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Consumer-Oriented Strategies for Improving Health Benefit Design: An Overview

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-Based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To bring the broadest range of experts into the development of evidence reports and health technology assessments, AHRQ encourages the EPCs to form partnerships and enter into collaborations with other medical and research organizations. The EPCs work with these partner organizations to ensure that the evidence reports and technology assessments they produce will become building blocks for health care quality improvement projects throughout the Nation. The reports undergo peer review prior to their release.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality.

We welcome comments on this evidence report. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by e-mail to **epc@ahrq.gov.**

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The authors of this report have no financial conflicts or interests with products, companies or persons mentioned in this study.

Structured Abstract

Objectives: Consumer oriented approaches have become increasingly common in health insurance plans. This report considers three sometimes, but not always, related consumer-oriented strategies: consumer directed health plans (CDHPs), tiered provider networks, and efforts to collect and disseminate information about provider quality. The goals of the report are to provide a framework for assessing the likely effects of CDHPs, tiered networks, and expanded quality data collection and dissemination, to review available published peer reviewed literature on CDHPs, and to provide information about the likely value of further review of the literature on tiered networks and provider quality data collection and dissemination.

Data Sources: We reviewed the published literature identified in MEDLINE® or Econlit.

Review Methods: We developed a framework that identifies important factors determining the impacts of these approaches. We also reviewed the published literature that reported original evidence about the prevalence of CDHPs, the impacts of CDHPs on health care utilization or health care costs, or the extent of selection bias in CHDP plan enrollment. We also conducted some inquiries into the literature on tiered networks.

Results: Among the implications of our framework, perhaps the most important is that the effects of these policies are likely to vary substantially with the context within which they are implemented. For example, some consumers may respond to the financial incentives inherent in CDHPs and tiered networks much more than others. By extension, some firms may have more favorable experiences with these plans than others. The impacts of consumer-oriented strategies may also differ between firms that offer a choice of plans and those that do not due to differences between the firms in the types of people joining the plans.

We found 11 published studies that provided evidence the prevalence or effects of CDHPs. Available evidence is insufficient to draw conclusions about the effects of CDHPs. Perhaps the most consistent point is that CDHPs are subject to selection bias. Evidence on the effects of CDHPs on utilization and spending was mixed and generally of limited strength. We conclude that further evidence synthesis will be most profitable after the literature has had further time to develop.

We also found that the number of studies that appear likely to produce reviewable evidence about the impacts of tiered networks on utilization and costs is small. The literature on the impacts of quality data collection and dissemination is somewhat larger, but is much more diffuse, with little evidence specific to the context of consumer-oriented strategies of the type examined here.

Conclusions: The effects of CDHPs, tiered provider networks, and efforts to collect and disseminate information about provider quality are likely to vary within the context in which they are implemented. There is insufficient published evidence to draw conclusions about the effectiveness of these CDHPs and tiered provider networks and the literature on the impacts of quality data collection and dissemination is diffuse.

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Chapter 1. Introduction

Background

Responding to persistently rising health care costs and continuing concerns about the quality of health care, many health insurance purchasers have become interested in consumer-oriented strategies to improve health plan design that hold the promise of reducing health care costs and improving quality.[1-3] While a number of specific activities fall within the general umbrella of consumer-oriented strategies, most of the recent developments in this area can be classified in three categories.[4] Consumer directed health plans (CDHPs) are health insurance plans that use high deductibles coupled with personal health spending accounts to increase consumer accountability for health care spending. Tiered networks are health benefit structures that group providers into tiers based on their costs or quality, and reward consumers with favorable prices if they choose providers in higher quality or lower cost tiers. These strategies, which place greater financial responsibility on consumers for health care decision-making, can also be accompanied by initiatives to provide consumers with better information about the cost and quality of health care, including, for example, information about the quality of health care providers, to enable them to make more informed decisions.

While these three strategies have been increasingly discussed, there remains little consensus about their likely impacts on the health care system or how purchasers can most effectively use these strategies, either alone or in combination, to achieve the goals of reducing costs and improving quality.

Over the past several years, several studies and reviews have been published that appear to offer some insight into how consumer-oriented strategies can affect the provision of care, costs, and outcomes. However, many of these studies have examined narrow ranges of consumer-oriented strategies and often do so in a very tightly focused setting such as a single employer. A synthesis of the existing literature may be able to provide valuable information about the potential for consumer-oriented strategies to bring about beneficial outcomes in health care. Beyond a 2005 report by the Rand Corporation,[4] however, existing synthesis work is limited.

The nomination of consumer-oriented health plan strategies was submitted by the Employer Health Care Alliance Cooperative (the Alliance). Discussion concerning the relative newness of the topic and the possibility of limited scope of literature prompted the decision to conduct an initial exploratory analysis and draft a feasibility report, with the goal of developing a foundation for further evidence review work in this area.

