Cost-Sharing Payments for Out-of-Network Care in Commercially Insured Adults

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ABSTRACT

OBJECTIVES: Providers who do not contract with insurance plans are considered out-of-network (OON) providers. There were 2 objectives in this study: (1) to examine the variations of OON cost sharing, both at the state level and by care settings, and (2) to investigate the pattern of OON care use and cost sharing associated with OON care over time.

STUDY DESIGN: Secondary data analysis using claims data of employer-sponsored insurance enrollees.

METHODS: The study sample included adults aged 18 to 64 years who were continuously enrolled for at least a full calendar year with medical and prescription drug coverage and for whom OON care payment data were available. We examined levels and distributions of cost sharing for OON care from 2012 to 2017, in both emergency department (ED) and non-ED care settings. Outcome measures included annual use of health plan–covered OON care and total out-of-pocket (OOP) cost sharing for OON care. We also measured the use of and cost-sharing spending for OON care based on urgency and site of service. Logistic regression models were constructed to estimate the probability of OON care. Among those with each type of OON care, a generalized linear regression model was used to estimate the OOP spending on OON care.

RESULTS: Slowly decreasing rates of OON care over time occurred in different care settings and at different urgency levels. The cost-sharing amounts for OON care rose rapidly from 2012 through 2016, before slowing slightly in 2017. The growth of cost sharing for OON care during nonemergent hospitalizations especially increased from $671 to $1286 during the study period. The amount enrollees spent on OON care grew in most states, but there were substantial variations.

CONCLUSIONS: Cost-sharing payments for OON care represent a growing financial burden for some enrollees. Consumers should be held harmless from higher cost sharing for OON care when it occurs without their knowledge or consent. Further, health plan network adequacy may also merit closer scrutiny. Leveraging provider participation in narrow networks must be balanced with broader consumer protections.

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Most privately insured Americans contribute toward insurance premiums and share in healthcare costs through substantial out-of-pocket (OOP) payments for deductibles, co-payments, and coinsurance. In recent years, growth in cost sharing for commercially insured individuals has outpaced wage growth.[1,2] Network strategies employed by health plans have further expanded the landscape of cost-sharing tools. Health plans establish contracts with selected healthcare providers and pharmacies, which offer price discounts and other features in exchange for participation as in-network providers. Care that enrollees receive from noncontracting providers or pharmacies is considered out-of-network (OON) care.

OON care may be covered or completely uncovered by health plans, resulting in various forms of OOP payments (see **eAppendix A** [eAppendices available at **ajmc.com**] for definitions). Insurance plans may impose ceiling reimbursements to providers for OON care covered as a plan benefit (ie, "covered OON care"). Enrollees are liable for differences in allowed reimbursements and charges from providers—a practice called "balance billing." In other cases, enrollees pay the entire bill OOP when care from noncontracting providers is not covered by plans (ie, "uncovered OON care"). Although balance billing has received attention from policy makers lately, there has been less attention to cost sharing for covered OON care and the differences between in-network and OON care. Typically, enrollees seeking covered OON care face steeper cost-sharing provisions. For example, in 2016, the average deductible for in-network medical care was $1800 for an individual plan and $3900 for family coverage, whereas the average deductibles for OON care were $3000 and $6000, respectively. Similarly, the OOP annual maximum and coinsurance payments for OON care were nearly 2-fold those for in-network care.[3,4]

Many factors influence an enrollee's OOP costs for OON care, including coverage rules for OON care, condition-specific demand, availability of in-network providers,[5-7] consumer preferences,[8] and regulations on OON care. Some enrollees accept higher OOP costs when seeking care for complex conditions from OON centers of excellence; however, other encounters with OON providers are

unavoidable. Recent evidence suggests that a large proportion of care involves covered care from OON providers, particularly in emergency departments (EDs).[9-12] Even when a hospital is in network, OON encounters with nonparticipating providers are prevalent.[8,11,12] Patients may be unaware of a provider's network status, or a network may have scarce availability of specific specialties.[8-12]

Lately, problematic "surprise bills" from OON providers have led some states to restrict balance billing practices and/or regulate reimbursements for OON care in EDs and in-network hospitals.[7,13] Rates of ED-related OON care decreased in New York following legislation enacted in 2014.[12] However, fewer legislative activities at state or federal levels have specifically targeted enrollees' cost-sharing burdens. Although the Affordable Care Act (ACA) limited the maximum cost-sharing amounts that private policyholders pay OOP annually, these spending caps do not include OOP payments required for OON care.[14] Moreover, although the ACA matched patient coinsurance rates to in-network rates for OON ED services,[14,15] it did not offer protections for patients in nonemergent settings.

As of 2018, 18% of large employers have used narrow networks of medical providers in their plans[16] and almost 50% of employers have reported using narrow pharmacy networks.[17] Understanding the level and distribution of cost-sharing payments associated with OON care is important to consumers and policy makers. Therefore, we sought to accomplish 2 objectives in this study: (1) to examine the variations of OON cost sharing, both at the state level and by care settings, and (2) to investigate the pattern of OON care use and cost sharing associated with OON care over time. We first focused on the trend of OON care use and cost sharing during a 6-year study interval, both nationwide and in specific states. Next, we examined patterns in use and cost sharing for OON care based on ED and facility settings.

TAKEAWAY POINTS

Cost-sharing payments for out-of-network (OON) care represent a substantial and growing financial burden to private plan enrollees.

