

# What Value Do Teaching Hospitals Provide Commercial Beneficiaries When in an ACO?

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## ABSTRACT

**Objectives:** The number of commercial beneficiaries cared for by accountable care organizations (ACOs) is growing, but the literature examining their trends is nascent.

**Study Design:** We examined commercial claims data from 2019 to 2021 to compare beneficiaries attributed to participants in Medicare Shared Savings Program ACOs with and without a major teaching hospital.

**Methods:** We calculated mortality and spending by setting for each ACO type by year.

**Results:** Compared with per-beneficiary rates at nonteaching ACOs, major teaching ACOs have lower mortality rates by up to 2.2 percentage points depending on the patient age group, \$283 lower inpatient spending, and lower emergency department utilization in inpatient (−0.008) and outpatient (−0.013) settings, as well as \$146 higher overall outpatient spending. Upward trends in mortality and beneficiary risk scores across both ACO types show disruption to health outcomes during COVID-19.

**Conclusions:** These results provide evidence that ACOs with major teaching hospitals may be more likely to achieve the value-based goals of ACOs. Means to accomplish those goals may include avoiding higher-intensity care and supporting access to lower-cost alternatives where clinically appropriate, such as reducing inpatient and emergency department stays by delivering timely, high-quality outpatient care.

## COMMERCIAL ACCOUNTABLE CARE ORGANIZATIONS

(ACOs) have substantially increased in prevalence, covering 36 million lives in 2021<sup>1</sup> and representing more contracts than Medicare and Medicaid combined.<sup>2</sup> Due in part to the large scale of the commercial sector in the US health care system, commercial ACOs tend to be bigger and cover more lives per contract compared with Medicare or Medicaid ACOs.<sup>2</sup> Nationally, as of 2024, the 10 largest ACOs are all commercial contracts, representing 375,000 to 5 million covered lives per contract.<sup>3</sup> The widespread adoption of commercial ACOs reflects the size of the investment in the private sector in solving the inadequacies of fee-for-service payments through value-based care.<sup>4</sup>

ACOs have implemented a variety of care redesign efforts, such as transforming primary care through increased access and team-based care, expanding disease management, and addressing nonmedical patient needs.<sup>5,6</sup> Although ACOs have achieved modest success in reducing episode spending,<sup>7</sup> their success has largely been in reducing high-intensity utilization, such as hospital admissions, hospital readmissions, and postacute care, while increasing lower-intensity office-based outpatient care.<sup>8,9</sup> Early adoption by teaching hospitals and the providers integrated in their health systems has been central to ACO traction due to their mission-oriented nature, large size, existing care coordination infrastructure, and access to capital.<sup>8,10,11</sup> Historical concerns that teaching hospitals are more costly for individual services in the hospital setting have recently been met with a broader view, which takes into account total costs of care.<sup>12</sup> This new, value-based approach, consistent with the mission of ACOs, raises the question of whether the infrastructure common in teaching hospitals and health systems is necessary for operating large ACOs and facilitates the provision of high-quality care. The literature on the structure and mix of providers contributing to ACO success is in its early stages, often favoring physician-led ACOs.<sup>13,14</sup> The importance of this question was particularly elevated during the increased uncertainty of the COVID-19 pandemic, which both catalyzed strengths and exposed weaknesses at the system level while simultaneously adding illness to the patient population and forcing delays in care and diagnosis. Organizations that had significant infrastructure in place may have been characterized

prepandemic as too large to easily adapt but were able to demonstrate their resilience during the crisis.

