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Managing Use of Health Care Services After People Satisfy Their Deductible: What Do Copayments and Coinsurance Do?

By Paul Fronstin, Ph.D., Employee Benefit Research Institute, and M. Christopher Roebuck, Ph.D., RxEconomics, LLC

AT A GLANCE

One of the strongest trends in employment-based health benefits has been the adoption by employers of high-deductible health plans (HDHPs). As a result, the percentage of individuals with private insurance who were enrolled in an HDHP increased from 17.4 percent to 46 percent between 2007 and 2018. Further, deductible levels have been increasing more generally regardless of whether someone is enrolled in an HDHP.

Recent research found that many high-cost claimants not only reach their deductible but often reach their maximum out-of-pocket limit. In essence, for these individuals, use of health care services early in the year affects what they pay for health care services at the end of the year. Because deductibles are often satisfied early in the year by high users of health care services, it can be argued that it is the end-of-year price that matters most when individuals are deciding whether to use a health care service even before the end of the year is reached. This phenomenon raises questions about the effectiveness of deductibles in controlling spending. But it also raises questions about the relative effectiveness of different types of cost sharing later in the year — such as copayments and coinsurance — once an individual reaches his or her deductible.

The purpose of this paper is to examine the differential effect of copayments and coinsurance on use of health care services. Our findings have implications for the effectiveness of deductibles, particularly once they are satisfied. Why would we expect to find differences in behavior by whether an individual faces copayments or coinsurance after they reach their deductible? Prior studies often found that individuals are not forward-looking when it comes to prices for health care. The same may be true when it comes to type of cost sharing. Before an individual reaches their deductible, they will know what the price of health care is if they face copayments after reaching their deductible. Copayments are well-defined and known before health care services are used. Coinsurance is less well-defined when it comes to knowing the price of a health care service in advance of using the service. The uncertainty of coinsurance relative to the certainty of copayments may mean that coinsurance has a differential impact on use of health care services compared with copayments.

Key Findings:

- Coinsurance reduces use of inpatient care and specialist physician office visits more than copayments do.
- However, while most employers already use coinsurance for inpatient care, only 44 percent use coinsurance for office visits.
- This suggests that employers seeking to manage use of health care services and spending — especially among high users of health care services — may look to moving from copayments to coinsurance for office visits as a way to do so.

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Paul Fronstin is Director of the Health Research and Education Program at the Employee Benefit Research Institute (EBRI). M. Christopher Roebuck is President and CEO of RxEconomics, LLC. This *Issue Brief* was written with assistance from the Institute's research and editorial staffs. Any views expressed in this report are those of the authors, and should not be ascribed to the officers, trustees, or other sponsors of EBRI, EBRI-ERF, or their staffs. Neither EBRI nor EBRI-ERF lobbies or takes positions on specific policy proposals. EBRI invites comment on this research.

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Managing Use of Health Care Services After People Satisfy Their Deductible: What Do Copayments and Coinsurance Do?

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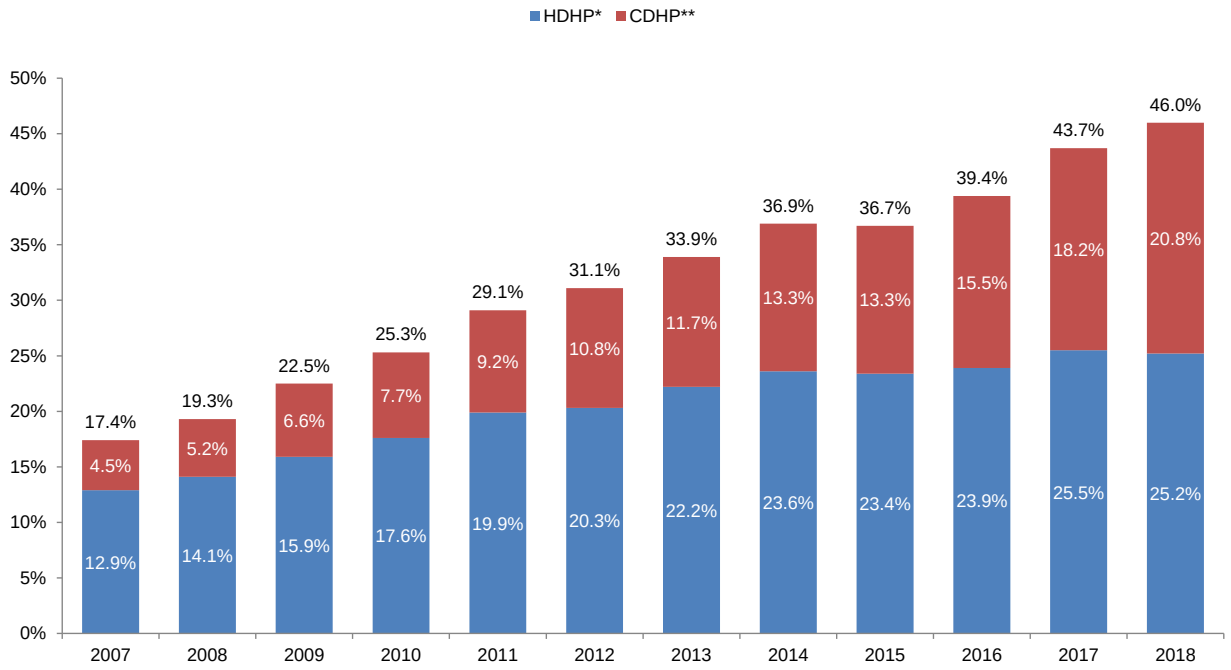
Introduction

One of the strongest trends in employment-based health benefits has been the adoption by employers of high-deductible health plans (HDHPs).[1] As a result, the percentage of individuals with private insurance who were enrolled in an HDHP increased from 17.4 percent to 46 percent between 2007 and 2018 (Figure 1). Further, deductibles have been increasing more generally regardless of whether someone is enrolled in an HDHP. Among individuals with a deductible, the average deductible amount increased from $446 to $1,931 from 2002 to 2019 among those with employee-only coverage (Figure 2). And it increased from $958 to $3,655 among those with family coverage.