AHRQ further determined that this initial analysis should address three issues. First, a conceptual framework should be developed that identifies important factors determining the impacts of consumer-oriented strategies, within which questions about the impacts of consumer-oriented strategies on health care utilization, costs, and quality can be addressed. Second, a review of published, peer-reviewed literature on CDHPs should be conducted. Several guiding questions specific to CDHPs were identified:

- *What are prevalence rates and expected trends for CDHPs?*
- *What is the evidence on the effect of CDHPs on quality improvement or lack of improvement?*

- *What is the evidence that CDHPs affect utilization of health care services, including doctors visits, ER visits, medications, and diagnostic tests?*
- *Is there evidence to determine whether effects on utilization are necessary vs. unnecessary services?*
- *What is the evidence that CDHPs discourage access to appropriate care?*
- *Is there evidence that effects of CDHPs on utilization vary depending on the underlying health status, income or education of individuals?*
- *What is the evidence that CDHPs reduce health care expenditures?*

Third, preliminary evidence should be gathered about the ability of the literature on tiered networks and provider quality collection and dissemination to support further productive evidence review.

This report addresses these issues. We develop a conceptual framework for the study of literature on consumer-oriented strategies. We reviewed published, publicly available studies of CDHPs identified in MEDLINE® or Econlit and summarized the relatively limited number of studies that provide evidence on their effects. We also present the results of some preliminary investigation of the literature on tiered networks. We present some observations about the literature on the collection and dissemination of data on provider quality. Finally, we develop some preliminary conclusions based on the information presented.

Consumer Directed Health Plans

Definition of CDHPs

The term "consumer directed health plan," or CDHP, has been used by many individuals in a variety of settings, and researchers and others differ on exactly how they define the term.[1, 5] In some settings, the term CDHP has been used quite broadly to refer to any of a wide range of health insurance benefit design strategies that might in one way or another encourage more responsibility for and involvement in health care decisionmaking by consumers. Other definitions are narrower, and typically focus on the financial incentives in plans. One approach is to characterize CDHPs simply as plans with more cost sharing than typical health plans. While somewhat relative, this definition would capture the spirit of many current efforts to increase incentives for consumer engagement in decision making by increasing financial incentives. Within this umbrella definition, the most specific usage of CDHP is to refer to a specific set of health insurance arrangements in which individuals have a high-deductible health plan coupled with a personal health account (PHA) that they can use to pay health care expenses not covered by insurance.[1] For purposes of our discussion here, we adopt this last definition of

[1] The specific aspects of CDHP design can be quite involved. This section outlines some key features. Further information may be found in: (1) EBRI Issue Brief No. 273, September 2004, http://www.ebri.org/pdf/briefspdf/0904ib1.pdf ; (2) CMS Legislative Summary http://www.cms.hhs.gov/mmu/hr1/PL108-173summary.asp ; (3) IRS Document at http://www.treas.gov/offices/public-affairs/has/pdf/notice2004-2.pdf ; (4) IRS document, "Health Savings Accounts and other Tax Favored Health Plans", IRS publication number 969, http://www.irs.gov/pub/irs-pdf/p969.pdf ; (5) US Department of Labor, Bureau of Labor Statistics Web site: http://www.bls.gov/opub/cwc/cm20031022ar01pl.htm .

CDHPs. While in principle many of the conceptual issues we discuss would extend to other health plans that attempt to increase cost sharing, this specific set of plans is well defined and distinct in practice, which facilitates discussion, and most current policy discussions of CDHPs take this set of plans as their starting point.

Though the precise structure of CDHPs can vary, all CDHPs share the common element of a high deductible health plan. In such a plan, the consumer is responsible for all spending up to a relatively high deductible, at least $1,000 per year and in many cases $2,000 per year or more.[2] After consumers reach that level of spending, the typical plan would cover all subsequent health care spending within the year, though the specific provisions of plans can vary.

The second essential component of a CDHP is the PHA, containing funds that consumers can use to pay their health care bills and can usually carry forward from year to year if not spent. The PHA portion of a CDHP can technically be structured in one of three ways: a Medical Savings Account (MSA), a Health Savings Account (HSA), or a Health Reimbursement Arrangement (also sometimes referred to as a Health Reimbursement Account, either way an "HRA"). MSAs were the first CDHPs mechanism to become available, established as a demonstration project by the Health Insurance Portability and Accountability Act of 1996 (HIPAA). An MSA is a tax-exempt account that an individual can use to pay for health expenses. Eligibility for these accounts is limited to employees of firms with 50 or fewer employees and the self-employed and tax-advantaged use of an MSA is contingent upon the individual being enrolled in a high-deductible health plan. The individual (or his or her employer) may deposit funds into the account tax free that can be used to pay for medical expenses, and which roll over from year to year and accumulate interest or dividends tax free if unused. Funds in an MSA cannot be used for non-medical purposes without taxes and penalties until the beneficiary turns 65, becomes disabled, or dies. Enrollment in these plans has been limited, however, never even reaching the cap on enrollment set as part of the demonstration project.[6]