The importance of this question is elevated by CMS' goal of moving all Medicare beneficiaries to ACOs by 2030.<sup>15</sup> It is believed that the infrastructure needed to succeed in ACOs may have cross-payer benefits, but existing literature has tended to focus on more easily accessible Medicare data rather than proprietary commercial payer data.<sup>16</sup> This article aims to augment the ACO literature and uncover cross-payer teaching hospital differences by comparing cost, utilization, and clinical outcomes in 2019 to 2021 among commercial beneficiaries, rather than Medicare beneficiaries, treated by providers participating in Medicare ACOs with and without an affiliated major teaching hospital. We describe each type of ACO using beneficiary data as well as health care spending by setting, hospital utilization rates, retention measures, and mortality rates. Our study seeks to determine if there is a value advantage to major teaching hospital-affiliated ACOs and to inform future ACO improvement strategies.

## METHODS

Our data consisted of complete, aggregated commercial claims data from 2019 to 2021, provided by FAIR Health from its multipayer claims database for 25.6 million beneficiary-years. The FAIR Health data consist of data from more than 70 private insurance companies that include large national, large and small regional payers, and third-party administrators. The data include Medicare Advantage, Medicaid managed care, individual and exchange plans, and commercial group plans (fully insured and self-insured). The data are geographically dispersed, with at least 500,000 beneficiary-years in each of the 9 US Census regions.<sup>17</sup> Using CMS' Medicare Shared Savings Program (MSSP) provider-level participants list for each year, we linked a participation indicator to the commercial claims data using National Provider Identifier and for hospitals, CMS Certification Number, and applied the MSSP patient attribution logic to the commercial population to attribute patients to the ACO. Under this logic, patients were attributed to the ACO whose participants delivered the plurality of their primary care.<sup>18</sup>

To determine academic status for each ACO, we identified major teaching hospital ACOs (MTH ACOs) as those ACOs with at least 1 hospital participant with an intern-and-resident-to-bed (IRB) ratio of 0.25. We defined nonteaching hospital ACOs (NTH ACOs) as those ACOs that either did not include a hospital participant or included hospitals only with an IRB of 0. To draw out the largest distinction between groups, we compared MTH ACOs with NTH ACOs. To isolate the difference in our theoretical framework between major teaching and nonteaching ACOs, we excluded 7.5 million beneficiaries in ACOs that have only minor teaching hospitals

(defined by an IRB less than 0.25 and greater than 0).

Although the risk scores for this excluded group were similar to those of ACOs with a major teaching hospital, the prior literature is less clear on the direction of the utilization effect of minor teaching hospitals.

The following outcomes and characteristics were constructed from our data source, pooled across the sample period: annual spending by setting (using actual allowed amounts blended across payers), utilization by setting, patient risk measured by Hierarchical Condition Category (HCC), and beneficiary mortality rate during an inpatient stay. HCC scores were computed by using HHS' risk adjustment methodology, version 07 HHS-HCC classification. Settings were identified based on claims data. Inpatient hospitals were defined by bill types 11X, 12X, 18X, 21X, 22X, 28X, 65X, 66X, or 85X. Short-term acute care hospitals were defined by bill types 11X, 12X, or 18X. Inpatient rehabilitation facilities (IRFs) were defined by bill types 73X or 75X or by provider taxonomy codes 283XC2000X or 283X00000X. Inpatient psychiatric facilities (IPFs) were defined by revenue codes 0114, 0124, 0134, 0144, or 0154 or by provider taxonomy code 273R00000X. Skilled nursing facilities (SNFs) were defined by bill types beginning with 2. Outpatient emergency department visits were defined by place of service code 23, or place of service code 22 or 19 and one of the following procedure codes: 99281, 99282, 99283, 99284, or 99285. Inpatient emergency department visits were defined by consisting of an inpatient admission, as defined above, preceded by an outpatient emergency department visit, as defined above. To measure continuity of care, also known as patient retention or leakage, we calculated the proportion of short-term acute care hospital discharges that occurred at hospitals that are participants of the ACO.

Using these constructed measures, we compared outcomes and characteristics across ACO types using *t* tests and  $\chi^2$  tests and by measuring the magnitude of the differences, comparing MTH and NTH ACOs. To investigate time trends during COVID-19, we also disaggregated the risk and mortality measures by year.

