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RESEARCH ARTICLE

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Impact of a selective narrow network with comprehensive patient navigation on access, utilization, expenditures, and enrollee experiences

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Abstract

Objective: To examine the effect of enrollee switching from a broad-network accountable care organization (ACO) health maintenance organization (HMO) to a "high performance" ACO-HMO with a selective narrow network and comprehensive patient navigation system on access, utilization, expenditures, and enrollee experiences.

Data Sources: Secondary administrative data were obtained for 2016–2020, and primary interview and survey data in 2021.

Study Design: Fixed-effects instrumental variable analyses of administrative data and regression analyses of survey data. Outcomes included access, utilization, expenditures, and enrollee experience. Background information was gathered via interviews.

Data Collection/Extraction Methods: We obtained medical expenditure/enrollment and access data on continuously enrolled members in a broad-network ACO-HMO ($n = 24{,}555$), a subset of those who switched to a high-performance ACO-HMO in 2018 ($n = 7664$); interviews of organizational leaders ($n = 13$); and an enrollee survey ($n = 512$).

Principal Findings: Health care effectiveness data and information Set (HEDIS) access measures were not different across plans. However, annual utilization dropped by 15.5 percentage points (95% CI: 18.1, 12.9) more in the high-performance ACO-HMO, with relative annual expenditures declining by $1251 (95% CI: $1461, $1042) per person per year. High-performance ACO-HMO enrollees were 10.1 percentage points (95% CI 0.001, 0.201) more likely to access primary care usually or always as soon as needed and 11.2 percentage points (95% CI 0.007, 0.217) more likely to access specialty care usually or always as soon as needed. Plan satisfaction was 7.1 percentage points (95% CI: −0.001, 0.138) higher in the high-performance ACO-HMO. Interviewees noted the comprehensive patient navigation system was designed to ensure patients remained in the narrow network to receive care.

Conclusions: ACO and HMO contracts with selective narrow networks supported by comprehensive patient navigation can reduce expenditures and improve specialty access and patient satisfaction compared to broad-network plans that lack these features. Payers should consider implementing narrow networks with comprehensive support systems.

KEYWORDS
health care costs, health care organizations and systems, instrumental variables, observational data/quasi-experiments

What is known on this topic

- ACOs meet most quality goals and produce reductions in expenditures, primarily due to lower outpatient expenditures for medically complex patients and fewer low-value services being delivered.
- Selection effects account for most of the cost savings in narrow-network plans relative to broad-network plans.

What this study adds

- When combined with narrow networks, comprehensive patient navigation and support systems can ensure patients stay within the network, reduce unneeded medical care, and improve patient satisfaction, all while reducing expenditures.
- Surveyed members of the narrow-network plan were more likely to usually/always visit their primary care provider or see a specialist as soon as needed as compared to broad-network plan members.

1 | INTRODUCTION

Accountable care organizations (ACOs) are "groups of health care providers who give coordinated care [and] chronic disease management [where]… the organization's payment is tied to achieving healthcare quality goals and outcomes that result in cost savings."[1] ACOs produce reductions in expenditures, primarily due to lower outpatient expenditures for medically complex patients, and fewer low-value services delivered.[2] ACOs also meet most quality goals,[2] including health care effectiveness data and information set (HEDIS) measures.

While often seen in juxtaposition to health maintenance organizations (HMOs),[3] there are ACOs that are also HMOs in some markets.[4,5] These ACOs combine hospitals, independent practice associations (IPAs), and an insurer that partners to improve the coordination of care. Coordination is incentivized via the sharing of savings (and sometimes losses) depending on the achievement of cost/quality goals in proprietary agreements.[4] This occurs within a capitated HMO environment.

This study examines the introduction of a high-performance ACO-HMO into the commercial insurance plan offerings of a set of large metropolitan organizations. High performance refers to high-quality care being provided at a lower premium. The high-performance ACO-HMO was designed to align financial and strategic incentives across hospitals, IPAs, and the insurer while focusing on serving enrollees holistically across the care continuum. The high-performance ACO-HMO included a selective narrow network, extensive data sharing, and a comprehensive patient navigation and customer support system.

The colocated patient navigation and customer support system included registered nurses, pharmacists, pharmacy technicians, health coaches, social workers, and customer representatives. The primary tasks of the team included helping enrollees (1) find a new doctor/specialist within the network, (2) continue receiving uninterrupted care, (3) obtain answers to questions regarding doctor's instructions, (4) obtain answers to drug/supplement questions, (5) transfer medical records and prescriptions, and (6) understand health benefits.

IPAs within the high-performance ACO-HMO were incentivized via the following trade-off: they received a lower base capitation rate but received additional funding if they achieved quality and cost improvements. Their resulting implicit capitation rate could thus be larger than the original rate.

