

## How Do High-Deductible Health Plans Affect Use of Health Care Services and Spending Among Enrollees With Mental Health Disorders?

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

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### AT A GLANCE

In this paper, we explore the impact of moving from a preferred provider organization (PPO) to a high-deductible health plan (HDHP) among people with mental health disorders. We focus on individuals with major depressive disorder (MDD), anxiety, and attention deficit hyperactivity disorder (ADHD) since these represent the majority of mental health patients. Furthermore, the prevalence of these conditions in the population with employment-based health insurance is especially high relative to other mental health conditions, and it has been increasing. In our analysis, we observe:

- Moving from a PPO to an HDHP reduced the probability of using health care services.
- The amount of health services used was also lower among patients with mental health disorders who moved from a PPO to an HDHP. Office visits, prescription drug fills, inpatient days, and emergency department visits all declined.
- Utilization of preventive services including cancer screenings and some vaccinations was also negatively affected by the move from a PPO to an HDHP.
- The reductions in use of health care services prompted declines in overall health care spending. Employer spending fell by a greater amount and percentage than overall spending. Employee spending increased because the move from the PPO to the HDHP shifted some pre-deductible spending onto users of health care.
- Moving from a PPO to an HDHP had a mixed impact on use of out-of-network health care services. While the probability of using an out-of-network mental health provider fell among those with ADHD and MDD, neither the number of office visits nor overall spending on out-of-network care were affected by the plan change.

When employers raise deductibles, they do so to better manage their costs. They are trying to balance their efforts to reduce low-value health care services while incentivizing the use of high-value services. Our findings are limited by the fact that outcomes related to changes in health care use during the switch from PPO to HDHP are unobserved. Such outcomes would ultimately be impacted by the value of care received, for which data is unavailable for this analysis.

Our research can help employers make targeted benefit design decisions. They can also inform policymakers as they consider allowing employers to provide enhanced coverage for health care services that prevent the exacerbation of chronic conditions.

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## Table of Contents

Introduction .....	4
Data .....	7
Methods .....	7
Prevalence of Mental Health Conditions .....	7
Analytical Dataset Construction.....	7
Study Variables .....	8
Impact of HDHP on Use of Health Care Services .....	12
Impact of HDHP on Health Care Spending .....	16
Sensitivity Analyses .....	20
Discussion.....	20
Conclusion .....	21
References.....	21
Endnotes .....	23

## Figures

Figure 1, Average Annual Employee-Only and Family Deductible, Among Workers in Private-Sector Establishments With a Deductible, 2002–2020 .....	4
Figure 2, Percentage of Population Under Age 65 Diagnosed With Various Mental Health Disorders, 2019.....	6
Figure 3, Percentage of Population Under Age 65 Diagnosed With Various Mental Health Disorders, 2013–2019.....	6
Figure 4, Demographics, by Mental Health Disorder .....	8
Figure 5, Presence of Health Conditions, by Mental Health Disorder .....	8
Figure 6, Probability of Receiving Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	9

Figure 7, Annual Use of Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	10
Figure 8, Annual Spending on Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	10
Figure 9, Annual Spending on Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	11
Figure 10, Impact of HDHP on Probability of Receiving Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	12
Figure 11, Impact of HDHP on Probability of Receiving Various Types of Prescription Drugs Among Individuals Ages 18–64 With Depression or Anxiety .....	13
Figure 12, Impact of HDHP on Use of Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD (per 100 Plan Members) .....	14
Figure 13, Impact of HDHP on Use of Various Types of Prescription Drugs Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD (per 100 Plan Members) .....	14
Figure 14, Impact of HDHP on Use of Various Types of Screenings Among Individuals Ages 18–64 With Depression or Anxiety (per 100 Plan Members) .....	15
Figure 15, Impact of HDHP on Use of Various Vaccines Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD (per 100 Plan Members) .....	15
Figure 16, Impact of HDHP on Health Care Spending Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	16
Figure 17, Impact of HDHP on Health Care Spending, by Type of Health Care Service Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	17
Figure 18, Probability of Using Out-of-Network Health Care Providers, Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	18
Figure 19, Annual Use of Various Types of Out-of-Network Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	18
Figure 20, Annual Spending on Out-of-Network Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	19
Figure 21, Impact of HDHP on Probability of Receiving Various Types of Health Care Services From Out-of-Network Providers Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD .....	19

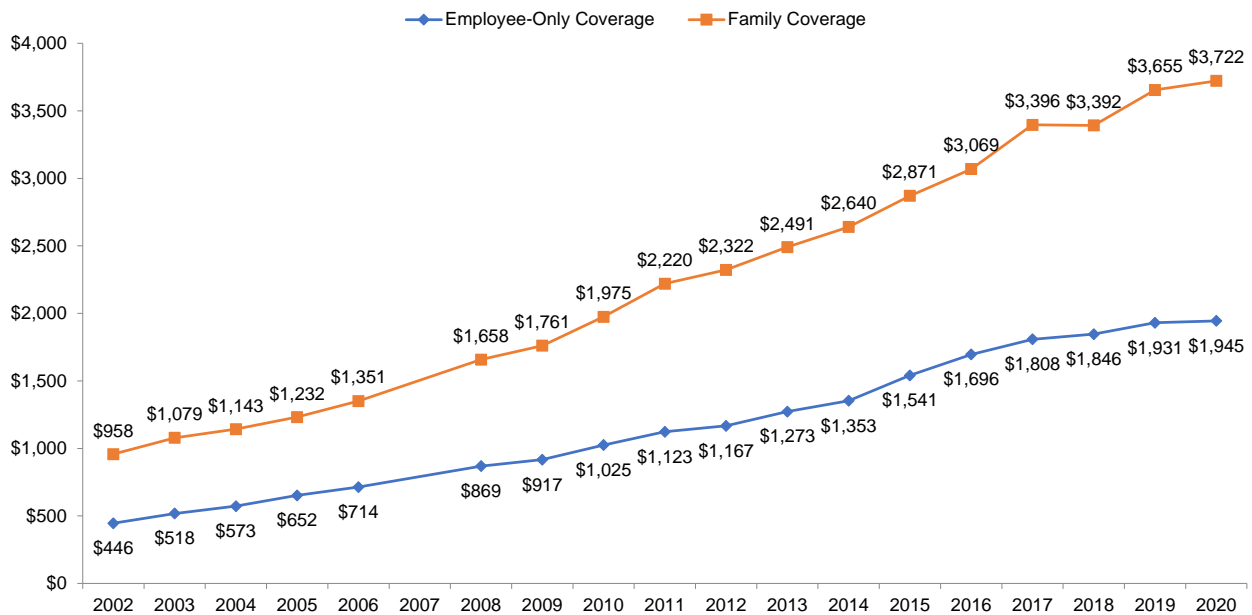
# How Do High-Deductible Health Plans Affect Use of Health Care Services and Spending Among Enrollees With Mental Health Disorders?

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## Introduction

Deductibles have become a prominent part of the health benefits landscape. Perhaps one of the strongest trends in employment-based health benefits has been their increased adoption, particularly in the context of high-deductible health plans (HDHPs).<sup>1</sup> In 2020, 89.2 percent of workers with health insurance had a deductible, up from 70.7 percent in 2008.<sup>2</sup> By 2020, nearly 60 percent of health plan enrollees were in plans with what was considered a high deductible (Fronstin and Fendrick 2021). Further, deductible levels have been increasing more generally regardless of being classified as “high” in an HDHP. The average deductible increased from \$446 to \$1,945 from 2002 to 2020 among those with employee-only coverage and from \$958 to \$3,722 among those with family coverage (Figure 1).

Figure 1  
Average Annual Employee-Only and Family Deductible, Among Workers in Private-Sector Establishments With a Deductible, 2002–2020



Source: Medical Expenditure Panel Survey Insurance Component (MEPS-IC), data generated at <https://datatools.ahrq.gov/meps-ic>.  
Note: Data not collected in 2007.

Employers have been increasing deductibles because it is one of the most efficient plan design changes to adopt to manage the cost of providing health benefits. When an employer increases the health plan deductible, it only must 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.

Much research has been done to understand the impact that the deductible in health savings account (HSA)-eligible health plans — and high-deductible health plans (HDHPs) more generally — has had on use of health care services and spending.<sup>3</sup> Early work focused on research questions pertaining to plan choice (e.g., enrollee characteristics, risk

selection), as well as quantifying the impact of HDHPs on overall use of services and spending. Studies have examined more specific outcomes such as medication adherence for individuals with chronic conditions (Fronstin, Sepulveda, and Roebuck 2013), generic drug use (Fronstin and Roebuck 2014), health care price shopping (Brot-Goldberg et al. 2015), quality (Fronstin and Roebuck 2014), use of specialty medications (Fronstin and Roebuck 2018), and delays in breast cancer screening (Wharam et al. 2019). Effects of deductible level, presence of an HSA or health reimbursement arrangement (HRA), and type of HDHP have also been explored (Haviland et al. 2011). A common finding in this literature is that HDHPs lead to reductions in use of health services.

### **Generosity of Employment-Based Health Insurance, 2013–2019**

Despite increases in deductibles, trends in actuarial value (AV) — or the relative generosity of health plans — in the employment-based health coverage market have not fallen commensurately. Both mean and median actuarial value — the percentage of covered health care expenses that is paid by the plan — were about 83 percent in each year from 2013 to 2019. Despite rigorous requirements around what can be excluded from deductibles, average AV also increased in HSA-eligible health plans. The movement of workers from PPOs to HRAs and HSA-eligible health plans would be expected to lower overall mean and median AV. Yet, despite higher deductibles, employers may have enhanced health benefits just enough to see AV increase if they were doing so to be competitive in a tight labor market. More information can be found in Fronstin et al. (2021).

In this study, we investigate the impact of HDHPs on use of health care services and spending among individuals with mental health disorders — a topic that has received little attention. Two recent papers studied the research question in a sample of HDHP enrollees with bipolar disorder (Wharam et al. 2020 and Lu et al. 2021) and found that the higher cost sharing appears to have caused patients to prioritize some services over others — psychiatrist visits were unaffected, while other mental health care visits fell. Stated differently, the authors concluded that the HDHP did not have the “blunt instrument” effect detected in many of the general studies previously discussed. Aside from this work on bipolar disorders, the effect of HDHPs among those with mental health disorders has not been examined.

We chose to focus on individuals with major depressive disorder (MDD), anxiety, and attention deficit hyperactivity disorder (ADHD). These individuals account for the majority of patients with mental health disorders, and the prevalence of these conditions in the population with employment-based health insurance is also especially high relative to other mental health disorders (Figure 2). In 2019, among those under age 65 with employment-based plans, 8.1 percent were classified as having anxiety, 5.3 percent had MDD, and 2.8 percent had ADHD. Otherwise, fewer than 1 percent were diagnosed with any of the other mental health disorders.