- Policy attention is needed on enrollees' burdens from cost sharing for OON care, especially during nonemergent hospitalizations.
- Patients should receive up-to-date disclosures of network status and be held harmless from higher cost sharing when OON care occurs without their consent or knowledge.
- Several policy changes, such as regulating cost-sharing amounts for OON care and scrutinizing network adequacy for commercial plans, could alleviate the burden.
- Health plans that leverage networks to lower costs must be balanced with the potential need for broader consumer protections.

METHODS

Data and Study Sample

Using data from the IBM MarketScan Commercial Claims and Encounter Database from 2012 to 2017, we studied patterns of cost sharing for OON care among those enrolled in employer-sponsored insurance (ESI) plans as policyholders or dependents. The data were comprised of fully paid and adjudicated claims for inpatient and outpatient services and prescription drugs. The enrollment information included each enrollee's demographic and plan design type. This study was exempted from review by The Ohio State University Institutional Review Board.

The study sample included adults aged 18 to 64 years who were continuously enrolled for at least a full calendar year with medical and prescription drug coverage and for whom OON care payment data were available. Approximately 23% of individuals were excluded due to missing OON payment information. Eighty-four percent of the sample used healthcare covered by insurance during the study time interval. Among them, 93% made OOP payments for cost-sharing requirements, and the remaining ones without cost-sharing payments were excluded. The final sample included 22,054,244 enrollees with 58,577,383 person-year observations, of whom 4,267,444 enrollees were continuously enrolled during the 6-year study period.

Outcome Measures

We first studied annual use of covered OON care and annual total OOP cost sharing for OON care, including co-payments, coinsurance, and deductibles for any care paid as OON benefits. This included inpatient hospitalizations, outpatient services, and covered prescription drugs filled in OON pharmacies. Spending was aggregated to per-person per-year and was adjusted to 2017 dollars.

Further, we categorized medical services from OON providers based on emergency status and site of service. Because prescription drug fills from OON pharmacies did not fit in any of these categories, they were excluded from this analysis. The categories were (1) nonemergent outpatient visits, (2) visits to EDs that did not lead to a hospitalization, (3) emergent hospital admissions in conjunction with an ED visit, and (4) nonemergent or elective hospitalizations. The OOP cost-sharing spending for OON medical services was also examined, conditioning on OON care utilization in each setting as described above.

Adjustment Covariates

Following the algorithm of the Hierarchical Condition Categories (HCC) risk adjustment model designed for the commercial population, a risk score was assigned to each enrollee.[18] The score reflects health conditions associated with expenditure levels in a year and took into consideration enrollee age, sex, and diagnostic conditions in each year. Higher risk scores indicate more complex healthcare needs and potential for higher spending (*International Classification of Diseases, Tenth Revision* codes were adopted in October 2015, but the HCC scores in our sample were similar before and after the transition).

TABLE 1. Study Sample Characteristics, 2012-2017[a]

	General Adult Sample	Continuously Enrolled Sample
Female, %	55.73	54.06
Age in years, mean (SD)	43.29 (27.72)	45.21 (26.03)
Rural residency, %	11.08	11.71
HCC score, mean (SD)	1.59 (9.34)	1.59 (8.86)
Plan types, %		
Health maintenance organization	11.26	12.25
Preferred provider organization	54.97	51.74
High-deductible/consumer-driven health plan	23.15	24.83
Exclusive provider organization	0.85	0.55
Point-of-service plan	6.84	7.22
Comprehensive plan	2.81	3.41
Sample average annual total spending	$7473	$7451
Sample average annual OOP spending	$997	$936
Number of unique enrollees	22,054,244	4,267,444
Number of person-year observations	58,577,383	20,324,595

HCC indicates Hierarchical Condition Categories; OOP, out-of-pocket.

[a]The sample characteristics accounted for sampling weights to reflect the characteristics of employer-sponsored insurance enrollees in the United States.

Health plan characteristics were reflected by plan design types, including health maintenance organizations (HMOs) and exclusive provider organizations, in which enrollees choose from a list of providers for nonemergent care; preferred provider organizations (PPOs) and point-of-service plans, in which enrollees are offered lower cost-sharing levels to use a list of providers; high-deductible/consumer-driven health plans (HDHPs), which include high deductible requirements; and comprehensive plans without network limitations.

Analysis

A logistic regression model was constructed to estimate the probability of OON care in a year. Among those with OON care, a generalized linear regression model (GLM) using log link was used to estimate the OON cost sharing, given various factors that potentially impact OOP spending for OON care. Further, we estimated the probability of having OON medical care based on the ED status and care settings. Similarly, a GLM was used to estimate cost sharing for OON care in each case.

All models considered health risk scores, plan characteristics, rural residence, state-fixed effects, and year-fixed effects on OOP payments for OON care. Age and sex were accounted for in the algorithm constructing the HCC risk scores and thus were not separately listed as covariates in regression models. Lastly, because access to network providers may differ between rural and urban areas, rural residency was defined as enrollees living in nonmetropolitan areas.

To reflect the national population of ESI enrollees, our analysis included sampling weights constructed based on the Public Use Microdata Sample of the American Community Survey.[19,20] In addition, robust clustered standard errors by unique enrollees were computed to reflect that the same enrollees may be observed multiple times.

