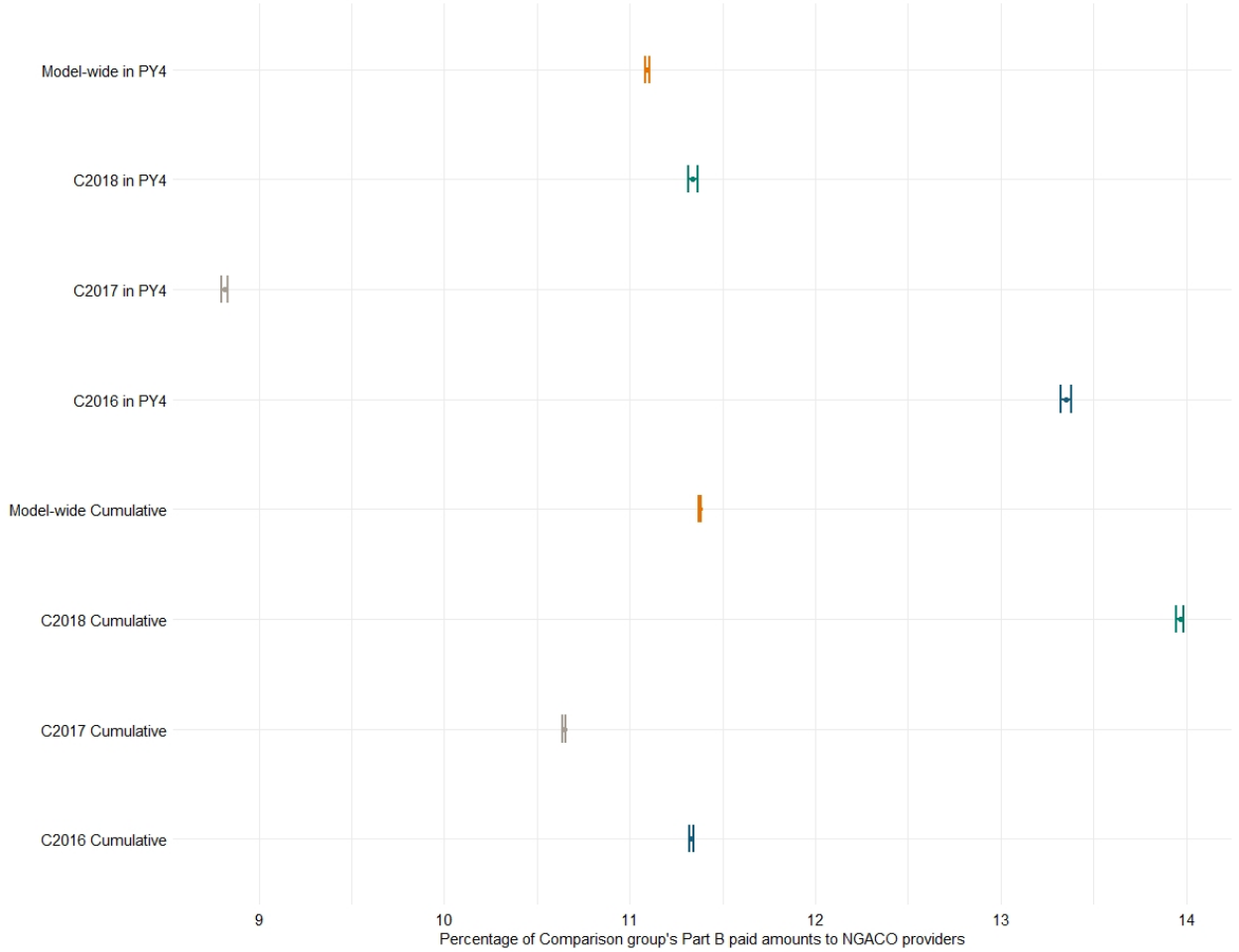

**NOTES:** BY spending includes unadjusted gross Medicare Parts A and B spending for the 41 NGACOs participating in PY4; baseline years varied by cohort between 2013 and 2017. "Other post-acute care facility" includes inpatient rehabilitation facilities and long-term care hospital facilities. Outpatient facility includes hospital outpatient, emergency department, and comprehensive outpatient rehabilitation facilities. Professional services includes physician, other professional, and ancillary services rendered under Part B.
**SOURCE:** NORC analysis of NGACO and comparison group enrollment and claims data.

## Exhibit D.11. Patterns of Care: NGACO Stickiness (Mean), Model-Wide and by Cohort, in PY4 and Cumulative



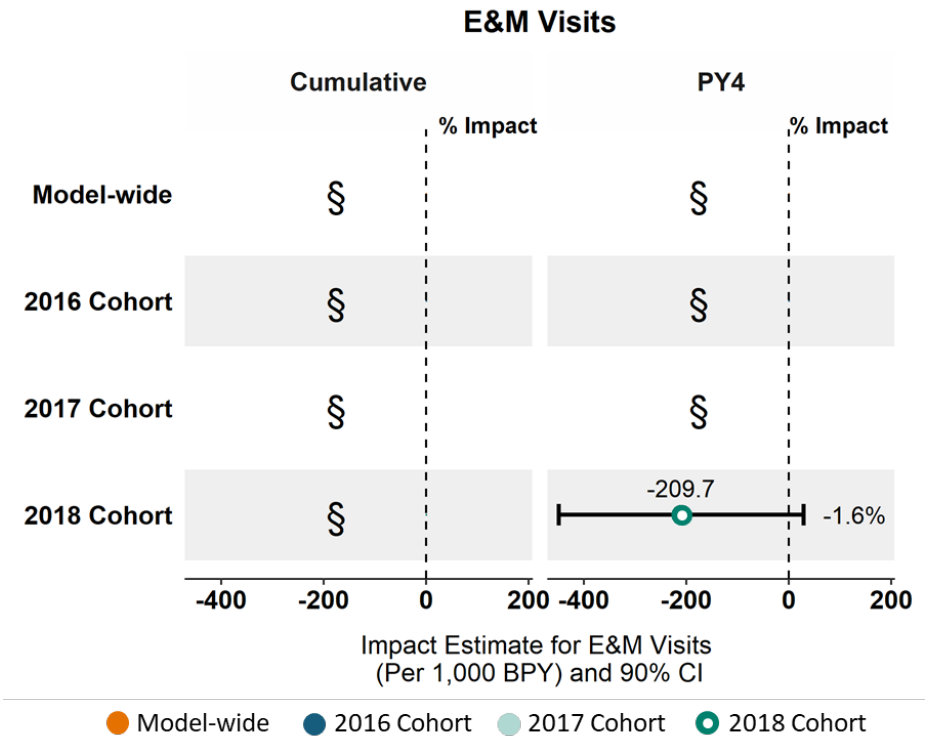

**NOTES:** Stickiness measured as percentage of NGACO beneficiaries' Medicare Parts A and B paid amounts in the PY(s) to providers inside their NGACOs; mean and 95 percent confidence intervals are depicted. Providers in an NGACO include both participating and preferred providers. Model-wide = orange; 2016 Cohort = blue; 2017 Cohort = gray; 2018 Cohort = teal.
**SOURCE**: NORC analysis of NGACO enrollment, claims, and model programmatic data.

## **Exhibit D.12.** Patterns of Care: NGACO Direct Spillover (Mean) on Comparison Group from NGACO providers, Model-Wide and for Cohorts, in PY4 and Cumulative




**NOTE**: Direct spillover as the percentage of the comparison group beneficiaries' Medicare Part B paid amounts in the performance year(s) to NGACO participating providers. Mean and 95 percent confidence intervals are depicted. Model-wide = orange; 2016 Cohort = blue; 2017 Cohort = gray; 2018 Cohort = teal.
**SOURCE**: NORC analysis of NGACO enrollment, claims, and model programmatic data.

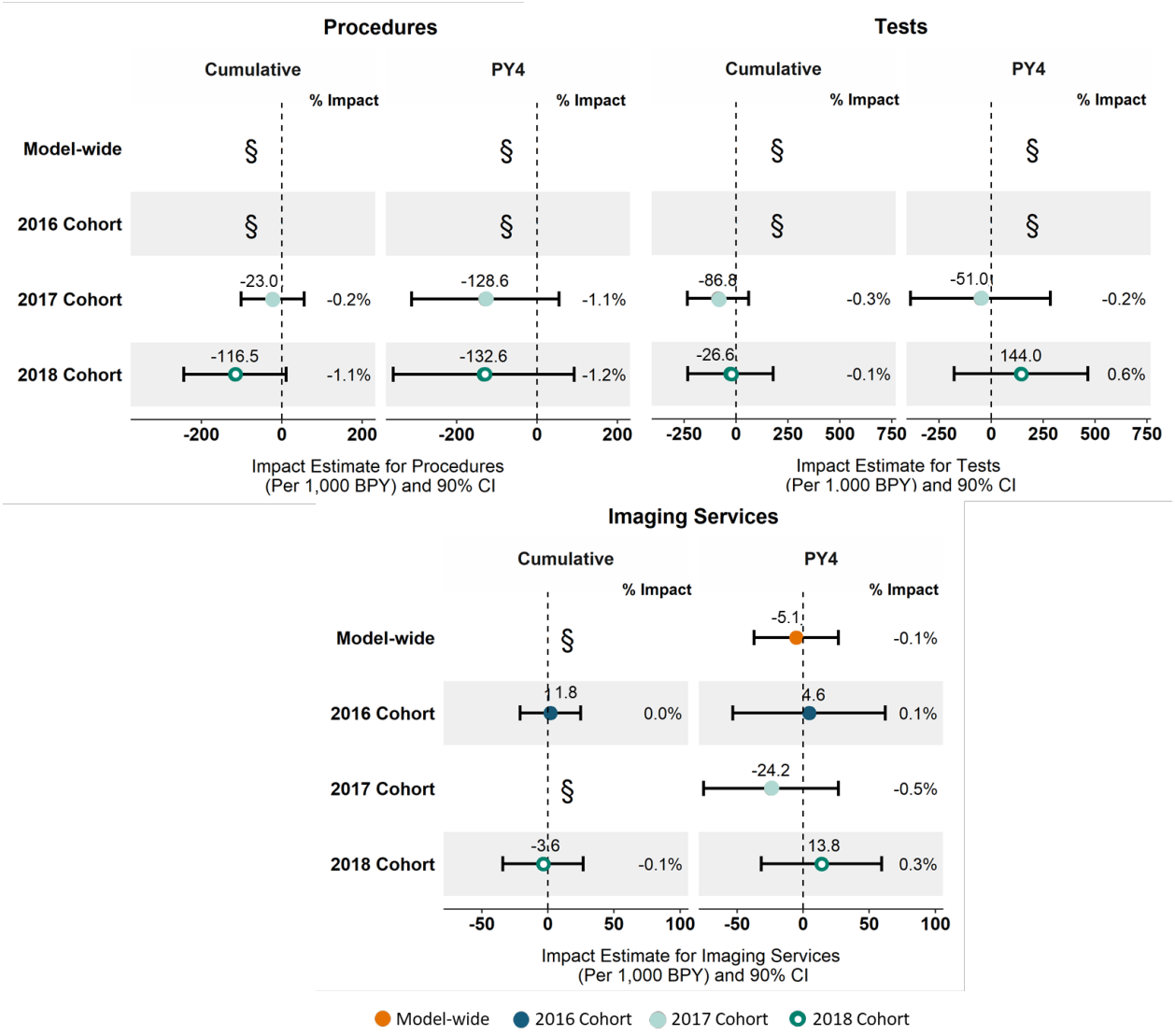
**Exhibit D.13.** Estimated Impacts on the Number of Beneficiaries with Evaluation and Management Visits, Cumulative and PY4 Only




**NOTES:** Estimated impacts per 1,000 BPY for utilization significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates are the DID estimates for procedures, tests, and imaging services. CIs at 90% level are displayed as bars around the impact estimates. Percentage impact is the impact relative to expected procedures, tests, and imaging services for NGACO beneficiaries in performance year(s) absent the model. § Denotes uninterpretable impact estimate due to failure of parallel trends assumption for outcome across baseline years.

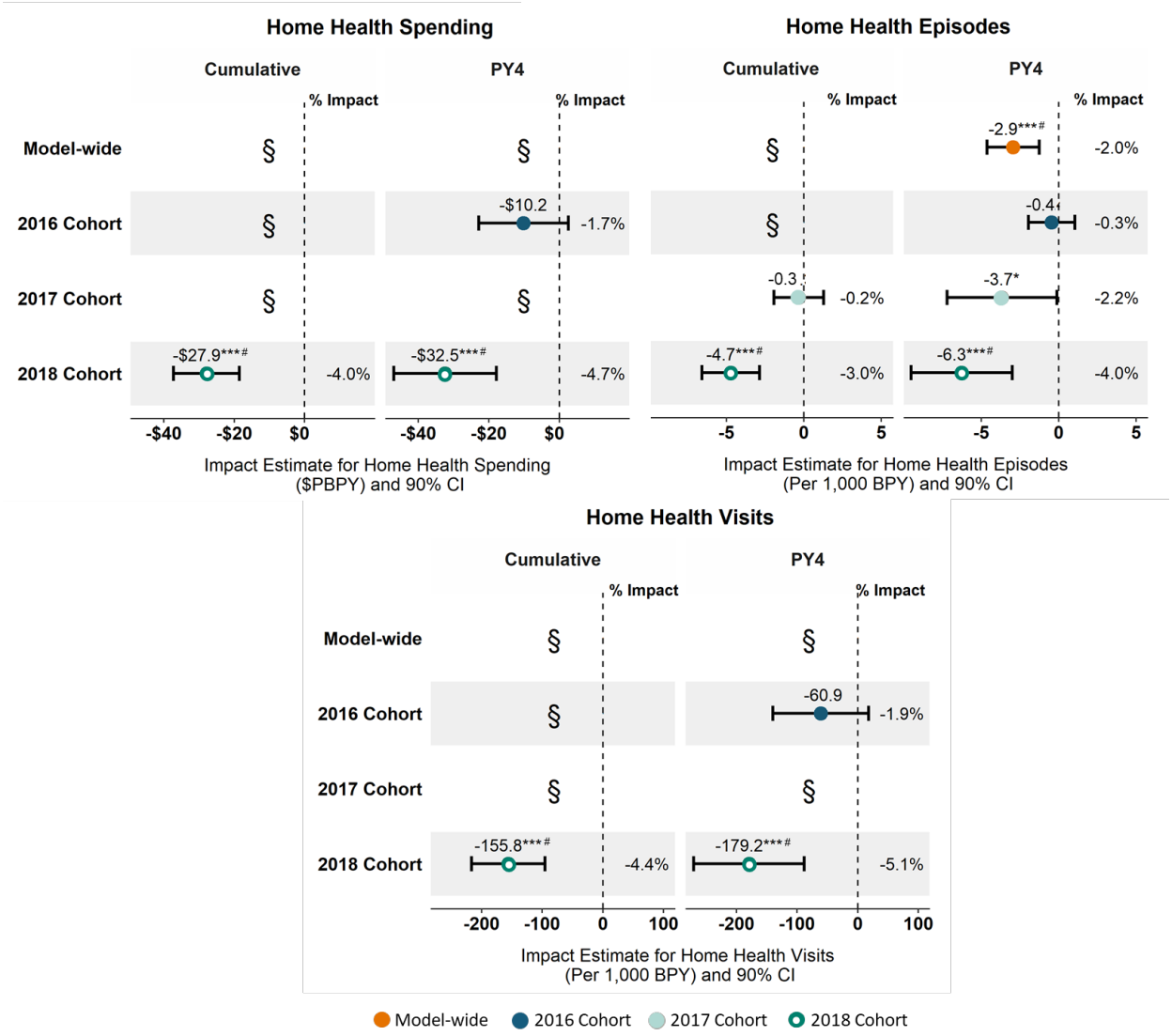
**SOURCE**: NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

## Exhibit D.14. Estimated Impacts on Procedures, Tests, and Imaging Services, Cumulative and PY4 Only



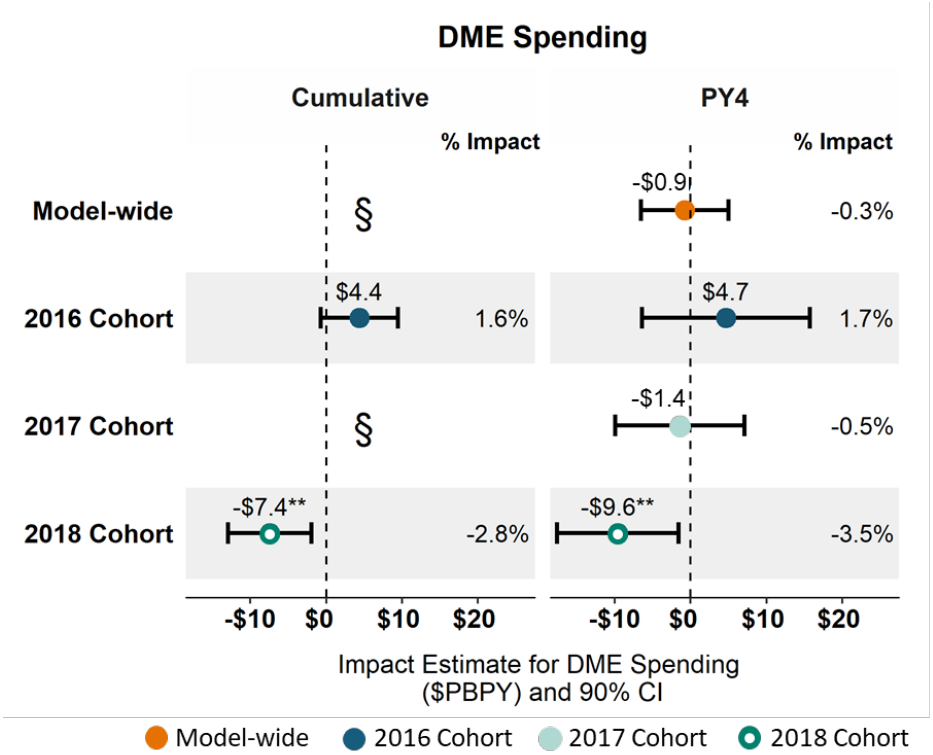

**NOTES:** Estimated impacts per 1,000 BPY for utilization significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates are the DID estimates for procedures, tests, and imaging services. CIs at 90% level are displayed as bars around the impact estimates. Percentage impact is the impact relative to expected procedures, tests, and imaging services for NGACO beneficiaries in performance year(s) absent the model. § Denotes uninterpretable impact estimate due to failure of parallel trends assumption for outcome across baseline years.
**SOURCE**: NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

## Exhibit D.15. Estimated Impacts for Home Health Spending, Episodes, and Visits, Cumulative and PY4 Only




**NOTES:** Estimated impacts PBPY for spending and per 1,000 BPY for utilization significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Impact estimates are the DID estimates for Medicare home health spending, home health episodes, and home health visits. CIs at 90% level are displayed as bars around the impact estimates. Percentage impact is the impact relative to expected average home health spending, episodes, and visits for NGACO beneficiaries in performance year(s) absent the model. § Denotes impact estimate that is not interpretable due to failure of parallel trends assumption for outcome across baseline years.
**SOURCE**: NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

**Exhibit D.16.** Estimated Impacts on Durable Medical Equipment Spending, Cumulative and PY4 Only




**NOTES:** Estimated impacts PBPY for spending significant at *p<0.1, **p<0.05, and ***p<0.01. Impact estimates are the DID estimates for Medicare DME spending. CIs at 90% level are displayed as bars around the impact estimates. Percentage impact is the impact relative to expected average DME spending for NGACO beneficiaries in performance year(s) absent the model. § Denotes uninterpretable impact estimate due to failure of parallel trends assumption for outcome across baseline years.
**SOURCE**: NORC analysis of NGACO and comparison group enrollment, claims, and model programmatic data.

# Appendix E: Exhibits to Support Chapter 3

This Appendix presents supplemental exhibits that compare our evaluation methodology with the CMS benchmarking methodology for the NGACO model and map the extent of concordance between evaluation findings on gross Medicare spending and NGACO performance against the financial benchmark. The exhibits support the summary discussion presented in Chapter 3 and are as follows:

- Differences between the NGACO Model Evaluation and Financial Benchmarking Methodologies (**Exhibit E.1**)
- Cumulative Gross Spending and Shared Savings/Losses for NGACOs, by Cohort, as of PY4
  - NGACOs That Have Remained in the Model (**Exhibit E.2**)
  - NGACOs That Exited the Model (**Exhibit E.3**)

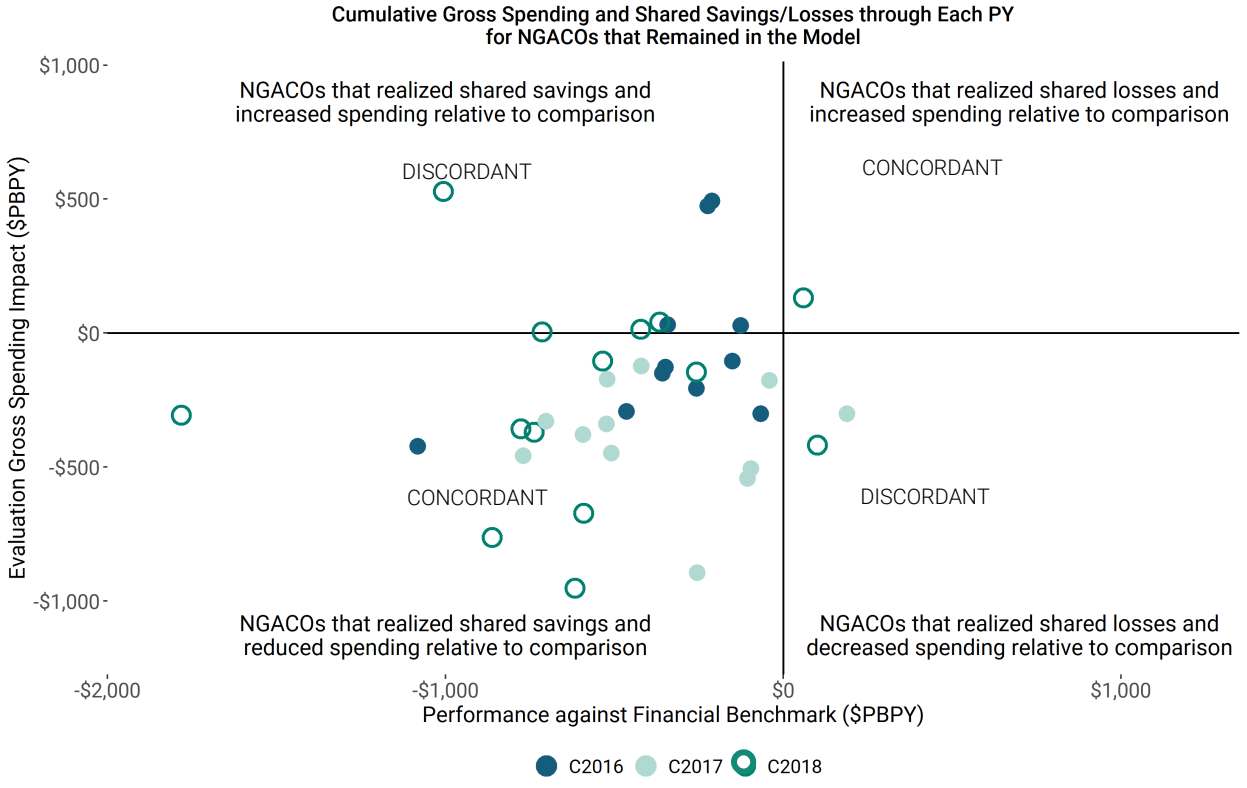
**Exhibit E.1.** Differences between the NGACO Model Evaluation and Financial Benchmarking Methodologies

| | Evaluation Methodology | Benchmarking Methodology (as of 2019) |
|---|---|---|
| **What is estimated?** | NGACOs' gross impact on Medicare Parts A & B spending in a PY for their beneficiaries, relative to a comparison group | NGACOs' shared savings (or losses) based on performance against a prospective financial benchmark for Medicare Parts A & B spending for their beneficiaries in a PY |
| **How is it estimated?** | <u>Comparison group</u><br>▪ Gross spending impact estimated using a differences-in-differences design, comparing changes in spending between the PY and a baseline period for each NGACO and their propensity score weighted comparison group from the same markets<br>▪ Gross spending impact estimated separately for each NGACO relative to its comparison group | <u>No comparison group</u><br>▪ Shared savings (or losses) calculated as the difference between the NGACO's financial benchmark and incurred expenditures for its beneficiaries in a PY<br>▪ NGACO's financial benchmark in a PY is trended from its baseline years' expenditures with an adjustment reflecting the NGACO's efficiency in the baseline period<br>▪ Final shared savings (or losses) depend on NGACO's risk level, savings/losses cap, performance on quality measures, and election of stop-loss<br>Benchmark computed for NGACOs relative to all eligible beneficiaries nationally |
| **How is the baseline period determined?** | A three-year average, set prior to an NGACO's first year in the model, as follows:<br>▪ 2016 Cohort: 2013 to 2015<br>▪ 2017 Cohort: 2014 to 2016<br>▪ 2018 Cohort: 2015 to 2017 | For PY1-PY3 the baseline was one year (2014).<br>For PY4-PY6, a two-year rolling average that starts three years prior to a PY, set as follows:<br>▪ PY4 (2019): 2016 and 2017<br>▪ PY5 (2020): 2017 and 2018<br>▪ PY6 (2021): 2019 and 2020 |
| **How are beneficiaries attributed?** | Beneficiaries are aligned to the NGACO and comparison providers in the PY and in the respective baseline years using the model's prospective attribution approach | Beneficiaries are aligned to the NGACO providers in the PY and in the respective baseline years using the model's prospective attribution approach |
| **Which beneficiaries are eligible?** | NGACO and comparison beneficiaries meet model's eligibility requirements and are aligned for at least a month in the PY or baseline year. Part-year eligibility is considered | NGACO beneficiaries meet model's eligibility requirements to be aligned. Part-year eligibility is considered |
| **How is risk-adjustment done?** | Risk-adjustment is prospective and includes beneficiaries' demographics, disease burden, and socioeconomic status of their communities | Risk-adjustment is prospective based on a coding adjustment risk score, which is no less or no more than 3% of the risk score from the rolling baseline years |

| | Evaluation Methodology | Benchmarking Methodology (as of 2019) |
|---|---|---|
| **Which providers are considered for attribution?** | NGACO beneficiaries attributed to alignment eligible participating providers in the PY and respective baseline years. Comparison beneficiaries attributed to alignment-eligible providers who are not in NGACOs or other Medicare ACOs | NGACO beneficiaries attributed to participating providers in the PY and respective baseline years |
| **What market or service area is considered?** | Hospital referral regions (HRRs) with one percent or more of an NGACO's aligned beneficiary population in the PY | Counties in which an NGACO's participating providers practice and contiguous counties |

**SOURCE:** Next Generation ACO Model Benchmarking Methodology in 2019 and 2020[57]

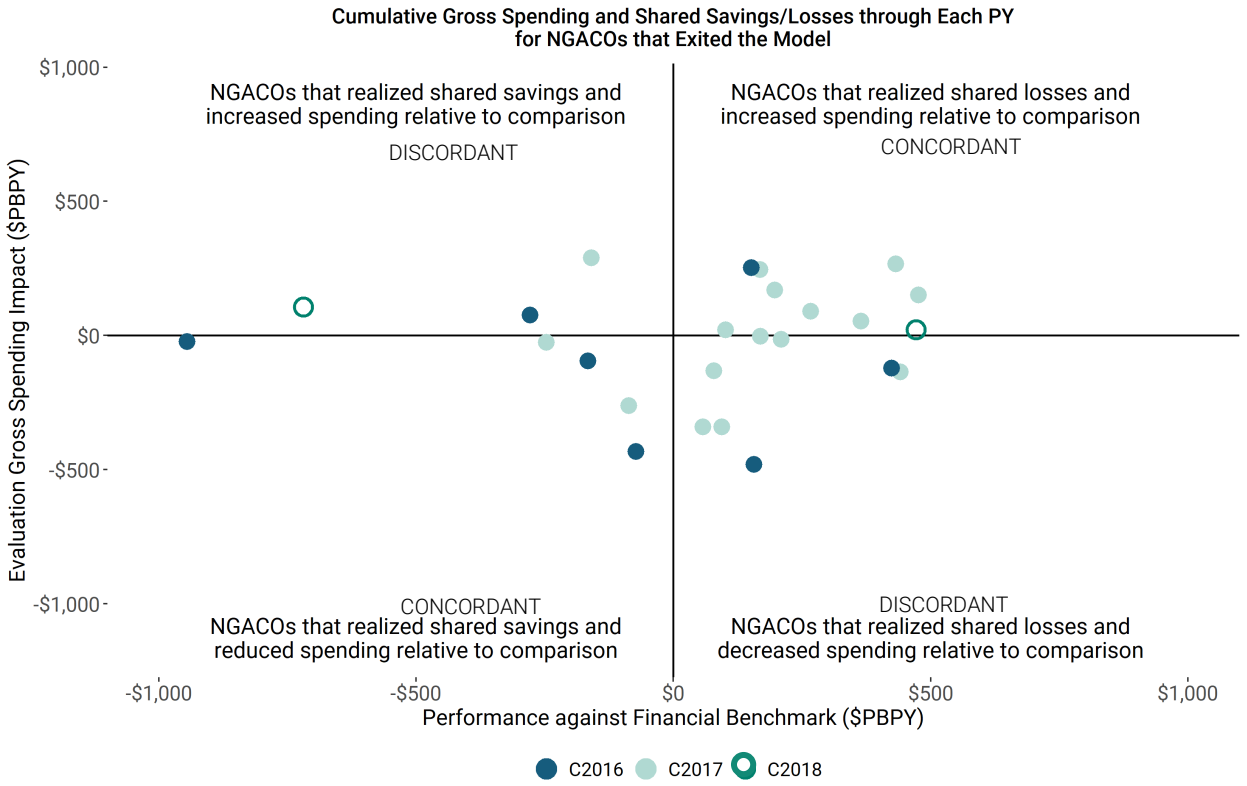
## Exhibit E.2. Cumulative Gross Spending and Shared Savings/Losses for NGACOs that Have Remained in the Model, by Cohort, as of PY4




**SOURCE:** Results are from claims-based analyses of total Medicare Part A and B spending, for the 62 NGACOs ever in the model.

[57] Centers for Medicare & Medicaid Services. Calculation of the Performance Year Benchmark: Performance Years 2019 and 2020. 2018 (September). https://innovation.cms.gov/files/x/nextgenaco-benchmarkmethodology-py4.pdf.

**Exhibit E.3.** Cumulative Gross Spending and Shared Savings/Losses for NGACOs that Exited the Model, as of PY4, By Cohort



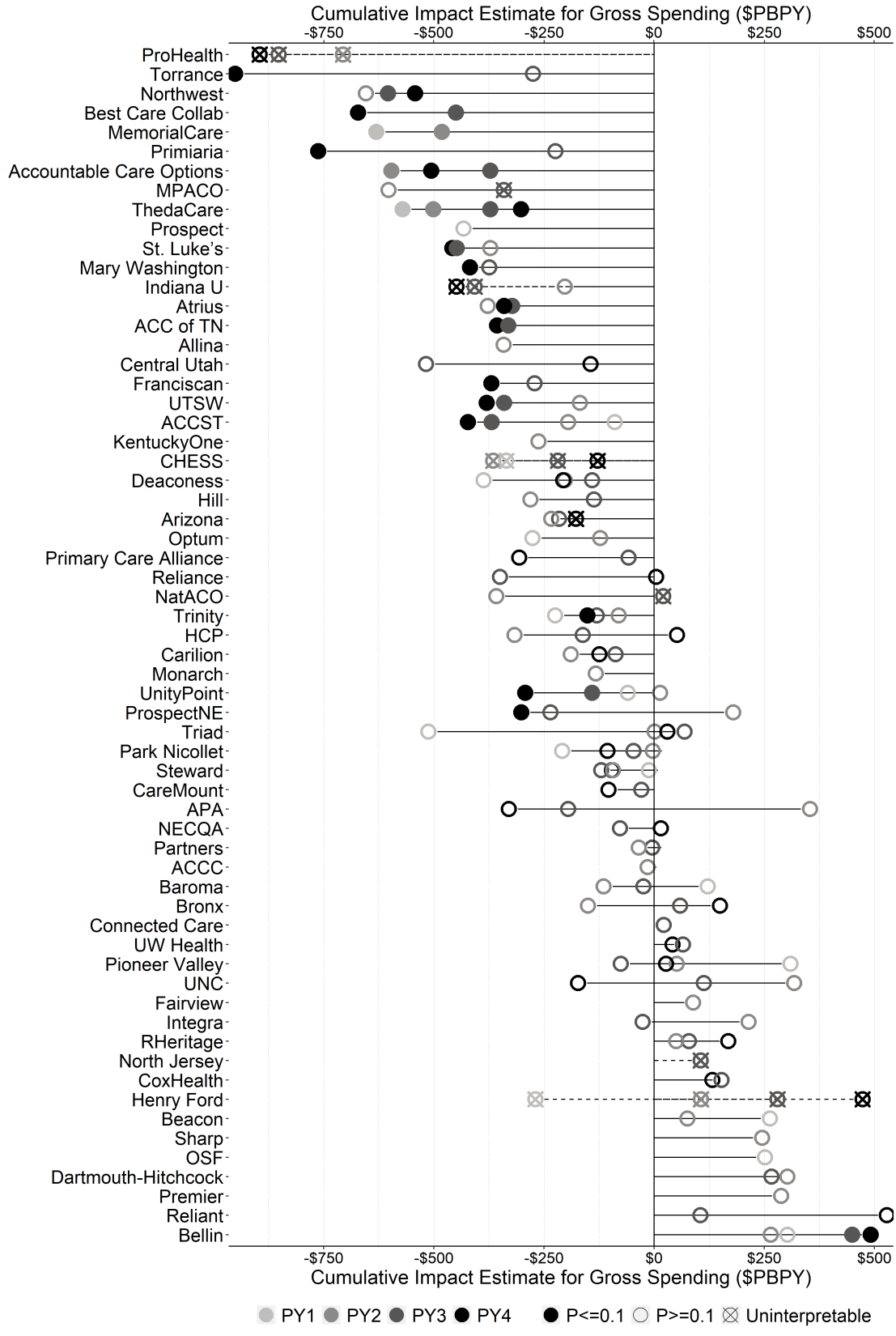

**SOURCE:** Results are from claims-based analyses of total Medicare Part A and B spending, for the 62 NGACOs ever in the model.

# Appendix F: Exhibits to Support Chapter 4

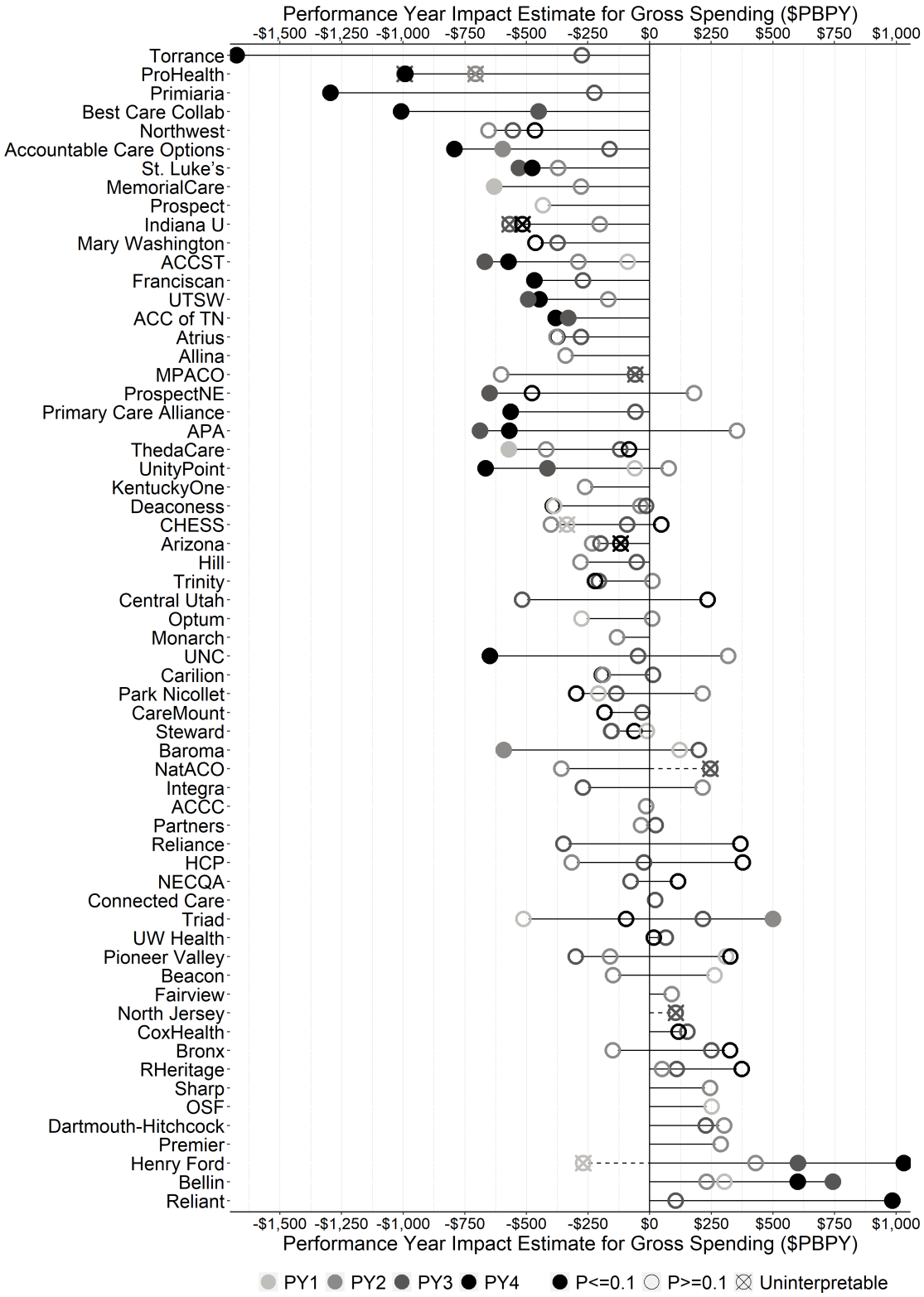
## Exhibits to Support NGACO Impacts on Gross Spending and Other Outcomes

The following two exhibits show results for each PY for all NGACOs that were ever in the model, and the cumulative result, including those that failed test of parallel trends. For these analysis, we report statistical significance at the 0.1 level. All estimates for a given performance year are depicted in the same color, with significant results as a filled circle, non-significant results as an empty circle (border only), and cross-hatching through a circle to denote estimates that could not be interpreted due to a failure of the parallel trends test.

## Exhibit F.1. Cumulative Gross Spending Impacts for NGACOs, as of PY4



## Exhibit F.2. Gross Spending Impacts for NGACOs, in PY4 and preceding PYs



## Exhibits to Support Trends in NGACO-Level Impacts on Spending, Utilization, and Quality of Care

NGACOs can reduce total spending through efforts to reduce unnecessary utilization, or improve care in different settings or for particular services. We compare NGACO performance over time related to declines in spending and utilization to understand where NGACOs have made sustained change and to what extent. **Exhibit F.3** shows the average impact for NGACOs in the model in each year and trends in the percentage of NGACOs that have made any decline and significant declines for the outcome category. The exhibit allows for comparisons of impacts across outcome measures as well as across performance years, and provides perspective on the spending categories and settings where NGACOs have made consistent declines, as well the level of change.

Some summary points are:

- The proportion of NGACOs that significantly reduced total spending grew over time.
- There was growth in the proportion of NGACOs that significantly reduced acute care spending as well as utilization, i.e. acute care hospital stays, hospice, home health spending, and home health episodes.
- The proportion of NGACOs that reduced professional services spending and beneficiaries with ACSC-related hospitalizations grew between PY1 and PY4, but the change and proportion of these reductions were smaller than in acute inpatient and outpatient spending and utilization.
- Over the last three performance years, about two-thirds of NGACOs showed reductions in imaging services, tests, and procedures each year.

