Published in final edited form as:
Forum Health Econ Policy. ; 16(1): 1–19. doi:10.1515/thep-2012-0028.

Price-Shopping in Consumer-Directed Health Plans

Neeraj Sood[1], **Zachary Wagner**[2], **Peter Huckfeldt**[3], and **Amelia Haviland**[4]

[1]University of Southern California [2]Leonard D. Schaeffer Center for Health Policy and Economics [3]RAND Corporation [4]RAND Corporation, Carnegie Mellon University

Abstract

We use health insurance claims data from 63 large employers to estimate the extent of price shopping for nine common outpatient services in consumer-directed health plans (CDHPs) compared to traditional health plans. The main measures of price-shopping include: (1) the total price paid on the claim, (2) the share of claims from low and high cost providers and (3) the savings from price shopping relative to choosing prices randomly. All analyses control for individual and zip code level demographics and plan characteristics. We also estimate differences in price shopping within CDHPs depending on expected health care costs and whether the service was bought before or after reaching the deductible. For 8 out of 9 services analyzed, prices paid by CDHP and traditional plan enrollees did not differ significantly; CDHP enrollees paid 2.3% less for office visits. Similarly, office visits was the only service where CDHP enrollment resulted in a significantly larger share of claims from low cost providers and greater savings from price shopping relative to traditional plans. There was also no evidence that, within CDHP plans, consumers with lower expected medical expenses exhibited more price-shopping or that consumers exhibited more price-shopping before reaching the deductible.

Introduction

‘Consumer-directed’ health plans (CDHPs), characterized by high deductibles and tax-advantaged personal health accounts, are becoming increasingly popular. Enrollment in these plans has risen from 4 to 17 percent of employer-provided insurance between 2006 and 2010, with 59% of large employers (with 1000+ employees) offering such a plan in 2011 (Kaiser Family Foundation and HRET 2011; Towers Watson and National Business Group on Health 2012). In exchange for the high deductible, CDHP enrollees typically face lower monthly premiums. To help cover the high deductible, CDHP enrollees, their employers, or both can contribute to tax-free personal health accounts. The goal of CDHPs is to reduce health care costs while maintaining health care quality through the use of higher value services. Proponents of CDHPs argue that by having enrollees pay the entire price out-of-pocket for services received before reaching the deductible, enrollees have increased financial incentive to “shop” for lower price providers of health care. Moreover, many CDHPs aim to facilitate price shopping by providing online decision support tools. To the extent that enrollees respond to these incentives, CDHPs could lower health care costs and even stimulate price competition among providers.

Prior research demonstrates that CDHPs reduce short-term costs (Buntin et al. 2011; Feldman and Parente 2010; Lo Sasso et al. 2004; Parente, Feldman, and Christianson 2004). However, it remains unclear whether these reductions reflect price-shopping or indiscriminate reductions on the part of enrollees. Numerous papers have shown short-term reductions in emergency department use and hospitalization rates after CDHP enrollment (Haviland et al. 2011; Wharam et al. 2007; Wharam et al. 2011b), potentially indicating more efficient use of health care. However, the prior literature shows mixed effects on use of high value services. Some papers show *decreased* use of some preventive services (Buntin et al. 2011; Wharam et al. 2008; Wharam et al. 2011a) and reductions in both high and low priority office visits (Hibbard, Greene, and Tusler 2008). In contrast, research examining a single CDHP shows no evidence of reductions in preventive care use relative to traditional plans (Rowe et al. 2008). Estimated impacts on pharmaceutical utilization are similarly mixed: results from a single employer show discontinuation of drugs treating asymptomatic chronic conditions and little change in use of generics (Greene et al. 2008), while estimates across employers and plans show increased use of generic drugs (Haviland et al. 2011). Other research finds that individuals in CDHPs with chronic conditions are more likely to delay care (Galbraith et al. 2012) and CDHPs restrict access to care and increase financial burden for sicker or lower income individuals (Davis, Doty, and Ho 2005; Galbraith et al. 2011). There is no research to-date investigating whether CDHP enrollees shop for lower cost care.

Even with the right incentives price-shopping for health care can be challenging, as consumers often do not have information on the prices charged by different providers. While a number of states have implemented initiatives aimed at improving price transparency, the effects of such policies remain largely unknown (Sinaiko and Rosenthal 2011). Early evidence shows that one initiative in New Hampshire had little impact on price variation (Tu and Lauer 2009). As most of these initiatives do not make available to patients the price they will actually be exposed to – the one negotiated by their health insurance plan (focusing instead on charges or averages over all negotiated prices) challenges are likely to remain. Several CDHPs attempt to address these concerns and facilitate price shopping by providing online decision support tools with information on prices charged by different providers in their network.

