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The Relationship Between Health Plan Type, Use of Specialty Medications, and Worker Productivity

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AT A GLANCE

Specialty medications have piqued the attention of employers because spending on specialty medications has been increasing. In 2012, specialty medications accounted for 24 percent of total drug spending in the commercial market, but by 2016 specialty medications accounted for 36 percent. By 2020, specialty medications are expected to account for nearly one-half of total drug spending in the commercial market. Managing specialty medications is considered one of the most effective tactics when it comes to controlling health care costs.

In this *Issue Brief,* the Employee Benefit Research Institute (EBRI) examines the impact of plan type on use of specialty medications. This paper also focuses on the impact that use of specialty medications both among workers and their dependents has on worker productivity. The analysis was conducted on nearly 100,000 unique individuals with rheumatoid arthritis (RA), Crohn's disease, ulcerative colitis, psoriasis, and multiple sclerosis (MS) using data from the Truven Health Analytics MarketScan® Research Commercial Claims and Encounters Database.

> Specialty medications are high-cost medications used to treat chronic conditions that are often rare, such as autoimmune diseases and multiple sclerosis (MS), which has a prevalence rate of about 0.1 percent in the United States. Specialty medications usually require special handling and/or storage, as they are often injected, infused, or inhaled. They can be covered by the pharmacy benefit, the medical plan, or both.

Use of specialty medications among individuals with multiple sclerosis (MS):

- Among individuals with MS, there was no difference in the likelihood of filling a prescription for a specialty medication by type of health plan. However, among individuals with MS that had filled a specialty medication prescription, individuals with preferred provider organization / point of service (PPO/POS) and health reimbursement arrangement (HRA) plans used more specialty medications than those with health maintenance organization / exclusive provider organization (HMO/EPO) plans. There was no difference between those with health savings account (HSA)-eligible health plans and those with HMO/PPO coverage.

Use of specialty medications among individuals with rheumatoid arthritis (RA), Crohn's disease, ulcerative colitis, and psoriasis:

- Plan type had no impact on whether any specialty medications were used, with one exception. Among individuals with RA, those with an HRA were less likely than those in HMO/EPO plans to use any specialty medications. Among individuals that had filled specialty medication prescriptions, we found mixed effects on the number of fills. For the most part, there were no differences in the number of fills by plan type. However, among individuals with RA, those in HRA plans filled fewer specialty medications than those in HMO/EPO plans.

Among individuals with Crohn's disease, those in PPO/POS plans used more specialty medications than those in HMO/EPO plans.

Use of Specialty Medications and Worker Productivity

- ***Any Use:*** We found few instances where productivity was affected by use of specialty medications. We did not find any relationship between any use of specialty medication and any use of sick or vacation leave, or number of days absent. We also did not find that any use of specialty medications affected whether a worker took short-term disability. However, we did find that any use of specialty medications reduced the number of days on short-term disability for workers with Crohn's disease by 37.6 days and for workers with psoriasis by 42.6 days.
- ***Number of Medications:*** Regarding the impact of the number of specialty medications fills on productivity, we did not find an impact on the likelihood of taking any days off or on the likelihood of being on short-term disability. There was evidence that a higher number of specialty medication fills increased the number of absentee days for individuals with Crohn's disease and psoriasis. However, the magnitude of these effects was quite small, increasing absenteeism by 0.53 days for those with Crohn's disease and by 0.25 days for those with psoriasis. There was also evidence that a higher number of specialty medication fills increased the length of short-term disability for individuals with MS by 5.6 days.
- ***Dependent Use:*** We also examined the impact of use of specialty medications on worker productivity by examining whether worker productivity was affected by use of specialty medications among dependents. We tested this by examining the impact of spousal use of specialty medications for married workers. We found nearly no evidence that any use of specialty medications reduced worker absenteeism with one exception—among spouses using specialty medications for ulcerative colitis, workers were absent from work 6.5 fewer days. With respect to the number of specialty medications filled among those who had filled at least one prescription, we found mixed results. There was no impact on worker absenteeism among spouses with Crohn's disease, psoriasis or MS. Higher use of specialty medications reduced absenteeism among workers with spouses treated for ulcerative colitis, but it increased absenteeism among workers with spouses treated for RA.

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Table of Contents

Background 5

Purpose of this Paper 8

Data 8

Methods 8

Results 16

Conclusion 20

References 22

Endnotes 24

Figures

Figure 1, Spending by Drug Type, 2012-2016, Projected to 2020 6

Figure 2, Employer Opinion on Most Effective Tactics to Control Health Care Costs 6

Figure 3, Percentage of Employers Offering HSA-Eligible Health Plan/HRA, by Firm Size, 2010–2016, With Projections Through 2019 7

Figure 4, Prescription Drugs (Generic Names) Included in Analyses 10

Figure 5, Select Demographic Means, by Disease, 2013 11

Figure 6, Select Demographic Means, by Plan Type, 2013 12

Figure 7, Average Prescription Drug Use, by Disease and Plan Type, 2013 13

Figure 8, Average Spending on Prescription Drugs, by Disease and Plan Type, 2013 14

Figure 9, Spending, by Disease, 2013 14

Figure 10, Average Out-of-Pocket (OOP) Spending, by Disease and Plan Type, 2013..... 15

Figure 11, Percent of Out-of-Pocket (OOP) Spending on Prescriptions, by Disease and Plan Type, 2013 15

Figure 12, Average Number of Days Absent, by Disease and Use of Specialty Medications, 2013..... 16

Figure 13, Average Number of Days on Short-Term Disability, by Disease and Use of Specialty Medications, 2013..... 16

Figure 14, Linear Fixed Effects Model Estimates of Plan Type Impact on Condition-Specific Specialty Drug Use 17

Figure 15, Predicted Number of Specialty Drug Fills Among Patients with Multiple Sclerosis, Conditional on Any Use, by Plan Type 17

Figure 16, Linear Fixed Effects Model Estimates of Employees Specialty Drug Use Impact on Productivity..... 18

Figure 17, Estimated Impact of Employees Use of Specialty Medications on Short-Term Disability Days..... 19

Figure 18, Linear Fixed Effects Model Estimates of Spouses Specialty Drug Use Impact on Productivity 19

Figure 19, Linear Fixed Effects Model Estimates of Medication Adherence on Worker Productivity, Patients With Multiple Sclerosis 20

The Relationship Between Health Plan Type, Use of Specialty Medications, and Worker Productivity

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Background

In 2015, $324.6 billion was spent on outpatient prescription drugs in the United States, accounting for 10 percent of national health expenditures (NHE) (Martin, et al. 2017). Annual growth in prescription drug spending averaged 4.4 percent between 2009 and 2015, higher than the 3.8 percent average annual growth rate in spending on professional services, and lower than the 5.2 percent rate for hospital services.[1] While only at 10 percent of NHE, prescription drugs accounted for the third largest share of NHE, following hospital services (32 percent), and professional services (26 percent).

Growth in prescription drug spending in 2015 was faster than that of any other health care service, primarily due to new medicines; growth in prices for existing brand-name drugs; higher spending on generic drugs; and a decline in the number of expensive blockbuster drugs whose patents expired (Martin, et al. 2017). There was also strong growth in new specialty medications.

