

Analysis of 2016 Connecticut ACO Medicare Shared Savings Program Data to Identify Opportunities for Population Health Pharmacist Services

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ABSTRACT

OBJECTIVES: To discuss the use of publicly reported Medicare Shared Savings Program (MSSP) accountable care organization (ACO) data to determine cost and medication-related quality performance improvement opportunities, analyze Connecticut MSSP ACO cost and quality performance data to identify significant findings and directional trends, and demonstrate how clinical pharmacy leaders can use this analytical approach to facilitate conversations with ACO executive leaders for pharmacist service integration.

METHODS: The 2016 MSSP ACO data set was used to analyze cost and medication-related quality performance metrics for 13 Connecticut ACOs. Research questions were formulated to identify significant (1) correlations between 30-day all-cause hospital readmission (HR) or emergency department (ED) utilization rates and ACO cost or medication-related quality metric performance and (2) associations between ACO governance and ACO cost or medication-related quality metric performance. Descriptive trends analyses were performed to explain differences in cost and medication-related quality performance according to ACO governance.

RESULTS: Statistically significant correlations were identified between (1) HR and/or ED utilization rates and several per capita expenditures or medication-related quality performance metrics and (2) ACO governance and per capita total expenditures or per capita skilled nursing facility expenditures. Looking at directional trends, health system-governed ACOs had greater total and per capita expenditures for all cost performance metrics, except per capita physician/supplier expenditures. Physician-governed ACOs performed better on all medication-related quality metrics.

CONCLUSIONS: Analysis of publicly reported MSSP ACO data can identify cost and medication-related quality performance improvement opportunities. Pharmacists can use such data for conversations with C-suite executive leaders about integrating population health pharmacist services in ACOs.

In 2008, the Triple Aim was developed to “improve the experience of care, improve the health of populations, and reduce per capita costs of health care.”¹ The Triple Aim guided the Center for Medicare and Medicaid Innovation to develop the first accountable care organization (ACO) model in 2012, known as the Pioneer ACO Model.² This care delivery and healthcare payment transformation initiative allowed high-functioning healthcare organizations to test new payment models based on shared savings and population-based payments.² As of 2016, more than 400 ACOs in the Medicare Shared Savings Program (MSSP) have been implemented.³

The MSSP is a value-based healthcare payment model that rewards healthcare organizations for delivering high-quality care while reducing total healthcare costs.⁴ Organizations involved in an MSSP contract must meet quality performance scores for several metrics in order to share in the generated savings with CMS. In the 2016 reporting year, MSSP ACOs were required to report year-end quality performance for 33 metrics spanning a variety of clinical foci, including medication-related process and outcome metrics.⁵ Many ACOs have not yet integrated pharmacists due to challenges with reimbursement for pharmacist services and identifying high-impact quality improvement opportunities for pharmacists.⁶

In this paper, we describe the use of publicly available MSSP ACO data in Connecticut to determine opportunities for improvement in cost and medication-related quality performance. Then, we discuss the significant findings and directional trend analyses for ACO cost and medication-related quality performance outcomes. We also describe one approach to identifying the impact of pharmacists on cost and medication-related quality by demonstrating how clinical

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pharmacist leaders can facilitate conversations with ACO executive leaders to explore pharmacist service integration.

METHODS

Each year, CMS publishes a public compilation of cost and quality performance data for MSSP ACOs across the country.⁷ Data for the 2016 reporting year⁵ were analyzed to evaluate cost and medication-related quality performance for 13 Connecticut ACOs. Here, we explain our ACO data analysis approach.

Extraction of Connecticut ACO Data

We extracted the MSSP data⁵ for ACOs with networks based solely in Connecticut or ACOs with multistate networks that included Connecticut.

Review of MSSP Data Set

To ensure accurate interpretations of the data used in the analyses, we reviewed the definitions of all cost and quality performance metrics reported within the 2016 MSSP ACO data dictionary.⁸ This tool provides detailed explanations of each cost and quality metric, including the numerators and denominators used to report the data.

Identification of Research Questions

The following research questions guided the MSSP ACO data analyses: (1) What is the correlation between ACO cost performance and 30-day all-cause hospital readmissions (HRs) or emergency department (ED) utilization? (2) What is the correlation between ACO medication-related quality metric performance and HR rates or ED utilization? (3) What is the association between ACO cost performance and ACO governance? and (4) What is the association between ACO medication-related quality metric performance and ACO governance?

Hospital and ED utilization and cost/quality performance. Two of the aforementioned research questions explored correlations between HRs or ED utilization and (1) ACO cost performance or (2) ACO medication-related quality performance. We selected this approach because hospitalizations, including readmissions, and ED visits are large drivers of total healthcare costs.⁹ Additionally, 38% of the Connecticut ACOs are governed by health systems that are invested in efforts to reduce preventable HRs and unnecessary ED visits. Therefore, the impact of integrated population health pharmacists on reducing medication-related hospital and ED utilization could potentially lead to significant reductions in ACO total healthcare expenditures.