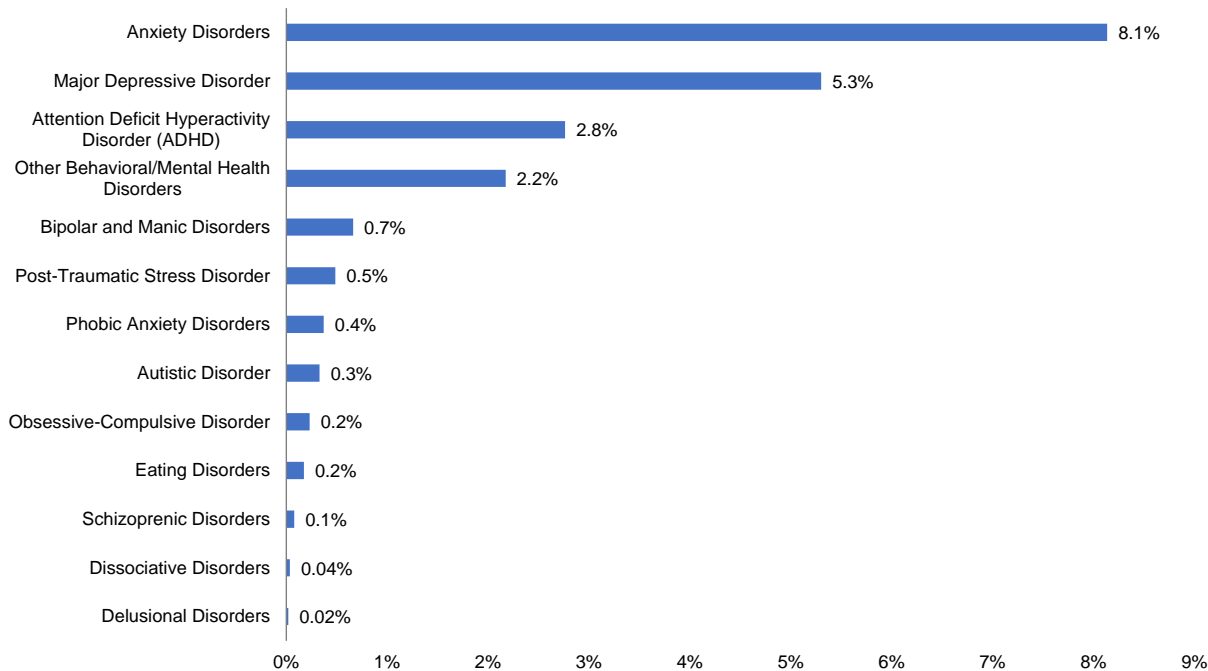
The prevalence of MDD, anxiety, and ADHD has also been increasing. Between 2013 and 2019, the percentage of the population with MDD increased from 4.1 percent to 5.3 percent, and the share with anxiety increased from 4.8 percent to 8.1 percent (Figure 3). ADHD prevalence increased only slightly, from 2.3 percent to 2.8 percent.

We corroborated our findings with other sources. Using data from the National Survey on Drug Use and Health (NSDUH), we found that self-reporting of MDD episodes increased from 6.5 percent to 8 percent between 2013 and 2019. These estimates are slightly higher than what we found in claims data, which is what we expected to find, because not everyone with MDD seeks treatment. Because the NSDUH does not contain questions on anxiety, we relied on secondary research to confirm our finding of increasing prevalence. One research study found that prior to the COVID-19 pandemic, anxiety rates were increasing, especially in young adults (Goodwin et al. 2020). Long-term trends in suicide rates were also increasing, a potential consequence of MDD and anxiety.<sup>4</sup>

The COVID-19 pandemic has exacerbated mental health issues nationally and in the workplace. Between August 2020 and February 2021, the proportion of adults showing symptoms of MDD or anxiety increased from 36.4 percent to 41.5 percent (Vahratian et al. 2021). According to the 2021 EBRI/Greenwald Research Workplace Wellness Survey, one-half of workers are at least moderately concerned about their emotional well-being.<sup>5</sup> And workers and employers strongly agree that employers have a responsibility for workers’ mental health.<sup>6</sup> Employers are looking for ways to address the mental health needs of workers given the current economic climate. And they are especially interested in addressing

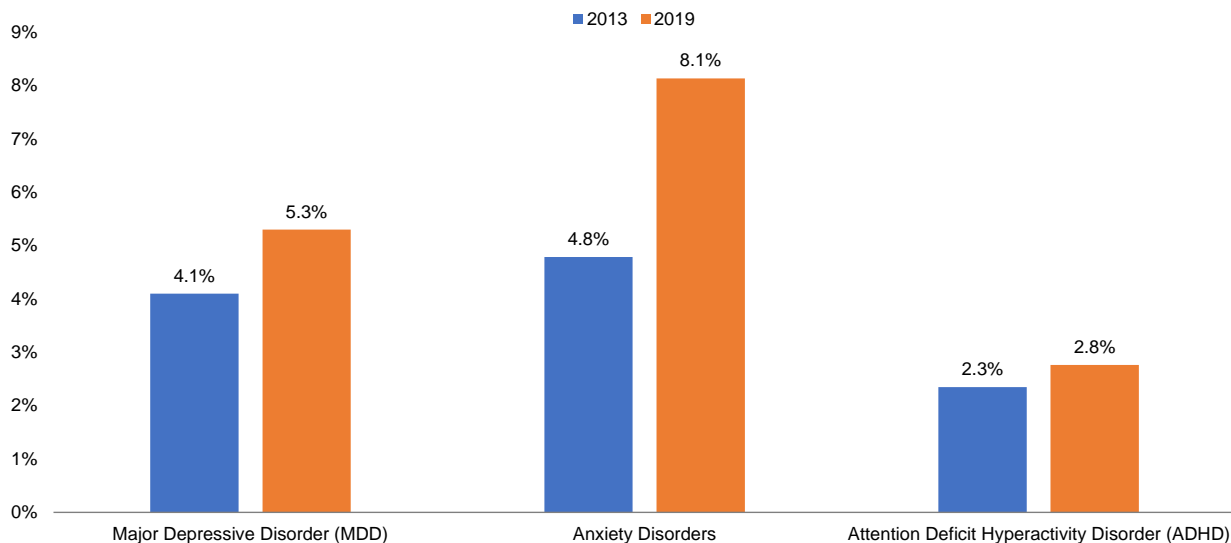
mental health needs because of the connection between MDD and productivity losses (Goetzel et al. 2018). Given the increasing adoption of HDHPs as well as the trend toward higher deductibles more generally, it is critical for employers to understand the effects these plan designs may have on members with mental health conditions. Thus, research on how plan design changes are impacting patients with mental health disorders can help employers make targeted benefit decisions. It can also inform policymakers' efforts by using sound information.

**Figure 2**  
**Percentage of Population Under Age 65 Diagnosed With Various Mental Health Disorders, 2019**



Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

**Figure 3**  
**Percentage of Population Under Age 65 Diagnosed With Various Mental Health Disorders, 2013–2019**



Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

## Data

This study makes use of the IBM® MarketScan® Commercial Claims and Encounters Database (CCAE). The CCAE database contains member enrollment information, as well as adjudicated inpatient and outpatient medical and pharmacy claims. It includes data on over 20 million people with employment-based and other health plan coverage in any given year. Data from 2016 through 2019 were used for this study. We limited our analysis to individuals who were continuously enrolled in their health plan within each calendar year. Those enrolled in capitated health plans were excluded from the analysis.

## Methods

### Prevalence of Mental Health Conditions

We searched medical claims for the presence of ICD 9/10<sup>7</sup> diagnosis codes for each of 13 mental health conditions, including anxiety, major depressive disorder (MDD), attention deficit hyperactivity disorders (ADHD), bipolar and manic disorders, post-traumatic stress disorder, phobias, autism, obsessive-compulsive disorder, eating disorders, schizophrenia, dissociative disorders, delusional disorders, and other behavioral/mental health disorders. Individuals were classified as having a mental health condition if they had claims for at least one inpatient admission or two outpatient visits on different dates within a given year with a candidate diagnosis code in the primary or secondary position. Finally, we calculated prevalence rates for each of the 13 mental health categories as the number of members identified with each condition divided by the total number of eligible lives in each year.

Prevalence rates for the 13 mental health disorders are shown in Figure 2. For the remainder of the paper, we focus on individuals with MDD, anxiety, and ADHD.

### Analytical Dataset Construction

To examine the impact of moving from a PPO to an HDHP on use of health care services and spending, we constructed analytical datasets for each of the three mental health conditions under investigation: anxiety (among those ages 18–64), MDD (among those ages 18–64), and ADHD (among those ages 5–24). We chose PPO as the baseline plan type since it is the most common type of health plan and is less likely to differ from an HDHP in (unobservable) ways not related to plan design (e.g., HMO and EPO provider networks). We first selected individuals with each condition in 2016 if they were continuously enrolled in a PPO plan. Then, we distinguished those who switched into an HDHP in 2017 (continuously enrolled) from those who remained in a PPO in 2017.

Next, we matched switching members 1:1 to non-switchers using a propensity score model that included 2016 (baseline) values of member age, gender, relationship to policyholder (self, spouse, child/dependent), region (Northeast, Midwest, South, West), Charlson Comorbidity Index,<sup>8</sup> and a partial vector of the health services utilization and cost outcomes described below. Subjects were matched using the nearest-neighbor approach to within one-fifth of a standard deviation of the predicted propensity score.<sup>9</sup> Given the relatively large sizes of the matching pools, very few unmatched switchers (<0.1 percent) were dropped from the ensuing analyses. We assessed covariate balance across the two groups and found very few instances of statistically significant differences or relative bias exceeding 10 percent. We conducted this process for each of the following pairs of years: 2016/2017; 2017/2018; and 2018/2019. Matched control subjects were only permitted entry once. Finally, we aggregated the three sets of matched data to form a single analytical dataset, while retaining indicators for each sample pair. This approach allowed for higher-powered statistical analyses. Our final sample sizes were 27,730 for individuals with MDD, 41,522 for those with anxiety, and 11,406 for those with ADHD. One-half of each sample switched from the PPO to the HDHP, while the other half remained in the PPO.

As a side note, we also conducted a sensitivity analysis that examined the impact of moving from a PPO to a plan with an HRA on services use and spending. For this work, we simply re-executed the analytical dataset construction process described above, as well as the statistical analyses presented below.

## Study Variables

For each of the three mental health disorders examined in this paper, we present means for a set of member characteristics, including age; gender; relationship to policyholder (self, spouse, child/dependent); geographic region; and Charlson Comorbidity Index and its chronic condition indicators; as well as flags for anxiety, depression, schizophrenia/bipolar disorder, hypertension, and dyslipidemia. Mean values for the demographic variables are shown in Figure 4, and Figure 5 contains information on comorbidities. We found that individuals with mental health disorders are often diagnosed with more than one condition. For example, 43 percent of patients with MDD also had anxiety, and 29 percent of patients with anxiety also had MDD. In addition, adults with mental health disorders have often also been diagnosed with hypertension and dyslipidemia.