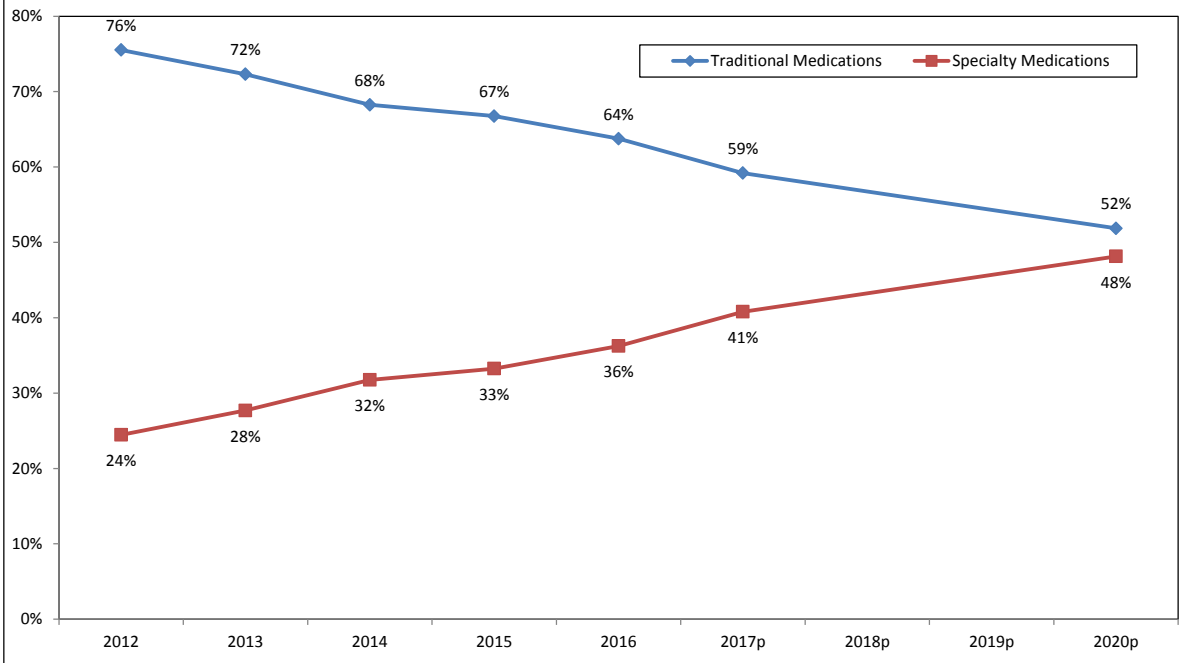
Specialty medications are different from traditional outpatient prescription drugs. They are high-cost medications used to treat chronic conditions that are often rare, such as autoimmune diseases and multiple sclerosis (MS), which have a prevalence rate of about 0.1 percent in the United States. Specialty medications usually require special handling and/or storage, as they are often injected, infused, or inhaled. They can be covered by the pharmacy benefit, the medical plan, or both.

Specialty medications provide a highly sophisticated treatment, generally when there are few or no other treatment options available. Some of the benefits of specialty medications include the reduction of the number relapses, prevention of disability progression, symptom management, disease remission, and the maintenance and/or improvement of quality of life.

Specialty medications have piqued the attention of employers because spending on specialty medications has been increasing. In 2012, specialty medications accounted for 24 percent of total drug spending in the commercial market, but by 2016 specialty medications accounted for 36 percent (Figure 1). By 2020, specialty medications are expected to account for nearly one-half of total drug spending in the commercial market. Hence, it should come as no surprise that managing specialty medications is considered one of the most effective tactics when it comes to controlling health care costs. Over 50 percent of employers rate pharmacy management techniques to manage specialty medications as either the most, second or third most effective tactic to control health care costs (Figure 2). Offering consumer-driven health plans (CDHPs) is the only other option that over 50 percent of employers rate as one of the top three most effective tactics to control costs. So, employers think that managing specialty medications and CDHPs are by far the most effective tactics to control health care costs. Among all of the other options examined, less than 30 percent of employers rated them as the most, second or third most effective tactic.

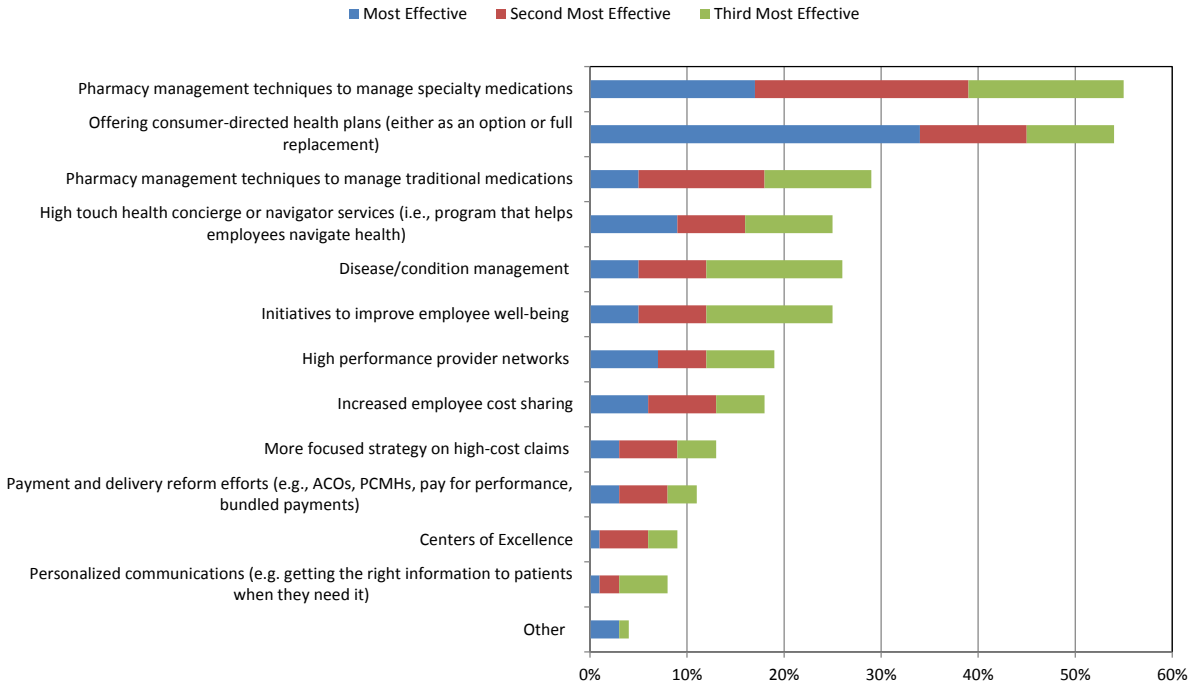
Employers often use cost-sharing as a way to manage the cost of specialty medications. Nearly one-half (47 percent) of workers with health insurance are in a plan with a separate (fourth) cost-sharing tier for specialty medications.[2] Among those workers, 45 percent have a copayment, 46 percent have coinsurance, and 8 percent have some other form of cost sharing.[3] The average copayment is $101 and the average coinsurance is 27 percent.[4] In plans with three or more tiers of cost sharing for prescription drugs (the most common plan design), average copayments are $11 for first-tier drugs (i.e., generics), $33 for second-tier drugs (i.e., preferred brands), $59 for third-tier drugs (i.e., nonpreferred brands), and $110 for fourth-tier drugs (i.e, specialty drugs).[5] Average coinsurance rates are 17 percent for first-tier drugs, 25 percent for second-tier drugs, 38 percent for third-tier drugs, and 28 percent for fourth-tier drugs.[6]

Figure 1
Spending by Drug Type, 2012-2016, Projected to 2020



Source: Express Scripts, Drug Trend Report, 2012-2017, and Employee Benefit Research Institute (EBRI) projections based on data from Express Scripts.

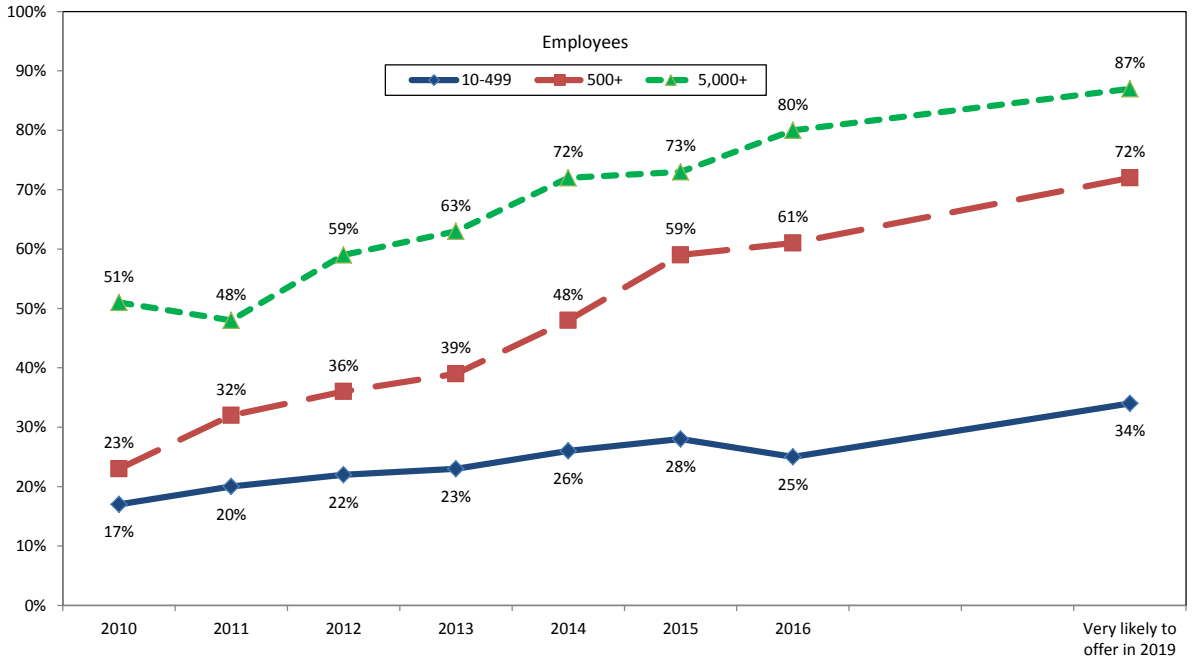
Figure 2
Employer Opinion on Most Effective Tactics to Control Health Care Costs



Source: National Business Group on Health, *2018 Health Care Strategy and Plan Design Survey*.