The high-performance ACO-HMO had a lower premium than the broad-network ACO-HMO. The broad-network ACO-HMO was presented to consumers as an HMO since only a subset of IPAs within the plan were subject to ACO contracts (approximately 75% of IPAs). By contrast, the high-performance ACO-HMO was presented to consumers as an ACO. The benefit packages of both health plans were identical apart from the narrow network and comprehensive patient navigation system (both plans had customer support systems, but the high-performance plan integrated its customer support with a comprehensive patient navigation system). We compared outcomes between the high-performance ACO-HMO and the broad-network ACO-HMO in which the enrollees in the high-performance ACO-HMO were originally enrolled.

Previous work has examined ACO-HMO plans in which enrollees were unaware of the ACO status of their IPA, making an enrollee's assignment to an ACO-HMO versus an HMO effectively exogenous.[4,6] In contrast, enrollees made an explicit choice to enroll in the newly introduced high-performance ACO-HMO studied here, making each enrollee's assignment to the high-performance ACO-HMO endogenous. While it is unknown whether enrollees chose the high-performance ACO-HMO solely or even partially due to its ACO status, the endogeneity of plan choice remains, so we use an individual

fixed-effects instrumental variable strategy to account for this. To our knowledge, this is the first study to examine the causal effect of a high-performance ACO-HMO relative to a broad-network ACO-HMO on expenditures, utilization, and access.

Some unique features characterize the plans. First, the same health insurer that organized the broad-network ACO-HMO also organized the high-performance ACO-HMO. In fact, the high-performance ACO-HMO was developed based on the insurer's experience with the broad-network ACO-HMO, in which a subset of participating IPAs was subject to ACO contracts, but enrollees were unaware of the ACO status of their IPA. This is similar to the situation that existed in past ACO-HMO research.[4,6] A select group of practices in the broad-network ACO-HMO (a subset of IPAs with ACO contracts) become part of the new high-performance ACO-HMO. After the introduction of the high-performance ACO-HMO, the broad-network ACO-HMO continued to have IPAs subject to ACO contracts.

IPAs were chosen to participate in the high-performance ACO-HMO based on the insurer's goals regarding network and geographical access, the ability to reach rate agreements, and consumer demand. Thus, neither IPAs nor physicians were randomly allocated between the two ACO-HMOs. However, the narrow/broad network distinction only applied to IPAs; the same set of hospitals was available to enrollees of either ACO-HMO.

The high-performance ACO-HMO was intended to include approximately one-half of the physicians from the broad-network ACO-HMO. This was considered the "sweet spot", below which few patients may enroll in the high-performance ACO-HMO, as its network may be perceived as too narrow. Also, physicians were not required to practice solely in either the high-performance or broad-network ACO-HMO but could affiliate with both. Physicians who practiced in both plans were those who practiced in IPAs subject to ACO contracts. ACO activities to improve quality and efficiency, whether for the broad-network or high-performance ACO-HMO, usually involved the same IPAs.

We hypothesized there would be no difference in average annual expenditures conditional on any utilization occurring. In contrast, we hypothesized that a lower proportion of patients would use any care in the high-performance ACO-HMO relative to the broad-network ACO-HMO due to the tendency of the comprehensive patient navigation and customer support system to minimize unneeded and inappropriate care, as well as to promote both timely and preventive care. Since total annual average expenditures are the product of the annual average propensity to use care and average annual expenditures conditional on any utilization occurring, we hypothesized we would find a reduction in overall average annual expenditures in the high-performance ACO-HMO relative to the broad-network ACO-HMO. Finally, it was unclear whether access would have been affected because the comprehensive patient navigation and customer support system may have facilitated needed appointments, mitigating any unintended restrictive effects of the select narrow-network of the high-performance ACO-HMO.

2 | METHODS

2.1 | Data

This research received Institutional Review Board approval. Medical expenditure/enrollment data were from 2016 to 2020 and included neither data on prescription drugs administered by pharmacy benefits managers (PBMs) nor data on carved-out mental health services. The analytic sample included 122,775 observations: 24,555 enrollees under age 65 continuously enrolled in either the broad-network ACO-HMO (2016–2020) or continuously enrolled in the broad-network ACO-HMO for 2 years (2016–2017) and then continuously enrolled for 3 years in the high-performance ACO-HMO (2018–2020). HEDIS access data were only available for 2017–2019 (64,359 observations, 21,453 enrollees). All data are for commercial enrollees employed in a large US metropolitan area and were obtained from the single insurer that organized the two ACO-HMOs studied here.

Thirteen interviews with leaders of major organizations involved in both plans were conducted. Leaders selected had intimate knowledge of the ACO-HMOs under study. Two members of the research team conducted 30-to-60-min interviews via internet video conferencing or telephone and used a semi-structured interview guide with 28 open-ended questions on history and background, care delivery and coordination, ACO processes, performance measurement, evaluative factors, and strategic factors. A separate paper will present interview analyses and results in detail.

Finally, a 2021 survey of enrollees was conducted on overall access, primary care provider relationship, medication reconciliation, care for chronic conditions, care coordination, access to specialists, gatekeeping, mental health services, plan satisfaction, and sociodemographics. The response rate was 17% and the analytic sample includes 512 respondents of which 461responses for individuals under age 65 could be analyzed using regression analyses. Weighted responses reflect the 2020 enrollment of both plans. See the Appendix S1.