**Exhibit F.3.** Trends in Performance: Average Impacts and Percent of NGACOs With Declines or Significant Declines For Outcomes, PY1-PY4

| Measure | PY1 | | | PY2 | | | PY3 | | | PY4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Avg Impact % (PBPY) | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % (PBPY) | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % (PBPY) | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % (PBPY) | ACOs with Decline (%) | ACOs with Sig Decline (%) |
| Total Spending | -0.9 (-$120.7) | 68.8 | 12.5 | -0.5 (-$69.1) | 62.8 | 4.7 | -1.2 (-$149.2) | 71.1 | 17.8 | -1.8 (-$226.2) | 66.7 | 35.9 |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | | | | | | | |
| Acute care hospital facility | -1.3 (-$50.2) | 73 | 13 | -0.3% (-$11.3) | 58 | 15 | -0.5 (-$21.7) | 70 | 7 | -1.9 (-$74.0) | 70 | 24 |
| Skilled nursing facility | -1.2 (-$12.6) | 60 | 13 | -1.3% (-$12.6) | 56 | 14 | -2.3 (-$21.1) | 70 | 24 | -3.1 (-$28.0) | 55 | 29 |
| Other post-acute care facility | -2.4 (-$10.6) | 73 | 13 | -4.6% (-$18.2) | 59 | 20 | -4.1 (-$15.7) | 60 | 17 | -6.4 (-$24.6) | 77 | 31 |
| Outpatient facility | -1.5 (-$36.1) | 71 | 21 | -1.0% (-$24.8) | 76 | 16 | -0.0 (-$0.5) | 57 | 17 | -1.1 (-$28.4) | 58 | 28 |
| Professional services | 0.6 ($18.6) | 27 | 7 | -0.4% (-$13.6) | 50 | 11 | -1.1 (-$36.0) | 58 | 20 | -1.4 (-$43.9) | 60 | 29 |
| Home health | -0.8 (-$5.3) | 67 | 7 | -0.2% (-$1.2) | 56 | 17 | -2.5 (-$16.9) | 67 | 33 | -3.2 (-$19.6) | 71 | 41 |
| Hospice | -10.0 (-$39.3) | 75 | 19 | -4.3% (-$15.6) | 65 | 19 | -6.2 (-$25.2) | 74 | 19 | -6.8 (-$27.8) | 78 | 30 |
| Durable medical equipment | 1.7 ($4.8) | 41 | 0 | 2.3% ($5.8) | 53 | 0 | 0.2 ($0.6) | 49 | 2 | -0.6 (-$1.7) | 59 | 5 |

**NOTES:** The analysis includes NGACOs that were active in each performance year and excludes NGACOs that failed the parallel trends test for each outcome in each performance year. Impact % is the average percentage impact for an outcome for all NGACOs in the performance year relative to their counterfactual, computed from differences-in-differences estimates for NGACOs. PBPY impact is the average impact per beneficiary per year. Decline % reflects the percentage of NGACOs in the year showing declines in impacts for an outcome. Significant decline % reflects the percentage of NGACOs in the year showing significant declines in impacts for an outcome. Significance is measured at $p<0.1$

**Exhibit F.3.** Trends in Performance: Average Impacts and Percent of NGACOs With Declines or Significant Declines For Outcomes, PY1-PY4, continued

| Measure | PY1 | | | PY2 | | | PY3 | | | PY4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | -0.0 (-0.1) | 43 | 0 | -0.1% (-0.3) | 54 | 14 | -0.5 (-1.6) | 57 | 14 | -0.6 (-1.9) | 66 | 21 |
| SNF stays | 2.3 (1.8) | 20 | 0 | 2.2% (1.3) | 33 | 9 | 3.2 (2.4) | 40 | 2 | 2.3 (1.6) | 31 | 6 |
| SNF days | -0.9 (-19.1) | 60 | 7 | 1.3% (16.9) | 46 | 5 | -0.9 (-16.2) | 59 | 15 | -1.9 (-32.2) | 59 | 30 |
| ED visits & obs. stays | 0.8 (4.7) | 45 | 9 | -0.0% (-0.1) | 49 | 11 | -1.8 (-10.1) | 63 | 37 | -1.5 (-8.1) | 53 | 29 |
| E&M visits | -0.9 (-116.9) | 67 | 44 | -0.9 (-133.3) | 71 | 48 | -1.4 (-202.2) | 72 | 56 | -2.0 (-265.0) | 75 | 69 |
| Procedures | -1.2 (-116.7) | 79 | 14 | 0.1% (13.3) | 54 | 29 | -0.2 (-25.2) | 56 | 22 | -0.4 (-40.1) | 63 | 31 |
| Tests | 0.5 (124.4) | 25 | 0 | -1.0 (-264.2) | 64 | 44 | -1.5 (-370.9) | 66 | 37 | -0.5 (-127.4) | 54 | 38 |
| Imaging services | 1.1 (55.5) | 20 | 0 | -0.6(-29.5) | 60 | 20 | -0.6 (-29.3) | 67 | 22 | -0.4 (-18.6) | 61 | 33 |
| Home health episodes | -0.9 (-1.2) | 53 | 20 | 0.5 (0.6) | 51 | 26 | -0.5 (-0.7) | 53 | 21 | -2.0 (-2.7) | 71 | 35 |
| Home health visits | -0.9 (-31.8) | 71 | 7 | -1.0 (-33.6) | 69 | 17 | -3.2 (-110.6) | 63 | 33 | -4.1 (-130.4) | 77 | 43 |
| Annual Wellness Visits* | 2.4 (8.4) | 33 | 33 | 16.6 (62.9) | 67 | 67 | 15.2 (59.1) | 85 | 85 | 20.6 (91.7) | 83 | 83 |

**NOTES:** The analysis includes NGACOs that were active in each performance year and excludes NGACOs that failed the parallel trends test for each outcome in each performance year. Impact % is the average percentage impact for an outcome for all NGACOs in the performance year relative to their counterfactual, computed from differences-in-differences estimates for NGACOs. Impact is the average impact per 1,000 beneficiaries per year for NGACOs in the performance year. *For this outcome, the data reflect the average % impact and percent of NGACOs that increased AWV, because for this outcome an increase is the desired direction, consistent with declines as desired for all other outcomes. Decline % reflects the percentage of NGACOs in the year showing declines in impacts for an outcome. Significant decline % reflects the percentage of NGACOs in the year showing significant declines in impacts for an outcome. Significance is measured at $p<0.1$

**Exhibit F.3.** Trends in Performance: Average Impacts and Percent of NGACOs With Declines or Significant Declines For Outcomes, PY1-PY4, continued

| Measure | PY1 | | | PY2 | | | PY3 | | | PY4 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) | Avg Impact % | ACOs with Decline (%) | ACOs with Sig Decline (%) |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 1.5 (0.6) | 35 | 6 | 0.2 (0.1) | 46 | 11 | -0.6 (-0.3) | 44 | 18 | -0.3 (-0.1) | 58 | 22 |
| Beneficiaries with Unplanned 30-day Readmissions | 2.1 (3.1) | 35 | 6 | -1.0 (-1.5) | 60 | 3 | 0.4 (0.6) | 38 | 9 | 0.6 (0.9) | 50 | 8 |
| Beneficiaries with Hospital Readmissions from SNF | 0.3 (0.5) | 53 | 6 | -1.6 (-3.0) | 55 | 8 | 1.0 (1.8) | 46 | 11 | 1.7 (3.1) | 43 | 3 |

**NOTES:** The analysis includes NGACOs that were active in each performance year and excludes NGACOs that failed the parallel trends test for each outcome in each performance year. Impact % is the average percentage impact for an outcome for all NGACOs in the performance year relative to their counterfactual, computed from differences-in-differences estimates for NGACOs. Impact is the average impact per 1000 beneficiaries per year for NGACOs in the performance year. Decline % reflects the percentage of NGACOs in the year showing declines in impacts for an outcome. Significant decline % reflects the percentage of NGACOs in the year showing significant declines in impacts for an outcome. Significance is measured at $p<0.1$.

## Performance on Total Spending in Relation to Other Outcomes

We compare how NGACOs performed on spending categories, utilization, and quality across three groups of NGACOs, clustered by performance in gross spending: 1) NGACOs that reduced gross spending by more than 1.2 percent (regardless of statistical significance), 2) NGACOs that increased gross spending by more than 1.2 percent (regardless of statistical significance ), and 3) NGACOs with neutral impacts on gross spending.[58] We present a table (**Exhibit F.4**) that shows the median PBPY and the percent of NGACOs that improved each of the evaluation's 22 outcome measures, by performance category. We excluded eight NGACOs from these analyses because they failed the parallel trends test for total spending and thus could not be classified into a performance category.[59] In addition, for each outcome, we excluded ACOs that failed the parallel trends test for that measure in any performance year.

Twenty-five NGACOs decreased total spending by at least 1.2 percent, with a median value of $356 PBPY. Twenty-two NGACOs had neutral cumulative impacts (between -1.2 percent and 1.2 percent), with a median value of $0.4 PBPY. Seven NGACOs had cumulative increases in total spending, with a median value of $266 PBPY. All the NGACOs that reduced total spending also reduced spending in the major categories of spending and utilization, as shown in Exhibit F.4. Other findings include the following:

- About 95 percent of NGACOs that decreased total spending reduced spending in acute care hospitals, compared to only 43 percent of NGACOs that increased total spending. Spending in the acute care hospital setting is the largest relative contributor to total Medicare spending (around 32 percent) and achieving reductions in this setting is likely a critical part of the pathway to successfully reducing total spending.
- About 89 percent of NGACOs that decreased total spending reduced spending in the outpatient setting. By contrast, only 33 percent of NGACOs that increased total spending were able to do so.
    - Outpatient spending accounts for about 18 percent of total spending PBPY; as a result, declines in spending in this category are an important means for lowering overall spending.
- Compared with the acute care inpatient setting, a smaller percentage (57 percent) of NGACOs that decreased total spending also decreased spending on professional services; none of the NGACOs that increased total spending realized reductions in professional services.
    - Reducing spending on professional services is an important way to lower total spending as it contributes 27 percent of total spending PBPY. However, the median decrease in spending is much smaller compared to other spending categories.
    - Reducing professional services also affects providers' revenue and this impact likely varies depending on the type of NGACO, payment type, and risk-sharing arrangement.

[58] We use the threshold of 1.2 percent since this was the cumulative model-wide percentage impact on total gross spending as of PY4.

[59] These eight NGACOs are CHESS, Henry Ford, MPACO, ProHealth, Indiana University, Arizona, National ACO, and North Jersey.

- All but one NGACO that reduced total spending also reduced the number of E&M visits. At least half of NGACOs with either neutral or increased impact on spending also reduced E&M visits. In interviews, some NGACOs reported that they implemented care management programs that included follow-up home visits to high-risk beneficiaries, many of whom had previously been hospitalized. In addition, many NGACOs described transitional care management strategies that included telephonic follow-up with patients in their homes. This follow-up care (whether in-person or remote), delivered mostly by nurse care managers, may have substituted for in-person visits in the physician office setting. Literature indicates that strong transitional care management has been associated with improved quality and cost metrics.[60,61,62,63]
- The proportion of NGACOs that decreased total spending and utilization in two PAC settings—other PAC facilities and SNF—is similar to the proportion that reduced spending in the acute care hospital and outpatient settings. This suggests that NGACOs that reduced overall total spending may better manage care across settings.
- The percentage of NGACOs that reduced SNF stays was comparable across the three performance categories, while SNF days varied. Because SNF spending contributes only 9 percent of total spending PBPY, decreases in SNF utilization did not result in reductions in total spending.
- All NGACOs that increased total spending experienced reductions in hospice spending. The median estimated impact for reductions in hospice spending was larger among those NGACOs that increased total Medicare spending. A reduction in hospice spending could have increased spending in costlier, other types of end-of-life care for beneficiaries with advanced illness, as the latter accounts for a large portion of Medicare spending. It may also be that because hospice care contributes to only 3 percent of total Medicare spending, reductions in hospice spending must be accompanied by spending reductions in other settings to reduce total spending.
- The percentage of NGACOs that improved quality of care as measured by beneficiaries with ACSC-related hospitalizations and 30-day readmissions was comparable across spending performance categories.

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[60] Lewis VA, Tierney KI, Fraze T, Murray GF. Care transformation strategies and approaches of accountable care organizations. *Medical Care Research and Review*. 2019;76(3):291–314. https://doi.org/10.1177/1077558717737841.

[61] Cross DA, Adler-Milstein J. Investing in post-acute care transitions: electronic information exchange between hospitals and long-term care facilities. *Journal of the American Medical Directors Association*. 2017;18(1):30–34. https://doi.org/10.1016/j.jamda.2016.07.024.

[62] Davidson GH, Austin E, Thornblade L, Simpson L, Ong TD, Pan H, Flum DR. Improving transitions of care across the spectrum of healthcare delivery: A multidisciplinary approach to understanding variability in outcomes across hospitals and skilled nursing facilities. *American Journal of Surgery*. 2017;213(5):910–14. https://doi.org/10.1016/j.amjsurg.2017.04.002.

[63] Salmon RB, Sanderson MI, Walters BA, Kennedy K, Flores RC, Muney AM. A collaborative accountable care model in three practices showed promising early results on costs and quality of care. *Health Aff*. 2012;31(11):2379–87.

- More than two-thirds of NGACOs that decreased total spending also reduced spending on procedures, tests, and imaging services. Utilization for these services among NGACOs that increased total spending increased. Reductions in procedures, tests, and imaging may reflect better care management and communication across providers. Some of the reductions in these services could have occurred from declines in some low-value (unnecessary or minimally beneficial) services that are known to contribute to higher total spending.[64]

**Exhibit F.4.** Estimated Impacts, by Category of Increased Spending, Held Spending Neutral, or Decreased Spending, Relative to the Comparison Group

| | Median Impact Estimate, by Total Spending Category | | | % NGACOs That Decreased Outcome by Total Spending Category | | |
|---|---|---|---|---|---|---|
| | Decreased | Neutral | Increased | Decreased | Neutral | Increased |
| Total Spending | -$356 | $0 | $266 | 100% | 50% | 0% |
| Acute Care Hospital Spending | -$127 | -$6 | $96 | 95% | 56% | 43% |
| Skilled Nursing Facility Spending | -$13 | $1 | $32 | 71% | 50% | 20% |
| Other PAC Spending | -$27 | $6 | -$9 | 75% | 50% | 57% |
| Outpatient Spending | -$89 | -$27 | $105 | 89% | 65% | 33% |
| Professional Services | -$11 | -$3 | $71 | 57% | 50% | 0% |
| Home Health Spending | -$30 | $5 | $1 | 84% | 44% | 50% |
| Hospice Spending | -$19 | -$17 | -$34 | 71% | 71% | 100% |
| Acute Care Hospital Stays | -3 | 0 | 6 | 74% | 53% | 29% |
| Skilled Nursing Facility Stays | 2 | 2 | 3 | 29% | 29% | 25% |
| Skilled Nursing Facility Days | -13 | 16 | 42 | 57% | 38% | 20% |
| ED Visits & Observation Stays | -19 | -2 | 14 | 75% | 60% | 33% |
| Evaluation & Management Visits | -183 | -69 | -30 | 89% | 63% | 50% |
| HH Episodes | -5 | 0 | 1 | 70% | 50% | 33% |
| Beneficiaries with ACSC Hospitalizations | 0 | 1 | 0 | 50% | 47% | 50% |
| Beneficiaries with 30-day Readmissions | 2 | 0 | 6 | 41% | 42% | 33% |
| Beneficiaries with Readmissions from SNF | -1 | 3 | -7 | 52% | 32% | 71% |

NOTES: Spending measures are $PBPY. Utilization and quality measures are per 1,000 BPY. PAC = Post-Acute Care; ED = emergency department; ACSC =ambulatory care sensitive conditions.

[64] Schwartz, A. L., Chernew, M. E., Landon, B. E., & McWilliams, J. M. (2015). Changes in low-value services in year 1 of the Medicare pioneer accountable care organization program. *JAMA internal medicine*, *175*(11), 1815-1825..

# Exhibits to Support Analysis on Factors Influencing Variation in Gross Spending Impacts for NGACOs

As discussed in the main report, all three organizational types showed similar gross spending reductions of between 1.0 and 1.2 percent on average, but each type reduced spending across different spending categories. Organizational structure may influence where spending reductions may occur. **Exhibit F.5** presents the weighted averages for outcomes, grouped by organizational type (for the 143 NGACO-years that passed the test of parallel trends for total spending).

**Exhibit F.5.** NGACOs by Organization Affiliation: Estimated Impacts on Medicare Spending Categories, Utilization, and Quality of Care

| Outcome | Average Impact from PY1-PY4 | | | | | |
|---|---|---|---|---|---|---|
| | IDS/ Hospital System Affiliated NGACOs | | Hospital-Physician Partnership NGACOs | | Physician Practice Affiliated NGACOs | |
| | Impact Estimate (95% CI) | % Impact | Impact Estimate (95% CI) | % Impact | Impact Estimate (95% CI) | % Impact |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | |
| Acute care hospital facility | -24.9** (-47.7,-2.1) | -0.65 | -15.7 (-58.6,27.3) | -0.42 | -45.5** (-80.5,-10.5) | -1.03 |
| SNF | -22.1*** (-31.1,-13.1) | -2.41 | -27.2*** (-44.3,-10.0) | -3.05 | -10.7 (-25.0,3.7) | -0.97 |
| Other post-acute care facility | -24.6*** (-32.0,-17.1) | -6.54 | -12.6* (-26.4,1.1) | -3.47 | -8.6 (-19.7,2.5) | -1.90 |
| Outpatient facility | -30.3*** (-46.3,-14.3) | -1.15 | 2.7 (-31.5,36.9) | 0.11 | -23.3** (-45.1,-1.5) | -0.98 |
| Professional services | -18.6*** (-31.1,-6.0) | -0.62 | -68.1*** (-88.8,-47.4) | -2.36 | 2.0 (-16.2,20.2) | 0.05 |
| Home health | -13.4*** (-17.4,-9.3) | -2.12 | -14.9*** (-22.5,-7.3) | -2.49 | -21.6*** (-27.9,-15.3) | -2.46 |
| Hospice | -24.2*** (-30.6,-17.7) | -6.49 | -35.1*** (-48.4,-21.8) | -8.80 | -16.7*** (-26.2,-7.3) | -3.97 |
| DME | 1.6 (-2.8,6.0) | 0.58 | -0.5 (-7.7,6.7) | -0.18 | 3.0 (-2.4,8.3) | 1.17 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | |
| Acute care stays | -0.9 (-2.3,0.5) | -0.30 | -0.5 (-3.2,2.3) | -0.15 | -0.3 (-2.1,1.5) | -0.10 |
| SNF stays | 2.8*** (2.2,3.5) | 4.02 | 1.5** (0.2,2.7) | 2.14 | 1.3*** (0.5,2.1) | 1.88 |
| SNF days | -13.3 (-30.0,3.5) | -0.82 | -29.9* (-64.0,4.1) | -1.83 | -3.0 (-26.5,20.5) | -0.17 |
| ED visits & observation stays | -7.4*** (-10.0,-4.8) | -1.24 | 3.1 (-2.1,8.3) | 0.51 | -2.9* (-6.0,0.3) | -0.56 |
| E&M visits | -92.9*** (-114.5,-71.4) | -0.69 | -220.8*** (-261.9,-179.7) | -1.69 | -149.2*** (-178.7,-119.7) | -1.03 |
| Procedures | -24.6 (-58.9,9.7) | -0.26 | -131.4*** (-195.7,-67.1) | -1.36 | 100.0*** (42.4,157.6) | 0.84 |
| Tests | -163.7*** (-213.7,-113.8) | -0.68 | -187.7*** (-284.6,-90.7) | -0.79 | 54.2 (-17.4,125.8) | 0.20 |
| Imaging services | -9.9 (-23.0,3.2) | -0.20 | -15.1 (-40.5,10.3) | -0.31 | -23.1** (-40.8,-5.4) | -0.43 |
| Beneficiaries with AWV | 78.9*** (77.9,79.8) | 21.64 | 62.8*** (60.9,64.7) | 17.94 | 64.2*** (63.0,65.5) | 15.37 |
| Home health episodes | -0.1 (-0.9,0.7) | -0.08 | -1.0 (-2.6,0.6) | -0.71 | -2.7*** (-3.9,-1.6) | -1.61 |
| Home health visits | -104.4*** (-130.2,-78.6) | -3.12 | -94.2*** (-140.6,-47.9) | -3.05 | -135.9*** (-173.3,-98.5) | -3.13 |
| **Quality of Care (Beneficiaries with Outcome, Per 1,000 Beneficiaries Per Year)** | | | | | | |
| ACSC hospitalizations | 0.2 (-0.2,0.5) | 0.46 | -0.7* (-1.4,0.1) | -1.58 | 0.0 (-0.4,0.5) | 0.08 |
| Unplanned 30-day Readmissions | 1.1 (-0.5,2.8) | 0.77 | 0.2 (-3.3,3.7) | 0.14 | -0.4 (-2.7,1.8) | -0.26 |
| Hospital readmissions from SNF | 0.3 (-3.1,3.7) | 0.17 | 6.0* (-0.9,13.0) | 3.38 | 1.1 (-3.5,5.8) | 0.60 |

**NOTES:** Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Impacts for the NGACO subgroups by organizational affiliation estimated from impacts for their respective NGACO-years weighted by their respective proportions of beneficiaries in a subgroup. Impacts for 143 out of 153 NGACO years were considered, excluding 10 NGACO years that failed parallel trends tests for total spending. IDS = integrated delivery system; SNF = skilled nursing facility; DME = durable medical equipment; ED = emergency department; E&M = evaluation and management; AWV = annual wellness visit; ACSC = ambulatory care-sensitive condition.

To understand the influences of different ACO characteristics on gross spending impacts we examined gross spending impact estimates for sub-groups of ACOs based on: ACOs' market context, organizational characteristics, provider networks, aligned beneficiary populations and model features. We conducted a meta-regression of impacts for the 62 NGACOs ever in the model across four performance years (see methods details in Appendix D) to examine the percent of variation explained in each factor. **Exhibit F.6** shows the variation explained by each factor used in the meta-regression model, between NGACOs and within NGACOs over time

**Exhibit F.6.** Percent of Variation in Model-Wide Estimated Impact on Total Medicare Spending Explained by Characteristics of Markets, Organizations, Providers, and Beneficiaries and Election of Model Features

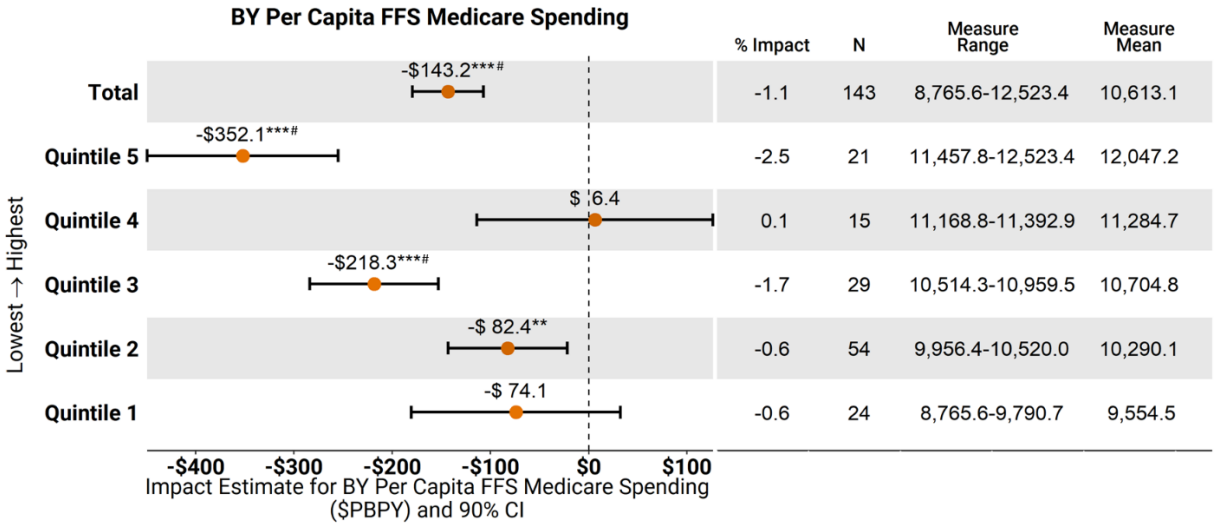
| Set of Covariates | Percent of Variation Explained for Gross Medicare Spending Impact |
|---|---|
| All variables mentioned in Exhibit A.13: | 57.4% |
| Only Market characteristics variables: excluding overlap with other CMMI initiatives: | 1.5% |
| Only Market characteristics variables: overlap of other CMMI Initiatives: | 25.1% |
| Only Organizational characteristics variables: | 0% |
| Only Provider characteristics variables: | 19.4% |
| Only Beneficiary characteristics variables: | 21.5% |
| Only Election of model feature variables: | 18.6% |

NOTES: Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01. Overlap with other CMMI initiatives is interaction of markets with providers and beneficiaries in the NGACO and comparison group.

The following exhibits accompany the discussion in Chapter 4 on impacts by market, organizational, risk-level, and beneficiary sub-groups. These are additional analyses intended to understand the influences of different ACO characteristics on gross spending impacts. The methodological approaches to create the subgroups are described in Appendix D. In brief, the impacts estimates are weighted averages of the gross Medicare spending difference-in-differences estimates for the NGACOs in each subgroup. For all graphs, we show impact estimates for gross Medicare spending per beneficiary per year (PBPY) and 90% confidence intervals. We also display the impact estimate as percentage (% Impact), number of NGACO-years (N), average and range of the measure.

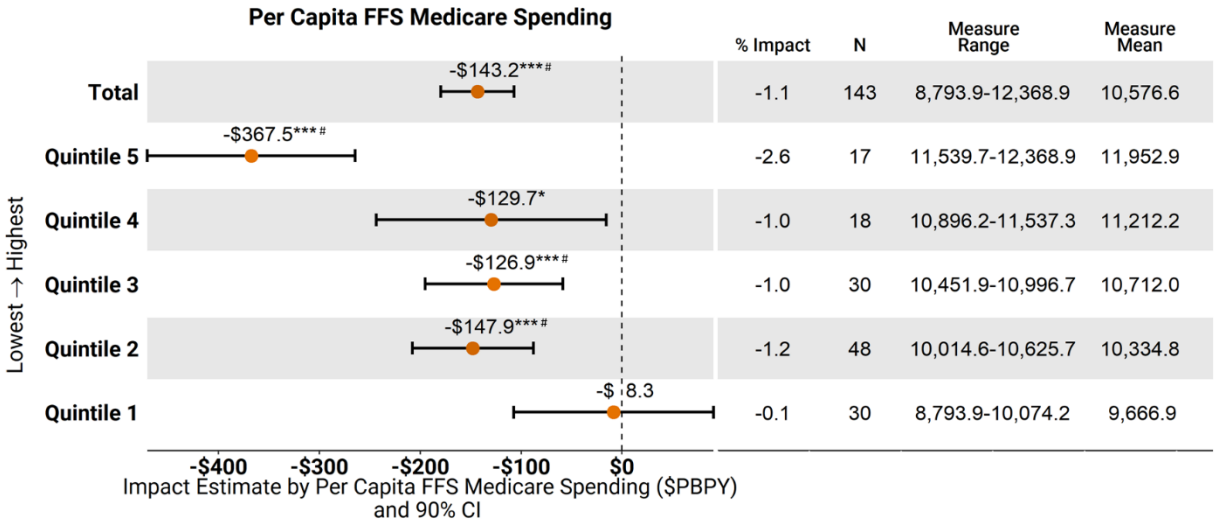
Graphs showing per capita FFS spending level, ACO or Medicare Advantage penetration rate, and hospital concentration define an NGACO's market as the collection of its hospital referral regions (HRRs), with HRR data lagged by one year. Hence, the market data used reflects the year prior to the performance or base years of the ACO's spending impact estimate. The market variables were also grouped into quintiles based on their level or rate relative to all HRRs nationally. Impact estimates are weighted averages of the gross Medicare spending difference-in-differences estimates for the NGACO-years in each quintile subgroup. Ten NGACOs were excluded due to failure of parallel trends test for total spending.

## Exhibit F.7. Average Gross Medicare Spending Impacts for NGACOs, by Base Year Per Capita FFS Medicare Spending Level in ACO Market



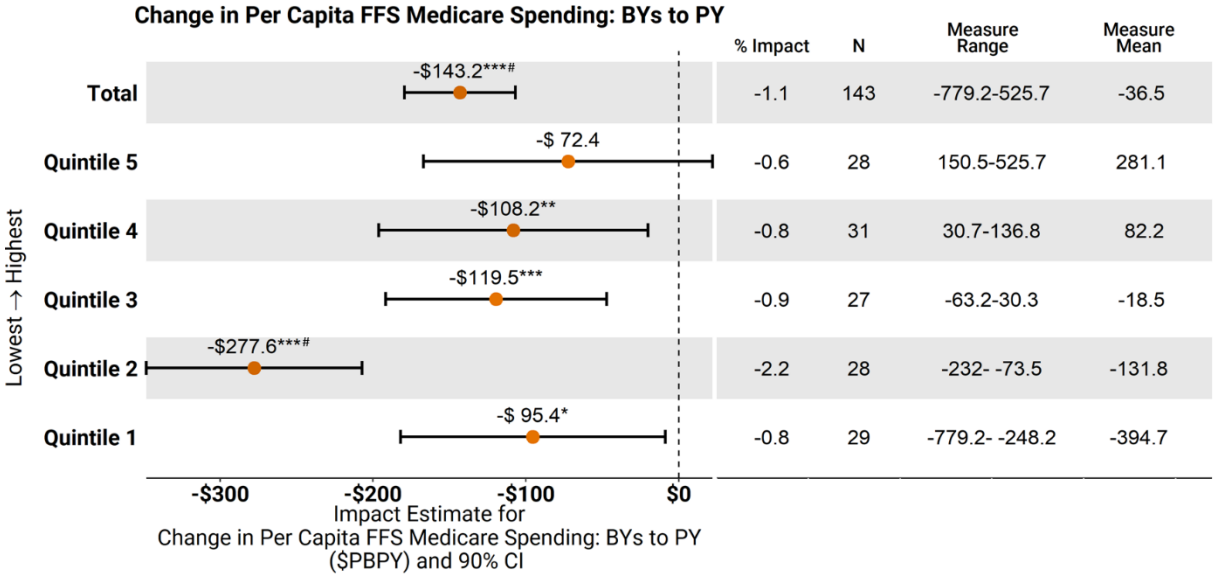

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.8 Average Gross Medicare Spending Impacts for NGACOs, by Performance Year Per Capita FFS Medicare Spending Level in ACO Market



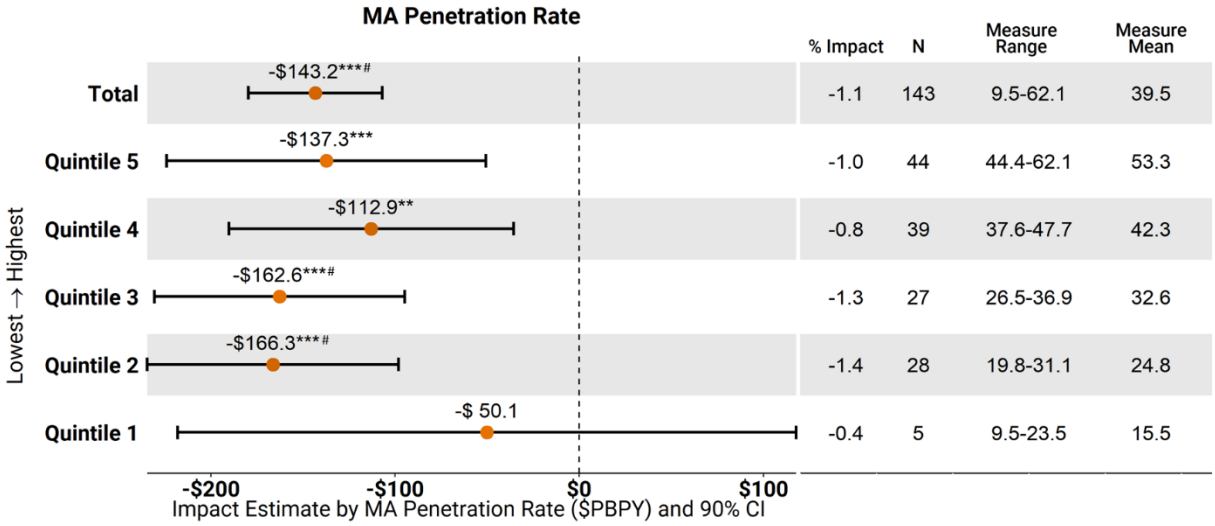

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.9. Average Gross Medicare Spending Impacts for NGACOs, by Change in Per Capita FFS Medicare Spending Level in ACO Market, from Base Years to Performance Year



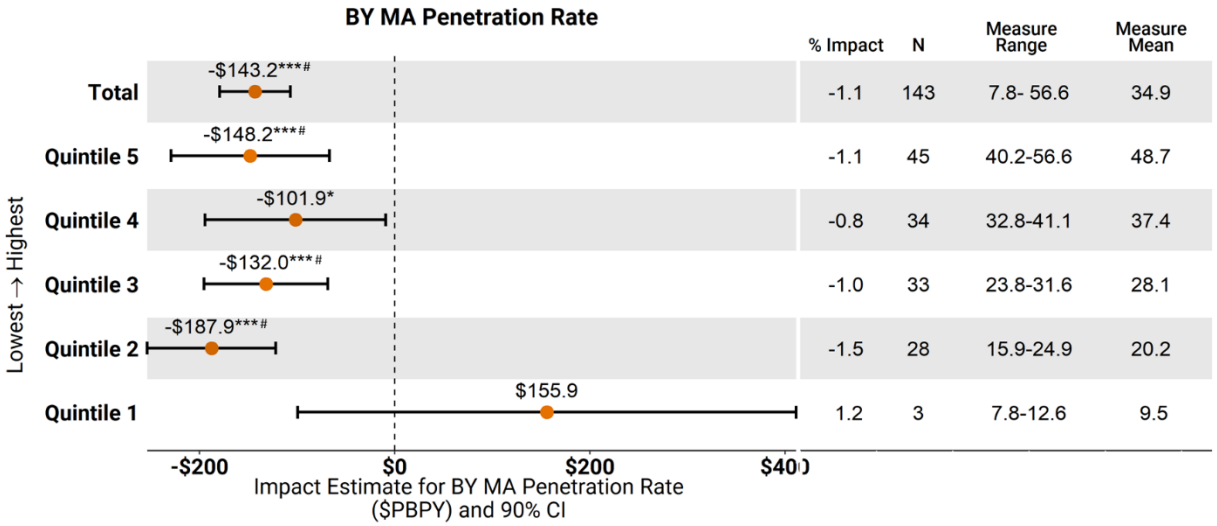

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.10. Average Gross Medicare Spending Impacts for NGACOs, by Performance Year Medicare Advantage Penetration Rate



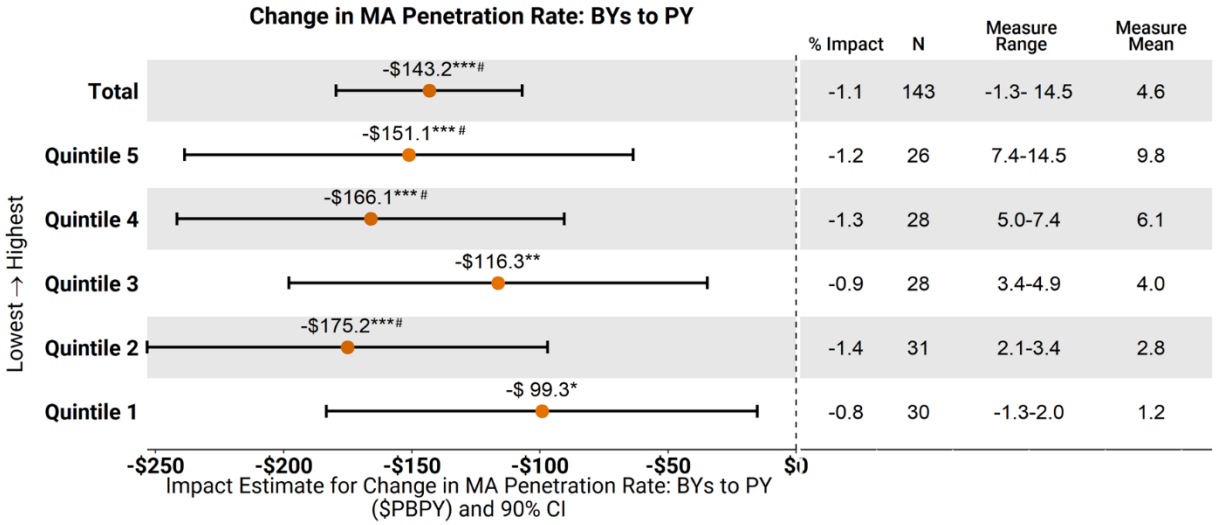

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.11. Average Gross Medicare Spending Impacts for NGACOs, by Baseline Medicare Advantage Penetration Rate



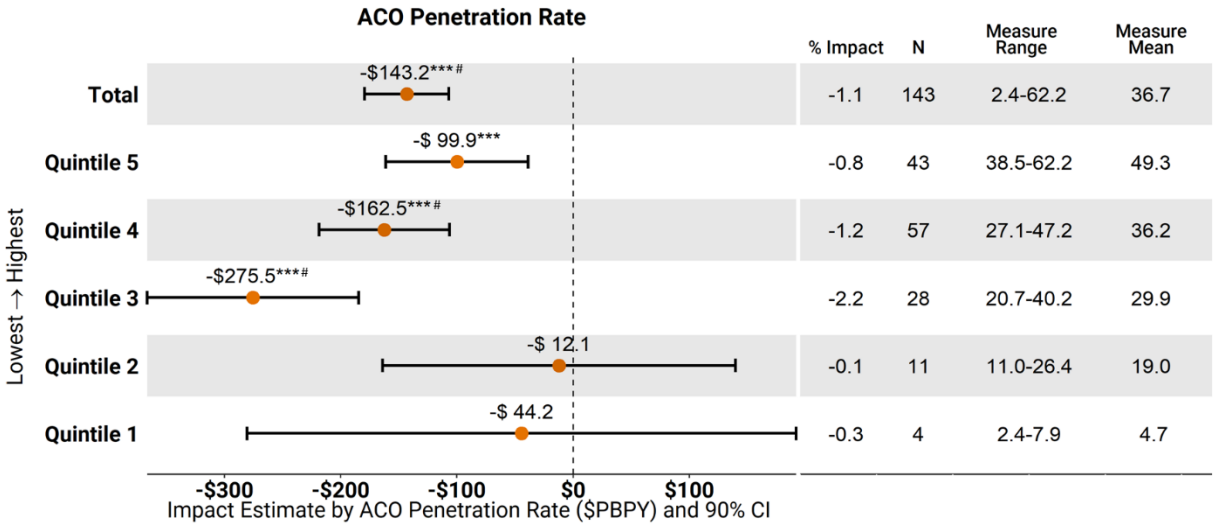

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005

## Exhibit F.12. Average Gross Medicare Spending Impacts for NGACOs, by Change in Medicare Advantage Penetration Rate from Base Years to Performance Year



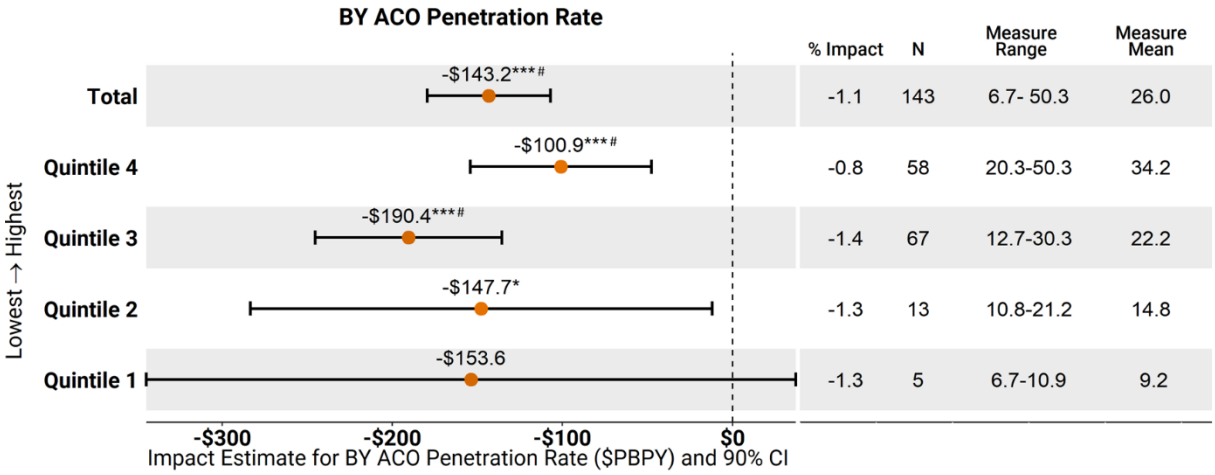

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.13. Average Gross Medicare Spending Impacts for NGACOs, by Performance Year ACO Penetration Rate



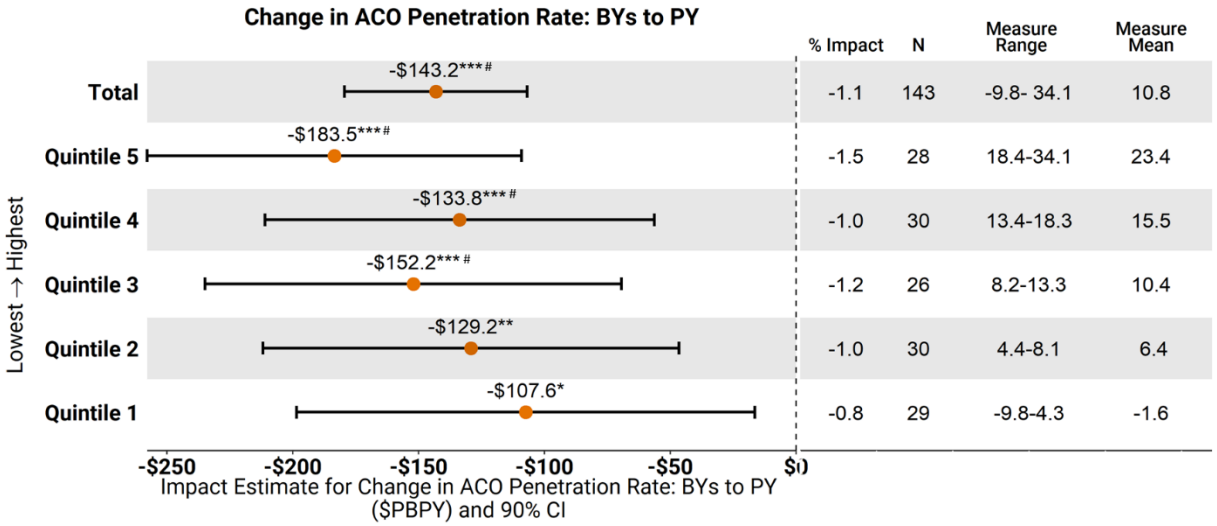

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.14. Average Gross Medicare Spending Impacts for NGACOs, by Base Year ACO Penetration Rate



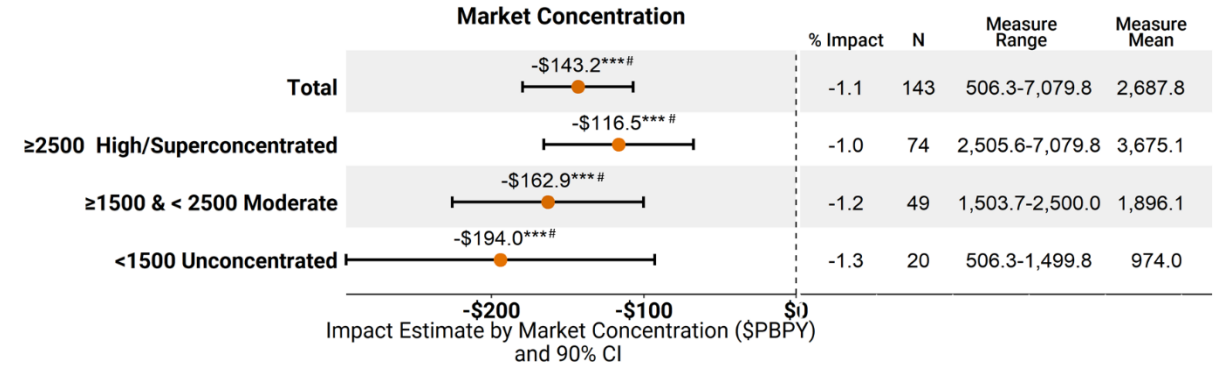

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, and ***p<0.01.