Employers can use CDHPs to manage the use of and spending on specialty medications. CDHPs are a combination of health coverage with high deductibles (at least $1,350 for individual coverage in 2018) and tax-preferred savings or spending accounts that workers and their families can use to pay their out-of-pocket health care expenses. The deductibles in these plans can be used to either shift the cost of health care to workers or get them to choose alternative health care services. By 2016, 25 percent of employers with 10–499 workers and 61 percent of employers with 500 or more workers offered either an HRA- or HSA-eligible plan (Figure 3). Use of CDHPs is expected to continue to expand, though there is evidence that the growth rate in the use of such plans may be slowing down (Fronstin, 2018).

Figure 3
Percentage of Employers Offering HSA-Eligible Health Plan/HRA, by Firm Size, 2010–2016, With Projections Through 2019



Source: Figure 5 in https://www.mercer.com/newsroom/national-survey-of-employer-sponsored-health-plans-2016.html.

Even in non-CDHPs, there has been an increase in the use of deductibles, as well as deductible levels. The percentage of workers with employee-only coverage and a deductible increased from 55 percent to 81 percent between 2006 and 2017.[7] Deductibles for employee-only coverage increased from $473 in 2006 to $1,046 in 2017 in PPOs, and from $352 in 2006 to $1,175 in 2017 in HMOs.[8]

There is evidence that patient cost sharing has an impact on use of specialty medications. A recent systematic review of the literature concluded that reductions in specialty drug use were associated with higher cost sharing, with stronger effects for non-initiation or abandonment of a prescription at the pharmacy, and somewhat smaller or no effects for refill behavior once therapy was initiated (Doshi, et al. 2016B). More recent studies have also found that member cost sharing is an impediment to specialty medications among Medicare beneficiaries covered by Part D (Doshi, et al. 2016A) (Winn, Keating and Dusetzina 2016) (Li, et al. 2017).

There is a well-developed body of work that documents significant medical cost offsets from prescription drug use in common chronic diseases (e.g., (Congressional Budget Office 2012), (Roebuck, Liberman, et al. 2011), (Roebuck, Dougherty, et al. 2015), (Roebuck, Kaestner and Dougherty 2018)). Moreover, it has been demonstrated that

employers also derive worker productivity enhancements from medication adherence (Carls, et al. 2012). Given these potential benefits, plan sponsors seeking to reduce expenditures through increased patient cost sharing for prescription drugs may actually experience net cost increases, and/or productivity losses.

Purpose of this Paper

The purpose of this paper is to examine the impact of plan type on use of specialty medications for individuals with rheumatoid arthritis (RA), Crohn's disease, ulcerative colitis, psoriasis, and multiple sclerosis (MS). Plan type is used as a proxy for high cost sharing, as the percentage of individuals in high-deductible health plans (HDHPs) has increased dramatically in the last decade. Our study is an improvement over prior studies for a number of reasons. First, prior studies used data mostly from 2000-2009, when fewer individuals were in HDHPs and cost sharing for specialty medications was generally low as compared to today.[9] Second, nearly all prior studies focused on cross-sectional data.[10] Our study uses longitudinal data and fixed effects models.[11] Our study also focuses on the impact that use of specialty medications – by both workers and their dependents -- has on worker productivity, which we believe has not been examined in the past.

Data

This study made use of the Truven Health Analytics MarketScan® Commercial Claims and Encounters Databases (copyright © Truven Health Analytics, all rights reserved) for 2013-2015. Using the full Commercial Claims and Encounters Database, outpatient and inpatient claims were searched for individuals diagnosed with one or more of the following conditions: rheumatoid arthritis (RA), Crohn's disease, ulcerative colitis, psoriasis, and multiple sclerosis (MS). Patients were classified as having the illness if associated primary or secondary diagnosis codes were recorded at least once in inpatient or twice in outpatient settings on different dates. Candidate International Classification of Diseases (ICD-9-CM) codes included 714.xx for RA, 555.xx for Crohn's, 556.xx for ulcerative colitis, 696.xx for psoriasis, and 340.xx for MS. We included individuals with one or more of these conditions in 2013. Furthermore, we limited the analysis to policyholders and their dependents where the policyholder was a full-time worker ages 18-64, who had been continuously enrolled in employment-based health insurance from Jan. 1, 2013 to Dec. 31, 2015. This resulted in three years of data for a sample of nearly 100,000 unique individuals, classified as follows: RA (N=32,982); Crohn's (N=14,899); ulcerative colitis (N=13,799); psoriasis (N=25,701); and MS (N=13,223).

Methods

Objective 1: Estimating the Impact of Plan Type on Specialty Drug Utilization

Plan Type Measures

As previously noted, the first objective entailed estimating the impact of plan type on the use of specialty drugs. For this analysis, the key independent variable—health plan type—is operationalized as a vector of four dichotomous indicators for each individual in each year as follows: 1) health maintenance organization (HMO) or exclusive provider organization (EPO); 2) preferred provider organization (PPO) or point-of-service (POS) plans; 3) health reimbursement arrangement (HRA); and 4) HSA-eligible health plan (HSA plan). Plan type is assumed to capture coverage generosity among other distinguishing characteristics (e.g., provider networks). For the present study, direct measures of patient cost sharing, such as deductible levels, coinsurance and copayments, would be preferred, but they are not routinely included in claims-based datasets like MarketScan® because that material must be gleaned from health insurance documents.

Specialty Drug Use Measures

Both ambulatory pharmacy and outpatient medical claims data were accessed to develop measures of specialty drug use as these medications can be in oral, injectable, or infusible form; and can be self-administered (i.e., filled at a community-based pharmacy and taken at home) or given by a treatment provider in another setting (and therefore

covered under the medical benefit). For simplicity, throughout the manuscript we used the term "fill" when referring to receipt of one course of medication recognizing that much of specialty drug use does not take this form. Using national drug codes (NDCs) for pharmacy and J-Codes for medical, we counted the number of claims for medications commonly used to treat the conditions under study. Medications were grouped in three general categories: corticosteroids, non-biologic disease-modifying antirheumatic drugs (DMARDs), and biologic DMARDs. Corticosteroids (e.g., prednisone, prednisolone, dexamethasone) are used to reduce inflammation, and are routinely prescribed concomitantly with DMARDs. To slow disease progression, DMARDs are the primary pharmacological treatment for RA, Crohn's disease, ulcerative colitis, psoriasis, and multiple sclerosis. Traditional DMARDs (such as methotrexate) differ from biologic DMARDs, which comprise newer specialty drug classes often classified according to their mechanism of action (either anti-tumor necrosis factor (anti-TNF) or other). See Figure 4 for a comprehensive list of generic drug names and their therapeutic classifications employed in this study.

Econometric Analysis

Univariate and bivariate analyses were conducted with difference in means tested using the Kruskal-Wallis equality-of-populations rank test method (Kruskal and Wallis 1952). Next, we estimated linear fixed effect models of specialty drug use as a function of plan type, and a vector of covariates including age; region (Northeast, Midwest, South, and West); relationship to policyholder (self, spouse, or child/adult dependent); Charlson Comorbidity Index (Charlson, et al. 1987) (Deyo, Cherkin and Ciol 1992) (Quan, et al. 2005); and indicators for the presence of seven comorbidities (diabetes, congestive heart failure, high blood pressure, dyslipidemia, asthma/chronic obstructive pulmonary disease, depression, and schizophrenia/bipolar disorder). Capitalizing on the panel nature of the analytical dataset (i.e., three yearly observations for each person), fixed effects estimates were generated via within-subject variation in all variables. Consequently, time-invariant characteristics, both observed (e.g., gender) and unobserved (e.g., a potential confounder) were eliminated. A single-year dummy (for 2014) also entered the model to control for underlying secular trends in outcomes. Finally, given the high proportion of zeros in the specialty drug use variable, we specified two models—one with any specialty drug use (dichotomous) as the dependent variable, and the other with the conditional number of specialty drug claims (count) as the dependent measure. These two models were repeated for each of the five conditions under study.