Several additional analyses were performed. First, because the employee sample could have fluctuated during the study interval, we repeated the analyses for a subsample of beneficiaries who were continuously enrolled across the entire 6-year period. Second, we examined the trend of in-network cost sharing to determine whether the trend differed from that of OON care. Finally, because some employers may have increased or decreased benefits across years, we constructed a model that allowed insurance benefit design to change over time within the same plan type. Detailed model specifications are in **eAppendix B**.

RESULTS

The characteristics of the general and continuously enrolled samples are shown in **Table 1**. Both samples consisted of slightly more women than men, and the average age reflected a slightly older population among those continuously enrolled. Most enrollees lived in metropolitan areas, consistent with Census Bureau data.[21] For both samples, the average HCC score was 1.59. The average annual total healthcare expenditures were almost identical. The most common health plan types were PPOs, accounting for 55% of individuals in the general adult sample, followed by HDHPs (23%) and HMOs (11%). The enrollment by plan types in our data was similar to the distribution of plans offered by employers from the Kaiser Family Foundation and the Health Research and Educational Trust Employer Health Benefits Survey data during the study interval.[22-27] On average, 16% of individuals encountered OON care, with an average cost-sharing amount of $621 toward OON care in the general sample. The average spending for in-network care was $895. Nearly 94% of total OON cost sharing contributed toward medical care instead of fills from OON pharmacies.

Estimates from regression analyses are shown in **Table 2**. Compared with in 2012, the probability of receiving OON care decreased modestly during 2015 to 2017: by 1.56, 2.82, and 3.14 percentage points each year, respectively. Sicker individuals were more likely to have OON payments. Estimated cost sharing among those who used OON care accelerated annually from 2012 to 2016, plateauing in 2017. On average, those who received OON care paid $679 and $648 in cost sharing in 2016 and 2017, respectively. Further, a 1-point-higher HCC score was associated with $97.72 more spending for OON care. Plan types also affected cost-sharing payments. For example, enrollees in PPO and HDHP plans had $483.62 and $491.23 higher cost-sharing payments, respectively, relative to those in HMO plans.

Also shown in Table 2, analyses of cost-sharing spending for in-network care exhibited similar trends by insurance plan design

types and risk scores, as observed with OON care. Controlling for the other covariates, the cost-sharing amount for in-network care decreased during 2013 to 2014 and increased in 2016 to 2017—a period when deductible payments rose significantly nationwide. Although the incremental changes in estimated cost sharing during 2012 to 2016 were larger for OON care than for in-network care, this trend was reversed during 2016 to 2017.

The cost sharing for OON care also exhibited substantial geographic variations (**Figure 1**). The average regression-adjusted cost-sharing spending for OON care in Connecticut and Oklahoma consistently ranked highest in both 2012 and 2017, reaching $1049 and $976, respectively, by 2017. Overall, states experienced an average 13.68% increase in cost-sharing payments for OON care during the study period. Enrollees with OON care in many states experienced average spending growth substantial enough to reach the next quartile level between 2012 and 2017.

The patterns of OON care differed by care settings and urgency levels. The adjusted rates of OON care by ED status and care settings are displayed in **Figure 2**. (The full regression results are available upon request.) As shown, a substantially higher portion of individuals encountered OON care in outpatient settings unrelated to ED use than in other settings. Moreover, the prevalence of OON care decreased since 2014 in all settings. For example, the average probability of experiencing nonemergent outpatient OON care decreased from 16.2% in 2012 to 12.5% in 2017.

TABLE 2. Factors Associated With Cost-Sharing Payments for OON Care in the General Adult Sample[a,b] (marginal effects, clustered standard errors)

	Percentage-Point Change in the Probability of OON Care	Cost-Sharing Payments for OON Care ($)[c]	Cost-Sharing Payments for In-Network Care ($)[d]
Year (reference: 2012)			
2013	−0.49* (0.01)	10.69* (2.10)	−12.90* (0.45)
2014	−0.49* (0.02)	2.53 (2.14)	−28.36* (0.49)
2015	−1.56* (0.02)	42.18* (2.24)	21.14* (0.53)
2016	−2.82* (0.02)	75.37* (2.50)	64.11* (0.55)
2017	−3.14* (0.02)	62.54* (2.61)	89.27* (0.58)
HCC score	4.89* (0.00)	97.72* (1.09)	379.78* (0.23)
Plan type (reference: health maintenance organization)			
Preferred provider organization	7.56* (0.02)	483.62* (1.97)	425.32* (0.51)
Point-of-service plan	6.12* (0.03)	570.65* (2.93)	215.08* (0.77)
High-deductible/ consumer-driven health plan	7.42* (0.02)	491.23* (2.27)	775.65* (0.72)
Exclusive provider organization	−2.99* (0.05)	−30.10* (6.07)	181.39* (1.78)
Comprehensive plan	1.60* (0.04)	335.89* (4.57)	359.68* (1.22)
Rural residency	1.12* (0.02)	−132.89* (2.57)	27.53* (0.71)
Number of person-year observations	58,577,383	9,968,156	58,409,724

HCC indicates Hierarchical Condition Categories; OON, out-of-network.

*P <.05.

[a]The logistic and generalized linear regression models were estimated with a list of covariates, including log-transformed HCC score, plan characteristics, rural residency, year-fixed effects, and state-fixed effects. Age and sex were both considered in the algorithm constructing the HCC risk scores, thus they were not separately listed as covariates in the regressions. The models were estimated considering the sampling weights to represent the national employer-sponsored insurance population.