## Exhibit F.15. Average Gross Medicare Spending Impacts for NGACOs, by Change in ACO Penetration Rate from Base Years to Performance Year



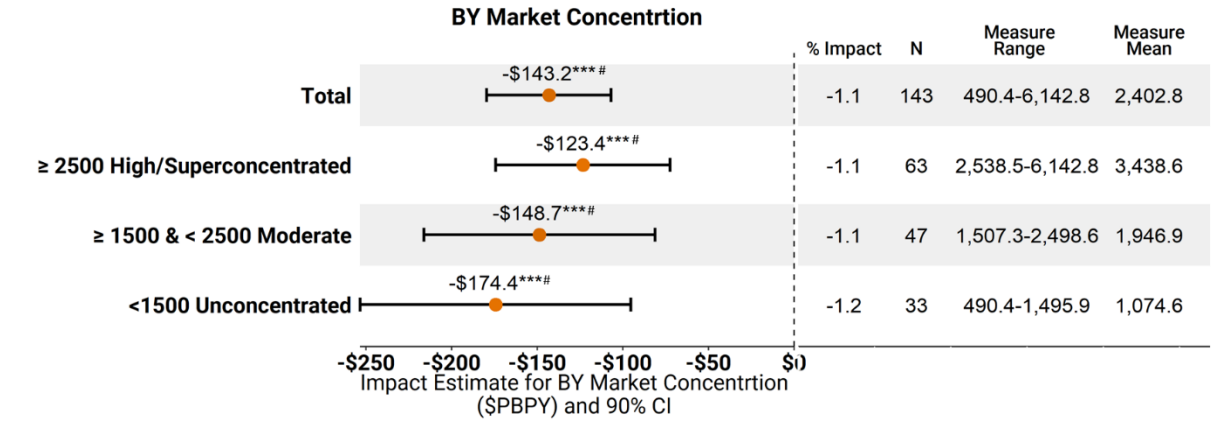

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005

## Exhibit F.16. Average Gross Medicare Spending Impacts for NGACOs, by Performance Year Hospital Market Concentration



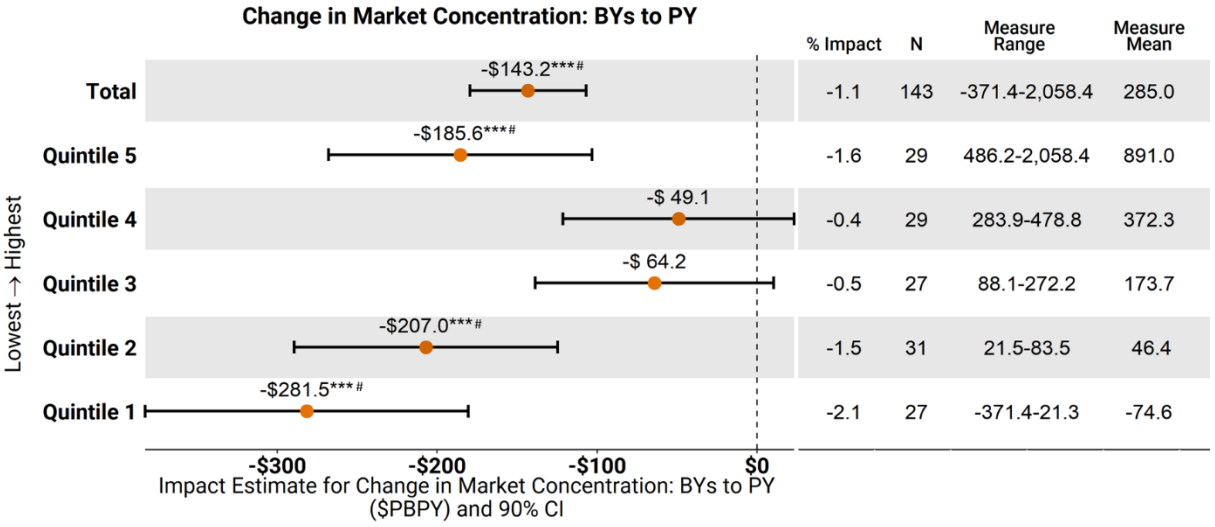

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Market hospital concentration is measured using the Herfindahl–Hirschman Index (HHI).

## Exhibit F.17. Average Gross Medicare Spending Impacts for NGACOs, by Base Year Hospital Market Concentration



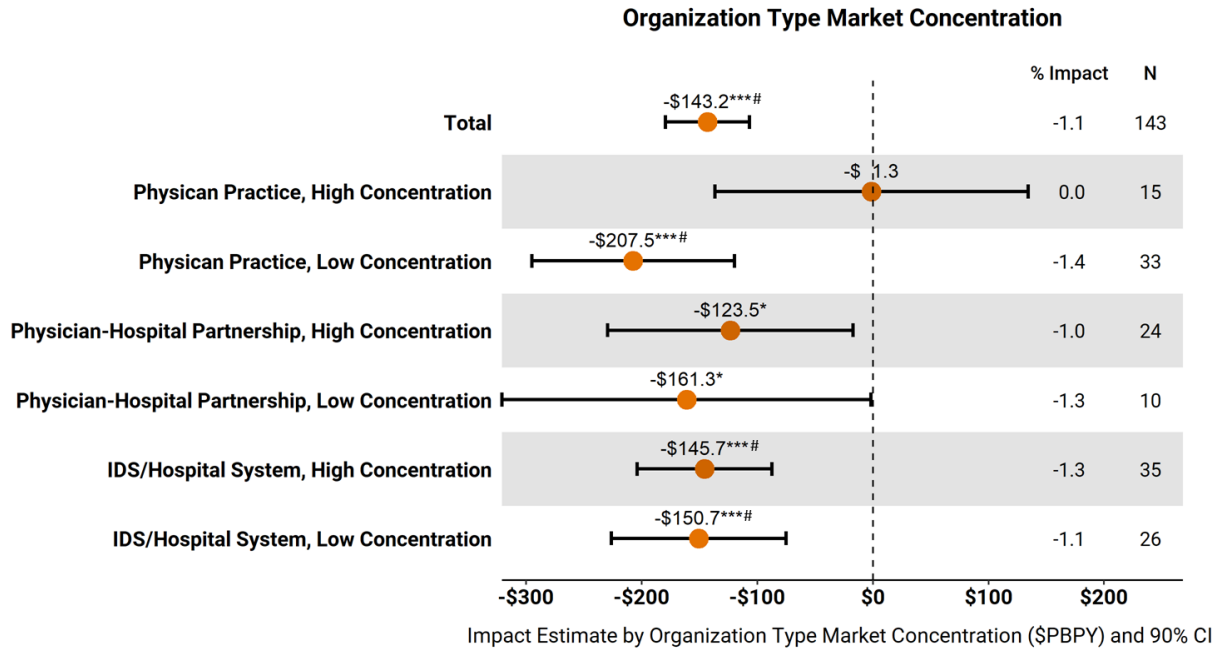

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Market hospital concentration is measured using the Herfindahl–Hirschman Index (HHI).

## Exhibit F.18. Average Gross Medicare Spending Impacts for NGACOs, by Change in Hospital Market Concentration from Base Years to Performance Year



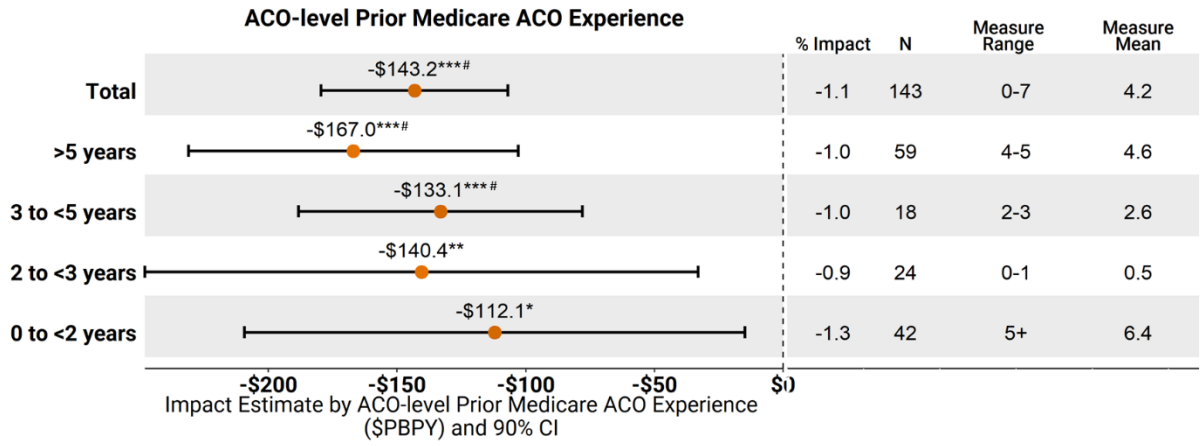

**NOTES:** Data for market characteristics are lagged one year. Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Market hospital concentration is measured using the Herfindahl–Hirschman Index (HHI).

## Exhibit F.19. Average Gross Medicare Spending Impacts for NGACOs, by Organization Type and Market Concentration



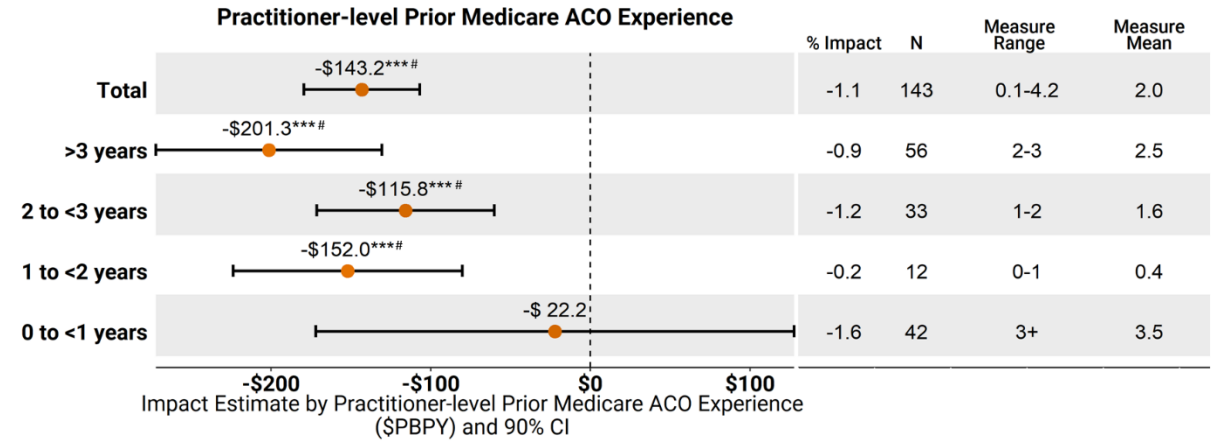

**NOTES:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Market hospital concentration is measured using the Herfindahl–Hirschman Index (HHI).

## Exhibit F.20. Average Gross Medicare Spending Impacts by Categories of NGACO Years of Prior Medicare ACO Experience



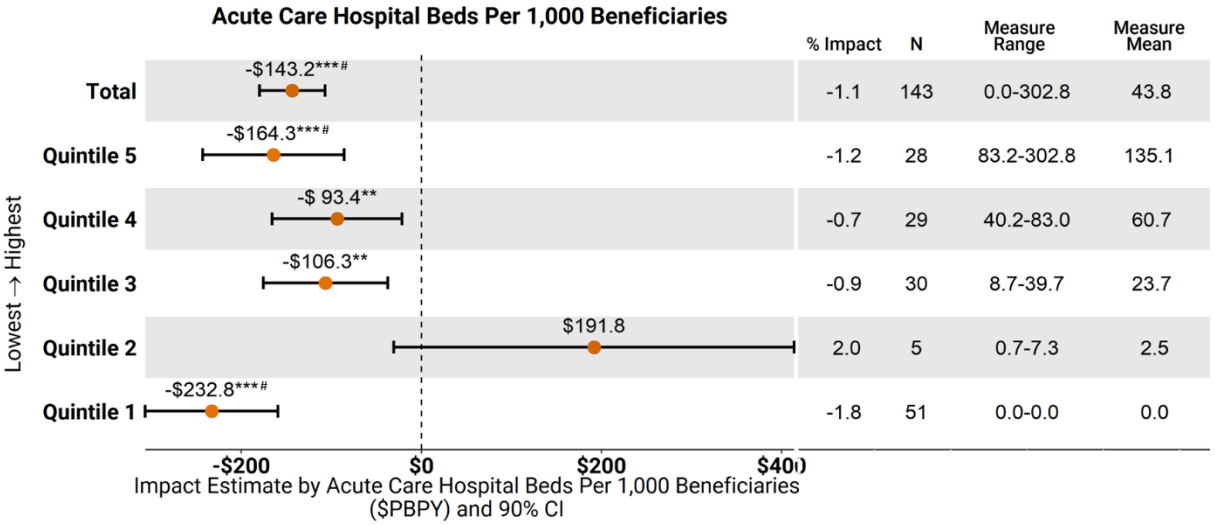

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

**Exhibit F.21.** Average Gross Medicare Spending Impacts by Categories of NGACO Practitioner Years of Prior Medicare ACO Experience



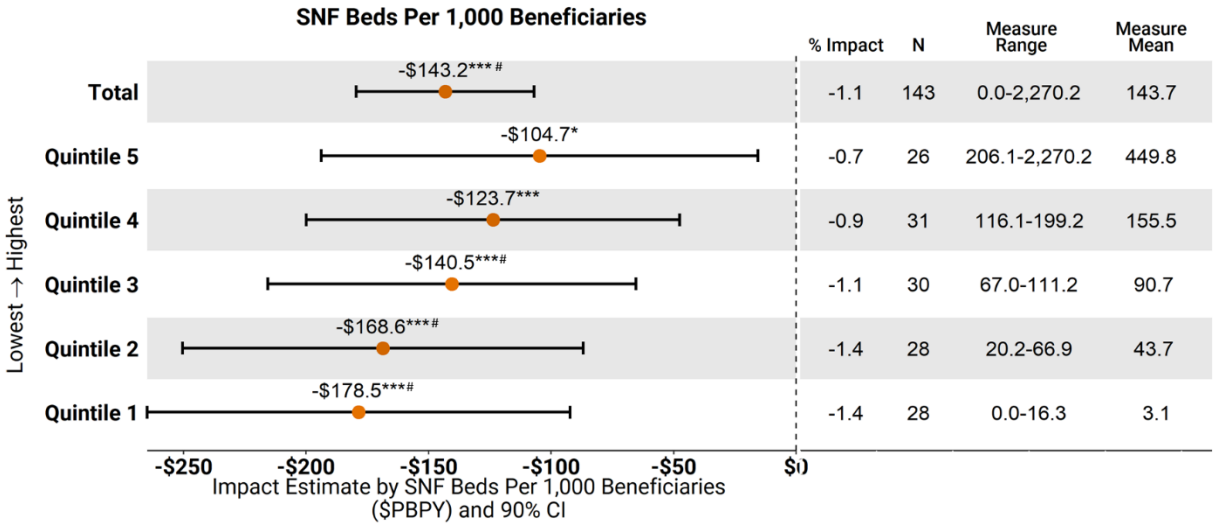

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

**Exhibit F.22.** Average Gross Medicare Spending Impacts by Number of Acute Care Hospital Beds (per 1,000 beneficiaries) in Provider Network



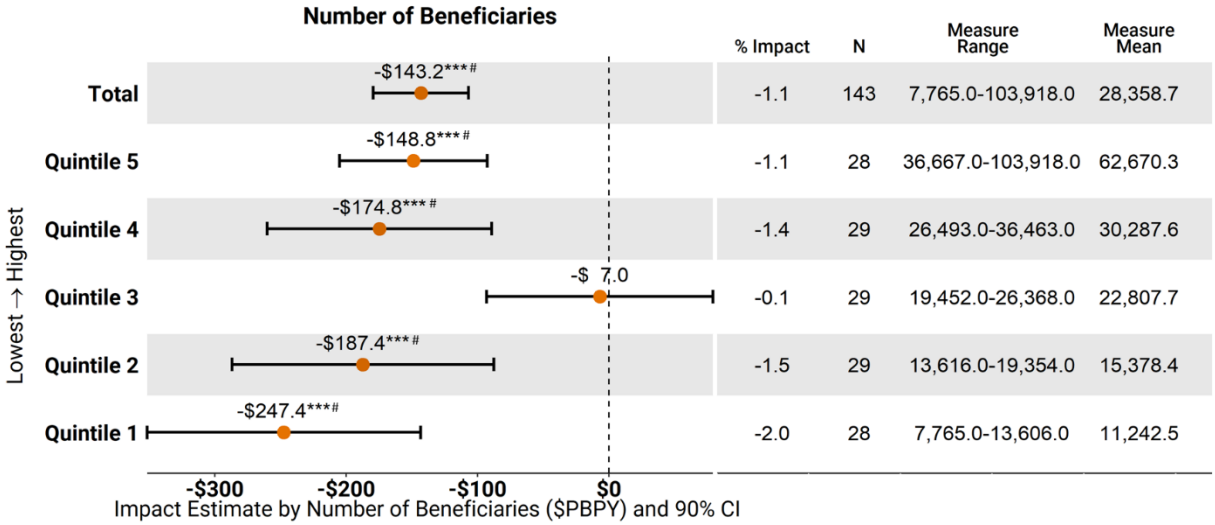

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.23. Average Gross Medicare Spending Impacts by Number of Skilled Nursing Facility Beds (per 1,000 beneficiaries) in Provider Network



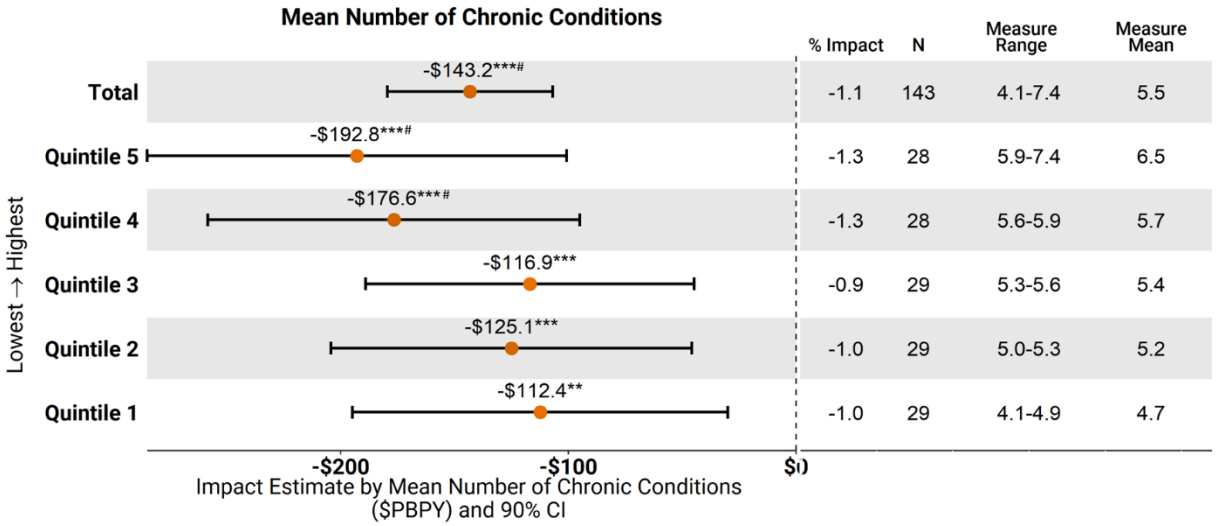

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.24. Average Gross Medicare Spending Impacts by Size of Beneficiary Population



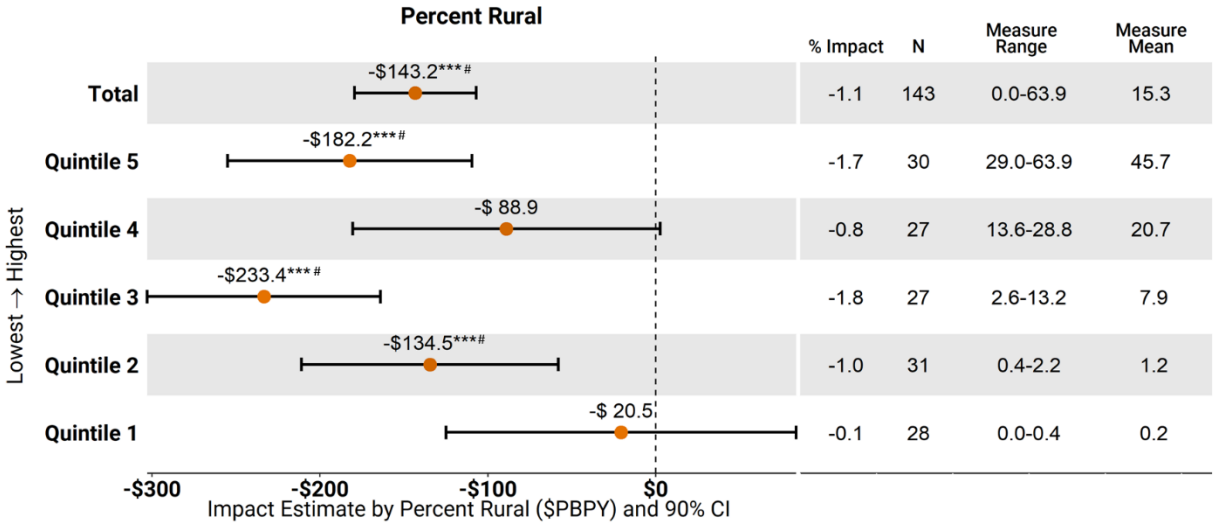

**NOTE**: Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.25. Average Gross Medicare Spending Impacts by Mean Number of Chronic Conditions within Beneficiary Population



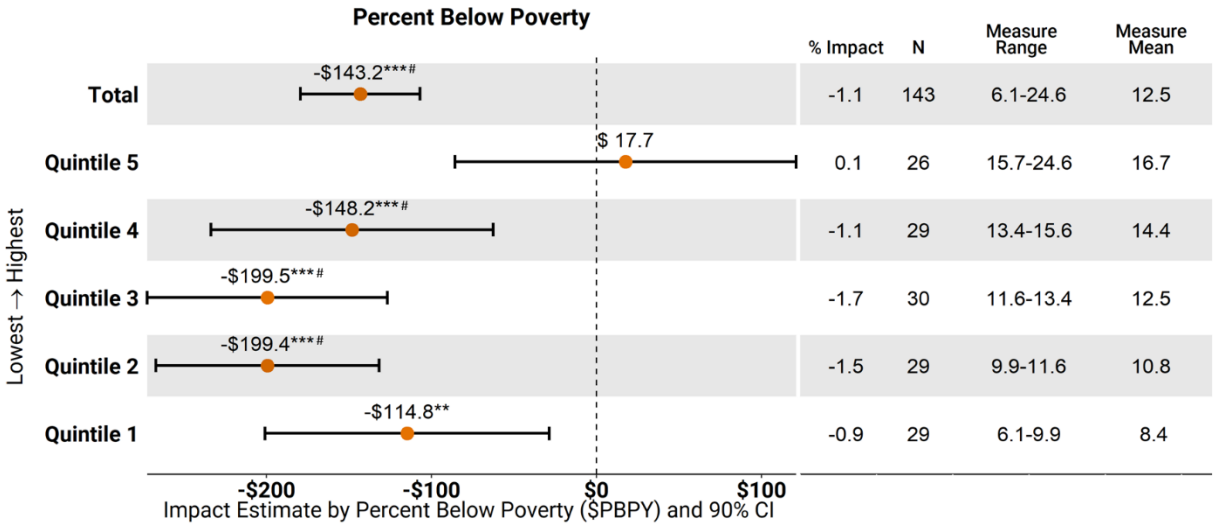

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.26. Average Gross Medicare Spending Impacts by Percentage Rural Beneficiaries



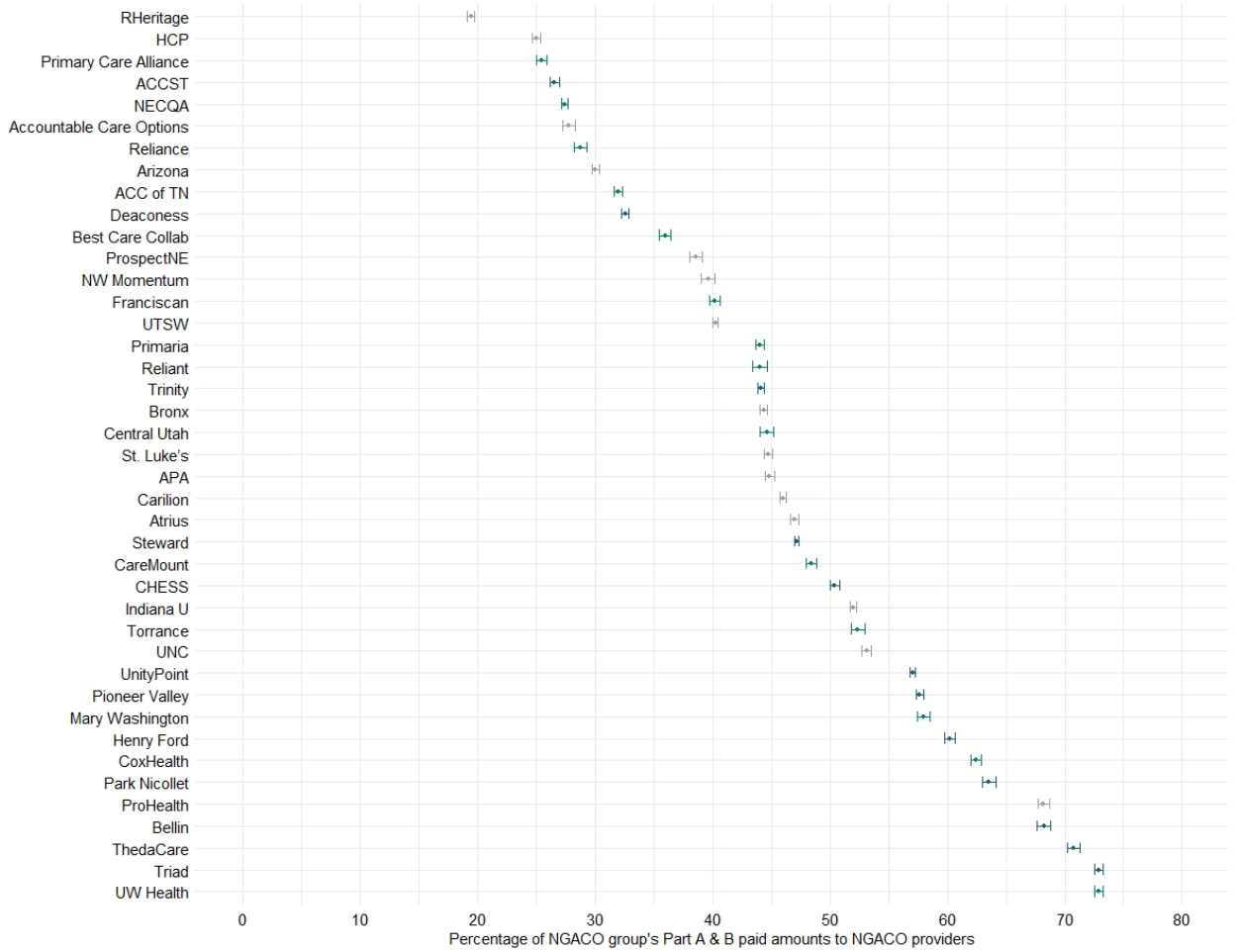

**NOTE:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005.

## Exhibit F.27. Average Gross Medicare Spending Impacts by Percentage of Beneficiaries Living in Higher-Poverty Communities



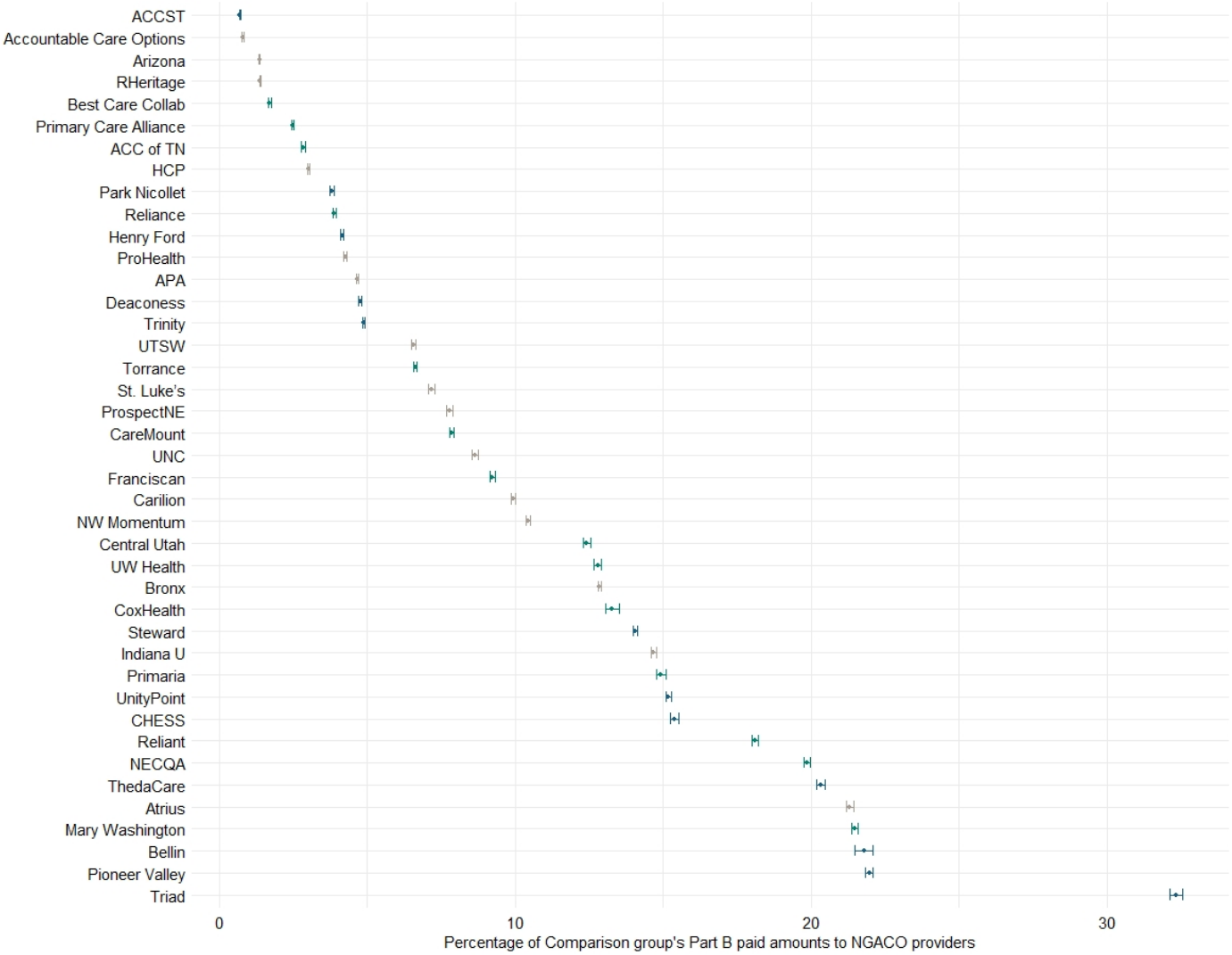

**NOTES:** Impact estimates significant at *p<0.1, **p<0.05, ***p<0.01, and ***#p<0.005. Poverty in community defined as percentage population in a NGACO beneficiary's ZIP Code Tabulation Area (ZCATA) below the Federal Poverty Level.

## Exhibit F.28. Stickiness for NGACO Group in PY4, by NGACO




**NOTES:** We measure stickiness as percentage of NGACO beneficiaries' Medicare Parts A and B paid amounts in the performance year(s) to providers in their NGACO, including both participating and preferred providers. 2016 Cohort = blue; 2017 Cohort = gray; 2018 Cohort = teal. We show 95% confidence intervals (CIs) as bars around the estimates.

## **Exhibit F.29.** Direct Spillover on Comparison Group from NGACO providers in PY4, by NGACO




**NOTES:** 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. 2016 Cohort = blue; 2017 Cohort = gray; 2018 Cohort = teal. We show 95% confidence intervals (CIs) as bars around the estimates.

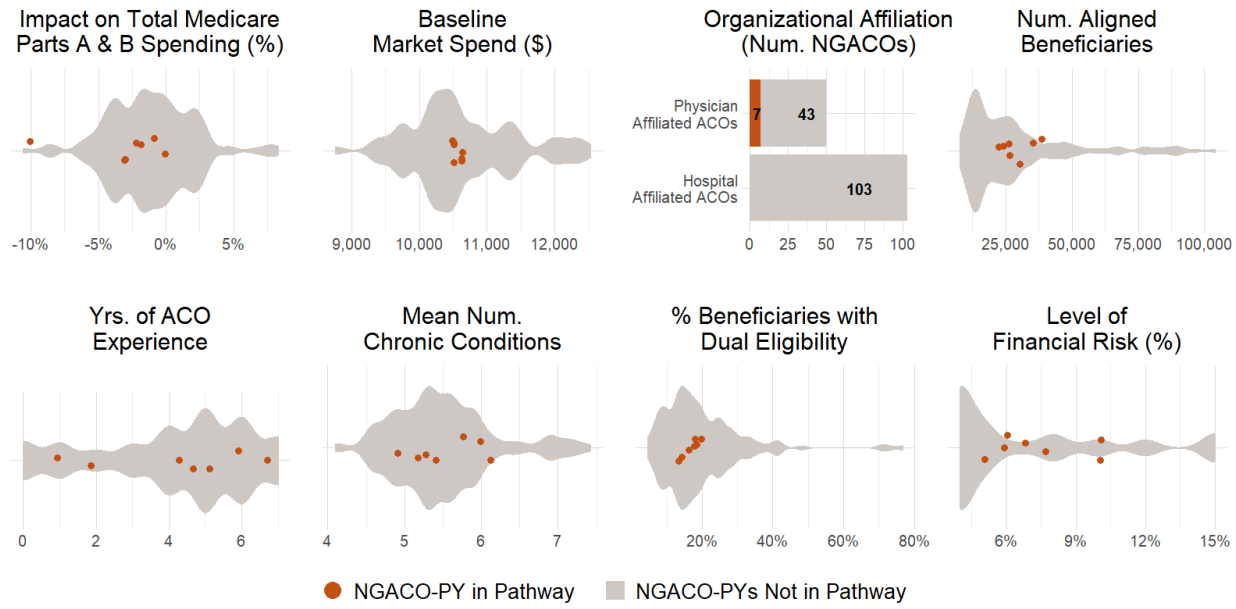
# Appendix G: Exhibits to Support Chapter 5

This Appendix presents supplemental exhibits that support the findings presented in Chapter 5

- Distribution of NGACO-PYs in a pathway and those not in the pathway for factors used in qualitative comparative analysis
  - Larger Physician Practice NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA (**Exhibit G.1**)
  - Smaller Physician Practice NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA (**Exhibit G.2**)
  - Hospital-affiliated NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA (**Exhibit G.3**)
  - Physician Practice NGACOs in Low-Spending Markets: Density Plots for Factors Used in fsQCA (**Exhibit G.4**)
  - Hospital-affiliated NGACOs in Low-Spending Markets: Density Plots for Factors Used in fsQCA (**Exhibit G.5**)

- Summary of factors analyzed and data calibration of factors and outcomes:
  - Data Calibration Detailed: Rescaling Factor and Outcome Values for Analysis (**Exhibit G.6**)
  - Factors Included in the Analysis, Description and Data Source (**Exhibit G.7**)

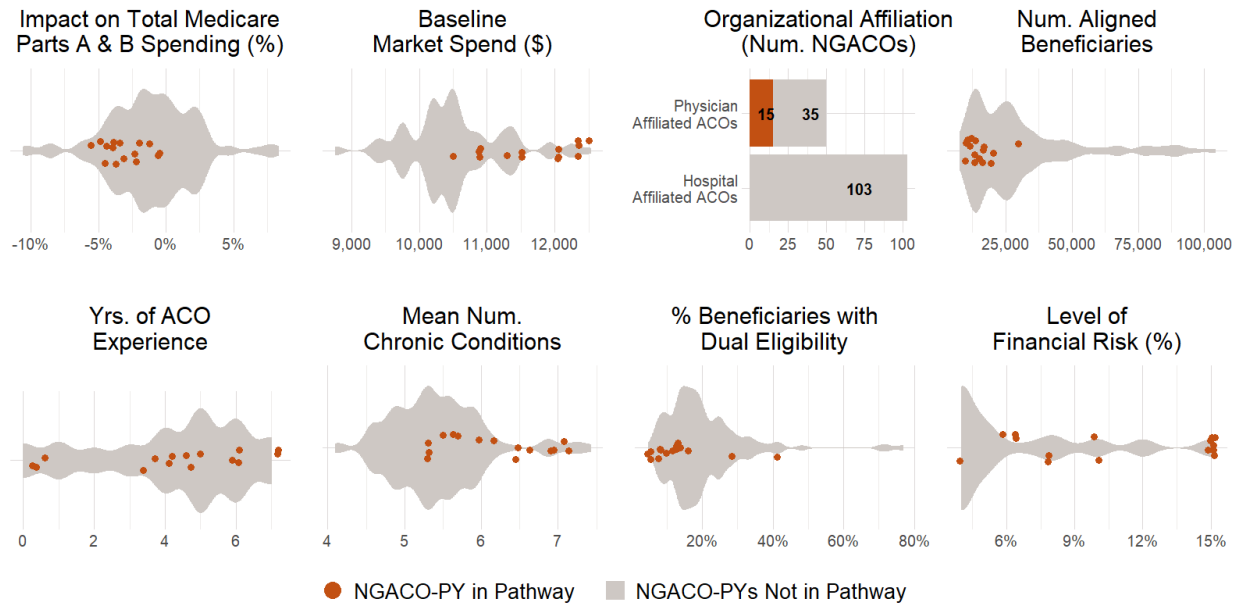
## Exhibit G.1. Larger Physician Practice NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA




**NOTES**: These exhibits contrast the distribution of the NGACO-PYs in the pathway with NGACO-PYs that are not in the pathway. The gray shaded area represents the density plot for the NGACO-PYs that are not in the pathway. The orange dots represent each NGACO-PY included in the pathway. To communicate the distributions visually, the portions of the density plot on both sides of the x-axis mirror each other. We jittered the orange dots over the y-axis for the same reason; the y-axis for the orange dots has no interpretive significance.