Objective 2: Estimating the Impact of Specialty Drug Use on Worker Productivity

The second aim of this paper was to examine the effect of specialty drug utilization on worker productivity. This part of the analysis was confined to the employee (i.e., excludes dependents) given the requirement for productivity data. Truven's Marketscan Health and Productivity Management (HPM) Database provides such data, albeit on a relatively smaller subset of employees in the employer market portion of the full Truven Marketscan Database. It is worth noting that the specialty disease patient can be either the employee or his/her spouse (we remove the small number of cases with children as the patient). The sample sizes differ by the variable of interest. For the present work, we focused on two measures: 1) the number of annual days absent from work and 2) the number of annual days on short-term disability.

As with the models of specialty drug use, each of the two productivity measures (days absent and days on short-term disability) were decomposed into two separate dependent variables—a dichotomous measure of any days, and a count measure of the conditional number of days. We estimated linear fixed effects models for these four dependent variables as a function of any specialty drug use or the total number of specialty drug fills (again, in distinct models) for each condition. Finally, all models were estimated separately for the samples in which the employee was the patient, and the samples in which the spouse was the patient.

Figure 4
Prescription Drugs (Generic Names) Included in Analyses

PHARMACY	MEDICAL
Biologic DMARDs (other mechanism of action)	Biologic DMARDs (other mechanism of action)
abatacept	abatacept
alemtuzumab	natalizumab
anakinra	rituximab
natalizumab	tocilizumab
rituximab	ustekinumab
secukinumab	
tocilizumab	
tofacitinib	
ustekinumab	
vedolizumab	
Biologic DMARDs (anti-TNF)	Biologic DMARDs (anti-TNF)
adalimumab	adalimumab
certolizumab pegol	certolizumab pegol
etanercept	etanercept
golimumab	golimumab
infliximab	infliximab
Non-Biologic DMARDs (non-specialty)	Non-Biologic DMARDs (non-specialty)
auranofin	aurothioglucose
azathioprine	azathioprine
cyclosporine	chloroquine
doxycycline	cyclosporine
doxycycline calcium	methotrexate
doxycycline hyclate	myochrysine
hydroxychloroquine	
leflunomide/teriflunomide	
methotrexate	
minocycline hydrochloride	
mycophenolate mofetil	
mycophenolate sodium	
sulfasalazine	
tacrolimus	
Other drugs for multiple sclerosis (specialty)	Other drugs for multiple sclerosis (specialty)
dalfampridine	glatiramer acetate
dimethyl fumarate	mitoxantrone
dimethyl fumarate;dimethyl fumarate	
fingolimod hydrochloride	
glatiramer acetate	
interferon beta-1a	
interferon beta-1a;interferon beta-1a	
interferon beta-1b	
peginterferon beta-1a	
peginterferon beta-1a;peginterferon beta-1a	
Corticosteroids (non-specialty)	Corticosteroids (non-specialty)

Notes:
DMARDs=disease-modifying antirheumatic drugs.
TNF=tumor necrosis factor.

Sample means for individual characteristics are shown in Figure 5 by health condition and in Figure 6 by health plan enrollment. The gender and age distributions of the sample vary by health condition. The gender distribution is split nearly equally among men and women among individuals with Crohn's disease, ulcerative colitis and psoriasis. However, about three-quarters of those with RA and MS are women, while only one-fourth are men. The average age ranges from 38.3 among those with Crohn's disease to 46.3 among those with RA. The average age for individuals with Crohn's disease is lower than the other conditions because Crohn's disease is often present among children, whereas the other conditions usually do not appear until someone is in their 30s. The Charlson Comorbidity Index is generally in the mid-0.3-to-0.39 range. However, it averages 1.3 among those with RA, suggesting that they are much more likely to have co-morbidities than those with the other conditions. The distribution of the sample by type of health plan does not appear to vary by condition. Only 14-16 percent of the sample was enrolled in a CDHP in 2013, which is just below the 18 percent national average.[12] There do not appear to be any differences in the samples when examined by health plan enrollment.

Figure 5
Select Demographic Means, by Disease, 2013

	Rheumatoid Arthritis (n=32,982)	Crohn's Disease (n=14,899)	Ulcerative Colitis (n=13,799)	Psoriasis (n=25,701)	Multiple Sclerosis (n=13,223)
Gender					
Male	23%	47%	49%	50%	23%
Female	77%	53%	51%	50%	77%
Age (years)	46.3	38.3	41.1	42.6	44.9
<18	5%	10%	6%	7%	1%
18-25	3%	12%	8%	5%	3%
26-35	7%	17%	17%	12%	13%
36-45	21%	24%	26%	25%	33%
46-55	41%	27%	30%	35%	38%
56-64	22%	10%	13%	16%	13%
Employee	55%	53%	60%	61%	51%
Spouse	38%	27%	28%	28%	46%
Child/Other Dependent	7%	20%	13%	12%	3%
Charlson Comorbidity Index (score)	1.3	0.3	0.4	0.4	0.4
Plan Type					
HMO/EPO	12%	12%	13%	13%	13%
PPO/POS	73%	72%	71%	72%	73%
Health reimbursement arrangement (HRA)	10%	10%	11%	10%	10%
HSA-eligible health plan	4%	5%	5%	4%	4%

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

Notes:
HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HSA=health savings account.

Figure 6
Select Demographic Means, by Plan Type, 2013

	Total (n=96,691)	HMO/EPO (n=12,231)	PPO/POS (n=70,329)	HRA (n=9,859)	HSA-Eligible Health Plan (n=4,272)	Statistical Significance
Gender						
Male	37%	**37%**	**37%**	**37%**	**41%**	***
Female	63%	**63%**	**63%**	**63%**	**59%**	***
Age (years)	43.3	**42.9**	**43.5**	**43.0**	**41.5**	***
<18	6%	**7%**	**6%**	**6%**	**9%**	***
18-25	5%	6%	5%	6%	6%	
26-35	12%	11%	12%	12%	12%	
36-45	25%	**26%**	**24%**	**25%**	**27%**	***
46-55	36%	**35%**	**36%**	**36%**	**32%**	***
56-64	16%	**15%**	**17%**	**15%**	**14%**	***
Employee	56%	**57%**	**57%**	**56%**	**50%**	***
Spouse	33%	**32%**	**33%**	**33%**	**36%**	***
Child/Other Dependent	10%	**12%**	**10%**	**11%**	**13%**	***
Charlson Comorbidity Index	0.7	**0.6**	**0.7**	**0.6**	**0.6**	***
Rheumatoid Arthritis	34%	**32%**	**34%**	**33%**	**31%**	***
Crohn's Disease	15%	15%	15%	15%	17%	
Ulcerative Colitis	14%	**15%**	**14%**	**15%**	**15%**	*
Psoriasis	26%	27%	26%	26%	27%	
Multiple Sclerosis	14%	14%	14%	13%	13%	

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Statistical significance of differences in means across plan type using Kruskal Wallis equality-of-populations rank test denoted as follows: *** p<0.01; ** p<0.05; * p<0.10.

Notes:
HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.

Figure 7 reports the average values for disease-specific prescription drug use (including specialty) by plan type. Across the conditions, biologic DMARD use was highest for MS, averaging 5.2 to 6.1 fills per patient in 2013. The fewest biologics consumed were in ulcerative colitis (0.9 to 1.2 fills). Non-biologic DMARDs were used far less often for MS (0.4 fills) compared to the other conditions. Non-biologic DMARD utilization was less than for specialty DMARDs, except in RA where patients had an average of 4.9 non-biologic and 2.7 biologic fills, and in ulcerative colitis where patients used slightly more Non-biologic DMARDs (1.2 versus 1.0). Average corticosteroid use was relatively consistent across the conditions (1.1 to 2.8 fills). No clear patterns emerged with respect to the levels of medication use by plan type.

In Figure 8, mean spending—based on allowed amounts from claims—on disease-specific medication is reported by condition and plan type. MS biologics by far were the costliest averaging $32,834 per patient per year. Specialty DMARDs for Crohn's disease were the second most expensive ($10,757) followed by psoriasis ($9,871), RA ($9,230), and ulcerative colitis ($4,605). Non-biologic DMARDs ranged in cost from $107 (ulcerative colitis) to $593 (MS). Finally, corticosteroid costs ranged from $54 (psoriasis) to $488 (Crohn's). The percentage of total spending accounted for by specialty medications ranged from 19 percent for ulcerative colitis to 66 percent for MS (Figure 9).