**Figure 4**  
**Demographics, by Mental Health Disorder**

	Depression	Anxiety	ADHD
<b>Gender</b>			
Male	28%	32%	65%
Female	72%	68%	35%
<b>Age, Years</b>	39.9	39.6	13.3
<18			76%
18–24	16%	14%	24%
25–34	21%	23%	
35–44	23%	26%	
45–54	22%	22%	
55–64	17%	15%	
<b>Relationship to Policyholder</b>			
Self	60%	62%	1%
Spouse	25%	25%	0%
Child/Dependent	14%	13%	99%

Note: ADHD = attention deficit hyperactive disorder.  
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

**Figure 5**  
**Presence of Health Conditions, by Mental Health Disorder**

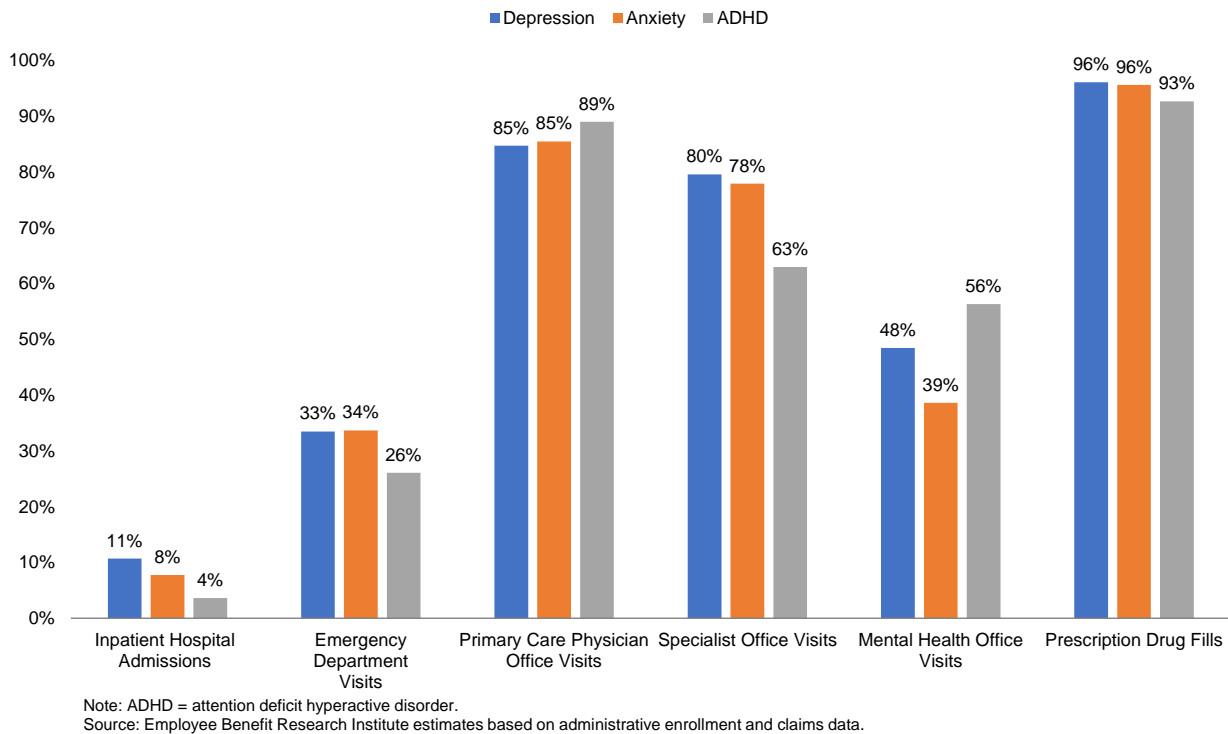
	Depression	Anxiety	ADHD
Charlson Comorbidity Index	0.39	0.31	0.10
<b>Charlson Comorbidity Index Indicators:</b>			
Chronic obstructive pulmonary disease/asthma	9%	8%	7%
Diabetes (with or without complications)	8%	5%	1%
Mild liver disease	3%	3%	0.3%
Cancer (non-metastatic or metastatic)	3%	2%	0.2%
Rheumatoid disease	2%	1%	0.1%
Cerebrovascular disease	2%	1%	0.2%
Peripheral vascular disease	1%	1%	0.2%
Renal disease	1%	1%	0.1%
Congestive heart failure	1%	1%	0.1%
Peptic ulcer	1%	0.4%	0.05%
Dementia	0.3%	0.1%	0.1%
Hemiplegia or paraplegia	0.2%	0.2%	0.2%
Acute myocardial infarction	0.5%	0.5%	0%
Moderate/severe liver disease	0.1%	0.1%	0%
AIDS	0.2%	0.2%	0%
<b>Other Conditions:</b>			
Anxiety	43%		23%
Depression		29%	13%
Schizophrenia/bipolar disorder	5%	5%	4%
Hypertension	16%	16%	1%
Dyslipidemia	15%	14%	1%

Note: ADHD = attention deficit hyperactive disorder.  
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.



Many health services utilization and spending outcomes were examined. These include inpatient hospital admissions and days, emergency department visits, primary care physician office visits, specialist office visits, mental health office visits, and prescription drug fills. For all of these, we analyzed the extent to which patients used any of these services, as well as the spending on this care. Use of these services is fairly high for people with mental health disorders when they were enrolled in a PPO. About one-third of those with MDD or anxiety had an emergency department visit; close to 9 in 10 visited a primary care physician; and nearly all had at least one prescription drug fill (Figure 6). Only between 39 percent and 56 percent had a mental health provider visit.

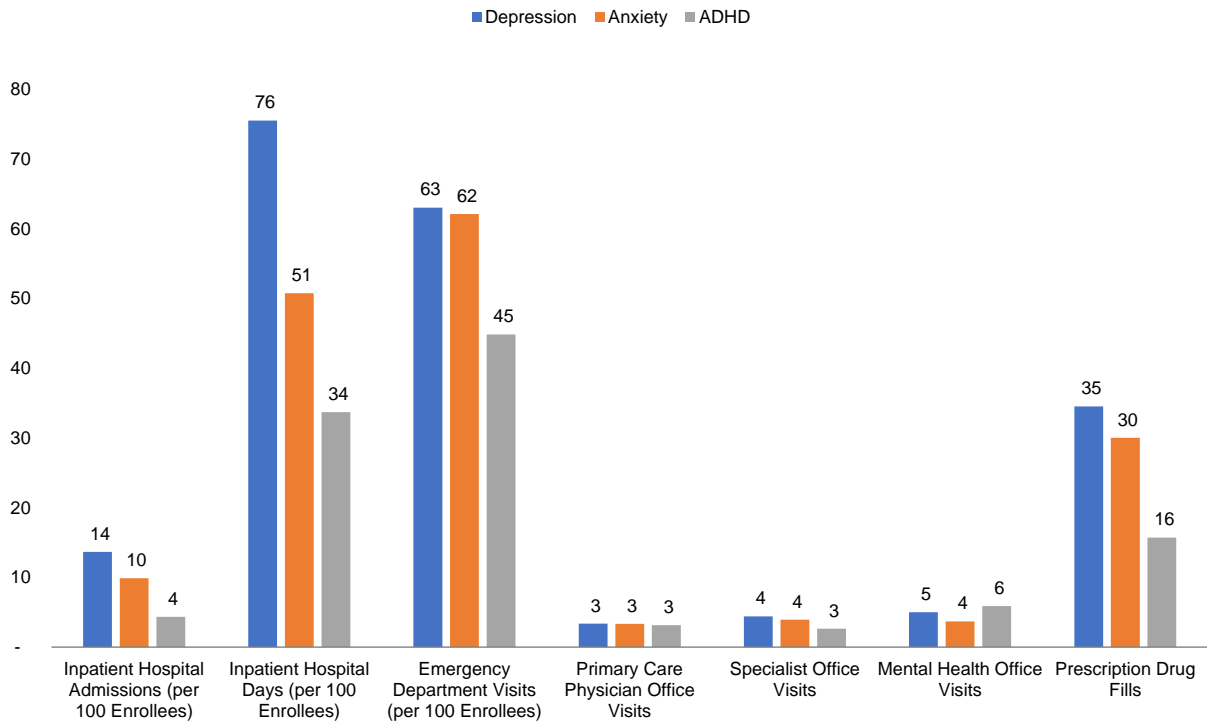
Figure 6  
**Probability of Receiving Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



Patients visited mental health providers 4–6 times per year on average and filled an average of 16 prescriptions among those with ADHD, 30 prescriptions among those with anxiety, and 35 prescriptions among those with MDD (Figure 7). Some of these prescriptions may be for non-mental health conditions. There were 14 inpatient hospital admissions per 100 patients among those with MDD, 10 admissions per 100 patients among those with anxiety, and four admissions per 100 patients among those with ADHD. It is worth noting that some mental health care might be captured in other service categories. For example, primary care physicians often provide medication management for mental health patients during routine office visits.

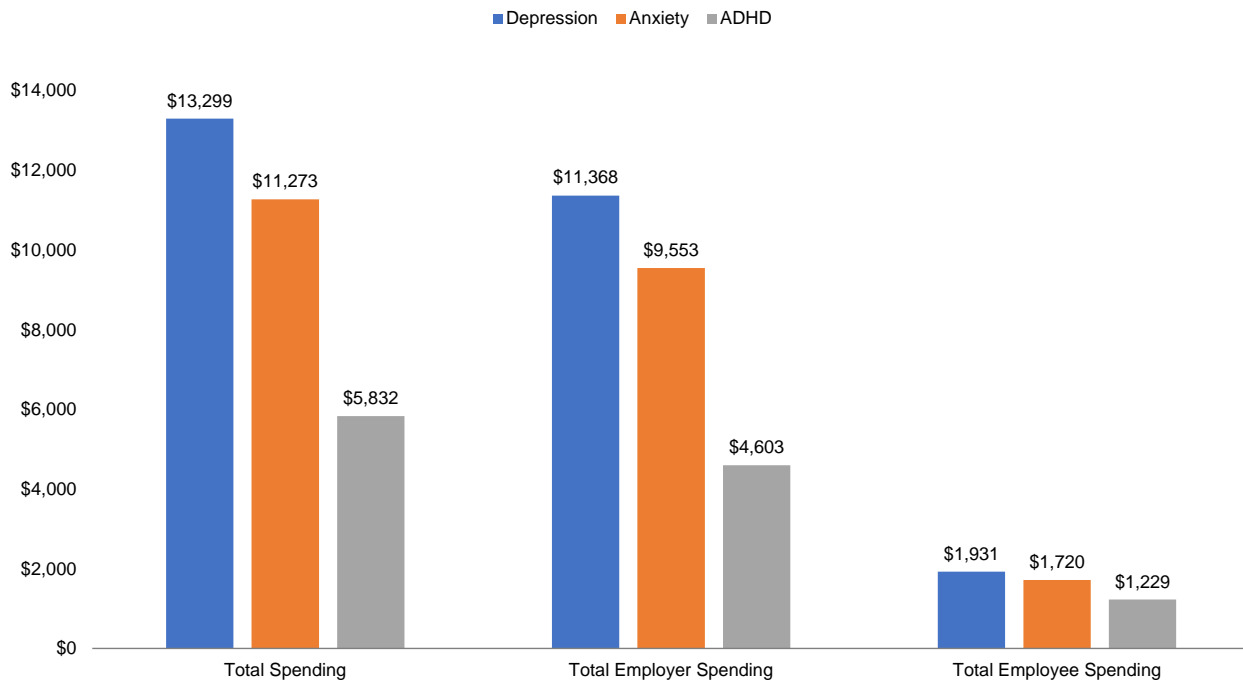
Overall spending — and the proportion of it paid by the employer — was also calculated and presented. When enrolled in a PPO, average annual total health care spending was over \$13,000 for patients with MDD, over \$11,000 among those with anxiety, and approximately \$5,800 for those with ADHD (Figure 8). Employers’ spending was 85 percent of total spending for MDD and anxiety and 79 percent of spending for patients with ADHD — leaving member cost sharing accounting for 15 percent of total health care spending for patients with MDD and anxiety and 21 percent for those with ADHD. While few patients used inpatient services, because of their high cost, they accounted for a large proportion of total spending (Figure 9). Prescription drug fills accounted for a sizable percentage of total spending as well.