In recent years, MSAs have been largely displaced by two newer approaches to designing CDHPs. HSAs are the most recent. They are similar to MSAs except that they are available to any individual who is also covered by a high deductible health plan, not just those who are self employed or work for small firms. Individuals are eligible to contribute to the account when they are enrolled in certain types of high deductible health plans. Funds in the HSA can be used to pay for medical expenses, and roll over from year to year if unused. HSAs were enabled by a provision of The Medicare Prescription Drug, Improvement, and Modernization Act of 2003. HSAs were first offered by insurers in January of 2004 though employers generally waited for guidance from the U.S. Treasury and I.R.S., which was issued during 2004, before offering these plans.

HRAs were introduced in 2002 and differ somewhat from MSAs and HSAs. An HRA is an employer-funded account that reimburses employees for qualified medical expenditures. The development of these types of accounts was facilitated by IRS Revenue Ruling 2002-41 and Notice 2002-45 which provided guidance on a number of matters related to the tax treatment of these accounts.

They are often set up by employers in conjunction with high-deductible health plans, but need not be. Employers setting up HRAs have considerable discretion over the specific

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[2] Specific deductible levels are set by legislation or regulation, and may vary with the specific types of plan as well as vary over time (e.g., be indexed for inflation).

provisions of the HRA, including whether or not the funds are allowed to roll over from year to year if unused. A typical CDHP scenario using an HRA would have an employer provide employees with a high deductible health plan, say with a deductible of $2,000, and set up and fund an HRA for each employee containing $1,000. Employees could use the $1,000 (on a tax free basis) to pay for qualifying medical expenses that were not covered by the health plan. Unused funds might roll over from year to year as long as the individual remained enrolled in the high deductible health plan. The treatment of funds in these accounts in the event that an individual leaves the employer can vary. In most cases of which we are aware, they are forfeited when an employee changes health plans or leaves the employer.

CDHPs may also be coupled with efforts to provide consumers with information about the cost and quality of providers and treatment options, which may increase the ability of now-cost-conscious patients to make optimal choices about spending their health care dollars. CDHPs may also include provisions to ensure that the prices charged by providers comply with the normal contractual arrangements between providers and health plans. In some discussions, these features are considered central parts of any CDHP. This is in many ways sensible – it may be difficult to expect consumers to improve their decisionmaking in response to increased financial responsibility without some improved information and mechanisms for making choices – but CDHPs are not required to have these features.

CDHPs are a small, though apparently growing segment of the employer sponsored health insurance market. Data from the 2005 Kaiser/HRET employer survey, a well-regarded survey, suggest that among employers offering health benefits, 1.9 percent offer a high deductible health plan coupled with an HRA, and 2.3 percent offer a high deductible health plan that meets the HSA standards. In all, 3.9 percent of benefits-offering employers appeared to offer CDHPs with an HRA or HSA.[7] Other surveys report higher rates. For example, a Hewitt survey reports that 9 percent of employers offered a health account with a high deductible health plan in 2005, and 19 percent did in 2006,[8] though little information is provided about the methodology of this survey. These plans are increasingly well known. Gabel et al reported that more than 80 percent of benefits managers were familiar with CDHPs in 2003, and that more than 10 percent of employers reported that they were "very likely" to offer an HRA plan in the next two years.[9] The GAO reported that in 2005 a range of insurers, including Aetna, Anthem/Wellpoint, Blue Cross and Blue Shield plans, CIGNA, Humana, and United HealthCare were offering CDHPs. CDHPs are also now available in the FEHBP.[10]

Financial Incentives in CDHPs

A key principle behind CDHPs is that they will increase the financial interest that patients have in their decisions about consumption of medical care.[3] Patients who consume medical care and deplete their PHA would be using up a resource that they could otherwise keep and use to their advantage in the future. Compared to patients with traditional insurance arrangements, at least for spending below the deductible, this would tend to raise the effective price of care and

[3]This section focuses on financial incentives facing individuals at the point of deciding what health care to purchase. There are other aspects of financial incentives that may affect things like whether or not an individual joins a CDHP or not, including premiums and expected health care costs. Some work also emphasizes the importance of tax incentives,[11] which can convey a substantial subsidy to funds placed in PHAs that can be advantageous relative to using after-tax dollars to pay out-of-pocket costs in other types of plans.