[b]The marginal effects of state-fixed effects were not reported.

[c]The cost-sharing payments for OON care were conditional on OON care use, including outpatient, inpatient, and pharmaceutical care that occurred OON.

[d]The cost-sharing payments for in-network care were conditional on in-network care use.

Figure 3 displays the adjusted OOP spending trends for OON medical services according to ED status and care setting. As shown, the OON cost sharing for nonemergent care was higher than for care associated with ED visits. In contrast to the decreased OON rates over time, the cost sharing for OON-related medical services increased for both ED and non-ED care, and the nonemergent hospitalizations saw the fastest growth—the adjusted spending grew from 2012 to 2017, from $671 to $1286, accelerating since 2014. OOP payments for OON care with emergent hospitalizations increased from $452 to $565. Growth rates of OOP spending for OON care in outpatient settings were modest compared with those of hospitalizations. Furthermore, in contrast to OON care in outpatient settings, better health status was associated with substantially lower amount of OOP payments for nonemergent hospitalizations.

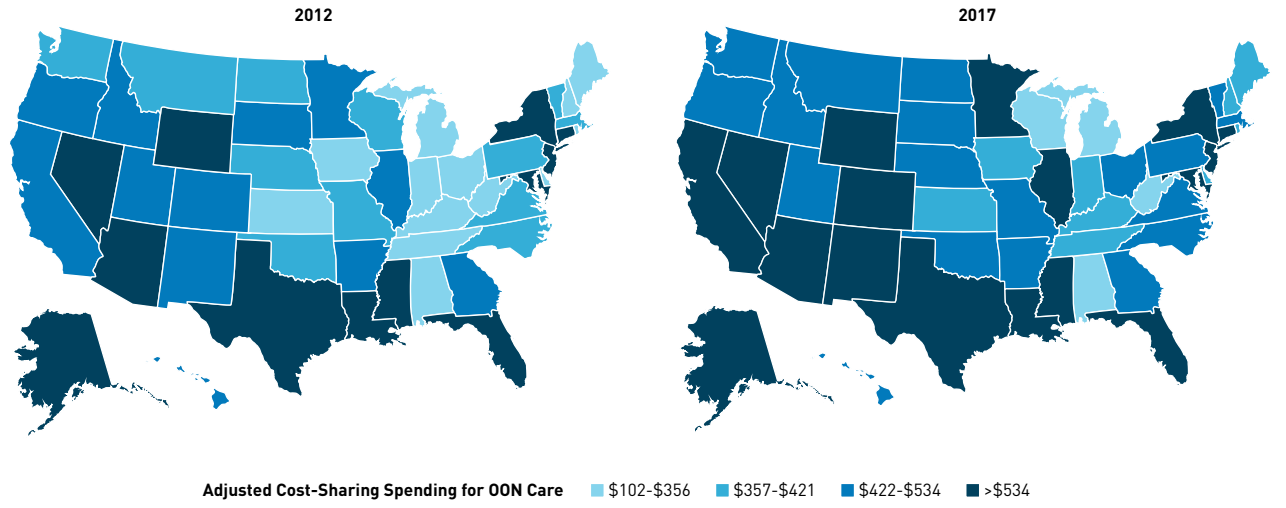
Results for the continuously enrolled sample are largely consistent with the general adult sample (**eAppendix C**), suggesting that our findings were not driven by time-invariant characteristics of the enrollees. Finally, the robustness test (results available upon request) that allowed insurance benefits to change over time within the same plan type also confirmed our main findings, indicating that changes of the benefit levels within health plans did not impact the trends that we observed.

DISCUSSION

Recent Gallup poll results suggested that healthcare costs remain the greatest financial concern to American families.[28] Our study revealed rapid growth trends in cost sharing for OON care with extensive variations among states. As commercial plans leverage network strategies combined with cost-sharing tools, the consequences may include increased enrollee financial burdens.

Several findings from our study are notable. First, the prevalence of OON care in all settings decreased over time, yet cost sharing among those with OON care climbed each year before plateauing in 2017. The size and growth of cost sharing for OON care during hospitalizations was especially noteworthy. Our findings of increased cost sharing for OON care could also reflect trends in the marketplace

FIGURE 1. Adjusted Cost-Sharing Spending for OON Care, Holding 2012 Quartiles Constant in Both Years[a]



OON indicates out-of-network.

[a]The cost-sharing spending for OON care was based on generalized linear regression model estimations as described in the Methods section of the text and eAppendix B. The model employed all data years in the general adult sample. The model was estimated considering the sampling weights to represent the national employer-sponsored insurance population. The predicted values from the regression were summarized by state and year in each map. By South Carolina law, data from that state cannot be presented separately, thus it is missing from the maps.

from mergers and acquisitions. Health plans may be experiencing more restricted capacity to negotiate fees with providers for covered OON care, resulting in higher cost sharing for OON care. As the cost sharing per visit became heftier, enrollees started to decrease their use of OON care. It is also possible that over time, consumers learned to avoid OON care and those who remained using it had higher OOP spending.