ACO governance and cost/quality performance. The remaining 2 research questions explored associations between ACO governance models and cost or medication-related quality performance metrics.

This was done to determine if quality improvement opportunities varied across ACOs with different governance structures. We categorized each Connecticut ACO as either physician-governed (PG) or health system-governed (HSG) based on publicly reported governance information found on each health system's website. PG ACOs "may include single or multiple owners (ie, physician groups/practices) but are characterized by providing outpatient care directly to their patient population and contracting with other providers to provide hospital or other services."¹⁰ HSG ACOs "may have a single or multiple owners (ie, hospital) with at least one owner providing direct inpatient services. Outpatient services may be provided directly if the owner(s) is an integrated health system or physician-hospital organization."¹⁰

Selection of Cost and Medication-Related Quality Metrics

The definitions of cost and medication-related quality performance metrics were reviewed to select metrics that had strong relevance to medication therapy or the potential for clinical impact by a population health pharmacist. Eight cost performance metrics and 10 medication-related quality performance metrics were used in the statistical analyses.

Data Analysis

Analysis of hospital and ED utilization and cost/quality performance. Correlation coefficient analyses were performed to determine the correlations between (1) HR rates and ACO cost or medication-related quality performance and (2) ED utilization rates and ACO cost or medication-related quality performance. Correlation coefficients (r) greater than 0.5 or less than -0.5 were further investigated for statistical significance using linear regression analyses. T tests were used to examine statistical significance for the influence of ACO cost or medication-related quality performance. $P < .05$ was considered statistically significant.

Analysis of ACO governance and cost/quality performance. Linear regression analysis was used to examine the influence of ACO governance on the individual cost and quality performance variables. T tests were used to examine statistical significance for the influence of ACO governance on the individual cost and quality performance variables. $P < .05$ was considered statistically significant.

RESULTS

Thirty-six correlation coefficient analyses were performed between (1) HR rates and cost or medication-related quality performance and (2) ED utilization rates and cost or medication-related quality performance. Thirteen correlations were statistically significant and are reported in **Table 1**.⁵

Eighteen linear regression analyses were performed between ACO governance and cost or medication-related quality

Table 1. Connecticut MSSP ACO Research Questions for Correlation and Linear Regression Analyses^a

Analysis of Hospital and ED Utilization and Cost/Quality Performance ^b				
Research Question	Cost/Quality Independent Variables ⁵	Correlation Coefficient and P ^c		
		30-Day Hospital Readmission	ED Utilization	
1. What is the correlation between ACO cost performance and: a. 30-day all-cause hospital readmissions? b. ED utilization?	Per capita total expenditures	0.702; P = .007*	0.708; P = .007*	
	Per capita total inpatient expenditures	0.870; P <.001*	0.719; P = .042*	
	Per capita SNF expenditures	0.779; P = .002*	0.755; P = .003*	
	Per capita home health expenditures	0.397 ^d	0.666; P = .013*	
2. What is the correlation between ACO medication-related quality metric performance ^e and: a. 30-day all-cause hospital readmissions? b. ED utilization?	ACO-15: administration of pneumococcal vaccination	-0.573; P = .041*	-0.384 ^d	
	ACO-17: tobacco use/cessation	-0.725; P = .005*	-0.611; P = .026*	
	ACO-27: percentage of beneficiaries with A1C >9%	0.772; P = .002*	0.582; P = .037*	
	ACO-33: use of an ACE inhibitor/ARB in beneficiaries with CHF, renal impairment, or diabetes	-0.650; P = .016*	-0.416 ^d	
Analysis of ACO Governance and Cost/Quality Performance ^f				
Research Question	Cost/Quality Dependent Variables ⁵	Cost/Quality Performance		
		Median (range) ^g		P ^h
		Physician-Governed ACOs	Health System-Governed ACOs	
3. What is the association between ACO cost performance and ACO governance?	Per capita total expenditures	\$10,075 (\$2450)	\$11,290 (\$3440)	.035*
	Per capita SNF expenditures	\$800 (\$428)	\$1162 (\$1079)	.021*
4. What is the association between ACO medication-related quality metric performance ^e and ACO governance?	Composite quality score	No statistically significant findings		
	ACO-39: documentation of medications in EHR			
	ACO-14: administration of influenza vaccination			
	ACO-15: administration of pneumococcal vaccination			
	ACO-17: tobacco use/cessation			
	ACO-27: percentage of beneficiaries with A1C >9%			
	ACO-28: percentage of beneficiaries with blood pressure <140/90 mm Hg			
	ACO-30: use of aspirin in beneficiaries with IVD			
	ACO-31: use of β-blockers in beneficiaries with CHF			
	ACO-33: use of an ACE inhibitor/ARB in beneficiaries with congestive heart failure, renal impairment, or diabetes			

A1C indicates glycated hemoglobin; ACE, angiotensin-converting enzyme; ACO, accountable care organization; ARB, angiotensin receptor blocker; CHF, congestive heart failure; ED, emergency department; EHR, electronic health record; IVD, ischemic vasculature disease; MSSP, Medicare Shared Savings Program; SNF, skilled nursing facility. *P <.05.

