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M. Kate Bundorf, M.B.A., M.P.H, Ph.D.
Stanford University

Consumer-directed health plans: Do they deliver?

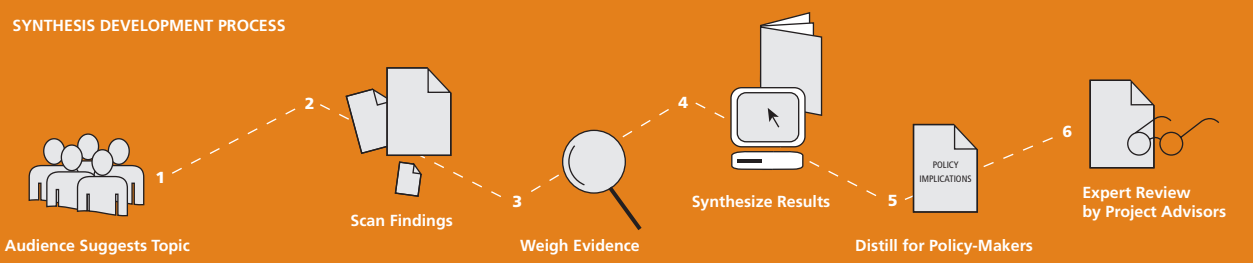
See companion Policy Brief available at *www.policysynthesis.org*

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THE SYNTHESIS PROJECT (Synthesis) is an initiative of the Robert Wood Johnson Foundation to produce relevant, concise, and thought-provoking briefs and reports on today's important health policy issues. By synthesizing what is known, while weighing the strength of findings and exposing gaps in knowledge, Synthesis products give decision-makers reliable information and new insights to inform complex policy decisions. For more information about the Synthesis Project, visit the Synthesis Project's Web site at *www.policysynthesis.org*. For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail request to *pubsrequest@rwjf.org*.



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Introduction

Consumer-directed health plans (CDHPs) emerged in the late 1990s in the wake of the public backlash against managed care and the subsequent rise in health care expenditures. In response to the perception among consumers that managed care plans were limiting access to potentially beneficial care (6), consumer-directed plans were intended to control costs by shifting responsibility for health care decision-making from insurers to consumers (31). The vision was that consumers, armed with sophisticated information tools and exposed to the financial consequences of their decisions, would drive value-based innovation in health care delivery (40). While CDHP enrollment initially grew slowly, it has increased more rapidly in recent years, rising from 8 percent to 17 percent of covered workers between 2009 and 2011 (17).

While consensus does not exist on the precise definition of a CDHP, these plans are often associated with three features: a relatively high deductible, a personal spending account, and the availability of information tools for enrollees. The purpose of the high deductible, the amount that the insured consumer is responsible for paying out-of-pocket before the insurance plan provides coverage for services, is to encourage consumers to make more cost-conscious treatment decisions by exposing them to the financial consequences of their choices. High deductibles, however, create a trade-off for consumers. While cost-sharing creates incentives to reduce the use of low-value insured services, it also reduces the amount of risk protection insurance provides (82). To address this, CDHPs often combine a high deductible with a personal spending account, which the enrollee can use to fund health expenditures not covered by the plan, in order to provide enrollees with greater financial protection. We discuss the different types of accounts in the Background section.

Information tools, the third feature often associated with CDHPs, are intended to facilitate enrollee decision-making. Although the objective of CDHPs is to create incentives for patients to consider both cost and quality when using medical care, patients often do not have access to the types of information necessary to make these decisions, such as the price and likely outcomes of treatment alternatives. Information tools are intended to provide enrollees with the resources they need to make informed decisions.

Proponents of CDHPs emphasize the potential for these plans to promote greater value in health care spending and to accommodate diverse consumer preferences (19, 3, 27). Critics, in contrast, raise the concern that, while consumers may respond to high deductibles by using less medical care, they may not differentiate effectively between more and less valuable care when making those reductions, ultimately reducing quality of care, and that greater cost-sharing places an excessive financial burden on low-income and/or less healthy enrollees (21, 81). Others point to the potential for greater risk segmentation in health insurance markets if CDHPs disproportionately attract favorable risks due to their lower premiums and higher cost-sharing (63, 66).

Doubts also exist over whether, in practice, CDHPs reduce health care spending. The 1970s Rand Health Insurance Experiment (HIE), in which spending was approximately 30 percent lower for families randomized to a high-deductible plan than to a plan with no cost-sharing, provides strong evidence of the potential for high-deductible health plans to reduce health spending (51). However, not only was the level of the deductible in the HIE much higher than what is typically observed in the market today (52), but the alternative to a high-deductible plan in today's market may provide care relatively more parsimoniously than the "free care" plan in the HIE, making it more difficult for CDHPs to deliver cost savings of the magnitude observed in the HIE (69). Many plans have adopted supply-side care management techniques intended to control utilization and others already incorporate substantial cost-sharing. Remler and Glied estimate that the group responsible for half of all medical spending in a given year would see either no change or a decline in their cost-sharing under a high-deductible health plan with a savings account (61).

Introduction

Given these controversies, our objective is to inform discussions over the impact of CDHPs by synthesizing the evidence to date on their effects. The research synthesis is guided by the following questions:

1. Who enrolls in a CDHP and how do they differ from enrollees in other types of plans?
2. Do CDHPs experience favorable risk selection and, if so, how has risk selection affected insurance markets?
3. How effective are CDHPs in controlling utilization and costs compared with other types of plans? What types of changes in utilization generate these differences?
4. What are the key differences among the CDHPs offered in the market, and what evidence exists on the effects of these differences?
5. What information do CDHPs provide to their enrollees and to what extent are enrollees using it to make health care decisions?

Background

Types of plans

The consumer-directed umbrella initially covered a variety of innovations in benefit design intended to promote greater consumer engagement in health care decision-making through the creation of stronger financial incentives directed at consumers and the provision of better information (15, 31, 62). The early products, which emerged during the "dot-com" era in early 2000, emphasized the role of the Internet in the development of information tools to facilitate consumer comparisons of the cost and quality of alternative treatment options. The type of plan that eventually gained the most traction in the marketplace combined a relatively high deductible with a personal spending account (60).

Federal tax policies played an important role in the evolution of CDHPs. For the early products, it was unclear whether personal spending accounts could be treated as tax-exempt for the purpose of employee compensation. In 2002, the Internal Revenue Service (IRS) clarified that health reimbursement arrangements (HRAs), an employee-specific account established and funded by the employer from which the employee can be reimbursed for medical expenditures, could be excluded from the taxable income of employees (43). HRAs can be funded only by employer contributions, the employer may allow the funds to accumulate over time, and the funds can be used only for qualified medical expenditures for employees or their dependents. A key limitation of these accounts is that they are tied to a particular employer and often a particular health plan. An employee leaving a firm or changing plans within a firm will not necessarily have access to any unused balances in the account and will be unable to make additional future contributions.[1]

The Medicare Prescription Drug Improvement and Modernization Act of 2003 (MMA) allowed individuals to establish health savings accounts (HSAs), creating an alternative vehicle for tax-favored spending accounts which addressed the lack of portability of HRAs. The MMA allowed individuals to establish or contribute to an HSA when they are covered by a high-deductible health plan (HDHP). The legislation explicitly defined the minimum deductible and the maximum annual out-of-pocket expenditure for a qualifying plan. While the legislation created a "preventive care safe harbor," allowing qualifying HDHPs to exempt preventive services from the deductible (44), the Patient Protection and Affordable Care Act (ACA) mandated that, beginning in 2010, all plans must cover certain preventive care services with no cost-sharing.