**SOURCE**: NORC analysis of claims and administrative data.

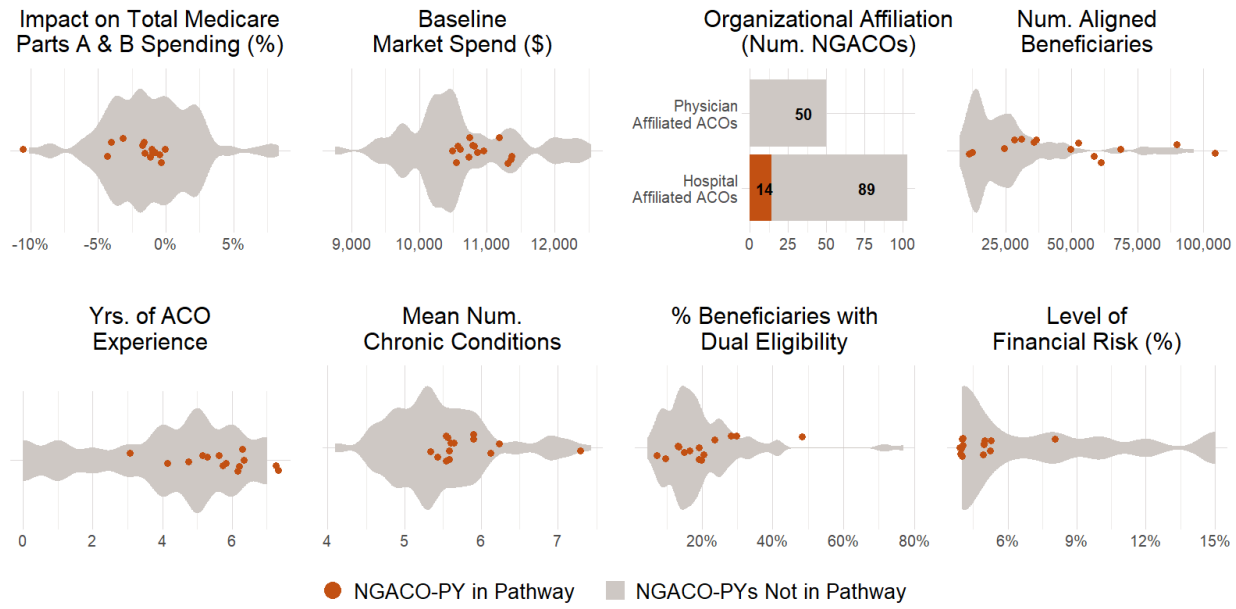
## **Exhibit G.2.** Smaller Physician Practice NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA




**NOTES:** These exhibits contrast the distribution of the NGACO-PYs in the pathway with NGACO-PYs that are not in the pathway. The gray shaded area represents the density plot for the NGACO-PYs that are not in the pathway. The orange dots represent each NGACO-PY included in the pathway. To communicate the distributions visually, the portions of the density plot on both sides of the x-axis mirror each other. We jittered the orange dots over the y-axis for the same reason; the y-axis for the orange dots has no interpretive significance.

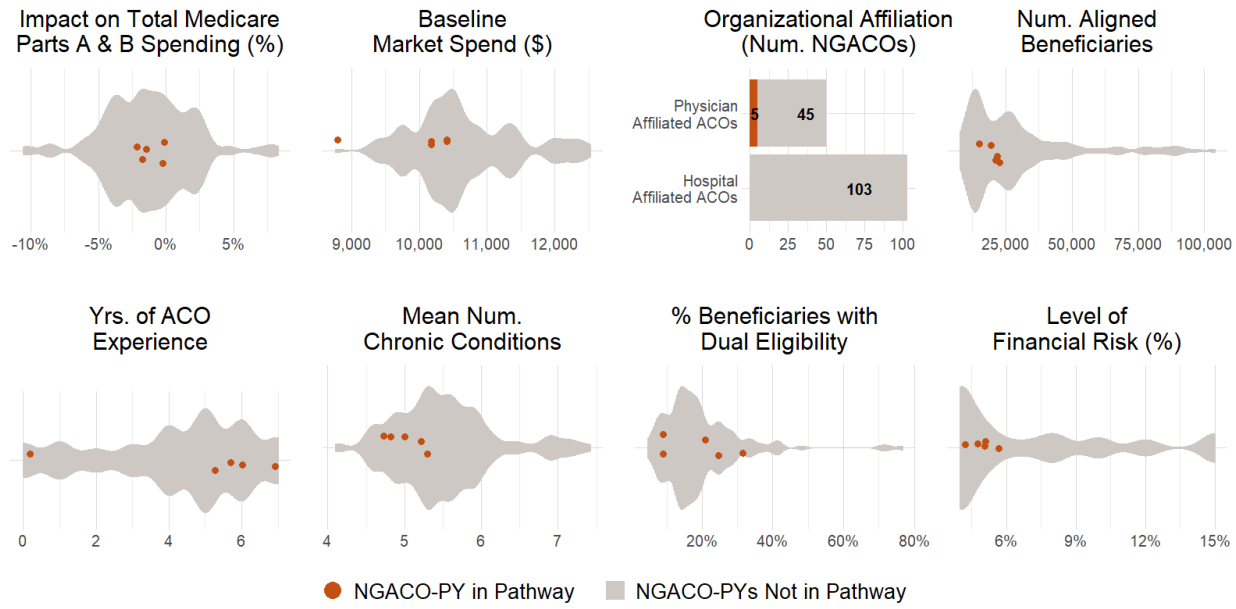
**SOURCE:** NORC analysis of claims and administrative data.

## Exhibit G.3. Hospital-Affiliated NGACOs in High-Spending Markets: Density Plots for Factors Used in fsQCA



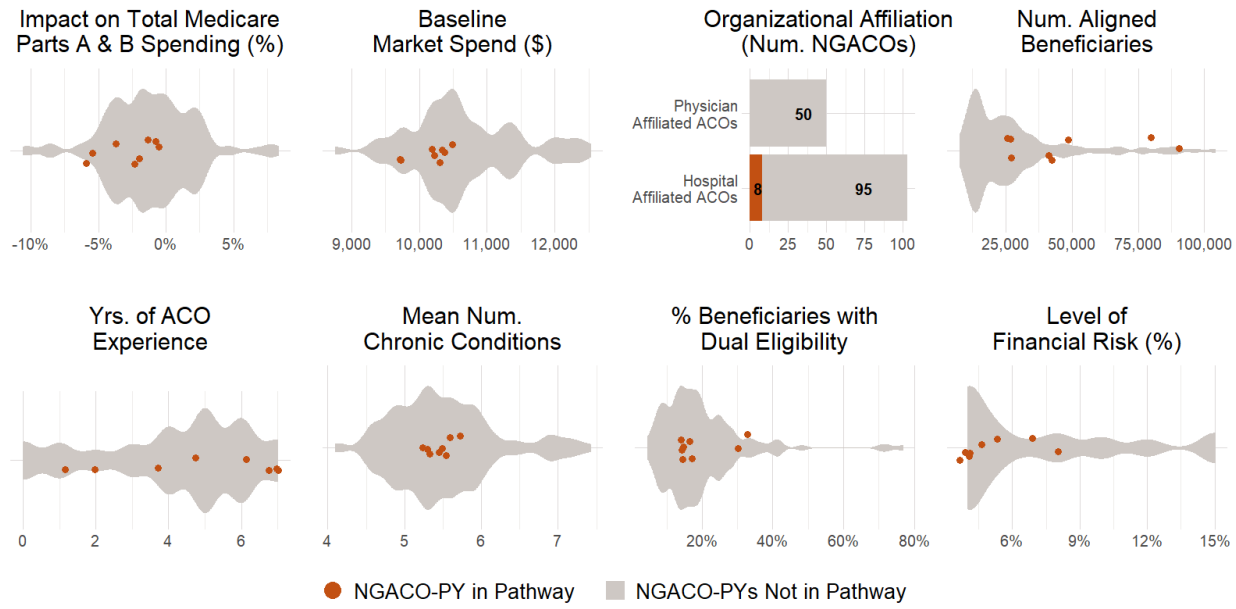

**NOTES**: These exhibits contrast the distribution of the NGACO-PYs in the pathway with NGACO-PYs that are not in the pathway. The gray shaded area represents the density plot for the NGACO-PYs that are not in the pathway. The orange dots represent each NGACO-PY included in the pathway. To communicate the distributions visually, the portions of the density plot on both sides of the x-axis mirror each other. We jittered the orange dots over the y-axis for the same reason; the y-axis for the orange dots has no interpretive significance.
**SOURCE**: NORC analysis of claims and administrative data

## Exhibit G.4. Physician Practice NGACOs in Low-Spending Markets: Density Plots for Factors Used in fsQCA




**NOTES**: These exhibits contrast the distribution of the NGACO-PYs in the pathway with NGACO-PYs that are not in the pathway. The gray shaded area represents the density plot for the NGACO-PYs that are not in the pathway. The orange dots represent each NGACO-PY included in the pathway. To communicate the distributions visually, the portions of the density plot on both sides of the x-axis mirror each other. We jittered the orange dots over the y-axis for the same reason; the y-axis for the orange dots has no interpretive significance.
**SOURCE**: NORC analysis of claims and administrative data

## Exhibit G.5. Hospital-affiliated NGACOs in Low-Spending Markets: Density Plots for Factors Used in fsQCA




**NOTES**: These exhibits contrast the distribution of the NGACO-PYs in the pathway with NGACO-PYs that are not in the pathway. The gray shaded area represents the density plot for the NGACO-PYs that are not in the pathway. The orange dots represent each NGACO-PY included in the pathway. To communicate the distributions visually, the portions of the density plot on both sides of the x-axis mirror each other. We jittered the orange dots over the y-axis for the same reason; the y-axis for the orange dots has no interpretive significance.
**SOURCE**: NORC analysis of claims and administrative data

## Exhibit G.6. Data Calibration Detailed: Rescaling Factor and Outcome Values for Analysis

| Factor(s) | Calibration Type | Threshold |
|---|---|---|
| Physician practice ACO | Binary | NA |
| Higher baseline spending | Higher values are favorable; Lower values are unfavorable | Inclusion: >$12,231.64<br>Crossover: $10,481.22<br>Exclusion: <$9,479.99 |
| More aligned beneficiaries | Higher values are favorable; Lower values are unfavorable | Inclusion: >78,089.8 beneficiaries<br>Crossover: 22,428.0 beneficiaries<br>Exclusion: <10,350.8 beneficiaries |
| More ACO experience | Higher values are favorable; Lower values are unfavorable | Inclusion: 7 years<br>Crossover: 5 years<br>Exclusion: 0 years |
| More chronic conditions | Higher values are favorable; Lower values are unfavorable | Inclusion: >6.9 chronic conditions<br>Crossover: 5.4 chronic conditions<br>Exclusion: <4.6 chronic conditions |

| Factor(s) | Calibration Type | Threshold |
|---|---|---|
| Fewer dually eligible beneficiaries | Lower values are favorable; Higher values are unfavorable | Inclusion: <7.4% dually eligible<br>Crossover: 16.6% dually eligible<br>Exclusion: >38.5% dually eligible |
| Higher risk selection | Higher values are favorable; Lower values are unfavorable; Minimum value set to 0* | Inclusion: >15% risk<br>Crossover 8% risk<br>Exclusion: <5% risk<br>*After minimum removed for exclusion; minimum value set to 0 |
| NGACO-PY reduced Medicare spending | Outcome | For purposes of QCA – "success" will include NGACO-PYs where: 1) overall spending reduction is statistically insignificant; and 2) that fail the parallel trends test as long as the magnitude of their reduction is greater than the NGACO-PY with the smallest, statistically significant overall spending reduction. |

## Exhibit G.7. Factors Included in Analysis, Description and Data Source

| Category | Factor(s) | Description | Data Source |
|---|---|---|---|
| Spending | Total Medicare Spending | Total parts A and B spending incurred by Medicare beneficiaries aligned the NGACO | NORC analysis of claims data |
| | Acute Care Hospital Facility | Acute Care Hospital Facility Spending incurred by Medicare beneficiaries aligned to the NGACO | |
| | Outpatient Facility | Outpatient Facility Spending incurred by Medicare beneficiaries aligned to the NGACO | |
| | Skilled Nursing Facility | SNF Spending incurred by Medicare beneficiaries aligned to the NGACO | |
| | Professional Services | Professional Services Spending incurred by Medicare beneficiaries aligned to the NGACO | |
| Utilization | SNF Stays | SNF Stays utilized by Medicare beneficiaries aligned to the NGACO | |
| | SNF Days | SNF Days utilized by Medicare beneficiaries aligned to the NGACO | |
| | Acute Care Stays | Acute Care Stays utilized by Medicare beneficiaries aligned to the NGACO | |
| | ED Visits and Observation Stays | ED Visits and Observation Stays utilized by Medicare beneficiaries aligned to the NGACO | |
| | Imaging Services | Imaging Services utilized by Medicare beneficiaries aligned to the NGACO | |
| | Tests | Tests utilized by Medicare beneficiaries aligned to the NGACO | |
| | Procedures | Procedures utilized by Medicare beneficiaries aligned to the NGACO | |
| NGACO Structure | Organization Type | Physician practice affiliated NGACOs or non-physician practice affiliated | NORC analysis of CMMI NGACO data |
| | Percent Dually Eligible | The percent of the NGACO attributed beneficiary population that are qualified for both Medicare and Medicaid participation | NORC analysis of Medicare Beneficiary Summary File linked to Master Database Management File |
| | Mean Number of Chronic Conditions | The mean number of chronic conditions for beneficiaries aligned to the NGACO | |
| | Medicare ACO Years of Experience | Number of Medicare NGACO years of experience accumulated by the NGACO as of 2019 | NORC analysis of SSP and Pioneer data |
| | Percent of Care Provided In Network | Percent of care provided in network (stickiness) measures the amount of care NGACOs receive within the NGACO as opposed to seeking care outside of the NGACO network. | NORC analysis of claims data |
| | Level of Financial Risk | A factor of the risk level assumed by the NGACO (80% or 100%) and the risk cap chosen (5-15%) | NORC analysis of CMMI NGACO data |

| Category | Factor(s) | Description | Data Source |
|---|---|---|---|
| NGACO Network | % of Beneficiaries in a Rural Area | Percent of NGACO aligned beneficiaries that reside in rural areas | NORC analysis of Master Beneficiary Summary File linked to HRSA Federal Office of Rural Health Policy Data files |
| | PCPs per 1000 Attributed Beneficiaries | The number of primary care physicians per 1000 beneficiaries attributed to the NGACO | NORC analysis of NGACO provider data linked to CMS Provider of Service files |
| | Specialists per 1000 Attributed Beneficiaries | The number of specialists per 1000 beneficiaries attributed to the NGACO | |
| | Hospital Beds in Network per 1000 Attributed Beneficiaries | The number of short term and critical access hospital beds per 1000 beneficiaries attributed to the NGACO | |
| | SNF Beds in Network per 1000 Attributed Beneficiaries | The number of skilled nursing facility beds per 1000 beneficiaries attributed to the NGACO | |
| | Number of Aligned Beneficiaries | The number of beneficiaries aligned to the NGACO | NORC analysis of Medicare Beneficiary Summary File |
| | Provider Network Size | The number of participating and preferred providers within the NGACO's network | NORC analysis of NGACO provider data linked to CMS Provider of Service files |
| NGACO Market | % Medicare ACO Penetration | The denominator for ACO penetration rate is the number of Medicare FFS beneficiaries with Part A and B coverage. The numerator is the number of beneficiaries aligned to an ACO. | Medicare Beneficiary Summary File linked to Master Database Management File |
| | % Medicare Advantage Penetration | The denominator for the Medicare Advantage penetration rate is total number of Medicare beneficiaries with Part A and B coverage. The numerator is the number of Medicare Advantage beneficiaries. | |
| | Hospital Beds in Market per 1000 population | Number of hospital beds in the NGACO market area per 1000 population | Medicare Data on Provider Practice and Specialty (MD-PPAS). |
| | Baseline PAC Market Spending ($) | The amount of PAC spending in the NGACOs market area in the baseline years. | CMS Geographic Variation Pubic Use File |
| | Total Baseline Market Spending ($) | Total parts A and B spending incurred by Medicare beneficiaries aligned the NGACO in the baseline years | |
| | Hospital Market Concentration (HHI) | 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). | American Hospital Association Data |

# Appendix H: Exhibits to Support Claims-Based Analyses

The exhibits below support the findings of the claims-based analyses presented in our Fourth Evaluation Report. The exhibits comprise a set of tables that present difference-in-differences (DID) estimates model-wide and for the three cohorts in performance year (PY) 4 (2019) and cumulatively, including PY1 (2016), PY2 (2017), PY3 (2018), and PY4 (2019). We present estimated impacts on spending, utilization, and quality of care for all 23 outcome measures studied both model-wide and for the three cohorts. We also present conditional means for the base (BY) and PYs as well as aggregate estimates.

This appendix is organized as follows:

- Exhibit H.1: Estimated cumulative impact on measures of Medicare spending, utilization, and quality of care, PY1 through PY4, model-wide
- Exhibit H.2: Estimated impact on measures of Medicare spending, utilization, and quality of care in PY4, model-wide
- Exhibits H.3 –H.5: Estimated cumulative impact on measures of Medicare spending, utilization, and quality of care in PY(s), at the cohort level
- Exhibits H.6 –H.8: Estimated impact on measures of Medicare spending, utilization, and quality of care in PY4, at the cohort level
- Exhibit H.9: Estimated cumulative impacts on total Medicare spending, PY1 through PY4, for NGACOs in the 2016, 2017, and 2018 cohorts
- Exhibit H.10: Estimated impacts on total Medicare spending in PY4, for NGACOs in the 2016, 2017, and 2018 cohorts
- Estimated cumulative impacts on measures of Medicare spending, utilization, and quality of care in PY4 by cohort:
  - Exhibits H.11 – H.16 for the 2016 cohort
  - Exhibits H.17 – H.22 for the 2017 cohort
  - Exhibits H.23 – H.28 for the 2018 cohort
- Estimated impacts on measures of Medicare spending, utilization, and quality of care in PY4 by cohort:
  - Exhibits H.29 – H.34 for the 2016 cohort
  - Exhibits H.35 – H.40 for the 2017 cohort
  - Exhibits H.41 – H.46 for the 2018 cohort

In each table, the DID estimate is the estimated relative change per beneficiary per year (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 2019 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, skilled nursing facility (SNF), and other post-acute care (PAC) facilities—excludes spending for professional services. Other PAC facilities included long-term care hospitals, inpatient rehabilitation hospitals.

## Exhibit H.1. Estimated Cumulative Impact on Medicare Spending, Utilization, and Quality of Care, PY1 through PY4, Model-Wide

| | Baseline Years | | Cumulative Model-wide in PY1, PY2,PY3 and PY4 (2016, 2017, 2018, and 2019) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Difference-in-Differences | | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 13,636.61 | 13,893.27 | 13,544.27 | 13,955.58 | -154.65 *** | ↓ | ↑ | -213.85 , -95.45 | -1.172 | 0.000 | -666,877,835 *** | -922,170,866 , -411,584,803 |
| Acute care hospital facility | 4,144.53 | 4,167.17 | 4,145.17 | 4,204.88 | -37.08 *** | ↕ | ↕ | -58.75 , -15.40 | -0.887 | 0.001 | -159,886,421 *** | -253,350,496 , -66,422,346 |
| Skilled nursing facility | 1,143.87 | 1,162.13 | 1,012.36 | 1,051.49 | -20.87 *** | ↓ | ↓ | -32.53 , -9.21 | -2.020 | 0.000 | -89,990,407 *** | -140,279,533 , -39,701,282 |
| Other post-acute care facility | 449.74 | 439.46 | 408.30 | 414.47 | -16.44 *** | ↓ | ↓ | -23.47 , -9.41 | -3.870 | 0.000 | -70,891,313 *** | -101,195,339 , -40,587,288 |
| Outpatient facility | 2,222.53 | 2,278.74 | 2,475.07 | 2,560.14 | -28.86 ** § | ↑ | ↑ | -54.64 , -3.08 | -1.153 | 0.028 | -124,459,576 ** § | -235,633,421 , -13,285,731 |
| Professional services | 3,222.75 | 3,229.33 | 3,264.38 | 3,297.93 | -26.96 *** | ↕ | ↕ | -45.15 , -8.77 | -0.850 | 0.004 | -116,261,256 *** | -194,709,973 , -37,812,540 |
| Home health | 766.69 | 771.37 | 747.85 | 766.53 | -14.00 *** § | ↓ | ↓ | -19.60 , -8.40 | -1.838 | 0.000 | -60,373,378 *** § | -84,514,008 , -36,232,748 |
| Hospice | 362.58 | 379.71 | 384.35 | 423.72 | -22.24 *** § | ↑ | ↑ | -27.78 , -16.71 | -5.471 | 0.000 | -95,923,787 *** § | -119,782,076 , -72,065,497 |
| Durable medical equipment | 280.91 | 276.38 | 260.17 | 253.02 | 2.62 § | ↓ | ↓ | -1.29 , 6.53 | 1.019 | 0.189 | 11,313,469 § | -5,549,887 , 28,176,825 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 317.87 | 319.05 | 311.50 | 313.03 | -0.37 | ↓ | ↓ | -1.71 , 0.97 | -0.118 | 0.590 | -1,587 | -5,767,391 , 5,764,216 |
| SNF stays | 76.51 | 77.54 | 73.19 | 72.01 | 2.21 *** § | ↓ | ↓ | 1.48 , 2.94 | 3.112 | 0.000 | 9,524 *** § | -3,144,507 , 3,163,556 |
| SNF days | 2,003.66 | 2,047.92 | 1,714.25 | 1,775.13 | -16.61 * | ↓ | ↓ | -36.20 , 2.98 | -0.960 | 0.097 | -71,626 * | -84,552,529 , 84,409,276 |
| ED visits & observation stays | 545.15 | 554.92 | 554.08 | 568.71 | -4.86 *** § | ↑ | ↑ | -8.39 , -1.33 | -0.869 | 0.007 | -20,949 *** § | -15,238,680 , 15,196,782 |
| E&M visits | 13,840.62 | 13,900.69 | 13,895.55 | 14,095.26 | -139.63 *** § | ↑ | ↑ | -188.49 , -90.78 | -1.029 | 0.000 | -602,140 *** § | -211,265,506 , 210,061,226 |
| Procedures | 9,435.93 | 9,490.82 | 10,756.97 | 10,842.40 | -30.54 § | ↕ | ↕ | -96.77 , 35.70 | -0.297 | 0.366 | -131,683 § | -285,761,493 , 285,498,126 |
| Tests | 27,132.19 | 27,632.81 | 26,498.32 | 27,136.94 | -138.00 *** § | ↓ | ↓ | -237.32 , -38.68 | -0.545 | 0.006 | -595,078 *** § | -428,895,267 , 427,705,111 |
| Imaging services | 5,394.92 | 5,417.64 | 5,275.65 | 5,305.39 | -7.02 § | ↓ | ↓ | -25.59 , 11.54 | -0.140 | 0.458 | -30,289 § | -80,100,684 , 80,040,106 |
| Beneficiaries with AWV | 255.21 | 218.01 | 436.06 | 331.99 | 66.86 *** | ↕ | ↕ | 54.47 , 79.25 | 18.109 | 0.000 | 288,304 *** | -53,139,267 , 53,715,875 |
| Home health episodes | 159.37 | 158.08 | 157.96 | 157.75 | -1.08 ** § | ↓ | ↓ | -2.15 , -0.01 | -0.681 | 0.047 | -4,669 ** § | -4,614,859 , 4,605,521 |
| Home health visits | 3,881.63 | 3,919.13 | 3,745.71 | 3,876.03 | -92.83 *** § | ↓ | ↓ | -126.66 , -59.00 | -2.419 | 0.000 | -400,305 *** § | -146,279,295 , 145,478,684 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 43.65 | 43.77 | 40.50 | 40.63 | -0.01 | ↓ | ↓ | -0.42 , 0.40 | -0.028 | 0.957 | -49 | -1,758,623 , 1,758,525 |
| Beneficiaries with unplanned 30-day readmissions | 154.66 | 154.79 | 151.68 | 151.30 | 0.51 | ↓ | ↓ | -0.75 , 1.78 | 0.340 | 0.427 | 364 | -897,984 , 898,712 |
| Beneficiaries with hospital readmissions from SNF | 178.78 | 178.23 | 184.82 | 182.52 | 1.74 | ↑ | ↑ | -0.86 , 4.35 | 0.952 | 0.189 | 341 | -509,732 , 510,415 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries in PYs, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries across the four PYs. "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 H.2. Estimated Impact on Medicare Spending, Utilization, and Quality of Care in PY4 (2019), Model-Wide

| | Baseline Years: | | Model-Wide in PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013-2017 | | 2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 13,532.17 | 13,776.62 | 13,544.23 | 14,046.53 | -257.85 *** | ↑ | ↑ | -402.02 , -113.68 | -1.964 | 0.000 | -310,315,681 *** | -483,816,669 , -136,814,692 |
| Acute care hospital facility | 4,050.05 | 4,081.02 | 4,030.98 | 4,154.80 | -92.85 *** | ↓ | ↑ | -138.60 , -47.11 | -2.252 | 0.000 | -111,746,661 *** | -166,804,178 , -56,689,145 |
| Skilled nursing facility | 1,114.98 | 1,127.09 | 942.16 | 993.70 | -39.43 *** | ↓ | ↓ | -63.00 , -15.87 | -4.017 | 0.001 | -47,455,804 *** | -75,812,367 , -19,099,242 |
| Other post-acute care facility | 430.31 | 421.31 | 376.51 | 391.37 | -23.86 *** | ↓ | ↓ | -36.98 , -10.74 | -5.961 | 0.000 | -28,719,661 *** | -44,509,796 , -12,929,526 |
| Outpatient facility | 2,239.66 | 2,284.96 | 2,605.49 | 2,697.60 | -46.80 | ↑ | ↑ | -113.00 , 19.39 | -1.765 | 0.166 | -56,324,641 | -135,990,098 , 23,340,816 |
| Professional services | 3,227.09 | 3,226.28 | 3,322.05 | 3,372.24 | -51.00 ** | ↑ | ↑ | -90.06 , -11.93 | -1.589 | 0.011 | -61,370,682 ** | -108,385,005 , -14,356,359 |
| Home health | 717.80 | 733.47 | 689.59 | 728.36 | -23.10 *** § | ↓ | ↓ | -34.55 , -11.65 | -3.242 | 0.000 | -27,803,866 *** § | -41,585,444 , -14,022,288 |
| Hospice | 353.05 | 374.09 | 385.34 | 434.72 | -28.33 *** | ↑ | ↑ | -38.84 , -17.83 | -6.849 | 0.000 | -34,099,740 *** | -46,738,805 , -21,460,676 |
| Durable medical equipment | 283.49 | 278.71 | 267.77 | 263.74 | -0.75 | ↓ | ↓ | -7.62 , 6.12 | -0.278 | 0.831 | -897,823 | -9,164,340 , 7,368,694 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 313.47 | 315.80 | 299.25 | 303.99 | -2.43 * | ↓ | ↓ | -5.00 , 0.14 | -0.805 | 0.064 | -2,921 * | -3,096,041 , 3,090,199 |
| SNF stays | 79.79 | 80.98 | 74.04 | 73.22 | 2.00 *** | ↓ | ↓ | 0.66 , 3.34 | 2.778 | 0.003 | 2,408 *** | -1,612,488 , 1,617,305 |
| SNF days | 2,145.11 | 2,195.29 | 1,735.79 | 1,832.43 | -46.47 ** | ↓ | ↓ | -83.39 , -9.56 | -2.608 | 0.014 | -55,928 ** | -44,478,936 , 44,367,079 |
| ED visits & observation stays | 545.39 | 557.96 | 545.65 | 564.68 | -6.46 | ↑ | ↑ | -15.14 , 2.22 | -1.170 | 0.144 | -7,775 | -10,448,617 , 10,433,068 |
| E&M visits | 13,813.00 | 13,903.73 | 13,732.17 | 14,025.06 | -202.15 *** § | ↓ | ↑ | -319.14 , -85.16 | -1.527 | 0.001 | -243,279 *** § | -141,036,176 , 140,549,617 |
| Procedures | 9,450.97 | 9,464.90 | 11,333.23 | 11,405.42 | -58.25 § | ↑ | ↑ | -212.04 , 95.54 | -0.549 | 0.458 | -70,096 § | -185,149,563 , 185,009,370 |
| Tests | 27,288.41 | 27,593.07 | 26,881.62 | 27,265.77 | -79.49 § | ↓ | ↓ | -297.00 , 138.02 | -0.315 | 0.474 | -95,662 § | -261,858,308 , 261,666,983 |
| Imaging services | 5,388.95 | 5,422.75 | 5,421.22 | 5,460.10 | -5.09 | ↑ | ↑ | -43.13 , 32.95 | -0.101 | 0.793 | -6,122 | -45,782,993 , 45,770,748 |
| Beneficiaries with AWV | 254.56 | 220.15 | 506.95 | 379.66 | 92.88 *** | ↑ | ↑ | 61.00 , 124.77 | 22.432 | 0.000 | 111,782 *** | -38,256,261 , 38,479,825 |
| Home health episodes | 149.39 | 149.54 | 147.65 | 150.75 | -2.94 *** | ↓ | ↑ | -4.95 , -0.94 | -1.954 | 0.004 | -3,541 *** | -2,416,627 , 2,409,545 |
| Home health visits | 3,672.65 | 3,767.50 | 3,442.43 | 3,669.27 | -131.99 *** § | ↓ | ↓ | -197.11 , -66.86 | -3.694 | 0.000 | -158,843 *** § | -78,534,090 , 78,216,405 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 42.53 | 42.70 | 35.72 | 36.22 | -0.32 | ↓ | ↓ | -1.25 , 0.61 | -0.894 | 0.498 | -388 | -1,120,361 , 1,119,585 |
| Beneficiaries with unplanned 30-day readmissions | 154.43 | 154.71 | 149.36 | 148.95 | 0.69 | ↓ | ↓ | -1.66 , 3.04 | 0.466 | 0.563 | 134 | -453,590 , 453,858 |
| Beneficiaries with hospital readmissions from SNF | 179.51 | 178.76 | 184.60 | 180.74 | 3.11 | ↑ | ↑ | -1.89 , 8.11 | 1.714 | 0.223 | 161 | -259,146 , 259,469 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries in PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in PY4. "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 H.3.** Estimated Cumulative Impact for 2016 Cohort on Medicare Spending, Utilization, and Quality of Care, PY1 through PY4

| | Base Years | | 2016 Cohort in PY1 (2016), PY2 (2017), PY3 (2018), and PY4 (2019) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013-2015 | | 2016-2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 13,031.13 | 13,252.04 | 13,095.40 | 13,398.98 | -82.67 * | ↑ | ↑ | -176.32 , 10.99 | -0.655 | 0.084 | -155,813,883 * | -332,348,506 , 20,720,740 |
| Acute care hospital facility | 4,034.15 | 4,053.27 | 3,962.58 | 3,999.79 | -18.11 | ↓ | ↓ | -46.15 , 9.92 | -0.455 | 0.205 | -34,139,443 | -86,982,452 , 18,703,565 |
| Skilled nursing facility | 1,154.11 | 1,167.28 | 954.69 | 996.71 | -28.86 *** | ↓ | ↓ | -49.59 , -8.12 | -2.934 | 0.006 | -54,390,316 *** | -93,471,188 , -15,309,444 |
| Other post-acute care facility | 474.44 | 444.27 | 429.51 | 414.36 | -15.02 ** | ↓ | ↓ | -26.57 , -3.48 | -3.380 | 0.011 | -28,319,237 ** | -50,082,738 , -6,555,735 |
| Outpatient facility | 2,230.84 | 2,303.60 | 2,517.84 | 2,608.26 | -17.67 § | ↑ | ↑ | -65.38 , 30.03 | -0.697 | 0.468 | -33,307,712 § | -123,223,378 , 56,607,953 |
| Professional services | 3,045.46 | 3,039.43 | 3,119.27 | 3,114.38 | -1.14 | ↑ | ↑ | -24.29 , 22.00 | -0.038 | 0.923 | -2,152,335 | -45,774,837 , 41,470,167 |
| Home health | 748.39 | 745.98 | 690.39 | 698.18 | -10.19 ** § | ↓ | ↓ | -18.18 , -2.20 | -1.455 | 0.012 | -19,208,385 ** § | -34,273,443 , -4,143,328 |
| Hospice | 359.52 | 367.24 | 367.11 | 405.37 | -30.54 *** § | ↑ | ↑ | -40.09 , -21.00 | -7.681 | 0.000 | -57,568,893 *** § | -75,557,213 , -39,580,572 |
| Durable medical equipment | 303.15 | 296.25 | 271.23 | 259.97 | 4.37 | ↓ | ↓ | -1.68 , 10.43 | 1.639 | 0.157 | 8,243,970 | -3,164,238 , 19,652,179 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 333.31 | 333.22 | 318.87 | 319.54 | -0.76 | ↓ | ↓ | -2.62 , 1.10 | -0.237 | 0.426 | -1,427 | -3,510,615 , 3,507,761 |
| SNF stays | 81.63 | 82.52 | 76.57 | 74.66 | 2.79 *** | ↓ | ↓ | 1.42 , 4.17 | 3.786 | 0.000 | 5,265 *** | -2,585,958 , 2,596,489 |
| SNF days | 2,155.73 | 2,183.07 | 1,731.38 | 1,785.37 | -26.66 | ↓ | ↓ | -61.12 , 7.81 | -1.516 | 0.130 | -50,243 | -65,011,312 , 64,910,825 |
| ED visits & observation stays | 558.70 | 568.70 | 579.30 | 592.49 | -3.18 § | ↑ | ↑ | -9.55 , 3.19 | -0.546 | 0.328 | -5,997 § | -12,018,756 , 12,006,763 |
| E&M visits | 13,265.67 | 13,331.00 | 13,647.97 | 13,785.79 | -72.50 * § | ↑ | ↑ | -158.03 , 13.03 | -0.548 | 0.097 | -136,646 * § | -161,351,573 , 161,078,281 |
| Procedures | 8,704.40 | 8,835.29 | 10,156.82 | 10,301.37 | -13.67 § | ↓ | ↓ | -124.61 , 97.28 | -0.143 | 0.809 | -25,762 § | -209,139,189 , 209,087,665 |
| Tests | 26,808.77 | 27,228.20 | 25,997.19 | 26,637.71 | -221.09 *** § | ↓ | ↓ | -346.66 , -95.52 | -0.888 | 0.001 | -416,731 *** § | -237,097,566 , 236,264,104 |
| Imaging services | 5,343.48 | 5,389.24 | 5,216.82 | 5,260.77 | 1.81 | ↓ | ↓ | -25.43 , 29.05 | 0.037 | 0.896 | 3,417 | -51,337,697 , 51,344,531 |
| Home health episodes | 215.33 | 188.55 | 437.47 | 326.24 | 84.45 *** | ↑ | ↑ | 61.73 , 107.17 | 23.921 | 0.000 | 159,172 *** | -42,667,247 , 42,985,591 |
| Home health visits | 160.52 | 158.37 | 150.50 | 149.17 | -0.81 § | ↓ | ↓ | -2.20 , 0.57 | -0.539 | 0.250 | -1,536 § | -2,618,930 , 2,615,858 |
| Beneficiaries with AWV | 3,924.05 | 3,904.73 | 3,627.10 | 3,675.85 | -68.08 ** § | ↓ | ↓ | -121.78 , -14.38 | -1.842 | 0.013 | -128,321 ** § | -101,347,274 , 101,090,631 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 46.12 | 46.20 | 41.72 | 41.78 | 0.02 | ↓ | ↓ | -0.62 , 0.67 | 0.057 | 0.943 | 45 | -1,218,080 , 1,218,170 |
| Beneficiaries with unplanned 30-day readmissions | 156.30 | 155.11 | 151.61 | 150.56 | -0.12 | ↓ | ↓ | -1.83 , 1.58 | -0.082 | 0.886 | -39 | -534,982 , 534,904 |
| Beneficiaries with hospital readmissions from SNF | 178.61 | 176.84 | 183.96 | 180.47 | 1.71 | ↑ | ↑ | -2.33 , 5.76 | 0.940 | 0.406 | 150 | -352,458 , 352,757 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PYs, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) across the four PYs. "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 H.4. Estimated Cumulative Impact for 2017 Cohort on Medicare Spending, Utilization, and Quality of Care, PY2 through PY4

| | Base Years | | 2017 Cohort in PY2 (2017), PY3 (2018), and PY4 (2019) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2014-2016 | | 2017-2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 14,382.08 | 14,703.00 | 14,153.00 | 14,678.05 | -204.12 *** | ↓ | ↓ | -290.89 , -117.36 | -1.463 | 0.000 | -386,036,154 *** | -550,117,955 , -221,954,353 |
| Acute care hospital facility | 4,310.03 | 4,336.82 | 4,391.37 | 4,456.98 | -38.82 ** | ↕ | ↕ | -74.76 , -2.89 | -0.876 | 0.034 | -73,424,091 ** | -141,388,221 , -5,459,960 |
| Skilled nursing facility | 1,153.95 | 1,182.78 | 1,085.03 | 1,129.24 | -15.38 ** | ↕ | ↕ | -30.49 , -0.27 | -1.398 | 0.046 | -29,090,102 ** | -57,667,016 , -513,189 |
| Other post-acute care facility | 435.13 | 439.46 | 395.20 | 418.60 | -19.06 *** | ↓ | ↓ | -29.17 , -8.96 | -4.602 | 0.000 | -36,053,997 *** | -55,159,308 , -16,948,685 |
| Outpatient facility | 2,216.65 | 2,260.36 | 2,449.41 | 2,531.63 | -38.51 ** | ↑ | ↑ | -68.82 , -8.19 | -1.548 | 0.013 | -72,822,495 ** | -130,159,683 , -15,485,307 |
| Professional services | 3,381.94 | 3,415.24 | 3,387.98 | 3,467.67 | -46.41 *** | ↑ | ↑ | -78.14 , -14.68 | -1.394 | 0.004 | -87,764,809 *** | -147,768,341 , -27,761,278 |
| Home health | 799.68 | 804.50 | 826.15 | 844.84 | -13.87 *** § | ↑ | ↑ | -23.33 , -4.41 | -1.651 | 0.004 | -26,229,852 *** § | -44,118,916 , -8,340,788 |
| Hospice | 359.46 | 385.39 | 392.47 | 434.55 | -16.15 *** | ↕ | ↕ | -23.36 , -8.94 | -3.952 | 0.000 | -30,543,405 *** | -44,178,596 , -16,908,214 |
| Durable medical equipment | 263.99 | 262.62 | 250.32 | 245.22 | 3.73 § | ↓ | ↓ | -2.56 , 10.03 | 1.514 | 0.245 | 7,058,772 § | -4,849,104 , 18,966,649 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 302.78 | 305.43 | 305.55 | 306.86 | 1.33 | ↕ | ↕ | -0.82 , 3.47 | 0.436 | 0.226 | 2,507 | -4,055,996 , 4,061,011 |
| SNF stays | 70.21 | 71.72 | 68.88 | 68.58 | 1.80 *** § | ↕ | ↕ | 0.98 , 2.61 | 2.680 | 0.000 | 3,399 *** § | -1,538,287 , 1,545,085 |
| SNF days | 1,831.93 | 1,901.94 | 1,664.36 | 1,743.43 | -9.06 | ↓ | ↓ | -34.19 , 16.07 | -0.541 | 0.480 | -17,129 | -47,546,484 , 47,512,225 |
| ED visits & observation stays | 528.90 | 538.27 | 530.74 | 548.12 | -8.01 *** | ↕ | ↑ | -12.36 , -3.65 | -1.486 | 0.000 | -15,140 *** | -8,247,282 , 8,217,002 |
| E&M visits | 14,334.63 | 14,403.09 | 14,159.74 | 14,410.99 | -182.79 *** § | ↕ | ↑ | -240.60 , -124.99 | -1.311 | 0.000 | -345,697 *** § | -109,667,586 , 108,976,193 |
| Procedures | 9,931.92 | 9,970.38 | 11,210.61 | 11,272.05 | -22.98 | ↕ | ↕ | -116.43 , 70.47 | -0.213 | 0.630 | -43,462 | -176,773,197 , 176,686,274 |
| Tests | 27,543.36 | 28,291.56 | 27,003.84 | 27,838.82 | -86.78 | ↕ | ↕ | -262.25 , 88.70 | -0.336 | 0.332 | -164,110 | -332,020,756 , 331,692,537 |
| Imaging services | 5,456.75 | 5,480.82 | 5,308.87 | 5,349.73 | -16.79 § | ↓ | ↓ | -47.62 , 14.04 | -0.331 | 0.286 | -31,760 § | -58,334,557 , 58,271,037 |
| Home health episodes | 270.36 | 230.91 | 415.06 | 326.42 | 49.18 *** | ↑ | ↑ | 36.19 , 62.17 | 13.442 | 0.000 | 93,010 *** | -24,478,313 , 24,664,332 |
| Home health visits | 158.85 | 157.06 | 166.92 | 165.44 | -0.32 | ↑ | ↑ | -2.22 , 1.59 | -0.190 | 0.744 | -602 | -3,604,633 , 3,603,429 |
| Beneficiaries with AWV | 3,915.11 | 3,960.00 | 3,966.49 | 4,111.01 | -99.63 *** § | ↑ | ↑ | -151.27 , -48.00 | -2.450 | 0.000 | -188,420 *** § | -97,839,268 , 97,462,427 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 41.74 | 42.12 | 39.86 | 40.06 | 0.17 | ↓ | ↓ | -0.45 , 0.79 | 0.432 | 0.590 | 324 | -1,177,957 , 1,178,605 |
| Beneficiaries with unplanned 30-day readmissions | 154.30 | 155.63 | 152.72 | 152.82 | 1.23 | ↓ | ↓ | -0.80 , 3.26 | 0.811 | 0.235 | 379 | -625,536 , 626,294 |
| Beneficiaries with hospital readmissions from SNF | 179.03 | 179.43 | 185.75 | 184.64 | 1.50 | ↑ | ↑ | -2.44 , 5.45 | 0.815 | 0.455 | 128 | -335,981 , 336,237 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries in PYs, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) across three PYs. "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 H.5.** Estimated Cumulative Impact for 2018 Cohort on Medicare Spending, Utilization, and Quality of Care, PY3 through PY4