Out-of-pocket (OOP) spending was not only higher among individuals enrolled in HSA-eligible health plans and HRAs as compared to individuals enrolled in PPOs/POS plans and HMO/EPOs, but much of the higher OOP spending was associated with prescription drugs. Individuals with MS spent the most out-of-pocket regardless of health plan. Those with an HSA-eligible health plan spent $4,068 OOP, compared with $3,083 among those with an HRA, $2,195 among those with a PPO/POS, and $1,421 among those with an HMO/EPO (Figure 10). Among MS patients with an HSA-eligible health plan, 60 percent of OOP spending was due to prescription drugs, compared with 46 percent among HRA enrollees, 40 percent among PPO/POS enrollees and 45 percent among HMO/EPO enrollees (Figure 11). A similar pattern emerged for individuals with psoriasis, RA, ulcerative colitis, and Crohn's disease. Higher OOP costs on prescription drugs were experienced among HSA-eligible health plan enrollees because of the high deductible. Not only did they spend more OOP, the percent spend OOP on prescriptions was higher because drug fills incurred early in the year were likely incurred before the individual reached his or her deductible.

For each disease, Figure 12 presents the average number of days absent and Figure 13 presents the average number of days on short-term disability by specialty drug use status (in 2013). Statistically significant differences in days absent emerged in two of the five diseases. In RA and psoriasis, any specialty drug use was associated with 2-3 more days of absenteeism. Short-term disability days were higher by about four days among specialty drug users in ulcerative colitis; whereas in multiple sclerosis specialty drug utilization was related to approximately six fewer days on short-term disability.

Figure 7
Average Prescription Drug Use, by Disease and Plan Type, 2013

	Total (n=96,691)	HMO/EPO (n=12,231)	PPO/POS (n=70,329)	HRA (n=9,859)	HSA-Eligible Health Plan (n=4,272)	Statistical Significance
Rheumatoid Arthritis						
DMARDs: biologics	2.7	**3.2**	**2.7**	**2.7**	**2.9**	***
DMARDs: non-biologics	4.9	**5.2**	**4.8**	**5.2**	**5.1**	***
Corticosteroids	2.8	**2.8**	**2.8**	**2.9**	**2.6**	***
Crohn's Disease						
DMARDs: biologics	2.6	**3.1**	**2.5**	**2.7**	**2.4**	***
DMARDs: non-biologics	1.5	1.5	1.4	1.5	1.6	
Corticosteroids	1.8	**1.8**	**1.8**	**1.7**	**1.5**	***
Ulcerative Colitis						
DMARDs: biologics	1.0	1.2	1.0	1.1	0.9	
DMARDs: non-biologics	1.2	**1.4**	**1.1**	**1.4**	**1.4**	*
Corticosteroids	1.5	1.5	1.5	1.5	1.6	
Psoriasis						
DMARDs: biologics	2.3	**2.7**	**2.3**	**2.4**	**1.9**	***
DMARDs: non-biologics	1.5	1.5	1.5	1.5	1.5	
Corticosteroids	1.1	**1.0**	**1.2**	**1.2**	**1.0**	***
Multiple Sclerosis						
DMARDs: biologics	5.6	**6.1**	**5.5**	**5.2**	**5.6**	***
DMARDs: non-biologics	0.4	0.4	0.4	0.4	0.5	
Corticosteroids	1.2	1.2	1.3	1.2	1.2	

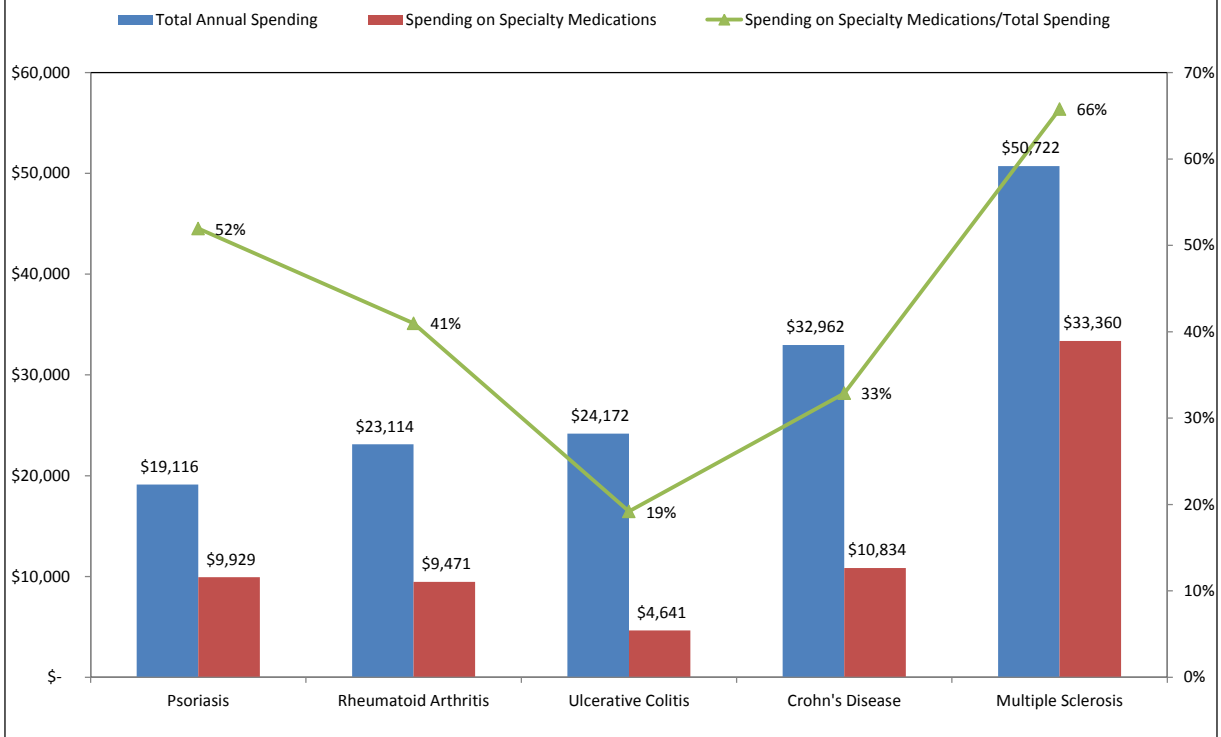
Notes:
HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization;
POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.
DMARDs=disease-modifying antirheumatic drugs.
Statistical significance of differences in means across plan type using Kruskal Wallis equality-of-populations rank test denoted as follows: *** p<0.01; ** p<0.05; * p<0.10.

Figure 8
Average Spending on Prescription Drugs, by Disease and Plan Type, 2013

	Total (n=96,691)	HMO/EPO (n=12,231)	PPO/POS (n=70,329)	HRA (n=9,859)	HSA-Eligible Health Plan (n=4,272)	Statistical Significance
Rheumatoid Arthritis						
DMARDs: biologics	$9,230	$9,835	$9,191	$9,047	$8,559	
DMARDs: non-biologics	$304	**$311**	**$303**	**$306**	**$297**	***
Corticosteroids	$105	**$122**	**$103**	**$104**	**$88**	***
Crohn's Disease						
DMARDs: biologics	$10,757	**$11,714**	**$10,693**	**$10,613**	**$9,562**	**
DMARDs: non-biologics	$108	$99	$110	$97	$113	
Corticosteroids	$488	**$518**	**$510**	**$378**	**$311**	***
Ulcerative Colitis						
DMARDs: biologics	$4,605	$4,538	$4,667	$4,731	$3,559	
DMARDs: non-biologics	$107	$122	$104	$118	$86	
Corticosteroids	$179	$156	$191	$147	$136	
Psoriasis						
DMARDs: biologics	$9,871	**$10,128**	**$9,924**	**$10,075**	**$7,814**	***
DMARDs: non-biologics	$131	$131	$131	$133	$129	
Corticosteroids	$54	**$48**	**$56**	**$54**	**$37**	***
Multiple Sclerosis						
DMARDs: biologics	$32,834	**$31,469**	**$33,104**	**$33,104**	**$31,693**	**
DMARDs: non-biologics	$593	$588	$598	$586	$530	
Corticosteroids	$71	**$63**	**$73**	**$67**	**$80**	*

Notes:
HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization;
POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.
DMARDs=disease-modifying antirheumatic drugs.
Statistical significance of differences in means across plan type using Kruskal Wallis equality-of-populations rank test denoted as follows:
*** p<0.01; ** p<0.05; * p<0.10.