Employers have been increasing deductibles because it is one of the easiest plan design changes to adopt in order to manage the cost of providing health benefits. When an employer increases the health plan deductible, it only has to change one number. It is much easier to increase deductibles than to do things like change insurance carriers, alter networks, move to a high-performing network, move to a limited network, change the formulary, offer health-risk assessments, offer financial incentives for biometric screenings, audit the plan for non-eligible dependents, etc.

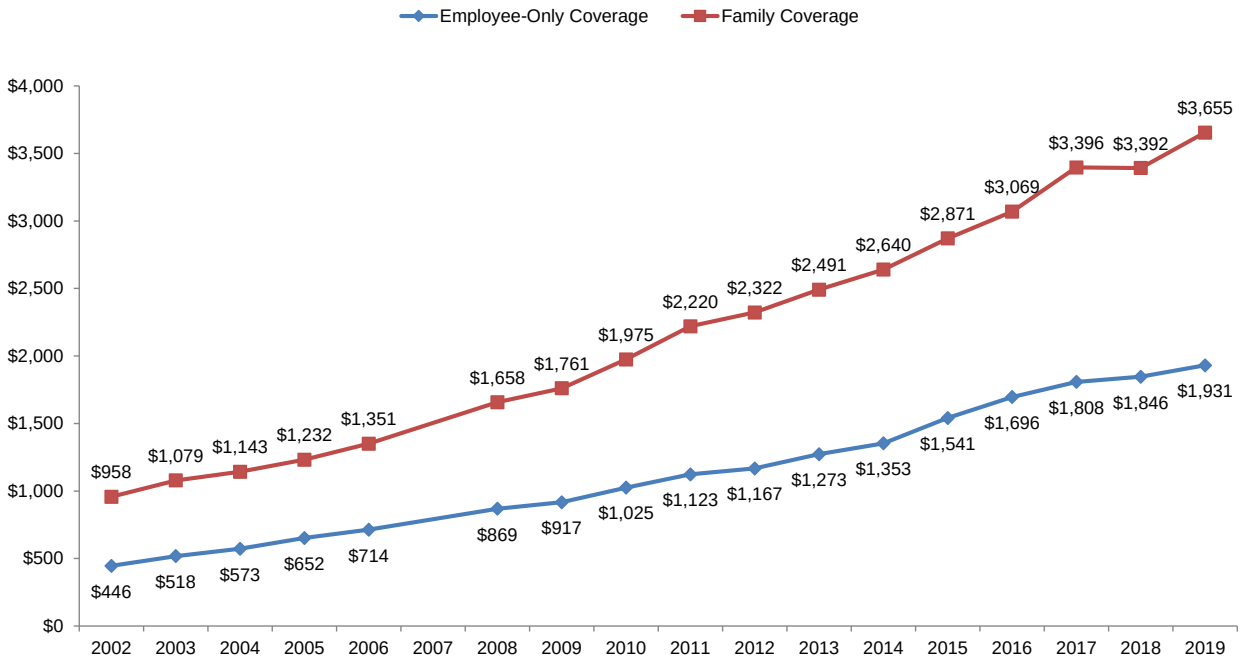
Increasing deductibles has been associated with a reduction in use of health care services and overall spending.[2] However, Fronstin and Roebuck (2013) found that the long-term savings was limited to individuals in the middle of the health care spending distribution prior to the adoption of the HDHP. They also found that there was no long-term spending reduction among high-cost claimants. More recent research found that many high-cost claimants not only satisfy their deductible but often also reach their maximum out-of-pocket limit.[3]

Figure 1
Percentage of Persons Under Age 65 Enrolled in an HDHP* or CDHP, Among Those With Private Health Insurance, 2007–2018**



* HDHP = high-deductible health plan with no health savings account or health reimbursement arrangement.
** CDHP = consumer-directed health plan, an HDHP with a health savings account or health reimbursement arrangement.
Source: Figure 11 in https://www.cdc.gov/nchs/data/nhis/earlyrelease/insur201811.pdf and Figure 3 in https://www.cdc.gov/nchs/data/nhis/earlyrelease/insur201306.pdf

Figure 2
Average Annual Employee-Only and Family Deductible, Among Workers in Private-Sector Establishments With a Deductible, 2002–2019



Source: Medical Expenditure Panel Survey Insurance Component (MEPS-IC).
Note: Data not collected in 2007.

More specifically, unless individuals faced deductibles of at least $12,000, we can conclude that everyone in the 10 percent of the population that uses 70 percent of the health care satisfied their deductible, because everyone in this population used at least $12,000 of health care (Figure 3). Furthermore, among these high users, 50 to 60 percent reached their maximum out-of-pocket limit. In essence, for these high-use individuals, use of health care services early in the year affects what they pay for health care services at the end of the year. This phenomenon raises questions about the effectiveness of deductibles in controlling spending. But it also raises questions about the relative effectiveness of different types of cost sharing later in the year, such as copayments and coinsurance, once an individual reaches his or her deductible.