2.2 | Outcome variables

The following outcome variables were available from the medical expenditure/enrollment data: annual expenditures, annual HEDIS measures of adult and child/adolescent access to care. Annual expenditures were divided into whether any expenditures were reported (any positive utilization), and the logarithm of total expenditures conditional on a positive level of expenditures.

HEDIS access measures included HEDIS Adults' Access to Preventive/Ambulatory Health Services and HEDIS Children and Adolescents' Access to Primary Care Practitioners.[7,8] Adult access describes "commercial members who had an ambulatory or preventive care visit during the measurement year or the two years prior to the measurement year."[7] Children and adolescent access is defined differently by group: children aged 1–6 who had a visit with a PCP during the measurement year; children/adolescents aged 7–19 who had a visit with a PCP during the measurement year or the year prior.[8]

The key background information from the interviews used here is whether the only observed differences between the plans were, as intended, the narrow network and the patient navigation and customer support system. These were judged qualitatively.

All measures from the survey were used as outcome variables except for demographic and health status variables and outcome variables with less than 90 observations due to skipping patterns. See the Appendix S1.

2.3 | Covariates and instrumental variable

Medical expenditure/enrollment data included age, sex, employee status, spouse/partner status, dependent status, monthly primary care physician (PCP) identifier, monthly enrollment status, monthly health plan status, and annual risk scores. Annual risk scores were the Verisk/Cotiviti DxCG (diagnostic cost grouper) measure.[9] Risk scores are sensitive to the completeness/accuracy of ICD-10-CM diagnosis codes.[10] Multiple interviewees noted that a program had been implemented during 2018–2020 to improve coding accuracy and was focused on all physicians, regardless of plan. Availability of the same PCP in the high-performance relative to the broad-network ACO-HMO plan at the time of the introduction of the high-performance ACO-HMO plan was generated by our comparing each enrollee's PCP (if any) during the open enrollment period in 2017 to the list of high-performance ACO-HMO PCPs available during 2018.

Survey data included the following: mental and physical health status, age, gender, race/ethnicity, education, LGBT+ identification, and household income. See the Appendix S1.

2.4 | Econometric models

To isolate the effect of the introduction of the high-performance ACO-HMO plan on outcomes, we only included continuously enrolled individuals. To control for omitted variable bias affecting enrollment in the high-performance ACO-HMO, we employed individual fixed effects and an instrumental variable. Individual fixed effects controlled for all time-invariant characteristics at baseline. The instrumental variable controlled for all time-varying characteristics. In order to do this, the instrument must have been exogenous, strongly correlated with enrollment in the high-performance ACO-HMO, and uncorrelated with the error term conditional on included covariates.[11]

Our instrument was the availability of the same PCP if an enrollee chose the high-performance ACO-HMO. Whether or not a given PCP was available in the high-performance ACO-HMO was exogenously determined by the high-performance ACO-HMO. The choice to maintain the same PCP has been highly valued by patients when selecting a health plan.[12,13] We applied Stock-Yogo weak instrument tests to evaluate the strength of the instrument.[14]

However, maintaining PCP continuity may have been correlated with an enrollee's health status (those with lower health status may be more likely to seek PCP continuity), opportunity cost (those with higher earnings may have been more likely to seek PCP continuity to avoid the higher implicit search costs involved in choosing a new PCP), and the quality of an enrollee's current physician. If any of these were present in the error term, the instrument would be correlated with the error term, violating the last criterion for instrument validity. Thus, for the outcomes of any nonzero expenditures (utilization), expenditures conditional on utilization, and access, we included the risk score as a covariate.

The opportunity cost of an enrollee's time and any residual health status not accounted for by the risk score were accounted for by individual fixed effects. Finally, the quality of each enrollee's baseline physician was accounted for by individual fixed effects.

Thus, the only possible pathway by which the offer of the same PCP could have impacted our outcome variables would be via the individual's choosing a plan that allowed such continuity. Thus, the instrument represented an exogenous offer regarding PCP continuity.

We used two-stage least squares (2SLS) with individual fixed effects to estimate each model. We estimated two different models: (1) two-part expenditure models, and (2) access models.

The two-part expenditure model separated the extensive margin and the intensive margin because this distinction is of interest to policy makers and because this allowed us to take advantage of probability rules, specifically $E(y|x) = \Pr(y > 0|x) \times E(y \mid y > 0, x)$, where y represents expenditures and x represents one or more independent variables.[15] Thus, we estimated the relevant parameters to compute the following equation describing the incremental impact of the high-performance ACO-HMO relative to the broad-network ACO-HMO, where x_d referred to the binary indicator for the high-performance ACO-HMO:

$$\begin{aligned} E(y|x_d=1) - E(y|x_d=0) = &\left(\Pr\left(y>0 \mid x_d=1\right) - \Pr\left(y>0 \mid x_d=0\right)\right) \\ &\times E\left(y \mid y>0, x_d=1\right) + \Pr\left(y>0 \mid x_d=0\right) \\ &\times \left(E\left(y \mid y>0, x_d=1\right) - E\left(y \mid y>0, x_d=0\right)\right) \end{aligned} \quad (1)$$