**Figure 7**  
**Annual Use of Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



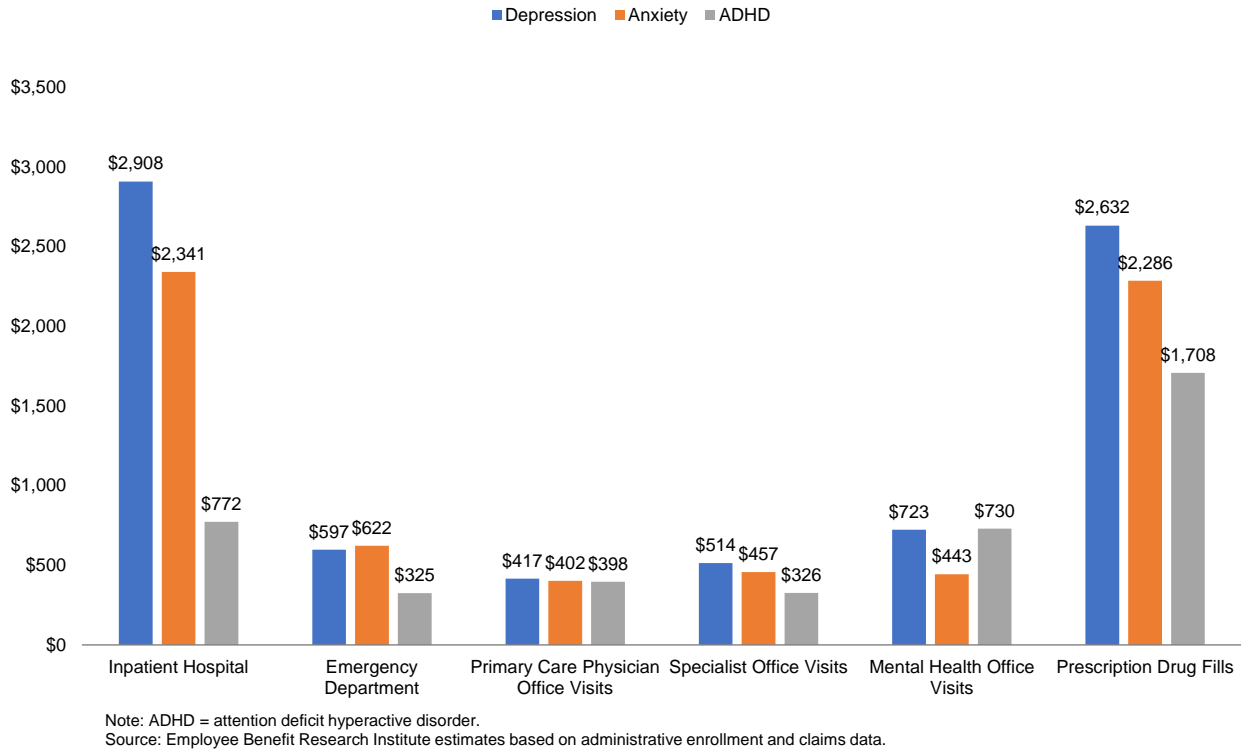
Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

**Figure 8**  
**Annual Spending on Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Figure 9  
**Annual Spending on Various Types of Health Care Services Among Individuals  
 Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



We looked at use and spending on specific prescription drug classes commonly used in the treatment of the mental health conditions under study, including sedatives and other benzodiazepines, anxiolytics and hypnotics, antidepressants, and stimulants. Moreover, we also included the extent to which (and levels of use and spending on) primary care, specialist, and mental health physician/office visits were received out of network. Finally, preventive care was also investigated. We incorporated indicators for the receipt of breast, cervical, and colorectal cancer screenings; prostate-specific antigen (PSA) and lipid tests; and tetanus, pneumonia, influenza, and human papillomavirus (HPV) vaccines. These preventive measures were constructed for individuals if they matched the recommended criteria set forth by the U.S. Preventive Services Task Force.

### Statistical Analysis

We estimated multivariate models of all of the health services utilization and cost measures using difference in differences (DiD). This method emulates a randomized-controlled trial design in that values for an outcome for otherwise comparable treatment and control group subjects are examined pre- and post-intervention to quantify the treatment effect. In the present study, the DiD estimator captures the change (from baseline to follow-up) in the dependent variable for the group of members who switched from a PPO to an HDHP, compared with the identical change for the group of non-switchers (i.e., those who remained in a PPO). The difference in these two differences represents the estimated impact of moving from a PPO to an HDHP. While this technique controls for the covariates included in the propensity score matching and multivariate DiD models, the effect estimates can still be biased due to unmeasured characteristics correlated with both the decision to switch plans (or not) and the use of and spending on health services.

Given the non-normal distributions of our dependent variables, we estimated nonlinear DiD models. For inpatient hospitalizations and days and emergency department visits, we used two-part models (part 1: probit; part 2: negative binomial regression); and for all other visits and prescription drug fills measures, we employed negative binomial regression. All dichotomous any use or preventive care measures were modeled using probit. Finally, for inpatient hospitalization and emergency department spending, we used two-part models (part 1: probit; part 2: generalized linear model with gamma family and log link); and for all other visits and prescription

drug spending measures, we employed generalized linear models with gamma family and log link. All specifications included controls for age, gender, region, relationship to policyholder, comorbidities, and year-fixed effects. In the ensuing results, we present the DiD estimators as marginal effects calculated at the means of all regressors. Standard errors in all models were clustered by person.

*Limitations*— 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 switching from a PPO to an HDHP (e.g., selection due to anticipation of increased or decreased demand for health care services).

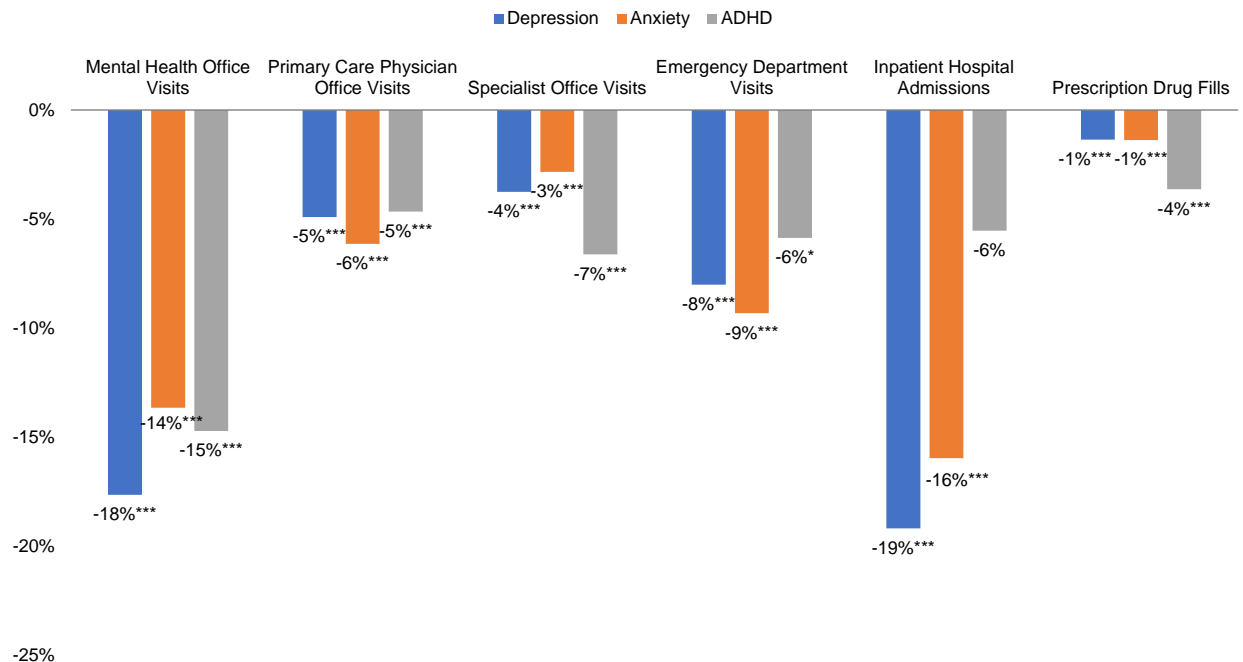
## Impact of HDHP on Use of Health Care Services

Moving from a PPO to an HDHP had a substantial impact on use of health care services. First, the plan switch reduced the extent of health care use. Specifically, the probability of having a mental health office visit fell 14 percent for those with anxiety, 15 percent for those with MDD, and 18 percent for those with anxiety (Figure 10). The probability of having a primary care physician office visit fell by 5–6 percent, and it fell 3–7 percent for specialist office visits.

The odds of having an emergency department visit were lower by 6 percent among those with ADHD, 8 percent among those with MDD, and 9 percent among those with anxiety. Similar to the decline in mental health office visits, the likelihood of being admitted to a hospital declined 16 percent and 19 percent among those with anxiety and MDD, respectively.

The decline in the probability of filling a prescription was small (1 percent in MDD and anxiety, 4 percent in ADHD); however, there was a 6–10 percent decrease in MDD and anxiety-related medications (Figure 11).