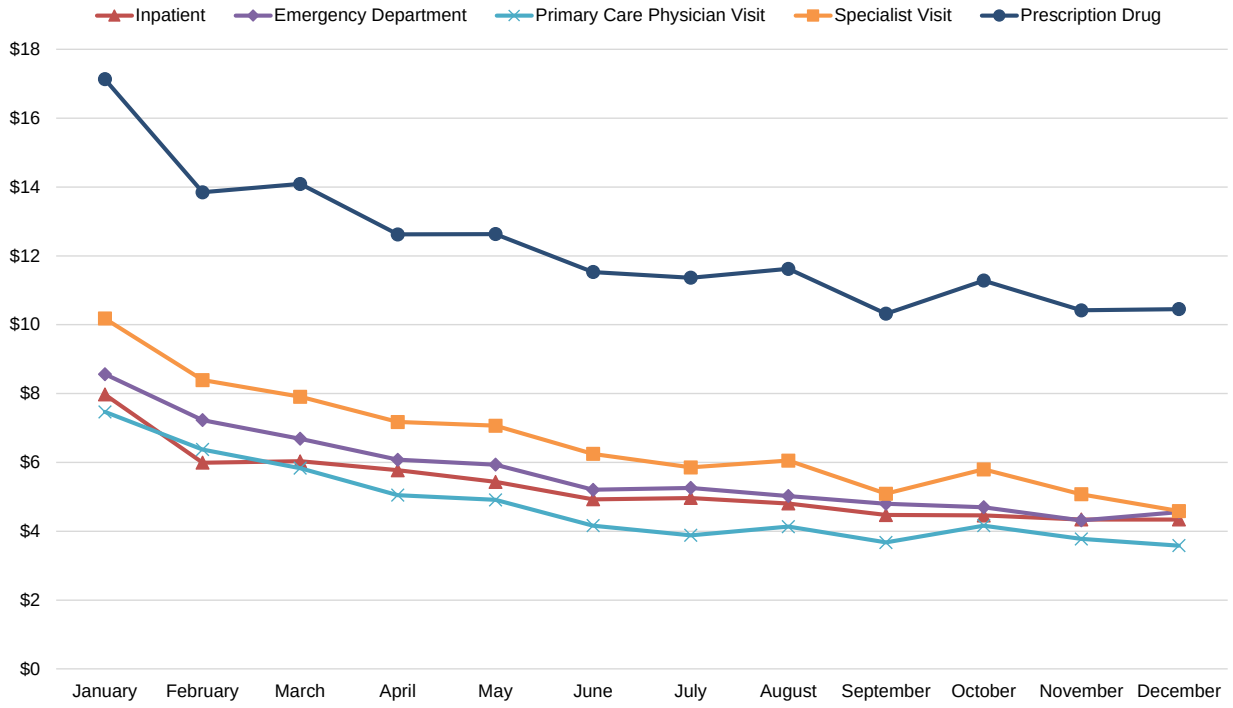
Figure 3
Distribution of Health Spending, Among Individuals With Employment-Based Health Coverage, Continuous Enrollment in 2017

Percentage of Enrollees	Percentage of Spending	Median Spending per Person	Average Spending per Person	Minimum Spending per Person	Percentage Who Reached Their Out-of-Pocket Maximum*
1%	28%	$120,500	$168,500	$80,000	70-80%
5%	56%	$41,500	$65,315	$23,000	60-70%
10%	70%	$23,500	$41,300	$12,000	50-60%
20%	84%	$12,700	$24,900	$5,400	30-40%

Source: EBRI analysis of IBM Health Analytics MarketScan® Commercial Claims and Encounters Databases.
* Based on a subset of individuals with data on out-of-pocket maximums.

Because deductibles are often reached early in the year by high users of health care services, it can be argued that it is the expected end-of-year price that matters most when individuals are deciding whether to use a health care service even before the end of the year is reached. Figure 4 shows that average out-of-pocket spending (i.e., the price that patients pay) among individuals enrolled in a preferred provider organization (PPO) fell from January through December in 2018. In other words, patient prices fall throughout the year. If consumers are sensitive to those prices, it is possible that the price sensitivity is different at different times of the year as well. This raises a question as to the generalizability of the widely used estimate of -0.2 for the elasticity of demand for health care[4] from the RAND Health Insurance Experiment (HIE) and other papers cited in Cutler and Zeckhauser (2000). More recently, there are a number of papers that look at the question as to whether consumers are more or less myopic in terms of price when it comes to use of health care services.[5] They find large variation in elasticities that are often of a magnitude higher than the -0.2 RAND HIE elasticity.

Figure 4
Average Out-of-Pocket Spending Among PPO Enrollees for Selected Health Care Services, by Calendar Month, 2018



Source: EBRI analysis of IBM Health Analytics MarketScan® Commercial Claims and Encounters Databases.

The purpose of this paper is to examine the differential effect of copayments and coinsurance on use of health care services. Our findings have implications for the effectiveness of deductibles, particularly once they are satisfied. We use data on between 1.9 and 3.6 million individuals, depending on the year, who either have copayments or coinsurance for various health care services. Why would we expect to find differences in behavior by whether an individual faces copayments or coinsurance after they reach their deductible? The studies cited above often found that individuals are not forward-looking when it comes to prices for health care. The same may be true when it comes to type of cost sharing. Before an individual reaches their deductible, they will know what the price of health care is if they face copayments after reaching their deductible. Copayments are well-defined and known before health care services are used. Coinsurance is less well-defined when it comes to knowing the price of a health care service in advance of using the service. An individual may know that they will pay 10 or 20 percent of the cost of the health care service, but they usually do not know what the allowed charge for the service will be until the claim has been adjudicated by the health plan. The uncertainty of coinsurance relative to the certainty of copayments may mean that coinsurance has a larger impact on use of health care services than copayments. Prior research on cost sharing for

prescription drugs found that when coinsurance and copayments have the same expected out-of-pocket costs, diabetes patients were less likely to refill prescriptions when they faced coinsurance, as compared with those with copayments.[6]