## RESULTS

The **Table** summarizes the 2 cohorts of commercial beneficiaries. MTH ACO beneficiaries were older than those at NTH ACOs; 83% of MTH ACO patients were aged 65 to 74 years compared with 77% of NTH ACO patients. Beneficiaries at MTH ACOs had 1.5% lower spending overall, and spending was even lower for key settings. For example, total acute care hospital spending was 9.7% lower for MTH ACOs, despite more frequent stays. On a per-stay basis, the MTH ACOs had 17.1% lower costs per inpatient stay, which may be due to differences in patient characteristics, the types of inpatient services provided, or the negotiated payments for each service.

**TABLE.** Comparison of Characteristics, Utilization, and Spending in MTH and NTH ACOs, 2019-2021

Variable	MTH ACOs	NTH ACOs	Difference <sup>a</sup>
Number of beneficiary-years (2019-2021)	8,880,813	9,239,242	
Beneficiary age distribution			
0-64 years	0.772	0.830	-0.058***
65-74 years	0.132	0.108	0.024***
≥75 years	0.096	0.062	0.034***
Annual expenditures per beneficiary, mean (SD)			
Short-term acute care hospital inpatient stays	\$2644 (\$33,609)	\$2927 (\$33,830)	-\$283***
Inpatient rehab	\$41 (\$2183)	\$58 (\$2209)	-\$18***
Inpatient psych	\$328 (\$7919)	\$293 (\$8031)	\$35***
Other inpatient	\$37 (\$1137)	\$35 (\$1151)	\$2***
Outpatient	\$4097 (\$21,409)	\$3951 (\$21,450)	\$146***
Physician/supplier	\$3996 (\$13,791)	\$4092 (\$13,841)	-\$96***
Skilled nursing facility	\$59 (\$1551)	\$42 (\$1549)	\$17***
Home health agency	\$29 (\$1717)	\$24 (\$1721)	\$4***
Hospice	\$2 (\$266)	\$3 (\$265)	-\$1***
Ambulance	\$78 (\$1332)	\$69 (\$1336)	\$9***
Durable medical equipment	\$86 (\$1009)	\$69 (\$1009)	\$17***
Total expenditures	\$11,394 (\$42,933)	\$11,563 (\$43,203)	-\$168***
Annual hospital utilization rates per beneficiary			
Short-term acute care hospital discharges, mean (SD)	0.067 (0.265)	0.063 (0.268)	0.004***
Proportion of short-term acute care hospital discharges to within-ACO hospitals	0.541	0.306	0.235***
Expenditures per inpatient hospital stay, mean (SD)	\$32,099 (\$102,897)	\$38,708 (\$114,551)	-\$6609***
Outpatient ED visits, mean (SD)	0.302 (0.872)	0.315 (0.881)	-0.013***
Inpatient ED visits, mean (SD)	0.095 (0.692)	0.103 (0.701)	-0.008***
Primary care visits with a primary care physician, mean (SD)	2.097 (1.533)	2.455 (1.552)	-0.358***
Primary care visits with a specialist, mean (SD)	4.369 (2.090)	3.894 (2.098)	0.475***

ACO, accountable care organization; ED, emergency department; MTH, major teaching hospital; NTH, nonteaching hospital. \*\*\* $P < .01$ .

<sup>a</sup> $P$  values represent  $t$  tests for continuous variables and  $\chi^2$  tests for binary variables.

Source: Authors' analysis of FAIR Health commercial claims data.