Figure 10  
**Impact of HDHP on Probability of Receiving Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**

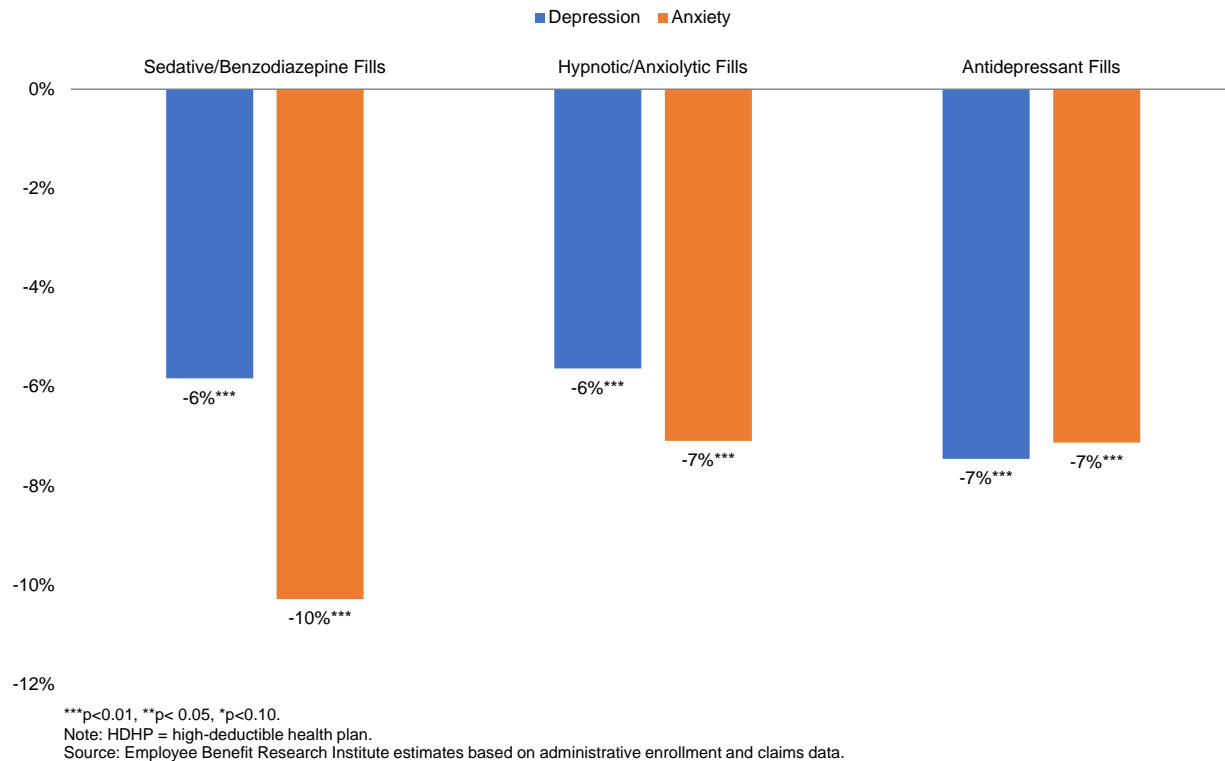


\*\*\*p<0.01, \*\*p< 0.05, \*p<0.10.

Note: HDHP = high-deductible health plan, ADHD = attention deficit hyperactive disorder.

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Figure 11  
**Impact of HDHP on Probability of Receiving Various Types of Prescription Drugs  
Among Individuals Ages 18–64 With Depression or Anxiety**



In addition to impacting the extent of health care use, the HDHP was nearly always associated with reductions in the volume of health services consumed. In all three conditions, the numbers of primary care office visits, specialist visits, and mental health visits all declined under the HDHP (Figure 12). The largest impact on office visits was for those with mental health providers, which were lower by 68, 66, and 34 per 100 plan members in the ADHD, MDD, and anxiety cohorts, respectively. Note that these reductions in use of services represent a reduction of less than one office visit per member. For individuals with MDD and anxiety, the numbers of inpatient hospital admissions and days, as well as the number of emergency department visits, were all negatively associated with the HDHP. Only hospital admissions, hospital days, and emergency department visits for individuals with ADHD were not significantly affected by the health plan change.

Similarly, prescription drug fills fell by 96.7 (ADHD), 68.9 (MDD), and 48.1 (anxiety) per 100 plan members. Nearly one-half of the decline for MDD patients was for antidepressant medication. About five fewer sedative/benzodiazepine prescriptions per 100 patients were also measured (Figure 13). Among patients with ADHD, the switch to an HDHP was associated with 62.3 fewer fills for stimulants or about two-thirds of the decrease in total drug fills for this cohort. These reductions in use of prescription drug fills represent less than 1 prescription drug fill per person per year. Patients with ADHD had an average of 16 prescription drug fills per year, so a reduction of 96.7 drug fills per 100 plan members reduces average use to about 15 prescription drug fills per year.

It is not surprising that the drop in medication use specific to the mental health condition was a smaller proportion of the overall decline in the MDD and anxiety groups compared with ADHD. Given that the MDD and anxiety samples were much older, these patients were more likely to have other chronic diseases, likely treated with pharmacotherapy. For example, 16 percent of patients with MDD or anxiety were diagnosed with hypertension, and 14–15 percent also had dyslipidemia.

As we have previously reported with the general population, HDHPs also negatively affect use of preventive services, even when they are covered in full pre-deductible (Fronstin, Sepulveda, and Roebuck 2013). This was the case in the present study as well (Figure 14). For example, we found reductions in breast cancer screening for women with MDD, cervical cancer screening for women with MDD and anxiety, PSA testing for men with anxiety, and lipid testing for both

men and women with MDD and anxiety. The movement from PPOs to HDHPs did not affect screening for colorectal cancer.

Similarly, some vaccination rates also declined for those who moved into an HDHP, including flu shots for patients with MDD and anxiety, tetanus vaccinations for patients with anxiety, and HPV vaccinations for women with MDD (Figure 15). There was no impact on pneumonia vaccinations for patients with congestive heart failure (CHF), chronic obstructive pulmonary disease (COPD), or diabetes.

Figure 12  
**Impact of HDHP on Use of Various Types of Health Care Services Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD (per 100 Plan Members)**

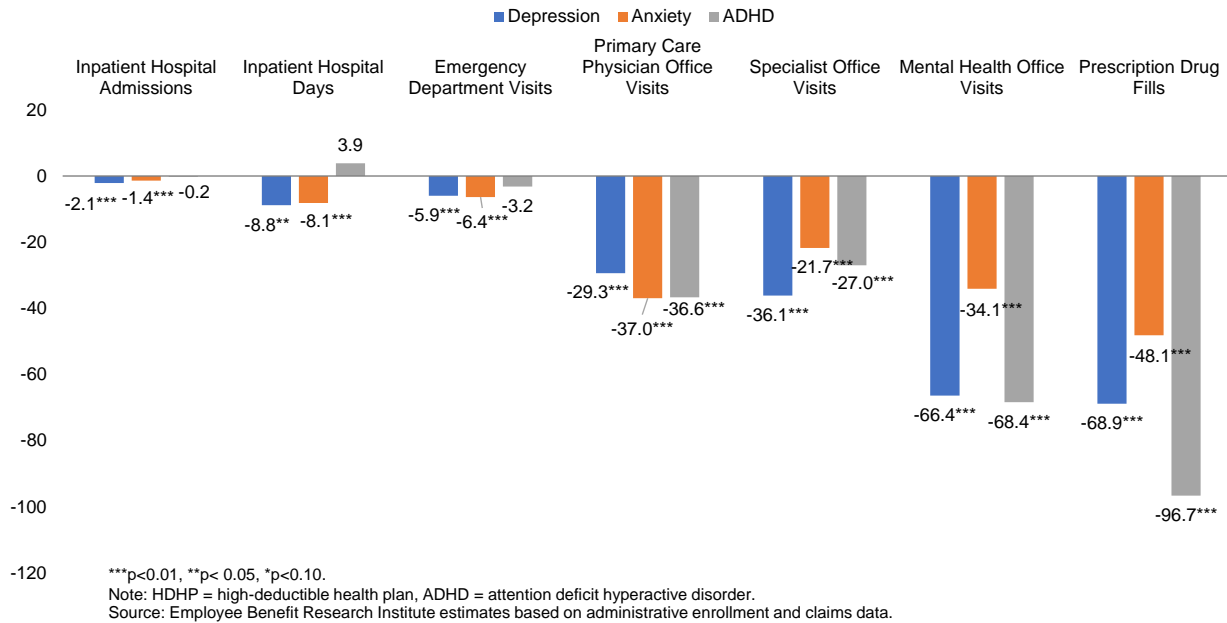


Figure 13  
**Impact of HDHP on Use of Various Types of Prescription Drugs Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD (per 100 Plan Members)**