Data Sources

This study makes use of the IBM® Marketscan® Commercial Claims and Encounters Database (CCAE) as well as the IBM® Marketscan® Benefit Plan Design Database (BPD). The CCAE database contains member enrollment information as well as adjudicated medical (inpatient and outpatient) and pharmacy claims. The BPD database is intended to provide numerical values for the main elements of health plan benefit design including deductibles, coinsurance rates, copayments, and maximum out-of-pocket (MOOP) amounts. This information was not abstracted from specific plan design documents but was instead generated by IBM® via a plan-specific statistical analysis of claims and enrollment data. For example, in attempting to determine the member cost share for a primary care physician (PCP) visit for a specific employer, the database developer would analyze all adjudicated claims for that service within that plan. Since the claim line includes distinct fields for deductible, coinsurance, and copayment (in addition to the plan paid and allowed amounts), it is possible to infer whether or not a coinsurance rate or fixed dollar copayment prevailed for PCP visits as well as its corresponding numerical value. In this example, the developer may determine that the statistical mode (e.g., copayment=$20) was the most likely member cost share for a PCP visit for that plan. Other techniques would be used to derive deductible and maximum out-of-pocket measures. Of course, the accuracy of this approach depends on the size and fidelity of the underlying data. For this reason, BPD developers set confidence thresholds (opaque to end users) below which data values were set to missing. As one would expect, the degree of missing data is smaller for PCP and specialist physician visit variables, and larger for emergency department visits and inpatient services measures. Moreover, individuals in the CCAE database in large-employer plans are less likely to have missing data in the BPD data. Finally, it is worth noting that 0 values were never inferred for any plan design element and were instead set to missing, despite the possibility of having true 0s (e.g., $0 PCP visit copays, $0 deductible).

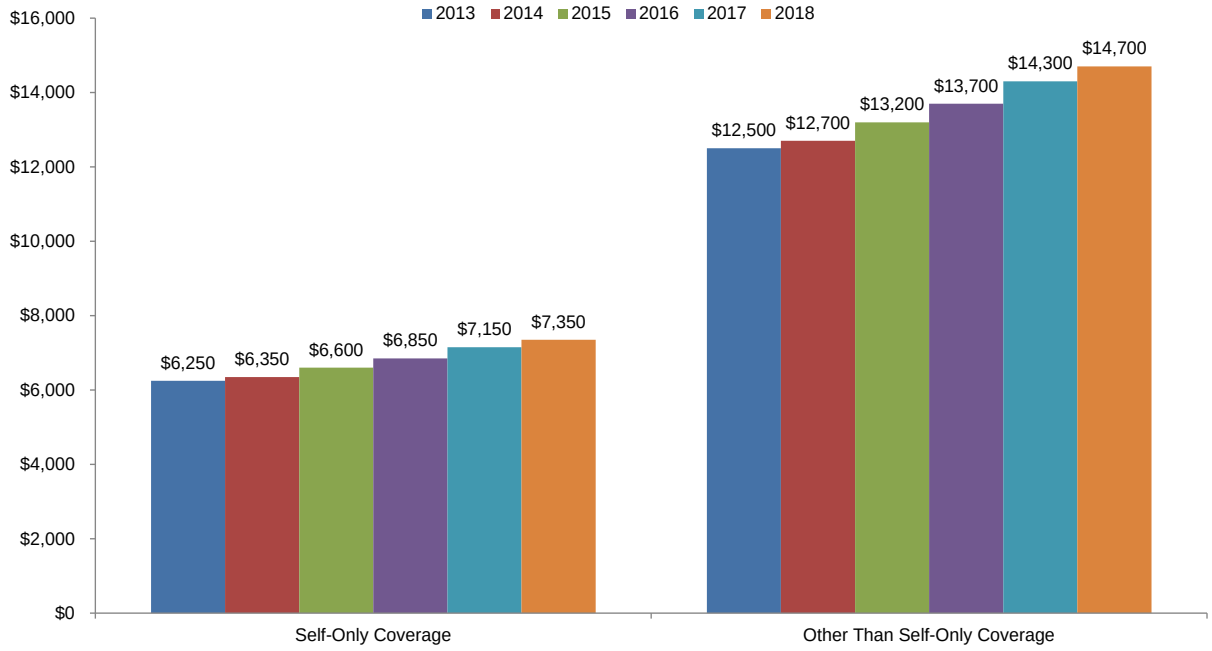
Study Sample

Construction of the analytical dataset involved several steps. First, each year from 2013 through 2018, we included all individuals in the IBM® Marketscan® Benefit Plan Design Database (BPD) file who had a non-missing value for (1) either copayment or coinsurance[7, 8] for an in-network primary care physician (PCP) visit,[9] (2) either copayment or coinsurance for an in-network specialist physician visit, and 3) both individual and family deductible amounts. We retained copayment and coinsurance variables for both inpatient services and emergency department visits, the values for which were missing for some individuals.[10] Finally, since the BPD's maximum out-of-pocket (MOOP) measure was routinely missing, we assume the statutory out-of-pocket maximum level prevails (Figure 5), recognizing that the true value can be lower.[11]

Next, using the IBM® Marketscan® Commercial Claims and Encounters Database (CCAE) enrollment files for each year from 2013 through 2018, we selected all full-time employees, along with their spouses and their dependents, with full-year (365 or 366 days) eligibility in a non-capitated PPO plan. PPO members comprise about two-thirds of all CCAE individuals. For our analysis, we isolated PPOs since other plan types (e.g., HMOs, EPOs) likely differ on unobservable plan design characteristics (e.g., breadth of physician networks), which may in turn be correlated with member cost-sharing arrangements. After merging with the previously described BPD file, the intersection of the two datasets formed the final sample of between 1.9 and 3.6 million individuals, depending on the year, over the six-year study period (i.e., an unbalanced panel dataset).

Individuals in HDHPs were excluded from the analysis for two reasons. First, because deductibles are highest for this group, few satisfy their deductible, which means we do not have cost-sharing information above the deductible for a large percentage of this sample. Second, where we do have cost-sharing information, nearly all HDHP enrollees have coinsurance above their deductible. The sample with copayments above the deductible was not large enough to be usable for our analysis.

Figure 5
Statutory Out-of-Pocket Maximum, by Type of Coverage, 2013–2018*



* As required by the Patient Protection and Affordable Care Act (ACA), out-of-pocket (OOP) maximums are set by the U.S. Department of Health and Human Services. OOP maximums are lower for HSA-eligible health plans, and are set by the Internal Revenue Service.