^aThe data used to perform the correlation coefficient/linear regression analyses above were extracted from the 2016 MSSP ACO database.⁵

^bCorrelation coefficient analyses were performed to determine the correlations between (1) 30-day all-cause hospital readmission rates and ACO cost or medication-related quality performance and (2) ED utilization rates and ACO cost or medication-related quality performance.

^cCorrelation coefficients (r) greater than 0.5 or less than -0.5 were further investigated for statistical significance using linear regression analysis. P values <.05 are significant. Only the statistically significant correlations identified in the analyses are shown.

^dOnly correlation coefficients (r) greater than 0.5 or less than -0.5 were further investigated for statistical significance using linear regression analysis. Therefore, there are no P values for correlation coefficients less than 0.5 or greater than -0.5.

^eOnly those cost and quality metrics that were determined to have strong relevance to medication therapy and had the potential for clinical impact by a pharmacist were included in the final analyses.

^fLinear regression analyses were used to examine the influence of ACO governance on the individual cost and quality performance variables.

^gRange is defined as the difference between the maximum and minimum values for each cost/quality variable across all physician-governed ACOs and health system-governed ACOs.

^hThe relationships between ACO governance and cost/quality performance were analyzed for statistical significance using t tests. P values <.05 are significant. Only the statistically significant relationships identified in the analyses are shown.

performance. Two statistically significant associations were found between ACO governance and cost performance and are reported in Table 1⁵ under “Analysis of ACO Governance and Cost/Quality Performance.” No statistically significant associations were noted between ACO governance and any of the medication-related quality performance metrics.

Given the limited number of statistically significant findings for the linear regression analyses between ACO governance and cost or medication-related quality performance, we conducted a descriptive trends analysis to identify potential differences in cost performance (Table 2⁵) and quality performance (Table 3⁵) according to ACO governance. Overall, HSG ACOs had greater expenditures (total and per capita) for all cost performance metrics, except for per capita physician/supplier expenditures. PG ACOs performed better on all medication-related quality metrics.

DISCUSSION

The statistically significant findings of the correlation coefficient and linear regression analyses and results of the cost and medication-related quality performance descriptive trend analyses are described as follows.

Analysis of Hospital and ED Utilization and Cost Performance (Table 1⁵)

Per capita total expenditures. Significant positive correlations were noted between (1) HRs and per capita total expenditures ($r = 0.702$; $P = .007$) and (2) ED utilization and per capita total expenditures ($r = 0.708$; $P = .007$). These results are expected given that HRs and ED visits are cost drivers for per capita total expenses.

Per capita total inpatient expenditures. A significant positive correlation was found between HRs and per capita total inpatient expenditures ($r = 0.870$; $P < .001$). As the number of HRs per patient increases, the per capita total inpatient expenditures should increase, as hospitalization expenditures are a major component of per capita total inpatient expenditures. Additionally, a significant positive correlation was noted between ED utilization and per capita total inpatient expenditures ($r = 0.719$; $P = .042$). Patients residing within the community are usually admitted to the hospital through the ED, which would increase the per capita total inpatient costs.

Per capita skilled nursing facility (SNF) expenditures. Significant positive correlations were noted between (1) HR and per capita SNF expenditures ($r = 0.779$; $P = .002$) and (2) ED utilization and per capita SNF expenditures ($r = 0.755$; $P = .003$). Both correlations are logical because patients who reside in SNFs usually have high acuity¹¹ and are likely to experience an HR and/or ED visit to address acute care needs.

Per capita home health expenditures. A significant positive correlation was identified between ED utilization and home healthcare expenditures ($r = 0.666$; $P = .013$). Home healthcare services are used for patients with complex medical needs or functional limitations to prevent use of more costly services,¹² such as SNF stays or HRs. Therefore, patients who receive home healthcare are often referred to the ED for evaluation of acute care problems.

Analysis of Hospital and ED Utilization and Quality Performance Measures (Table 1⁵)

ACO-15: pneumococcal vaccination. A significant negative correlation was noted between HRs and ACO-15 ($r = -0.573$; $P = .041$). This suggests that pneumococcal vaccinations in older adults prevent or lessen infection severity, thereby decreasing the likelihood of HRs. This may also explain the moderate negative correlation between ED utilization and ACO-15, although it was statistically insignificant ($r = 0.384$).