To estimate this equation required, in part, parameters from the following equations:

$$\begin{aligned} \Pr(Expend>0) = &\alpha_0 + \alpha_1 High\_Performance + \alpha_2 Year2018\_2020 \\ &+\alpha_3 Age + \alpha_4 Age^2 + \alpha_5 (Age \times Female) \\ &+\alpha_6 (Age \times Employee) + \alpha_7 (Age \times Partner) \\ &+\alpha_8 \left(Age^2 \times Female\right) + \alpha_9 \left(Age^2 \times Employee\right) \\ &+\alpha_{10} \left(Age^2 \times Partner\right) + \alpha_{11} PropYearEnroll \\ &+\alpha_{12} RiskScore + \alpha_{13} FE + \varepsilon, \end{aligned} \quad (2)$$

$$\begin{aligned} \ln(Expend|Expend>0) = &\beta_0 + \beta_1 High\_Performance + \beta_2 Year2018\_2020 \\ &+\beta_3 Age + \beta_4 Age^2 + \beta_5 (Age \times Female) \\ &+\beta_6 (Age \times Employee) + \beta_7 (Age \times Partner) \\ &+\beta_8 \left(Age^2 \times Female\right) + \beta_9 \left(Age^2 \times Employee\right) \\ &+\beta_{10} \left(Age^2 \times Partner\right) + \beta_{11} PropYearEnroll \\ &+\beta_{12} RiskScore + \beta_{13} FE + \varsigma, \end{aligned} \quad (3)$$

where *Expend* refers to expenditures, *High_Performance* was a binary indicator of high-performance ACO-HMO status in the 2018–2020

period, *Year* 2018_2020 indicated the three-year period during which enrollees were continuously enrolled in either the high-performance or broad-network ACO-HMO (*Year* 2018_2019 for HEDIS outcomes), *Age* indicated age (0–64), *Female* indicated biological sex, *Employee* was an indicator of employee status, *Partner* was an indicator of partner/spouse, *PropYearEnroll* was the proportion of the year someone is enrolled, *Risk Score* was each individual's concurrent risk score, and *FE* were individual fixed effects. The square of *Age* was included to capture any nonlinear association of age with the outcome. Interaction terms were included to capture variation among subgroups.

The access model took the following form:

$$\begin{aligned}\Pr(HEDIS=1) = {} & \theta_0 + \theta_1 High\_Performance + \theta_2 Year2018\_2019 \\ & + \theta_3 Age + \theta_4 Age^2 + \theta_5 (Age \times Female) \\ & + \theta_6 (Age \times Employee) + \theta_7 (Age \times Partner) \\ & + \theta_8 \left(Age^2 \times Female\right) + \theta_9 \left(Age^2 \times Employee\right) \\ & + \theta_{10} \left(Age^2 \times Partner\right) + \theta_{11} PropYearEnroll \\ & + \theta_{12} RiskScore + \theta_{13} FE + \upsilon, \end{aligned} \quad (4)$$

where *HEDIS* refers to HEDIS. Each of the above models was the second stage of 2SLS models, where the first stage was defined as follows (the access model substituted *Year* 2018_2019 for *Year* 2018_2020)

$$\begin{aligned}\Pr(High\_Performance) = {} & \pi_0 + \pi_1 KeepPCPIV + \pi_2 Year2018\_2020 \\ & + \pi_3 Age + \pi_4 Age^2 + \pi_5 (Age \times Female) \\ & + \pi_6 (Age \times Employee) + \pi_7 (Age \times Partner) \\ & + \pi_8 \left(Age^2 \times Female\right) + \pi_9 \left(Age^2 \times Employee\right) \\ & + \pi_{10} \left(Age^2 \times Partner\right) + \pi_{11} PropYearEnroll \\ & + \pi_{12} RiskScore + \pi_{13} FE + \epsilon. \end{aligned} \quad (5)$$

where *KeepPCPIV* was the binary instrumental variable indicating whether that person was offered the opportunity to keep the same PCP if they switched to the high-performance ACO-HMO. In the equations, $\alpha, \beta, \gamma, \theta, \pi$ represented estimated coefficients, and $\varepsilon, \varsigma, \zeta, \upsilon, \epsilon$ represented error terms.

Equations (2), (4) and (5) were modeled using 2SLS linear probability models with individual fixed effects rather than logit or probit models. This was because neither logit nor probit models allow individual fixed effects to be included in a manner that produces consistent estimates of marginal effects.[16,17] Linear probability models provided a good approximation of the relevant local average treatment effect (LATE).[18] In the current case, LATE captured the average treatment effect, assuming treatment effects are homogeneous, for individuals who chose the high-performance ACO-HMO due to being able to maintain the same PCP. Equation (3) was estimated using a log-linear individual fixed-effects 2SLS model.

Survey measures were estimated using generalized least squares, weighted to the enrolled population in 2020, and used linear probability models for binary dependent variables, and linear or log-linear models for continuous dependent variables. All regressions controlled for mental and physical health status, age group, gender, race/ethnicity, education, LGBT+ identification, and household income category. See the Appendix S1.