The variations observed in OON cost sharing across states were remarkable, yet the cost sharing for OON care rose substantially in most states over time. One reason is that neither state nor federal efforts have systematically targeted cost-sharing burdens for OON care. For example, only 6 states established payment standards for OON care that may affect cost-sharing amounts.[13] Moreover, because self-insured plans are exempted from state regulations and provide coverage for more than 60% of enrollees for employer-sponsored plans, the effects of state policies may be constrained.[13] Thus, many ESI enrollees may still face excessive OON cost sharing despite regulatory efforts.

We believe that several policy changes could help to relieve the burden of cost sharing for OON care. First, patients should receive disclosures of network status by providers and facilities, regardless of the urgency. Second, the requirement of network status notification should further protect consumers from "surprise bills." Additionally, patients could be held harmless from higher cost sharing for OON care when timely disclosures are not forthcoming. Third, states may need to reevaluate criteria for demonstrating network adequacy for commercial plans.[29] Use of narrow networks may be making it difficult for consumers to access certain specialists within network.[6,7] Last, consumer protections for excessive OOP cost-sharing payments for OON care must be balanced with the need for lower pricing from participating providers to address overall healthcare costs. Policy interventions addressing cost-sharing burden for in-network care (eg, annual cost-sharing caps) may be different from those targeting OON care. For example, bundled payments to hospitals from insurance plans, combined with prohibitions to balance billing, would insulate enrollees from the impacts of provider network status. On the other hand, implementing reference pricing or multiple-tier network designs could incentivize consumers to preferentially use care from in-network providers.

Limitations

First, findings from our study of covered OON care reflected only a portion of the OOP costs that consumers face with OON care. We did not evaluate uncovered OON care, the balance billing amounts that consumers paid, or liable-but-unpaid cost-sharing requirements. The practice of balance billing is common, and the amounts billed to patients can be financially devastating. Further research that quantifies the amount paid for balance billing is critical for policy makers to address appropriate remedies.

Second, unobserved changes in employers that contributed claims to the database could potentially influence the trends observed. To mitigate this concern, we studied a sample that was continuously enrolled over the 6 years and, in another robustness test, we allowed the design within specific plan types to change over time in the modeling. Both robustness tests confirmed our main findings. Thus, we are confident that the potential bias from the data pool is minimal.

Third, we have no data for unobserved consumer preferences. For example, the relatively lower OOP cost sharing for OON care by HMO members may indicate that narrow-network plans push enrollees toward in-network care. However, it may also be a result of plan designs attracting enrollees who exchanged broader network availability for lower premiums and deductibles. Thus, this finding should be interpreted cautiously.

Lastly, the generalizability of our study conclusions is limited by the use of a convenience sample for analysis. For example, individuals who were excluded from analysis because of missing OON payment information were more likely to enroll in specific plan types. Nonetheless, the distribution of plan types in our study sample was similar to what was found in national employer benefit survey data.[22-27] Therefore, we believe that the associations we observed between plan type and OON cost sharing are valid and policy relevant.

CONCLUSIONS

Although rates of OON care in commercially insured adults decreased from 2012 to 2017, we observed that cost sharing rose rapidly from 2012 to 2016, before slowing in 2017. The cost sharing for OON care during nonemergent hospitalizations was particularly noteworthy given the amount and growth. Consumers should be informed of provider network status at the point of care. In cases of nondisclosure, whether intentional or inadvertent, patients should be held harmless from higher cost sharing for OON care. State policies, such as closely monitoring plan network adequacies, would also help alleviate financial burdens. We conclude that health plans that leverage networks to lower costs must be balanced with the potential need for broader consumer protections. ■

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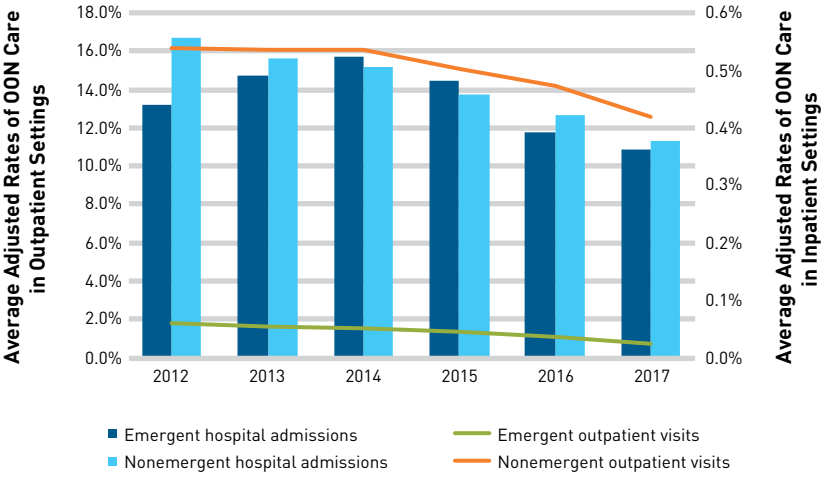
Author Disclosures: Dr Retchin is a member of the Board of Directors of Aveanna Healthcare, a privately owned