Funds in HSAs receive very favorable tax treatment. Both employers and individuals may contribute to an HSA when the individual is enrolled in a qualifying plan, and contributions from either, up to a maximum, are not treated as taxable income for the purpose of calculating federal income taxes.[2] Contributions to HSAs may accumulate over time and any earnings are also tax-exempt. HSA withdrawals are not subject to income tax if they are used for qualified medical expenses for the account owner or a spouse or dependent. Funds which are withdrawn for nonqualified medical expenses are included in taxable income and withdrawals before age 65 are subject to an additional penalty. Table 1 summarizes the differences between HSAs and HRAs.

1 The employer may choose whether to allow former plan enrollees to have access to remaining account balances.

2 Differences exist in the tax implications of contributions from employers and employees which make employer contributions more favorable (18).

Background

Table 1: Comparison of types of personal spending accounts

	Health Reimbursement Arrangement (HRA)	Health Savings Account (HSA)
Description	Employer-funded account to reimburse employees' qualified medical expenses.	Tax-favored savings account to pay for qualified medical expenses.
Account funder	Employer only.	Employee, employer or both.
Account owner	Employer.	Employee.
Annual contribution limit	No federal limits.	In 2012, the maximum allowable contribution was $3,100 for an individual and $6,250 for a family.
Tax treatment of contributions	Employer contributions are excluded from the gross income of employees and not subject to taxes.	Employer contributions are excluded from employee gross income and not subject to taxes; individual contributions are tax-deductible.
Rollover provisions	Employers may choose whether to allow funds to accumulate from year to year. Employers may also choose whether to allow employees to continue to withdraw any unused funds after employment is terminated.	Funds in accounts accumulate over time.
Non-medical use	Not allowed.	Allowed but subject to income tax. Withdrawals before age 65 are subject to an additional penalty.
Required companion plan	None required.	In 2012, the minimum qualifying deductible was $1,200 for individual and $2,400 for family coverage and the maximum out-of-pocket expenditure was $6,050 for individual and $12,200 for family coverage.
Enabling legislation	Authorized by Treasury Department Revenue Ruling 2002–41 in 2002 and IRS Guidance 2002–45	Medicare Prescription Drug, Improvement and Modernization Act of 2003, amended by Tax Relief and Health Care Act of 2006.

Source: Adapted from Tu and Ginsburg (74)

Three aspects of cost-sharing are relevant for CDHPs. First, the annual deductible is the amount the enrollee pays out-of-pocket before expenditures are covered by the plan. For example, in a plan with a $2,000 deductible, the enrollee must spend $2,000 on covered services before the plan begins to pay for care. After the enrollee reaches the deductible, services are subject to the plan's cost-sharing requirements. Although cost-sharing can be very complex, varying both in level and in form across services, a simple example is a 20 percent coinsurance rate. In this case, the enrollee would pay out-of-pocket for 20 percent of the fees for services used after reaching the deductible. Finally, most plans have an annual out-of-pocket maximum. This is the maximum amount an enrollee must pay for covered services during a plan year. After the enrollee reaches the out-of-pocket maximum, services are covered in full by the plan for the remainder of the year. In some CDHPs, the level of the deductible is the same as the out-of-pocket maximum.

Background

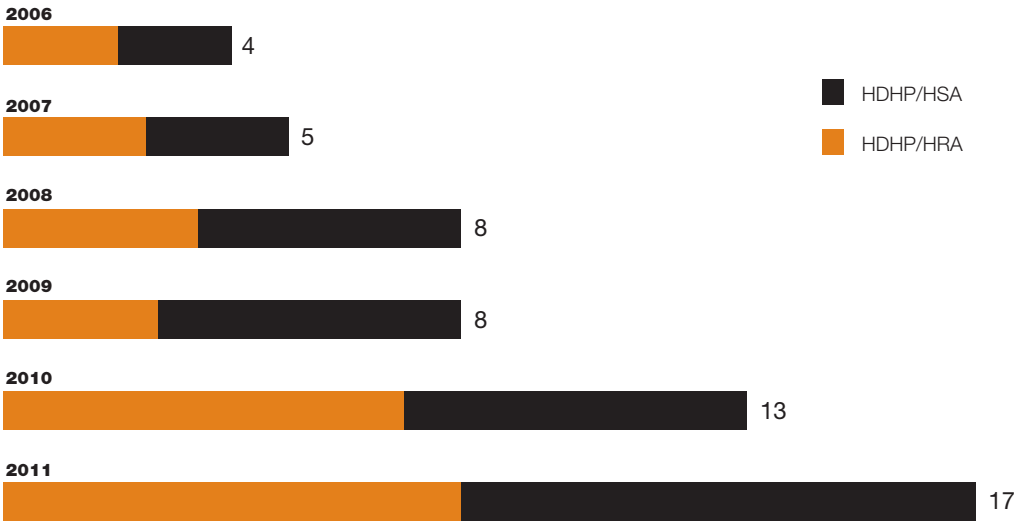
Enrollment trends and plan characteristics

CDHP enrollment has increased over the last decade. Based on the KFF/HRET Annual Employer Survey, in 2011, 17 percent of people with employer-sponsored health insurance were enrolled in a CDHP, up from 4 percent in 2006 (17) (See Figure 1).

The survey differentiates between two types of plans: a health plan with a deductible of at least $1,000 for single and $2,000 for family coverage offered with an HRA (HDHP/HRA), and a high-deductible health plan that meets the federal legal requirements to permit an enrollee to establish and contribute to an HSA (HDHP/HSA). More firms offered HDHP/HSAs in 2011 (18%) than HDHP/HRAs (7%), although approximately equal proportions of workers were enrolled in HDHP/HSAs (9%) and HDHP/HRAs (8%). Potential reasons for the continued growth of HRAs, despite their less attractive savings features, are that they allow employers more flexibility in product design due to the less stringent regulation of the characteristics of the associated plan and that employers may retain accumulated spending account funds should employees switch plans or leave the firm (60).

Among firms offering health insurance, large firms are more likely to offer a CDHP than small or medium-sized firms, but a larger proportion of covered workers are enrolled in CDHPs in small firms than in large firms. Twenty-three percent of firms with 3 to 199 workers offered a CDHP compared with 41 percent of firms with 1,000 or more workers. However, 23 percent of covered workers in small firms (3–199 workers) are enrolled in CDHPs compared with 15 percent in medium and large firms (200+ workers). When small firms offer a CDHP, they are likely to offer only a single plan, while larger firms are more likely to offer a CDHP alongside other plans. Using data from the 2008 KFF/HRET survey, Gates, Kapur et al. find that large firms were more likely than small firms to offer either an HRA or HSA conditional on offering a high-deductible plan, and firms with a greater proportion of low-wage workers were less likely to offer health insurance

Figure 1: Percentage of covered workers enrolled in a CDHP, 2006–2011



Data Source: KFF/HRET Annual Employer Survey (17)

but more likely to offer high-deductible plans, conditional on offering coverage (33). They also document substantial persistence in offering an HDHP; employers are more likely to drop the associated spending accounts than to drop the HDHP altogether.