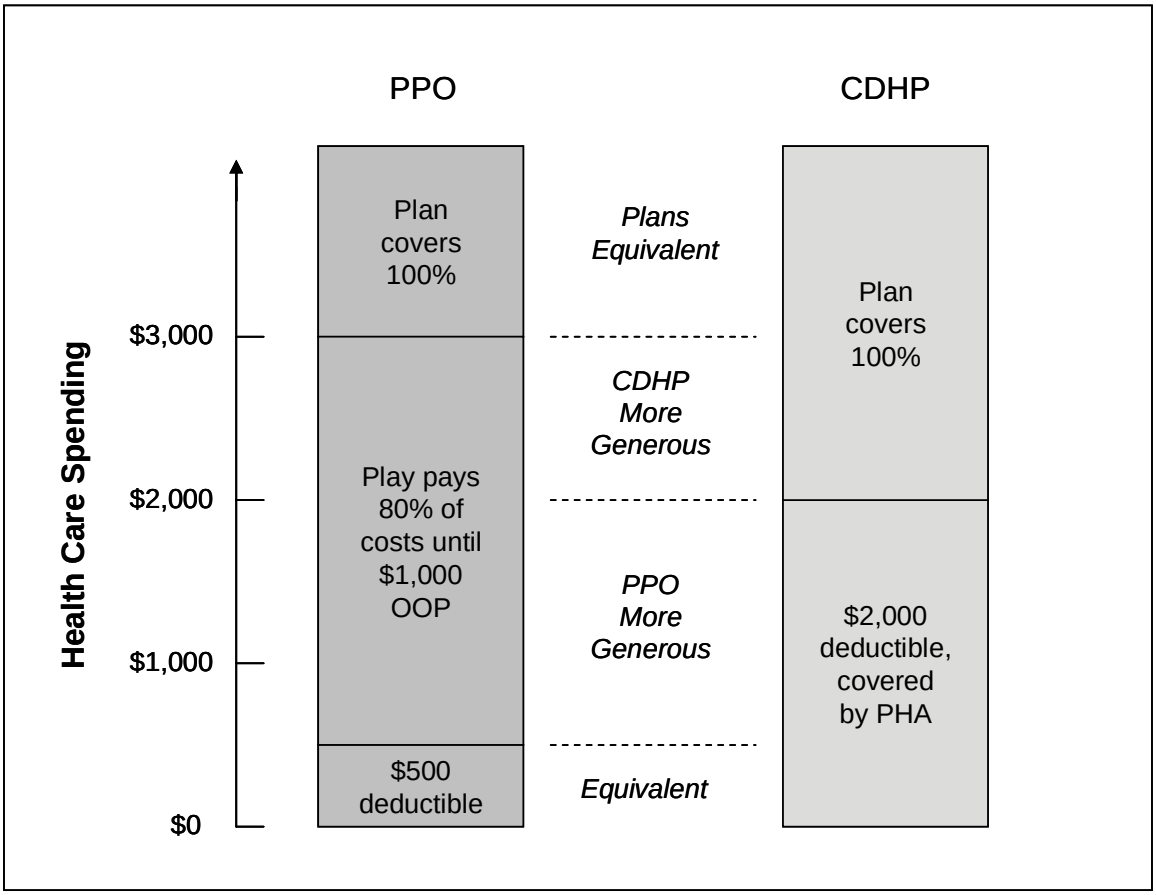
may thus make patients less likely to consume care on which they place relatively low value. This type of incentive would be strongest for individuals with MSAs or HSAs because of the more permanent nature of the benefits that accrue to them as a result of limiting their spending on health care.

A careful look at CDHPs suggests that the extent of the price incentives could vary substantially depending on the level of spending and other factors. First, the strongest incentives will face consumers who have not reached the deductible of their insurance plan. These consumers will typically face the full price of medical care. However, after they reach the deductible, and their insurance policy begins to cover their care, they would typically face low rates of cost sharing or even no cost sharing.[2, 5] Compared to some traditional insurance arrangements, CDHPs may thus have more generous cost sharing arrangements in certain ranges, and there may be many situations in which the incentives under CDHPs could be very similar to those in other health plans. For example, consider the comparison between a (hypothetical) CDHP with a deductible of $2,000 above which the plan pays all medical costs, and a PPO with a deductible of $500, patient cost sharing of 20 percent until an out-of-pocket maximum is reached at $1,000, and full coverage thereafter (Figure 1). For the first $500 in spending, consumers in the two plans will face the same incentives. Between $500 and $2,000 in annual health spending, the PPO will have more generous coverage since it will cover 80 percent of medical costs for the consumer while the consumer will be responsible for 100 percent of the costs in the CDHP. But, between $2,000 and $2,500 in annual spending, the CDHP will be more generous since at that level the consumer will be 100 percent covered by the high deductible plan but the PPO consumer will still not have met the out of pocket maximum and continue to be responsible for 20 percent of costs. After $2,500 in spending, the two plans are again equal, with consumers fully covered.