ACO-17: tobacco use/cessation. Significant negative correlations were identified between (1) HRs and ACO-17 ($r = -0.725$; $P = .005$) and (2) ED utilization and ACO-17 ($r = -0.611$; $P = .026$). This suggests that smoking cessation may prevent HRs or ED visits due to poor lung function (eg, chronic obstructive pulmonary disease, emphysema) or pulmonary infection (eg, pneumonia).

ACO-27: percentage of beneficiaries with glycated hemoglobin greater than 9%. Significant positive correlations were identified between (1) HRs and ACO-27 ($r = 0.772$; $P = .002$) and (2) ED utilization and ACO-27 ($r = 0.582$; $P = .037$). These findings imply that patients with uncontrolled diabetes are likely to be readmitted to the hospital or use the ED as a result of acute medical needs precipitated by hyperglycemia.

ACO-33: use of an angiotensin-converting enzyme inhibitor/angiotensin receptor blocker. A significant negative correlation was found between HRs and ACO-33 ($r = 0.650$; $P = .016$). This finding suggests that evidence-based prescribing of an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker in patients with congestive heart failure, renal impairment, or diabetes may prevent medical condition decompensation that may otherwise precipitate an HR.

Analysis of ACO Governance and Cost/Quality Performance (Table 1⁵)

Cost performance: per capita total expenditures. A significant association was found between ACO governance and per capita total expenditures ($P = .035$). HSG ACOs had a higher per capita total expenditure (median = \$11,290) compared with PG ACOs (median = \$10,075). Importantly, no significant differences in

Table 2. Connecticut MSSP ACO Cost Performance Trend Analysis by ACO Governance Model^a

ACO	Cost Performance									
	Achieved Shared Savings in CY 2016? (yes/no)	Total Number of Attributed Lives Across ACO, n	Total Annualized ACO Expenditures, \$	Total Healthcare Expenditure Benchmark Minus Total ACO Expenditures, \$	Per Capita Total Expenditures, \$	Per Capita Total Inpatient Expenditures, \$	Per Capita SNF Expenditures, \$	Per Capita Outpatient Expenditures, \$	Per Capita Physician/Supplier Expenditures, \$	Per Capita Home Healthcare Expenditures, \$
Physician-Governed										
1	Yes	30,480	292,645,206	12,475,518	9827	2810	818	1791	3398	706
2	No	7554	78,253,245	-3,218,330	10,582	3092	825	2263	3354	801
3	No	23,962	216,767,340	-183,058	9230	2916	500	1536	3874	319
4	No	12,967	124,405,157	3,014,662	9818	2858	708	1436	4213	463
5	No	17,717	186,287,218	-4,361,956	10,729	3035	782	2285	3519	835
6	No	24,538	280,244,139	-17,062,438	11,680	3480	928	2463	3559	995
7	No	11,891	114,885,409	-2,043,928	9918	3306	718	1898	3533	349
8	No	115,415	1,143,232,131	20,888,424	10,232	3286	820	2245	2858	577
Median (range^b)	N/A	20,840	201,527,279 (1,064,978,886)	-1,113,493 (37,950,862)	10,075 (2450)	3064 (670)	800 (428)	2072 (1027)	3526 (1355)	642 (676)
Health System-Governed										
9	No	20,845	228,374,218	-857,072	11,256	3301	1162	2373	3422	729
10	No	23,264	306,479,683	-9,976,071	13,557	4394	1840	2328	3761	1041
11	No	11,993	135,449,343	-145,560	11,613	3438	1200	2272	3468	920
12	No	27,957	307,761,505	-21,993,591	11,290	3199	908	2591	3473	799
13	Yes	18,646	183,633,439	8,312,722	10,117	3209	761	2231	2937	629
Median (range^b)	N/A	20,845	228,374,218 (172,312,162)	-857,072 (30,306,313)	11,290 (3440)	3301 (1195)	1162 (1079)	2328 (360)	3468 (824)	799 (412)

ACO indicates accountable care organization; CY, calendar year; MSSP, Medicare Shared Savings Program; N/A, not applicable; SNF, skilled nursing facility.

^aThe data above were extracted from the 2016 MSSP ACO database.⁵

^bRange is defined as the difference between the maximum and minimum values for each cost variable across all physician-governed ACOs or health system-governed ACOs.