An America's Health Insurance Plans (AHIP) survey of health plans regarding enrollment in HSA-eligible products sold in both the group and individual markets estimates that overall enrollment in a high-deductible plan meeting the eligibility requirements for contributing to a tax-favored health savings account (HSA) grew from 1.0 million in 2005 to 13.5 million in 2012 (2). While enrollment in HSA-eligible plans has increased in both the individual and group markets, it has increased more rapidly in the group market, with the proportion of enrollees in HSA-eligible plans who purchased their coverage in the individual market declining from 54 percent in 2005 to 18 percent in 2012.

CDHP premiums are generally lower than those of other types of plans. In 2011, the average premium for a CDHP plan was $4,793 for single and $13,704 for family coverage, compared with $5,429/$15,073 for all other types of plans including HMOs, PPOs, and POS plans. Differences in average premiums by plan type reflect three factors: the extent to which services are financed by out-of-pocket payments, differences in health status among plan enrollees, and differences in the quantity and prices of services used by enrollees, conditional on health status.

HDHP/HSAs tend to have lower total premiums, lower employee contributions and higher annual deductibles than HDHP/HRAs (17). Firm contributions to the spending account tend to be higher for HDHP/HRAs than for HDHP/HSAs. Employers make no contribution to the HSA for 31 percent of workers covered by HDHP/HSAs and make contributions of $1,000 or more for 22 percent. In contrast, HRAs, by definition, are funded by employers and 31 percent of employers make contributions of $1,000 or more.

Differences in the generosity of employer contributions to the two accounts may be driven by rules regarding their ownership. Employers have significant control over the contributions they make to the HRAs of their employees. Employers have discretion over whether the funds may accumulate over time and can be used by the employee after termination of the employment relationship. HSA balances, in contrast, are owned by the employee. While the employer may choose whether and how much to contribute to the HSA, the employee keeps any unused funds if he or she changes plans or leaves the firm. Qualitative research suggests that employers in high turnover industries are less likely to contribute to HSAs (75).

Based on data from the KFF/HRET survey, preventive services are exempt from the deductible for the vast majority of workers enrolled in CDHPs offered by employers. CDHPs exempted many preventive services from the deductible even before coverage without cost-sharing was mandated for certain preventive services by the ACA. In 2007, 88 percent of workers covered by HDHP/HRAs and 86 percent of workers covered by HDHP/HSAs were enrolled in plans that exempted preventive services from the deductible (16). For other types of services, only employers offering HDHP/HRAs have discretion over whether they are subject to the deductible. Thirty-nine percent of HDHP/HRAs exempt office visits for primary care from the deductible and 75 percent exempt prescription drugs (17).

Methodology Overview

Scope of the review

While the term CDHP generally refers to a high-deductible health plan accompanied by a spending account, in practice not all plans considered CDHPs necessarily have both features. Because employers offering HRAs face no restrictions on the deductible level of the associated plan, employees with HRAs are often enrolled in plans which have deductibles lower than the HSA-qualifying level. And neither employers offering HSA-qualifying plans nor individuals enrolled in them are required to establish or to contribute to an HSA.

Thus, for the purpose of the literature review, we defined a CDHP as a high-deductible health plan which is either accompanied by an HRA or is eligible for an HSA. Because what is classified as a "high deductible" varies across settings, instead of setting a precise threshold for the deductible, we searched for studies in which researchers classify the plans they study as either a CDHP or an HDHP and examined the prevalence and impact of different deductible choices.

We searched Ovid Medline® and Econlit databases for articles published between January 1, 2002 and December 16, 2011. Our review ultimately focused on approximately 45 published articles that provide original empirical evidence on the effects of CDHPs based on the realized experience of actual products. We prioritized these studies, but we also drew on findings from simulations, experimental studies involving hypothetical decisions, and qualitative case studies to supplement and interpret our findings, particularly for questions for which evidence from quantitative studies of the experience of actual products and enrollees is lacking. See the technical appendix at the end of this report for more information on the literature search methods.

Study settings

While the review included studies published between 2002 and 2011, the studies published during this time period are based on the experience of CDHPs between 2000 and 2009, with the vast majority of studies focusing on the early to mid-2000s. Studies based on more recent data had not been published by the end of 2011. In addition, most studies examined settings in which plans were offered with HRAs rather than HSAs. Out of 34 studies that provided original empirical evidence on either utilization or selection effects, only eight were based on settings in which HSA-eligible plans were offered. And among studies involving HSA-eligible plans, information on whether the enrollee had an HSA, the level of funding in the account, and who contributed the funding was usually not available. Finally, all studies examine the experience of plans in the employer-sponsored market; we found no evidence on the effects of CDHPs in the individual market. In summary, while data on trends in enrollment and product characteristics are available through 2011, the evidence on the effects of CDHPs primarily reflects the experience of HRA-style plans in the employer-sponsored market prior to the period of dramatic growth in enrollment in CDHPs in 2009 (see Figure 1).

Methodological issues

A standard methodological challenge for retrospective studies of the effects of interventions is controlling for both potential selection of individuals into the treatment and possible changes in the outcome of interest for the intervention group that would have occurred in the absence of treatment. Many studies treat enrollment in a CDHP as an intervention, and the literature review focuses on studies that adopt methods to control for both selection into the CDHP and changes in treatment patterns that may have occurred over time in the absence of CDHP enrollment. The typical study of utilization effects of CDHPs uses a pre-post design with a

control group. The pre-post design addresses issues of selection into treatment by comparing the treated population with itself prior to treatment. This involves examining changes in utilization among people initially enrolled in a different type of health plan who switch to a CDHP. The control group accounts for trends in outcomes between the pre- and post-intervention time period that may have occurred in the absence of the intervention. The control group in the typical CDHP study is made up of people who did not change health plans during the study period. An important issue is whether the control group is an accurate proxy for the treatment group in the absence of treatment. In the studies we review, the control group was usually selected using propensity score methods to achieve greater similarity between the cases and controls in order to address this issue. While this general approach establishes a reasonably high methodological bar, the possibility of bias in the estimate of the effect of the intervention due to selection remains, primarily driven by the selection of the control group. While propensity score methods allow the analyst to control for differences in observable characteristics between the two groups, such as age and gender, the possibility of selection based on unobservable characteristics that are correlated with both selection of the treatment and outcomes, such as attitudes toward the use of medical care or expectations of changes in health status, remains. The technical appendix provides more information on methodological issues in this context.

Findings

Who enrolls in a CDHP and how do they differ from enrollees in other types of plans?

CDHP enrollees tend to have higher levels of income or education than enrollees in other types of plans (10, 5, 54, 29, 47). Greene, Hibbard et al., however, find that income increases the likelihood of CDHP enrollment among salaried but not among hourly workers (36). Because most studies are based on insurance claims data, which generally do not include information on family income, studies have measured socioeconomic characteristics in a variety of ways including the wage of the subscriber, census block information on income and education within a community, or self-reported family income from separately administered enrollee surveys. While the different measures have different strengths and weaknesses, the fact that studies using different measures generally produce consistent findings promotes confidence in the overall result.

CDHP enrollees may be more knowledgeable about and more skillful in managing their health compared with enrollees in other plans. Analyses based on an annual population-based survey conducted by the Employee Benefits Research Institute (EBRI) usually find that CDHP enrollees tend to have better self-reported health status and more health-conscious behaviors, such as lower rates of smoking and higher rates of exercise (23). Using a patient activation measure which assesses "patient knowledge, skill and confidence with respect to managing one's health," Hibbard, Greene et al. found that, while those with higher activation scores were more likely to select the CDHP than a traditional plan, there was no evidence that enrollment in a CDHP caused an enrollee to become more activated over time (41). These results suggest that CDHP enrollees may differ from those in traditional plans in ways that are difficult for researchers to capture using standard data sources.