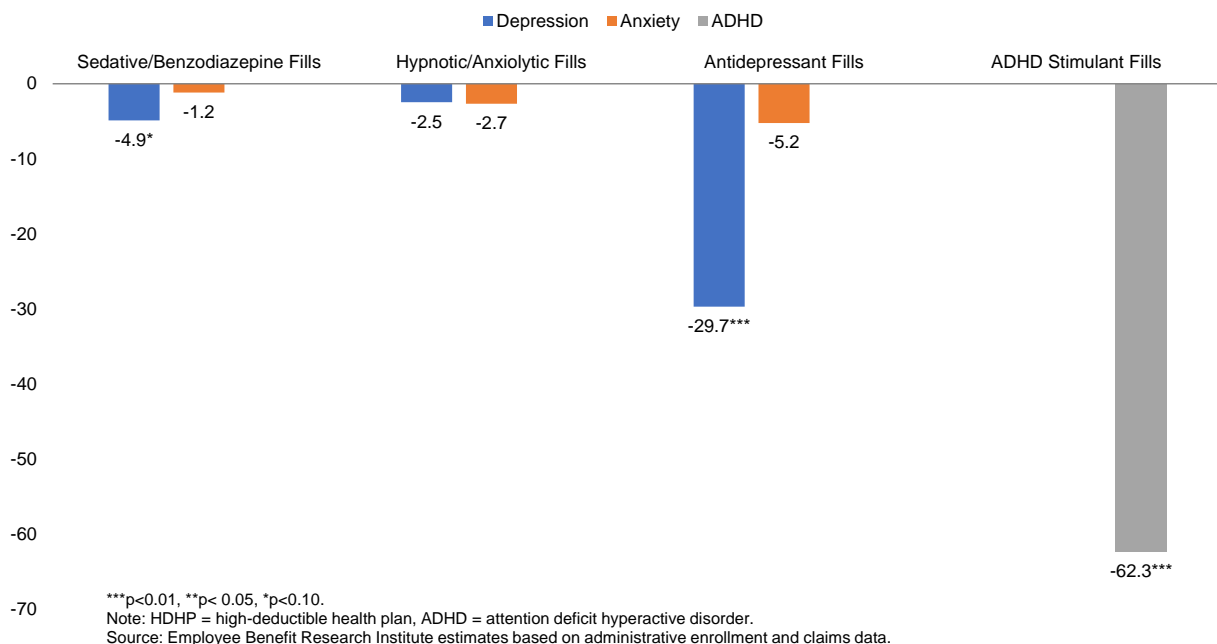
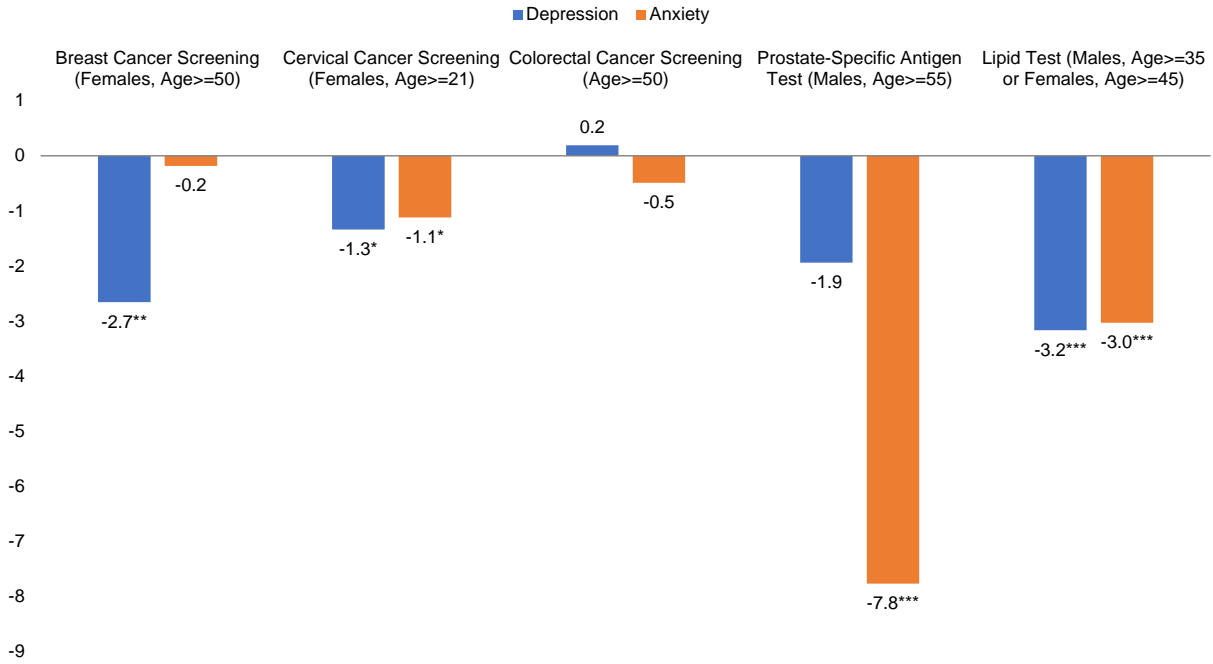
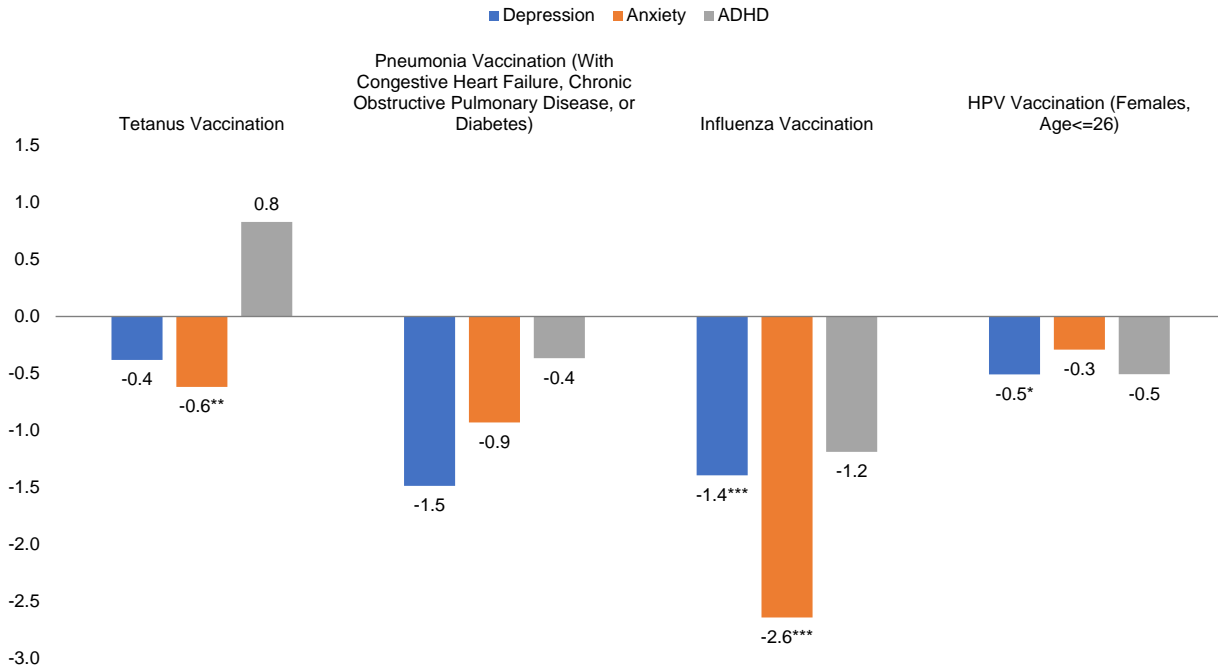


Figure 14  
**Impact of HDHP on Use of Various Types of Screenings  
Among Individuals Ages 18–64 With Depression or Anxiety  
(per 100 Plan Members)**



\*\*\*p<0.01, \*\*p< 0.05, \*p<0.10.  
Note: HDHP = high-deductible health plan.  
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Figure 15  
**Impact of HDHP on Use of Various Vaccines Among  
Individuals Ages 18–64 With Depression or Anxiety and  
Individuals Ages 5–24 With ADHD (per 100 Plan Members)**



\*\*\*p<0.01, \*\*p< 0.05, \*p<0.10.  
Note: HDHP = high-deductible health plan, ADHD = attention deficit hyperactive disorder.  
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

## Impact of HDHP on Health Care Spending

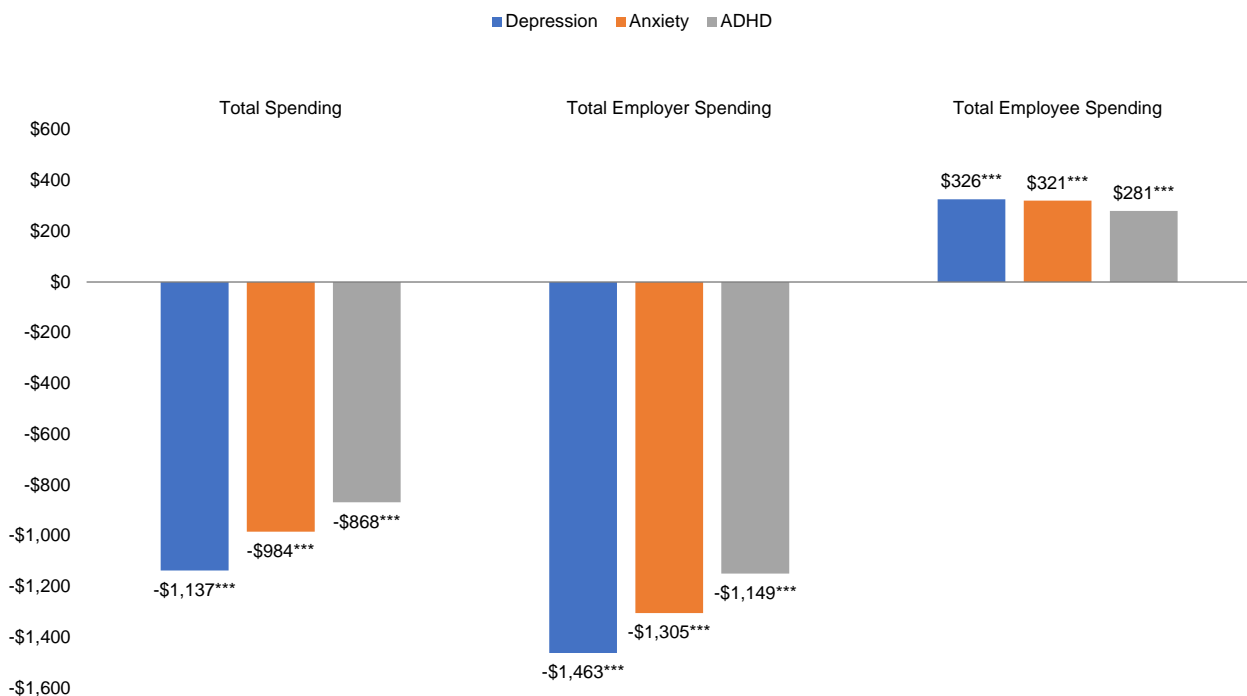
The declines in use of health care services associated with the HDHP translated into reductions in health care spending (Figure 16). Total annual spending per member fell by \$1,137 for patients with MDD; \$984 for patients with anxiety; and \$868 for patients with ADHD. In percentage terms, spending fell by 9 percent for both MDD and anxiety and by 15 percent for patients with ADHD.

Annual employer spending per member declined by an even greater amount: \$1,463 for patients with MDD, \$1,305 for patients with anxiety, and \$1,149 for patients with ADHD. These represent 13 percent, 14 percent, and 25 percent reductions, respectively. As a result of the higher deductible in the HDHP, but despite the decreased use of health care services, annual employee spending (i.e., out-of-pocket costs) increased about \$300 per person, depending on the mental health disorder cohort, representing 17 percent to 23 percent increases in out-of-pocket spending when patients moved from a PPO to an HDHP.

Because there was an across-the-board decrease in use of health care as a result of the HDHP, reductions in spending were reflected in nearly all of the health services examined (Figure 17). Inpatient hospitalization represented the largest decline in spending among individuals with MDD (\$513 per member) and anxiety (\$353 per member). Among ADHD patients for whom inpatient spending was not significantly impacted, prescription drug spending exhibited the greatest drop in spending (\$325 per member).

Although spending on primary care physician and specialist office visits fell between \$36 and \$54 per member due to the HDHP, the effects on mental health office visits' spending were mixed: The measure decreased by \$104 per member among those with ADHD and \$58 per member among those with MDD. In contrast, the decline in spending on mental health office visits among anxiety patients was not statistically significant, despite the decline in use.