Thus, while there would typically be regions in which CDHPs would strengthen the financial incentives facing consumers, CDHPs need not always do so uniformly and may even have weaker incentives than some plans in some spending regions. Specific comparisons would depend on the characteristics of the plans in question. For example, in our hypothetical example, the CDHP did not have any cost sharing provisions above the PHA amount, and some CDHPs may have this. Comparisons between CDHPs and HMOs would also tend to produce different results, since many HMOs have no deductibles and relatively low copayments.

The financial incentives associated with CDHPs will also be a function of the prices that providers charge for services. At spending levels below the deductible, patients in many CDHPs are functionally responsible for paying providers bills themselves (possibly using their PHA). They may thus be subject to variations in prices that providers charge. Virtually all health plans negotiate prices for services with providers and monitor provider bills, but this may not happen as effectively for CDHP spending under the deductible. If patients are systematically subject to higher prices when they are in CDHPs than they would be if they were in other health plans, the effective financial incentives may also vary. In current practice, this does not appear to be a significant issue since most CDHPs appear to contain provisions that regulate the prices charged to consumers in ways that lead them to resemble prices charged in other types of health plans.

Figure 1. Healthcare spending



Tiered Provider Networks

The introduction of tiered benefit designs into health plans has emerged in several health plan contexts in recent years. The central concept of tiered benefits is variation in the prices consumers have to pay depending on the provider or specific type of service they use. One common form of tiered benefits uses different copayments for different pharmaceutical products. A tiered pharmacy plan could, for example, impose a copayment of $5 for a generic drug and a copayment of $15 for a branded drug with similar characteristics. Many pharmacy plans go even further to place pharmaceuticals into multiple tiers based on their prices and other characteristics, charging the highest copayments for very expensive drugs with less expensive substitutes and the lowest copayment for the least expensive generics.

In this study, we focus on a variant of this strategy that develops tiers for health care providers. In this type of plan, hospitals or physicians that meet criteria imposed by the health plan are identified and favorable financial terms are provided to patients who seek care at those providers. For example, a plan may divide hospitals in its networks into two tiers, one for those hospitals that provide the plan with favorable prices, and a second tier for hospitals that are less favored. The plan may then establish different copayments for hospitals in the two tiers, so that

patients who use hospitals in the more-preferred tier face lower cost sharing. In practice, the tiers have typically been defined based on cost criteria, but in principle other criteria such as quality scores could be used as well.

Most tiered networks to date have also focused on hospitals, though some insurers have been developing tiered networks involving physicians. Aetna and UnitedHealth, for example, have worked to develop tiered networks for specialist physicians.

The fundamental strategy behind the development of tiered provider networks is to reward patients for using providers that are designated as preferred by plans. The imposition of price variability would provide incentives for patients to choose the less expensive providers favored by the plans.[4]

Tiered network plans have thus far been a small segment of the market. A Hewitt survey reports that 5 percent of employers offered a multi-tiered network plan in 2005, and that 7 percent did so in 2006.[8] The Kaiser/HRET survey data suggested that 2 percent of employers were "very likely" and 16 percent "somewhat likely" to adopt tiered network plans in 2005.[7]

Quality Information

A central tenet of strategies that place greater responsibility on consumers for managing their health care is that they will have adequate information to make those choices. Thus, a key feature of consumer directed strategies is the extent to which they provide consumers with the types of information they need to make effective choices. The information needs of consumers, however, will likely vary depending on the strategy.

For example, people enrolled in consumer driven health plans may benefit from information that would help them determine whether or not they need to see a doctor (e.g., information about self-management of conditions), information that might help them determine which doctors to see (e.g., information about the appropriate treatments for given symptoms and information about the comparative cost and quality of providers), and information about the types of treatments they might choose from once they have consulted a physician (e.g., information about the cost and outcomes associated with different treatments[5] or other decision support tools). Along the way, the availability of information about their covered benefits and personal health accounts would be valuable. Individuals with CDHPs might also benefit from information about prevention if they wish to minimize their need to seek care. Correspondingly, researchers report that a variety of tools are either under consideration or are being make available to individuals enrolled in these plans.[4]

Provider tiering, in contrast, promotes consumer responsibility only at the point of choosing among providers for a particular service. As a result, this strategy theoretically suggests a need for providing consumers a more limited set of information including comparative provider