Do CDHPs experience favorable risk selection and, if so, how has risk selection affected insurance markets?

CDHPs generally offer lower premiums in exchange for greater cost-sharing, and this trade-off may be more attractive to low-risk enrollees who expect to use less care. Reviews of the early experience of CDHPs concluded that they did experience favorable selection (9, 4, 8). The implications of risk selection, however, depend on why it occurs. One possibility is that consumers view CDHPs as a product that differs from others offered in the market and that low risks have stronger preferences for this type of coverage. In other words, even when premiums reflect individual risk, CDHPs may experience favorable risk selection simply reflecting differences across individuals in their preferences for coverage. The alternative is that disproportionate enrollment of low risks in CDHPs results from the conscious efforts of insurers to segment the market through product design. When insurers cannot set premiums based on predictable differences in the likely expenditures of potential enrollees, either because such information is unavailable or too costly for them to collect or because regulations prohibit the use of information they can observe, they have incentives to design policies which will cause consumers to self-select into coverage based on their risk (70). In this case, favorable selection into CDHPs may reflect the efforts of insurers to segment the market based on enrollee risk.

The causes and implications of risk selection likely vary across settings. In the individual market, risk selection is driven by the characteristics of those who choose to purchase health insurance and the type of plan in which they choose to enroll. When insurers engage in risk-based pricing, selection into CHDPs will reflect the relative preferences of low and high risks for different products. While pricing may be unfair relative to social objectives (66), coverage will be efficient

in the sense that the choices of enrollees will reflect the costs and benefits to them of the available alternatives. Alternatively, if insurers are unable to price based on risk, risk-based sorting may reflect insurer attempts to achieve risk segmentation through product design. While the efforts of insurers to design products in order to select risks, rather than to promote more efficient use of health care, represent an inefficient use of resources, greater risk segmentation may expand coverage among low risks by providing insurance on terms that more accurately reflect their expected benefits.[3] However, this type of risk segmentation would also increase premiums for high risks, so the net effect on rates of coverage would depend on how each group responds to these changes.

In the employer-sponsored market, CDHPs may be offered either alone or alongside other plans, and selection may take place at the level of the employer choosing to offer the plan or at the level of the employees choosing among plans. For large firms, which generally offer CDHPs alongside other plans, risk selection takes place primarily within the group. Because regulation prohibits employers from varying employee contributions based on individual health status, employee contributions do not vary by individual risk. Thus, if a CDHP with a low employee contribution and a high deductible is offered alongside a plan with lower cost-sharing and a higher employee contribution, it is likely to be more attractive to low risks for whom expected out-of-pocket spending will be lower. When the employer is self-insured, however, as nearly all large firms are, the employer is at risk for the spending of the entire group. Thus, the employer, who does not benefit financially from disproportionately enrolling low risks into the CDHP, has little incentive to offer CDHPs to promote such risk segmentation. While an additional concern is that this type of selection could threaten the stability of a more generous plan (20), an employer could avoid this type of adverse selection "death spiral" through the choice of the employee contribution policy. Thus, favorable selection into CDHPs within firms in the large group market is unlikely to be problematic.

In the small group market, in contrast, employers typically offer only one plan and often purchase fully insured products. In this case, risk selection takes place primarily in the form of the employer choosing which plan to offer employees and potentially among employees choosing whether to enroll in the coverage offered by the employer. Insurers have incentives to price products based on the risk of the group, and if they are unable to use risk-based pricing, they may design coverage in order to achieve risk segmentation. This would ultimately lower premiums for low-risk groups and increase them for high-risk groups. The net effect on rates of coverage would depend on how each group responds to the corresponding changes in premiums.

In both the small and large group markets, if employers are unable to adjust individual wages based on employee risk in order to reflect differences among workers in the cost of providing health insurance, they have incentives to adopt high-deductible health plans as a mechanism to make financing for coverage–considering out-of-pocket premium contributions, wage offsets, and out-of-pocket payments for coverage–more closely linked to individual risk. As in the case of risk-based pricing in the individual market, this may increase rates of coverage overall but make coverage more expensive for high risks and less expensive for low risks.

In summary, risk selection associated with CDHPs is a greater concern in the small group and individual markets because insurers have incentives to engage in risk selection through benefit design in these settings when enrollee risk is difficult or costly for them to observe. CDHP enrollment in these settings, however, does not necessarily signal problematic risk-based selection. CDHP enrollment may reflect preferences for lower-premium, less generous plans in this setting.

3 Feldman and Dowd (24) make this point in the context of HMOs.

Findings

In response to higher loading fees for health insurance, which increase the price of coverage in the individual and small group markets (45), consumers may prefer less generous plans. And the net effect of risk segmentation on the overall rate of insurance coverage is not clear. While high risks may lose coverage in response to higher premiums, low risks may gain coverage.

Despite potentially important differences across settings in the causes and effects of risk-based selection into CDHPs, the vast majority of evidence on risk selection associated with CDHPs is based on the experience of these plans in the employer-sponsored, large group market.

When employers offer CDHPs alongside other plans, CDHPs generally experience favorable selection based on either age, health status or both. Some studies have documented this effect using measures of health status based on administrative data (73, 36, 5, 58, 50, 7, 47), while others use self-reported measures of health status (14, 28, 36). Favorable selection into a CDHP within an employment-based group may be a one-time phenomenon. In a study of nine firms offering at least one tax-advantaged HDHP for the first time in 2006, Lave, Men et al. (47) found that, while firms experienced favorable selection into the HDHP in the first year, few people switched in the second year, resulting in no change on average in the extent of favorable selection. They note, however, that risk segmentation did increase in two of the nine firms in the second year, suggesting that not all firms will experience this type of stability.

The extent to which CDHPs experience favorable selection in choice-based settings depends on the characteristics of the CDHP as well as the alternatives. Most of the evidence documenting favorable selection into CDHPs is based on settings in which the CDHP is offered alongside a PPO. While fewer studies have examined how the structure of the employer setting (i.e., the nature of the available alternatives to the CDHP) affects the degree and form of selection across plans, those that have suggest that these factors can be important. In a setting in which a CDHP was offered alongside both an HMO and a PPO, the CDHP experienced favorable selection relative to the PPO but not relative to the HMO (56). In a setting in which employees chose from a variety of plan types, a CDHP with an HSA experienced favorable selection and two plans with HRAs experienced unfavorable selection relative to the other types of plans (58). The types of tools which employers provide employees to choose among plans also may affect the extent of risk-based selection. Tollen, Ross et al. document substantial favorable selection, based on health status, into a CDHP relative to more traditional plans–prior year pharmaceutical claims for CDHP enrollees were 50 percent of the mean for all enrollees–when consumers had an information tool to help them choose among plans based on their expected health care use (73).

Very little evidence exists on how the risk of a group affects the decision of an employer to offer a CDHP either as a choice or on a full replacement basis. Two studies suggest that workers in firms choosing full replacement with a CDHP are on average less healthy than workers in either firms choosing to offer a choice of plans (50)[4] or firms maintaining traditional coverage (11).

The effects of CDHPs on risk segmentation in the individual market are unknown. Although many people with coverage from the individual market are enrolled in HSA-eligible plans, no published studies have examined risk selection in this context.