Figure 9
Spending, by Disease, 2013



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

Figure 10
Average Out-of-Pocket (OOP) Spending, by Disease and Plan Type, 2013

	Total	HMO/EPO	PPO/POS	HRA	HSA-Eligible Health Plan	Statistical Significance
Rheumatoid Arthritis						
Total OOP spending	$1,972	$1,298	$1,925	$2,651	$3,192	***
OOP spending on prescriptions	$663	$560	$617	$843	$1,346	***
Percent of OOP spending on prescriptions	37%	49%	35%	35%	39%	***
Crohn's Disease						
Total OOP spending	$2,149	$1,343	$2,079	$2,983	$3,503	***
OOP spending on prescriptions	$582	$482	$538	$794	$1,057	***
Percent of OOP spending on prescriptions	32%	42%	30%	32%	32%	***
Ulcerative Colitis						
Total OOP spending	$1,962	$1,274	$1,900	$2,662	$3,162	***
OOP spending on prescriptions	$583	$463	$538	$795	$1,095	***
Percent of OOP spending on prescriptions	36%	46%	34%	36%	38%	***
Psoriasis						
Total OOP spending	$1,491	$936	$1,451	$2,046	$2,478	***
OOP spending on prescriptions	$582	$429	$531	$856	$1,235	***
Percent of OOP spending on prescriptions	40%	50%	38%	43%	43%	***
Multiple Sclerosis						
Total OOP spending	$2,261	$1,421	$2,195	$3,083	$4,068	***
OOP spending on prescriptions	$856	$613	$772	$1,199	$2,253	***
Percent of OOP spending on prescriptions	41%	50%	38%	41%	52%	***

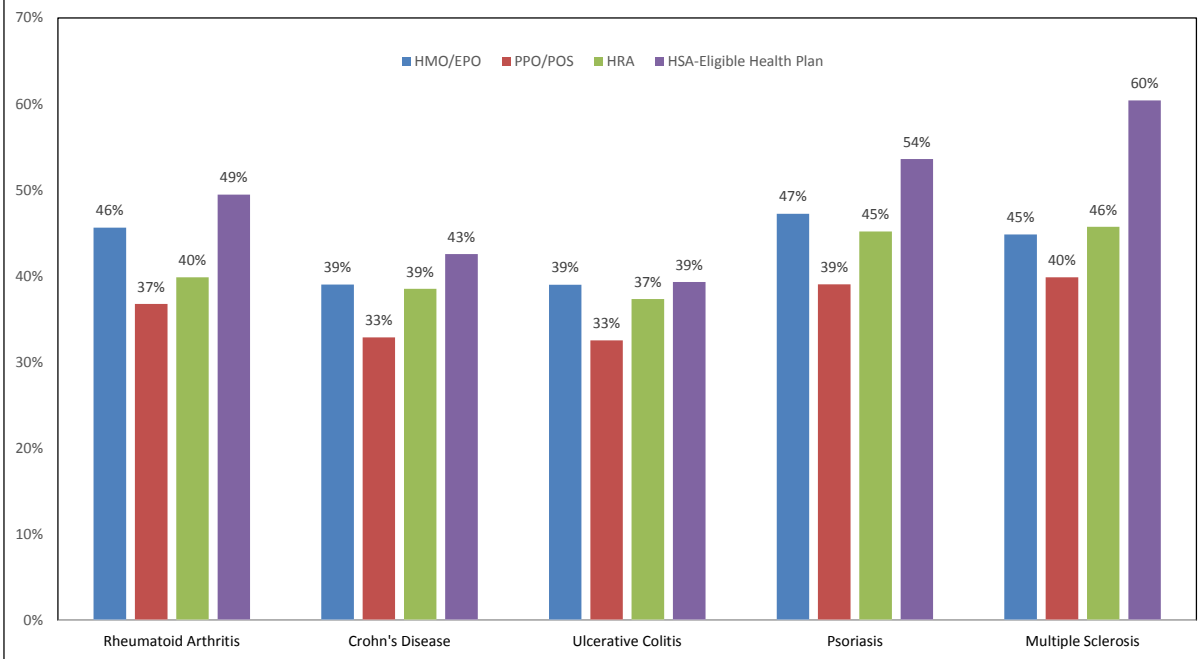
Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.

Notes:

HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.

*Statistical significance of differences in means across plan type using Kruskal Wallis equality-of-populations rank test denoted as follows: *** p<0.01; ** p<0.05; * p<0.10.*

Figure 11
Percent of Out-of-Pocket (OOP) Spending on Prescriptions, by Disease and Plan Type, 2013



Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.

Figure 12
Average Number of Days Absent, by Disease and Use of Specialty Medications, 2013

Disease	Sample Sizes	Any Specialty Drug Fills	No Specialty Drug Fills	Statistical Significance
Rheumatoid Arthritis	1,240	31.3	29.4	**
Crohn's Disease	706	29.9	31.0	
Ulcerative Colitis	757	27.2	26.9	
Psoriasis	1,463	31.1	28.3	**
Multiple Sclerosis	521	30.7	28.5	

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Statistical significance of differences in means by any fills using Kruskal Wallis equality-of-populations rank test denoted as follows: *** p<0.01; ** p<0.05; * p<0.10.

Figure 13
Average Number of Days on Short-Term Disability, by Disease and Use of Specialty Medications, 2013

Disease	Sample Sizes	Any Specialty Drug Fills	No Specialty Drug Fills	Statistical Significance
Rheumatoid Arthritis	8,487	5.1	6.0	
Crohn's Disease	4,155	7.1	6.7	
Ulcerative Colitis	4,353	8.6	4.7	**
Psoriasis	8,279	3.2	3.2	
Multiple Sclerosis	3,391	5.3	11.2	**

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Statistical significance of differences in means by any fills using Kruskal Wallis equality-of-populations rank test denoted as follows: *** p<0.01; ** p<0.05; * p<0.10.

Results

Use of Specialty Medications by Condition and Plan Type

Figure 14 shows the results from the multivariate regression models of health plan type on use of specialty medications. Only the coefficients from the regression related to the impact of health plan type are presented. Separate models are shown for any use of specialty medications, and the number of specialty medications conditional on any use. We found mixed results when it came to whether plan type had an impact on whether any specialty medications were used. Plan type had no impact on whether any specialty medications were filled among individuals with Crohn's disease, ulcerative colitis, psoriasis, and MS. Among individuals with RA, those enrolled in an HRA were less likely than those enrolled in an HMO/EPO to fill a prescription for a specialty medication.

Among individuals that had filled a specialty medication prescription, we found mixed effects by plan type on the number of prescriptions filled, depending on the disease. Among those with MS, individuals in PPO/POS and HRA plans used more specialty medications than those in an HMO/EPO plan. Similarly, among individuals with Crohn's disease, those in a PPO/POS plan used more specialty medications than those in an HMO/EPO plan. Among individuals with RA, those in an HRA plan used less specialty medications than those in the HMO/EPO. Finally, there were no statistically significant differences by plan type for ulcerative colitis and psoriasis patients.

The predicted number of drug fills for patients with MS are shown in Figure 15 by type of health plan. While these predictions are based on the regression results that show PPO/POS and HRA plan participants use more specialty medications than those in the HMO/EPO plan, the magnitude of the differences in predictions is quite small.