This study is the first to investigate whether CDHPs are effective in encouraging enrollees to shop for lower cost providers of health care. We examine the prices paid for common outpatient procedures using claims data from 63 large employers more than half of which offered CDHPs in 2007. In order to identify the role played by price transparency, we investigate a range of common outpatient services with both higher and lower levels of price transparency and scope for price-shopping (e.g. office visit versus pelvic ultrasound).

Methods and Data

Study Design

The objective of our analyses is to estimate differences in price-shopping behavior between patients in CDHPs and patients in conventional health plans. We define a CDHP plan as including a deductible of $1000 or more for individual coverage (twice this for family

coverage). CDHP plans typically are defined to include a tax-advantaged health savings account (employee owned, employer contribution not required) or health reimbursement arrangement (employer owned, employer contribution required); 91 percent of CDHP plans in our sample include such personal health accounts which comprise 94 percent of all CDHP members in our sample. We focus on total prices for the following nine common outpatient procedures and services: arthrocentesis, chest x-ray, colonoscopy, emergency department visit, flu vaccine, mammogram, office visit, pelvic ultrasound, and preventive visits.

We first estimate differences in total prices paid by CDHP beneficiaries relative to prices paid by enrollees in traditional plans. If CDHP patients are more price-sensitive, they may be more likely to seek lower-cost providers of procedures and services. However, unadjusted differences in prices may also reflect differences in individual characteristics related to the propensity to price shop or differences in health plans affecting bargaining power to negotiate for lower prices for procedures and services. Reflecting this, we also compute adjusted differences, controlling for individual and zip code level demographic characteristics and plan characteristics.

In further analysis, we more explicitly account for differential price availability between CDHP and conventional plans. Specifically, the set of available prices for a given service may be higher for enrollees in CDHPs compared to conventional plans if the CDHP has a smaller share of the market and thus less bargaining power when negotiating with providers. In such a case, CDHP enrollees may pay higher prices than conventional plan enrollees even if CDHP enrollees price-shop more than enrollees in conventional plans. To account for this, we identify the distribution of *unique* prices paid for each service within a plan and metropolitan statistical area (MSA). If CDHP enrollees are more likely to price shop than enrollees in conventional plans, we would expect a higher proportion of CDHP claims to come from providers in the lower end of the distribution of offered prices in comparison to this proportion in traditional plans.

However, it is possible that the proportion of enrollees purchasing health care from the lower end of the observed distribution of offered prices is sensitive to the distribution of unique prices. Therefore, the results from the above analysis might be biased if there are large differences in the distribution of unique price points across CDHP and conventional plans. Table 3 the shows that while there are more unique price points in traditional plans, there is no systematic relationship between plan type (CDHP vs conventional) and the standard deviation or interquartile range of the distribution of unique price points. However, there could still exist differences in access to specific price points between CDHPs and conventional plans. For example, conventional plans might have larger networks and thus more providers with low price points compared to early CDHPs from smaller carriers, biasing our estimates against observing price-shopping behavior. To account for such differences, we examine within-plan changes in price-shopping behavior for CDHP enrollees before and after reaching the deductible. CDHP patients have a greater incentive to price shop prior to reaching the deductible when they must pay the full cost of non-exempt services. If CDHP enrollees exhibit price-shopping behavior, we would expect to see a higher proportion of claims for providers in the lower end of the price distribution prior to reaching the deductible relative to after reaching the deductible.

However, one potential problem with the above analysis is that if enrollees are forward looking then their price-seeking behavior might be determined by the end of year price of health care services rather than the current price(Aron-Dine et al. 2012). If this is the case, we would expect less price shopping from enrollees more likely to reach the deductible as they face a lower end of year price. We examine this by estimating whether CDHP enrollees who are more likely to reach the deductible are less likely to demonstrate price-shopping behavior. We note that behaviorally, this requires patients to have no "myopia", that is, they are impervious to seeing and paying out of pocket the entire price of care prior to meeting their deductible which while rational, may be unlikely.

The scope for individuals to price-shop varies across services and may be a function of price transparency, the urgency of the service, and whether patients have agency to choose providers. For services such as office visits, prices are knowable and relatively transparent, especially as the service is used repeatedly on a regular basis. Patients may have time to search for the lowest cost provider, and patients have agency to choose from a range of providers. However, some consumers might find it difficult to change primary care providers even if they are expensive, especially if they have a long-standing relationship with that provider. In contrast, even with transparent pricing, there is little scope for patients to price-shop for the lowest cost emergency department after an accident. However, patients might have ability to price shop for non-urgent emergency room care. For services such as pelvic ultra sound or chest x-ray, there may be less ability to choose a lower cost provider as the service might be bundled with a physician visit or a patient's physician may always use a particular facility for such services. On the other hand, price-shopping for laboratory tests might be easier as the quality of services offered is likely to be similar across providers. Reflecting this potential heterogeneity, we examine price shopping for a range of outpatient procedures and services.