Table 3. Connecticut MSSP ACO Medication-Related Quality Performance Trend Analysis by ACO Governance Model^a

ACO	PCP-to-Specialist Ratio ^b	Medication-Related Quality Performance ^c (%)															
		CQ	ACO-8 ^d	ACO-36 ^d	ACO-37 ^d	ACO-38 ^d	ACO-9 ^d	ACO-10 ^d	ACO-39	ACO-14	ACO-15	ACO-17	ACO-27 ^d	ACO-28	ACO-30	ACO-31	ACO-33
Physician-Governed																	
1	20.72	98	14.42	44.19	65.88	51.97	6.77	15.76	94.14	78.85	87.56	98.03	11.17	76.18	90.17	86.67	82.98
2	1.28	100	15.12	41.87	66.73	54.47	11.19	12.72	93.15	80.49	65.80	94.33	17.85	80.97	88.04	93.55	79.67
3	0.47	90	15.19	49.44	80.41	61.63	9.80	15.18	98.04	74.70	73.90	94.91	14.86	72.69	67.07	94.78	71.13
4	0.44	95	14.62	45.72	65.96	49.39	6.85	14.71	80.13	76.21	83.17	98.04	6.39	76.79	79.04	86.11	88.03
5	0.76	99	14.07	46.69	60.34	47.91	5.09	13.85	87.67	73.05	80.70	97.74	17.54	82.44	85.97	83.16	80.30
6	0.90	99	15.28	52.98	79.37	59.27	6.22	14.20	99.66	74.55	78.97	97.59	18.40	73.79	80.16	96.34	79.12
7	0.80	100	15.47	49.74	77.29	62.91	12.43	15.94	97.87	53.75	61.04	86.75	26.09	71.89	70.97	92.73	64.10
8	0.55	98	14.95	54.68	78.32	61.07	9.43	15.36	96.22	65.80	68.44	90.57	20.83	70.12	90.19	91.72	77.24
Median^e (range^f)	0.78	99 (10)	15.04 (1.40)	48.07 (12.81)	72.01 (20.07)	56.87 (15.00)	8.14 (7.34)	14.95 (3.22)	95.18 (19.53)	74.63 (26.74)	76.44 (26.52)	96.25 (11.29)	17.70 (19.70)	74.99 (12.32)	83.07 (23.12)	92.23 (13.18)	79.40 (23.93)
Health System-Governed																	
9	0.48	89	15.39	60.01	78.45	64.17	11.29	14.56	88.12	56.99	54.35	88.21	20.34	72.53	80.26	82.44	79.68
10	0.43	84	15.44	61.67	92.08	68.83	7.58	17.77	95.55	70.02	70.94	88.69	28.33	70.26	82.92	79.13	57.86
11	1.13	100	15.28	58.98	82.46	63.88	11.66	18.40	72.58	66.57	77.59	87.22	13.50	67.53	81.29	93.75	78.57
12	0.56	97	14.55	54.74	78.05	63.14	7.63	13.30	91.28	82.81	76.53	96.70	13.45	72.99	92.49	91.28	77.84
13	0.57	96	14.71	52.14	80.30	61.39	10.18	15.93	80.38	52.27	58.36	90.27	21.56	75.45	86.76	90.65	76.87
Median (range^f)	0.56	96 (16)	15.28 (0.89)	58.98 (9.53)	80.30 (14.03)	63.88 (7.44)	10.18 (4.08)	15.93 (5.10)	88.12 (22.97)	66.57 (30.54)	70.94 (23.24)	88.69 (9.48)	20.34 (14.88)	72.53 (7.92)	82.92 (12.23)	90.65 (14.62)	77.84 (21.82)

A1C indicates glycated hemoglobin; ACO, accountable care organization; CQ, composite quality score; MSSP, Medicare Shared Savings Program; PCP, primary care provider.

^aThe data above were extracted from the 2016 MSSP ACO database.⁵

^bDefined as the ratio of total primary care providers to total specialist providers across all practices within the ACO.

^cOnly those cost and quality metrics⁵ that were determined to have strong relevance to medication therapy and had the potential for clinical impact by a pharmacist were included in the final analyses. ACO-8 indicates risk-standardized all-cause readmissions; ACO-9, ambulatory care-sensitive admissions for chronic obstructive pulmonary disease or asthma in older adults; ACO-10, ambulatory care-sensitive admissions for heart failure; ACO-14, administration of influenza vaccination; ACO-15, administration of pneumococcal vaccination; ACO-17, tobacco use/cessation; ACO-27, percentage of beneficiaries with A1C >9%; ACO-28, percentage of beneficiaries with blood pressure <140/90 mm Hg; ACO-30, use of aspirin in beneficiaries with ischemic vasculature disease; ACO-31, use of β-blockers in beneficiaries with heart failure; ACO-33, use of an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker in beneficiaries with congestive heart failure, renal impairment, or diabetes; ACO-36, all-cause unplanned admissions for patients with diabetes; ACO-37, all-cause unplanned admissions for patients with heart failure; ACO-38, all-cause unplanned admissions for patients with multiple chronic conditions; ACO-39, documentation of medications in electronic health record.