4 Author's calculations based on KFF/HRET data.

Findings

The effect of CDHPs on rates of insurance coverage is unknown. One of the potential benefits of lower-premium, high-deductible plans is that they might increase rates of insurance coverage by providing access to a lower-premium product that limits coverage to high-value services. Glied and Remler argue, however, that it is unlikely that these plans, particularly HSA-eligible CDHPs, will increase rates of coverage because neither the relatively high cost-sharing nor the tax-favored savings vehicle is likely to make insurance coverage more attractive among the currently uninsured who are disproportionately low-income and less wealthy (34). Despite these conflicting potential effects, there is no evidence on the effect of these products on overall rates of insurance coverage.

How effective are CDHPs in controlling utilization and costs compared with other types of plans? What types of changes in utilization generate these differences?

Three reviews summarized the early evidence on the effects of CDHPs on utilization (9, 4, 8). Two concluded that there was insufficient evidence to evaluate the effects of CDHPs on health care utilization relative to other types of plans (4, 8). Buntin, Damberg et al., in contrast, concluded that the early literature provided evidence that "consumer-directed plans are associated with both lower costs and lower cost increases" and that "the early effects of CDHPs on quality are mixed with evidence of both appropriate and inappropriate changes in care use" (9). This conclusion, however, is based on evidence from the very early experience of CDHPs, including reports from carriers and uncontrolled studies. Not only has the market share of CDHPs expanded and the types of plans available evolved since these three reviews were conducted, but the research literature has increased in both quantity and quality with the availability of data from new settings.

CDHPs reduce health care spending by between 5 percent and 14 percent on average, although the experience of individual firms varies. Studies which examine the experience of a large number of employers have found that CDHPs reduce total spending relative to other types of plans. Based on the experience of 53 large employers offering products from different insurers, Buntin, Haviland et al. found that families enrolled in HDHPs had 14 percent less total spending on care than families remaining in a traditional plan (10). Based on claims data from a large national insurer offering traditional plans as well as CDHPs, Lo Sasso, Shah et al. found that total spending was 5 percent to 7 percent lower among CDHP enrollees (50). Single firm studies, in contrast, have generated less consistent evidence on cost savings, with some concluding that CDHPs lead to substantially lower spending (11), others finding no overall detectable effect (7), and still others documenting that CDHPs lead to higher spending (57) .

CDHPs reduce spending primarily among low or medium risks. Studies which have examined differences by risk type in the effect of enrollment in a CDHP on utilization usually find that spending reductions are concentrated among more healthy enrollees (50, 39). Similarly, Feldman and Parente document that the cost increase associated with the introduction of the CDHP in their earlier study was concentrated among high risks; spending fell among low-risk enrollees (26). Finally, the increase in utilization of prescription drugs and outpatient visits associated with HRA contributions documented by Lo Sasso, Helmchen et al. was concentrated among low risks (49). Borah, Burns et al., in contrast, find that the introduction of a full replacement CDHP reduced total spending among those in the 50th to 75th percentiles of the spending distribution, but not among lower or higher risks (7).

Findings

The savings associated with CDHPs are driven primarily by reductions in pharmaceutical and outpatient expenditures. Studies which document that CDHPs reduce health care spending generally find that at least a portion of the reduction was driven by lower pharmaceutical spending (9, 55, 49, 10, 11). Parente, Feldman et al. find that enrollment in a CDHP reduced drug expenditures relative to remaining in a plan with a three-tier pharmacy benefit (55).

Studies which find that CDHPs reduce total spending also often find reductions in outpatient utilization or spending (10, 11).[5] In a setting in which the CDHP had no overall effect on total spending, Borah, Burns et al. find that outpatient utilization declined among medium to high risks (7). One study, however, offers a notable exception to this finding. Examining the effects of the HDHP products of a single insurer offered by many employers in a single state, Waters, Chang et al. find that enrollment in an HDHP increased pharmaceutical utilization and had no effect on outpatient utilization relative to remaining in a PPO (76). It is not clear why the results of this study deviate from others in the literature. The HDHPs in this study had relatively high deductibles (most were $5,000) and the authors document substantive differences in out-of-pocket spending between the HDHP and the comparison PPO through the 90th percentile of the expenditure distribution. One possible explanation is that this study represents an unusual set of enrollees. Only approximately 2 percent of the insurer's covered lives were enrolled in the HDHP, with the rest enrolled in a PPO with a lower deductible.

CDHPs do not have a consistent effect on inpatient utilization. One study finds reductions in inpatient utilization (10), another finds no effect (11), and others document increases in at least some patient groups (57, 7). A study focusing on hospitalization rates and expenditures among individuals who switched from a traditional HMO to a high-deductible version of the HMO found that, while inpatient utilization initially declined after the first year of enrollment in a CDHP, differences were not detectable by the second year (80).

Similarly, the results from studies of the effects of CDHPs on emergency department (ED) use are varied. Borah, Burns et al. found that enrollment in a CDHP increased ED utilization among very high spenders (7). Wharam, Landon et al. document that, in the year following a change in enrollment from an HMO to a CDHP, CDHP enrollees experienced a 10 percent decline in ED visits relative to HMO enrollees, although the reduction did not result in a statistically significant reduction in ED expenditures (79). Buntin, Haviland et al., in contrast, found no effect on ED use in a setting in which CDHPs had relatively large negative effects on other types of spending (10).

CDHPs generate modest to no reductions in the use of preventive services when they are exempted from the deductible and greater reductions when they are not. In settings in which preventive services are exempted from the deductible, Buntin, Haviland et al. document small reductions in immunization and cancer screening rates but no change in diabetes A1C measurement (10). Similarly, Wharam, Galbraith et al. find no evidence of reductions in recommended breast, cervical or colorectal cancer screening associated with enrollment in the CDHP relative to remaining in an HMO (77). In a three-year follow-up of people who switched to a CDHP that exempted preventive services from the deductible, Rowe, Brown-Stevenson et al. find no difference in either levels or trends of cancer screening or use of diabetic monitoring services relative to people who remained enrolled in a PPO (71). In a setting in which these services were subject to the deductible, in contrast, Charlton, Levy et al. find more substantive

5 Lo Sasso et al. (2010) find a negative, but not statistically significant effect of CHDPs on medical spending which includes both inpatient and outpatient spending, but it is not possible from the results presented to determine whether the CDHP had a statistically significant negative effect on either outpatient or inpatient expenditures separately.

reductions in cervical and breast cancer screening rates associated with enrollment in a HDHP, although they find no evidence of reductions in rates of prostate cancer screening or routine exams (11).

Some research suggests that, when potential substitutes for screening tests are available, enrollees are sensitive to which tests are covered. Wharam, Galbraith et al. found that, when a more expensive colorectal cancer screening method, colonoscopy, was subject to the deductible, enrollees substituted to the less expensive and covered alternative (77). While this pattern of utilization continued into the second year for the group with lower socioeconomic status, the higher socioeconomic group appeared to reduce use of the high-cost uncovered test without a corresponding increase in the low-cost, covered alternative (78).

CDHPs generate modest reductions in continuation or adherence in prescription drug use among patients with chronic conditions. The negative effects on utilization tend to be concentrated on drugs for asymptomatic conditions such as hypertension and high cholesterol (35, 12).