Data Sources and Study Population

The study population is drawn from full time employees and their dependents working for 63 employers in 2007. Roughly half of the employers were recruited based on their offering of a CDHP between 2003–2007, representing a range of geographic locations, size, and industries. The other half was drawn from the Thomson Reuters MarketScan database to roughly match the characteristics of the CDHP-offering firms. To account for variation in prices by geographic location, we define each plan unit as the unique combination of plan by MSA, meaning that a plan that spans across two MSAs is considered two distinct plan units. Henceforth, we will use the term "plan-MSA" for these units.

The base sample includes beneficiaries incurring a claim for one of the nine outpatient services in the analysis. We identify these services in the claims using the designated Current Procedure Technology (CPT) code. Each service has number of variations, all identified by a unique CPT code; we use the most common CPT code for each procedure. The list of services, their CPT codes, and a detailed description are displayed in Appendix Table 1.

Appendix Table 1

Procedures and services included in sample

Procedure	CPT Code	Description
Colonoscopy	45378	Colonoscopy, flexible, proximal to splenic flexure; diagnostic, with or without collection of specimen(s) by brushing or washing, with or without colon decompression (separate procedure)
Office Visit	99213	Office or other outpatient visit for the evaluation and management of an established patient, which requires at least two of these three key components: an expanded problem focused history; an expanded problem focused examination; medical decision making of low complexity. Counseling and coordination of care with other providers or agencies are provided consistent with the nature of the problem(s) and the patient's and/or family's needs. Usually, the presenting problem(s) are of low to moderate severity. Physicians typically spend 15 minutes face-to-face with the patient and/or family.
Preventive Visit	99396	Periodic comprehensive preventive medicine reevaluation and management of an individual including an age and gender appropriate history, examination, counseling/anticipatory guidance/risk factor reduction interventions, and the ordering of appropriate immunization(s), laboratory/ diagnostic procedures, established patient; 40–64 years
Mammogram	77057	Short description is “MAMMOGRAM, SCREENING” (not listed in long description file)
Chest X-Ray	71020	Radiologic examination, chest, two views, frontal and lateral;
Flu Vaccine	90658	Influenza virus vaccine, split virus, 3 years and above dosage, for intramuscular or jet injection use
Arthrocentesis	20610	Arthrocentesis, aspiration and/or injection; major joint or bursa (eg, shoulder, hip, knee joint, subacromial bursa)
Pelvic Ultra Sound	76856	Ultrasound, pelvic (nonobstetric), b-scan and/or real time with image documentation; complete
Knee Surgery	29881	Arthroscopy, knee, surgical; with meniscectomy (medial or lateral, including any meniscal shaving)
Hernia Repair	49650	Laparoscopy, surgical; repair initial inguinal hernia
Brain MRI	70553	Magnetic resonance (eg, proton) imaging, brain (including brain stem); without contrast material, followed by contrast material(s) and further sequences
Emergency Department Visit	99283	Emergency department visit for the evaluation and management of a patient, which requires these three key components: an expanded problem focused history; an expanded problem focused examination; and medical decision making of moderate complexity. Counseling and/or coordination of care with other providers or agencies are provided consistent with the nature of the problem(s) and the patient's and/or family's needs. Usually, the presenting problem(s) are of moderate severity.

We limit the sample to include only plan-MSAs with at least 50 claims for a given service in 2007. Our empirical strategy requires within plan-MSA variation in prices, thus we only include plan-MSA combinations with at least three unique price points for a particular service. As shown in Table 1, the final sample includes 6.3 million claims from 2.1 million enrollees in 9,377 plan-MSA combinations (21% of which are CDHPs).

Study Variables

Outcomes—The primary outcome in the analyses is the total amount paid for a particular claim. The total amount includes payments by both the insurer and the enrollee. To account for errors and outliers, we drop claims that have negative payment values and claims with

payments that are greater than the 99th percentile or less than the 1st percentile of payments for each respective service, resulting 1.8 percent of claims being dropped. To ensure the validity of claims and the distribution of unique price-points, we require that the payment on a claim be observed more than once within a service and plan-MSA; otherwise the claim is dropped (5 percent of claims were dropped due to this restriction).

For analyses investigating the distribution of claims over unique price-points, we construct variables indicating whether the claim was from a provider in the highest or lowest tercile of a plan-MSA's distribution of *unique* prices for each service. Specifically, we construct the set of unique prices for a particular service within each plan-MSA combination, define terciles in the unique price distribution, and then indicate claims from the highest tercile as coming from "high cost" providers and indicate claims from the lowest tercile as coming from "low cost" providers.

Finally, we construct a variable, "Savings from Price-Shopping", indicating the savings due to price-shopping relative to costs if patients randomly chose a price from the available price-points for a particular service. This outcome is defined in equation (1):

$$Savings\ from\ price\ shopping_{ip} = 1 - \frac{P_{ip}}{\frac{1}{N_p}\sum_{u=1}^{N_p} P_{up}} \quad (1)$$

where P_{ip} represents the price on claim i from plan-MSA p, P_{up} represents the uth unique price point for plan-MSA p, and N_p represents the number of unique price points in plan-MSA p.