^dLower performance score indicates better performance.

^eThis row indicates the highest median performance when comparing physician-governed and health system-governed ACO performance for each medication-related quality metric.

^fRange is defined as the difference between the maximum and minimum values for each cost/quality variable across all physician-governed ACOs or health system-governed ACOs.

total attributed patient lives were noted between HSG ACOs and PG ACOs (median = 20,840 and 20,845, respectively). This implies that the number of covered lives alone is not sufficient to explain differences in per capita total expenditures based on ACO governance. These findings also suggest that HSG ACOs may have larger or broader medical specialist and provider referral networks than PG ACOs. Therefore, PG ACOs may have greater control over the use of medical resources (eg, referral to medical specialists, ED or hospital utilization) within their practice network for attributed patients.

To further assess the differences in per capita total expenditures for PG ACOs and HSG ACOs, we analyzed associations between ACO governance and several individual components of the per capita expenditure.^{5,8} This analysis demonstrated that HSG ACOs had greater SNF expenditures (median = \$1162) compared with PG ACOs (median = \$800) ($P = .021$). This suggests that the difference in per capita total expenditures is due to the greater per capita SNF expenditures for HSG ACOs compared with PG ACOs. This variation in SNF expenditures for HSG and PG ACOs may be due to differences in SNF referral rates or patterns during care transitions and SNF preferred networks based on cost/quality performance.

Quality performance. No statistically significant associations were identified between ACO governance and medication-related quality performance, which suggests that ACO governance structure alone may be insufficient to identify these differences. Also, many of the medication-related quality performance metrics included in the 2016 ACO data set¹³ are process-oriented and are not related to patient clinical outcomes. A descriptive trend analysis of ACO governance differences in cost and quality performance is described below.

ACO Governance Descriptive Trend Analyses

ACO cost performance is shown in Table 2⁵ and ACO quality performance is shown in Table 3.⁵

ACO cost performance: annualized total ACO expenditures. HSG ACOs generated greater annualized total healthcare expenditures (median = \$228,374,218) compared with PG ACOs (median = \$201,527,279). This is supported by the finding that HSG ACOs generated greater per capita expenditures for all individual cost expenditure variables listed in Table 2⁵ except for “per capita physician/supplier expenditures.” Based on this finding, we examined the individual components of total expenditures to identify more specific differences between ACO governance models.

ACO cost performance: total healthcare expenditure benchmark minus total ACO expenditures. Although HSG ACOs

generated greater annualized total healthcare spending, they were closer to meeting their 2016 total healthcare expenditure benchmark compared with PG ACOs. HSG and PG ACOs surpassed their annualized total healthcare spending benchmark by medians of \$857,072 and \$1,113,493, respectively. This trend could be corroborated by differences in cost containment opportunities between health systems and affiliated physician medical groups. Health systems that have shared governance across inpatient and outpatient services have the capability to contain both inpatient and outpatient service costs within their ACO. Conversely, PG ACOs not associated with a health system have direct control over the costs for patient care services provided only within their practice network.

ACO cost performance: achievement of Medicare shared savings.

One PG ACO (ie, ACO no. 1, a single-state network in Connecticut) achieved shared savings in 2016. Notably, this ACO generated greater annualized total ACO expenditures for the 2016 calendar year (\$292,645,206) compared with the Connecticut median for PG ACOs (\$201,527,279). However, this ACO also generated lower per capita expenditures for most individual cost components, except for per capita home healthcare expenditures, compared with Connecticut median values for PG ACOs. It is possible that ACO no. 1 invested more per beneficiary in home healthcare services (\$706) compared with other PG ACOs in Connecticut (median = \$642) to avoid preventable acute care utilization, which would thereby lower the per capita total expenditure. It is also important to note that this PG ACO partnered with an integrated medical management company designed to provide clinical, administrative, and technical support for physician-led ACOs in late 2015. It is possible that the corporate oversight of a medical management company helped ACO no. 1 reduce its per capita expenditures and increase its opportunity to achieve shared savings,¹⁴ especially given that this was the first year the ACO achieved shared savings.