Study Variables

In addition to the benefit design measures previously described, other annual variables were constructed and utilized in the ensuing analyses, including gender, age, type of coverage (individual vs. family), relationship code (policyholder, spouse, or other dependent), region (Northeast, Midwest, South, or West), and the Charlson Comorbidity Index.[12] We also created a dichotomous variable indicating whether the member had satisfied their deductible (either individual or family) by year end. This was accomplished by summing the deductible field values from all claims[13] — at both the individual and family levels — and comparing those values with the prevailing benefit plan deductibles levels. An indicator for met maximum out-of-pocket costs was also derived using the same approach with the deductible, copayment, and coinsurance claim fields.

Seven annual health service utilization count measures were constructed for use as dependent variables. These were the numbers of:

- Inpatient hospital days.
- Emergency department visits.
- Primary care physician visits.
- Specialist physician visits.
- Physical therapy visits.
- Chiropractor visits.
- Psychotherapy/counseling visits.

We did not examine how copayments and coinsurance affected prescription drug use. The BPD does not provide cost-sharing information for prescription drugs.

Methods

For enrollees in plans with copayments, cost sharing for a given service is a fixed dollar amount (*c*). Under coinsurance, however, member out-of-pocket cost is the product of the coinsurance rate (*r*) and the price (*p*) of the service. The two cost-sharing regimes should not be expected to necessarily produce identical demand responses, since under coinsurance, consumer cost sharing is a function of variation in price (*p).* In theory, members could be more or less responsive under coinsurance compared with copayments.

Copayment Regime Model

To examine the impact of member out-of-pocket cost on health services utilization under a copayment regime, we specify the following linear fixed-effects model:

$$\boldsymbol{Y_{it} = \alpha_i + \beta_1 c_{gt} + X_{it}\theta + \varepsilon_{it}} \qquad \textbf{(1)}$$

Individuals are indexed by *i* (from 1 to N) and time by *t* (from year 2013 through 2018). For each of the seven dependent variables (*Y*), we estimate models of any use, conditional use, and overall use.[14] Individuals enrolled in the same group plan (denoted by *g*) in year (*t*) will have the same benefit design. The coefficient β_1 represents the marginal impact of the member cost share, copayment (*c*), on *Y*.[15] The model also includes the following vector of covariates (*X*) with θ parameters to be estimated: age-squared; Charlson Comorbidity Index; Midwest, South, or West (Northeast as reference); met deductible; met maximum out-of-pocket cost; and year indicators, with 2013 as the reference. Finally, α_i captures individual fixed effects, and ε_{it} is the idiosyncratic error term.

Coinsurance Regime Models

Under coinsurance, our comparable linear fixed-effects specification is:

$$\boldsymbol{Y_{it} = \delta_i + \beta_2 r_{gt} p_{gt} + X_{it}\tilde{\theta} + \omega_{it}} \qquad \textbf{(2)}$$

where the member cost share is the product of coinsurance rate (*r*) applicable to service *Y*, and price (*p*) of each unit of service *Y*. We calculated *p* as the mean allowed amount per unit of service *Y*, using all adjudicated claims for service *Y* within *g* and *t*. The coefficient β_2 represents the marginal impact of the member cost share paid under the coinsurance regime on *Y* and can be compared to β_1. In Equation 2, δ_i captures individual fixed effects, ω_{it} is the idiosyncratic error term, and the tilde accent on θ distinguishes between companion estimates in Equation 1.

Of key interest in the present study, however, is the impact of coinsurance on health services utilization. In Equation 2, both *r* and *p* are sources of variation in member cost share. That is, changes in either variable produce changes in their product. Moreover, *r* and *p* can even move in opposite directions. Equation 2 implicitly assumes that members respond similarly to relative changes in *r* as they do to relative changes in *p*. We should not expect this to be the case. Arguably, at the time of making a health care decision, the member is more likely to know their coinsurance rate than the price of the service. Several factors might enhance or diminish this price uncertainty. For example, the patient may have experience with the service and its associated cost-share. Conversely, the price of an emergency department visit may be unknown to the naïve patient. To isolate the effect of *r*, we enter *p* in Equation 2 to form Equation 3 as follows:

$$Y_{it} = \tau_i + \beta_3 r_{gt} p_{gt} + \beta_4 p_{gt} + X_{it}\ddot{\theta} + \varphi_{it} \quad (3)$$

Coefficient β_3 is the marginal impact of the coinsurance rate on *Y,* holding *p* constant. In Equation 3, τ_i captures individual fixed effects, ϕ_{it} is the idiosyncratic error term, and the double-dot accent on θ distinguishes between companion estimates in Equations 1 and 2.

Statistical Inference

Of critical concern was the fact that despite having data on millions of individuals, the plan design measures — the regressors of interest — only varied at the plan/year level. Ignoring this would have led to an overconfidence in our estimates of the impact of member cost sharing on health services utilization. Unfortunately, neither the CCAE nor BPD contain a plan-specific identifier. As a solution — albeit an imperfect one — we assumed that everyone in a given year who had identical values for all benefit design measures were enrolled in the same plan.[16] Using this approach, we created a synthetic plan identifier for each year (this corresponds to *g* in the models above). We then reassigned individuals to their most recent plan identifier for all prior years to force panels to be nested within cluster. In all multivariate models, we clustered standard errors by this new plan identifier.[17] Of course, compared with not clustering, p-values were substantially higher, but we believe this conservative approach to be more appropriate.

Elasticities of Member Cost Sharing

Postestimation of Equations 1, 2, and 3, we transformed coefficients β_1, β_2, and β_3 into elasticities calculated at the mean of all regressors.

$$e_1 = \beta_1 * \frac{\bar{c}}{\bar{Y}} \qquad e_2 = \beta_2 * \frac{\bar{r}\bar{p}}{\bar{Y}} \qquad e_3 = \beta_3 * \frac{\bar{r}\bar{p}}{\bar{Y}}$$

Elasticity e_1 reports the expected percentage change in *Y* from a 1 percent increase in copayments. e_2 is the expected percentage change in *Y* from a 1 percent increase in member cost-share under a coinsurance regime. e_3 is the expected percentage change in *Y* from a 1 percent increase in the coinsurance rate holding price constant under a coinsurance regime. Note that the difference, $e_2 - e_3$, represents the price elasticity component of member cost share under coinsurance.