Explanatory variables—The explanatory variable of interest is whether a claim belongs to a CDHP or traditional plan enrollee, whether a CDHP enrollee has reached their deductible, or the CDHP enrollee's prospective risk of reaching the deductible.

Individual level demographic controls include age, age squared, indicators for being less than 2 years old and between 2 and 16 years old, and gender. Zip-code level socio-economic status controls include the share of residents that are Hispanic, black, and white; the share of residents that have a high school and college education; the unemployment rate, and median household income. Plan-level controls include the number of claims for each service and total number of enrollees to serve as proxies for bargaining power, and coinsurance rate and average copayment to control for cost sharing features of each plan's benefit design.

Statistical Analysis

We complete three analyses for each of the nine services, each estimated at the claim-level. First, we regress the natural log of total payment on just an indicator for CDHP enrollment to estimate the percent difference in mean prices between CDHPs and conventional plans using ordinary least squares. We then estimate adjusted percent differences in prices paid controlling for the individual and plan characteristics described above.

Second, we estimate probit regression models where the outcome is either that the claim came from a low cost provider (a provider with a price in the lowest tercile of the unique

prices for a plan-MSA) or a high cost provider (a provider with a price in the highest tercile of the unique prices distribution for a plan-MSA). The explanatory variables include the CDHP enrollment indicator and the individual and plan characteristics described above. We then estimate linear regressions of the savings variable (defined in equation 1) on the CDHP indicator, and controls.

Next, for CDHP enrollees only, we run probit regressions on the low and high cost indicators with the “pre-deductible” indicator, demographic characteristics, plan-level characteristics, and a cubic specification of calendar month to control for seasonal variation in utilization as predictors. We report the adjusted shares of pre- and post-deductible claims that fall into each category (using recycled-predictions) and the difference in these shares pre- and post-deductible.

We then use linear regression models to model average savings among CDHP enrollees from price-shopping pre- versus post-deductible including controls for individual and plan characteristics and a cubic in calendar month.

It is possible that CDHP enrollees are forward looking and anticipate reaching their deductible, in which case price seeking behavior would not change after reaching the deductible (enrollees would be paying up to the deductible out-of-pocket regardless) (Aron-Dine et al. 2012). To account for this, we perform an additional analysis using the 2006 prospective risk score; this score predicts health care costs in 2007 based on health utilization and demographic information from 2006. A higher 2006 prospective risk score indicates a greater likeliness of reaching the deductible in 2007, and therefore less incentive to price-shop. For the sample of CDHP enrollees, we regress the natural log of price paid for a particular service on the prospective risk score (in the main analysis the risk score is defined as a continuous variable, in alternative specifications we used the quintile of risk score) , controlling for individual, and plan characteristics and a cubic polynomial in calendar month.

We cluster standard errors at the plan-MSA level for all analyses. Obtaining separate estimates for the nine services in our sample poses a potential multiple-comparisons problem. We account for this by implementing the Bonferroni correction in our statistical inference, multiplying each p-value by nine. All analyses were performed using STATA/MP 12.0 and the study was approved by the IRBs of each of the study author’s institutions.

Results

Study population

Table 1 displays the summary statistics for enrollees with claims for the nine services in our sample. The statistical significance of the difference between CDHP and traditional plans is indicated for average measures. CDHP plans comprise roughly 21 percent of the sample (1,953 plans compared to 7,424 traditional plans) and approximately 10 percent of claims. CDHP plans have fewer enrollees. CDHP enrollees with claims for common outpatient services are younger, more likely to be female, and live in zip codes with higher income and education levels ($p < 0.01$ for all). CDHP plans have a median individual deductible of

$1,250 with first and third quartiles of $1,100 and $1,750, respectively. Traditional plans have substantially lower deductibles with a median of $250 and first and third quartiles of $0 and $400, respectively.

Price differences in CDHPs relative to traditional plans

Table 2 shows the mean price paid for each service in CDHPs and traditional plans for all nine procedures along with the 25^{th} and 75^{th} percentiles (across all CDHP or traditional claims) and the percentage differences with and without adjustment for controls. The unadjusted differences are either statistically insignificant or show that CDHP patients pay *more* for services than non-CDHP patients (emergency department visits, $p< 0.01$). The 25^{th} and 75^{th} percentiles are similar between CDHP and traditional plans and for most services imply a wide range of available prices (and thus scope for price-shopping). Flu vaccines have somewhat narrower ranges indicating a smaller scope for price-shopping for these services. Once demographic and plan-level controls are included in column 4, most point estimates on the percent differences are reduced and remain statistically insignificant except that after adjustment the price of an office visit is 2.3% less for CDHP enrollees compared to the price of an office visit for traditional plan enrollees ($p< 0.01$).