One of the HSG ACOs (ie, ACO no. 13, a multistate network spanning Rhode Island, Massachusetts, and Connecticut) achieved shared savings in 2016. ACO no. 13 generated one of the lowest annualized total healthcare expenditures in 2016 (\$183,633,439) compared with the other HSG ACOs in Connecticut (median = \$228,374,218). Additionally, this ACO generated below-median per capita expenditures for all individual cost performance variables listed in Table 2.⁵ It is possible that the smaller amount of attributed lives within this ACO (compared with other HSG ACOs) contributed to this ACO's ability to manage expenditures and achieve shared savings. Additionally, ACO no. 13's network is highly integrated, consisting of community hospitals, primary care and specialty medical groups, and a visiting nurse association (VNA). ACOs that have shared governance across outpatient medical practices, hospital systems, and community-based organizations, such as VNAs, may

be in a better position to achieve shared savings with an improved ability to manage healthcare costs at all care levels for beneficiaries. However, there is inconclusive evidence in the literature regarding factors that influence ACO performance.¹⁵ We also do not know how this ACO's costs for Connecticut providers compared with those for providers in the 2 other states.

ACO quality performance. PG ACOs performed better on all medication-related quality metrics listed in Table 3⁵ compared with HSG ACOs. This could be supported by the finding that PG ACOs have a larger number of primary care providers (PCPs) compared with specialist providers within their ACO network. PG ACOs had a greater PCP-to-specialist ratio (median = 0.78) compared with HSG ACOs (median = 0.56). ACOs with a larger number of PCPs may be more inclined to provide whole-person

chronic condition and preventive care. Therefore, ACOs that have a greater PCP-to-specialist ratio may be more likely to achieve higher overall quality performance scores for ambulatory care-sensitive chronic conditions and preventive care metrics, including those pertaining to medication use.

Practice Implications

Identifying opportunities for medication-related quality improvement. In Table 4,⁵ we demonstrate how a descriptive trends analysis of ACO medication-related quality performance measures can be used to identify opportunities for improvement in this area. We selected 1 PG ACO (ACO no. 5) and 1 HSG ACO (ACO no. 9) to illustrate variances in ACO-specific medication-related performance measures compared with the median value for each measure. For both ACOs, the top 3 variances in medication-

Table 4. Greatest Needs for Medication-Related Quality Performance Improvement for 2 Connecticut MSSP ACOs^a

Medication-Related Quality Metric ^b	Physician-Governed ACO (ACO No. 5)			Health System-Governed ACO (ACO No. 9)		
	ACO No. 5 Performance, %	Median Performance for Connecticut Physician-Governed ACOs, %	Opportunity for Performance Improvement, ^c %	ACO No. 9 Performance, %	Median Performance for Connecticut Health System-Governed ACOs, %	Opportunity for Performance Improvement, ^c %
ACO-8 ^e	14.62	15.04	-0.42	15.39	15.28	0.11
ACO-36 ^e	45.72	48.07	-2.35	60.01	58.98	1.03
ACO-37 ^e	65.96	72.01	-6.05	78.45	80.30	-1.85
ACO-38 ^e	49.39	56.87	-7.48	64.17	63.88	0.29
ACO-9 ^d	6.85	8.14	-1.29	11.29	10.18	1.11
ACO-10 ^e	14.71	14.95	-0.24	14.56	15.93	-1.37
ACO-39	80.13	95.18	-15.05 ^d	88.12	88.12	0
ACO-14	76.21	74.63	1.58	56.99	66.57	-9.58 ^d
ACO-15	83.17	76.44	6.73	54.35	70.94	-16.59 ^d
ACO-17	98.04	96.25	1.79	88.21	88.69	-0.48
ACO-27 ^e	6.39	17.70	-11.31	20.34	20.34	0
ACO-28	76.79	74.99	1.80	72.53	72.53	0
ACO-30	79.04	83.07	-4.03 ^d	80.26	82.92	-2.66
ACO-31	86.11	92.23	-6.12 ^d	82.44	90.65	-8.21 ^d
ACO-33	88.03	79.40	8.63	79.68	77.84	1.84

A1C indicates glycated hemoglobin; ACO, accountable care organization; MSSP, Medicare Shared Savings Program.

^aThe data above were extracted from the 2016 MSSP ACO database.³

^bOnly those cost and quality metrics⁵ that were determined to have strong relevance to medication therapy and had the potential for clinical impact by a pharmacist were included in the final analyses. ACO-8 indicates risk-standardized all-cause readmissions; ACO-9, ambulatory care-sensitive admissions for chronic obstructive pulmonary disease or asthma in older adults; ACO-10, ambulatory care-sensitive admissions for heart failure; ACO-14, administration of influenza vaccination; ACO-15, administration of pneumococcal vaccination; ACO-17, tobacco use/cessation; ACO-27, percentage of beneficiaries with A1C >9%; ACO-28, percentage of beneficiaries with blood pressure <140/90 mm Hg; ACO-30, use of aspirin in beneficiaries with ischemic vasculature disease; ACO-31, use of β -blockers in beneficiaries with heart failure; ACO-33, use of an angiotensin-converting enzyme inhibitor/angiotensin receptor blocker in beneficiaries with congestive heart failure, renal impairment, or diabetes; ACO-36, all-cause unplanned admissions for patients with diabetes; ACO-37, all-cause unplanned admissions for patients with heart failure; ACO-38, all-cause unplanned admissions for patients with multiple chronic conditions; ACO-39, documentation of medications in electronic health record.