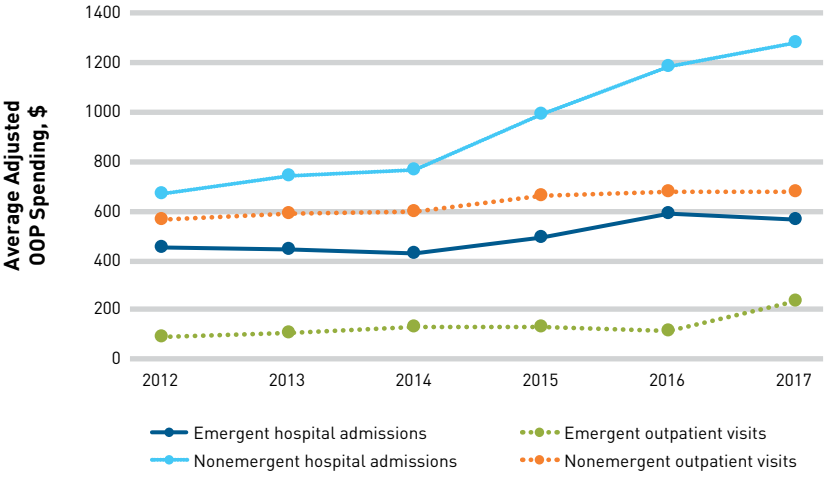
FIGURE 2. Adjusted Prevalence of OON Care by ED Status and Care Settings[a]



ED indicates emergency department; OON, out-of-network.

[a]The bars correspond to the right-hand axis, and the lines correspond to the left-hand axis. The prevalence indicated the probability of having a specific type of OON care in a year, based on the general adult sample. The logistic model specifications were described in the Methods section of the text and eAppendix B.

FIGURE 3. Adjusted OOP Spending Among Individuals Who Received OON Care According to Setting and Urgency[a]



ED indicates emergency department; OON, out-of-network; OOP, out-of-pocket.

[a]The cost-sharing spending presented was estimated within individuals who encountered a specific type of OON-related care. The observation numbers in each generalized linear regression model analysis are 263,552 for cost sharing for OON care associated with emergent hospital admissions; 278,557 for cost sharing for OON care associated with nonemergent hospital admissions; 802,216 for cost sharing for OON care associated with emergent outpatient visits; and 8,852,414 for cost sharing for OON care associated with nonemergent outpatient visits. The cost-sharing amounts were estimated by generalized linear regression models as described in the Methods section of the text and eAppendix B. The model employed all data years in the general adult sample and the values presented in the Figure were summarized predicted values by year.

pediatric home care company (no direct conflict), and owns stock in UnitedHealthcare. The remaining 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 (WYX, SMR); acquisition of data (WYX, YL, SMR); analysis and interpretation of data (WYX, BED, MMD, YL, SMR); drafting of the manuscript (WYX, BED, MMD, SMR); critical revision of the manuscript for important intellectual content (WYX, BED, MMD, SMR); statistical analysis (WYX, YL, SMR); obtaining funding (WYX, SMR); administrative, technical, or logistic support (WYX, SMR); and supervision (WYX).