Price selection in CDHPs relative to traditional plans

Table 3 shows the average number of price points per plan, the average standard deviation, and the average first and third quartiles for CDHP and traditional plans. This table shows that there are more price points in traditional plans; however there is no systematic relationship between plan type (CDHP vs. traditional) and the standard deviation or inter quartile range of the distribution of price points.

The first two panels of Table 4 display estimates from probit regressions, showing the predicted share of CDHP and traditional plan claims from low and high cost providers. The table also reports the difference in these shares between CDHP and traditional plans. Across the nine services in the sample, there is only a statistically significant difference in the share of low cost providers for office visits. The share of claims of low cost providers in CDHP plans is 6.4 percentage points higher than the share of claims of low cost providers in traditional plans ($p<0.01$). The only statistically significant difference in the share of high cost providers is for colonoscopies. The share of claims of high cost providers in CDHP plans is 28.8 percentage points higher than the share of claims from high cost providers in traditional plans ($p<0.05$). Finally, to test the robustness of our results to our tercile –based specification of high and low cost providers, we run an additional analysis using within-plan price point percentile (continuous) as the dependent variable and find that our results are consistent with the main analysis. In particular, CDHP enrollment has a negative and significant coefficient for office visits only.

The third panel of Table 4 shows estimates of savings from price-shopping for CDHP and traditional plans. This measure indicates the average percent difference in observed prices (for either CDHP or traditional plans) relative to what would be seen if patients randomly choose providers from the observed unique price points; a positive percentage indicates positive saving and evidence of price-shopping. Panel 3 shows price-shopping related

savings for CDHPs for only five procedures whereas we see price shopping related savings for eight of the nine procedures for traditional plans. Savings from price-shopping are only greater for CDHP plans compared to traditional plans for office visits ($p< 0.01$). Claims for colonoscopies show a greater degree of price-shopping in traditional plans compared to CDHP plans ($p<0.01$).

Price selection pre- versus post-deductible

The first and second panels of Table 5 show differences in the predicted share of claims from high and low cost providers, pre- and post-deductible. If CDHP enrollees are price sensitive and engage in price-shopping, we would expect a higher fraction of claims from low cost providers prior to reaching the deductible relative to after the deductible when patient cost- sharing is lower. Similarly, we would expect a lower fraction of claims for high cost providers prior to reaching the deductible relative to after reaching the deductible. However, Panel 1 shows that predicted shares for low cost providers are similar before and after reaching the deductible ($p> 0.1$) for 6 of the 9 services. The only procedure where the share of low cost providers is significantly higher prior to reaching the deductible is preventive care visits, ($p<.01$). For chest x-rays and colonoscopies the low cost provider share is significantly *lower* prior to reaching the deductible ($p<0.01$). Panel 2 shows that the fraction of claims for high cost providers are similar pre- and post-deductible for all services ($p>0.1$).

The third panel shows whether the savings from price-shopping change after reaching the deductible. We would expect greater savings *prior* to the deductible relative to after reaching the deductible, as cost sharing decreases. However, savings are similar in both periods for all services ($p>0.1$) except for chest x-ray and pelvic ultra sound, which implies 5.7 percent ($p<0.01$) and 7.7 percent ($p<.1$) more savings from price-shopping *after* reaching the deductible ($p<0.01$), respectively.

Finally, we find no relationship between CDHP enrollees' prospective risk score and price paid for all procedures (results not presented). This result is consistent with a lack of forward looking behavior, as patients who anticipated spending past the deductible would have reduced incentive to price shop. .

Discussion

Overall, we find that prices for most common outpatient services are indistinguishable in CDHPs and traditional plans. The only exception to these null-findings is office visits which fall at the upper end of the price transparency and price-shopping scope continuum. The lower average prices, greater use of low cost providers, and greater plan level savings due to price- shopping for office visits in CDHPs relative to traditional plans suggests CDHPs may be effective at incentivizing price-shopping for office visits. However, the magnitude of the effect is modest.

Consistent with the above null findings, comparing price-shopping by CDHP enrollees, we see no evidence of greater price-shopping for CDHP enrollees prior to meeting their deductible compared with after meeting their deductible. One possible explanation for this

lack of change is that patients are returning to the same providers they used prior to meeting their deductible and another is that patients are forward looking and thus not sensitive to this within year change in the price.

The findings of this study should be viewed in light of its limitations. First, while we address potential differential bargaining power of CDHPs versus traditional plans by analyzing share of high versus low cost providers across CDHP and traditional plans and within CDHPs before and after reaching the deductible, bargaining power could still play a role. For example traditional plans may be able to negotiate the same low price point for a larger share of their providers relative to CDHP plans. Also, a traditional plan may have larger networks and thus many providers offering the same (relative) low price point. This would make low price providers the default option for many traditional plan enrollees whereas CDHP enrollees may have a more difficult time finding prices at the lower end of the distribution.