Figure 16  
Impact of HDHP on Health Care Spending Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD



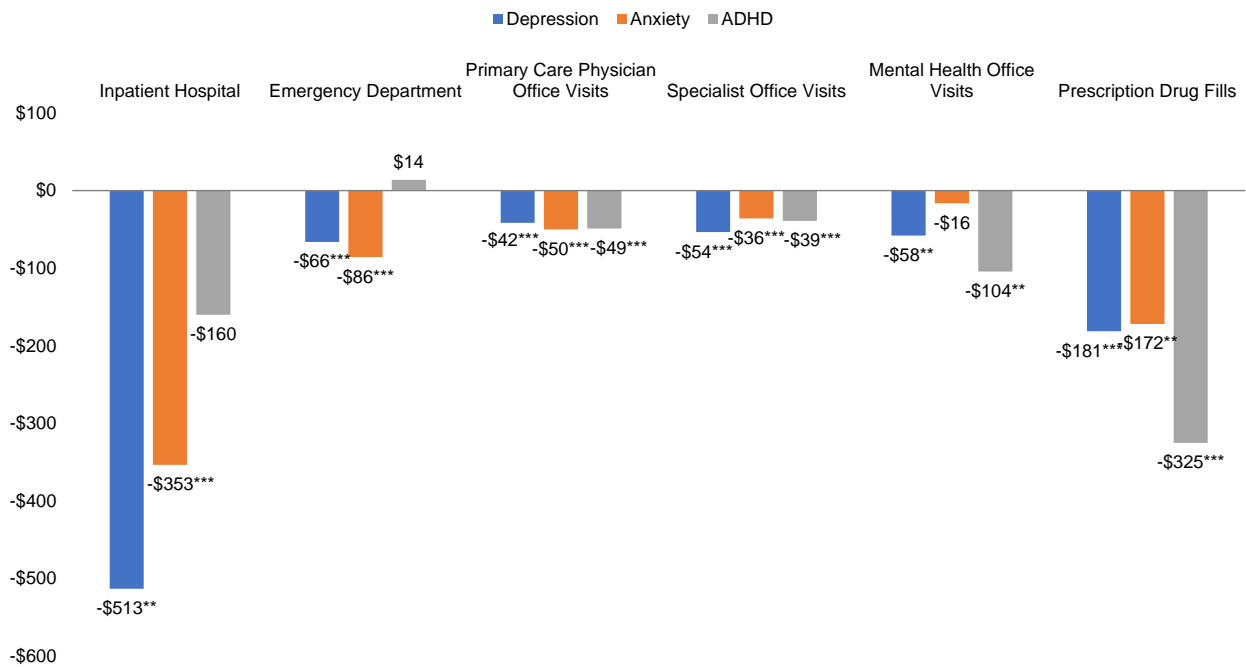
\*\*\*p<0.01, \*\*p<0.05, \*p<0.10.

Note: HDHP = high-deductible health plan, ADHD = attention deficit hyperactive disorder.

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.



Figure 17  
**Impact of HDHP on Health Care Spending, by Type of Health Care Service  
 Among Individuals Ages 18–64 With Depression or Anxiety and Individuals Ages  
 5–24 With ADHD**



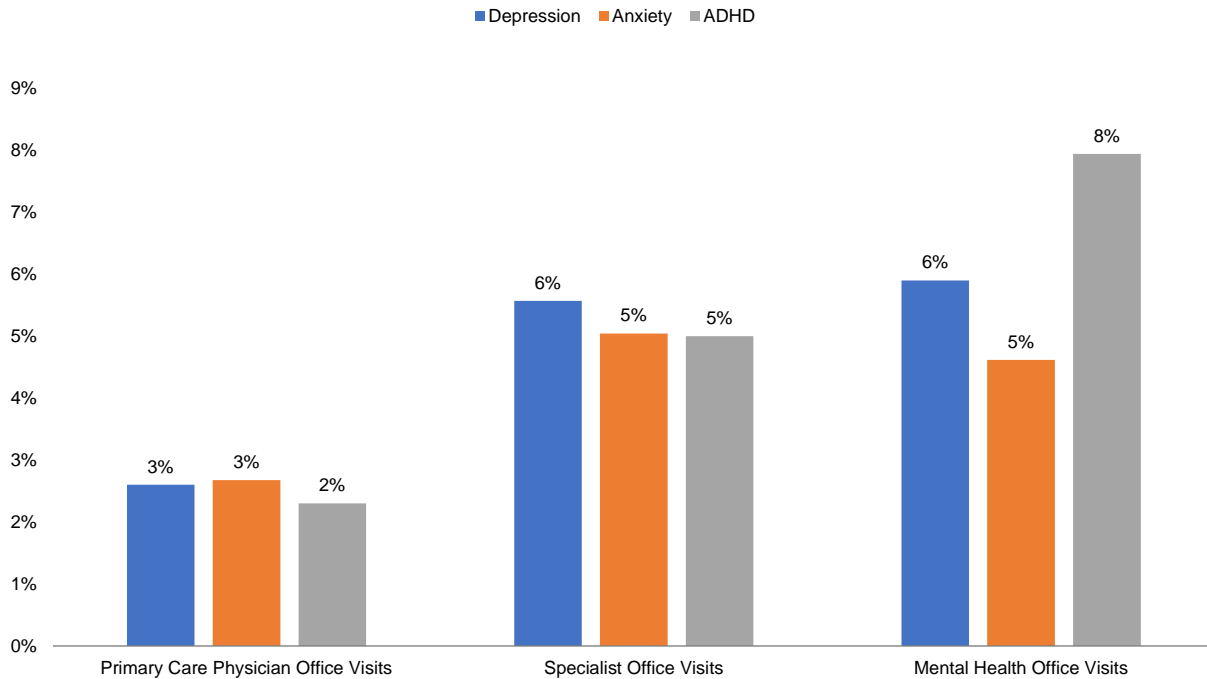
\*\*\*p<0.01, \*\*p< 0.05, \*p<0.10.  
 Note: HDHP = high-deductible health plan, ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

### Impact of HDHP on Out-of-Network Use

We found that only 5–8 percent of patients with the mental health disorders in our study filed a claim for an out-of-network mental health provider, and even fewer had an out-of-network primary care physician visit (2–3 percent) or specialist visit (5–6 percent) (Figure 18). Among patients who did have out-of-network office visits, they averaged 11.4 visits to mental health providers for the MDD and ADHD cohorts and 12.6 visits for the anxiety group (Figure 19). Total annual spending averaged \$259 to \$418 for out-of-network primary care physician office visits; \$443–\$511 for specialist office visits; and \$2,381–\$3,136 for mental health office visits (Figure 20).

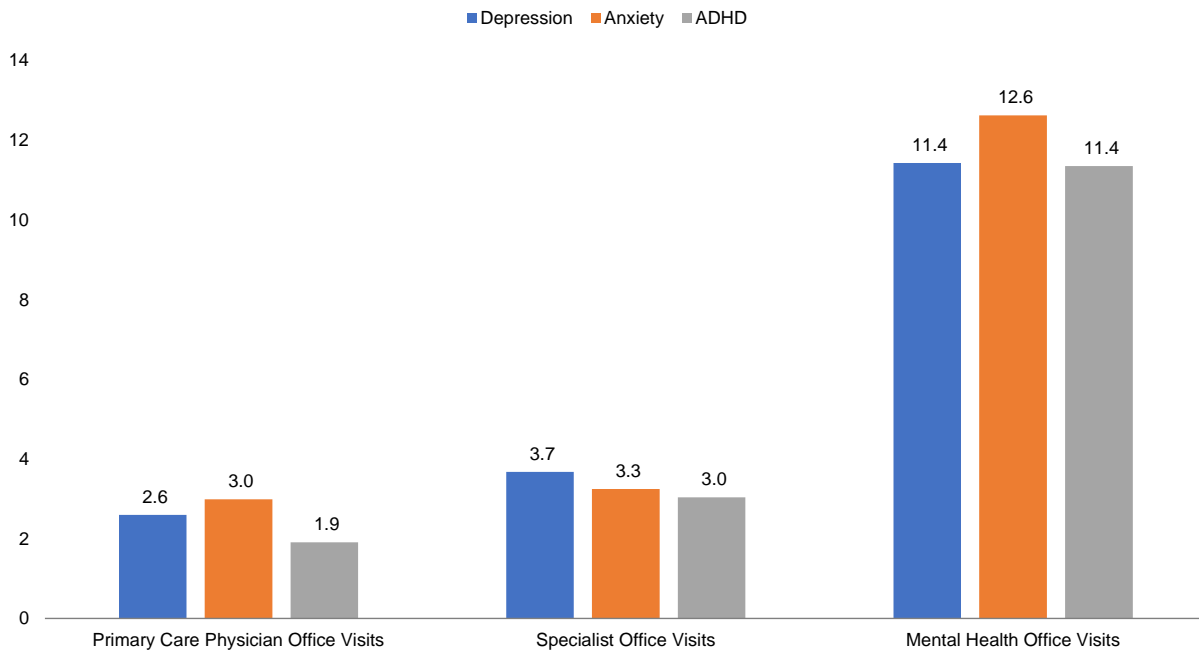
Switching from a PPO to an HDHP had a mixed impact on use of out-of-network health care services (Figure 21). Out-of-network mental health office visits declined 18 percent among patients with ADHD and 12 percent among those with MDD. Other estimates were not statistically significant. Not shown in the charts are the findings related to the number of office visits among those using out-of-network health care providers and the findings related to the impact of moving from a PPO to an HDHP on overall spending on out-of-network health care. These results were also not statistically significant.

**Figure 18**  
**Probability of Using Out-of-Network Health Care Providers, Among Individuals**  
**Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



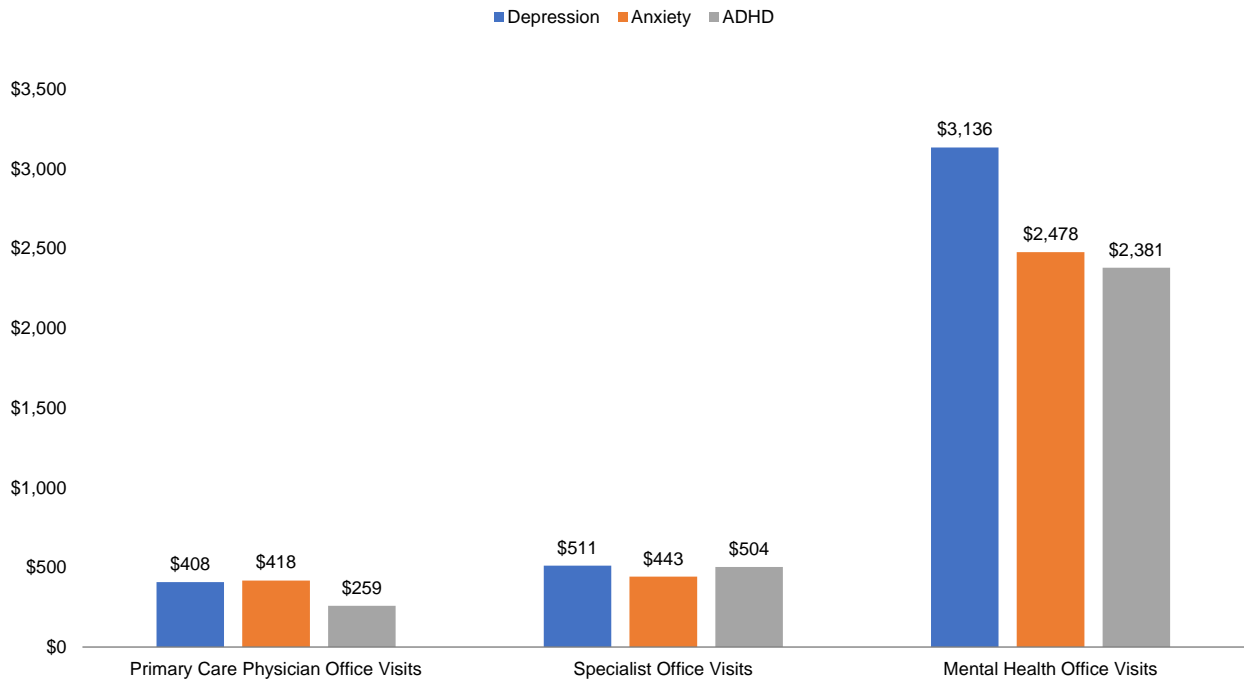
Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