Since health services utilization differs in both type and frequency by age and health status (among other characteristics), we also re-estimate all models for three age groups: ages under 18, ages 18–39, and ages 40–64. Our models are also estimated for different levels of health status as defined by a combination of the Charlson Comorbidity Index and depression. All analyses were conducted using Stata 16.1MP.[18]

In the remainder of the paper, we focus on the elasticities derived from Equations 1 and 3, e_1 and e_3. The elasticities from Equation 2 are available upon request.

Possible Confounders

By design of our analytical dataset, individuals could have either coinsurance or copayment for a given service each year. Individuals can, however, have a change in cost-sharing regime (coinsurance vs. copay) over time. In our analytical dataset, this occurred for approximately 5.1 percent of individuals for outpatient, 14.1 percent for emergency room, and 4.8 percent for inpatient. We decided not to make use of this within-person variation and instead modeled the two regimes separately. A key issue in our study is that because individuals selected their own health plan, unmeasured reasons for that choice that are also correlated with health services use would likely lead to biased estimates of the impact of member cost sharing. It is for this reason that we segregated models by regime. This is not to say, however, that changes in copayment levels or coinsurance rates themselves cannot also be endogenous. While

we control for general health status via inclusion of the Charlson Comorbidity Index, we cannot rule out other potential confounders. Nevertheless, time-invariant unobservable characteristics are eliminated using linear fixed effects.

Results

Sample Statistics

Demographics of the sample for 2018 are in Figure 6 and information on cost sharing is in Figure 7. As you can see, cost sharing comes in many different shapes and sizes. Generally, after reaching average deductibles of $1,045 for employee-only coverage and $1,858 for family coverage, individuals face a mix of cost-sharing arrangements. When it came to inpatient services, most plan enrollees (98 percent) faced coinsurance instead of copayments. For those with coinsurance, the average was 18 percent. Copayments averaged $304 per stay.

Figure 6
Sample Characteristics, 2018

	2018
Gender	
Male	**49%**
Female	**51%**
Age (years)	**34.5**
Under 18	**23%**
18–39	**31%**
40–64	**46%**
Type of Coverage	
Employee-only coverage	**20%**
Family coverage	**80%**
Person Covered	
Policyholder	**46%**
Spouse	**18%**
Child/dependent	**36%**
Charlson Comorbidity Index (#)	**0.25**

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

The mix between coinsurance and copayments was much more even when it came to health care provided in an emergency department. About one-half of plan enrollees had coinsurance (52 percent) and copayments (48 percent). Coinsurance averaged 20 percent and copayments averaged $162 for emergency department services.

The mix between coinsurance and copayments was also evenly split when it came to outpatient office visits. A little less than one-half of plan enrollees had coinsurance (44 percent), while a little more than one-half had copayments (56 percent). Coinsurance averaged 20 percent, and copayments averaged $26 for primary care physician office visits and $41 for specialist office visits.

Figure 7
Cost Sharing, 2018

Deductible	
Employee-only coverage	**$1,045**
Family coverage	**$1,858**
Inpatient Services	
% with coinsurance	**98%**
% with copayment	**2%**
Average coinsurance	**18%**
Average copayment	**$304**
Emergency Department	
% with coinsurance	**52%**
% with copayment	**48%**
Average coinsurance	**20%**
Average copayment	**$162**
Outpatient Office Visits	
% with coinsurance	**44%**
% with copayment	**56%**
Average coinsurance	**20%**
Average copayment, primary care physicians	**$26**
Average copayment, specialist physicians	**$41**

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

Coinsurance Reduces Demand for Specialist Physician Office Visits

We find substantial variation in the elasticity of demand for health care for different types of services in Figure 8. We also find a few differences in the elasticity by type of cost sharing. For instance, coinsurance has an effect on use of inpatient health care, while copayments do not. The coinsurance elasticity of demand for inpatient health care was -0.18, meaning a 1 percent increase in price leads to a 0.18 percent decrease in utilization. This is close to the widely cited -0.20 estimate from the RAND HIE. We find no effect for copayments. This may be due to the fact that such a small percentage of our sample had copayments for inpatient health care (2 percent) and because there may not be sufficient variation within person over time as relied upon by fixed-effect modelling. Neither copayments nor coinsurance were found to have an impact on emergency department visits.

When it comes to PCP office visits, we find that copayments had nearly twice the impact on the number of visits as coinsurance. The elasticity of demand for PCP office visits was -0.11 for coinsurance, while it was -0.19 for copayments. In contrast, while copayments had no impact on the demand for specialist visits, coinsurance had nearly the same effect as it did for PCP office visits (-0.08).

We looked at a number of other types of office visits for outpatient services to see if they were more or less impacted by type of cost sharing. They included physical therapy visits, chiropractor visits, and psychotherapy/counseling visits. The copayment and coinsurance elasticities were about the same with respect to physical therapy and psychotherapy/counseling visits. However, the copayment elasticity for chiropractic care was twice that of the coinsurance elasticity.

Figure 8

Demand Responses to Cost Sharing, by Type of Health Care Service

	Overall Elasticities	
	Copayments (Model #1)	Coinsurance (Model #3)
Inpatient Days	-0.05	-0.18***
Emergency Department Visits	0.03	0.004
Primary Care Physician Office Visits	-0.19***	-0.11***
Specialist Physician Office Visits	-0.03	-0.08***
Physical Therapy Visits	-0.25***	-0.23***
Chiropractor Visits	-0.33***	-0.16***
Psychotherapy/Counseling Visits	-0.09***	-0.10***

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.
*p< 0.05, **p<0.01, ***p<0.001.