Second, we only look at price outcomes, but not quality. Thus, CDHP enrollees may make "value" based decisions using quality outcomes that we do not observe. Ideally, we would like data on the provider choices for each consumer including data on the prices charged by each provider, the quality of care for each provider, and information on amenities and other provider characteristics that might influence such choices. Such data could be used to estimate choice models to understand how the role of price and quality in determining provider choice differs across CDHP and traditional plans. However, to the best of our knowledge such detailed data on providers is not available.

Finally, our study relies on observational data and thus CDHP status is not randomly assigned. While we control for a range of observable characteristics, there may still be selection on unobservable characteristics biasing the results. Specifically, our estimates of the effects of CDHPs on price-shopping might be positively biased if individuals with an inherent propensity to price shop (unobserved to the researcher) are more likely to enroll in CDHP plans. If this is the case, our findings might overstate the effects of CDHPs on price-shopping. On the other hand the CDHP enrollees utilizing outpatient care in this study are healthier, lower utilizers of health care, and somewhat higher income than those in traditional plans. Thus CDHP enrollees might be less experienced health care consumers and less sensitive to prices. If this is the case, our findings might be understate the effects if CDHPs on price shopping.

Overall, our results suggest that CDHPs do not stimulate "price-shopping" for most common outpatient services. This naturally raises the question: Why do the incentives of CDHPs appear to be largely ineffective in motivating price-shopping for outpatient services? There are a number of potential factors. In particular, there may be limited scope for patients to search for low cost providers. Other studies have shown that the price transparency of health services is low, and early state-level efforts to improve price transparency have so far shown little effect. This is compounded by uncertainty in the degree to which patients perceive their agency to choose alternative providers for some services.

Similarly, it may be that price-shopping is not an immediate response to enrolling in a CDHP plan, perhaps because patients do not perceive the degree of price variation. One key factor encouraging price-shopping may be the availability of clear signals of price (such as generic drugs, or “out-of-network” providers). Another important determinant of price-shopping may be repeated use of a service. The only service where we found limited evidence of price-shopping was for outpatient doctor visits, which occur with some regularity and thus offer opportunities to “learn” to price shop after having to pay for a service which may then outweigh patients’ potential attachment to the providers seen most often. Finally, consumers might not have the agency to shop for some diagnostic services if the service is bundled with a physician visit or a patient’s physician may always use a particular facility for such services.

Improved education for enrollees about benefit design and more aggressive, health insurance carrier specific, price and quality transparency initiatives may be next steps for employers, health plans, and policy makers to increase consumerism in health care decision-making.

Acknowledgments

Funding Sources: California Health Care Foundation and National Institute for Aging Grant # R01 AG043850-01

References

Aron-Dine, A.; Einav, L.; Finkelstein, A.; Cullen, MR. Moral hazard in health insurance: How important is forward looking behavior?. National Bureau of Economic Research; 2012.

Buntin MB, Haviland A, McDevitt R, Sood N. Health care spending and preventive care in high-deductible and consumer-directed health plans. American Journal of Managed Care. 2011; 17(3): 222–230. [PubMed: 21504258]

Davis K, Doty M, Ho A. How high is too high? Implications of high-deductible health plans. The Commonwealth Fund. 2005 Pub No. 816.

Feldman RD, Parente ST. Enrollee incentives in consumer-directed health plans: spend now or save later? Forum for Health Economics and Policy. 2010; 13(2) Art. 3.

Galbraith AA, Ross-Degnan D, Soumerai SB, Rosenthal MB, Gay C, Lieu TA. Nearly Half of Families In High-Deductible Health Plans Whose Members Have Chronic Conditions Face Substantial Financial Burden. Health Affairs. 2011; 30(2):322–331. [PubMed: 21289354]

Galbraith AA, Soumerai SB, Ross-Degnan D, Rosenthal MB, Gay C, Lieu TA. Delayed and Forgone Care for Families with Chronic Conditions in High-Deductible Health Plans. Journal of General Internal Medicine. 2012

Greene J, Hibbard J, Murray JF, Teutsch SM, Berger ML. The impact of consumer directed health plans on prescription drug use. Health Affairs. 2008; 27(4):1111–1119. [PubMed: 18607045]

Haviland AM, McDevitt RD, Sood N, Marquis MS. The Effects of Consumer-Directed Health Plans on Episodes of Health Care. Forum for Health Economics and Policy. 2011; 14(2) Article 9.

Hibbard JH, Greene J, Tusler M. Does enrollment in a CDHP stimulate cost-effective utilization? Medical Care Research and Review. 2008; 65(437):437–449. [PubMed: 18403783]

Kaiser Family Foundation and HRET. Survey of Employer-Sponsored Health Benefits 1999–2011. 2011.