| | Base Years | | 2018 Cohort in PY3 and PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015-2017 | | 2018-2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 13,135.77 | 13,291.43 | 12,975.16 | 13,364.01 | -233.17 *** | ↓ | ↑ | -390.18 , -76.17 | -1.865 | 0.004 | -125,027,798 *** | -209,213,435 , -40,842,161 |
| Acute care hospital facility | 3,948.83 | 3,969.23 | 3,918.68 | 4,036.66 | -97.58 *** | ↓ | ↑ | -165.44 , -29.72 | -2.430 | 0.005 | -52,322,887 *** | -88,710,065 , -15,935,709 |
| Skilled nursing facility | 1,072.33 | 1,071.20 | 958.77 | 969.78 | -12.14 | ↓ | ↓ | -37.51 , 13.23 | -1.250 | 0.348 | -6,509,989 | -20,112,988 , 7,093,010 |
| Other post-acute care facility | 414.45 | 422.60 | 379.94 | 400.25 | -12.16 | ↓ | ↓ | -28.80 , 4.49 | -3.100 | 0.152 | -6,518,080 | -15,443,945 , 2,407,785 |
| Outpatient facility | 2,214.05 | 2,256.15 | 2,415.22 | 2,491.50 | -34.18 | ↑ | ↑ | -92.78 , 24.41 | -1.396 | 0.253 | -18,329,369 | -49,749,804 , 13,091,066 |
| Professional services | 3,284.45 | 3,241.17 | 3,338.58 | 3,344.42 | -49.13 ** | ↑ | ↑ | -96.71 , -1.55 | -1.534 | 0.043 | -26,344,112 ** | -51,855,965 , -832,258 |
| Home health | 714.64 | 743.73 | 673.69 | 730.64 | -27.85 *** | ↓ | ↓ | -39.01 , -16.70 | -3.970 | 0.000 | -14,935,140 *** | -20,918,070 , -8,952,210 |
| Hospice | 384.36 | 403.52 | 416.35 | 450.07 | -14.57 ** | ↑ | ↑ | -28.98 , -0.16 | -3.381 | 0.048 | -7,811,489 ** | -15,539,354 , -83,624 |
| Durable medical equipment | 262.42 | 255.06 | 256.02 | 256.09 | -7.44 ** | ↓ | ↑ | -14.01 , -0.87 | -2.824 | 0.027 | -3,989,273 ** | -7,514,616 , -463,931 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 316.84 | 317.24 | 306.55 | 311.92 | -4.98 ** | ↓ | ↓ | -8.91 , -1.04 | -1.597 | 0.013 | -2,668 ** | -2,114,217 , 2,108,881 |
| SNF stays | 80.74 | 80.58 | 76.52 | 74.76 | 1.60 * | ↓ | ↓ | -0.12 , 3.33 | 2.141 | 0.069 | 860 * | -924,710 , 926,430 |
| SNF days | 2,074.81 | 2,087.77 | 1,830.05 | 1,850.94 | -7.93 | ↓ | ↓ | -55.77 , 39.91 | -0.432 | 0.745 | -4,253 | -25,656,600 , 25,648,094 |
| ED visits & observation stays | 554.88 | 565.19 | 547.72 | 557.68 | 0.35 | ↓ | ↓ | -7.89 , 8.59 | 0.064 | 0.934 | 188 | -4,416,233 , 4,416,608 |
| E&M visits | 14,119.26 | 14,131.34 | 13,834.07 | 14,069.57 | -223.42 *** § | ↓ | ↓ | -373.05 , -73.78 | -1.663 | 0.003 | -119,797 *** § | -80,353,990 , 80,114,396 |
| Procedures | 10,258.02 | 10,103.72 | 11,266.70 | 11,228.88 | -116.49 | ↑ | ↑ | -268.26 , 35.28 | -1.064 | 0.133 | -62,460 | -81,441,592 , 81,316,673 |
| Tests | 26,818.85 | 26,731.72 | 26,476.89 | 26,416.31 | -26.55 | ↓ | ↓ | -271.81 , 218.71 | -0.107 | 0.832 | -14,238 | -131,522,416 , 131,493,941 |
| Imaging services | 5,357.68 | 5,294.59 | 5,365.29 | 5,305.84 | -3.63 | ↑ | ↑ | -39.80 , 32.54 | -0.073 | 0.844 | -1,946 | -19,396,330 , 19,392,437 |
| Home health episodes | 342.00 | 276.05 | 505.17 | 371.85 | 67.37 *** | ↑ | ↑ | 29.30 , 105.44 | 15.388 | 0.001 | 36,122 *** | -20,375,964 , 20,448,209 |
| Home health visits | 157.16 | 160.63 | 152.57 | 160.75 | -4.72 *** | ↓ | ↑ | -6.94 , -2.50 | -3.002 | 0.000 | -2,532 *** | -1,191,675 , 1,186,612 |
| Beneficiaries with AWV | 3,614.43 | 3,825.61 | 3,383.96 | 3,750.99 | -155.84 *** | ↓ | ↓ | -228.07 , -83.62 | -4.407 | 0.000 | -83,563 *** | -38,809,719 , 38,642,593 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 41.72 | 41.03 | 38.47 | 38.55 | -0.78 * | ↓ | ↓ | -1.65 , 0.10 | -1.983 | 0.081 | -417 * | -469,895 , 469,061 |
| Beneficiaries with unplanned 30-day readmissions | 149.96 | 150.56 | 148.20 | 148.53 | 0.28 | ↓ | ↓ | -3.90 , 4.46 | 0.189 | 0.896 | 24 | -359,276 , 359,324 |
| Beneficiaries with hospital readmissions from SNF | 178.50 | 179.00 | 184.62 | 182.41 | 2.72 | ↑ | ↑ | -3.72 , 9.16 | 1.498 | 0.407 | 64 | -151,176 , 151,304 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PYs, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) across two PYs. "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 H.6. Estimated Impact of the 2016 Cohort on Medicare Spending, Utilization, and Quality of Care in PY4 (2019)

| | Baseline Years: | | 2016 Cohort in PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013-2015 | | 2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 12821.42 | 13024.62 | 13296.41 | 13647.82 | -148.21 | ↓ | ↓ | -424.59, 128.17 | -1.19 | 0.293 | -69,756,911 | -199,837,080, 60,323,258 |
| Acute care hospital facility | 3889.39 | 3929.00 | 3780.08 | 3852.83 | -33.15 | ↓ | ↓ | -81.49, 15.20 | -0.86 | 0.179 | -15,600,244 | -38,354,626, 7,154,137 |
| Skilled nursing facility | 1099.82 | 1114.49 | 823.78 | 884.93 | -46.48** | ↓ | ↓ | -90.33, -2.63 | -5.34 | 0.038 | -21,874,658** | -42,513,839, -1,235,477 |
| Other post-acute care facility | 432.86 | 404.51 | 370.04 | 361.00 | -19.31* | ↓ | ↓ | -39.84, 1.23 | -4.95 | 0.065 | -9,086,668* | -18,752,486, 579,150 |
| Outpatient facility | 2303.14 | 2355.24 | 2754.68 | 2849.03 | -42.25 | ↑ | ↑ | -180.39, 95.89 | -1.51 | 0.549 | -19,884,249 | -84,901,412, 45,132,913 |
| Professional services | 2958.46 | 2947.12 | 3116.00 | 3109.22 | -4.55 | ↓ | ↓ | -54.10, 45.00 | -0.15 | 0.857 | -2,142,228 | -25,464,824, 21,180,368 |
| Home health | 662.35 | 665.78 | 595.64 | 609.26 | -10.19 | ↓ | ↓ | -25.29, 4.90 | -1.68 | 0.186 | -4,798,183 | -11,903,571, 2,307,204 |
| Hospice | 337.66 | 345.99 | 350.47 | 401.04 | -42.23*** | ↑ | ↑ | -62.19, -22.28 | -10.7 | 0.000 | -19,877,286*** | -29,268,598, -10,485,975 |
| Durable medical equipment | 303.99 | 297.90 | 276.17 | 265.43 | 4.66 | ↓ | ↓ | -8.52, 17.83 | 1.715 | 0.489 | 2,191,434 | -4,010,043, 8,392,911 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 327.93 | 330.43 | 303.02 | 307.17 | -1.65 | ↓ | ↓ | -4.34, 1.03 | -0.54 | 0.227 | -779 | -2,042, 484 |
| SNF stays | 84.95 | 86.30 | 76.33 | 74.83 | 2.84** | ↓ | ↓ | 0.25, 5.44 | 3.867 | 0.032 | 1,337** | 116, 2,559 |
| SNF days | 2257.42 | 2301.23 | 1633.09 | 1725.94 | -49.05 | ↓ | ↓ | -114.44, 16.34 | -2.91 | 0.141 | -23,087 | -53,863, 7,690 |
| ED visits & observation stays | 572.46 | 587.52 | 578.95 | 601.39 | -7.37 | ↑ | ↑ | -26.12, 11.38 | -1.25 | 0.441 | -3,469 | -12,293, 5,355 |
| E&M visits | 13218.55 | 13299.55 | 13554.91 | 13757.11 | -121.20 § | ↑ | ↑ | -329.95, 87.54 | -0.94 | 0.255 | -57,045 § | -155,293, 41,202 |
| Procedures | 8451.42 | 8546.28 | 10698.83 | 10740.33 | 53.36 § | ↑ | ↑ | -236.63, 343.34 | 0.55 | 0.718 | 25,112 § | -111,370, 161,594 |
| Tests | 26886.19 | 26908.58 | 26351.01 | 26600.27 | -226.87 § | ↓ | ↓ | -538.98, 85.24 | -0.92 | 0.154 | -106,779 § | -253,676, 40,118 |
| Imaging services | 5300.13 | 5357.93 | 5324.69 | 5377.93 | 4.56 | ↑ | ↑ | -64.28, 73.40 | 0.09 | 0.897 | 2,146 | -30,256, 34,547 |
| Beneficiaries with AWV | 221.02 | 190.36 | 548.17 | 394.79 | 122.72*** | ↑ | ↑ | 57.82, 187.61 | 28.84 | 0.000 | 57,758*** | 27,214, 88,302 |
| Home health episodes | 145.09 | 144.11 | 135.09 | 134.56 | -0.45 | ↓ | ↓ | -2.24, 1.34 | -0.33 | 0.623 | -212 | -1,056, 632 |
| Home health visits | 3499.87 | 3505.15 | 3128.87 | 3195.08 | -60.94 | ↓ | ↓ | -155.30, 33.42 | -1.91 | 0.206 | -28,682 | -73,095, 15,732 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 46.50 | 46.80 | 37.51 | 37.99 | -0.18 | ↓ | ↓ | -1.87, 1.51 | -0.47 | 0.835 | -85 | -880, 711 |
| Beneficiaries with unplanned 30-day readmissions | 157.30 | 155.77 | 152.21 | 149.91 | 0.78 | ↓ | ↓ | -1.84, 3.39 | 0.513 | 0.561 | 60 | -143, 263 |
| Beneficiaries with hospital readmissions from SNF | 178.37 | 176.86 | 187.73 | 179.99 | 6.22 | ↑ | ↑ | -2.52, 14.96 | 3.426 | 0.163 | 132 | -54, 318 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 Cohort) in PY4. "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 H.7. Estimated Impact of the 2017 Cohort on Medicare Spending, Utilization, and Quality of Care in PY4 (2019)

| | Baseline Years: | | 2017 Cohort in PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2014-2016 | | 2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | | | | | | | |
| Total gross Medicare spending (Part A and B) | 14438.01 | 14732.04 | 14176.29 | 14817.66 | -347.35*** | ↓ | ↑ | -522.44, -172.25 | -2.46 | 0.000 | -168,167,849*** | -252,941,022, -83,394,67 |
| Acute care hospital facility | 4285.51 | 4302.12 | 4353.92 | 4498.34 | -127.81*** | ↓ | ↓ | -208.84, -46.78 | -2.85 | 0.002 | -61,878,323*** | -101,110,143, -22,646,50 |
| Skilled nursing facility | 1175.34 | 1186.63 | 1081.46 | 1131.72 | -38.97** | ↓ | ↓ | -74.17, -3.77 | -3.47 | 0.030 | -18,868,379** | -35,910,683, -1,826,075 |
| Other post-acute care facility | 435.73 | 440.85 | 389.99 | 420.62 | -25.51** | ↓ | ↓ | -46.97, -4.04 | -6.13 | 0.020 | -12,349,572** | -22,742,797, -1,956,348 |
| Outpatient facility | 2184.38 | 2222.63 | 2538.61 | 2620.83 | -43.96 | ↑ | ↑ | -120.55, 32.63 | -1.70 | 0.261 | -21,282,946 | -58,365,131, 15,799,238 |
| Professional services | 3477.97 | 3498.91 | 3517.23 | 3632.18 | -94.01*** | ↑ | ↑ | -164.36, -23.67 | -2.70 | 0.009 | -45,517,352*** | -79,574,127, -11,460,577 |
| Home health | 776.13 | 794.24 | 796.14 | 845.09 | -30.85*** § | ↑ | ↑ | -53.55, -8.15 | -3.73 | 0.008 | -14,935,952*** § | -25,928,426, -3,943,478 |
| Hospice | 362.00 | 393.59 | 407.20 | 462.44 | -23.65*** | ↓ | ↓ | -37.07, -10.23 | -5.48 | 0.001 | -11,449,163*** | -17,947,778, -4,950,547 |
| Durable medical equipment | 270.75 | 267.95 | 262.82 | 261.47 | -1.44 | ↓ | ↓ | -11.61, 8.72 | -0.54 | 0.781 | -699,289 | -5,620,399, 4,221,820 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 299.42 | 302.40 | 294.95 | 298.53 | -0.61 | ↓ | ↓ | -5.21, 4.00 | -0.20 | 0.796 | -294 | -2,524, 1,936 |
| SNF stays | 75.91 | 77.34 | 72.43 | 72.36 | 1.50 | ↓ | ↓ | -0.34, 3.34 | 2.113 | 0.110 | 726 | -165, 1,616 |
| SNF days | 2103.22 | 2172.99 | 1844.43 | 1957.89 | -43.69 | ↓ | ↓ | -100.10, 12.72 | -2.31 | 0.129 | -21,154 | -48,465, 6,157 |
| ED visits & observation stays | 512.37 | 523.05 | 508.73 | 529.55 | -10.15** | ↓ | ↑ | -19.40, -0.89 | -1.95 | 0.032 | -4,912** | -9,393, -430 |
| E&M visits | 14267.23 | 14349.95 | 13967.64 | 14327.36 | -276.99*** § | ↓ | ↑ | -425.17, -128.81 | -2.02 | 0.000 | -134,105*** § | -205,845, -62,365 |
| Procedures | 10107.09 | 10103.86 | 11926.52 | 12051.86 | -128.57 | ↑ | ↑ | -346.88, 89.75 | -1.13 | 0.248 | -62,246 | -167,943, 43,451 |
| Tests | 27955.27 | 28686.20 | 27617.20 | 28399.11 | -50.98 | ↑ | ↑ | -452.78, 350.82 | -0.20 | 0.804 | -24,682 | -219,214, 169,850 |
| Imaging services | 5488.04 | 5541.55 | 5482.12 | 5559.81 | -24.18 | ↓ | ↑ | -84.87, 36.51 | -0.47 | 0.435 | -11,707 | -41,092, 17,677 |
| Beneficiaries with AWV | 249.56 | 221.73 | 453.16 | 357.80 | 67.53*** | ↑ | ↑ | 35.97, 99.09 | 17.51 | 0.000 | 32,695*** | 17,413, 47,977 |
| Home health episodes | 151.42 | 150.58 | 159.29 | 162.11 | -3.66* | ↑ | ↑ | -7.88, 0.56 | -2.24 | 0.089 | -1,773* | -3,817, 271 |
| Home health visits | 3867.16 | 3986.31 | 3816.97 | 4112.93 | -176.81*** § | ↓ | ↑ | -298.01, -55.60 | -4.42 | 0.004 | -85,601*** § | -144,281, -26,920 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 40.03 | 40.39 | 34.47 | 34.81 | 0.02 | ↓ | ↓ | -1.47, 1.51 | 0.062 | 0.978 | 10 | -713, 733 |
| Beneficiaries with unplanned 30-day readmissions | 153.44 | 155.28 | 148.08 | 148.59 | 1.33 | ↓ | ↓ | -2.53, 5.19 | 0.908 | 0.499 | 102 | -193, 396 |
| Beneficiaries with hospital readmissions from SNF | 180.52 | 180.77 | 182.82 | 182.26 | 0.81 | ↑ | ↑ | -5.55, 7.17 | 0.445 | 0.803 | 16 | -112, 144 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 Cohort) in PY4. "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 H.8. Estimated Impact of the 2018 Cohort on Medicare Spending, Utilization, and Quality of Care in PY4 (2019)

| | Baseline Years: | | 2018 Cohort in Performance Year : 2019 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2015-2017 | | 2019 | | Difference-in-Differences | | | | | | | |
| | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **Spending ($ Per Beneficiary Per Year)** | | | | | | | | | | | | |
| Total Gross Medicare spending (Part A and B) | 13113.75 | 13339.73 | 12782.62 | 13299.74 | -291.14* | ↓ | ↓ | -602.54, 20.26 | -2.34 | 0.067 | -72,390,919* | -149,819,308, 5,037,469 |
| Acute care hospital facility | 3895.68 | 3938.26 | 3877.07 | 4057.47 | -137.82** | ↓ | ↕ | -263.36, -12.28 | -3.43 | 0.031 | -34,268,094** | -65,483,864, -3,052,323 |
| Skilled nursing facility | 1026.15 | 1034.99 | 894.98 | 930.82 | -27.00 | ↓ | ↕ | -64.65, 10.66 | -2.92 | 0.160 | -6,712,767 | -16,076,307, 2,650,772 |
| Other post-acute care facility | 414.94 | 415.05 | 362.49 | 391.90 | -29.29** | ↓ | ↓ | -57.12, -1.46 | -7.47 | 0.039 | -7,283,420** | -14,202,987, -363,854 |
| Outpatient facility | 2227.12 | 2273.29 | 2453.34 | 2560.46 | -60.96 | ↑ | ↑ | -170.68, 48.76 | -2.42 | 0.276 | -15,157,446 | -42,438,259, 12,123,367 |
| Professional services | 3247.06 | 3223.85 | 3332.01 | 3363.94 | -55.14 | ↕ | ↕ | -145.66, 35.37 | -1.73 | 0.232 | -13,711,104 | -36,217,377, 8,795,170 |
| Home health | 709.18 | 743.26 | 659.96 | 726.50 | -32.45*** | ↓ | ↓ | -49.80, -15.10 | -4.68 | 0.000 | -8,069,731*** | -12,383,684, -3,755,778 |
| Hospice | 364.76 | 389.30 | 408.80 | 444.49 | -11.15 | ↕ | ↑ | -32.93, 10.62 | -2.65 | 0.315 | -2,773,292 | -8,187,780, 2,641,197 |
| Durable medical equipment | 269.48 | 263.35 | 261.50 | 264.98 | -9.61** | ↕ | ↑ | -19.18, -0.04 | -3.54 | 0.049 | -2,389,968** | -4,768,918, -11,018 |
| **Utilization (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Acute care stays | 313.47 | 314.18 | 300.47 | 308.62 | -7.43** | ↓ | ↓ | -14.40, -0.47 | -2.41 | 0.036 | -1,848** | -3,580, -116 |
| SNF stays | 77.59 | 78.02 | 72.83 | 71.87 | 1.39 | ↓ | ↓ | -0.89, 3.67 | 1.943 | 0.233 | 345 | -222, 913 |
| SNF days | 2014.11 | 2038.16 | 1718.66 | 1789.72 | -47.00 | ↓ | ↓ | -114.34, 20.33 | -2.66 | 0.171 | -11,688 | -28,429, 5,054 |
| ED visits & observation stays | 558.45 | 569.96 | 554.51 | 563.58 | 2.44 | ↓ | ↓ | -10.95, 15.82 | 0.442 | 0.721 | 606 | -2,722, 3,934 |
| E&M visits | 14053.74 | 14178.51 | 13609.20 | 13943.63 | -209.65 | ↓ | ↓ | -494.69, 75.39 | -1.59 | 0.149 | -52,129 | -123,005, 18,747 |
| Procedures | 10065.41 | 9959.60 | 11378.86 | 11405.62 | -132.57 | ↕ | ↕ | -401.01, 135.87 | -1.21 | 0.333 | -32,962 | -99,709, 33,784 |
| Tests | 26751.31 | 26760.26 | 26453.71 | 26318.69 | 143.97 | ↕ | ↕ | -239.64, 527.58 | 0.59 | 0.462 | 35,799 | -59,585, 131,182 |
| Imaging services | 5364.14 | 5314.12 | 5485.36 | 5421.51 | 13.83 | ↑ | ↑ | -40.46, 68.12 | 0.28 | 0.618 | 3,439 | -10,059, 16,938 |
| Beneficiaries with AWV | 327.79 | 273.48 | 533.68 | 393.58 | 85.78** | ↕ | ↑ | 15.47, 156.09 | 19.15 | 0.017 | 21,329** | 3,846, 38,812 |
| Home health episodes | 153.59 | 157.81 | 148.78 | 159.26 | -6.26*** | ↓ | ↕ | -10.15, -2.38 | -4.03 | 0.002 | -1,557*** | -2,523, -591 |
| Home health visits | 3620.94 | 3838.06 | 3306.66 | 3703.00 | -179.21*** | ↓ | ↕ | -287.62, -70.80 | -5.14 | 0.001 | -44,560*** | -71,517, -17,603 |
| **Quality of Care (Per 1,000 Beneficiaries Per Year)** | | | | | | | | | | | | |
| Beneficiaries with ACSC hospitalizations | 39.89 | 39.46 | 34.78 | 35.61 | -1.26** | ↓ | ↓ | -2.52, -0.00 | -3.49 | 0.050 | -313** | -626, -1 |
| Beneficiaries with Unplanned 30-day readmissions | 150.69 | 151.53 | 146.21 | 147.76 | -0.71 | ↓ | ↓ | -7.82, 6.40 | -0.48 | 0.844 | -28 | -307, 251 |
| Beneficiaries with Hospital Readmissions from SNF | 179.86 | 178.73 | 181.68 | 179.32 | 1.23 | ↑ | ↑ | -10.97, 13.42 | 0.679 | 0.844 | 13 | -115, 141 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 Cohort) in PY4. "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 H.9.** Estimated Cumulative Impacts on Total Medicare Spending, PY1 through PY4, for NGACOs in the 2016, 2017, and 2018 Cohorts

| | | Baseline Years: | | Total Spending Cumulatively as of PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **2016 Cohort** | | | | | | | | | | | | | |
| ACCST | 61,065 | 14922.79 | 16455.36 | 14659.17 | 16614.24 | -422.49*** | ↓ | ↕ | -731.80, -113.18 | -2.86 | 0.01 | -25,799,452 *** | -18,888,248 , 18,887,403 |
| Bellin | 40,291 | 9776.58 | 10386.05 | 10256.96 | 10374.45 | 491.98*** | ↑ | ↓ | 207.68, 776.27 | 5.38 | 0.00 | 19,822,202 *** | -11,453,925 , 11,454,909 |
| CHESS | 79,376 | 11576.13 | 11747.01 | 12299.80 | 12598.63 | -127.94 § | ↑ | ↑ | -385.68, 129.81 | -1.13 | 0.33 | -10,155,126 § | -20,458,711 , 20,458,455 |
| Deaconess | 134,690 | 12017.98 | 12173.69 | 12391.57 | 12753.70 | -206.42 | ↑ | ↕ | -495.09, 82.26 | -1.68 | 0.16 | -27,802,042 | -38,881,671 , 38,881,258 |
| Henry Ford | 94,024 | 15137.07 | 14460.33 | 15477.78 | 14327.80 | 473.24*** § | ↑ | ↓ | 182.84, 763.65 | 3.40 | 0.00 | 44,496,308 *** § | -27,304,228 , 27,305,175 |
| Park Nicollet | 54,648 | 11349.83 | 12049.79 | 11767.45 | 12573.07 | -105.66 | ↑ | ↑ | -450.75, 239.43 | -0.92 | 0.55 | -5,773,997 | -18,858,662 , 18,858,451 |
| Pioneer Valley | 158,126 | 13371.74 | 13406.28 | 12724.13 | 12731.59 | 27.09 | ↓ | ↓ | -231.20, 285.37 | 0.22 | 0.84 | 4,282,917 | -40,841,590 , 40,841,645 |
| Steward | 251,434 | 14326.76 | 14479.16 | 14752.45 | 15000.50 | -95.65 | ↑ | ↑ | -266.15, 74.84 | -0.69 | 0.27 | -24,049,839 | -42,868,393 , 42,868,202 |
| ThedaCare | 58,911 | 10159.88 | 10621.28 | 9414.66 | 10178.12 | -302.06* | ↓ | ↓ | -633.17, 29.04 | -2.98 | 0.07 | -17,794,882 * | -19,506,239 , 19,505,635 |
| Triad | 112,713 | 11222.12 | 11736.04 | 11622.49 | 12106.05 | 30.36 | ↑ | ↑ | -337.95, 398.68 | 0.28 | 0.87 | 3,422,375 | -41,513,888 , 41,513,948 |
| Trinity | 294,032 | 13104.61 | 13194.39 | 12977.30 | 13218.16 | -151.09** | ↓ | ↑ | -291.74, -10.44 | -1.18 | 0.04 | -44,424,537 ** | -41,355,358 , 41,355,056 |
| UnityPoint | 312,494 | 10761.24 | 10827.38 | 10805.11 | 11163.86 | -292.62*** | ↑ | ↑ | -422.48, -162.76 | -2.73 | 0.00 | -91,442,047 *** | -40,581,465 , 40,580,880 |
| **2017 Cohort** | | | | | | | | | | | | | |
| Accountable Care Options | 30,372 | 14322.29 | 15088.06 | 13899.16 | 15171.00 | -506.07*** | ↓ | ↑ | -831.89, -180.25 | -3.69 | 0.00 | -15,370,320 *** | -9,896,283 , 9,895,271 |
| APA | 78,582 | 18451.57 | 19904.66 | 19260.18 | 21042.81 | -329.54 | ↑ | ↑ | -728.07, 68.98 | -1.81 | 0.11 | -25,896,266 | -31,317,384 , 31,316,725 |
| Arizona | 78,112 | 12626.81 | 13001.09 | 12419.68 | 12971.00 | -177.05 § | ↑ | ↓ | -421.76, 67.66 | -1.46 | 0.16 | -13,829,611 § | -19,115,111 , 19,114,757 |
| Atrius | 104,052 | 12940.79 | 13777.15 | 12139.32 | 13315.84 | -340.15*** | ↓ | ↓ | -596.13, -84.18 | -2.72 | 0.01 | -35,393,427 *** | -26,635,054 , 26,634,374 |
| Bronx | 134,713 | 18323.23 | 18243.59 | 18495.18 | 18265.85 | 149.70 | ↑ | ↑ | -181.01, 480.41 | 0.83 | 0.37 | 20,166,964 | -44,550,918 , 44,551,217 |
| Carillion | 142,963 | 10408.90 | 10665.21 | 11134.19 | 11514.32 | -123.81 | ↑ | ↑ | -306.28, 58.65 | -1.20 | 0.18 | -17,700,957 | -26,086,148 , 26,085,900 |
| HCP | 68,480 | 15799.73 | 16589.96 | 16212.20 | 16950.20 | 52.22 | ↑ | ↕ | -384.12, 488.57 | 0.33 | 0.81 | 3,576,245 | -29,880,810 , 29,880,915 |
| Indiana U | 152,219 | 13363.10 | 13111.19 | 12768.91 | 12965.70 | -448.70*** § | ↓ | ↓ | -765.45, -131.96 | -3.45 | 0.01 | -68,301,353 *** § | -48,215,390 , 48,214,493 |
| ProHealth | 46,509 | 11129.78 | 11173.58 | 10590.45 | 11529.77 | -895.52*** § | ↓ | ↑ | -1,211.57, -579.46 | -7.86 | 0.00 | -41,649,684 *** § | -14,700,275 , 14,698,484 |
| ProspectNE | 40,823 | 13833.50 | 13954.84 | 13633.18 | 14055.80 | -301.28* | ↓ | ↕ | -627.67, 25.11 | -2.24 | 0.07 | -12,299,066 * | -13,324,573 , 13,323,971 |
| PSW | 28,138 | 11205.82 | 11014.36 | 9540.26 | 9891.41 | -542.61** | ↓ | ↓ | -989.11, -96.11 | -5.09 | 0.02 | -15,267,972 ** | -12,564,255 , 12,563,169 |
| RHeritage | 64,921 | 14213.25 | 15077.09 | 15200.63 | 15895.78 | 168.69 | ↑ | ↑ | -130.77, 468.16 | 1.19 | 0.27 | 10,951,707 | -19,441,499 , 19,441,837 |
| St. Luke's | 81,464 | 10857.57 | 10863.39 | 10775.40 | 11239.11 | -457.89*** | ↓ | ↕ | -737.03, -178.74 | -4.24 | 0.00 | -37,301,324 *** | -22,740,881 , 22,739,965 |
| UNC | 73,227 | 11535.22 | 11550.56 | 11051.54 | 11239.41 | -172.53 | ↓ | ↓ | -449.26, 104.20 | -1.54 | 0.22 | -12,634,030 | -20,264,330 , 20,263,985 |
| UTSW | 230,200 | 14783.15 | 15044.57 | 14186.69 | 14827.75 | -379.64*** | ↓ | ↓ | -569.63, -189.65 | -2.61 | 0.00 | -87,393,177 *** | -43,735,443 , 43,734,684 |
| **2018 Cohort** | | | | | | | | | | | | | |
| ACC of TN | 39,888 | 10306.96 | 10334.24 | 9900.28 | 10283.82 | -356.26*** | ↓ | ↓ | -610.07, -102.46 | -3.70 | 0.01 | -14,210,638 *** | -10,124,147 , 10,123,434 |
| Best Care Collab | 30,866 | 12609.63 | 11718.97 | 12065.12 | 11846.41 | -671.96*** | ↓ | ↑ | -1,014.46, -329.45 | -5.64 | 0.00 | -20,740,680 *** | -10,572,427 , 10,571,083 |
| CareMount | 44,305 | 12974.50 | 12512.40 | 13320.68 | 12961.95 | -103.37 | ↑ | ↑ | -487.60, 280.86 | -0.81 | 0.60 | -4,579,808 | -17,023,445 , 17,023,238 |
| Central Utah | 28,603 | 11371.08 | 11730.54 | 11805.20 | 12308.84 | -144.19 | ↑ | ↑ | -712.37, 424.00 | -1.27 | 0.62 | -4,124,188 | -16,251,923 , 16,251,634 |
| CoxHealth | 30,178 | 10210.99 | 10595.32 | 10581.80 | 10833.84 | 132.29 | ↑ | ↑ | -360.63, 625.21 | 1.35 | 0.60 | 3,992,298 | -14,875,273 , 14,875,538 |
| Franciscan | 44,650 | 11766.75 | 13133.91 | 11493.41 | 13230.03 | -369.47** | ↓ | ↑ | -736.71, -2.23 | -3.25 | 0.05 | -16,496,888 ** | -16,397,625 , 16,396,886 |

| | | Baseline Years: | | Total Spending Cumulatively as of PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| Mary Washington | 26,855 | 12090.25 | 11647.90 | 12085.27 | 12060.68 | -417.76* | ↓ | ↑ | -873.88, 38.35 | -3.46 | 0.07 | -11,219,030 * | -12,249,388 , 12,248,552 |
| NEQCA | 66,682 | 15189.29 | 15226.71 | 15664.41 | 15686.59 | 15.24 | ↕ | ↑ | -325.06, 355.55 | 0.10 | 0.93 | 1,016,420 | -22,692,177 , 22,692,208 |
| Primaria | 52,691 | 12576.45 | 12864.94 | 12465.02 | 13515.95 | -762.45*** | ↕ | ↑ | -1,139.74, -385.16 | -6.13 | 0.00 | -40,174,262 *** | -19,880,780 , 19,879,255 |
| Primary Care Alliance | 23,636 | 12487.30 | 13376.16 | 12177.62 | 13372.79 | -306.32 | ↓ | ↓ | -671.44, 58.81 | -2.60 | 0.10 | -7,240,121 | -8,630,366 , 8,629,754 |
| Reliance | 23,534 | 14159.45 | 15332.16 | 14276.13 | 15444.19 | 4.65 | ↑ | ↕ | -404.63, 413.93 | 0.04 | 0.98 | 109,480 | -9,632,012 , 9,632,022 |
| Reliant | 20,501 | 13735.25 | 15772.29 | 14058.92 | 15567.26 | 528.69 | ↕ | ↓ | -171.42, 1,228.80 | 4.05 | 0.14 | 10,838,651 | -14,352,488 , 14,353,546 |
| Torrance | 22,527 | 16161.82 | 16282.83 | 14271.21 | 15343.00 | -950.77*** | ↓ | ↓ | -1,461.22, -440.33 | -6.14 | 0.00 | -21,418,071 *** | -11,499,802 , 11,497,900 |
| UW Health | 50,990 | 10680.19 | 10167.52 | 10510.88 | 9956.17 | 42.03 | ↓ | ↓ | -285.04, 369.10 | 0.42 | 0.80 | 2,143,201 | -16,677,335 , 16,677,419 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries in PYs, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries across the four PYs.

**Exhibit H.10.** Estimated Impact on Total Medicare Parts A & B Spending in PY4, for NGACOs in the 2016, 2017, and 2018 Cohorts

| | | Baseline Years: | | Total Spending in PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BY3-BY1 | | 2019 | | Difference-in-Differences | | | | | | | |
| NGACO Name | # Aligned Beneficiaries | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| **2016 Cohort** | | | | | | | | | | | | | |
| ACCST | 16,069 | 14783.05 | 16539.36 | 15005.88 | 17335.10 | -572.91* | ↑ | ↑ | -1,191 , 45 | -3.86 | 0.069 | -9,206,100* | -19,138,795 , 726,595 |
| Bellin | 11,314 | 9893.74 | 10383.62 | 10792.54 | 10682.14 | 600.28** | ↑ | ↑ | 36 , 1,165 | 6.58 | 0.037 | 6,791,547** | 406,375 , 13,176,719 |
| CHESS | 27,029 | 11598.45 | 11717.87 | 13263.59 | 13335.96 | 47.06 | ↑ | ↑ | -408 , 502 | 0.41 | 0.839 | 1,271,882 | -11,016,216 , 13,559,980 |
| Deaconess | 35,304 | 11826.92 | 12068.71 | 12329.54 | 12963.81 | -392.49 | ↑ | ↑ | -956 , 172 | -3.18 | 0.173 | -13,856,380 | -33,767,746 , 6,054,986 |
| Henry Ford | 24,140 | 14952.94 | 14389.58 | 16580.16 | 14985.31 | 1031.50*** | ↑ | ↑ | 460 , 1,603 | 7.54 | 0.000 | 24,900,420*** | 11,106,045 , 38,694,795 |
| Park Nicollet | 12,879 | 11152.73 | 11884.65 | 11349.33 | 12379.18 | -297.92 | ↑ | ↑ | -857 , 261 | -2.63 | 0.296 | -3,836,971 | -11,038,950 , 3,365,008 |
| Pioneer Valley | 40,295 | 13594.65 | 13641.36 | 13030.09 | 12749.65 | 327.14 | ↓ | ↓ | -200 , 854 | 2.62 | 0.224 | 13,182,232 | -8,064,224 , 34,428,688 |
| Steward | 103,918 | 13804.59 | 14105.13 | 14623.02 | 14985.16 | -61.60 | ↑ | ↑ | -323 , 200 | -0.46 | 0.644 | -6,400,932 | -33,552,335 , 20,750,471 |
| ThedaCare | 14,191 | 10207.15 | 10577.54 | 9742.49 | 10196.36 | -83.48 | ↓ | ↓ | -796 , 629 | -0.83 | 0.818 | -1,184,620 | -11,294,150 , 8,924,910 |
| Triad | 26,548 | 11166.01 | 11685.00 | 11860.69 | 12474.94 | -95.25 | ↑ | ↑ | -921 , 731 | -0.87 | 0.821 | -2,528,706 | -24,451,027 , 19,393,615 |
| Trinity | 68,359 | 13104.68 | 13184.43 | 13155.48 | 13456.03 | -220.80 | ↑ | ↑ | -515 , 74 | -1.74 | 0.142 | -15,093,544 | -35,217,943 , 5,030,855 |
| UnityPoint | 90,611 | 10850.56 | 10689.84 | 10931.12 | 11435.74 | -665.34*** | ↑ | ↑ | -936 , -394 | -6.01 | 0.000 | -60,287,300*** | -84,844,047 , -35,730,553 |
| **2017 Cohort** | | | | | | | | | | | | | |
| Accountable Care Options | 9,716 | 14,595.93 | 15,431.43 | 14,289.52 | 15,917.18 | -792.17*** | ↓ | ↑ | -1,369 , -215 | -5.60 | 0.007 | -76,967,08*** | -13,304,300 , -2,089,116 |
| APA | 28,197 | 17,574.06 | 19,003.18 | 18,030.93 | 20,029.71 | -569.66* | ↓ | ↓ | -1,194 , 54 | -3.24 | 0.073 | -16,062,653* | -33,653,122 , 1,527,816 |
| Arizona | 30,814 | 12,537.48 | 12,986.63 | 12,419.56 | 12,986.45 | -117.75 § | ↓ | ↓ | -506 , 271 | -0.98 | 0.552 | -3,628,339 § | -15,593,109 , 8,336,431 |
| Atrius | 35,336 | 12,817.78 | 13,713.41 | 12,391.17 | 13,661.85 | -375.05 | ↓ | ↓ | -844 , 94 | -2.99 | 0.117 | -13,252,935 | -29,834,801 , 3,328,931 |
| Bronx | 45,645 | 18,351.50 | 18,203.80 | 19,333.92 | 18,860.37 | 325.85 | ↑ | ↑ | -265 , 917 | 1.80 | 0.280 | 14,873,481 | -12,099,577 , 41,846,539 |
| Carillion | 48,574 | 10,233.65 | 10,470.70 | 11,100.79 | 11,532.01 | -194.17 | ↑ | ↑ | -529 , 141 | -1.91 | 0.256 | -9,431,535 | -25,698,004 , 6,834,934 |
| HCP | 27,156 | 16,017.77 | 17,070.75 | 17,332.43 | 18,007.45 | 377.95 | ↓ | ↑ | -326 , 1,081 | 2.33 | 0.292 | 10,263,659 | -8,840,151 , 29,367,469 |
| Indiana U | 58,223 | 13,148.00 | 12,906.81 | 12,854.34 | 13,129.06 | -515.91** § | ↓ | ↑ | -975 , -57 | -4.03 | 0.027 | -30,037,894** § | -56,741,317 , -3,334,471 |
| ProHealth | 14,550 | 11,066.92 | 11,216.77 | 10,508.13 | 11,648.59 | -990.61*** | ↓ | ↑ | -1,515 , -466 | -8.85 | 0.000 | -14,413,307*** | -22,043,257 , -6,783,357 |
| ProspectNE | 11,169 | 13,714.12 | 13,811.24 | 13,767.01 | 14,341.63 | -477.49 | ↓ | ↓ | -1,077 , 122 | -3.55 | 0.118 | -5,333,124 | -12,028,606 , 1,362,358 |
| PSW | 12,371 | 11,416.07 | 11,252.00 | 9,895.59 | 10,196.36 | -464.84 | ↓ | ↓ | -1,114 , 185 | -4.31 | 0.161 | -5,750,542 | -13,785,413 , 2,284,329 |
| RHeritage | 19,649 | 14,553.72 | 15,502.68 | 16,290.54 | 16,865.44 | 374.06 | ↑ | ↑ | -161 , 909 | 2.55 | 0.171 | 7,349,881 | -3,160,512 , 17,860,274 |
| St. Luke's | 29,812 | 10,594.55 | 10,677.71 | 10,924.16 | 11,483.03 | -475.72** | ↓ | ↓ | -949 , -3 | -4.41 | 0.049 | -14,182,167** | -28,277,775 , -86,559 |
| UNC | 27,489 | 12,342.70 | 12,126.82 | 10,932.08 | 11,363.79 | -647.59*** | ↓ | ↓ | -1,128 , -168 | -5.44 | 0.008 | -17,801,568*** | -30,998,722 , -4,604,414 |
| UTSW | 85,451 | 14,763.41 | 15,107.88 | 14,316.11 | 15,107.03 | -446.46*** | ↓ | ↓ | -764 , -129 | -3.04 | 0.006 | -38,150,124*** | -65,259,921 , -11,040,327 |
| **2018 Cohort** | | | | | | | | | | | | | |
| ACC of TN | 20,419 | 10,272.12 | 10,312.99 | 9,904.23 | 10,325.71 | -380.62** | ↓ | ↑ | -743 , -19 | -3.94 | 0.039 | -7,771,790** | -15,165,660 , -377,920 |
| Best Care Collab | 12,280 | 12,521.83 | 11,723.33 | 11,964.58 | 12,174.19 | -1,008.11*** | ↓ | ↑ | -1,507 , -510 | -8.37 | 0.000 | -12,379,558*** | -18,501,788 , -6,257,328 |
| CareMount | 21,307 | 12,775.85 | 12,347.96 | 13,176.59 | 12,932.19 | -183.49 | ↑ | ↑ | -698 , 331 | -1.47 | 0.485 | -3,909,666 | -14,880,350 , 7,061,018 |
| Central Utah | 14,174 | 11,269.32 | 11,687.42 | 12,474.35 | 12,656.65 | 235.79 | ↑ | ↑ | -540 , 1,012 | 2.10 | 0.551 | 3,342,106 | -7,654,716 , 14,338,928 |
| CoxHealth | 17,729 | 10,201.24 | 10,561.74 | 10,858.12 | 11,101.21 | 117.42 | ↑ | ↑ | -517 , 752 | 1.18 | 0.717 | 2,081,736 | -9,167,533 , 13,331,005 |
| Franciscan | 22,413 | 12,018.93 | 13,129.71 | 11,275.42 | 12,853.27 | -467.07* | ↓ | ↓ | -1,004 , 70 | -4.03 | 0.088 | -10,468,403* | -22,504,274 , 1,567,468 |

| | | Baseline Years: | | Total Spending in PY4 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | BY3-BY1 | | 2019 | | Difference-in-Differences | | | | | | | |
| NGACO Name | # Aligned Beneficiaries | NGACO mean | Comparison mean | NGACO mean | Comparison mean | DID Estimate | NGACO Diff. | Comp Diff. | 95% Confidence Interval (CI) | % Impact | p | Aggregate | Aggregate 95% CI |
| Mary Washington | 13,239 | 12,122.66 | 11,855.39 | 12,438.80 | 12,634.42 | -462.89 | ↑ | ↑ | -1,175 , 250 | -3.73 | 0.203 | -6,128,171 | -15,559,825 , 3,303,483 |
| NEQCA | 32,002 | 15,022.25 | 15,317.63 | 15,609.44 | 15,789.15 | 115.67 | ↕ | ↑ | -362 , 593 | 0.82 | 0.635 | 3,701,660 | -11,577,701 , 18,981,021 |
| Primaria | 26,493 | 12,797.31 | 13,082.98 | 12,119.02 | 13,699.68 | -1294.98*** | ↓ | ↑ | -1,851 , -739 | -10.09 | 0.000 | -34,307,908*** | -49,041,865 , -19,573,951 |
| Primary Care Alliance | 11,600 | 12,362.68 | 13,272.71 | 11,652.88 | 13,127.05 | -564.13** | ↓ | ↓ | -1,089 , -39 | -4.86 | 0.035 | -6,543,959** | -12,633,888 , -454,030 |
| Reliance | 11,620 | 14,139.29 | 15,305.91 | 14,772.37 | 15,570.69 | 368.30 | ↑ | ↕ | -246 , 983 | 2.87 | 0.240 | 4,279,698 | -2,861,675 , 11,421,071 |
| Reliant | 9,877 | 13,623.63 | 15,647.31 | 14,375.39 | 15,414.87 | 984.19* | ↕ | ↕ | -6 , 1,974 | 7.73 | 0.051 | 9,720,852* | -54,708 , 19,496,412 |
| Torrance | 10,873 | 16,267.58 | 16,260.34 | 13,629.83 | 15,297.72 | -1675.13*** | ↓ | ↓ | -2,410 , -940 | -10.57 | 0.000 | -18,213,716*** | -26,206,874 , -10,220,558 |
| UW Health | 24,622 | 10,737.69 | 10,245.40 | 10,264.99 | 9,756.23 | 16.47 | ↓ | ↓ | -435 , 468 | 0.17 | 0.943 | 405,446 | -10,711,055 , 11,521,947 |

**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 baseline years. Direction of change (difference) in impact estimates for NGACO group and for comparison groups denoted as arrow up (increase) or arrow down (decrease). Percentage impact is relative to expected average outcome for NGACO beneficiaries in PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries in PY4.