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[4] For further information about tiered networks see (1) Mays GP, Claxton, G, and BC Strunk, "Tiered Provider Networks: Patients Face Cost-Choice Trade-Offs" Center for Studying Health Systems Change, Issue Brief #71, November 2003 www.hschange.org/CONTENT/627/627.pdf ; (2) Robinson JC, Hospital Tiers in health Insurance: Balancing Consumer Choice with Financial Motives" Health Affairs Web Exclusive 2003; (3) Yegian, JM, Tiered Hospital Networks, Helth Affairs Web Exclusive March 19, 2003. (4) Sweeney, K, "Health Plans Embrace Tiered-provider Networks," Employee Benefit News. EBRI, October 1, 2003.; (5) Rosenthal and Milstein, HSR 2004;

[5] Ideally, information about costs would include both information about the costs of specific procedures and information about the likely longer-term costs of treatment strategies, including things like the potential need for and cost of follow-up procedures or the probability of hospitalizations.

quality and price information for a defined set of potential providers. While the lessons from tiering may be relevant for analyzing the potential effects of consumer driven health plans, they represent only a small subset of the potential issues.

Beyond the types of information collected or provided, research suggests that the ways information is presented and the ease with which consumers can grasp the information are crucial determinants of the extent to which it will influence their decisions. Individual characteristics also likely play a role, since some individuals may be more skilled at interpreting or using available information than others.

Evaluating the effectiveness of information in this setting requires addressing a range of issues including the types of information consumers need, the extent to which health plan provide this information, and whether consumers use the available information effectively. Relatively little evidence is available from recent consumer directed initiatives.[4] Earlier literature raises questions regarding the extent to which consumers use the available information,[12, 13] whether the information available has the desired effects,[14] and whether existing information resources are developed in ways in which they will be most effectively used by consumers.[15] It should be noted, however, that earlier evidence was primarily developed in settings where the incentives for consumers to use the information were not as strong as they might be in CDHPs.

Chapter 2. A Conceptual Model

The impact of consumer-oriented health plan strategies such as CDHPs, tiered networks, and improvements in the collection and dissemination of provider quality information will, in principle, be determined by a number of factors. In this section, we discuss a range of factors that are expected to be important determinants of their ultimate effects. We consider two types of factors. First, the consumer-oriented strategies we study manipulate features of health benefits in ways designed to change the economic incentives consumers face, or the information available to them, when they make health care decisions. CDHPs, for example, change the prices facing consumers in certain spending ranges. These changes are expected to have impacts on the decisions of patients and providers. We term the central changes in benefits or information availability that are brought about by the use of these strategies as the "core mechanisms" by which they work.

Second, the impact of the core mechanisms would be affected by the context within which they operate. The importance of the overall financial and non-financial aspects of the setting within which decision making agents act to the impact of any given set of specific incentives has been discussed previously.[16-18] Hellinger concludes from a review of the effect of managed care on quality that assesement of any management strategy, which would include these kinds of benefit design changes, requires detailed information about the characteristics of health plans, providers, and enrollees to draw conclusions.[16] Hutchison et al. point to the importance of considering the context in which financial incentives are designed or implemented to understand their potential effects.[17] Dudley et al. show how incorporating contextual factors into their conceptual model of quality based purchasing can shed important light on the functioning of financial incentives in different situations.[18]

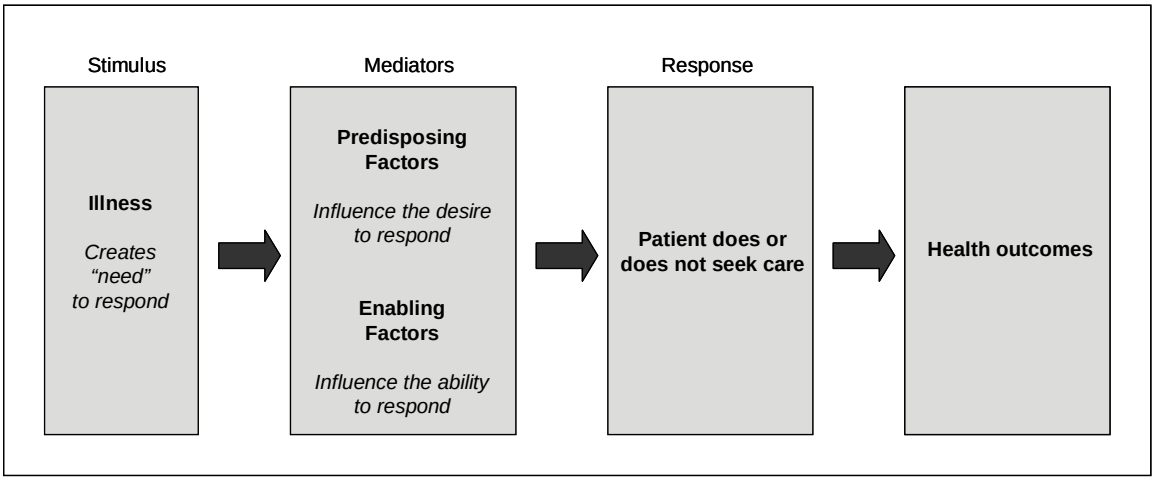
To our knowledge, no conceptual model of the factors influencing the impact of specific benefit design changes considered here has been proposed. The model we propose incorporates both the core set of incentives targeted by benefit design changes and incorporates important aspects of the context within which they operate.