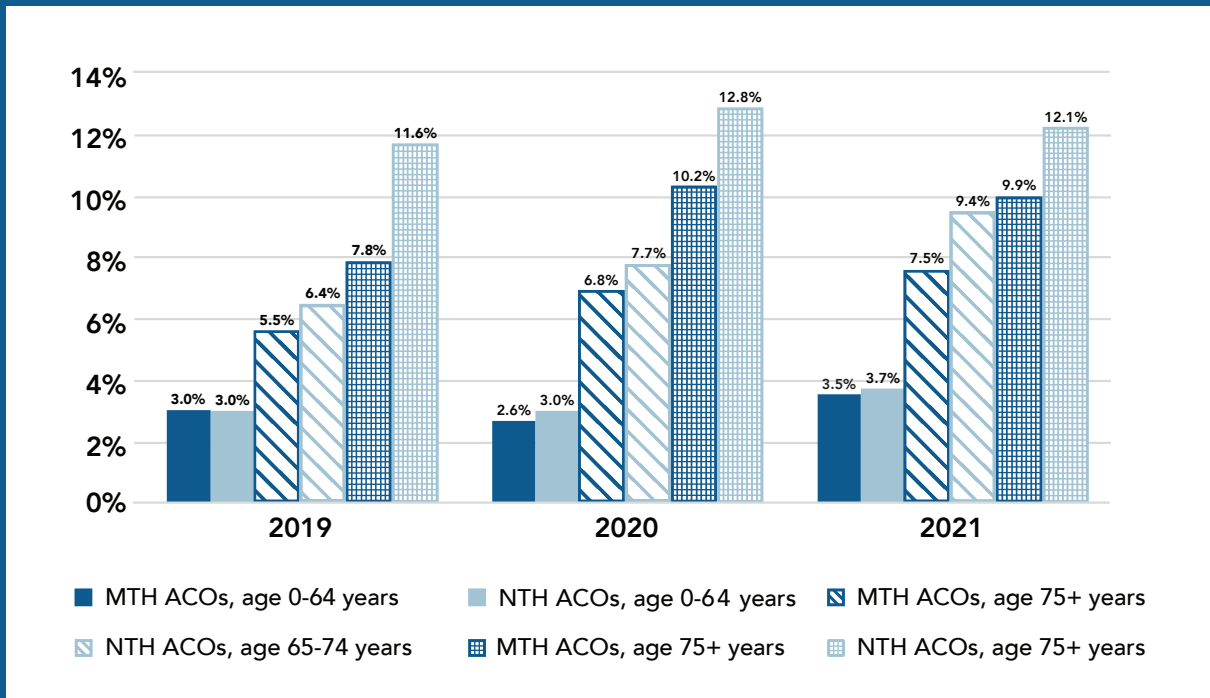
In addition, MTH ACOs retained a higher proportion of their attributed patients' inpatient stays within the ACO (54.1%) compared with NTH ACOs (30.6%). Although MTH ACOs had \$283 (9.7%) lower per-beneficiary annual spending in the inpatient setting, this difference was partially offset by \$146 (3.7%) higher outpatient spending. However, ED utilization was lower in both visits resulting in an admission (-7.8%) and those that remained in outpatient settings (-4.3%). Primary care visit rates were 14.6% lower at MTH ACOs, and specialist visit rates were 12.2% higher.

**Figure 1** and **Figure 2** illustrate trends during COVID-19. Mortality for both beneficiary groups 65 years and older increased in 2020 but did not increase for those under age 65 until 2021. Beneficiaries at MTH ACOs had substantially

lower mortality rates for older beneficiaries (both for those aged 65 to 74 years and those 75 years and older), as well as similar or marginally better mortality rates for beneficiaries younger than 65 years (**Figure 1**). In 2020, both mean and median beneficiary HCCs increased, and these increases were sustained through 2021. MTH ACOs had higher median HCC scores by a similar margin in each year from 2019 to 2021.