**Exhibit H.11.** Estimated Cumulative Impact of the 2016 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care hospital facility | | | Skilled nursing facility | | | Other post-acute care facility | | | Outpatient facility | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 61,065 | -59.64 | -176.66, 57.38 | -1.54 | 12.13 | -30.51, 54.77 | 1.76 | -25.39 | -94.02, 43.23 | -2.29 | -164.70*** § | -234.54, -94.86 | -6.65 |
| Bellin | 40,291 | -157.23*** | -274.06, -40.39 | -5.79 | 172.89*** | 120.31, 225.48 | 26.43 | -50.35*** | -75.04, -25.65 | -29.95 | 117.26** | 4.34, 230.17 | 4.02 |
| CHESS | 79,376 | 31.25 § | -73.91, 136.42 | 0.98 | -1.67 | -33.64, 30.30 | -0.24 | -30.87** | -61.22, -0.51 | -11.39 | 139.42*** | 60.91, 217.93 | 5.89 |
| Deaconess | 134,690 | -13.32 § | -110.14, 83.50 | -0.40 | -23.85 | -76.01, 28.31 | -2.06 | 7.75 | -28.51, 44.01 | 1.62 | -49.56 | -132.11, 33.00 | -1.72 |
| Henry Ford | 94,024 | -123.57** | -242.42, -4.71 | -2.32 | -30.79 § | -73.96, 12.39 | -2.59 | -0.74 | -35.80, 34.32 | -0.18 | 389.05*** | 306.39, 471.70 | 11.77 |
| Park Nicollet | 54,648 | -13.90 § | -158.78, 130.99 | -0.35 | 8.83 | -50.53, 68.19 | 0.92 | -0.73 | -28.21, 26.76 | -0.70 | -184.61*** | -295.95, -73.26 | -6.50 |
| Pioneer Valley | 158,126 | -9.92 | -134.26, 114.42 | -0.22 | -109.05*** § | -152.25, -65.85 | -11.74 | 21.92 | -9.85, 53.69 | 5.84 | 24.53 | -59.92, 108.99 | 0.93 |
| Steward | 251,434 | -13.27 | -80.13, 53.59 | -0.33 | -22.99* | -46.18, 0.19 | -2.45 | -34.34*** | -54.99, -13.69 | -7.76 | 0.90 § | -38.43, 40.23 | 0.04 |
| ThedaCare | 58,911 | -140.67* | -285.69, 4.34 | -4.52 | 82.00** | 14.10, 149.89 | 10.23 | -47.68* | -100.20, 4.84 | -28.35 | -6.94 § | -134.30, 120.42 | -0.25 |
| Triad | 112,713 | 72.21 | -60.12, 204.54 | 2.19 | -41.52 | -91.66, 8.62 | -6.15 | -43.77* | -90.84, 3.30 | -18.50 | 155.72** | 18.80, 292.64 | 6.78 |
| Trinity | 294,032 | -78.43** | -141.60, -15.26 | -1.82 | -76.67*** | -102.05, -51.28 | -6.78 | -15.32 § | -37.09, 6.44 | -3.85 | -23.70 | -63.67, 16.26 | -0.93 |
| UnityPoint | 312,494 | -9.84 | -63.09, 43.42 | -0.32 | -49.69*** | -72.38, -26.99 | -6.68 | -21.31** § | -37.64, -4.98 | -9.42 | -136.65*** § | -172.37, -100.94 | -5.47 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. "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.

**Exhibit H.12.** Estimated Cumulative Impact of the 2016 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional services | | | Home health | | | Hospice | | | Durable medical equipment | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 61,065 | -8.85 § | -81.82, 64.11 | -0.22 | -65.61*** | -96.35, -34.87 | -5.82 | -65.56*** | -100.39, -30.72 | -16.51 | 26.01* | -4.68, 56.69 | 7.89 |
| Bellin | 40,291 | 247.47*** | 190.06, 304.88 | 13.49 | -27.30*** § | -44.25, -10.34 | -9.27 | -33.64* | -73.16, 5.88 | -9.84 | -7.48 | -35.90, 20.94 | -2.97 |
| CHESS | 79,376 | -234.17*** § | -288.57, -179.76 | -8.13 | -26.00*** | -42.30, -9.71 | -4.85 | -36.85** | -66.41, -7.28 | -8.97 | 11.37 | -7.23, 29.96 | 3.53 |
| Deaconess | 134,690 | -136.75*** | -205.66, -67.83 | -5.33 | -11.95 | -30.00, 6.10 | -2.44 | -40.00** | -74.26, -5.74 | -12.15 | -9.70 § | -25.65, 6.25 | -3.35 |
| Henry Ford | 94,024 | -26.39 § | -78.07, 25.28 | -1.03 | 0.86 § | -17.45, 19.17 | 0.11 | -12.45 | -38.72, 13.83 | -3.78 | 56.98*** | 33.65, 80.32 | 19.29 |
| Park Nicollet | 54,648 | 150.82*** | 77.33, 224.31 | 5.56 | -12.07 | -29.77, 5.64 | -3.33 | 16.13 | -22.92, 55.19 | 4.23 | -17.58 | -45.14, 9.99 | -6.80 |
| Pioneer Valley | 158,126 | -45.82*** | -76.77, -14.87 | -1.74 | 4.11 § | -17.68, 25.90 | 0.58 | -34.70** | -68.99, -0.41 | -10.67 | -6.69 | -25.89, 12.51 | -2.47 |
| Steward | 251,434 | 23.46 § | -7.62, 54.54 | 0.71 | 10.71* | -0.92, 22.33 | 1.47 | -22.99** | -41.27, -4.71 | -5.84 | 6.66 | -2.44, 15.76 | 2.77 |
| ThedaCare | 58,911 | -10.52 | -80.40, 59.35 | -0.46 | -52.43*** § | -74.16, -30.69 | -14.59 | -102.59*** | -166.67, -38.52 | -18.93 | -7.04 | -32.50, 18.42 | -2.74 |
| Triad | 112,713 | -14.79 | -71.85, 42.27 | -0.55 | -25.79** § | -49.58, -1.99 | -5.20 | -49.81** | -94.59, -5.02 | -11.64 | 7.01 | -18.03, 32.05 | 2.34 |
| Trinity | 294,032 | -24.99 | -58.73, 8.76 | -0.75 | -6.32 | -16.40, 3.76 | -0.99 | -16.56** | -31.80, -1.32 | -4.83 | -0.10 | -8.84, 8.63 | -0.04 |
| UnityPoint | 312,494 | 43.86** | 8.80, 78.91 | 1.69 | -12.10*** | -19.12, -5.08 | -3.95 | -30.77*** § | -44.22, -17.32 | -10.61 | -5.50 | -15.76, 4.77 | -1.94 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.13.** Estimated Cumulative Impact of the 2016 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 61,065 | -6.92** | -13.55, -0.28 | -2.30 | 0.10 | -2.62, 2.81 | 0.20 | 25.02 | -59.68, 109.72 | 1.94 | -13.95** § | -25.30, -2.60 | -2.58 |
| Bellin | 40,291 | -14.43*** | -21.67, -7.20 | -6.32 | 13.80*** | 10.13, 17.48 | 26.53 | 311.20*** | 204.14, 418.26 | 23.73 | 4.97 | -11.74, 21.69 | 0.86 |
| CHESS | 79,376 | 1.00 § | -5.00, 7.00 | 0.35 | 2.04 | -0.56, 4.64 | 3.33 | -5.99 | -76.53, 64.56 | -0.41 | 9.12 § | -3.33, 21.57 | 1.48 |
| Deaconess | 134,690 | -2.83 § | -9.86, 4.21 | -0.91 | 4.23** | 0.78, 7.68 | 5.25 | -14.23 | -119.87, 91.42 | -0.64 | -1.42 § | -14.93, 12.09 | -0.21 |
| Henry Ford | 94,024 | -5.73 | -13.09, 1.63 | -1.32 | 1.61 § | -2.06, 5.29 | 1.56 | -20.75 § | -112.27, 70.78 | -0.88 | 22.45*** § | 9.84, 35.05 | 3.12 |
| Park Nicollet | 54,648 | 2.72 § | -5.83, 11.26 | 0.89 | 6.39*** | 2.29, 10.50 | 8.73 | 60.94 | -33.65, 155.54 | 4.09 | -11.73 | -30.39, 6.93 | -1.75 |
| Pioneer Valley | 158,126 | -5.95 | -13.33, 1.43 | -1.81 | -4.22** § | -7.80, -0.63 | -5.03 | -196.31*** § | -275.95, -116.66 | -12.32 | 5.33 | -6.66, 17.31 | 0.89 |
| Steward | 251,434 | -1.94 | -5.76, 1.88 | -0.62 | 3.72*** § | 1.88, 5.56 | 4.80 | -45.33** | -89.38, -1.28 | -2.68 | 3.01 § | -4.02, 10.05 | 0.53 |
| ThedaCare | 58,911 | -7.31 | -17.05, 2.43 | -2.52 | 3.77 | -0.80, 8.33 | 6.08 | 167.53** | 34.91, 300.14 | 11.32 | -3.36 § | -21.60, 14.88 | -0.52 |
| Triad | 112,713 | 1.99 | -7.80, 11.78 | 0.68 | 1.77 | -2.12, 5.65 | 3.16 | -52.75 | -162.08, 56.59 | -3.75 | 29.51*** | 8.93, 50.10 | 4.46 |
| Trinity | 294,032 | -3.61** | -7.21, -0.02 | -1.09 | -0.20 § | -1.95, 1.55 | -0.25 | -136.97*** § | -183.70, -90.23 | -6.97 | -7.44** | -13.76, -1.12 | -1.33 |
| UnityPoint | 312,494 | -0.00 | -3.44, 3.44 | -0.00 | 5.41*** § | 3.73, 7.10 | 8.35 | -0.74 | -42.78, 41.31 | -0.05 | -38.01*** | -44.65, -31.36 | -6.76 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.14.** Estimated Cumulative Impact of the 2016 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 61,065 | -253.57*** | -351.48, -155.66 | -1.96 | 125.51* | -22.04, 273.05 | 1.40 | -330.87** | -604.45, -57.30 | -1.19 | -98.23*** | -167.62, -28.83 | -1.71 |
| Bellin | 40,291 | 1,101.54*** § | 965.70, 1,237.38 | 10.19 | 546.75*** | 345.98, 747.52 | 6.88 | 1,024.58*** | 744.17, 1,305.00 | 5.29 | 201.75*** | 127.28, 276.22 | 4.91 |
| CHESS | 79,376 | -213.04*** § | -317.45, -108.63 | -1.59 | -404.61*** § | -539.74, -269.48 | -4.86 | -160.65 § | -383.14, 61.84 | -0.69 | -18.26 § | -80.27, 43.76 | -0.38 |
| Deaconess | 134,690 | -42.69 § | -137.73, 52.35 | -0.36 | -281.91*** | -445.27, -118.55 | -3.07 | -467.40*** § | -743.64, -191.16 | -2.10 | 45.70 § | -24.12, 115.52 | 0.89 |
| Henry Ford | 94,024 | 394.14*** § | 287.51, 500.76 | 2.61 | 248.76*** § | 94.30, 403.21 | 2.69 | 802.11*** § | 575.85, 1,028.37 | 3.36 | 179.18*** § | 120.11, 238.26 | 3.66 |
| Park Nicollet | 54,648 | -405.59*** § | -534.00, -277.17 | -3.60 | -540.83*** | -718.57, -363.09 | -6.53 | -201.97 | -557.58, 153.63 | -0.90 | -105.40*** | -184.14, -26.67 | -2.36 |
| Pioneer Valley | 158,126 | -466.10*** § | -574.47, -357.73 | -3.22 | 193.87*** § | 65.44, 322.29 | 2.46 | -144.30 § | -381.88, 93.28 | -0.59 | -13.02 § | -70.89, 44.85 | -0.28 |
| Steward | 251,434 | -252.08*** § | -313.43, -190.73 | -1.75 | 311.55*** | 219.17, 403.93 | 3.35 | -426.62*** | -574.22, -279.02 | -1.52 | 5.05 § | -33.34, 43.44 | 0.10 |
| ThedaCare | 58,911 | -374.36*** § | -497.71, -251.01 | -3.70 | -162.83 | -391.21, 65.55 | -1.87 | 138.07 § | -267.12, 543.26 | 0.57 | -108.43** § | -196.11, -20.76 | -2.50 |
| Triad | 112,713 | -176.12** § | -324.48, -27.75 | -1.42 | -112.00 | -327.48, 103.47 | -1.29 | -123.61 | -448.41, 201.19 | -0.55 | 21.19 | -74.08, 116.46 | 0.44 |
| Trinity | 294,032 | -65.91** § | -120.59, -11.23 | -0.47 | 169.38*** | 70.10, 268.66 | 1.56 | -446.10*** § | -567.83, -324.38 | -1.81 | -32.47* | -66.48, 1.54 | -0.63 |
| UnityPoint | 312,494 | 169.60*** § | 117.68, 221.51 | 1.49 | -338.75*** § | -427.90, -249.60 | -3.62 | -218.30*** § | -353.77, -82.83 | -0.98 | -29.30* | -61.79, 3.18 | -0.64 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.15.** Estimated Cumulative Impact of the 2016 Cohort on Utilization (Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 61,065 | 141.69*** § | 137.10, 146.27 | 31.06 | -4.68** | -8.44, -0.92 | -3.41 | -452.59*** | -651.16, -254.01 | -7.16 |
| Bellin | 40,291 | 159.25*** § | 152.85, 165.64 | 30.53 | -6.75*** § | -10.88, -2.62 | -8.44 | -177.23*** | -288.07, -66.39 | -11.01 |
| CHESS | 79,376 | 140.55*** § | 135.60, 145.51 | 29.07 | -4.89*** § | -8.48, -1.30 | -3.72 | -211.17*** | -308.97, -113.37 | -7.22 |
| Deaconess | 134,690 | 85.00*** § | 80.51, 89.50 | 40.52 | -0.75 § | -4.57, 3.07 | -0.70 | -33.93 | -151.01, 83.15 | -1.21 |
| Henry Ford | 94,024 | 61.37*** § | 57.46, 65.28 | 20.68 | -1.35 § | -6.09, 3.38 | -0.58 | 48.26 § | -55.88, 152.41 | 1.19 |
| Park Nicollet | 54,648 | 177.92*** § | 173.17, 182.67 | 69.95 | -3.83* | -7.76, 0.11 | -4.26 | -114.28** | -212.58, -15.98 | -6.76 |
| Pioneer Valley | 158,126 | 48.91*** § | 44.31, 53.50 | 14.88 | 3.67 § | -0.75, 8.09 | 2.22 | -20.93 § | -155.66, 113.79 | -0.57 |
| Steward | 251,434 | 52.50*** § | 49.77, 55.23 | 11.11 | -0.58 § | -2.94, 1.78 | -0.35 | 121.91*** | 49.03, 194.80 | 3.19 |
| ThedaCare | 58,911 | 51.91*** § | 46.06, 57.77 | 8.10 | -8.28*** | -13.78, -2.79 | -8.18 | -265.30*** § | -397.94, -132.67 | -14.53 |
| Triad | 112,713 | 47.89*** § | 39.77, 56.00 | 11.16 | -2.66 | -8.36, 3.04 | -2.05 | -175.63** § | -316.42, -34.84 | -6.71 |
| Trinity | 294,032 | 130.46*** § | 128.31, 132.62 | 45.35 | 2.57** § | 0.45, 4.70 | 1.76 | -95.41*** § | -151.61, -39.21 | -3.15 |
| UnityPoint | 312,494 | 149.63*** § | 146.75, 152.52 | 42.92 | 0.51 | -1.21, 2.23 | 0.61 | -76.82*** | -126.26, -27.39 | -4.39 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. AWV = annual wellness visit.

## Exhibit H.16. Estimated Cumulative Impact of the 2016 Cohort on Quality of Care as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | 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 | 61,065 | -1.37 § | -3.07, 0.33 | -3.57 | 3.61 | -4.76, 11.97 | 2.36 | 0.39 | -22.26, 23.05 | 0.20 |
| Bellin | 40,291 | -5.59*** | -7.69, -3.48 | -20.32 | -8.28 | -18.84, 2.28 | -7.18 | -11.10 | -32.16, 9.96 | -8.01 |
| CHESS | 79,376 | 2.10** | 0.35, 3.86 | 5.14 | -6.74 | -15.16, 1.68 | -4.55 | -12.72 | -30.47, 5.03 | -7.09 |
| Deaconess | 134,690 | -2.55** § | -4.74, -0.36 | -5.01 | -2.39 § | -10.95, 6.16 | -1.58 | 10.24 | -5.91, 26.38 | 6.19 |
| Henry Ford | 94,024 | -1.71* | -3.42, 0.00 | -3.41 | -0.40 | -7.49, 6.70 | -0.22 | -5.15 | -20.16, 9.86 | -2.25 |
| Park Nicollet | 54,648 | 3.52*** | 1.44, 5.60 | 10.50 | -1.43 | -12.24, 9.38 | -0.98 | -8.07 | -29.33, 13.19 | -4.68 |
| Pioneer Valley | 158,126 | -3.72*** | -5.78, -1.65 | -7.91 | -2.69 | -11.83, 6.46 | -1.59 | 9.71 | -8.19, 27.62 | 5.00 |
| Steward | 251,434 | 1.43** | 0.31, 2.54 | 2.87 | 2.09 | -2.64, 6.83 | 1.25 | 3.50 | -5.69, 12.69 | 1.78 |
| ThedaCare | 58,911 | -0.63 | -3.00, 1.73 | -2.10 | -1.99 | -13.60, 9.62 | -1.76 | -17.27 | -40.45, 5.90 | -13.58 |
| Triad | 112,713 | 2.59* | -0.04, 5.21 | 6.37 | -1.79 | -14.44, 10.86 | -1.23 | 24.33** | 1.77, 46.88 | 15.86 |
| Trinity | 294,032 | 0.89** | 0.05, 1.73 | 2.32 | -0.52 § | -4.56, 3.52 | -0.35 | -1.43 | -9.53, 6.66 | -0.78 |
| UnityPoint | 312,494 | -1.37*** § | -2.33, -0.41 | -3.62 | 0.57 | -3.96, 5.11 | 0.42 | -6.18 | -15.44, 3.09 | -3.56 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2016 cohort) as of PY4. ACSC = ambulatory care-sensitive condition; SNF = skilled nursing facility.

**Exhibit H.17.** Estimated Cumulative Impact of the 2017 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care hospital facility | | | Skilled nursing facility | | | Other post-acute care facility | | | Outpatient facility | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | -227.89*** | -382.56, -73.22 | -5.72 | -23.31 | -76.97, 30.36 | -2.84 | -169.32*** | -230.60, -108.04 | -27.07 | -151.49*** | -249.11, -53.88 | -6.91 |
| APA | 78,582 | -117.61* | -241.36, 6.13 | -2.48 | -1.76 | -55.89, 52.37 | -0.13 | -60.45*** | -104.68, -16.23 | -9.25 | -48.47 | -121.94, 24.99 | -2.17 |
| Arizona | 78,112 | -67.54 § | -160.79, 25.71 | -2.10 | -52.16*** | -78.71, -25.60 | -10.22 | 10.56 | -25.07, 46.19 | 2.67 | -132.47*** § | -192.51, -72.43 | -7.41 |
| Atrius | 104,052 | -133.12** § | -248.82, -17.42 | -3.18 | -14.49 § | -50.99, 22.01 | -1.72 | -29.32** | -57.43, -1.20 | -9.19 | -47.14 | -118.29, 24.01 | -1.90 |
| Bronx | 134,713 | 90.34 | -44.61, 225.30 | 1.55 | 7.51 § | -52.42, 67.44 | 0.46 | 20.67 | -10.83, 52.17 | 5.83 | 81.29* | -1.47, 164.04 | 3.15 |
| Carillion | 142,963 | -76.71* | -155.99, 2.57 | -2.28 | -39.56*** | -69.28, -9.84 | -4.84 | -3.03 | -20.92, 14.85 | -1.56 | -44.62* | -97.29, 8.05 | -1.85 |
| HCP | 68,480 | 138.61* | -11.14, 288.36 | 2.60 | 98.66** § | 23.19, 174.13 | 5.68 | -2.25 | -56.19, 51.69 | -0.37 | 87.03* | -4.52, 178.57 | 3.50 |
| Indiana U | 152,219 | -19.20 | -110.45, 72.04 | -0.52 | -11.54 | -49.40, 26.32 | -1.10 | -6.53 § | -30.73, 17.66 | -2.46 | 10.07 § | -74.89, 95.03 | 0.33 |
| ProHealth | 46,509 | -302.21*** § | -433.42, -171.00 | -9.08 | -47.99** § | -93.74, -2.24 | -7.07 | 78.55*** § | 31.37, 125.72 | 17.76 | -113.23** | -219.57, -6.89 | -3.88 |
| ProspectNE | 40,823 | 72.34 | -74.78, 219.47 | 1.60 | -113.39*** | -171.88, -54.91 | -8.93 | 5.20 | -17.96, 28.36 | 3.75 | -326.88*** | -410.47, -243.29 | -12.29 |
| PSW | 28,138 | -188.26* | -380.86, 4.33 | -5.42 | -131.33*** | -218.30, -44.35 | -14.35 | 11.08 | -22.81, 44.97 | 13.88 | -123.83 | -303.10, 55.45 | -4.65 |
| RHeritage | 64,921 | -2.18 | -142.52, 138.17 | -0.05 | -82.82** § | -154.01, -11.62 | -6.43 | 61.59*** § | 20.98, 102.20 | 14.89 | -27.54 | -99.06, 43.99 | -1.21 |
| St. Luke's | 81,464 | -152.80** | -272.71, -32.89 | -5.01 | -96.62*** | -141.45, -51.80 | -17.73 | -21.47 | -57.28, 14.34 | -10.91 | -156.53*** | -272.19, -40.87 | -4.43 |
| UNC | 73,227 | -2.95 | -118.25, 112.34 | -0.08 | 8.70 | -32.61, 50.02 | 1.15 | -6.79 | -32.82, 19.23 | -3.73 | -131.01*** | -225.28, -36.73 | -4.93 |
| UTSW | 230,200 | -98.13*** | -165.92, -30.35 | -2.53 | -1.09 | -29.61, 27.42 | -0.12 | -86.62*** | -121.06, -52.19 | -9.45 | 73.03*** | 25.02, 121.03 | 3.18 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. "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.

**Exhibit H.18.** Estimated Cumulative Impact of the 2017 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional services | | | Home health | | | Hospice | | | Durable medical equipment | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | -81.11* § | -170.56, 8.34 | -1.61 | -32.94 | -75.75, 9.87 | -2.49 | -18.66 | -78.80, 41.49 | -3.41 | 14.53 | -9.12, 38.19 | 5.83 |
| APA | 78,582 | 40.05 § | -14.95, 95.05 | 0.99 | -127.65*** | -160.81, -94.49 | -7.20 | 11.11 | -36.54, 58.77 | 1.85 | -3.72 § | -17.25, 9.81 | -1.73 |
| Arizona | 78,112 | 37.45 | -50.88, 125.77 | 0.85 | -26.02*** | -40.28, -11.76 | -6.42 | -31.69* | -64.96, 1.59 | -6.61 | 21.26** | 1.08, 41.45 | 8.93 |
| Atrius | 104,052 | 3.33 | -40.26, 46.92 | 0.11 | -4.90 § | -24.25, 14.46 | -0.66 | -9.44 | -40.28, 21.41 | -2.51 | -11.54 | -33.23, 10.16 | -5.49 |
| Bronx | 134,713 | -36.97 | -81.49, 7.55 | -0.90 | 26.44*** | 12.17, 40.70 | 5.03 | -8.00 § | -28.10, 12.10 | -4.03 | 20.33*** § | 6.83, 33.83 | 10.08 |
| Carillion | 142,963 | 52.64*** | 13.54, 91.75 | 2.11 | -5.57 | -19.61, 8.46 | -1.11 | 5.58 | -17.16, 28.32 | 1.89 | -12.52 | -30.83, 5.80 | -4.34 |
| HCP | 68,480 | -80.05 | -210.04, 49.94 | -2.01 | -43.96*** § | -76.36, -11.57 | -3.20 | -29.08 | -74.36, 16.19 | -5.18 | 24.32** | 3.58, 45.07 | 9.26 |
| Indiana U | 152,219 | -237.00*** | -334.36, -139.65 | -8.78 | -24.71*** | -38.06, -11.36 | -5.66 | -26.39* | -52.86, 0.08 | -7.14 | 9.66 | -7.26, 26.59 | 2.98 |
| ProHealth | 46,509 | -137.35*** § | -183.68, -91.02 | -5.52 | -41.48*** § | -59.43, -23.54 | -11.10 | -44.92** § | -80.63, -9.21 | -12.04 | -6.86 | -31.69, 17.97 | -3.07 |
| ProspectNE | 40,823 | 59.76* | -2.49, 122.01 | 1.85 | 1.82 | -26.88, 30.51 | 0.22 | -18.36 | -54.60, 17.89 | -5.07 | 8.44 § | -10.10, 26.98 | 3.74 |
| PSW | 28,138 | -161.26*** | -263.49, -59.02 | -5.61 | -13.47 | -39.17, 12.24 | -3.81 | 0.47 | -51.65, 52.60 | 0.18 | -2.48 | -19.89, 14.93 | -1.25 |
| RHeritage | 64,921 | 122.77*** | 60.92, 184.62 | 3.14 | 37.51** | 5.38, 69.65 | 2.72 | -83.93*** | -130.11, -37.76 | -13.54 | -0.65 | -19.00, 17.70 | -0.23 |
| St. Luke's | 81,464 | -115.08*** | -164.91, -65.24 | -5.80 | -44.66*** | -70.11, -19.21 | -8.31 | -51.15** | -100.92, -1.38 | -9.78 | -15.28 | -45.20, 14.64 | -4.86 |
| UNC | 73,227 | -73.82* § | -153.15, 5.50 | -2.57 | 33.38*** | 15.57, 51.18 | 6.86 | -15.11 | -48.06, 17.84 | -4.00 | -43.26*** | -69.22, -17.30 | -12.52 |
| UTSW | 230,200 | -163.94*** | -213.90, -113.97 | -4.07 | -69.35*** § | -87.05, -51.65 | -6.07 | -32.34*** § | -55.24, -9.45 | -6.36 | 13.08 | -4.65, 30.82 | 3.87 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.19.** Estimated Cumulative Impact of the 2017 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | -21.07*** § | -30.52, -11.62 | -6.30 | -2.85 | -6.72, 1.01 | -4.45 | -42.72 | -150.75, 65.31 | -2.77 | -35.52*** | -52.51, -18.53 | -6.05 |
| APA | 78,582 | -2.32 | -8.18, 3.54 | -0.79 | 2.74** § | 0.15, 5.33 | 4.30 | 51.32 § | -29.94, 132.57 | 2.77 | -2.34 | -12.30, 7.61 | -0.55 |
| Arizona | 78,112 | 0.57 | -4.78, 5.93 | 0.24 | -2.18** | -4.33, -0.04 | -5.06 | -83.08*** | -131.56, -34.61 | -9.26 | -4.16 § | -15.10, 6.78 | -0.78 |
| Atrius | 104,052 | 3.30 | -2.90, 9.51 | 1.12 | 2.62* | -0.30, 5.55 | 3.50 | -15.98 § | -77.76, 45.79 | -1.19 | -22.44*** | -32.92, -11.95 | -4.25 |
| Bronx | 134,713 | 14.65*** § | 8.69, 20.61 | 4.36 | 3.38** § | 0.63, 6.13 | 4.33 | 78.43* | -9.33, 166.19 | 3.49 | -1.91 | -11.04, 7.21 | -0.46 |
| Carillion | 142,963 | 0.99 | -4.09, 6.07 | 0.34 | -1.37 § | -3.78, 1.04 | -1.97 | -17.08 | -85.06, 50.91 | -0.97 | -7.93 § | -18.04, 2.17 | -1.29 |
| HCP | 68,480 | 11.23*** | 4.44, 18.03 | 3.37 | 6.93*** § | 3.45, 10.41 | 8.52 | 148.05** § | 34.19, 261.91 | 6.12 | 1.28 | -9.13, 11.69 | 0.27 |
| Indiana U | 152,219 | 4.37 | -1.12, 9.86 | 1.44 | 0.69 | -2.09, 3.48 | 0.86 | -28.56 | -108.50, 51.37 | -1.40 | -16.32*** § | -27.90, -4.73 | -2.40 |
| ProHealth | 46,509 | -14.15*** § | -22.44, -5.86 | -4.79 | 1.32 § | -2.09, 4.73 | 2.51 | -69.42 | -158.05, 19.21 | -5.68 | -34.20*** | -50.30, -18.11 | -5.68 |
| ProspectNE | 40,823 | -1.60 | -10.04, 6.84 | -0.49 | 0.16 | -4.17, 4.49 | 0.17 | -114.09** | -214.61, -13.57 | -5.59 | -50.21*** | -64.35, -36.06 | -8.03 |
| PSW | 28,138 | -7.71 | -17.39, 1.96 | -3.24 | -5.75** § | -10.51, -1.00 | -9.94 | -194.02*** | -328.39, -59.65 | -13.30 | -57.70*** | -75.69, -39.71 | -10.92 |
| RHeritage | 64,921 | 0.29 | -6.04, 6.63 | 0.10 | -0.76 § | -3.57, 2.05 | -1.22 | -114.90*** § | -201.65, -28.16 | -6.47 | 2.10 | -8.10, 12.31 | 0.44 |
| St. Luke's | 81,464 | -2.73 | -10.16, 4.71 | -1.15 | -0.53 | -3.65, 2.59 | -1.21 | -121.14*** | -194.20, -48.07 | -13.31 | -10.70 § | -24.17, 2.77 | -2.07 |
| UNC | 73,227 | -0.96 | -8.08, 6.16 | -0.32 | 4.19*** | 1.04, 7.35 | 6.80 | 21.91 | -66.17, 109.99 | 1.43 | 0.04 | -15.01, 15.10 | 0.01 |
| UTSW | 230,200 | -6.50*** | -10.72, -2.27 | -2.04 | 2.71*** | 0.84, 4.59 | 4.22 | 12.28 | -43.83, 68.38 | 0.72 | 8.75** | 0.85, 16.65 | 1.44 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.20.** Estimated Cumulative Impact of the 2017 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | -807.16*** § | -976.96, -637.36 | -4.26 | -308.15* | -622.64, 6.34 | -1.90 | -834.77*** § | -1,192.25, -477.29 | -2.53 | -218.68*** | -313.46, -123.91 | -3.42 |
| APA | 78,582 | 22.60 § | -72.48, 117.68 | 0.15 | 340.87*** § | 109.70, 572.05 | 2.58 | 1,132.85*** § | 890.43, 1,375.27 | 3.91 | -22.31 § | -84.93, 40.31 | -0.42 |
| Arizona | 78,112 | -270.23*** | -371.24, -169.21 | -1.93 | -195.38 § | -442.78, 52.01 | -1.33 | 98.57 | -140.27, 337.40 | 0.37 | -96.37*** § | -163.49, -29.26 | -1.70 |
| Atrius | 104,052 | -371.90*** § | -469.45, -274.36 | -2.75 | -74.81 | -239.28, 89.66 | -0.75 | -582.41*** § | -832.76, -332.05 | -2.32 | -38.66 § | -95.97, 18.65 | -0.79 |
| Bronx | 134,713 | -34.99 § | -144.46, 74.48 | -0.20 | 537.39*** | 300.68, 774.10 | 3.73 | 274.83* § | -3.53, 553.19 | 0.81 | 9.91 | -47.88, 67.71 | 0.18 |
| Carillion | 142,963 | -92.58** § | -167.53, -17.64 | -0.75 | -11.14 | -116.05, 93.78 | -0.15 | 652.19*** § | 500.18, 804.19 | 3.25 | -28.89 | -75.91, 18.12 | -0.66 |
| HCP | 68,480 | 145.84*** | 48.10, 243.59 | 1.09 | 299.05*** § | 108.45, 489.64 | 2.67 | 520.33*** | 285.66, 755.01 | 2.00 | 37.61 | -23.16, 98.37 | 0.77 |
| Indiana U | 152,219 | -262.63*** § | -342.05, -183.21 | -2.12 | -73.07 § | -204.19, 58.05 | -0.80 | 59.54 § | -138.06, 257.14 | 0.26 | 124.46*** § | 67.88, 181.04 | 2.55 |
| ProHealth | 46,509 | -207.59*** § | -333.79, -81.40 | -1.83 | -796.14*** § | -1,031.44, -560.84 | -7.52 | -1,458.28*** § | -1,778.15, -1,138.41 | -6.00 | -190.94*** § | -266.97, -114.91 | -4.04 |
| ProspectNE | 40,823 | -328.05*** § | -456.02, -200.09 | -2.30 | -149.42 | -374.50, 75.67 | -1.37 | -863.34*** | -1,166.88, -559.79 | -3.12 | -81.35** | -156.95, -5.74 | -1.63 |
| PSW | 28,138 | -382.99*** § | -531.97, -234.00 | -3.50 | -519.12*** | -828.97, -209.28 | -5.17 | -1,430.26*** | -1,797.04, -1,063.48 | -7.22 | -161.21*** | -255.61, -66.80 | -3.87 |
| RHeritage | 64,921 | -146.91*** § | -250.93, -42.90 | -1.06 | -312.75*** | -510.08, -115.41 | -2.54 | 236.52* | -20.93, 493.97 | 0.88 | 72.63** | 9.49, 135.77 | 1.40 |
| St. Luke's | 81,464 | -380.05*** | -534.60, -225.50 | -2.57 | -474.93*** | -667.30, -282.56 | -5.08 | -306.44** | -550.34, -62.54 | -1.59 | -220.32*** | -292.18, -148.45 | -5.10 |
| UNC | 73,227 | -493.40*** | -604.20, -382.60 | -3.64 | -292.67*** § | -474.17, -111.18 | -2.95 | -928.60*** § | -1,178.10, -679.09 | -3.82 | 20.05 | -48.54, 88.64 | 0.41 |
| UTSW | 230,200 | -285.79*** § | -349.64, -221.94 | -2.07 | 1.25 | -104.82, 107.32 | 0.01 | -205.49** § | -365.46, -45.51 | -0.75 | -48.19** § | -93.02, -3.35 | -0.82 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.21.** Estimated Cumulative Impact of the 2017 Cohort on Utilization (Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | 87.25*** § | 81.72, 92.78 | 12.32 | -6.64* | -14.33, 1.04 | -2.49 | -617.47*** | -949.27, -285.66 | -7.15 |
| APA | 78,582 | 112.01*** § | 107.37, 116.65 | 27.29 | -21.79*** | -26.33, -17.26 | -8.28 | -573.74*** | -755.47, -392.02 | -6.87 |
| Arizona | 78,112 | 44.60*** § | 39.92, 49.27 | 10.31 | -5.09*** | -8.21, -1.97 | -5.08 | -165.69*** | -248.99, -82.40 | -8.25 |
| Atrius | 104,052 | 8.77*** § | 4.42, 13.12 | 1.66 | 2.64 | -1.34, 6.61 | 1.53 | -49.10 § | -154.71, 56.52 | -1.46 |
| Bronx | 134,713 | 55.32*** § | 51.71, 58.93 | 20.59 | 9.31*** | 6.16, 12.46 | 7.08 | 127.62*** | 51.86, 203.39 | 5.55 |
| Carillion | 142,963 | 85.42*** § | 81.55, 89.30 | 24.58 | 2.40 | -0.58, 5.37 | 2.00 | -83.33 | -187.34, 20.68 | -2.67 |
| HCP | 68,480 | 78.75*** § | 74.20, 83.30 | 22.46 | -3.24 § | -8.06, 1.58 | -1.46 | -172.86* | -350.43, 4.71 | -2.76 |
| Indiana U | 152,219 | 5.51*** § | 2.41, 8.60 | 2.94 | -4.51*** | -7.33, -1.70 | -4.42 | -187.27*** | -271.75, -102.78 | -7.96 |
| ProHealth | 46,509 | 92.78*** § | 86.79, 98.76 | 17.52 | -2.85 | -7.06, 1.35 | -3.02 | -343.86*** § | -457.58, -230.13 | -17.36 |
| ProspectNE | 40,823 | 92.95*** § | 87.36, 98.54 | 21.12 | 0.24 | -5.15, 5.62 | 0.13 | 49.65 | -135.08, 234.38 | 1.12 |
| PSW | 28,138 | 100.45*** § | 92.79, 108.11 | 33.32 | 0.11 | -4.65, 4.87 | 0.15 | -76.53 | -198.31, 45.25 | -5.08 |
| RHeritage | 64,921 | 23.81*** § | 19.36, 28.25 | 9.20 | 2.67 | -2.32, 7.67 | 1.13 | 230.87*** § | 62.97, 398.77 | 3.71 |
| St. Luke's | 81,464 | 103.47*** | 97.09, 109.85 | 21.19 | -9.96*** | -14.82, -5.10 | -8.59 | -320.31*** | -492.06, -148.57 | -10.05 |
| UNC | 73,227 | 52.53*** § | 47.25, 57.81 | 13.33 | 14.04*** | 9.87, 18.21 | 11.03 | 100.27* | -4.11, 204.65 | 4.05 |
| UTSW | 230,200 | 18.12*** § | 15.16, 21.07 | 5.28 | -4.15*** § | -6.57, -1.74 | -2.73 | -535.56*** § | -659.41, -411.70 | -8.04 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. AWV = annual wellness visit.