In short, coinsurance reduced use of inpatient care and specialist physician office visits more than copayments. Otherwise, copayments and coinsurance had about an equal effect on the use of the other health care services examined. Chiropractic care was the exception, where we found that copayments had a larger effect than coinsurance.

Little Impact on Youngest and Oldest Individuals

Use of health care varies by age. As seen in Figure 9, older individuals generally use more health care than younger people and the nature of health care used also varies. For example, individuals ages 40–64 saw specialist physicians an average of 2.7 times per year, whereas those ages 18–39 saw specialist physicians an average of 1.8 times per year. Furthermore, whether a person reaches his or her deductible and/or out-of-pocket maximum may impact their overall demand for health care services. Older individuals (ages 40–64) were about 3 times as likely to reach their out-of-pocket maximum than those under age 18. As such, it can be argued that older individuals are less responsive to any form of cost sharing. However, it can also be argued that parents are less sensitive to the cost of health care when it comes to their children as compared with themselves.

Figure 9

Use of Health Care Services, by Age, 2018

	Under Age 18	18–39	40–64
Inpatient Hospitalization Admissions (per 100)	1.4	5.2	4.4
Inpatient Hospital Days (per 100)	9.8	20.6	20.3
Emergency Department Visits (per 100)	29.7	36.3	30.2
Primary Care Physician Visits	2.2	1.4	2.2
Specialist Physician Visits	1.2	1.8	2.7
Physical Therapy Visits	0.6	0.8	1.5
Chiropractor Visits	0.2	0.5	0.7
Psychotherapy/Counseling Visits	0.7	0.8	0.6
Met Deductible by Year-End	21%	19%	22%
Met Maximum Out-of-Pocket by Year-End	0.3%	0.5%	1%

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.

There were only a few instances where coinsurance had a larger impact than copayments (Figure 10). Among 18–39-year-olds, coinsurance had a greater impact than copayments on inpatient days, specialist office visits, and psychotherapy/counseling visits. Among 40–64-year-olds, coinsurance had a greater impact than copayments on use of emergency department visits.

Interestingly, among individuals under age 18, with the exception of chiropractor visits — which is a relatively rare occurrence — we find that coinsurance had no impact on use of health care services. Copayments also did not affect inpatient, emergency department, or specialist office visits. However, they were found to reduce primary care visits, physical therapy visits, and psychotherapy visits. Copayments had the largest impact on use of chiropractor services.

Overall, both coinsurance and copayments have a greater impact on individuals ages 18–39 than on those under age 18 or ages 40–64.

Figure 10

Demand Responses to Cost Sharing, by Age and Type of Health Care Service

	Overall Elasticities	
	Copayments (Model #1)	**Coinsurance (Model #3)**
Under Age 18		
Inpatient days	**-0.08**	**0.13**
Emergency department visits	**0.008**	**0.01**
Primary care physician office visits	**-0.16*** **	**-0.11**
Specialist physician office visits	**0.07**	**-0.01**
Physical therapy visits	**-0.14*** **	**-0.23**
Chiropractor visits	**-0.48*** **	**-0.28*** **
Psychotherapy/counseling visits	**-0.11***	**-0.003**
Ages 18–39		
Inpatient days	**-0.14** **	**-0.50*** **
Emergency department visits	**0.00**	**0.05**
Primary care physician office visits	**-0.13*** **	**-0.06*** **
Specialist physician office visits	**-0.05*** **	**-0.12*** **
Physical therapy visits	**-0.28*** **	**-0.28*** **
Chiropractor visits	**-0.36*** **	**-0.28*** **
Psychotherapy/counseling visits	**-0.12*** **	**-0.20*** **
Ages 40–64		
Inpatient days	**0.04**	**-0.03**
Emergency department visits	**0.03**	**-0.02** **
Primary care physician office visits	**-0.13*** **	**-0.05*** **
Specialist physician office visits	**-0.05** **	**-0.07*** **
Physical therapy visits	**-0.23*** **	**-0.20*** **
Chiropractor visits	**-0.32*** **	**-0.10** **
Psychotherapy/counseling visits	**-0.14*** **	**-0.15*** **

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.
*p< 0.05, **p<0.01, ***p<0.001.

Healthiest Are Most Sensitive to Cost Sharing

As mentioned above, we measure health status using the Charlson Comorbidity Index (CCI). The CCI is a weighted index that predicts risk of death within one year of hospitalization for patients with specific comorbid conditions. It is widely used in the extant literature as a gauge of general health status. Medical conditions such as diabetes, cancer, and heart disease are included. Overall, the CCI currently consists of 17 health conditions. We augmented the CCI with an indicator for depression (CCI&D) and examined 3 groups of patients: those with CCI=0, those with a CCI=1, and those with a CCI=2 or more. Clearly, those with a CCI of zero use very few health care services in any given year. Those with a CCI=1 use some health care services. And those with a CCI equal to two or more comprise the bulk of the 20 percent of the population who use around 80 percent of the health care in any given year.