Lo Sasso A, Rice T, Gabel J, Whitmore H. Tales from the New Frontier: Pioneers' Experiences with Consumer-Driven Health Care. Health Services Research. 2004; 39(4p2):1071–1090. [PubMed: 15230912]

Parente ST, Feldman R, Christianson JB. Evaluation of the effect of a consumer-directed health plan on medical care expenditures and utilization. Health Services Research. 2004; 39(4, Part II):1189–1209. [PubMed: 15230920]

Rowe J, Stevenson TB, Downey R, Newhouse J. Effect of consumer-directed health plans on the use of preventive and chronic illness services. Health Affairs. 2008; 27(1):113–120. [PubMed: 18180485]

Sinaiko AD, Rosenthal MB. Increased Price Transparency in Health Care -Challenges and Potential Effects. The New England Journal of Medicine. 2011; 364(10):891–892. [PubMed: 21388306]

Towers Watson and National Business Group on Health. Performance in an Era of Uncertainty: Employer Survey on Purchasing Value in Health Care. 2012

Tu HT, Lauer JR. Impact of health care transparency: the New Hampshire experience. Center for Studying Health System Change: Issue Brief. 2009 No. 128.

Wharam JF, Galbraith AA, Kleinman KP, Soumerai SB, Ross-Degnan D, Landon BE. Cancer screening before and after switching to a high-deductible health plan. Annals of Internal Medicine. 2008; 148(9):647–655. [PubMed: 18458277]

Wharam JF, Graves AJ, Landon BE, Zhang F, Soumerai SB, Ross-Degnan D. Two-year trends in colorectal cancer screening after switch to a high-deductible health plan. Medical Care. 2011a; 49(9):865–871. [PubMed: 21577162]

Wharam JF, Landon BE, Galbraith AA, Kleinman KP, Soumeraj SB, Ross-Degnan D. Emergency department use and subsequent hospitalizations among members of a high-deductible plan. JAMA. 2007; 297(10):1093–1102. [PubMed: 17356030]

Wharam JF, Landon BE, Zhang F, Soumerai SB, Ross-Degnan D. High-deductible insurance: two-year emergency department and hospital use. American Journal of Managed Care. 2011b; 17(10):e410–e418. [PubMed: 21999721]

Table 1

Descriptive Statistics for CDHP and Traditional Plans Included in Sample

	CDHP	Traditional
Number of plans[1]	1,953	7,424
Number of enrollees	245,176	1,907,973
Number of claims	631,434	5,640,554
Average number of enrollees per plan-MSA	15,545***	35,770
Age of enrollee	30***	32
Male	56%***	54%
Median household income	$56,817**	$52,471
% Unemployed	4.1%***	4.7%
% College degree	32%***	27%
% High school degree	55%***	57%
% Hispanic	7.2%***	7.1%
% Black	7.5%***	9.9%
% White	80%***	78%
Average number of enrollees	15,545***	35,770

* $p<.05$;

** $p<.01$;

*** $p<.001$

[1] Plans are defined as unique by plan and MSA

Note: T-tests are used to test for significant differences

Table 2

Mean Price Difference Across CDHP and Traditional Plans

	Mean Price		Percentage Difference	
Procedure	**CDHP**	**Traditional**	**No Controls**	**With Controls**
Arthrocentesis (n=43,533)	$90.47 (78, 105)	$85.87 (72, 97)	5.4%	−1.9%
Chest X-Ray (n= 249,313)	$36.85 (17, 45)	$35.57 (16, 42)	3.6%	−2.7%
Colonoscopy (n= 21,681)	$470.00 (369, 535)	$461.45 (335, 545)	1.9%	2.3%
Emergency Department Visit (n= 184,912)	$171.32 (85, 216)	$141.05 (81, 165)	21.5%**	4.3%
Flu Vaccine (n=127,711)	$15.08 (12.5, 15.5)	$14.82 (12.5, 15.6)	1.8%	−0.1%
Mammogram (n=132,952)	$77.77 (49, 100)	$71.09 (43, 94)	9.4%**	−3.6%
Office Visit (n=5,257,140)	$63.89 (54, 72)	$62.55 (55, 67)	2.1%	−2.3%***
Pelvic Ultra Sound (n=35,515)	$103.07 (54, 119)	$103.22 (55, 123)	−0.1%	−4.6%
Preventive Visit (n= 219,231)	$131.26 (109, 152)	$126.56 (110, 139)	3.7%	−1.0%

* p<.1;

** p<.05;

*** p<.01

Standard errors are clustered at the plan-MSA level.
p-values include Bonferroni corrections.
Percentage price difference with controls is based on OLS regression of Log Price adjusting for demographics of enrollee and enrollee zip code, MSA of enrollee, plan bargaining power proxied by number of claims per plan, and plan benefit design.