## Exhibit H.22. Estimated Cumulative Impact of the 2017 Cohort on Quality of Care as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | 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% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 30,372 | -3.23*** § | -5.58, -0.88 | -8.16 | 1.95 | -9.51, 13.40 | 1.28 | -11.71 | -36.68, 13.27 | -6.00 |
| APA | 78,582 | -0.83 § | -2.56, 0.89 | -1.79 | 0.60 § | -7.51, 8.72 | 0.34 | 4.77 | -11.68, 21.22 | 2.19 |
| Arizona | 78,112 | 0.07 | -1.34, 1.47 | 0.26 | 5.93 | -1.76, 13.62 | 4.72 | -2.37 | -23.63, 18.89 | -1.32 |
| Atrius | 104,052 | 0.25 | -1.25, 1.76 | 0.71 | -2.63 | -10.25, 4.99 | -1.77 | -7.77 | -22.68, 7.14 | -4.39 |
| Bronx | 134,713 | 3.43*** | 1.85, 5.02 | 7.61 | 4.38 | -2.59, 11.36 | 2.53 | 9.16 | -4.01, 22.33 | 4.73 |
| Carillion | 142,963 | 1.29* § | -0.02, 2.61 | 3.25 | 9.48*** | 3.17, 15.80 | 6.61 | 2.83 | -10.62, 16.27 | 1.54 |
| HCP | 68,480 | 2.33*** § | 0.77, 3.89 | 7.19 | 0.29 | -7.78, 8.37 | 0.19 | 2.50 | -13.80, 18.80 | 1.32 |
| Indiana U | 152,219 | 0.53 § | -0.99, 2.06 | 1.24 | -2.55 | -9.39, 4.30 | -1.74 | -3.77 § | -16.88, 9.34 | -2.16 |
| ProHealth | 46,509 | -1.95* § | -4.08, 0.17 | -5.55 | -0.51 | -10.56, 9.54 | -0.37 | 4.85 § | -18.66, 28.36 | 2.63 |
| ProspectNE | 40,823 | -1.53 | -3.90, 0.83 | -3.17 | 2.29 | -7.86, 12.43 | 1.34 | -9.27 | -27.13, 8.59 | -4.61 |
| PSW | 28,138 | 0.39 | -2.20, 2.98 | 1.62 | 7.20 | -7.13, 21.54 | 6.32 | 14.11 | -21.26, 49.48 | 8.67 |
| RHeritage | 64,921 | -1.13 | -2.71, 0.45 | -3.47 | 2.98 § | -5.17, 11.13 | 2.03 | 14.25 | -4.89, 33.40 | 7.43 |
| St. Luke's | 81,464 | 1.59 | -0.40, 3.58 | 6.09 | -2.00 | -12.71, 8.71 | -1.74 | -14.85 § | -40.04, 10.35 | -10.42 |
| UNC | 73,227 | -0.27 | -2.10, 1.55 | -0.76 | 4.88 | -3.97, 13.73 | 3.61 | 20.60** | 1.46, 39.75 | 12.29 |
| UTSW | 230,200 | -2.09*** § | -3.19, -0.99 | -5.18 | -2.90 | -7.89, 2.10 | -1.93 | -3.29 | -14.94, 8.35 | -1.77 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2017 cohort) as of PY4. ACSC = ambulatory care-sensitive condition; SNF = skilled nursing facility.

**Exhibit H.23.** Estimated Cumulative Impact of the 2018 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 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 | 39,888 | -11.04 | -104.02, 81.93 | -0.44 | 2.26 | -35.05, 39.58 | 0.40 | 2.72 | -29.89, 35.32 | 1.32 | -122.37*** § | -204.91, -39.83 | -6.31 |
| Best Care Collab | 30,866 | -149.56** | -286.71, -12.42 | -4.66 | 5.92 | -50.92, 62.76 | 0.69 | -39.07 | -98.42, 20.28 | -13.24 | -21.21 § | -114.05, 71.62 | -0.99 |
| CareMount | 44,305 | -152.98 § | -353.03, 47.08 | -3.21 | -46.05 § | -131.69, 39.58 | -3.29 | 12.58 | -22.09, 47.25 | 5.57 | -83.61 | -197.36, 30.14 | -3.34 |
| Central Utah | 28,603 | -56.08 | -252.80, 140.64 | -1.78 | -17.22 | -107.52, 73.08 | -2.19 | 15.06 | -92.40, 122.52 | 2.73 | -39.91 | -208.40, 128.58 | -1.78 |
| CoxHealth | 30,178 | -2.73 | -199.20, 193.74 | -0.09 | -42.09 | -116.26, 32.08 | -6.57 | 47.43* | -6.87, 101.73 | 21.68 | 104.90 | -70.58, 280.37 | 3.86 |
| Franciscan | 44,650 | -36.39 | -178.17, 105.38 | -1.15 | -3.22 | -78.89, 72.44 | -0.40 | 7.14 | -61.54, 75.83 | 1.05 | -151.54** | -280.10, -22.98 | -6.22 |
| Mary Washington | 26,855 | -136.77 | -305.14, 31.60 | -3.89 | -52.16* | -107.67, 3.36 | -7.65 | -70.12** | -124.73, -15.52 | -14.31 | -33.64 | -132.31, 65.02 | -1.73 |
| NEQCA | 66,682 | -14.91 | -155.16, 125.33 | -0.33 | 9.40 | -32.63, 51.42 | 0.98 | -21.21 | -63.35, 20.93 | -4.95 | -23.51 | -110.92, 63.90 | -0.83 |
| Primaria | 52,691 | -350.87*** | -498.71, -203.03 | -9.44 | -178.99*** | -237.38, -120.59 | -17.75 | -14.18 | -71.36, 43.00 | -3.34 | -82.71 § | -226.49, 61.07 | -2.78 |
| Primary Care Alliance | 23,636 | -331.26*** | -476.34, -186.18 | -10.33 | 6.60 | -51.71, 64.90 | 0.80 | -72.56*** | -124.71, -20.41 | -24.10 | 31.60 | -56.67, 119.88 | 1.93 |
| Reliance | 23,534 | -27.50 | -188.97, 133.97 | -0.67 | -49.26* | -100.08, 1.56 | -5.78 | -7.57 | -59.01, 43.86 | -2.37 | 100.86* § | -1.53, 203.24 | 4.48 |
| Reliant | 20,501 | 96.05 | -208.89, 400.99 | 2.28 | 130.51*** § | 39.00, 222.01 | 17.13 | -36.88 | -107.94, 34.18 | -8.78 | 246.84*** | 93.35, 400.33 | 11.41 |
| Torrance | 22,527 | -223.13* | -477.56, 31.29 | -4.20 | 11.40 | -99.92, 122.71 | 0.77 | -158.69*** | -243.22, -74.16 | -26.46 | -382.08*** | -537.75, -226.41 | -12.55 |
| UW Health | 50,990 | 44.27 | -98.96, 187.50 | 1.31 | 70.17** | 16.23, 124.11 | 10.01 | 17.47 § | -32.63, 67.58 | 6.99 | 106.56* | -16.42, 229.54 | 3.38 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. "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.

**Exhibit H.24.** Estimated Cumulative Impact of the 2018 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Spending PBPY ($) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional services | | | Home health | | | Hospice | | | Durable medical equipment | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 39,888 | -34.38 | -139.28, 70.52 | -1.03 | -7.18 § | -31.09, 16.73 | -1.33 | -19.85 | -62.18, 22.47 | -5.60 | -23.72 | -60.69, 13.25 | -6.18 |
| Best Care Collab | 30,866 | -389.77*** | -525.43, -254.11 | -8.20 | -26.78 | -59.27, 5.71 | -3.53 | -91.04*** | -158.56, -23.52 | -13.26 | -5.29 § | -32.17, 21.58 | -2.01 |
| CareMount | 44,305 | 131.20*** | 35.05, 227.36 | 3.48 | -20.75* | -42.00, 0.49 | -4.55 | -0.68 | -31.93, 30.57 | -0.30 | 4.45 | -23.14, 32.03 | 1.75 |
| Central Utah | 28,603 | 56.29 | -96.93, 209.51 | 1.80 | -119.19*** | -172.47, -65.91 | -12.47 | -64.04* | -140.09, 12.02 | -11.12 | -35.46* | -72.53, 1.62 | -8.80 |
| CoxHealth | 30,178 | -49.46 § | -153.39, 54.47 | -2.43 | 7.79 | -22.61, 38.19 | 2.28 | -6.54 | -67.48, 54.40 | -1.95 | 1.23 | -64.06, 66.53 | 0.29 |
| Franciscan | 44,650 | -51.04 | -124.55, 22.47 | -1.76 | -71.04*** | -104.33, -37.74 | -8.59 | -28.53 | -72.36, 15.30 | -6.65 | -8.21 | -37.48, 21.06 | -2.57 |
| Mary Washington | 26,855 | 34.97 | -109.60, 179.55 | 0.91 | 4.69 | -25.05, 34.43 | 0.84 | -50.77** | -94.38, -7.16 | -14.29 | 5.61 | -17.50, 28.73 | 2.45 |
| NEQCA | 66,682 | -45.70** | -91.08, -0.32 | -1.51 | 10.45 | -10.80, 31.71 | 1.44 | 15.35 | -16.66, 47.36 | 4.08 | -5.29 | -23.25, 12.67 | -2.52 |
| Primaria | 52,691 | -108.39*** | -182.50, -34.28 | -4.14 | -58.95*** | -82.48, -35.41 | -10.88 | -12.03 | -47.28, 23.21 | -3.38 | -20.30 | -50.97, 10.38 | -6.18 |
| Primary Care Alliance | 23,636 | -7.54 | -131.86, 116.77 | -0.16 | -64.60*** § | -91.83, -37.37 | -9.85 | 15.39 | -34.82, 65.60 | 3.66 | 0.22 | -29.18, 29.62 | 0.08 |
| Reliance | 23,534 | -38.79 | -115.45, 37.86 | -1.12 | -35.10*** | -60.00, -10.20 | -5.47 | -5.20 | -47.59, 37.19 | -1.55 | -15.12 § | -45.76, 15.52 | -4.93 |
| Reliant | 20,501 | 54.12 | -36.71, 144.95 | 1.94 | 9.17 | -40.88, 59.21 | 1.28 | -18.15 | -101.18, 64.87 | -4.61 | 3.60 | -31.23, 38.43 | 1.63 |
| Torrance | 22,527 | -274.07*** | -405.17, -142.97 | -5.90 | -47.64* | -104.39, 9.10 | -3.48 | 1.93 § | -63.48, 67.34 | 0.39 | -35.46** | -69.85, -1.08 | -11.20 |
| UW Health | 50,990 | -34.45 | -84.07, 15.18 | -1.95 | -5.60 | -25.09, 13.89 | -1.72 | -21.12 | -77.23, 34.99 | -3.49 | 12.46 | -6.68, 31.60 | 5.86 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.25.** Estimated Cumulative Impact of the 2018 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 39,888 | -4.61 | -12.59, 3.38 | -1.71 | 3.95** | 0.36, 7.54 | 6.83 | 3.11 | -100.02, 106.24 | 0.21 | -13.35* | -27.21, 0.51 | -2.69 |
| Best Care Collab | 30,866 | -14.23*** | -24.84, -3.62 | -4.41 | 5.17** | 0.34, 10.00 | 7.08 | 50.62 | -80.04, 181.27 | 2.78 | 19.54** | 2.96, 36.12 | 4.27 |
| CareMount | 44,305 | -12.82*** | -22.51, -3.13 | -3.74 | -2.10 § | -7.24, 3.04 | -2.26 | -42.32 § | -205.80, 121.16 | -1.70 | 23.62*** § | 6.48, 40.77 | 4.16 |
| Central Utah | 28,603 | -7.65 | -20.07, 4.77 | -3.10 | -0.87 | -6.47, 4.72 | -1.49 | -13.02 | -166.23, 140.20 | -0.93 | 8.44 § | -15.43, 32.30 | 1.57 |
| CoxHealth | 30,178 | -8.80 | -23.05, 5.44 | -3.17 | -2.44 | -9.25, 4.37 | -3.87 | -74.93 | -248.36, 98.50 | -5.07 | 47.38*** | 22.45, 72.31 | 7.90 |
| Franciscan | 44,650 | -0.97 | -11.22, 9.29 | -0.34 | 0.85 | -3.85, 5.54 | 1.42 | 94.94 | -80.55, 270.42 | 5.06 | 20.81** | 1.26, 40.36 | 3.48 |
| Mary Washington | 26,855 | 1.38 | -9.27, 12.03 | 0.46 | -0.23 | -4.55, 4.10 | -0.42 | -93.00 | -212.87, 26.87 | -6.77 | -41.80*** | -61.90, -21.69 | -7.23 |
| NEQCA | 66,682 | 1.58 | -5.81, 8.98 | 0.51 | 1.31 | -2.10, 4.72 | 1.57 | 0.97 | -77.73, 79.66 | 0.06 | -7.37 | -21.37, 6.64 | -1.27 |
| Primaria | 52,691 | -13.55*** | -23.06, -4.03 | -4.37 | -5.14** | -9.60, -0.68 | -6.59 | -364.19*** | -487.05, -241.33 | -17.88 | -39.84*** | -57.64, -22.04 | -6.07 |
| Primary Care Alliance | 23,636 | -36.31*** | -46.54, -26.09 | -12.02 | 2.96 | -1.74, 7.67 | 4.31 | 46.26 | -97.90, 190.43 | 2.49 | 39.99*** § | 21.30, 58.69 | 8.69 |
| Reliance | 23,534 | -8.32 | -19.38, 2.74 | -2.31 | 0.81 | -4.63, 6.26 | 0.93 | -116.21** | -228.38, -4.05 | -6.40 | 20.83** § | 1.94, 39.73 | 3.62 |
| Reliant | 20,501 | 10.21 | -5.09, 25.52 | 3.79 | 11.85*** § | 4.35, 19.35 | 17.16 | 205.97** § | 25.56, 386.39 | 14.70 | 35.68** | 5.64, 65.71 | 6.26 |
| Torrance | 22,527 | 11.43* | -1.21, 24.07 | 3.38 | 2.25 | -3.88, 8.38 | 2.63 | 57.99 | -134.47, 250.46 | 2.46 | -13.72 | -36.08, 8.63 | -2.57 |
| UW Health | 50,990 | 9.76** | 0.61, 18.92 | 3.71 | 7.18*** | 3.05, 11.31 | 12.64 | 133.85** | 18.85, 248.85 | 9.50 | 5.84 | -12.01, 23.69 | 0.99 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.26.** Estimated Cumulative Impact of the 2018 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 39,888 | -253.22*** § | -381.18, -125.26 | -2.03 | 300.70** | 12.02, 589.38 | 2.61 | 387.14*** § | 108.62, 665.67 | 1.62 | -18.40 | -98.20, 61.40 | -0.38 |
| Best Care Collab | 30,866 | -135.61* | -291.00, 19.78 | -0.95 | -810.81*** | -1,108.53, -513.09 | -6.32 | -447.43*** § | -785.38, -109.47 | -1.86 | -44.89 | -145.45, 55.67 | -0.80 |
| CareMount | 44,305 | -221.67*** § | -361.29, -82.04 | -1.56 | -204.11 | -522.80, 114.59 | -1.52 | 381.27** | 40.90, 721.63 | 1.38 | -2.80 | -88.22, 82.63 | -0.05 |
| Central Utah | 28,603 | -618.89*** § | -796.94, -440.84 | -5.67 | -47.18 | -464.87, 370.52 | -0.43 | -1,448.99*** | -1,896.53, -1,001.44 | -7.36 | -176.13*** § | -292.45, -59.81 | -4.41 |
| CoxHealth | 30,178 | 15.69 § | -170.58, 201.96 | 0.15 | -163.20 § | -487.47, 161.08 | -2.13 | 225.69 | -237.56, 688.94 | 1.12 | 213.28*** | 61.03, 365.52 | 4.46 |
| Franciscan | 44,650 | -766.40*** § | -918.78, -614.02 | -5.68 | -271.21* | -587.39, 44.96 | -2.39 | 44.41 | -281.45, 370.27 | 0.20 | -37.08 | -133.36, 59.19 | -0.71 |
| Mary Washington | 26,855 | -111.74 | -262.84, 39.37 | -0.90 | 149.96 | -204.46, 504.38 | 1.32 | 221.88 | -155.10, 598.85 | 0.91 | -77.68 | -186.66, 31.29 | -1.48 |
| NEQCA | 66,682 | -30.96 | -157.48, 95.57 | -0.21 | -97.75 | -290.51, 95.00 | -0.97 | 447.85*** § | 132.56, 763.15 | 1.59 | 1.35 | -70.45, 73.15 | 0.03 |
| Primaria | 52,691 | -469.67*** § | -608.94, -330.40 | -3.81 | -612.06*** | -825.25, -398.87 | -6.73 | -433.89*** | -700.01, -167.77 | -2.17 | 23.97 | -61.92, 109.86 | 0.49 |
| Primary Care Alliance | 23,636 | -22.69 | -215.68, 170.30 | -0.14 | 408.10** | 54.76, 761.44 | 3.04 | 445.35** | 40.62, 850.08 | 1.48 | -202.48*** § | -322.14, -82.82 | -3.38 |
| Reliance | 23,534 | -42.85 § | -224.66, 138.96 | -0.29 | 217.57 § | -123.29, 558.44 | 1.81 | -92.29 § | -457.51, 272.92 | -0.34 | -56.72 | -158.92, 45.48 | -1.03 |
| Reliant | 20,501 | 76.93 § | -163.11, 316.96 | 0.63 | 606.81*** | 236.52, 977.10 | 7.18 | 397.34 § | -198.00, 992.69 | 1.60 | 109.69 | -47.94, 267.31 | 2.22 |
| Torrance | 22,527 | -277.27*** § | -457.26, -97.28 | -1.80 | -633.06*** | -1,029.45, -236.67 | -4.11 | 503.83** | 74.00, 933.67 | 1.65 | -123.82** | -220.30, -27.33 | -2.40 |
| UW Health | 50,990 | 197.30** § | 43.60, 350.99 | 1.62 | 91.76 | -112.42, 295.94 | 1.13 | 191.13 § | -159.47, 541.74 | 0.92 | 69.39* § | -8.05, 146.83 | 1.77 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.27.** Estimated Cumulative Impact of the 2018 Cohort on Utilization (Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 39,888 | 7.81*** § | 3.12, 12.50 | 0.96 | -2.94 | -7.77, 1.89 | -2.51 | -51.45 § | -222.23, 119.33 | -1.52 |
| Best Care Collab | 30,866 | 86.76*** § | 79.17, 94.34 | 17.81 | -4.82 | -12.61, 2.96 | -2.45 | -158.11 | -363.29, 47.06 | -3.79 |
| CareMount | 44,305 | 222.46*** § | 216.05, 228.87 | 52.24 | -5.14** | -9.89, -0.38 | -4.55 | -196.75*** | -319.84, -73.66 | -8.91 |
| Central Utah | 28,603 | 134.63*** § | 124.26, 145.01 | 28.61 | -19.12*** | -28.67, -9.57 | -11.50 | -822.15*** | -1,250.08, -394.22 | -13.75 |
| CoxHealth | 30,178 | 4.95 § | -6.56, 16.46 | 1.16 | 3.67 | -3.44, 10.77 | 4.12 | 41.07 | -168.19, 250.34 | 2.09 |
| Franciscan | 44,650 | 42.57*** § | 34.94, 50.19 | 14.82 | -4.72 | -10.79, 1.35 | -3.34 | -408.28*** | -653.63, -162.93 | -7.71 |
| Mary Washington | 26,855 | 228.75*** | 220.84, 236.66 | 60.46 | -0.59 | -6.97, 5.79 | -0.44 | 127.05 | -40.84, 294.93 | 4.83 |
| NEQCA | 66,682 | 26.83*** | 21.61, 32.05 | 6.19 | 2.23 | -2.21, 6.66 | 1.34 | 80.08 | -44.53, 204.69 | 2.30 |
| Primaria | 52,691 | 169.32*** § | 162.07, 176.57 | 32.98 | -10.97*** § | -15.65, -6.29 | -9.81 | -409.27*** | -553.89, -264.65 | -14.65 |
| Primary Care Alliance | 23,636 | -83.11*** | -91.59, -74.63 | -25.04 | -11.24*** § | -18.24, -4.25 | -6.56 | -395.72*** § | -566.26, -225.17 | -11.08 |
| Reliance | 23,534 | 44.26*** § | 36.85, 51.67 | 10.09 | -10.63*** | -17.58, -3.68 | -5.70 | -144.81** | -282.70, -6.92 | -4.64 |
| Reliant | 20,501 | 38.87*** § | 27.51, 50.24 | 7.16 | -0.74 | -11.20, 9.71 | -0.44 | 152.47 | -129.88, 434.82 | 4.57 |
| Torrance | 22,527 | -22.80*** § | -30.09, -15.51 | -3.96 | -7.37 | -16.40, 1.65 | -3.13 | -165.48 | -467.26, 136.30 | -2.74 |
| UW Health | 50,990 | 16.31*** § | 12.31, 20.31 | 10.53 | -0.96 | -5.61, 3.69 | -1.17 | 4.72 | -113.95, 123.38 | 0.29 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. AWV = annual wellness visit.

## Exhibit H.28. Estimated Cumulative Impact of the 2018 Cohort on Quality of Care as of PY4 (2019)

| | # of NGACO beneficiaries as of PY4 | 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% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 39,888 | -1.98* § | -4.14, 0.18 | -5.98 | 3.81 | -7.20, 14.83 | 2.85 | 10.09 § | -13.40, 33.58 | 6.15 |
| Best Care Collab | 30,866 | 1.12 | -1.41, 3.66 | 3.28 | -6.88 | -19.43, 5.67 | -4.63 | -7.94 | -34.83, 18.95 | -4.58 |
| CareMount | 44,305 | -2.62** | -4.71, -0.54 | -7.34 | -6.33 | -17.50, 4.83 | -4.33 | 9.25 | -11.73, 30.23 | 5.38 |
| Central Utah | 28,603 | -2.66* § | -5.82, 0.50 | -10.70 | -14.15 | -31.42, 3.12 | -14.11 | 12.41 | -15.94, 40.76 | 12.12 |
| CoxHealth | 30,178 | 1.47 § | -2.52, 5.46 | 3.81 | 5.02 § | -14.26, 24.30 | 3.58 | -14.22 | -61.58, 33.13 | -6.96 |
| Franciscan | 44,650 | 0.50 | -2.02, 3.02 | 1.45 | 10.65* | -1.56, 22.87 | 8.15 | -4.78 | -37.64, 28.07 | -2.96 |
| Mary Washington | 26,855 | -0.72 | -4.07, 2.63 | -1.46 | 10.67 | -3.06, 24.41 | 6.83 | 4.37 | -30.32, 39.07 | 2.02 |
| NEQCA | 66,682 | -0.08 | -2.24, 2.07 | -0.17 | 0.59 | -8.66, 9.84 | 0.34 | 8.00 | -9.42, 25.42 | 3.96 |
| Primaria | 52,691 | -0.44 | -3.11, 2.23 | -0.93 | -2.95 | -14.36, 8.46 | -1.98 | -8.51 | -32.25, 15.23 | -4.49 |
| Primary Care Alliance | 23,636 | -6.35*** | -9.21, -3.49 | -17.23 | -33.11*** | -46.22, -20.00 | -24.58 | -9.34 | -35.56, 16.89 | -5.79 |
| Reliance | 23,534 | -4.18*** | -7.17, -1.20 | -7.89 | 0.11 | -11.66, 11.87 | 0.06 | -10.13 | -35.98, 15.71 | -4.53 |
| Reliant | 20,501 | 3.18 | -0.96, 7.32 | 8.49 | 15.10 | -3.31, 33.51 | 10.61 | -4.64 | -44.98, 35.71 | -2.64 |
| Torrance | 22,527 | 1.28 | -1.35, 3.90 | 4.37 | 12.89* | -1.10, 26.88 | 8.63 | -0.72 § | -29.23, 27.80 | -0.40 |
| UW Health | 50,990 | 1.60 | -0.46, 3.66 | 6.14 | 4.65 | -7.89, 17.19 | 3.45 | -3.35 | -29.15, 22.45 | -2.00 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) as of PY4, absent the model. Aggregate estimate is the cumulative DID impact estimate for all beneficiaries (2018 cohort) as of PY4. ACSC = ambulatory care-sensitive condition; SNF = skilled nursing facility.

**Exhibit H.29.** Estimated Impact of the 2016 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Spending ($ Per Beneficiary Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care hospital facility | | | Skilled nursing facility | | | Other post-acute care facility | | | Outpatient facility | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | -71.47 | -298 , 155 | -1.76 | -19.80 | -94 , 54 | -3.07 | -6.84 | -124 , 110 | -0.70 | -286.07*** | -422 , -150 | -10.80 |
| Bellin | 11,314 | -85.16 | -307 , 137 | -3.25 | 197.33*** | 98 , 297 | 31.61 | -53.05** | -98 , -8 | -37.52 | 226.55* | -18 , 471 | 7.24 |
| CHESS | 27,029 | 147.81* | -23 , 319 | 4.46 | 25.61 | -30 , 81 | 3.69 | -29.12 | -82 , 23 | -11.85 | 101.54 | -41 , 244 | 3.91 |
| Deaconess | 35,304 | -80.09 § | -271 , 111 | -2.47 | 2.28 | -94 , 99 | 0.22 | -4.82 | -66 , 57 | -1.14 | -193.48** | -384 , -3 | -5.90 |
| Henry Ford | 24,140 | 135.63 | -102 , 373 | 2.65 | 22.85 | -54 , 100 | 2.14 | -0.47 | -65 , 64 | -0.12 | 558.68*** | 398 , 720 | 17.15 |
| Park Nicollet | 12,879 | -172.21 § | -403 , 59 | -4.66 | 59.38 | -34 , 152 | 6.81 | -43.18** | -85 , -2 | -43.25 | -211.27** | -401 , -22 | -7.67 |
| Pioneer Valley | 40,295 | -37.55 | -309 , 234 | -0.77 | -173.62*** § | -268 , -79 | -19.22 | 45.01 | -21 , 111 | 11.53 | 221.80** | 46 , 398 | 8.08 |
| Steward | 103,918 | -34.53 | -132 , 63 | -0.93 | -16.95 | -50 , 16 | -2.17 | -38.07** | -72 , -4 | -8.31 | 33.47 | -30 , 97 | 1.42 |
| ThedaCare | 14,191 | -140.67 | -462 , 181 | -4.37 | 110.14 | -26 , 247 | 14.45 | -51.58 | -170 , 67 | -29.74 | 192.50 § | -132 , 517 | 6.06 |
| Triad | 26,548 | 126.36 | -142 , 395 | 3.65 | -29.86 | -129 , 69 | -4.57 | -25.58 | -108 , 57 | -11.28 | 230.78 | -50 , 511 | 9.65 |
| Trinity | 68,359 | -62.40 | -192 , 67 | -1.47 | -116.11*** | -162 , -70 | -11.17 | -10.07 | -50 , 29 | -2.74 | -112.62** | -200 , -25 | -4.03 |
| UnityPoint | 90,611 | -122.66** | -229 , -17 | -3.93 | -108.59*** | -153 , -64 | -14.38 | -32.79** | -65 , -1 | -14.17 | -325.43*** | -410 , -240 | -11.45 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, 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.

**Exhibit H.30.** Estimated Impact of the 2016 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Spending ($ Per Beneficiary Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional services | | | Home health | | | Hospice | | | Durable medical equipment | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | -51.77 § | -195 , 91 | -1.28 | -100.61*** | -155 , -46 | -9.65 | -111.12*** | -181 , -41 | -25.45 | 31.95 | -18 , 81 | 9.94 |
| Bellin | 11,314 | 278.10*** | 166 , 390 | 15.95 | -19.44 § | -53 , 14 | -6.67 | -83.49** | -158 , -9 | -23.45 | -7.59 | -57 , 42 | -2.91 |
| CHESS | 27,029 | -168.47*** § | -274 , -63 | -5.94 | -5.27 | -33 , 23 | -0.99 | -51.91* | -106 , 2 | -11.28 | 14.40 | -14 , 43 | 4.32 |
| Deaconess | 35,304 | -82.01 | -210 , 46 | -3.32 | -12.18 | -48 , 23 | -2.63 | -54.04 | -119 , 11 | -17.59 | -22.25 § | -52 , 8 | -7.29 |
| Henry Ford | 24,140 | -56.60 | -168 , 55 | -2.13 | 25.87 § | -8 , 60 | 3.54 | -14.79 | -65 , 35 | -4.43 | 75.79*** | 29 , 123 | 26.38 |
| Park Nicollet | 12,879 | 80.68 | -60 , 221 | 2.81 | -16.21 | -46 , 14 | -4.24 | -22.25 | -88 , 44 | -6.00 | -30.66 | -67 , 6 | -11.84 |
| Pioneer Valley | 40,295 | -50.79 | -118 , 17 | -1.92 | 8.60 | -38 , 55 | 1.17 | -54.27 | -135 , 26 | -14.02 | -7.19 | -46 , 31 | -2.56 |
| Steward | 103,918 | 7.74 | -49 , 64 | 0.22 | 7.07 | -10 , 24 | 1.03 | -30.82** | -61 , -0 | -7.09 | 16.65** | 2 , 31 | 6.43 |
| ThedaCare | 14,191 | -113.08* | -239 , 13 | -5.10 | -20.98 | -66 , 24 | -5.79 | -123.81* | -268 , 20 | -21.41 | 7.39 | -45 , 59 | 2.65 |
| Triad | 26,548 | -29.23 | -158 , 99 | -1.07 | -0.68 | -46 , 45 | -0.14 | -20.28 | -110 , 69 | -4.63 | -5.19 | -46 , 36 | -1.72 |
| Trinity | 68,359 | -2.18 | -69 , 64 | -0.07 | -18.89* | -40 , 2 | -2.80 | -36.73** | -68 , -5 | -10.12 | -2.09 | -19 , 15 | -0.82 |
| UnityPoint | 90,611 | 77.22** | 6 , 148 | 3.03 | -30.23*** | -43 , -17 | -10.38 | -38.75*** | -66 , -12 | -13.08 | -12.73 | -34 , 8 | -4.28 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.31.** Estimated Impact of the 2016 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | -4.20 | -17 , 9 | -1.40 | -0.77 | -6 , 5 | -1.56 | 7.32 | -154 , 169 | 0.57 | -32.14*** | -54 , -10 | -5.88 |
| Bellin | 11,314 | -12.95* | -27 , 1 | -5.88 | 16.71*** | 10 , 24 | 32.00 | 388.01*** | 179 , 597 | 28.71 | -0.62 | -32 , 31 | -0.11 |
| CHESS | 27,029 | 7.28 | -4 , 18 | 2.48 | 3.34 | -1 , 8 | 5.07 | 50.13 | -74 , 174 | 3.31 | 17.75 | -4 , 40 | 2.82 |
| Deaconess | 35,304 | -12.79* § | -27 , 1 | -4.35 | 6.13* | -1 , 13 | 7.38 | 25.24 | -183 , 233 | 1.16 | 0.68 § | -27 , 29 | 0.10 |
| Henry Ford | 24,140 | 9.50 | -5 , 24 | 2.31 | 6.03* | -1 , 13 | 5.97 | 101.25 | -67 , 269 | 4.53 | 19.87 | -5 , 44 | 2.90 |
| Park Nicollet | 12,879 | -9.88 § | -24 , 5 | -3.34 | 10.78*** | 4 , 18 | 15.14 | 202.55** | 36 , 369 | 13.83 | 3.06 | -30 , 36 | 0.47 |
| Pioneer Valley | 40,295 | -1.85 | -18 , 14 | -0.56 | -9.91** | -18 , -2 | -11.63 | -308.88*** § | -489 , -129 | -18.78 | 11.34 | -14 , 37 | 1.81 |
| Steward | 103,918 | -0.96 | -7 , 5 | -0.32 | 4.70*** § | 2 , 7 | 6.78 | -19.10 | -87 , 49 | -1.24 | 6.88 | -4 , 18 | 1.31 |
| ThedaCare | 14,191 | 5.22 | -16 , 26 | 1.79 | 8.00 | -2 , 18 | 12.87 | 259.85* | -29 , 548 | 17.16 | -1.71 § | -38 , 35 | -0.27 |
| Triad | 26,548 | -3.96 | -24 , 16 | -1.36 | 2.45 | -6 , 11 | 4.07 | -32.61 | -256 , 191 | -2.25 | 32.95 | -8 , 74 | 5.15 |
| Trinity | 68,359 | -2.78 | -10 , 4 | -0.87 | -1.50 | -5 , 2 | -1.83 | -210.27*** | -301 , -120 | -10.83 | -13.76** | -27 , -0 | -2.43 |
| UnityPoint | 90,611 | -4.99 | -12 , 2 | -1.86 | 2.49 | -1 , 6 | 3.72 | -89.40** | -171 , -8 | -6.46 | -65.91*** | -79 , -53 | -11.98 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.32.** Estimated Impact of the 2016 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | -487.74*** | -680 , -296 | -3.80 | 268.74* | -21 , 559 | 2.98 | -542.04** | -1,054 , -30 | -1.99 | -117.80* | -253 , 18 | -2.04 |
| Bellin | 11,314 | 1560.46*** § | 1,294 , 1,827 | 15.28 | 670.04*** | 254 , 1,086 | 8.19 | 962.06*** | 418 , 1,506 | 5.16 | 231.69*** | 80 , 384 | 5.51 |
| CHESS | 27,029 | -362.39*** § | -550 , -175 | -2.70 | -506.53*** | -762 , -251 | -5.80 | 269.25 § | -144 , 683 | 1.14 | 69.87 § | -43 , 182 | 1.44 |
| Deaconess | 35,304 | 6.21 | -189 , 202 | 0.05 | -510.37*** | -844 , -177 | -5.35 | -942.28*** | -1,397 , -487 | -4.24 | -70.97 | -212 , 70 | -1.36 |
| Henry Ford | 24,140 | 351.98*** § | 137 , 567 | 2.34 | 266.00 § | -74 , 606 | 2.72 | 1104.22*** § | 648 , 1,561 | 4.66 | 245.65*** § | 125 , 367 | 4.90 |
| Park Nicollet | 12,879 | -495.52*** | -709 , -282 | -4.56 | -939.23*** | -1,257 , -621 | -10.69 | -675.84** | -1,230 , -122 | -3.08 | -266.06*** | -402 , -130 | -5.87 |
| Pioneer Valley | 40,295 | -406.30*** § | -628 , -184 | -2.91 | 226.25 § | -52 , 504 | 2.80 | 445.24* § | -40 , 931 | 1.87 | 132.13** | 8 , 257 | 2.87 |
| Steward | 103,918 | -437.37*** | -535 , -340 | -3.05 | 553.87*** | 395 , 713 | 5.50 | -221.62* | -457 , 14 | -0.80 | 71.72** | 9 , 134 | 1.34 |
| ThedaCare | 14,191 | -679.94*** § | -951 , -409 | -6.77 | -34.52 | -514 , 445 | -0.39 | 133.52 § | -671 , 938 | 0.57 | -137.87 § | -328 , 52 | -3.13 |
| Triad | 26,548 | -8.97 § | -314 , 296 | -0.07 | -166.13 | -651 , 319 | -1.83 | -370.17 | -1,052 , 312 | -1.62 | 13.96 | -189 , 217 | 0.29 |
| Trinity | 68,359 | -113.90** § | -226 , -2 | -0.83 | 284.46*** | 70 , 499 | 2.61 | -677.75*** § | -925 , -431 | -2.83 | -8.59 | -80 , 63 | -0.17 |
| UnityPoint | 90,611 | 183.11*** § | 80 , 286 | 1.66 | -276.34*** | -463 , -90 | -2.87 | -75.63 § | -348 , 197 | -0.34 | -110.36*** | -176 , -45 | -2.40 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.33.** Estimated Impact of the 2016 Cohort on Utilization (Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | 158.76*** § | 150 , 168 | 32.37 | -5.10 | -12 , 2 | -4.06 | -706.87*** | -1,051 , -363 | -12.10 |
| Bellin | 11,314 | 221.93*** § | 209 , 235 | 44.01 | -4.57 § | -13 , 4 | -5.76 | -149.42 | -366 , 67 | -9.21 |
| CHESS | 27,029 | 170.06*** § | 161 , 179 | 31.83 | 0.23 | -6 , 7 | 0.18 | -71.81 | -234 , 91 | -2.56 |
| Deaconess | 35,304 | 81.13*** § | 71 , 91 | 32.36 | -0.65 § | -8 , 7 | -0.64 | -33.58 | -274 , 207 | -1.23 |
| Henry Ford | 24,140 | 45.15*** § | 37 , 53 | 13.36 | 7.31 § | -2 , 16 | 3.47 | 227.58** § | 33 , 422 | 6.32 |
| Park Nicollet | 12,879 | 324.57*** § | 313 , 336 | 68.51 | -6.15* | -13 , 1 | -6.46 | -132.96 | -297 , 31 | -7.51 |
| Pioneer Valley | 40,295 | 49.50*** | 39 , 60 | 14.04 | 3.16 | -6 , 13 | 1.85 | 1.70 | -268 , 272 | 0.05 |
| Steward | 103,918 | 47.23*** § | 43 , 52 | 9.66 | -0.45 | -4 , 3 | -0.28 | 62.26 | -50 , 175 | 1.65 |
| ThedaCare | 14,191 | 72.73*** § | 61 , 84 | 10.13 | -3.82 | -16 , 9 | -3.42 | -13.14 | -282 , 255 | -0.74 |
| Triad | 26,548 | 99.24*** § | 82 , 116 | 20.49 | 6.01 | -5 , 17 | 4.67 | -66.85 | -338 , 204 | -2.63 |
| Trinity | 68,359 | 245.57*** § | 241 , 250 | 64.72 | -0.30 § | -5 , 4 | -0.20 | -180.48*** | -296 , -65 | -5.62 |
| UnityPoint | 90,611 | 190.72*** § | 185 , 197 | 45.57 | -3.26** | -7 , -0 | -4.04 | -157.83*** | -246 , -70 | -9.78 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. AWV = annual wellness visit.

## Exhibit H.34. Estimated Impact of the 2016 Cohort on Quality of Care in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | 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% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACCST | 16,069 | -2.76* § | -6 , 0 | -7.68 | 3.08 | -13 , 19 | 1.99 | 27.32 | -20 , 74 | 12.28 |
| Bellin | 11,314 | -4.49** | -8 , -1 | -17.72 | -13.33 | -34 , 7 | -11.81 | -8.78 | -51 , 33 | -6.77 |
| CHESS | 27,029 | 3.75** | 1 , 7 | 9.70 | -3.35 | -19 , 12 | -2.19 | -1.60 | -34 , 31 | -0.87 |
| Deaconess | 35,304 | -3.25 | -7 , 1 | -7.29 | -0.02 | -18 , 18 | -0.01 | 6.63 | -26 , 39 | 3.98 |
| Henry Ford | 24,140 | 1.21 | -2 , 4 | 2.64 | 2.25 | -12 , 16 | 1.25 | -13.35 | -43 , 16 | -5.75 |
| Park Nicollet | 12,879 | 1.42 | -2 , 5 | 5.05 | -0.58 | -19 , 17 | -0.43 | -8.28 | -44 , 27 | -5.46 |
| Pioneer Valley | 40,295 | -4.21** | -8 , -0 | -9.78 | -0.93 | -20 , 19 | -0.57 | 5.74 | -33 , 45 | 3.03 |
| Steward | 103,918 | 1.78** | 0 , 3 | 4.16 | 4.71 | -3 , 12 | 2.96 | 12.63 | -3 , 28 | 6.67 |
| ThedaCare | 14,191 | 2.07 | -2 , 7 | 7.98 | -2.23 | -27 , 23 | -1.95 | -20.19 | -72 , 31 | -15.31 |
| Triad | 26,548 | -0.27 | -5 , 5 | -0.73 | -2.74 | -29 , 24 | -1.76 | 57.50*** | 16 , 99 | 38.83 |
| Trinity | 68,359 | 1.59* | -0 , 3 | 4.73 | 1.34 | -7 , 10 | 0.90 | -6.55 | -24 , 11 | -3.48 |
| UnityPoint | 90,611 | -2.71*** § | -4 , -1 | -8.07 | 0.14 | -9 , 9 | 0.10 | 1.95 | -17 , 21 | 1.11 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2016 Cohort) in PY4, absent the model. ACSC = ambulatory care-sensitive conditions; SNF = skilled nursing facility.