**Figure 19**  
**Annual Use of Various Types of Out-of-Network Health Care**  
**Services Among Individuals Ages 18–64 With Depression**  
**or Anxiety and Individuals Ages 5–24 With ADHD**



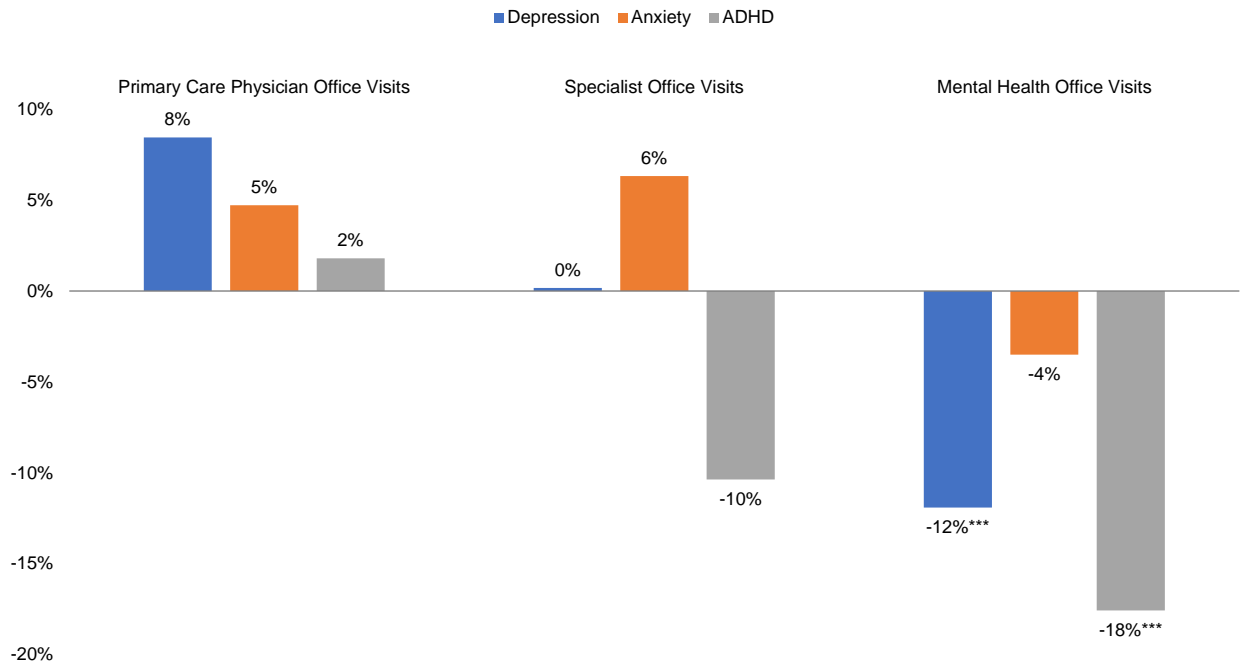
Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Figure 20  
**Annual Spending on Out-of-Network Health Care Services Among Individuals  
 Ages 18–64 With Depression or Anxiety and Individuals Ages 5–24 With ADHD**



Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Figure 21  
**Impact of HDHP on Probability of Receiving Various Types of Health Care  
 Services From Out-of-Network Providers Among Individuals Ages 18–64 With  
 Depression or Anxiety and Individuals Ages 5–24 With ADHD**



\*\*\*p<0.01, \*\*p< 0.05, \*p<0.10.  
 Note: ADHD = attention deficit hyperactive disorder.  
 Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

## Sensitivity Analyses

The findings in this paper examined the impact of moving from a PPO to an HDHP. We also examined the impact of moving from a PPO to an HRA. It can be argued that patients moving from PPOs to HRAs may respond differently than those moving from PPOs to HDHPs with HSAs. Different responses may exist for the following reasons:

- HRAs often have a high deductible, but sometimes they do not. HDHPs with HSAs must meet a statutory minimum deductible.
- HRAs can provide pre-deductible coverage for any service the plan sponsors choose, including inpatient care and primary care. HDHPs with HSAs may only provide pre-deductible coverage for services specified by law.
- HRAs are funded only with employer money. Both employers and employees can contribute to HSAs.
- Employers can put restrictions on how HRAs are used. For instance, they may require that the HRA be spent on health care services before workers reach their deductible. Moreover, they might not allow unused funds to roll over or balances to grow above a certain level. No such limits can be placed on HSAs.

Some or all of these differences between HRAs and HSA-eligible HDHPs may affect the way patients with mental health disorders respond when they move from a PPO to a new high-deductible plan. However, estimated effects from the HRA analysis were very similar to those of the HDHP in terms of direction, magnitude, and statistical significance. Thus, these results are not presented.

We also investigated whether there were differences in the impact of HDHP by gender among people with MDD and anxiety. It would not be a surprise if men and women reacted differently to the financial incentives associated with the move from a PPO to an HDHP. Research suggests that men are less likely than women to use health care, and women are more likely than men to experience barriers to health care due to cost.<sup>10</sup> Our findings were mixed when it came to gender differences. Women decreased visits to primary care providers and specialists more than men, yet men cut back on their visits to mental health providers more than women. Prescription drug fills and total health care spending also declined more for women than for men.

## Discussion

Overall, our results are consistent with and extend prior research that finds that use of health care services decline when individuals with chronic conditions move from a PPO to an HDHP. However, we found meaningful differences between our prior work on the general population (Fronstin, Sepulveda, and Roebuck 2013) and our current work on individuals with mental health disorders. First, in our earlier work, we found no impact on inpatient and emergency department visits. In contrast, in this paper, we found a significant reduction in inpatient and emergency department visits among people with mental health disorders. Second, in our earlier work, we found that office visits fell 15 percent and prescription drug fills fell 16 percent. In contrast, in this paper, we found that office visits fell between 3 and 7 percent, while prescription drug fills fell between 1 and 4 percent. Our findings may imply that individuals with mental health disorders are less sensitive than the general population to financial incentives when it comes to routine services (i.e., office visits and prescription drugs) and that they are more sensitive to financial incentives when it comes to less frequently used services (i.e., inpatient services and emergency department visits).

When employers raise deductibles, they do so to better manage costs. They are trying to balance their efforts to reduce low-value health care services while incentivizing the use of high-value services. It is one of the reasons why employers have embraced the concept of value-based insurance design, which allows employers to provide the right mix of incentives to better engage patients in their health care (Chernew, Rosen, and Fendrick 2007).

When HDHPs were first introduced in 2003 as part of the Medicare Prescription Drug Improvement, and Modernization Act, their ability to provide coverage for certain preventive services prior to satisfaction of the health plan deductible was limited. Under the IRS guidance, until the deductible is met, coverage does not include "any service or benefit

intended to treat an existing illness, injury, or condition, including drugs or medications." As our study sample included only those with mental health disorders as a pre-existing condition prior to the switch from PPO to HDHP, we find this narrow definition of the "safe harbor" may have negatively affected outcomes due to fewer office visits and lower prescription drug fills.

In 2019, the IRS gave HDHPs the ability to adopt a more flexible design offering more protection for certain medical services through a VBID plan structure via Notice 2019-45. This was an extremely popular guidance — three-quarters of employers say that they have enhanced coverage as a result (Fronstin and Fendrick 2021). As allowed under the Notice, employers added pre-deductible coverage for services related to diabetes, hypertension, and heart disease. However, medications to prevent the exacerbation of mental health disorders were not included in the Notice.

According to the guidance, the list of preventive services that can be covered pre-deductible will be reviewed on a periodic basis. In fact, the guidance specifically states that the periodic review is expected to occur approximately every five to 10 years. For patients and employers alike, 10 years may be a long time to wait for such coverage decisions to be made given the pace of research on plan design and medical innovation. There is already an appetite for adding more services, as evidenced by the Chronic Disease Management Act, which was reintroduced in the U.S. Congress as recently as May 2021. This bipartisan, bicameral legislation would provide additional flexibility to allow enhanced coverage for services that prevent the exacerbation of chronic conditions.

Smarter deductibles accommodating services preventing the exacerbation of chronic conditions might be a natural evolution of health plans. Value-based reimbursement promotes the delivery of evidence-based, high-quality care that encourages use of — rather than creating barriers to — high-value services. Interventions that improve patient-centered outcomes while maintaining affordability may be found in the form of a clinically nuanced health plan that better meets workers' clinical and financial needs.

## Conclusion

In the present study, use of health care services among patients with MDD, anxiety, and ADHD declined when they moved from a PPO to an HDHP. Overall spending on health care services also fell. Of course, our findings are limited by the fact that outcomes related to changes in health care use during the switch from PPO to HDHP are unobserved. Such outcomes would ultimately be impacted by the value of care received, for which data is unavailable for this analysis.

Our research can help employers make targeted benefit design decisions. They can also inform policymakers as they grapple with allowing employers to provide enhanced coverage for health care services that prevent the exacerbation of chronic conditions.

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## Endnotes

<sup>1</sup> The Medicare Modernization Act of 2003 (MMA) created HSA-eligible health plans or HDHPs. HDHPs are health plans with deductibles of at least \$1,400 for individual coverage and \$2,800 for family coverage in 2022.

<sup>2</sup> See Exhibit 5.1 in [https://meps.ahrq.gov/data\\_files/publications/cb25/cb25.pdf](https://meps.ahrq.gov/data_files/publications/cb25/cb25.pdf).

<sup>3</sup> See Buchmueller (2009); Bundorf (2012); Buntin et al. (2006); Fronstin and Roebuck (2013); and Fronstin, Sepulveda, and Roebuck (2013).

<sup>4</sup> See Figure 1 in <https://www.nimh.nih.gov/health/statistics/suicide>.

<sup>5</sup> See <https://www.ebri.org/docs/default-source/wbs/www-2021/2021-workplace-wellness-short-report.pdf>.

<sup>6</sup> See Figure 8 in Copeland (2021).

<sup>7</sup> ICD-9-CM = International Classification of Diseases, 9th Revision, Clinical Modification, and ICD-10-CM = International Classification of Diseases, 10th Revision, Clinical Modification.

<sup>8</sup> See Charlson et al. (1987), Deyo, Cherkin, and Ciol (1992), and Quan et al. (2005).

<sup>9</sup> See Austin (2011a) and Austin (2011b).

<sup>10</sup> See <https://www.kff.org/womens-health-policy/fact-sheet/gender-differences-in-health-care-status-and-use-spotlight-on-womens-health/>.

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