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REFERENCES

1. Claxton G, Levitt L, Rae M, Sawyer B. Increases in cost-sharing payments continue to outpace wage growth. Peterson–Kaiser Health System Tracker website. healthsystemtracker.org/brief/increases-in-cost-sharing-payments-have-far-outpaced-wage-growth. Published June 15, 2018. Accessed June 17, 2018.
2. Abdus S, Selden TM, Keenan P. The financial burdens of high-deductible plans. *Health Aff (Millwood)*. 2016;35(12):2297-2301. doi: 10.1377/hlthaff.2016.0842.
3. Gregware J. Mercer's national survey of employer-sponsored health plans 2016. International Society of Certified Employee Benefit Specialists website. iscebs.org/Local/chapter-benefits-bootcamp/Documents/Group%20Benefits%20Health%20Full%20Day/170622_2016MercerSurvey.pdf. Published 2017. Accessed October 9, 2018.
4. Lane G. Mercer's national survey on employer-sponsored health plans 2015. Washington Area Total Rewards Association website. watradc.org/files/PROGRAM%20FILES/2016%20Programs/Mercer%20Survey%20Presentation.pdf. Published March 17, 2016. Accessed November 27, 2017.
5. Casey M, Henning-Smith C, Abraham J, Moscovice I. Regulating network adequacy for rural populations: perspectives of five states. University of Minnesota Rural Health Research Center website. rhrc.umn.edu/wp-content/files_mf/1502732117UMRHRCNetworkAdequacy.pdf. Published August 2017. Accessed October 7, 2018.
6. Bishop TF, Press MJ, Keyhani S, Pincus HA. Acceptance of insurance by psychiatrists and the implications for access to mental health care. *JAMA Psychiatry*. 2014;71(2):176-181. doi: 10.1001/jamapsychiatry.2013.2862.
7. Hall MA, Ginsburg PB, Lieberman SM, Adler L, Brandt C, Darling M. Solving surprise medical bills. Brookings Institution website. brookings.edu/wp-content/uploads/2016/10/sbb1.pdf. Published October 2016. Accessed August 8, 2018.
8. Kyanko KA, Curry LA, Busch SH. Out-of-network provider use more likely in mental health than general health care among privately insured. *Med Care*. 2013;51(8):699-705. doi: 10.1097/MLR.0b013e31829a4f73.
9. Garmon C, Chartock B. One in five inpatient emergency department cases may lead to surprise bills. *Health Aff (Millwood)*. 2016;36(1):177-181. doi: 10.1377/hlthaff.2016.0970.
10. Cooper Z, Morton FS. Out-of-network emergency-physician bills—an unwelcome surprise. *NEJM* Catalyst website. catalyst.nejm.org/out-of-network-physicians-emergency-billing. Published December 19, 2016. Accessed July 1, 2018.
11. Claxton G, Rae M, Cox C, Levitt L. An analysis of out-of-network claims in large employer health plans. Peterson–Kaiser Health System Tracker website. healthsystemtracker.org/brief/an-analysis-of-out-of-network-claims-in-large-employer-health-plans. Published August 13, 2018. Accessed August 15, 2018.
12. Cooper Z, Morton FS, Shekita N. Surprise! out-of-network billing for emergency care in the United States [NBER working paper no. 23623]. National Bureau of Economic Research website. nber.org/papers/w23623. Updated January 2019. Accessed October 17, 2018.
13. Lucia K, Hoadley J, Williams A. Balance billing by health care providers: assessing consumer protections across states. The Commonwealth Fund website. commonwealthfund.org/publications/issue-briefs/2017/jun/balance-billing-health-care-providers-assessing-consumer. Published June 13, 2017. Accessed December 5, 2018.
14. Affordable Care Act implementation FAQs - set 18. CMS website. cms.gov/cciio/resources/fact-sheets-and-faqs/aca_implementation_faqs18.html#ftn6. Accessed April 15, 2019.
15. Getting emergency care. HealthCare.gov website. healthcare.gov/using-marketplace-coverage/getting-emergency-care. Accessed November 15, 2019.
16. Anderman T. What to know about narrow network health insurance plans. Consumer Reports website. consumerreports.org/health-insurance/what-to-know-about-narrow-network-health-insurance-plans. Accessed November 23, 2018. Accessed June 5, 2019.
17. Fein AJ. Yes, commercial payers are adopting narrow retail pharmacy networks. Drug Channels website. www.drugchannels.net/2017/01/yes-commercial-payers-are-adopting.html. Published January 11, 2017. Accessed November 15, 2019.
18. Kautter J, Pope GC, Ingber M, et al. The HHS-HCC risk adjustment model for individual and small group markets under the Affordable Care Act. *Medicare Medicaid Res Rev*. 2014;4(3). doi: 10.5600/mmrr2014-004-03-a03.
19. American Community Survey (ACS): Public Use Microdata Sample (PUMS) documentation. US Census Bureau website. census.gov/programs-surveys/acs/technical-documentation/pums.html. Updated September 23, 2019. Accessed November 15, 2019.
20. IBM MarketScan Research Databases user guide commercial insurance weights, data year 2017 edition. IBM MarketScan Research Databases.
21. Parker K, Horowitz JM, Brown A, Fry R, Cohn D, Igielnik R. What unites and divides urban, suburban and rural communities. Pew Research Center website. pewsocialtrends.org/2018/05/22/demographic-and-economic-trends-in-urban-suburban-and-rural-communities. Published May 22, 2018. Accessed April 16, 2019.
22. 2012 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/private-insurance/report/employer-health-benefits-2012-annual-survey. Published September 11, 2012. Accessed April 15, 2019.
23. 2013 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/private-insurance/report/2013-employer-health-benefits. Published August 20, 2013. Accessed April 15, 2019.
24. 2014 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/private-insurance/report/2014-employer-health-benefits-survey. Published September 10, 2014. Accessed April 15, 2019.
25. 2015 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/health-costs/report/2015-employer-health-benefits-survey. Published September 22, 2015. Accessed April 15, 2019.
26. 2016 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/health-costs/report/2016-employer-health-benefits-survey. Published September 14, 2016. Accessed April 15, 2019.
27. 2017 Employer Health Benefits Survey. Kaiser Family Foundation website. kff.org/health-costs/report/2017-employer-health-benefits-survey. Published September 19, 2017. Accessed April 15, 2019.
28. Jones JM. Healthcare costs top financial problem for U.S. families. Gallup website. news.gallup.com/poll/257906/healthcare-costs-top-financial-problem-families.aspx. Published May 30, 2019. Accessed November 15, 2019.
29. Giovannelli J, Lucia K, Corlette S. Regulation of health plan provider networks. *Health Affairs* website. healthaffairs.org/do/10.1377/hpb20160728.898461/full. Published July 28, 2016. Accessed October 8, 2018.

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eAppendix A. Taxonomy of Enrollee Out-of-Pocket Spending According to Network Status

	Provider Health Care Network Status	
Is the Care by Providers Covered by Insurance Plan?	**In-Network**	**Out-of-Network**
Yes	Cost-sharing payments including copayments, coinsurance, and/or deductible. Providers cannot bill patients to collect more than the agreed reimbursements contracted with health plans.	Health care providers are out-of-network, but plans allow reimbursement. Enrollees have cost-sharing payments as specified for out-of-network care. Cost-sharing portions are often higher than for in-network care. <u>Fully covered:</u> Total reimbursements to out-of-network providers include enrollee cost-sharing as well as health plan payments. Providers do not directly bill enrollees. *Example: The out-of-network care has a $1000 bill from providers. The plan covers the care but requiring a 50% coinsurance from enrollees for out-of-network care. The enrollees will have to pay an out-of-pocket cost-sharing amount of $1000*50%=$500.* <u>Partially covered:</u> What the provider expected can be higher than enrollee's cost-sharing payments plus payments from plans. Providers may directly bill enrollees for the difference in plan allowed reimbursements and what providers charge. This is a form of balance billing. The balance-billed amount cannot be observed in claims data. *Example: The out-of-network care has a $1000 bill from providers, but the plan coverage is up to $800 for out-of-network care, with a 50% co-insurance. The enrollees will have to pay a coinsurance of $800*50%=$400. The enrollees will also have to pay the "balance billing" from providers for ($1000-$800)=$200. The total out-of-pocket is $600.*
No	Health plans do not cover the specific health care provided even when it is from in-network providers.	Health plans do not cover the specific health care provided by out-of-network providers.