Adapted Andersen Framework

The aim of CDHPs, tiered networks, and improved collection and dissemination of provider quality information is to influence decisions made by patients and their health care providers about the use of different types of care. It is these utilization decisions that ultimately determine the impact of benefit design changes on the quality and cost of care.

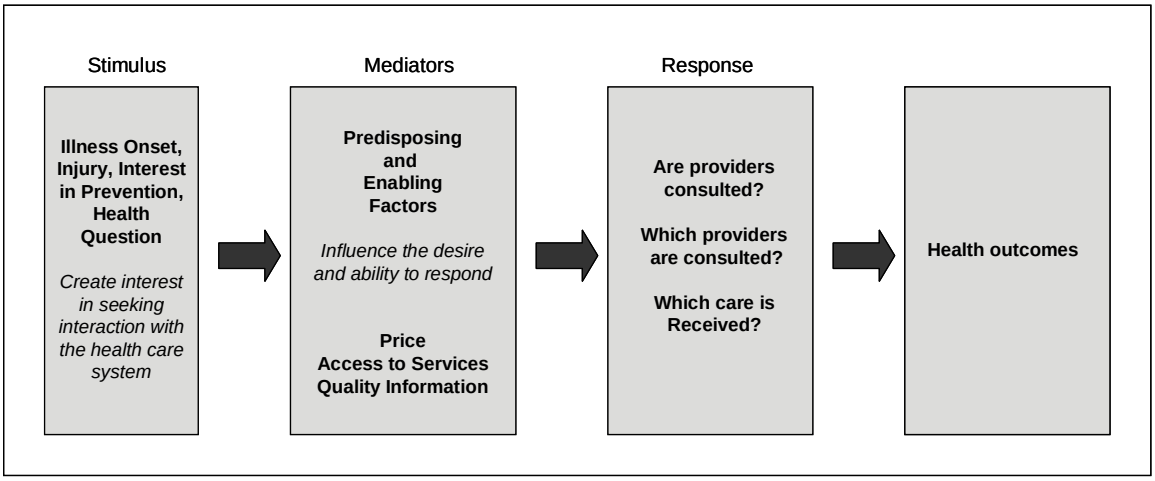
From the perspective of an individual patient facing a situation that could give rise to the consumption of health care, the Andersen framework[19] provides a valuable foundation (Figure 2). The classic implementation of this framework considers a patient's response to an illness. Patients are conceptualized as responding to stimuli – the illness onset – that creates a "need" to take action. Whether they take action and what type of action they ultimately take is mediated by "predisposing factors" that influence their desire to respond to the stimulus, and "enabling factors" that influence their ability to respond to the stimulus. Patients ultimately arrive at the point of either using or not using services that, in turn, influence their health status.

Figure 2. Andersen Model



The general framework presented in this model is a useful point of departure for the development of an adapted model that can incorporate many of the important features important when assessing consumer-oriented strategies. In our adapted version of the model (Figure 3), patients may respond to any number of events that might produce an impulse toward seeking interaction with the health care system. The extent to which they do is influenced by mediating factors, which may include economic factors as well as other things. In our application, it can sometimes be unclear which factors are predisposing and which are enabling, in the classic sense of the Andersen model, so we simply retain the category of mediating factors. From the standpoint of assessing consumer-oriented strategies, we expect three factors to be particularly important mediators: the price of services, the ease with which they can access services and the types of services most easily accessible, and the availability of information. These factors will influence the response the individual ultimately makes to the stimulus. In this setting, the principle choices affected are expected to be whether or not the patient seeks any interaction with the system, which providers are consulted, and which services are ultimately received from those providers. These, in turn, determine the spending and outcomes.

Figure 3. Adapted Andersen Model



Core Mechanisms

Prices of Services

The central focus of CDHPs and tiered networks is on changing the prices that consumers face for purchasing health care services. Economic theory clearly predicts that the price facing consumers can influence the number and type of services they consume, and empirical evidence confirms this prediction.[20, 21] Evaluating the impacts of price changes will require understanding both the size of the price changes and the strength of the response to price changes. Fully understanding the size of the price changes brought about by consumer-oriented strategies may be challenging. While a goal of CDHPs is to raise the prices facing consumers for some of their health care spending, the amount by which prices change will vary with the provisions of the CDHP and the situation from which consumers are moving (i.e., the health plan to which the CDHP is being compared). As discussed in the previous section, CDHPs would not be expected to increase prices at all levels of spending, and may, in fact, lower effective prices in some ranges.