While some studies suggest that consumers indiscriminately reduce utilization in response to CDHP enrollment, others provide evidence that CDHP enrollees reduce use of less clinically appropriate care. Consistent with the findings of the HIE, Hibbard, Greene et al. found that CDHP enrollment led to reductions in physician visits for both acute and chronic conditions as well as for visits classified as both high and low priority based on a taxonomy that considers whether there is evidence for a likely benefit of medical intervention (41). In the case of ED use, in contrast, consumers responded to the introduction of a deductible by cutting back on visits for low severity rather than high severity conditions, suggesting that they were effectively adjusting utilization based on the expected value of seeking care in the emergency department, a more expensive setting (79, 80). And in a study of the effects of a CDHP on maternity services, quality indicators (early prenatal care, appropriate frequency of prenatal care, and timely postpartum care) were not affected by CDHP enrollment (46).

Few studies have examined whether CDHPs cause enrollees to switch to lower-priced products or services. The only explicit tests of this mechanism for cost control are from studies of the effects of CDHPs on the extent of substitution of generic for brand name drugs or the use of mail order for prescription drugs. These studies suggest that enrollment in a CDHP appears to be associated with a small shift toward use of generic drugs (35, 58) and an increase in use of mail order (58). Published studies have not examined whether patients seek services from lower-priced physicians and hospitals in response to CDHP enrollment.

Relatively little evidence exists on differences between low-income and high-income enrollees in the clinical or financial implications of enrollment in a CDHP. While a major concern of critics of CDHPs is that enrollment in these plans negatively affects low-income and less healthy enrollees, very few studies have explicitly examined these issues (21, 81). Galbraith, Ross-Degnan et al., combining survey and claims data for HMO enrollees with chronic conditions, found that those enrolled in a high-deductible version of the HMO reported greater financial burden (32). Forty-eight percent of families enrolled in the HDHP reported they experienced financial burden associated with health care expenditures compared with 21 percent of families in traditional plans. Fifty-three percent of families with incomes below four times the poverty level with a family member with a chronic condition in HDHPs spent more than 3 percent of income on health care expenses, compared with 29 percent of families in the regular HMO.

Findings

Only one study has examined whether CDHPs differentially affect total spending on health care across enrollees with differing levels of income (39). While the study documents large reductions in spending associated with CDHPs overall, the authors find little evidence that the magnitude of the effect varies across families with differing levels of income. Family income, however, is measured based on the median income of families in an employee's 5-digit ZIP code, creating the possibility that measurement error may attenuate the differences between groups.

What are the key differences among the CDHPs offered in the market, and what evidence exists on the effects of these differences?

The key differences among CDHPs in the market are the specific parameters of the cost-sharing provisions, the form of the personal spending account, and the extent to which the plan uses care management techniques. With respect to the cost-sharing provisions, the key parameters are the level of the deductible, which services are exempt from the deductible, the level of the out-of-pocket maximum, and how cost-sharing is structured between the deductible and the out-of-pocket maximum. Although it is less often emphasized in the literature, the extent and type of care management techniques used by the plan is likely also important. While the original vision of a CDHP was a plan in which the responsibility for managing care was in the hands of the consumer rather than the plan, more traditional plans, such as PPOs and HMOs, are now offering products that incorporate higher deductibles and personal spending accounts and tend to fall under the CDHP umbrella. Not only does this change the nature of the CDHP product, but it also creates important differences across plans that are not easily observable to researchers and consumers. Selective contracting, most often associated with HMO and PPO plans, also influences the prices both enrollees and plans pay to providers. CDHPs with contractual relationships with provider groups likely pay lower rates than those without these relationships.

Plans with higher deductibles and less generous HRAs generate larger reductions in spending. The significant cost savings documented by Buntin, Haviland et al. were concentrated among enrollees in plans with higher deductibles (>$1,000) (10). Their results also indicate that the savings generated by plans with higher deductibles were smaller when employers made generous contributions to a spending account. Comparisons across studies generate roughly consistent results. Borah, Burns et al., who found no detectable overall effect on total health spending, examined a setting in which the CDHP plan deductible was relatively high–$2,000 per person and $4,000 for a family–but the employer contribution to the HRA was also relatively high–$1,000 for single coverage and $2,000 for family coverage (7). Thus, the existence of a generous spending account may have attenuated any reductions in utilization associated with a high deductible. In contrast, Charlton, Levy et al., examining a setting in which deductibles were relatively high ($2,000 for individuals and $6,000 for families) and employers did not establish an HRA, documented a 17 percent reduction in total spending (11).[6] Lo Sasso, Helmchen et al. estimate that a $1 increase in the size of an HRA is associated with a $1 increase in spending, with the spending increase concentrated on outpatient care and pharmaceuticals (49). In other words, increases in employer contributions to HRAs translated into greater utilization of medical care. Existing studies do not provide evidence on whether spending increases associated with personal spending accounts differ between HRAs and HSAs.

6 It is unknown in this setting whether enrollees had HSAs funded either by themselves or their employers.

The structure of cost-sharing above the deductible may also affect the savings associated with a given plan. Examining the experience of a large, self-insured employer, Parente, Feldman et al. document that, while spending per person was lower before the introduction of CDHPs in 2001 for those who ultimately enrolled in the CDHP than for those who did not, it increased more quickly in the subsequent years for those who chose a CDHP than for those who were continuously enrolled in either an HMO or a PPO (57). At the end of three years, spending per enrollee, particularly hospital spending, was higher in the CDHP cohort than in the HMO cohort (25). These authors attribute the inability of the CDHP in this context to control costs to the relatively weak cost-sharing associated with the plan. The difference between the spending account and the deductible was $500 for individuals and $1,000 for family policies and enrollees faced minimal cost-sharing above the deductible. In this setting, out-of-pocket spending was actually *lower* for enrollees in the CDHP than for those in the PPO (57).

What information do CDHPs provide and to what extent are enrollees using it to make health care decisions? How do the information and tools provided by CDHPs affect consumer decision-making?

While the quantity and quality of information tools available to consumers enrolled in CDHPs appears to be increasing, significant weaknesses remain. Most of the available information on the extent and types of tools provided by CDHPs comes from case studies and qualitative interviews with industry participants. In the absence of quantitative data, we summarize the evidence from these qualitative studies, which provide important insights into this issue. Studies of the early market entrants concluded that decision support was limited at best (68, 67, 60), driven in part by the lack of reliable data on cost and quality (60). The extent and degree of sophistication of the tools offered to enrollees differ across plans (13). While many plans provide basic health information and some provide more detailed information on specific conditions and treatment alternatives, few provide tools that allow enrollees to compare costs and quality across hospitals and even fewer provide this type of information about individual physicians. When information on quality of care is available, it often has significant weaknesses that limit its effectiveness for decision-making. Cost data are often based on provider averages, rather than being specific to a particular provider, and estimates are often procedure-based rather than episode-based. Plans are more likely to offer comparative cost information on pharmaceuticals, particularly brand name versus generic. Information on quality is often limited to a small set of measures, which sometimes conflict across tools. Employers often provide tools to assist employees in choosing among plans based on personalized information about their likely spending, with some requiring employees to input their own information and others automatically importing employees' claims or health risk assessment data. Parente, Christianson et al. report that, among people enrolled in a CDHP, those with chronic illness are more likely to use information tools (53).

Virtually no evidence is available on the effects of information tools on either enrollment in CDHPs or utilization of care when enrolled. The only study on the effects of interventions intended to promote quality decision-making among CDHP enrollees found that targeted messaging designed to encourage compliance with chronic medication use and to raise awareness regarding lower-cost generic alternatives did not improve medication persistence (72). Dixon, Greene et al. found that those who enrolled in CDHPs were more likely to use information before they enrolled. However, they found no evidence that enrollment in a CDHP prompted greater information use among those who were low users of information prior to enrolling (22).