Models were estimated in Stata 16 using *xtivreg2*, *xtreg*, and *regress*. All models were estimated with robust standard errors.[19]

2.5 | Qualitative interview methodology

A combined inductive-deductive approach was used to develop a codebook informed by the de-identified interviews and interview guide questions. Coding was conducted by the second and third authors, and differences in interpretation were reconciled during meetings. Interview information was used primarily as background information in this study due to space limitations.

2.6 | Survey methodology

The survey used language from other surveys validated in the academic literature. It was sent to 3024 enrollees of both plans with available email addresses. The survey was fielded for one month, with regular reminder emails sent to members who had not yet completed the survey. See the Appendix S1.

3 | RESULTS

3.1 | Medical expenditure/enrollment results

In the 2020 portion of the analytic sample, 41.1% of PCPs participated only in the broad-network ACO-HMO (962 PCPs in 26 IPAs), 51.7% participated in both the broad-network and the high-performance ACO-HMO (1209 PCPs in 70 IPAs), and 7.2% only participated in the high-performance ACO-HMO (169 PCPs in 23 IPAs). See Table 1 for descriptive statistics of enrollees. The column describing the 2016–2017 period before the introduction of the high-performance ACO-HMO represented only enrollment in the broad-network ACO-HMO.

Whether expenditures were incurred at all (any positive utilization), was significantly different between the broad-network and the high-performance ACO-HMOs. As shown in Table 2, the high-performance ACO-HMO reduced utilization by 15.5 percentage points (95% CI: 18.1, 12.9) relative to the broad-network ACO-HMO. This is consistent with the two features of the high-performance ACO-HMO that were not present in the broad-network ACO-HMO, the select narrow network and the comprehensive patient navigation and customer support system.

However, an additional finding was a joint 18.9 percentage point (95% CI: 17.7, 20.0) reduction across both ACO-HMOs. This is consistent with background interviews indicating a series of programs and efforts to improve the delivery of care across both ACO-HMOs, programs that were due to the combined efforts of the IPAs of both ACO-HMOs and the insurer. These programs are not described in

TABLE 1 Descriptive statistics of balanced panel of continuously enrolled individuals less than 65 years of age

	Preperiod (2016–2017) Total enrollees mean (SD)	Postperiod (2018–2020)		
		Total enrollees mean (SD)	High-performance network mean (SD)	Broad network mean (SD)
Proportion of enrollees choosing each network at the transition point	-	-	0.312	0.688
Risk score	1.424(3.734)	1.450(4.297)	1.450(4.297)	1.503(4.396)
Any expenditures	0.795	0.535	0.474	0.562
Annual expenditures if expenditures >0	6139(31277)	7830(40416)	8074(46784)	7737(37694)
Total annual expenditures	4884(28006)	4186(29806)	3830(32472)	4347(28514)
Proportion of year enrolled	0.985	0.965	0.965	0.965
Demographics				
Age	36.3(18.5)	38.8(18.6)	40.4(18.9)	38.1(18.8)
Female	0.522	0.522	0.512	0.526
Employee	0.490	0.490	0.55	0.463
Spouse/Partner	0.186	0.186	0.176	0.191
Dependent	0.324	0.324	0.274	0.346
Instrument: Same PCP available in high-performance network at transition point	0	0.727	0.979	0.612
Observations	49,110	73,665	22,992	50,673
Individual enrollees	24,555	24,555	7664	16,891
HEDIS access measure	Preperiod (2017)	Postperiod (2018–2019)		
Access	0.957	0.963	0.954	0.966
Observations	21,453	42,906	13,080	29,826
Individual enrollees	21,453	21,453	6540	14,913

Abbreviations: HEDIS, Healthcare Effectiveness Data and Information Set; PCP, primary care provider; SD, standard deviation.

detail here due to space limitations and because these programs are not relevant to the issue of the relative performance of the two ACO-HMOs.

Annual expenditures conditional on utilization are presented in Table 3. We find no statistical difference in the annual expenditures per patient treated between enrollees in the high-performance ACO-HMO versus the broad-network ACO-HMO. This is consistent with multiple interviewees' comments on programs being implemented to increase medical efficiency and effectiveness and that these programs focused on all physicians, regardless of plan.

Finally, regarding HEDIS access measures, access did not vary between the high-performance relative to the broad-network ACO-HMO. See Table 4.

The overall reduction in annual average expenditures due to the introduction of the high-performance ACO-HMO can be determined using Equation (1). However, since there was not a statistically significant impact on the $(E(y \mid y > 0, x_d = 1)) - (E(y \mid y > 0, x_d = 0))$ portion of Equation (1), making it effectively zero, we only need to compute $(\Pr(y > 0 \mid x_d = 1) - \Pr(y > 0 \mid x_d = 0)) \times E(y \mid y > 0, x_d = 1)$, where x_d indicates the high-performance ACO-HMO. This is equal to \$1251 (0.155 × \$8074; 95% CI: \$1461, \$1042) per patient per year.