The difference between getting any specialty medications filled and the number of prescriptions filled after having filled a prescription for individuals with MS is interesting. The findings suggest that the high cost of the prescription may be a

Figure 14

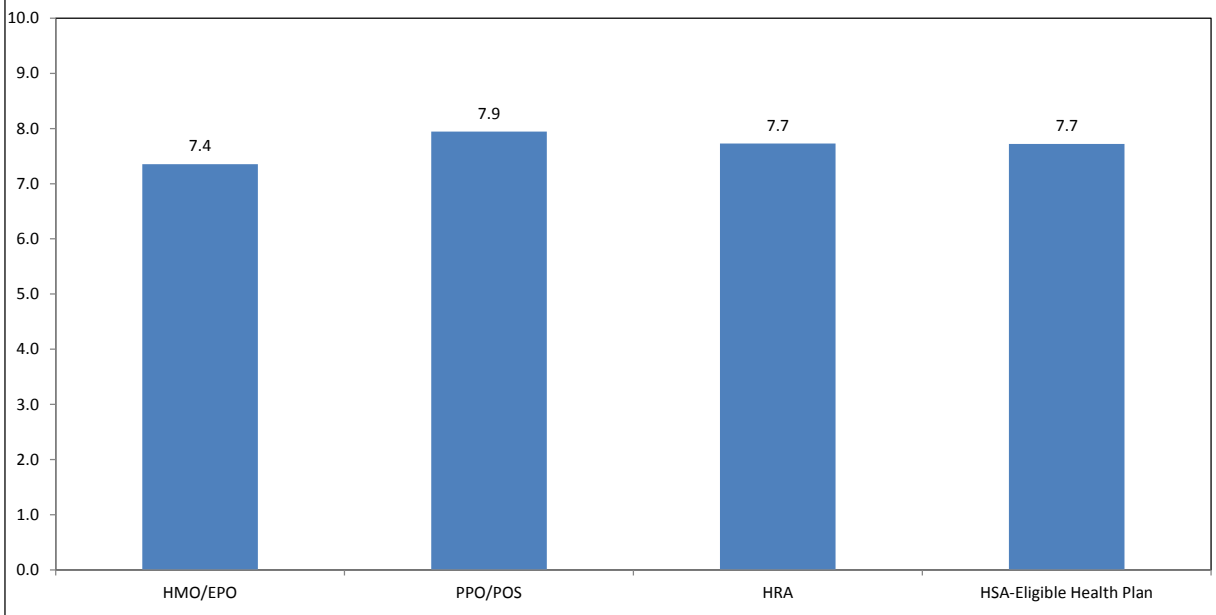
Linear Fixed Effects Model Estimates of Plan Type Impact on Condition-Specific Specialty Drug Use

Disease	Dependent Variable			
Independent Variable	Coefficient-Any Specialty Drug Fills	Predicted Probability-Any Specialty Drug Fills	Coefficient-Conditional Number of Specialty Drug Fills	Predicted-Conditional Number of Specialty Drug Fills
Rheumatoid Arthritis				
HMO/EPO	ref	41%	ref	7.0
PPO/POS	0.003	42%	0.140	7.1
HRA	**-0.0158****	40%	**-0.2948***	6.7
HSA-eligible health plan	0.001	42%	-0.021	7.0
Crohn's Disease				
HMO/EPO	ref	40%	ref	6.7
PPO/POS	-0.012	39%	**0.3971***	7.1
HRA	-0.003	40%	0.058	6.8
HSA-eligible health plan	-0.020	38%	0.267	7.0
Ulcerative Colitis				
HMO/EPO	ref	17%	ref	6.8
PPO/POS	0.017	19%	0.083	6.9
HRA	0.010	18%	-0.242	6.6
HSA-eligible health plan	0.000	17%	0.179	7.0
Psoriasis				
HMO/EPO	ref	38%	ref	6.2
PPO/POS	0.004	38%	0.037	6.3
HRA	-0.006	37%	-0.231	6.0
HSA-eligible health plan	0.007	38%	-0.036	6.2
Multiple Sclerosis				
HMO/EPO	ref	73%	ref	7.4
PPO/POS	0.009	74%	**0.5932*****	7.9
HRA	0.007	73%	**0.3768***	7.7
HSA-eligible health plan	-0.026	70%	0.369	7.7

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: *** p<0.01, ** p<0.05, *p<0.10
Models include other covariates, but are suppressed for brevity.
HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.

Figure 15

Predicted Number of Specialty Drug Fills Among Patients with Multiple Sclerosis, Conditional on Any Use, by Plan Type



Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: HMO=health maintenance organization; EPO=exclusive provider organization; PPO= preferred provider organization; POS=point of service; HRA=health reimbursement arrangement; HSA=health savings account.

deterrent initially, but once a patient gets a prescription filled, there is little incentive to reduce the quantity used because the first fill could easily wipe out the entire deductible.

Use of Specialty Medications and Worker Productivity

The analysis of worker productivity includes both days absent and on short-term disability. One limitation of using days absent is that the data field (as received from the data provider) includes both sick leave and vacation time. As reported in Figure 16, we found few instances where productivity was affected by use of specialty medications. We did not find significant relationships between any use of specialty medication, and any days absent or conditional number of days absent except in one case. Namely, any specialty drug use for RA was associated with 2.5 fewer conditional days absent (p=0.09). In MS, each additional specialty drug fill was associated with 0.28 more days absent.

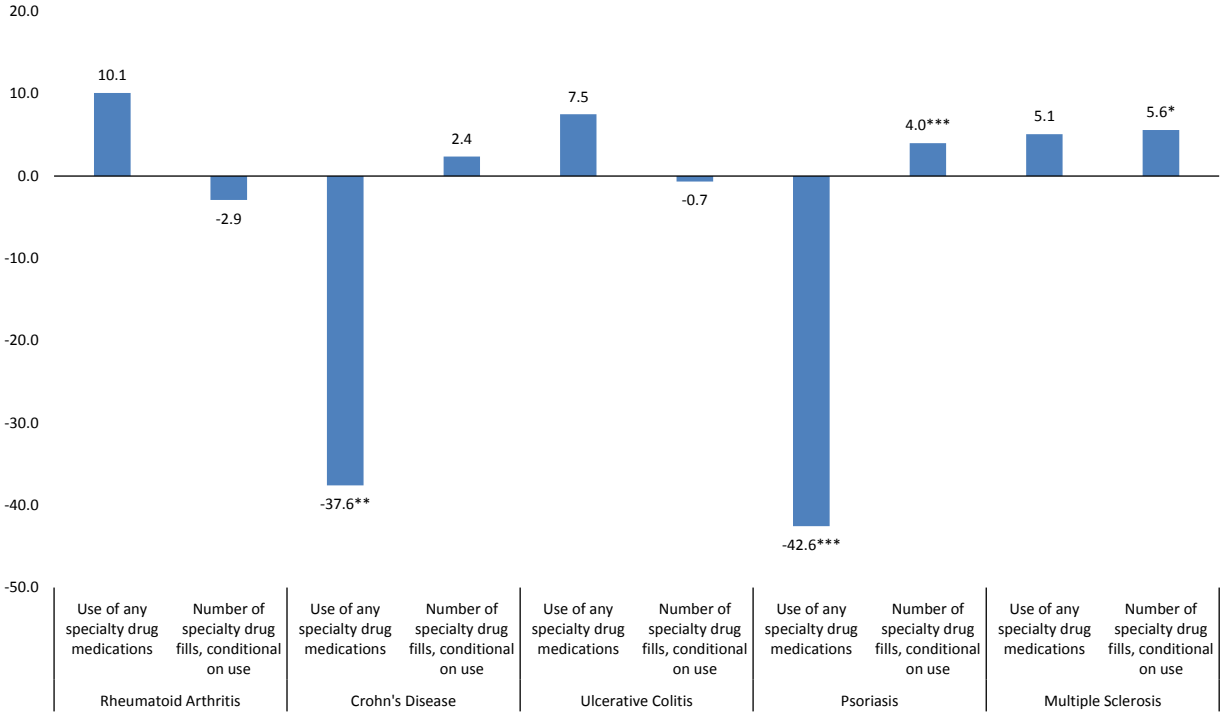
Figure 16
Linear Fixed Effects Model Estimates of Employees Specialty Drug Use Impact on Productivity

Disease	Dependent Variable			
Independent Variable	Any Days Absent	Conditional Number of Days Absent	Any Days on Short-Term Disability	Conditional Number of Days on Short-Term Disability
Rheumatoid Arthritis				
Any specialty drug fills	-0.005	-2.455*	0.018	10.077
Conditional number of specialty drug fills	0.002	-0.199	0.002	-2.900
Crohn's Disease				
Any specialty drug fills	0.049	1.240	0.015	-37.585**
Conditional number of specialty drug fills	0.0001	0.722	0.005	2.354
Ulcerative Colitis				
Any specialty drug fills	0.025	4.838	-0.021	7.490
Conditional number of specialty drug fills	-0.003	-0.947	-0.004	-0.665
Psoriasis				
Any specialty drug fills	-0.014	0.169	0.007	-42.554***
Conditional number of specialty drug fills	0.003	0.278	0.00004	3.983**
Multiple Sclerosis				
Any specialty drug fills	-0.033	-3.432	-0.002	5.090
Conditional number of specialty drug fills	0.000	0.284**	0.003	5.575*

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: *** p<0.01, ** p<0.05, *p<0.10
Models include other covariates, but are suppressed for brevity.

We also did not find evidence that use of specialty medications affected whether a worker took short-term disability. However, once on short-term disability, the duration was impacted in several cases. Any specialty drug use was related to 37.6 and 42.6 fewer short-term disability days among Crohn's and psoriasis patients, respectively (Figure 17). Conversely, each additional specialty drug fill was associated with 4.0 and 5.6 more days on short-term disability among psoriasis and MS patients.