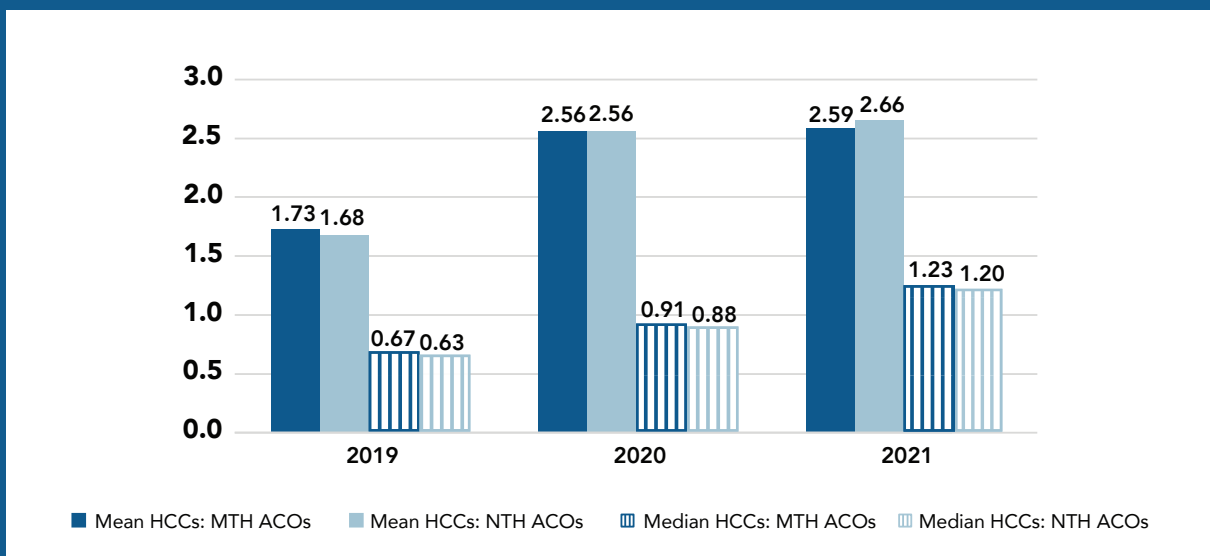
**Figure 3** and **Figure 4** demonstrate opposite trends in the share of inpatient stays during the pandemic. Although the share of inpatient stays for total hip arthroplasty (THA) and total knee arthroplasty (TKA) decreased for both ACO types in both 2020 and 2021, the share for sepsis increased in both 2020 and 2021.

**FIGURE 1.** Mortality Rate During an Inpatient Stay by ACO's Teaching Status, 2019-2021



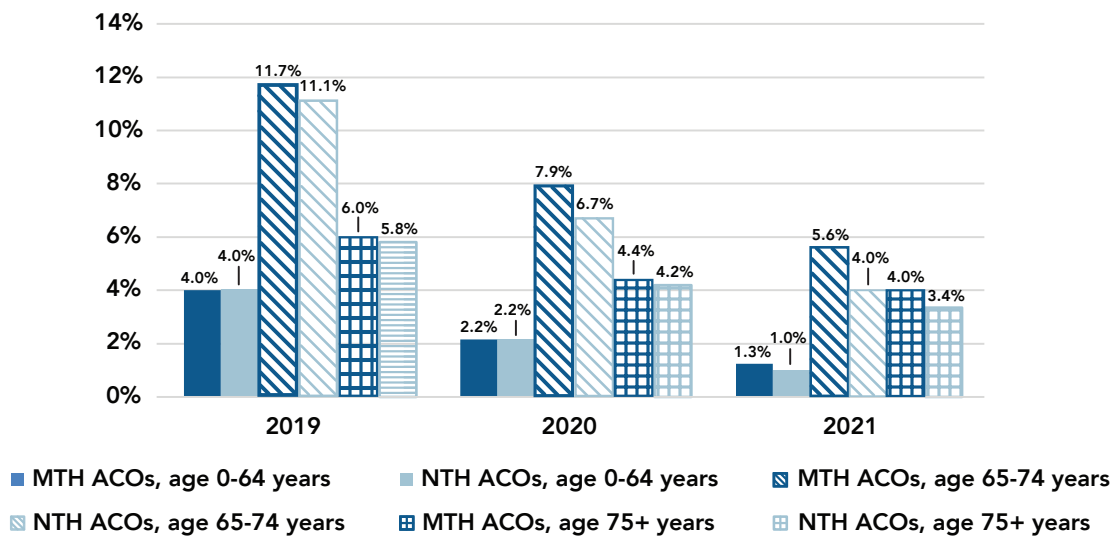
ACO, accountable care organization; MTH, major teaching hospital; NTH, nonteaching hospital.