3.2 | Sensitivity analyses

Sensitivity analyses were performed, including (1) limiting the dataset only to patients who maintained the same physician during the entire period ($n = 101{,}592$ (24,226 enrollees) for any expenditures and expenditures conditional on positive utilization; and $n = 52{,}424$ (19,432 enrollees) for HEDIS access measures), (2) limiting the dataset only to patients whose physician(s) was(were) involved in both the high-performance and the broad network ACO-HMOs during the 2018–2020 period ($n = 93{,}385$ (20,071 enrollees) for any expenditures and expenditures conditional on positive utilization; and $n = 49{,}741$ (16,939 enrollees) for HEDIS access measures), and (3) limiting the dataset to only patients who maintained the same physician where that physician was involved in both the high-performance and the broad network ACO-HMO during the 2018–2020 period ($n = 77{,}096$ (18,768 enrollees) for any expenditures and expenditures conditional on positive utilization; and $n = 39{,}428$ (14,488 enrollees) for HEDIS access measures). Finally, since the last year of data, 2020, was collected during the beginning of COVID-19 in the relevant geographical areas studied, we also added a COVID-19 indicator to the original set of models and each of the sensitivity analyses performed

TABLE 2 Effect of high-performance ACO-HMO choice on any expenditures: Instrumental variables and OLS results

	HP ACO-HMO enrollee			Any expenditures			Any expenditures		
	First stage	95%	CI	Second stage	95%	CI	OLS	95%	CI
HP ACO-HMO enrollee				−0.155	−0.181	−0.129	−0.051	−0.061	−0.041
Year 2018–2020[a]	0.023	0.019	0.027	−0.189	−0.200	−0.177	−0.221	−0.230	−0.211
Age	−0.002	−0.010	0.005	−0.001	−0.001	−0.001	0.045	0.037	0.053
Age × Female	−0.004	−0.011	0.003	−0.012	−0.020	−0.005	−0.012	−0.019	−0.005
Age × Employee	0.027	0.012	0.041	−0.059	−0.074	−0.045	−0.065	−0.079	−0.050
Age × Spouse/Partner	−0.017	−0.040	0.007	−0.045	−0.068	−0.021	−0.044	−0.068	−0.021
$(Age)^2$	0.000	0.000	0.000	−0.001	−0.001	−0.001	−0.001	−0.001	−0.001
$(Age)^2$ × Female	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$(Age)^2$ × Employee	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
$(Age)^2$ × Spouse/Partner	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.001
Proportion of year enrolled	0.039	0.020	0.058	0.408	0.379	0.438	0.404	0.375	0.434
Ln (risk score)	0.001	0.000	0.003	0.123	0.120	0.125	0.123	0.120	0.125
Instrument: Same PCP available	0.393	0.3853	0.402						
Observations	122,775			122,775			122,775		
Individual fixed effects	Yes			Yes			Yes		
F-test				2385.86			2417.08		
K-P rk LM statistic	8869								

Note: See Kleibergen and Paap (2006).[20]

Abbreviations: ACO, accountable care organization; CI, confidence interval; HMO, health maintenance organization; HP, high performance; K-P, Kleibergen-Paap; LM, lagrange multiplier; OLS, ordinary least squares; PCP, primary care provider; rk, rank.

[a]Year 2018–2020 was the period during which HP ACO-HMO was available.

above (except for HEDIS access models, which did not include data occurring during the COVID-19 pandemic).

Regarding expenditures per patient conditional on any treatment and whether any utilization occurred, each subset yielded results that did not statistically differ from the main results. Regarding access, there was no relevant difference for the second and third subsets, but there was a very small improvement in access for the high-performance relative to the broad-network ACO-HMO for the first subset, which, while statistically significant (0.017; 95% CI: 0.001, 0.033), was likely too small to have policy significance. Finally, adding the COVID-19 indicator resulted in a statistically significant positive coefficient in most of the sensitivity analyses (higher utilization and higher expenditures) but did not impact any of the results described above.

3.3 | Survey results

All survey results are presented in the Appendix S1. The survey found that the overall satisfaction of enrollees was 7.1% higher in the high-performance ACO-HMO plan (0.069; 95% CI: −0.001, 0.138; $p = 0.052$). Here the parameter was transformed by the formula $(100 \times [exp(\beta) - 1])$ to account for the natural log of the dependent variable.

The plans were also statistically different with regard to access, in that high-performance ACO-HMO enrollees were 10.1 percentage points more likely to usually/always visit their PCP as soon as needed (0.101, 95% CI: 0.001, 0.201). With regard to PCP measures, high-performance ACO-HMO enrollees were 13.3 percentage points less likely to email their PCP (−0.133, 95% CI: −0.237, −0.030). In addition, enrollees in the high-performance ACO-HMO also were 8.4 percentage points more likely to say it was easy to get a referral from their PCP (0.084, 95% CI: 0.002, 0.167).

Regarding specialists, the plans were statistically different in two ways. Enrollees in high-performance ACO-HMOs were 11.2 percentage points more likely to see a specialist usually/always as soon as needed (0.112, 95% CI 0.007, 0.217) and 33.8 percentage points less likely to state that the specialist they wanted was not in their network (−0.338, 95% CI: −0.494, −0.181).