Findings

Enrollees often have limited understanding of plan features. One study found that, among consumers enrolled in a plan with a deductible, approximately 50 percent knew their plan had a deductible (59). Survey respondents also reported changes in care-seeking behavior even for services that were exempt from the deductible. Research also points to differences across different types of consumers in their level of understanding of plan features. Qualitative analyses among workers in a company offering a CDHP revealed large differences between the hourly and salaried workers in the understanding of their plan options and enrollment decisions (37). In an experimental study, Greene, Peters et al. found that, although less numerate consumers understood less about CDHPs, they were substantially more likely to select them (37).

Other studies suggest that consumers learn about plan features after enrollment. In an analysis of the effects of a CDHP on ED use, Wharam, Landon et al. found that a reduction in ED use among CDHP enrollees was concentrated among repeat visits, suggesting that people changed their utilization patterns in response to the financial consequences of their first visit (79). A focus group analysis found that enrollees in a high-deductible plan who had experienced high out-of-pocket expenditures had a good general understanding of how the plan worked but that they faced barriers in trying to control costs, such as the inability to assess potential costs when seeking care for urgent problems; inaccurate knowledge about what services the HDHP covered; and reluctance to discuss costs with doctors (48). Focus group participants also felt that, while they could delay or forego visits to physicians, they had little control over costs once a clinical encounter had begun.

Conclusions

CDHPs have neither transformed health insurance markets as dramatically as their proponents had hoped nor been as detrimental as their detractors had feared. The evidence indicates that CDHPs reduce health care expenditures–studies which pool information from a relatively large number of firms find that CDHPs reduce health care expenditures by approximately 5 percent to 14 percent. CDHPs generate greater spending reductions among low- or medium-risk enrollees than among high-risk enrollees and spending reductions are concentrated among outpatient services and pharmaceuticals. The evidence also suggests that spending reductions are greater in plans with larger deductibles and smaller employer contributions to HRAs.

Strong evidence of spending reductions places greater importance on understanding the effect of reductions in utilization on quality of care. To date, the evidence on their effect on quality of care is mixed. While some studies indicate that consumers reduce utilization indiscriminately, others suggest that consumers differentiate between more and less clinically appropriate care. Thus, while the initial research points to the potential for these plans to reduce utilization in effective ways, more evidence is necessary to draw strong conclusions.

The effects of CDHPs on rates of insurance coverage are unknown. Although the potential for these products to generate risk segmentation across different types of coverage raises concern over the affordability and access to coverage among high risks, the availability of lower-premium products which lower premiums by reducing spending on low-value services could ultimately increase rates of insurance coverage among both low- and high-risk consumers. While the evidence indicates that CDHPs tend to experience favorable selection when they are offered by large employers alongside other types of plans, there is no evidence that favorable selection in this context has influenced overall rates of insurance coverage. In the case of the individual and small group markets, there is little to no evidence on the extent to which CDHPs experience favorable risk selection and the implications for rates of coverage.

In addition, the impact of these plans on vulnerable populations, particularly among people with low levels of income and formal education, is still unclear. A better understanding of these effects is important as market penetration of these products increases and they are increasingly offered by employers on a full replacement basis.

The area in which the development of CDHPs has perhaps been the most disappointing, particularly from the perspective of the early promise of these plans, is in the development of tools to assist patients in decision-making. Despite the difficulty that consumers face in evaluating the cost and quality of treatment alternatives, the research literature provides very little evidence of either widespread adoption by plans or use by consumers of tools to assist in decision-making. Correspondingly, there is even less evidence on how these types of tools affect decision-making.

An important qualification is that the evidence from this report may not accurately reflect the experience of many who are enrolled today in CDHPs. The vast majority of the evidence underlying this synthesis is based on employment-based settings in which high-deductible plans are offered in conjunction with HRAs. While the focus of the research to date is likely driven by both the types of plans that were typically offered during the early to mid-2000s and the types of settings in which researchers typically had access to data, enrollment in HSA-eligible plans is growly rapidly in all segments of the insurance market (2). People may have stronger incentives to save rather than spend funds in their HSAs since they may accumulate over time, either as investments or through additional contributions on the part of the individual, and may be used to finance expenditures for other types of goods and services, particularly after retirement. In addition, people enrolled in HSA-eligible plans do not necessarily have spending accounts since

neither employers nor individuals are required to make contributions. Finally, either employers or individuals may contribute to these accounts, unlike HRAs which are restricted to employer contributions, and enrollee behavior may vary depending upon the source of funds.

For the purpose of this synthesis, it was difficult to precisely define a CDHP, and moving forward, the CDHP label is likely to continue to become even less meaningful. To take advantage of the availability of tax-favored spending accounts, "managed care" plans, which traditionally were characterized by low cost-sharing and more aggressive supply-side care management, have been offering a version of their product which incorporates a deductible and a spending account. Similarly, plans traditionally considered CDHPs have been offering more aggressive care management techniques, such as tiered cost-sharing for pharmaceuticals and narrow or price-differentiated provider networks. All types of plans have been incorporating wellness and disease management programs. In a survey of consumers, traditional plan enrollees were more likely to report they had access to quality information than CDHP enrollees (30). Robinson and Ginsburg refer to this emerging system of plans that incorporate features of both managed care and CDHPs as "managed consumerism" or "facilitated consumerism" (64).

Policy Implications

Overall, the results of this synthesis suggest that the types of strategies used by CDHPs should continue to be considered as an approach to health care cost containment. Research documents significant cost savings associated with these plans, suggesting that financial incentives targeted at consumers can be effective in reducing health care expenditures. Against this evidence of cost savings is relatively little evidence of reductions in quality of care. While the effects of these plans on utilization and outcomes should continue to be monitored, particularly given the changes in the types of plans available in the market, the initial results are promising.

In their current form, however, CDHPs are likely to represent only part of a solution to address high and rising health care costs. The evidence indicates that CDHPs generate savings primarily among low- and medium-risk enrollees. They have little effect on spending for the small proportion of the population who generate the bulk of health care spending. Thus, a comprehensive approach to addressing high health care spending would require alternative solutions targeted toward high-risk populations.

Finally, a priority for policy development in this area is to determine how policy can promote the development and use of more effective information tools. This would assist not only CDHP enrollees but also people enrolled in other types of plans.

Need for Additional Information

While there has been major expansion in the evidence on the effects of CDHPs on utilization of care, the evidence base has a number of important gaps. The evidence on the effects of CDHPs on utilization among low-income populations is sparse. Studies that examine simultaneously the effect of CDHPs on use of medical care, consumption of other goods and services, and savings and wealth would provide a more complete picture of the impacts of these types of plans on low-income families. In addition, while researchers have examined high-risk enrollees, defined as those with a chronic condition or those with high expected expenditures based on age and the presence of chronic conditions, fewer studies have examined patients with particular health conditions. For example, Hardie, Lo Sasso et al. provide an initial look at the impact of an HSA-eligible plan on the use of behavioral health services (38). Studies of specific clinical populations such as those with mental health conditions would be informative.

The evidence on HSAs, in particular, is also lacking. Although HRAs and HSAs have important differences in their attractiveness as savings vehicles, little evidence exists on whether they have different effects on health care utilization when offered in conjunction with an HDHP. In addition, very little work has examined the implications of their tax-related relative advantages over other potential savings vehicles (1, 54).