Figure 17
Estimated Impact of Employees Use of Specialty Medications on Short-Term Disability Days



Notes: *** p<0.01, ** p<0.05, *p<0.10

Figure 18

Linear Fixed Effects Model Estimates of Spouses Specialty Drug Use Impact on Productivity

Disease / Independent Variable	Dependent Variable: Any Days Absent	Dependent Variable: Conditional Number of Days Absent
Rheumatoid Arthritis		
Any specialty drug fills	0.015	-1.115
Conditional number of specialty drug fills	0.006**	0.635**
Crohn's Disease		
Any specialty drug fills	0.040	6.128
Conditional number of specialty drug fills	0.0030	0.559
Ulcerative Colitis		
Any specialty drug fills	-0.021	-6.455**
Conditional number of specialty drug fills	0.000	-0.725***
Psoriasis		
Any specialty drug fills	0.040	3.322
Conditional number of specialty drug fills	-0.004	-0.050
Multiple Sclerosis		
Any specialty drug fills	0.056	-0.944
Conditional number of specialty drug fills	0.005*	-0.053

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: *** p<0.01, ** p<0.05, *p<0.10
Models include other covariates, but are suppressed for brevity.

Our expectation was that use of specialty medications might increase productivity by reducing both absenteeism and short-term disability among workers with these treatable autoimmune disorders. Yet, we did not find strong evidence to support this. Our results may be driven by the timing of taking a specialty medication, especially if those taking it are more likely to be on disability or close to being disabled and/or so ill that they are already taking a lot of time off from work.

Another potential productivity impact might be to spouses of patients. Indeed, worker absenteeism would be lower when dependents are on specialty medications if those medications reduce the need for the employee to take time off from work to care for their dependent. Alternatively, spousal time might be needed to accompany or transport patients to receive specialty drug injections.

We examined the impact of spousal use of specialty medications for married workers. The findings are presented in Figure 18. We found nearly no evidence that any use of specialty medications reduced worker absenteeism. There was one exception: among spouses using specialty medications for ulcerative colitis, employees were absent from work 6.5 fewer days. When it came to the number of specialty medications filled among those who had filled at least one prescription, we found mixed results. There was no impact on worker absenteeism among spouses with Crohn's disease, psoriasis or MS. Higher use of specialty medications reduced absenteeism among workers with spouses treated for ulcerative colitis, but it increased absenteeism among workers with spouses treated for RA.

While overall use of specialty medications may be expected to impact worker productivity, medication adherence may be a better measure. Count measures of prescription drug utilization do not account for drug switching, concomitant use, and or timing. Medication adherence measures are routinely used in health services research (Carls, et al. 2012), (Fronstin, Sepulveda and Roebuck 2013). We generated the proportion of days covered for individuals with MS by custom coding the drug-specific days' supply for each prescription drug fill--including all pharmacy and medical insurance adjudicated claims. We subsequently re-estimated the multivariate models of worker productivity, and reported the results in Figure 19. We found that medication adherence had no significant impact on absenteeism or short-term disability among workers with MS.

Figure 19
Linear Fixed Effects Model Estimates of Medication Adherence on Worker Productivity, Patients With Multiple Sclerosis

	Proportion of Days Covered	Adherent (PDC>=0.80)
Multiple Sclerosis		
Any days absent	-0.05	-0.01
Conditional number of days absent	4.21	2.07
Any days on short-term disability	0.03	-0.01
Conditional number of days on short-term disability	-25.13	1.50

Source: Employee Benefit Research Institute estimates based on administrative enrollment and claims data.
Notes: *** p<0.01, ** p<0.05, *p<0.10
Models include other covariates, but are suppressed for brevity.

Conclusion

In this paper, we examined the relationship between health plan type and use of specialty medications for patients with rheumatoid arthritis (RA), Crohn's disease, ulcerative colitis, psoriasis, and multiple sclerosis (MS). Plan type may affect use of specialty medications because some health plans are associated with high deductibles, which may be a deterrent to use of high-cost medications. Alternatively, high deductibles may have no impact on use of specialty medications because patients may reach their deductible as a result of one drug fill or may expect to reach it due to the various other medical services that they receive each year. Depending on the condition and the method for measuring the use

of specialty medications, in some cases we found that plan type affected use, but in other cases we found it had no effect.

We also examined whether use of specialty medications affected worker productivity. We found few instances where productivity was affected by use of specialty medications.

There are some limitations to the data and research methods used for our analysis. Fixed effects regression modeling helps safeguard against obtaining biased estimates due to confounding. However, the technique is inefficient in that it requires within-person variation over time. With relatively small sample sizes (particularly in the productivity analyses), we may not have sufficient variation to exploit (i.e., patients might not be varying specialty drug use over time). Also, all patients had their respective conditions as of the first year (of the three) of the panel dataset. This represented a mixture of incident and prevalent cases; and varying degrees of disease severity, which could not be controlled. Similarly, we did not index specialty drug use, therefore utilizers included both existing and new users.

There are a number of limitations related to type of health plan as well. For instance, we are unable to control for the choice set of available health plans. We do not know if a plan enrollee had a choice of other health plans, nor do we know what other health plans might have been available had there been choice. We do not know to what degree individuals with the diseases examined in the paper choose specific jobs based on the available health coverage. We also do not know if individuals with the diseases examined in the paper pick a health plan because a specific physician is in the plan's network.

Ultimately, plan type may not matter simply because individuals with high-cost conditions are more likely to reach their out of pocket maximum regardless of their health plan enrollment. Goldman, Joyce, et al. (2006) found that use of specialty medications were largely insensitive to cost sharing among individuals with RA and MS, with price elasticities of -0.07 for MS and -0.21 for RA. In other words, if cost sharing doubled, use of specialty medications would fall by 7 percent among individuals with MS and 21 percent for individuals with RA. Similarly, Karaca-Mandic, et al. (2010) found that doubling average OOP costs reduced the predicted probability of initiating a specialty medication for RA by 9.3 percent (from 4.3 percent to 3.9 percent) and reduced continued use by 3.8 percent (from 80 percent to 77 percent). Hence, trying to manage the cost of specialty medications via cost sharing may simply be a cost shift to patients if use of services is unaffected.

While employers are concerned about the cost of specialty medications, focusing solely on the cost of such medications may not impact overall spending. Further research should examine whether there are any significant medical cost offsets, as a well-developed body of work has documented, with respect to prescription drug use in common chronic diseases.

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Endnotes

[1] Calculated from Figure 4 in http://content.healthaffairs.org/content/early/2016/11/22/hlthaff.2016.1330.

[2] See Figure 9.11 in https://www.kff.org/report-section/ehbs-2017-section-9-prescription-drug-benefits/.

[3] See Figure 9.12 in https://www.kff.org/report-section/ehbs-2017-section-9-prescription-drug-benefits/

[4] See Figure 9.13 in https://www.kff.org/report-section/ehbs-2017-section-9-prescription-drug-benefits/.

[5] See Figure 9.6 in https://www.kff.org/report-section/ehbs-2017-section-9-prescription-drug-benefits/

[6] See Figure 9.6 in https://www.kff.org/report-section/ehbs-2017-section-9-prescription-drug-benefits/

[7] See Figure 7.2 in https://www.kff.org/report-section/ehbs-2017-section-7-employee-cost-sharing/.

[8] See Figure 7.8 in https://www.kff.org/report-section/ehbs-2017-section-7-employee-cost-sharing/.

[9] In one prior study, only 30 of the over 24,000 individuals in the sample were in an HDHP (Palmer, et al. 2012). In contrast, 15 percent of our sample is in HDHPs.

[10] See studies reviewed in Doshi, et al (2016B).

[11] Three studies examined longitudinal data. Two of those studies focused on cancer ((Darkow, et al. 2012) and (Goldman, Jena, et al. 2010)) and one focused on RA (Karaca-Mandic, et al. 2010). Data was used from 2005 and earlier in two of the studies ((Goldman, Jena, et al. 2010) and (Karaca-Mandic, et al. 2010)), and from 2009 and earlier in the Darkow, et al. (2012) study, when fewer individuals were in HDHPs and cost-sharing for specialty medications was generally low as compared to today

[12] See Figure 5 in https://www.mercer.com/newsroom/mercer-national-health-survey-employers-finding-new-ways-to-hold-the-line-on-health-benefit-cost-growth.html.

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