**Exhibit H.35.** Estimated Impact of the 2017 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Spending ($ Per Beneficiary Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care hospital facility | | | Skilled nursing facility | | | Other post-acute care facility | | | Outpatient facility | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | -197.84 | -470 , 74 | -4.82 | -18.28 | -105 , 69 | -2.44 | -174.60*** | -277 , -72 | -28.59 | -257.36*** | -446 , -68 | -10.92 |
| APA | 28,197 | -106.83 | -312 , 99 | -2.42 | 19.38 | -68 , 107 | 1.48 | -57.19* | -116 , 1 | -10.56 | -70.15 | -191 , 51 | -2.93 |
| Arizona | 30,814 | -53.99 § | -202 , 94 | -1.73 | -12.31 | -56 , 31 | -2.45 | 9.79 | -45 , 65 | 2.58 | -203.23*** § | -300 , -106 | -11.09 |
| Atrius | 35,336 | -161.05 | -371 , 49 | -3.82 | -55.77* § | -119 , 7 | -6.81 | -46.72* | -98 , 4 | -14.67 | 13.95 | -120 , 148 | 0.53 |
| Bronx | 45,645 | 147.02 | -85 , 379 | 2.54 | 52.50 | -50 , 155 | 3.25 | 28.56 | -22 , 79 | 8.87 | 129.29* | -22 , 281 | 4.83 |
| Carillion | 48,574 | -105.25 | -250 , 40 | -3.18 | -75.53*** | -126 , -25 | -9.81 | -20.02 | -51 , 11 | -10.72 | -58.13 | -158 , 42 | -2.36 |
| HCP | 27,156 | 275.07** | 45 , 505 | 5.29 | 185.60*** | 65 , 306 | 10.67 | -15.45 | -100 , 69 | -2.41 | 145.80* | -24 , 315 | 5.64 |
| Indiana U | 58,223 | -232.89*** | -398 , -68 | -6.23 | -65.85** | -127 , -5 | -6.58 | -12.59 | -49 , 23 | -5.32 | -4.49 § | -142 , 133 | -0.14 |
| ProHealth | 14,550 | -346.08*** | -556 , -136 | -10.42 | -68.10* | -142 , 6 | -10.94 | 55.58 § | -25 , 137 | 12.75 | -12.94 | -201 , 175 | -0.43 |
| ProspectNE | 11,169 | -98.45 | -372 , 175 | -2.13 | -220.03*** | -323 , -117 | -17.48 | 39.62* | -6 , 85 | 28.89 | -451.10*** | -611 , -291 | -15.82 |
| PSW | 12,371 | -55.86 | -306 , 194 | -1.73 | -159.05*** | -270 , -48 | -18.24 | 7.67 | -38 , 53 | 10.89 | -140.84 | -403 , 121 | -5.12 |
| RHeritage | 19,649 | 18.71 | -223 , 260 | 0.40 | -145.75*** | -241 , -50 | -12.13 | 63.21* | -8 , 134 | 14.17 | -57.21 | -187 , 72 | -2.32 |
| St. Luke's | 29,812 | -204.51* | -412 , 3 | -6.63 | -135.57*** | -218 , -53 | -24.66 | -25.00 | -81 , 31 | -15.09 | -20.57 | -204 , 162 | -0.59 |
| UNC | 27,489 | -80.25 | -267 , 107 | -2.25 | -15.46 | -78 , 47 | -2.17 | -2.49 | -46 , 41 | -1.41 | -271.98*** | -452 , -92 | -9.66 |
| UTSW | 85,451 | -130.54** | -246 , -15 | -3.35 | 7.84 | -37 , 52 | 0.92 | -88.97*** | -144 , -33 | -10.16 | 78.68* | -5 , 162 | 3.38 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, 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.

**Exhibit H.36.** Estimated Impact of the 2017 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Spending ($ Per Beneficiary Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Professional services | | | Home health | | | Hospice | | | Durable medical equipment | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | -189.39** § | -345 , -34 | -3.79 | -21.03 | -98 , 56 | -1.57 | 5.69 | -96 , 107 | 1.061 | 9.48 | -35 , 54 | 3.26 |
| APA | 28,197 | -72.89* § | -156 , 10 | -1.87 | -162.35*** | -212 , -113 | -10.08 | -14.06 | -94 , 66 | -2.215 | -14.08 | -32 , 3 | -7.22 |
| Arizona | 30,814 | 29.66 | -93 , 152 | 0.68 | -17.68 | -39 , 4 | -4.48 | -11.75 | -66 , 42 | -2.347 | 7.19 | -22 , 36 | 2.91 |
| Atrius | 35,336 | -61.24 | -138 , 16 | -2.00 | -3.24 § | -36 , 30 | -0.45 | 2.09 | -54 , 58 | 0.524 | -1.49 | -40 , 37 | -0.70 |
| Bronx | 45,645 | -41.99 | -121 , 37 | -1.01 | 34.99*** | 13 , 57 | 7.33 | -27.76* § | -61 , 5 | -13.771 | 23.30* § | -1 , 48 | 10.56 |
| Carillion | 48,574 | 42.11 | -35 , 119 | 1.67 | -14.62 | -39 , 10 | -2.96 | 8.60 | -35 , 53 | 2.555 | -15.46 | -43 , 12 | -5.24 |
| HCP | 27,156 | 7.44 | -183 , 198 | 0.18 | -50.00* § | -104 , 4 | -3.43 | 14.13 | -63 , 91 | 2.363 | 10.33 | -20 , 41 | 3.74 |
| Indiana U | 58,223 | -181.54*** | -288 , -76 | -6.85 | -32.36*** | -54 , -11 | -7.61 | -16.06 | -60 , 28 | -4.376 | 8.25 | -23 , 39 | 2.48 |
| ProHealth | 14,550 | -189.05*** § | -270 , -108 | -7.53 | -52.64*** § | -82 , -23 | -14.43 | -70.42* § | -142 , 1 | -17.940 | -10.72 | -53 , 32 | -4.57 |
| ProspectNE | 11,169 | 80.07 | -43 , 203 | 2.45 | 3.01 | -49 , 55 | 0.37 | -11.63 | -81 , 57 | -3.056 | 16.82 | -20 , 53 | 6.89 |
| PSW | 12,371 | -109.47 | -244 , 25 | -4.07 | -28.08* | -61 , 5 | -8.52 | -25.48 | -100 , 49 | -9.924 | -18.49 | -51 , 14 | -7.63 |
| RHeritage | 19,649 | 232.09*** | 119 , 346 | 5.85 | 30.96 | -26 , 88 | 2.11 | -103.83** | -184 , -24 | -16.055 | 7.98 | -27 , 43 | 2.65 |
| St. Luke's | 29,812 | -170.27*** | -267 , -74 | -8.21 | -48.36** | -90 , -7 | -9.71 | -50.34 | -133 , 32 | -9.700 | -9.18 | -55 , 36 | -2.74 |
| UNC | 27,489 | -202.72*** | -323 , -83 | -6.75 | 8.14 | -22 , 38 | 1.66 | -33.96 | -90 , 23 | -7.802 | -54.74** | -101 , -8 | -15.05 |
| UTSW | 85,451 | -216.86*** | -306 , -128 | -5.18 | -79.24*** § | -108 , -50 | -7.32 | -33.23* § | -72 , 6 | -6.264 | 9.32 | -18 , 37 | 2.68 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.37.** Estimated Impact of the 2017 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | -19.33** | -36 , -3 | -5.75 | 0.53 | -7 , 8 | 0.80 | -9.80 | -200 , 180 | -0.62 | -40.70*** | -71 , -10 | -6.83 |
| APA | 28,197 | -2.45 | -11 , 7 | -0.92 | 5.53** | 1 , 10 | 8.61 | 115.14* | -22 , 252 | 5.89 | 6.28 | -9 , 22 | 1.54 |
| Arizona | 30,814 | 1.34 | -7 , 10 | 0.58 | 1.21 | -2 , 5 | 2.76 | -12.16 | -93 , 69 | -1.32 | -13.14 | -31 , 5 | -2.44 |
| Atrius | 35,336 | 7.80 | -3 , 19 | 2.71 | 2.55 | -3 , 8 | 3.31 | -85.66 § | -199 , 28 | -6.00 | -29.72*** | -48 , -11 | -5.70 |
| Bronx | 45,645 | 20.92*** | 11 , 31 | 6.26 | 7.12*** | 2 , 12 | 8.58 | 151.33* | -9 , 311 | 6.08 | -2.36 | -17 , 12 | -0.56 |
| Carillion | 48,574 | 1.79 | -7 , 11 | 0.64 | -3.50 | -8 , 1 | -4.92 | -124.15** | -247 , -1 | -6.79 | -3.04 § | -22 , 16 | -0.49 |
| HCP | 27,156 | 22.15*** | 11 , 33 | 6.85 | 11.47*** § | 6 , 17 | 13.26 | 360.33*** § | 164 , 557 | 13.52 | 9.26 | -8 , 26 | 1.95 |
| Indiana U | 58,223 | -3.14 | -12 , 6 | -1.03 | -1.65 | -6 , 3 | -1.94 | -98.88 | -234 , 36 | -4.63 | -27.05*** § | -46 , -8 | -4.05 |
| ProHealth | 14,550 | -16.65** § | -30 , -3 | -5.76 | 2.62 § | -3 , 9 | 4.86 | -146.21* | -301 , 8 | -11.49 | -48.42*** | -77 , -20 | -7.85 |
| ProspectNE | 11,169 | -15.75** | -31 , -0 | -4.81 | -5.91 | -14 , 2 | -5.83 | -314.05*** | -507 , -121 | -13.88 | -65.40*** | -91 , -40 | -10.30 |
| PSW | 12,371 | -7.43 | -21 , 6 | -3.28 | -6.40* § | -13 , 1 | -10.25 | -243.82** | -434 , -54 | -15.46 | -84.19*** | -110 , -58 | -14.85 |
| RHeritage | 19,649 | 0.94 | -10 , 12 | 0.32 | -2.58 | -7 , 2 | -4.10 | -172.31** | -321 , -24 | -9.40 | -7.65 | -25 , 10 | -1.63 |
| St. Luke's | 29,812 | -3.54 | -16 , 9 | -1.55 | -2.56 | -8 , 3 | -5.87 | -167.09*** | -289 , -45 | -19.23 | 18.02 | -5 , 41 | 3.61 |
| UNC | 27,489 | -7.79 | -19 , 4 | -2.60 | 1.93 | -3 , 7 | 3.01 | -58.86 | -201 , 83 | -3.72 | -15.74 | -41 , 9 | -2.42 |
| UTSW | 85,451 | -10.68*** | -18 , -4 | -3.49 | 3.12* | -0 , 6 | 4.75 | 22.01 | -73 , 117 | 1.26 | 8.10 | -5 , 21 | 1.34 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.38.** Estimated Impact of the 2017 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | -1193.35*** § | -1,477 , -909 | -6.52 | -728.48*** | -1,270 , -187 | -4.56 | -2035.92*** § | -2,661 , -1,411 | -6.11 | -420.37*** | -584 , -257 | -6.48 |
| APA | 28,197 | -55.58 § | -207 , 96 | -0.39 | 14.83 § | -382 , 411 | 0.11 | 1761.85*** § | 1,373 , 2,151 | 6.48 | -94.71* | -197 , 8 | -1.85 |
| Arizona | 30,814 | -346.98*** | -507 , -187 | -2.52 | 309.51 | -98 , 717 | 2.11 | 594.35*** | 223 , 965 | 2.34 | -30.81 § | -139 , 77 | -0.54 |
| Atrius | 35,336 | -613.02*** | -785 , -441 | -4.53 | -38.38 | -336 , 259 | -0.37 | -504.81** | -948 , -62 | -2.04 | -45.02 § | -147 , 57 | -0.91 |
| Bronx | 45,645 | 146.20 § | -43 , 335 | 0.87 | 733.16*** | 282 , 1,184 | 4.82 | 468.18* § | -19 , 955 | 1.39 | 139.56*** | 39 , 241 | 2.44 |
| Carillion | 48,574 | -171.28** § | -306 , -37 | -1.42 | -37.44 | -235 , 160 | -0.49 | 760.72*** § | 485 , 1,036 | 3.83 | 2.17 | -84 , 88 | 0.05 |
| HCP | 27,156 | 138.35* | -16 , 293 | 1.03 | -9.75 § | -315 , 296 | -0.08 | 836.73*** | 463 , 1,210 | 3.19 | 53.66 | -46 , 153 | 1.06 |
| Indiana U | 58,223 | -343.85*** § | -475 , -212 | -2.82 | -185.37 | -414 , 43 | -1.96 | -53.58 | -371 , 264 | -0.23 | 98.16** § | 4 , 192 | 1.97 |
| ProHealth | 14,550 | 110.29 § | -95 , 315 | 0.98 | -975.45*** § | -1,406 , -545 | -8.91 | -1278.07*** § | -1,827 , -730 | -5.31 | -312.44*** § | -442 , -183 | -6.53 |
| ProspectNE | 11,169 | -556.24*** § | -793 , -320 | -3.91 | -334.57 | -760 , 91 | -2.97 | -1064.97*** | -1,627 , -503 | -3.86 | -203.19*** | -348 , -59 | -3.97 |
| PSW | 12,371 | -485.59*** § | -689 , -282 | -4.48 | -230.73 | -648 , 186 | -2.32 | -1914.33*** | -2,444 , -1,385 | -9.17 | -246.73*** | -380 , -114 | -5.78 |
| RHeritage | 19,649 | -139.66 § | -317 , 37 | -1.02 | -274.64 | -624 , 75 | -2.21 | 442.73* | -4 , 889 | 1.61 | 117.56** | 7 , 228 | 2.23 |
| St. Luke's | 29,812 | -338.62** | -599 , -79 | -2.37 | -558.57*** | -909 , -208 | -5.74 | -175.65 | -591 , 240 | -0.91 | -196.06*** | -320 , -72 | -4.51 |
| UNC | 27,489 | -594.51*** | -783 , -406 | -4.49 | -745.58*** | -1,076 , -416 | -7.04 | -1756.24*** | -2,197 , -1,315 | -7.05 | -104.43* | -222 , 13 | -2.10 |
| UTSW | 85,451 | -326.38*** § | -433 , -220 | -2.38 | 19.17 | -168 , 206 | 0.18 | -129.36 § | -398 , 139 | -0.47 | -20.96 | -97 , 55 | -0.35 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.39.** Estimated Impact of the 2017 Cohort on Utilization (Number of Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | 137.90*** § | 128 , 148 | 19.76 | -10.35 | -24 , 3 | -3.88 | -750.47** | -1,332 , -169 | -8.44 |
| APA | 28,197 | 80.42*** § | 73 , 88 | 18.16 | -24.52*** | -32 , -17 | -9.93 | -699.59*** | -944 , -455 | -9.94 |
| Arizona | 30,814 | 53.98*** § | 46 , 62 | 12.16 | -3.46 | -8 , 2 | -3.47 | -122.27* | -248 , 3 | -6.30 |
| Atrius | 35,336 | 10.08*** § | 2 , 18 | 1.84 | 2.02 | -5 , 9 | 1.19 | -11.92 § | -192 , 168 | -0.37 |
| Bronx | 45,645 | 67.36*** § | 61 , 74 | 22.13 | 8.96*** | 4 , 14 | 7.23 | 179.82*** | 65 , 295 | 8.88 |
| Carillion | 48,574 | 91.35*** § | 84 , 99 | 24.30 | 1.63 | -4 , 7 | 1.36 | -160.67* | -344 , 22 | -5.22 |
| HCP | 27,156 | 91.03*** § | 84 , 98 | 24.73 | -5.48 § | -13 , 2 | -2.41 | -98.89 | -394 , 196 | -1.49 |
| Indiana U | 58,223 | 36.15*** § | 31 , 41 | 16.98 | -7.57*** | -12 , -3 | -7.31 | -198.66*** | -331 , -67 | -8.83 |
| ProHealth | 14,550 | 167.87*** | 158 , 178 | 30.15 | -8.98** | -16 , -2 | -9.34 | -406.75*** § | -587 , -226 | -21.32 |
| ProspectNE | 11,169 | 194.51*** § | 184 , 205 | 38.00 | -7.88 | -18 , 2 | -4.37 | 128.40 | -212 , 469 | 2.96 |
| PSW | 12,371 | 127.23*** § | 117 , 138 | 37.73 | -2.26 | -9 , 4 | -3.43 | -112.12 | -279 , 55 | -7.58 |
| RHeritage | 19,649 | 49.08*** § | 41 , 57 | 17.24 | 6.89 | -2 , 16 | 2.85 | 225.80 § | -65 , 517 | 3.44 |
| St. Luke's | 29,812 | 167.26*** | 156 , 178 | 30.99 | -6.40 | -15 , 2 | -5.70 | -377.41*** | -655 , -100 | -13.06 |
| UNC | 27,489 | 65.30*** § | 56 , 74 | 15.76 | 7.49** | 1 , 14 | 5.86 | -2.67 | -175 , 170 | -0.11 |
| UTSW | 85,451 | 6.43** § | 1 , 11 | 1.78 | -7.02*** | -11 , -3 | -4.69 | -538.73*** § | -736 , -341 | -8.73 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. AWV = annual wellness visit.

## Exhibit H.40. Estimated Impact of the 2017 Cohort on Quality of Care in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | 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% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| Accountable Care Options | 9,716 | -3.69* § | -7 , 0 | -9.68 | 11.92 | -8 , 32 | 7.38 | 48.82** | 2 , 96 | 21.59 |
| APA | 28,197 | -0.72 | -3 , 2 | -1.88 | 0.77 § | -13 , 14 | 0.46 | 9.42 | -18 , 36 | 4.50 |
| Arizona | 30,814 | -1.39 | -3 , 1 | -5.94 | 0.94 | -11 , 13 | 0.80 | -17.85 | -51 , 15 | -10.69 |
| Atrius | 35,336 | -0.81 | -3 , 2 | -2.48 | -2.72 | -16 , 11 | -1.83 | 5.20 | -22 , 32 | 2.81 |
| Bronx | 45,645 | 4.98*** | 2 , 7 | 11.91 | 12.97** | 1 , 25 | 7.70 | 9.35 | -13 , 32 | 5.04 |
| Carillion | 48,574 | 1.69 | -1 , 4 | 4.54 | 9.05 | -2 , 20 | 6.42 | 1.39 | -23 , 26 | 0.78 |
| HCP | 27,156 | 3.67*** | 1 , 6 | 11.95 | 13.74** | 1 , 27 | 8.67 | 12.19 | -13 , 38 | 6.32 |
| Indiana U | 58,223 | -0.83 | -3 , 2 | -1.96 | -6.89 | -19 , 5 | -4.61 | -10.43 | -33 , 12 | -5.86 |
| ProHealth | 14,550 | -0.02 | -3 , 3 | -0.05 | -3.25 | -21 , 14 | -2.40 | -26.18 § | -67 , 15 | -14.22 |
| ProspectNE | 11,169 | -4.39** | -8 , -1 | -10.44 | -1.59 | -20 , 17 | -0.95 | -0.96 | -34 , 32 | -0.49 |
| PSW | 12,371 | 1.10 | -2 , 4 | 4.88 | 1.16 | -19 , 22 | 0.99 | 20.16 | -27 , 68 | 13.44 |
| RHeritage | 19,649 | -0.54 | -3 , 2 | -1.87 | -3.44 § | -18 , 11 | -2.39 | 11.08 | -24 , 47 | 5.62 |
| St. Luke's | 29,812 | 3.21** | 0 , 6 | 15.23 | -3.75 | -22 , 14 | -3.44 | -28.01 | -71 , 15 | -20.52 |
| UNC | 27,489 | -1.75 | -5 , 1 | -5.47 | -5.62 | -21 , 10 | -4.16 | 10.97 | -22 , 44 | 6.88 |
| UTSW | 85,451 | -2.55*** | -4 , -1 | -7.24 | -0.50 | -9 , 8 | -0.33 | 0.99 | -19 , 21 | 0.53 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2017 Cohort) in PY4, absent the model. ACSC = ambulatory care-sensitive conditions; SNF = skilled nursing facility.

**Exhibit H.41.** Estimated Impact of the 2018 Cohort on Spending (Acute Care Hospital, Skilled Nursing, Other Post-Acute Care, and Outpatient Facility) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Spending ($ Per Beneficiary Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acute care hospital facility | | | Skilled nursing facility | | | Other post-acute care facility | | | Outpatient facility | | |
| | | DID Estimate | 95% COnfidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 20,419 | -13.77 | -142 , 115 | -0.55 | 1.20 | -50 , 52 | 0.21 | -18.65 | -61 , 24 | -9.60 | -180.59*** | -302 , -60 | -9.00 |
| Best Care Collab | 12,280 | -244.87** | -453 , -37 | -7.69 | -30.25 | -110 , 49 | -3.72 | -69.52* | -146 , 7 | -25.04 | 3.22 | -115 , 121 | 0.18 |
| CareMount | 21,307 | -179.15 § | -452 , 94 | -3.83 | -132.99** § | -245 , -21 | -9.49 | -7.25 | -54 , 40 | -3.23 | -132.90 | -294 , 28 | -5.16 |
| Central Utah | 14,174 | -58.63 | -353 , 236 | -1.81 | 2.10 | -118 , 122 | 0.27 | 41.37 | -117 , 200 | 7.51 | 14.19 | -224 , 252 | 0.63 |
| CoxHealth | 17,729 | 43.25 | -204 , 290 | 1.41 | -16.19 | -112 , 79 | -2.45 | 52.94 | -25 , 131 | 21.50 | 16.01 | -225 , 257 | 0.57 |
| Franciscan | 22,413 | -52.23 | -256 , 152 | -1.61 | 58.88 | -37 , 154 | 7.82 | -36.05 | -128 , 56 | -5.30 | -158.54 | -351 , 34 | -6.26 |
| Mary Washington | 13,239 | -140.32 | -395 , 115 | -3.94 | -73.59* | -150 , 3 | -10.93 | -95.53** | -176 , -15 | -19.83 | -2.12 | -158 , 154 | -0.11 |
| NEQCA | 32,002 | 60.31 | -135 , 255 | 1.37 | 21.62 | -37 , 80 | 2.36 | -25.74 | -88 , 37 | -5.88 | -14.10 | -138 , 109 | -0.50 |
| Primaria | 26,493 | -601.47*** | -828 , -375 | -15.92 | -201.62*** | -286 , -117 | -20.91 | -23.34 | -102 , 56 | -5.40 | -247.27** § | -468 , -26 | -8.21 |
| Primary Care Alliance | 11,600 | -471.88*** | -691 , -253 | -14.57 | -27.18 | -111 , 57 | -3.42 | -116.61*** | -194 , -39 | -37.59 | -6.77 | -155 , 142 | -0.40 |
| Reliance | 11,620 | 85.99 | -149 , 321 | 2.11 | -48.45 | -119 , 22 | -5.79 | 29.91 | -49 , 109 | 9.99 | 96.00 § | -36 , 228 | 4.29 |
| Reliant | 9,877 | 198.51 | -234 , 631 | 4.71 | 91.78 | -39 , 222 | 11.84 | -72.70 | -172 , 26 | -18.01 | 215.08* | -27 , 457 | 9.30 |
| Torrance | 10,873 | -538.77*** | -902 , -175 | -10.06 | 14.96 | -141 , 171 | 1.08 | -184.42*** | -305 , -64 | -32.22 | -598.32*** | -845 , -352 | -18.59 |
| UW Health | 24,622 | 87.47 | -117 , 292 | 2.59 | 27.37 | -50 , 105 | 3.82 | -6.42 § | -85 , 72 | -2.22 | 192.88** | 20 , 366 | 6.09 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, 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.

**Exhibit H.42.** Estimated Impact of the 2018 Cohort on Spending (Professional Services, Home Health, Hospice, and Durable Medical Equipment) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | 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 | 20,419 | 29.95 | -131 , 191 | 0.90 | 9.22 | -24 , 42 | 1.73 | -59.37* | -119 , 0 | -16.04 | -36.41 | -86 , 13 | -9.50 |
| Best Care Collab | 12,280 | -600.66*** | -786 , -415 | -12.52 | -34.41* | -73 , 4 | -5.38 | -35.41 | -101 , 30 | -7.18 | 0.87 | -43 , 45 | 0.29 |
| CareMount | 21,307 | 128.20** | 9 , 248 | 3.42 | -24.72* | -52 , 2 | -5.70 | -2.49 | -47 , 42 | -1.09 | -3.50 | -39 , 32 | -1.34 |
| Central Utah | 14,174 | 186.34* | -4 , 377 | 5.98 | -87.39** | -161 , -13 | -9.54 | -13.62 | -121 , 93 | -2.46 | -36.05 | -86 , 14 | -8.98 |
| CoxHealth | 17,729 | -17.23 § | -150 , 116 | -0.88 | 0.09 | -39 , 40 | 0.03 | -15.81 | -97 , 65 | -4.57 | 5.32 | -87 , 97 | 1.16 |
| Franciscan | 22,413 | -118.22** | -230 , -6 | -3.93 | -87.23*** | -134 , -41 | -10.59 | -64.94** | -124 , -6 | -14.99 | -14.08 | -57 , 29 | -4.21 |
| Mary Washington | 13,239 | 35.42 | -192 , 263 | 0.89 | -3.05 | -46 , 40 | -0.54 | -62.44* | -126 , 1 | -17.01 | -7.09 | -39 , 25 | -3.09 |
| NEQCA | 32,002 | -79.32** | -145 , -14 | -2.61 | 19.69 | -10 , 49 | 2.87 | 32.86 | -12 , 78 | 8.90 | 0.92 | -20 , 22 | 0.48 |
| Primaria | 26,493 | -94.48* | -206 , 17 | -3.61 | -67.73*** | -101 , -34 | -12.95 | -33.98 | -87 , 19 | -9.02 | -39.41 | -90 , 11 | -11.49 |
| Primary Care Alliance | 11,600 | -24.07 | -209 , 161 | -0.53 | -60.07*** § | -101 , -19 | -9.43 | 54.26 | -24 , 132 | 12.63 | -13.86 | -60 , 32 | -4.91 |
| Reliance | 11,620 | -19.15 | -133 , 95 | -0.56 | -49.20*** | -84 , -14 | -7.64 | 31.13 | -28 , 91 | 9.81 | -19.07 | -53 , 15 | -6.68 |
| Reliant | 9,877 | 47.04 | -81 , 175 | 1.70 | 13.81 | -56 , 83 | 1.97 | -8.86 | -117 , 99 | -2.43 | -5.53 | -47 , 36 | -2.55 |
| Torrance | 10,873 | -407.96*** | -598 , -218 | -8.63 | -72.58* | -157 , 12 | -5.35 | 6.32 § | -90 , 102 | 1.25 | -62.89** | -113 , -13 | -19.60 |
| UW Health | 24,622 | -52.88 | -125 , 19 | -2.97 | -6.11 | -32 , 20 | -1.99 | 14.95 | -62 , 92 | 2.53 | 28.28** | 2 , 55 | 13.68 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. Professional services include physician, other professional, and ancillary services rendered under Part B.

**Exhibit H.43.** Estimated Impact of the 2018 Cohort on Utilization (Acute Care Stays, SNF Stays, SNF Days, and ED Visits and Observation Stays) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Acute care stays | | | SNF stays | | | SNF days | | | ED visits & observation stays | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 20,419 | -2.23 | -13 , 9 | -0.84 | 5.99** | 1 , 11 | 10.21 | -14.87 | -158 , 129 | -1.01 | -8.14 | -27 , 11 | -1.71 |
| Best Care Collab | 12,280 | -21.65*** | -36 , -7 | -7.08 | 1.02 | -6 , 8 | 1.43 | -2.49 | -184 , 179 | -0.14 | 9.13 | -12 , 30 | 2.22 |
| CareMount | 21,307 | -20.32*** | -33 , -8 | -5.91 | -7.60** § | -14 , -1 | -8.06 | -262.69** § | -465 , -60 | -10.49 | 13.44 § | -12 , 39 | 2.35 |
| Central Utah | 14,174 | -2.08 | -20 , 16 | -0.83 | -0.64 | -9 , 8 | -1.02 | -1.08 | -228 , 226 | -0.07 | 14.78 | -20 , 50 | 2.71 |
| CoxHealth | 17,729 | -4.17 | -22 , 13 | -1.50 | 1.23 | -7 , 10 | 1.97 | -18.32 | -243 , 206 | -1.21 | 58.88*** | 28 , 89 | 10.10 |
| Franciscan | 22,413 | -1.58 | -16 , 13 | -0.54 | 5.89* | -0 , 12 | 10.03 | 220.43* | -14 , 455 | 12.19 | 28.33** | 1 , 56 | 4.67 |
| Mary Washington | 13,239 | -2.97 | -19 , 13 | -0.98 | -1.98 | -8 , 4 | -3.54 | -171.30** | -332 , -11 | -12.75 | -52.38*** | -83 , -22 | -8.80 |
| NEQCA | 32,002 | 8.24 | -2 , 19 | 2.70 | 5.21** | 0 , 10 | 6.41 | 37.99 | -71 , 147 | 2.31 | -13.65 | -35 , 7 | -2.41 |
| Primaria | 26,493 | -29.40*** | -44 , -15 | -9.42 | -5.59* | -12 , 1 | -7.48 | -397.58*** | -573 , -222 | -20.50 | -50.11*** | -77 , -24 | -7.69 |
| Primary Care Alliance | 11,600 | -49.73*** | -65 , -34 | -16.66 | 0.66 | -6 , 8 | 0.97 | -30.24 | -240 , 180 | -1.66 | 64.11*** § | 36 , 92 | 13.83 |
| Reliance | 11,620 | -3.66 | -19 , 12 | -1.04 | 2.52 | -5 , 10 | 2.95 | -130.14* | -282 , 22 | -7.29 | 27.89** § | 1 , 55 | 4.94 |
| Reliant | 9,877 | 4.58 | -17 , 27 | 1.67 | 7.99 | -3 , 19 | 11.27 | 127.16 | -135 , 389 | 8.77 | 19.63 | -22 , 62 | 3.37 |
| Torrance | 10,873 | 6.94 | -11 , 25 | 2.10 | 3.32 | -5 , 12 | 4.14 | 16.93 | -249 , 283 | 0.76 | -12.60 | -43 , 18 | -2.36 |
| UW Health | 24,622 | 14.58** | 2 , 27 | 5.62 | 4.08 | -2 , 10 | 7.03 | 66.77 | -100 , 233 | 4.63 | 6.53 | -19 , 32 | 1.09 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. ED = emergency department; SNF = skilled nursing facility.

**Exhibit H.44.** Estimated Impact of the 2018 Cohort on Utilization (E&M Visits, Procedures, Tests, and Imaging Services) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E&M visits | | | Procedures | | | Tests | | | Imaging services | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 20,419 | -193.24** | -370 , -16 | -1.57 | 457.04** | 44 , 870 | 3.95 | 625.26*** § | 238 , 1,013 | 2.64 | 39.97 | -71 , 151 | 0.83 |
| Best Care Collab | 12,280 | -312.28*** | -532 , -92 | -2.29 | -1029.11*** | -1,463 , -595 | -8.16 | -1236.83*** § | -1,707 , -767 | -5.15 | -84.58 | -233 , 64 | -1.51 |
| CareMount | 21,307 | -269.17*** § | -462 , -76 | -1.92 | -125.49 | -578 , 327 | -0.92 | 595.66*** | 147 , 1,044 | 2.19 | -16.68 | -132 , 99 | -0.32 |
| Central Utah | 14,174 | -600.36*** | -858 , -342 | -5.58 | 303.59 | -295 , 902 | 2.81 | -896.84*** | -1,520 , -274 | -4.64 | -76.06 | -245 , 93 | -1.88 |
| CoxHealth | 17,729 | -2.98 § | -233 , 227 | -0.03 | -172.82 § | -597 , 251 | -2.27 | 263.77 | -306 , 834 | 1.35 | 146.68 | -56 , 349 | 3.04 |
| Franciscan | 22,413 | -787.44*** § | -997 , -578 | -5.90 | -484.04** | -933 , -35 | -4.11 | -149.45 | -617 , 318 | -0.66 | 7.76 | -129 , 145 | 0.15 |
| Mary Washington | 13,239 | -297.97*** | -517 , -79 | -2.39 | 128.63 | -410 , 667 | 1.09 | 164.44 | -396 , 725 | 0.66 | -135.12 | -299 , 29 | -2.51 |
| NEQCA | 32,002 | 238.66*** | 57 , 420 | 1.64 | -175.51 | -471 , 120 | -1.70 | 840.57*** | 382 , 1,299 | 3.07 | 31.37 | -74 , 136 | 0.61 |
| Primaria | 26,493 | -497.81*** § | -706 , -289 | -4.07 | -732.71*** | -1,056 , -410 | -7.85 | -574.29*** | -969 , -180 | -2.88 | -1.85 | -131 , 127 | -0.04 |
| Primary Care Alliance | 11,600 | -193.30 | -493 , 106 | -1.24 | -251.28 | -777 , 275 | -1.84 | 596.02* | -9 , 1,201 | 2.03 | -249.54*** | -432 , -67 | -4.18 |
| Reliance | 11,620 | -85.50 § | -339 , 168 | -0.59 | 313.75 | -181 , 808 | 2.59 | -169.31 § | -674 , 336 | -0.63 | -68.62 | -216 , 79 | -1.23 |
| Reliant | 9,877 | -206.00 § | -544 , 132 | -1.66 | 630.21** | 98 , 1,162 | 7.45 | 689.19 | -190 , 1,568 | 2.85 | 201.23* | -22 , 425 | 4.11 |
| Torrance | 10,873 | -649.30*** § | -903 , -396 | -4.26 | -797.51*** | -1,384 , -211 | -5.09 | 682.27** | 63 , 1,301 | 2.25 | -154.43** | -296 , -13 | -2.95 |
| UW Health | 24,622 | 439.76*** | 232 , 648 | 3.79 | 236.11 | -57 , 529 | 2.91 | 499.13** | 8 , 990 | 2.43 | 112.63** § | 1 , 225 | 2.79 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. Procedures, Tests, and Imaging Services include counts of services rendered by professionals and outpatient facilities. E&M = evaluation and management.

**Exhibit H.45.** Estimated Impact of the 2018 Cohort on Utilization (Beneficiaries with AWV, Home Health Episodes, and Home Health Visits) in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | Utilization (Per 1,000 Beneficiaries Per Year): | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Beneficiaries with AWV | | | Home health episodes | | | Home health visits | | |
| | | DID Estimate | 95% Confidence Interval (CI) | % Impact | DID Estimate | 95% CI | % Impact | DID Estimate | 95% CI | % Impact |
| ACC of TN | 20,419 | 46.54*** § | 40 , 53 | 5.74 | -2.45 | -9 , 4 | -2.05 | 70.80 | -167 , 309 | 2.12 |
| Best Care Collab | 12,280 | 128.45*** § | 117 , 139 | 25.79 | -9.42* | -19 , 1 | -5.38 | -214.99* | -450 , 20 | -6.27 |
| CareMount | 21,307 | 282.54*** § | 274 , 291 | 60.45 | -8.46*** | -15 , -2 | -7.63 | -247.20*** | -400 , -94 | -11.86 |
| Central Utah | 14,174 | 133.22*** § | 118 , 148 | 27.20 | -18.86*** | -33 , -5 | -11.17 | -632.15** | -1,209 , -55 | -11.20 |
| CoxHealth | 17,729 | 0.42 § | -14 , 15 | 0.11 | 4.97 | -4 , 14 | 5.52 | -6.92 | -284 , 270 | -0.35 |
| Franciscan | 22,413 | 46.70*** § | 36 , 57 | 15.32 | -8.02* | -16 , 0 | -5.64 | -555.96*** | -895 , -217 | -10.57 |
| Mary Washington | 13,239 | 336.39*** | 325 , 348 | 77.81 | -2.06 | -12 , 7 | -1.50 | 129.63 | -113 , 372 | 4.91 |
| NEQCA | 32,002 | 13.99*** | 6 , 22 | 3.03 | 4.27 | -2 , 11 | 2.62 | 127.04 | -43 , 297 | 3.88 |
| Primaria | 26,493 | 208.63*** § | 198 , 220 | 39.99 | -13.17*** § | -20 , -6 | -11.80 | -429.00*** | -629 , -229 | -16.45 |
| Primary Care Alliance | 11,600 | -116.89*** | -130 , -104 | -32.80 | -8.21 § | -19 , 3 | -4.88 | -373.26*** § | -633 , -113 | -10.76 |
| Reliance | 11,620 | 50.58*** § | 40 , 61 | 11.02 | -15.93*** | -26 , -6 | -8.53 | -175.42* | -370 , 19 | -5.57 |
| Reliant | 9,877 | 45.96*** § | 30 , 62 | 8.52 | -3.90 | -19 , 11 | -2.29 | 188.95 | -197 , 574 | 5.80 |
| Torrance | 10,873 | -50.81*** § | -61 , -40 | -8.66 | -14.43** | -27 , -2 | -6.29 | -211.42 | -660 , 237 | -3.56 |
| UW Health | 24,622 | -6.97** § | -13 , -1 | -4.69 | -0.91 | -7 , 6 | -1.13 | -6.60 | -166 , 153 | -0.44 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. AWV = annual wellness visit.

## **Exhibit H.46.** Estimated Impact of the 2018 Cohort on Quality of Care in PY4 (2019)

| | # of NGACO beneficiaries in PY4 | 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 | 20,419 | -1.68 § | -4 , 1 | -5.58 | 2.28 | -13 , 18 | 1.75 | 21.47 | -11 , 54 | 13.29 |
| Best Care Collab | 12,280 | -0.09 | -4 , 4 | -0.26 | -18.06* | -38 , 2 | -11.70 | -33.43 | -77 , 10 | -18.44 |
| CareMount | 21,307 | -2.80** | -5 , -0 | -8.72 | -7.05 | -21 , 7 | -4.88 | 3.72 | -25 , 32 | 2.16 |
| Central Utah | 14,174 | -2.63 | -7 , 2 | -10.84 | -6.31 | -32 , 19 | -5.81 | 24.57 | -18 , 67 | 23.05 |
| CoxHealth | 17,729 | 4.09* § | -0 , 9 | 11.41 | 4.27 § | -19 , 28 | 3.12 | -22.17 | -84 , 40 | -10.46 |
| Franciscan | 22,413 | -0.42 | -4 , 3 | -1.32 | 12.31 | -5 , 30 | 9.17 | -3.86 | -48 , 40 | -2.42 |
| Mary Washington | 13,239 | -5.17** | -10 , -0 | -10.90 | 8.43 | -12 , 29 | 5.22 | 12.46 | -38 , 63 | 5.44 |
| NEQCA | 32,002 | 0.43 | -2 , 3 | 0.92 | 5.13 | -8 , 19 | 2.96 | 18.61 | -7 , 44 | 9.19 |
| Primaria | 26,493 | -1.33 | -5 , 3 | -2.97 | -14.79* | -32 , 3 | -9.79 | -31.68* | -67 , 4 | -16.46 |
| Primary Care Alliance | 11,600 | -9.44*** | -13 , -5 | -29.60 | -43.45*** | -64 , -23 | -33.28 | -24.52 | -64 , 15 | -15.85 |
| Reliance | 11,620 | -3.39* | -7 , 1 | -6.92 | 8.18 | -9 , 25 | 4.62 | -7.83 | -45 , 29 | -3.51 |
| Reliant | 9,877 | 2.34 | -3 , 8 | 6.35 | 9.68 | -17 , 36 | 6.92 | 21.60 | -34 , 78 | 12.50 |
| Torrance | 10,873 | 0.35 | -3 , 4 | 1.28 | 2.16 | -18 , 22 | 1.49 | -2.75 | -44 , 38 | -1.62 |
| UW Health | 24,622 | 0.86 | -2 , 4 | 3.69 | 17.16* | -0 , 35 | 13.08 | 6.57 | -28 , 42 | 4.20 |

**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 baseline years. Percentage impact is relative to expected average outcome for NGACO beneficiaries (2018 Cohort) in PY4, absent the model. ACSC = ambulatory care-sensitive conditions; SNF = skilled nursing facility.