Another important gap in the literature is the absence of evidence of the effects of these plans on coverage in the individual and small group markets. Because premiums tend to be higher and rates of coverage tend to be lower in these markets, HDHPs may represent an attractive lower-premium alternative for many consumers. Yet the net effect on overall rates of coverage is unclear, depending on both the attractiveness of the products to different types of consumers and the extent to which insurers price coverage based on individual risk.

In addition, most studies have examined the experience of enrollees using only one year of data. The maximum follow-up was three years in a study based on the implementation of one of the earlier products. Evidence on the longer-term effects of CDHPs is important for evaluating their impact. As individuals become accustomed to their coverage, the performance of these products may improve. In contrast, over the longer term, any negative financial consequences may be magnified, particularly for individuals with chronic conditions, which could have corresponding negative effects on utilization.

Finally, the literature offers relatively little evidence of the effects of CDHPs on health care quality and no evidence on the effects of CDHPs on outcomes. Even studies of more easily measured outcomes, such as consumer satisfaction, are sparse. While consumer experience was addressed by the earlier literature examining the innovator products (14), more recent studies have not addressed this issue.

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Appendix II Methodological Issues

Search strategy

We searched Ovid Medline® and Econlit databases using the following four combinations of search terms (the exact implementation varied slightly between the two databases):

- ((consumer driven OR consumer directed) AND (health plan OR health insurance))
- ((deductible.mp) AND (health plan.mp OR health insurance.mp))
- (hra OR hsa) AND (health plan OR health insurance)
- (health savings account OR health saving account OR health reimbursement account)

In each database, the search included articles published between January 1, 2002 and December 16, 2011. From this search, we retrieved 509 unique references. Many were clearly not relevant to the topic and we were able to eliminate them based on the information in the abstract. We excluded studies focused explicitly on Medical Savings Accounts (MSAs) or Flexible Savings Accounts (FSAs). In the case of MSAs, the use of these accounts has not been particularly widespread and they have generally been replaced by HSAs, which have fewer restrictions on the settings in which they are offered and have more favorable tax treatment. FSAs, in contrast, are prevalent among those with employer-sponsored coverage. Thus, while they are not a focus of our analysis, studies of settings in which FSAs exist are included. We formally reviewed only studies that provide original empirical evidence on the effects of CDHPs based on the realized experience of actual products. We exclude simulations, experimental studies involving hypothetical decisions, and qualitative case studies. However, we draw on findings from studies incorporating these alternative research designs to supplement and interpret our findings.

We conducted a nonsystematic review of the "grey" literature, primarily by reviewing studies which were referenced in other peer-reviewed articles. While we considered evidence from both peer-reviewed and non-peer-reviewed sources, in practice, studies from peer-reviewed journals were more likely to meet the methodological criteria. In particular, many studies from the grey literature examine the experience of a single firm without a control group. In addition, we felt that studies from the grey literature were more likely to disproportionately represent the experience from a setting that had favorable outcomes, biasing the overall evidence base.

We reviewed the text of over 200 studies, ultimately identifying approximately 45 which represented original, empirical research. Twenty-four studies provided evidence on the effects of CDHPs on utilization and 15 provided evidence on selection into CDHPs. In some cases, studies of the utilization effects provided additional evidence on selection.

Methodological issues

A standard methodological challenge for retrospective studies of the effects of interventions is controlling for both potential selection of individuals into the treatment and possible changes in the outcome of interest for the intervention group which would have occurred in the absence of treatment. The literature review focuses on studies that adopt methods to control for both. The typical study of utilization effects of CDHPs that we reviewed uses a pre-post design with a control group. The pre-post design addresses issues of selection into treatment by comparing the treated population with itself prior to treatment. The control group accounts for trends in outcomes between the pre- and post-intervention time period that may have occurred in the absence of the intervention. An important issue is whether the control group is an accurate proxy for the treatment group in the absence of treatment. In the studies we review, the control group

was usually selected using propensity score methods to achieve greater similarity between the cases and controls in order to address this issue. While this general approach establishes a reasonably high methodological bar, the possibility of bias in the estimate of the effect of the intervention due to selection remains, primarily driven by the selection of the control group. While propensity score methods allow the analyst to control for differences in observable characteristics between the two groups, the possibility of selection based on unobservable characteristics which are correlated with both selection of the treatment and outcomes remains. In this context, selection based on unobservable characteristics could be an important issue. Some employers offer CDHPs alongside other types of plans and allow employees to choose among the various options. In this case, selection takes the form of individuals choosing among the alternatives based on their expected outcomes. In other cases, an employer will switch to a CDHP on a full replacement basis–moving all enrollees within a firm to a single plan. While full replacement eliminates the possibility of selection due to individual choices, the possibility of selection based on employer-level characteristics remains. In other words, the employers who choose full replacement may differ systematically in ways that are difficult to observe from those who do not.

Another dimension along which studies in this literature vary is whether they examine the experience of one or a small number of employers adopting a CDHP or whether they pool data from a large number of firms. In the latter case, some studies use data from a single insurer that offers the products across a large number of employers; others examine the products of multiple insurers offered by many different employers. The approaches have differing strengths and weaknesses. While the case study approach generally offers the advantage of allowing the researcher to have much more knowledge on the institutional features of the particular setting, the primary drawback is the extent of external validity. Even if the estimate of the effect is unbiased for a particular setting, it may not be generalizable across insurers, markets or employers. Studies relying on the experience of a more heterogeneous group of insurers, employers and geographies, in contrast, provide greater external validity, often at a loss of detail regarding the institutional features of a particular setting.

A final empirical issue worth noting for research in this setting is the extent to which insurance claims, the basis for most studies of utilization, accurately reflect the health care utilization of enrollees in high-deductible plans. In particular, enrollees who do not expect to meet their deductible in a given year may not file claims for the services they do use. If this occurs, the estimates of utilization of enrollees in high-deductible plans will be biased downward, generating results which suggest that HDHPs generate larger savings than they really do. This issue would be less of a concern in settings in which the provider files the claims directly with the insurer or the enrollee has an incentive to file claims in order to receive a negotiated rate. None of the studies in the literature discusses this issue.

Notes

For more information about the Synthesis Project, visit the Synthesis Project Web site at *www.policysynthesis.org.* For additional copies of Synthesis products, please go to the Project's Web site or send an e-mail message to *pubsrequest@rwjf.org.*

PROJECT CONTACTS

David C. Colby, Ph.D., the Robert Wood Johnson Foundation

Katherine Hempstead, Ph.D., the Robert Wood Johnson Foundation

Sarah Goodell, M.A., Synthesis Project

SYNTHESIS ADVISORY GROUP

Linda T. Bilheimer, Ph.D., Congressional Budget Office

Jon B. Christianson, Ph.D., University of Minnesota

Paul B. Ginsburg, Ph.D., Center for Studying Health System Change

Jack Hoadley, Ph.D., Georgetown University Health Policy Institute

Haiden A. Huskamp, Ph.D., Harvard Medical School

Julia A. James, Independent Consultant

Judith D. Moore, Independent Consultant

William J. Scanlon, Ph.D., National Health Policy Forum

Michael S. Sparer, Ph.D., Columbia University



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The Synthesis Project
The Robert Wood Johnson Foundation
Route 1 & College Road East
P.O. Box 2316
Princeton, NJ 08543-2316
E-Mail: synthesisproject@rwjf.org
Phone: 888-719-1909
www.policysynthesis.org