**FIGURE 2.** Mean and Median HCC Scores by ACO's Teaching Status, 2019-2021



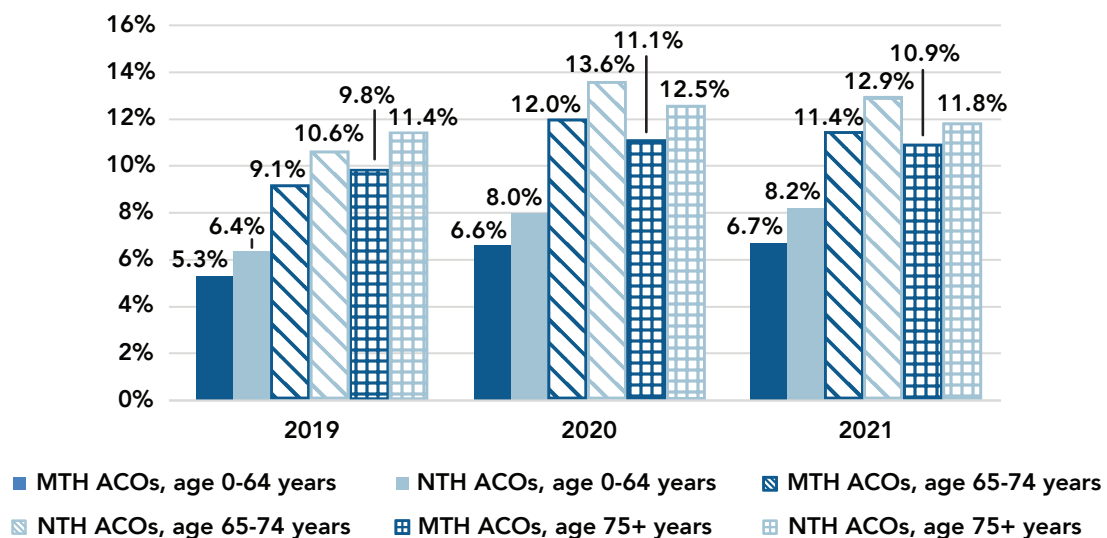
ACO, accountable care organization; HCC, Hierarchical Condition Category; MTH, major teaching hospital; NTH, nonteaching hospital.

**FIGURE 3.** THA/TKA Proportion of Inpatient Stays by ACO's Teaching Status, 2019-2021



ACO, accountable care organization; MTH, major teaching hospital; NTH, nonteaching hospital; THA, total hip arthroplasty; TKA, total knee arthroplasty.

**FIGURE 4.** Sepsis Proportion of Inpatient Stays by ACO's Teaching Status, 2019-2021



ACO, accountable care organization; MTH, major teaching hospital; NTH, nonteaching hospital.

## DISCUSSION

This study found that compared with NTH ACOs, MTH ACOs had lower mortality, lower total spending, lower inpatient spending, and lower ED utilization, as well as higher outpatient spending. Our results suggest that MTH ACOs may provide high-value care relative to other ACOs that do not include teaching hospitals. This finding builds upon previous evidence showing that academic hospitals have lower patient mortality<sup>19</sup> by suggesting that MTH ACOs also have lower commercial beneficiary mortality rates than other ACOs. In addition, in contrast to the common criticism of teaching hospitals' high expense, our data show significantly lower spending per inpatient stay, as well as significantly lower overall inpatient spending. Shifting some of the care, as evidenced by increased spending to the outpatient setting, may not have resulted in worse outcomes or increased ED utilization, and it may have been correlated with an overall savings of \$6609 per patient annually on inpatient stays. This finding suggests that academic medicine can provide high-value care within an ACO, measured through both quality of care and judicious stewardship of financial resources.