Regarding mental health care, enrollees in the high-performance ACO-HMO were 36.5% more satisfied with the mental health care they received (0.311, 95% CI: 0.057, 0.565). Here the parameter was transformed as above to account for the natural log of the dependent variable. With regard to seeking mental health care, enrollees in the high-performance ACO-HMO were 20.8 percentage points more likely to look for mental health information on health plan materials (0.208, 95% CI: 0.028, 0.387). There were statistically insignificant

TABLE 3 Effect of high-performance ACO-HMO choice on the logarithm of total expenditures given any positive utilization: Instrumental variables and OLS results.

	HP ACO-HMO enrollee			Ln (Total expenditures)			Ln (Total expenditures)		
	First stage	95%	CI	Second stage	95%	CI	OLS	95%	CI
HP ACO-HMO enrollee				−0.035	−0.214	0.143	−0.010	−0.085	0.064
Year 2018–2020[a]	0.022	0.017	0.027	−0.291	−0.367	−0.215	−0.298	−0.362	−0.235
Age	−0.007	−0.016	0.001	0.025	−0.026	0.076	0.026	−0.025	0.076
Age × Female	−0.003	−0.011	0.005	−0.004	−0.050	0.042	−0.004	−0.049	0.042
Age × Employee	0.022	0.003	0.041	0.242	0.135	0.349	0.241	0.134	0.347
Age × Spouse/Partner	−0.010	−0.039	0.018	0.190	0.017	0.363	0.191	0.018	0.363
$(Age)^2$	0.000	0.000	0.000	0.001	0.000	0.003	0.001	0.000	0.003
$(Age)^2$ × Female	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.001
$(Age)^2$ × Employee	0.000	0.000	0.000	−0.004	−0.005	−0.002	−0.004	−0.005	−0.002
$(Age)^2$ × Spouse/Partner	0.000	0.000	0.000	−0.003	−0.006	−0.001	−0.003	−0.006	−0.001
Proportion of year enrolled	0.039	0.007	0.072	−0.314	−0.601	−0.027	−0.316	−0.602	−0.029
Ln (risk score)	0.004	0.001	0.006	0.857	0.839	0.875	0.857	0.839	0.875
Instrument: Same PCP available	0.373	0.363	0.382						
Observations	76,298			76,298			76,298		
Individual fixed effects	Yes			Yes			Yes		
F-test				730.00			729.62		
K-P rk LM statistic	5950								

Note: See Kleibergen and Paap (2006).[20]
Abbreviations: ACO, accountable care organization; CI, confidence interval; HMO, health maintenance organization; HP, high performance; K-P, Kleibergen-Paap; Ln, natural logarithm; LM, lagrange multiplier; OLS, ordinary least squares; PCP, primary care provider; rk, rank.
[a]Year 2018–2020 was period during which HP ACO-HMO was available.

differences across the two plans regarding the remaining survey measures.

4 | DISCUSSION

There is public concern about restricted choice associated with narrow physician networks, and past research explains the history of provider networks and underscores the merits of these concerns.[21–24] Additionally, research of some narrow-network plans finds that selection effects account for most cost savings (those who choose narrow-network plans are different from those who choose broader network plans and use less care)[25]

However, this is not the case in our study. Our study, which accounted for selection bias by using 2SLS fixed-effects models, is the first to examine the effects of enrollee switching to a high-performance selective narrow-network ACO-HMO from a broad-network ACO-HMO with regard to access, utilization, and expenditures. We found that when selective narrow networks are coupled with comprehensive patient navigation and consumer support and are supported by broader value-based payment models, including ACOs and HMOs, they can reduce spending and improve enrollee experiences without reducing access to care. In fact, the results of our member survey suggest that, with the right infrastructure, health plan members can be happier with the design of a narrow-network plan than with a broad-network alternative.

Average annual HEDIS access measures were not statistically different across the two plans. However, average annual utilization dropped by 15.5 percentage points more for enrollees switching to the high-performance ACO-HMO compared to enrollees in the broad-network ACO-HMO, and average annual expenditures declined by $1251 per person per year. This was on top of the overall decline in utilization experienced by both ACO-HMOs because of numerous initiatives to improve health plan performance across both ACO-HMOs. High-performance ACO-HMO enrollees were significantly less likely to report network-related problems with accessing specialty care, were more satisfied with the mental health care they received,

TABLE 4 Effect of high-performance ACO-HMO choice on HEDIS access: Instrumental variables and OLS results