[1] Q1 is the 25th percentile and Q3 is the 75th percentile

Table 3

Descriptive statistics of plan price points

	Average Number of Price Points Per Plan-MSA		Average SD		Average Q1, Q3	
Procedure	**CDHP**	**Traditional**	**CDHP**	**Traditional**	**CDHP**	**Traditional**
Arthrocentesis	10	15	28.69	36.02	(67, 103)	(63, 107)
Chest X-Ray	19	24	25.26	30.67	(22, 54)	(22, 62)
Colonoscopy	10	14	254.27	226.85	(358, 6450)	(349, 642)
Emergency Department Visit	17	25	87.88	92.69	(133, 254)	(115, 245)
Flu Vaccine	9	13	3.01	2.92	(13, 17)	(13, 17)
Mammogram	16	20	31.56	32.53	(57, 102)	(53, 101)
Office Visit	27	46	11.97	12.14	(57, 73)	(57, 72)
Pelvic Ultra Sound	14	17	50.85	59.77	(67, 137)	(66, 146)
Preventive Visit	16	20	20.07	20.96	(115, 143)	(114, 142)

Table 4

Share of claims from low and high cost providers and savings from price shopping

	Low			High			Savings From Price-Shopping		
Procedure	**CDHP**	**Traditional**	**Difference**	**CDHP**	**Traditional**	**Difference**	**CDHP**	**Traditional**	**Difference**
Arthrocentesis (n=43,533)	25%	27%	−2.7%	24%	23%	0.7%	−4%	2%	−5.8%
Chest X-Ray (n= 249,313)	46%	46%	0.4%	27%	23%	4.4%	10%	14%	−4.5%
Colonoscopy (n= 21,681)	35.5%	46.1%	−10.6%	50%	21%	28.8%**	−8%	7%	−15.1%***
Emergency Department Visit (n= 184,912)	44%	42%	2.2%	23%	23%	0.2%	6%	11%	−4.4%
Flu Vaccine (n=127,711)	29%	27%	2.2%	39%	36%	3.6%	−2%	−2%	−0.4%
Mammogram (n=132,952)	47%	46%	0.8%	24%	25%	−0.9%	7%	8%	−0.6%
Office Visit (n=5,257,140)	40%	34%	6.4%***	22%	25%	−3.1%	3%	2%	1.4%***
Pelvic Ultra Sound (n=35,515)	36%	35%	0.1%	32%	28%	4.6%	−1%	4%	−4.9%
Preventive Visit (n= 219,231)	36%	35%	1.4%	30%	31%	−0.7%	0%	0%	−0.4%

* p<.1;

** p<.05;

*** p<.01,.

Standard errors are clustered at the plan-MSA level.
p-values include Bonferroni corrections
Low (high) cost provider has a price in the lowest (highest) tercile of the respective plan's price distribution
Low and High shares are predicted from a probit regression adjusting for demographics of enrollee and enrollee zip code, MSA of enrollee, plan bargaining power proxied by number of claims per plan, and plan benefit design. Values for Savings From Price-Shopping are predicted an OLS regression with the same adjustments.

Table 5

Share of claims from low and high cost providers and savings by whether CDHP enrollee had reached the deductible at the time of the claim

	Low			High			Savings From Price -Shopping		
Procedure	**Pre**	**Post**	**Difference**	**Pre**	**Post**	**Difference**	**Pre**	**Post**	**Difference**
Arthrocentesis (n=980)	22%	21%	0.5%	33%	32%	0.4%	−4.7%	−5.8%	1.1%
Chest X-Ray (n= 13,178)	38%	44%	−6.6%***	33%	30%	3.0%	2.2%	7.9%	−5.7%***
Colonoscopy (n= 643)	17%	26%	−8.4%***	38%	47%	−9.1%	−1.8%	−2.6%	0.8%
Emergency Department Visit (n= 8,094)	46%	46%	0.2%	23%	24%	−0.9%	6.0%	6.5%	−0.5%
Flu Vaccine (n=10,994)	27%	28%	−0.3%	38%	36%	2.5%	−2.3%	−1.5%	−0.8%
Mammogram (n=3,933)	28%	42%	−13.5%	37%	24%	13.2%	−1.9%	6.0%	−7.9%
Office Visit (n=531,671)	40%	40%	0.9%	24%	25%	−1.0%	2.5%	2.4%	0.2%
Pelvic Ultra Sound (n=1,236)	30%	34%	−3.9%	35%	32%	3.5%	−8.4%	−0.7%	−7.7%*
Preventive Visit (n=9,177)	53%	32%	21.1%***	28%	32%	−4.3%	4.7%	−0.9%	5.6%

* p<.1;

** p<.05;

*** p<.01

Standard errors are clustered at the plan-MSA level

p-values include Bonferroni corrections

Low (high) cost provider has a price in the lowest (highest) tercile of the respective plan's price distribution

Low and High shares are predicted from a probit regression adjusting for demographics of enrollee and enrollee zip code, MSA of enrollee, month, month squared and month cubed. Values for Savings From Price-Shopping are predicted using an OLS regression with the same adjustments.