Trends from these data also show that the pandemic may have disrupted preexisting trends in costs, utilization, and mortality for ACOs, even into 2021. Not only did mortality and beneficiary risk scores increase, the composition of inpatient stays also changed dramatically. For services that are often elective, such as THA/TKA, utilization as a share of total inpatient stays fell by more than half for beneficiaries aged 65 to 74 years, whereas sepsis increased as a proportion of total stays.

From a health system perspective, the connectedness of the teaching hospital to the ACO may establish a "virtuous cycle" effect, where ACO beneficiaries may largely come back to the teaching hospital for any hospital readmissions. We found that beneficiaries covered by MTH ACOs and receiving hospital care are 77% more likely to receive care from a hospital within the ACO, further supporting this hypothesis and underscoring the advantage that occurs when cross-payer infrastructure supports care coordination. This may reflect an emphasis on timely access to primary and specialty care as well as standardized care transitions after an inpatient admission. Because continuous care is an aspect of quality, promoting retention within a system may be a positive aspect of consolidated care often criticized in other contexts,<sup>20</sup> supporting ACOs' core promise of continuity of care through high-quality, coordinated, and connected care.<sup>21</sup>

This study broadens the literature beyond previous studies on commercial beneficiaries, which have tended to examine single ACOs or were limited to a small geographic area.<sup>22</sup> The commercial source for this study and the range

of measures add nuance to prior findings in Medicare, where ACOs with independent primary care providers tend to have more savings.<sup>23</sup>

## LIMITATIONS


There are several limitations to our methodology that provide context for our findings. The per-beneficiary per-month measures show the total cost of care on a per-beneficiary basis, which multiplicatively combines utilization and price per service. Because our data represent real allowed amounts aggregated across payers, our data did not allow the exact price per service set by a given payer for a given beneficiary. We partially addressed this issue by including utilization measures, which are price neutral.

Additionally, we estimated the impact of MSSP ACO providers on their commercial populations, because commercial ACO contracts are not publicly available. MSSP represents the largest ACO program in the nation and has publicly available participation lists. Because providers strive to provide a consistent standard of care across their entire patient population, regardless of payer, we believe that the effect of MSSP participation on the quality of care may have spillover effects to participants' entire patient population, including both inpatient care and ACO referral networks that impact primary, specialty, and postacute care.

Because the study data do not include potential confounding factors or other control variables, we cannot conclude a causal effect.

## CONCLUSIONS

ACOs are best able to achieve value by avoiding higher-intensity care and supporting access to lower-cost alternatives where clinically appropriate, such as reducing inpatient and ED stays by delivering timely, high-quality outpatient care. These differences in care patterns can provide context for comparing performance across ACOs.

These results uncover a quality difference in the type of ACO on commercially insured beneficiaries, indicating that beneficiaries experience lower mortality rates and lower overall spending when seen by ACOs that include a teaching hospital. Future policy should support different needs of different ACO types and should avoid penalizing large or hospital-based ACOs, as well as consider rewarding ACOs that exhibit benefits of scale. 

**Author Affiliations:** Association of American Medical Colleges (MCB, TRFD, ENH, KAH), Washington, DC.

**Source of Funding:** None.

**Author Disclosures:** The authors report no relationship or financial interest with any entity that would pose a conflict of interest with the subject matter of this article.

**Authorship Information:** Concept and design (MCB, TRFD, ENH, KAH); acquisition of data (MCB, TRFD, ENH, KAH); analysis and interpretation of data (MCB, TRFD, ENH, KAH); drafting of the manuscript (MCB, TRFD, ENH, KAH); administrative, technical, or logistic support (KAH); and supervision (KAH).

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