	HP ACO-HMO enrollee			Hedis access			Hedis access		
	First stage	95%	CI	Second stage	95%	CI	OLS	95%	CI
HP ACO-HMO enrollee				0.013	−0.001	0.028	−0.003	−0.009	0.003
Year 2018–2020[a]	0.024	0.021	0.028	−0.008	−0.014	−0.002	−0.003	−0.007	0.002
Age	−0.003	−0.016	0.008	0.024	0.014	0.033	0.023	0.014	0.033
Age × Female	−0.007	−0.019	0.005	0.004	−0.005	0.013	0.004	−0.005	0.012
Age × Employee	0.017	−0.010	0.043	−0.022	−0.036	−0.008	−0.021	−0.035	−0.007
Age × Spouse/Partner	−0.042	−0.085	0.001	−0.009	−0.028	0.009	−0.010	−0.028	0.009
$(Age)^2$	0.000	0.000	0.000	0.000	−0.001	0.000	0.000	−0.001	0.000
$(Age)^2$ × Female	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$(Age)^2$ × Employee	0.000	−0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.001
$(Age)^2$ × Spouse/Partner	0.000	0.000	0.001	0.000	0.000	0.001	0.000	0.000	0.001
Proportion of year enrolled	−0.056	−0.164	0.053	−0.011	−0.099	0.076	−0.012	−0.099	0.076
Ln (risk score)	0.000	−0.002	0.003	0.014	0.012	0.015	0.014	0.012	0.015
Instrument: Same PCP available	0.389	0.380	0.397						
Observations	68,145			68,145			68,145		
Individual fixed effects	YES			YES			YES		
F-test				29.39			29.23		
K-P rk LM statistic	7087								

Note: See Kleibergen and Paap (2006).[20]

Abbreviations: ACO, accountable care organization; CI, confidence interval; HMO, health maintenance organization; HP, high performance; K-P, Kleibergen-Paap; LM, lagrange multiplier; OLS, ordinary least squares; PCP, primary care provider; rk, rank.

[a]Year 2018–2020 was period during which HP ACO-HMO was available.

and were more satisfied with their plan than broad-network ACO-HMO enrollees.

Additionally, this does not appear to be due to any differences in access to either PCPs or specialty care. Survey results showed slightly better-perceived access to both PCPs and specialty care in the high-performance ACO-HMO relative to the broad-network ACO-HMO.

The equality in expenditures conditional on utilization appears to be not so much due to the high-performance ACO-HMO structure being ineffective in treating patients at a lower cost but rather due to the rational response from the broad-network ACO-HMO PCPs to economic incentives with regard to using all efficiency and effectiveness information available (including information on how the high-performance ACO-HMO was run) in this specific context.

In contrast, the comprehensive patient navigation and customer support system appears to be the primary reason that only the high-performance ACO-HMO experienced a proportionate decrease in utilization. The comprehensive patient navigation and customer support system was only available in the high-performance ACO-HMO. Information from background interviews suggested the patient navigation and customer support system was intended to ensure that patients in the high-performance narrow-network plan had access to and received needed care. In addition, patient stratification was used to identify patients who might benefit from outreach by the patient navigation and customer support system.

4.1 | Limitations

Our results are subject to limitations. First, our dataset did not include data from the relevant PBM and mental health carve-outs. Second, the external validity of these results only applies to continuously enrolled patients. To the extent that individuals lacking continuous enrollment were different from continuously enrolled individuals, our results may have been different. It is important to note that including individuals who are not continuously enrolled would not allow us to attribute changes in expenditures, utilization, and access to the different health plans in question since these outcomes could have been influenced by the residual impact of other health plans in which individuals may have been enrolled.

Third, our survey data may be biased due to nonrandom response bias. Although we attempted to minimize any such bias by weighting the data to represent the relevant enrolled population, some bias may remain.

Fourth, our interviews did not include any practicing physicians. Thus, the perspectives of practicing physicians were necessarily filtered by the perspectives of the leaders whom we interviewed, perspectives that may or may not completely overlap with each other.

A fifth limitation is that our individual fixed effects strategy may not have completely controlled for opportunity cost, as although it controls for baseline opportunity cost, the opportunity cost of some individuals may have changed between baseline and the time at which they

made the decision regarding whether to enroll in the high-performance ACO-HMO or not. However, we suggest that any such marginal change in opportunity cost, if it occurred at all, was likely too small to be consequential regarding the decision to maintain one's physician relationship.

A final limitation is the instrumental variable used. All of the results presented are local average treatment effects.[26] They reflect the impact of high-performance ACO-HMOs relative to broad-network ACO-HMOs on each outcome where the relevant group of high-performance ACO-HMO patients was those persuaded to switch to the high-performance ACO-HMO due to the condition that they could continue seeing the same PCP. Thus, these results may or may not reflect the results of those who would have switched plans irrespective of whether they could maintain the same PCP.

4.2 | Conclusions

The results of this study underline two important conclusions. First, the high-performance ACO-HMO appears to be very effective at reducing expenditures without reducing access. Second, the comprehensive patient navigation and customer support system, designed to direct patient care and be sure that patients have what they need to adhere to care, appears to be a primary driver of the reduction in expenditures. In sum, selective narrow physician networks can control costs and improve enrollee experiences when they also include comprehensive patient navigation and consumer support. Payers should consider implementing such plans.

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CONFLICT OF INTEREST

The authors declare no potential conflicts of interest. The views expressed in this article are those of the authors and do not necessarily reflect those of the Peterson Center on Healthcare nor Catalyst for Payment Reform.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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