^cOpportunities for medication-related quality performance improvement were calculated by subtracting the Connecticut (physician-governed or health system-governed ACO) median performance score from the individual ACO performance score for each medication-related quality metric.

^dThese cells indicate the metrics with the largest magnitude for improvement (considered the top 3 greatest opportunities for medication-related performance improvement). Although measures ACO-38 and ACO-27 for ACO no. 5 resulted in large variances, ACO no. 5 achieved better performance for these measures compared with the average for Connecticut physician-governed ACOs and were therefore not included in the top 3 opportunities for performance improvement.

^eLower performance score indicates better performance.

related performance measures show areas with the greatest opportunity for improvement. This approach can help pharmacist leaders align ACO pharmacist service integration opportunities with the greatest needs for medication-related performance improvement for a particular ACO in their state.

Facilitating discussions with C-suite executives. The approach shown in Table 4⁵ can generate data to engage C-suite executive leaders in discussions about integrating pharmacist services in ACOs. Pharmacy leaders can use this approach to propose strategies for pharmacist service integration to support their role in population health management to prevent readmissions and inappropriate use of medications and to optimize medication use and safety for chronic diseases. In Table 5, we exemplify this approach using the performance improvement needs identified in Table 4⁵ for ACO no. 5 and ACO no. 9 (defined as the top 3 quality metrics with greatest magnitude for performance improvement).

Limitations

There are some limitations to the data analyses. First, the data set used to perform the statistical analyses is small and, therefore,

it is possible that it fails to reveal significant correlations due to the limited number of ACOs. Second, the analysis of cost and medication-related quality performance was conducted for ACOs in a single state. Therefore, individuals looking to use this approach will need to consider that there may be wide variations in the results of the cost and quality analyses depending on the state or geographic location of the ACOs selected for analyses. Also, we made assumptions about the selected cost and quality measures that could be affected by pharmacists' services or medication therapy based on clinical practice experiences. Finally, we did not know if ACOs had any existing pharmacist programs directed at the selected cost and quality measures. Given that most cost and quality measures had room for improvement, we believe that the analyses show opportunity for further pharmacist involvement.

CONCLUSIONS

As healthcare payment continues to move away from fee-for-service toward value-based payment models and shared savings, an opportunity exists to integrate population health pharmacists into ACO care teams. Analysis of publicly reported MSSP ACO data is one method that pharmacists can use to identify effective

Table 5. Talking Points to Engage Discussions With ACO Leaders for Pharmacist ACO Integration

Performance Improvement Opportunity	Pharmacist Service Integration Opportunities
Physician-Governed ACO No. 5	
1. ACO-39: documentation of medications in electronic health record	<ul style="list-style-type: none"> Integrate a pharmacist into care management teams to conduct comprehensive medication reviews and medication reconciliation for patients with multiple or complex medication regimens Embed a pharmacist in primary care practice(s) to conduct face-to-face or telephonic comprehensive medication reviews and medication reconciliation prior to in-office appointments with primary care providers
2. ACO-30: use of aspirin in beneficiaries with ischemic vasculature disease	<ul style="list-style-type: none"> Close medication therapy gaps in care by: <ol style="list-style-type: none"> Integrating a pharmacist into care transitions teams for high-risk patients with ischemic vasculature disease or CHF Having a pharmacist review population health reports to identify patients requiring aspirin or β-blocker therapy
3. ACO-31: use of β -blockers in beneficiaries with CHF	
Health System-Governed ACO No. 9	
1. ACO-14: administration of influenza vaccination	<ul style="list-style-type: none"> Schedule a pharmacist vaccination clinic for common vaccine-preventable diseases (eg, influenza, pneumococcal disease) within the health system's outpatient provider practices Collaborate with local community pharmacists to close vaccination gaps in care for ACO patients requiring influenza and pneumococcal vaccinations
ACO-15: administration of pneumococcal vaccination	
3. ACO-31: use of β -blockers in beneficiaries with CHF	<ul style="list-style-type: none"> Close medication therapy gaps in care by: <ol style="list-style-type: none"> Integrating a pharmacist into care transitions teams for high-risk patients with CHF Having a pharmacist review population health reports to identify patients requiring β-blocker therapy

ACO indicates accountable care organization; CHF, congestive heart failure.

medication-related quality performance improvement opportunities for ACOs in their state. This approach can provide pharmacy executives and clinical pharmacy leaders with state-level data to prepare for discussions with ACO executive leaders about population health pharmacist integration.

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