	As a result, enrollees pay the entire care out-of-pocket. *Example: health plans may not cover cosmetic plastic surgeries even if the care is provided from an in-network surgeon.*	

eAppendix B.

The following represents model specifications that were used to estimate predicted values and marginal effects displayed in Table 2, eAppendix C, and Figures 1, 2 and 3.

In the analysis, unit of analysis is person-year. OON_{ijpt} indicates the occurrence of any OON care associated with cost-sharing payments. A logit model is estimated to predict the probability of having any cost-sharing spending for OON care during a year. The model is specified as:

$$\begin{aligned} Prob(OON_{ijpt} = 1 | X_{ijpt}) \\ = \Omega[\beta_0 + \beta_1 HCC_{it} + \beta_2 Plan_p + \beta_3 Year2017_t + \beta_4 Year2016_t \\ + \beta_5 Year2015_t + \beta_6 Year2014_t + \beta_7 Year2013_t + \beta_8 Rural_i + \beta_{9-j} State_j \\ + \varepsilon_{ijpt}] \end{aligned}$$

Here, i indicates individual, p indicates a Plan Type, j indicates State (a vector of dummy variables), and t indicates year.

Health status (HCC_{it}) is represented by a risk score following definitions of HHS for commercial population. The algorithm to calculate HCC_{ijt} already incorporated age and gender, thus the demographic factors were not separately controlled in the modeling. Year-fixed effects ($\beta_3 - \beta_7$) controlled for secular trends.

Similar regression models were used to estimate the respective probability of having each ED-based OON care outcomes as described in the Method.

Among those who had any OON care (that is, $OON_{ijpt} = 1$), the expected amount of total OOP cost-sharing payments for OON care covered by insurance (OOP_OON_{ijpt}) was estimated using a generalized linear regression model (GLM) with a log link and Gamma family distribution ($g(.)$).

$$\begin{aligned} g(.) = \beta_0 + \beta_1 HCC_{it} + \beta_2 Plan_p + \beta_3 Year2017_t + \beta_4 Year2016_t + \beta_5 Year2015_t \\ + \beta_6 Year2014_t + \beta_7 Year2013_t + \beta_8 Rural_i + \beta_{9-j} State_j + \varepsilon_{ijpt} \end{aligned}$$

Similar regression models were estimated for each spending outcome measure based on ED status and setting among those who had a specific type of OON care, respectively. In addition, a GLM model was estimated for total in-network OOP spending levels during the observation period.

Finally, to account for the potential changes in benefit designs even within the same plan types over time, we performed an additional robustness test allowing the effects of plan characteristics to be time-variant by adding the covariate of ($\underline{Plan_p \times Year_t}$).

eAppendix C. Factors Associated with Out-of-Pocket Spending for Out-of-Network Care in the 6-Year Continuously-Enrolled Sample[§] (Marginal Effects in dollars, Clustered Standard Errors)

	Percentage-point change in the probability of out-of-network care	**Cost-sharing payments for out-of-network care ($)[±]**	**Cost-sharing payments for in-network care ($)[‡]**
Year (Reference: 2012)			
Year 2013	-0.40** (0.03)	32.87** (2.10)	-15.61** (0.87)
Year 2014	-0.97** (0.03)	7.45** (3.36)	-53.27** (0.86)
Year 2015	-1.44** (0.03)	27.00** (3.36)	-1.67 (0.88)
Year 2016	2.42** (0.03)	38.37** (3.41)	23.57** (0.88)
Year 2017	2.12** (0.03)	8.73** (3.86)	68.53** (0.93)
Average HCC scores	4.98** (0.01)	84.44** (1.58)	356.26** (0.28)
Plan Type (Reference: HMO)			
PPO	7.25** (0.04)	461.92** (2.72)	403.51** (0.58)
POS	5.07** (0.06)	602.78** (4.90)	185.66** (0.84)
High deductible plan	6.31** (0.04)	530.30** (3.44)	762.81** (0.86)
EPO	-3.96** (0.11)	-64.97** (5.53)	122.77** (2.32)
Comprehensive	0.01 (0.01)	304.01** (6.17)	414.27** (1.51)
Rural Residency	0.63** (0.04)	-165.60** (3.73)	9.16** (0.84)
Observation numbers	20,324,595	3,432,880	71,653,505

[§]The Logistic and GLM models were estimated with a list of covariates, including HCC score, plan characteristics, rural residency, year fixed effects and state fixed effects. Age and sex were both considered in the algorithm constructing the HCC risk scores, thus, they were not separately listed as covariates in the regressions. The models were estimated considering the sampling weights to represent national ESI population.

The marginal effects of state fixed effects were not reported.

[±]The cost-sharing payments for out-of-network care were conditional on out-of-network care use, including outpatient, inpatient and pharmaceutical care that occurred out-of-network

[‡] The cost-sharing payments for in-network care were conditional on in-network care use

[**]Indicates statistical significance at 95% Confidence Interval