Figure 11

Demand Responses to Cost Sharing, by Health Status Among Adults Ages 18–64

	Overall Elasticities	
	Copayments (Model #1)	**Coinsurance (Model #3)**
CCI and Depression = 0		
Inpatient days	**-0.13**	**-0.72**
Emergency department visits	**0.019**	**0.05**
Primary care physician office visits	**-0.13*** **	**-0.06**
Specialist physician office visits	**-0.07**	**-0.12**
Physical therapy visits	**-0.29*** **	**-0.25**
Chiropractor visits	**-0.33*** **	**-0.18*** **
Psychotherapy/counseling visits	**-0.08***	**-0.16**
CCI and Depression = 1		
Inpatient days	**0.02****	**-0.13*** **
Emergency department visits	**0.03**	**-0.02**
Primary care physician office visits	**-0.14*** **	**-0.06*** **
Specialist physician office visits	**-0.03*** **	**-0.07*** **
Physical therapy visits	**-0.22*** **	**-0.23*** **
Chiropractor visits	**-0.31*** **	**-0.14*** **
Psychotherapy/counseling visits	**-0.12*** **	**-0.13*** **
CCI and Depression = 2 or More		
Inpatient days	**-0.06**	**-0.01**
Emergency department visits	**-0.01**	**-0.02****
Primary care physician office visits	**-0.13*** **	**-0.02*** **
Specialist physician office visits	**-0.02****	**-0.05*** **
Physical therapy visits	**-0.12*** **	**-0.04*** **
Chiropractor visits	**-0.21*** **	**-0.03****
Psychotherapy/counseling visits	**-0.08*** **	**-0.12*** **

Source: Authors' analysis of IBM MarketScan administrative enrollment and claims data.
*p< 0.05, **p<0.01, ***p<0.001.

When it comes to the impact of cost-sharing by health status, we have a number of expectations. First, we expect the least healthy to be less sensitive to cost sharing, regardless of whether they face copayments or coinsurance. Past research has found that these patients are not only likely to satisfy their deductible but are also likely to reach their out-of-pocket maximum. Second, regardless of health status, we expect those with coinsurance to be more sensitive to cost sharing than those with copayments.

We find exactly what we would expect to find among people with chronic conditions. Those patients who were least healthy were less sensitive to cost sharing, whether it be copayments or coinsurance (Figure 11). Consistent with our overall findings in Figure 8, we find that coinsurance had a greater impact on reducing inpatient length of stay and specialist office visits among patients with a CCI=1. Among patients with a CCI equal to two or more, coinsurance had a greater impact than copayments on emergency department visits and specialist office visits.

Conclusion

Use of health care services and associated spending are far from evenly distributed across the population. As a general rule, 20 percent of the population accounts for about 80 percent of health care spending. Many of these high-cost claimants reach their deductible. Because deductibles are often reached early in the year by high users of health care services, it can be argued that it is the end-of-year price that matters most when individuals are deciding whether to use a health care service even before the end of the year is reached. This phenomenon raises questions about the relative effectiveness of different types of cost sharing later in the year, such as copayments and coinsurance, once an individual reaches his or her deductible.

Copayments are well-defined and known before health care services are used. Coinsurance is less well-defined when it comes to knowing the price of a health care service in advance of using the service. An individual may know that they will pay 10 or 20 percent of the cost of the health care service, but they usually do not know what the allowed charge for the service will be until the claim has been adjudicated by the health plan. The uncertainty of coinsurance relative to the certainty of copayments may mean that coinsurance has a differential impact on use of health care services than copayments.

And indeed, we find that coinsurance reduces use of inpatient care and specialist physician office visits more than copayments. In contrast, copayments reduce use of primary care office visits more than coinsurance. Otherwise, we found that copayments and coinsurance had about an equal effect on the use of the other health care services examined in this paper.

Most employers already use coinsurance for inpatient care. However, only 44 percent use coinsurance for office visits. If an employer is seeking to manage use of health care services and spending — especially among high users of health care services —moving from copayments to coinsurance for specialist office visits could provide a viable alternative.

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Endnotes

[1] HDHPs are health plans with deductibles of at least $1,400 for individual coverage and $2,800 for family coverage in 2020.

[2] Buntin et al. (2006) examined some of the early evidence from a number of studies that looked at, among other things, the impact of moving to HDHPs on health care spending. It found one-time spending reductions ranging from 4 percent to 15 percent. In a more recent study, Brot-Goldberg et al. (2017) found that savings ranged from 12 percent to 14 percent, while Fronstin and Roebuck (2013) found a 25 percent savings in year 1, but by year 4, savings amounted to only 6 percent.

[3] Fronstin and Roebuck (2019).

[4] The elasticity of demand is the measure of responsiveness of consumers to a change in a product's price. An elasticity of demand for health care of -0.2 means that a 10 percent increase in health care prices results in a 2 percent decrease is use of health care services.

[5] These studies include Aron-Dine et al. (2015); Brot-Goldberg et al. (2017); Eichner (1998); Einav, Finkelstein, and Schrimpf (2015); Ellis, Martins, and Zhu (2017); Keeler and Rolph (1988); and Kowolski (2016).

[6] Dor and Encinosa (2010).

[7] The BPD contains a single outpatient coinsurance rate variable that presumably applies to all outpatient services.

[8] In about 8 percent to 13 percent of cases, both copayment and coinsurance for a given service contained non-missing values. To allow for a straightforward analysis of copayment vs. coinsurance, these individuals were dropped from our analysis.

[9] The BPD includes sets of copayment and coinsurance variables for both in-network and out-of-network services. However, values for the latter are routinely missing. Therefore, we used the in-network measures only.

[10] It is worth noting that besides likely being correlated with plan size, the missingness of inpatient and emergency department cost-sharing measures may also not be at random due to plan-level health status. For example, employees of a mining company might, on average, use more urgent care, thereby increasing the amount of usable data for BPD developers to infer plan design values.

[11] The BPD does not contain any variables for prescription drug benefit design.

[12] Charlson et al. (1987), Deyo, Cherkin, and Ciol (1992), and Quan et al. (2005).

[13] We assumed that pharmacy expenditures were included.

[14] The findings presented in this paper are based on overall use of health care services. The findings based on the models for any use (i.e., the extensive margin) and conditional use (i.e., the intensive margin) are available upon request.

[15] For simplicity, we omit an index for health services, but c, r, and p pertain to the specific service Y being modeled.

[16] The benefit design variables included in this process included individual and family deductibles, and coinsurance and copayments for inpatient, emergency room, primary care physician, and specialist physician. We required numerical values (and whether or not values were missing) to exactly match.

[17] A total of 2,119 unique plans were detected across all years (426 in 2018).

[18] StataCorp. (2019).

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