In tiered networks, the relevant comparisons are the prices that are charged for access to providers in different tiers. These price differences would typically be relatively clearly delineated by the plan in the form of copayment amounts or other cost sharing differences associated with using providers in different tiers (though there could still be differences in the baseline prices charged by different providers, which could also affect the price paid).

The strength of the response to price changes is the second key component of evaluating the ultimate effect of a price change. Economic analyses of price responsiveness often focus on the "price elasticity of demand," which is a measure of how responsive consumption of a given service is to a change in price. Demand for services that are "price-inelastic" responds relatively little to price changes, whereas demand for "price-elastic" services responds more strongly. Price elasticities can vary from service to service, and from consumer to consumer, so that evaluating the impact of consumer-oriented strategies may require knowing which services, and which consumers, are of primary interest. The effects of a price change in CDHPs could, for

example, affect the use of preventive care differently than the use of acute care because the price elasticities differ.[22]

The interaction of price effects and the appropriateness of services gives rise to some of the important questions about the impacts of CDHPs on health care delivery and outcomes. Consumers will tend to use health care services for which the benefits they perceive they will obtain exceed the price, in money or time or other goods that they will pay to obtain it. If CDHPs increase the prices that consumers face, some services that would have been consumed at lower prices may now not be consumed. Some observers worry that consumers may not value services like preventive care sufficiently highly, and thus may decide to forego these services under a CDHP if preventive care is subject to the deductible. More generally, an important concern about CDHPs is the extent to which they may cause consumers, who may undervalue some services, to forego appropriate care from which they would benefit.

It is also worth noting that price effects can influence more than just the product whose price changes. Consumption of products that are substitutes or complements of the product that had its price changed could also move in response to price changes.

Provider Access

Patient choices of providers are also expected to be influenced by the restrictions that their plan places on provider choice. HMOs, for example, usually tightly regulate the set of providers that their members can see and have their care covered by the plan. HMOs also often require primary care physician referrals before specialists can be consulted. PPOs also often place some constraints on patient choices of providers. Many CDHPs, on the other hand, place less emphasis on patients using particular sets of providers than other types of plans, even going so far as to impose no restrictions on provider choice or direct access to specialists. Understanding the impacts of consumer-oriented strategies, and CDHPs in particular, would require understanding the provider access provisions under the consumer-directed plan as opposed to a comparison plan.

As with prices, the ultimate effect of changes in provider access depends not only on the extent of the changes in provider access, but also on the extent to which consumers respond to the changes. Some consumers may exhibit stronger responses than others. For example, consumers with long standing relationships with providers may not change providers as quickly as consumers without such relationships. Some services may be more amenable to provider search than others.

Availability of Information

Information about the price and quality of different treatments and providers would be expected to improve the ability of consumers to make informed decisions and enable them to make trade-offs between cost and quality. Whether an individual seeks information depends on the costs and benefits of obtaining this information.[23] By increasing the out of pocket cost associated with seeking care, consumer-driven strategies would likely increase the extent to which individuals seek information on the costs and quality of health care.[24] Because the benefits and costs of obtaining information vary across individuals, we would also expect differences across individuals in the extent to which they use these resources.[25] For example, those who are in worse health would be more likely to use information resources because the

expected benefits would be greater. The effect of education, in contrast, could be mixed. While the costs of accessing information in this setting may be lower for those with higher levels of formal education, the benefits of information resources may also be lower. This is because they may have been better informed in the absence of the information tools provided by the health plan. Finally, the extent to which information influences treatment patterns will depend on the quality of information available. If these resources are difficult to use or provide consumers with relatively little new information, we would expect them to have relatively little impact on decision-making.

Contextual Factors

The adapted Andersen model provides a valuable way of conceptualizing the ways that core forces associated with the policy instruments under consideration can influence decisions about health care use. The insights gained by simply considering these factors are important. In fact, many discussions of CDHPs, tiering, and quality information provision get no further than these core plan features. However, going no further than the core mechanisms would leave out crucial information. In particular, the context within which the core mechanisms operate may have a very important impact on how effectively they function. Incorporating contextual information adds important nuance to the narrow core concepts and emphasizes the importance of context for assessing the contributions of existing empirical evidence. We focus on two key types of contextual factors: the types of consumers who end up in different health plans, and the effects of the health care market context within which health plans operate.

Selection

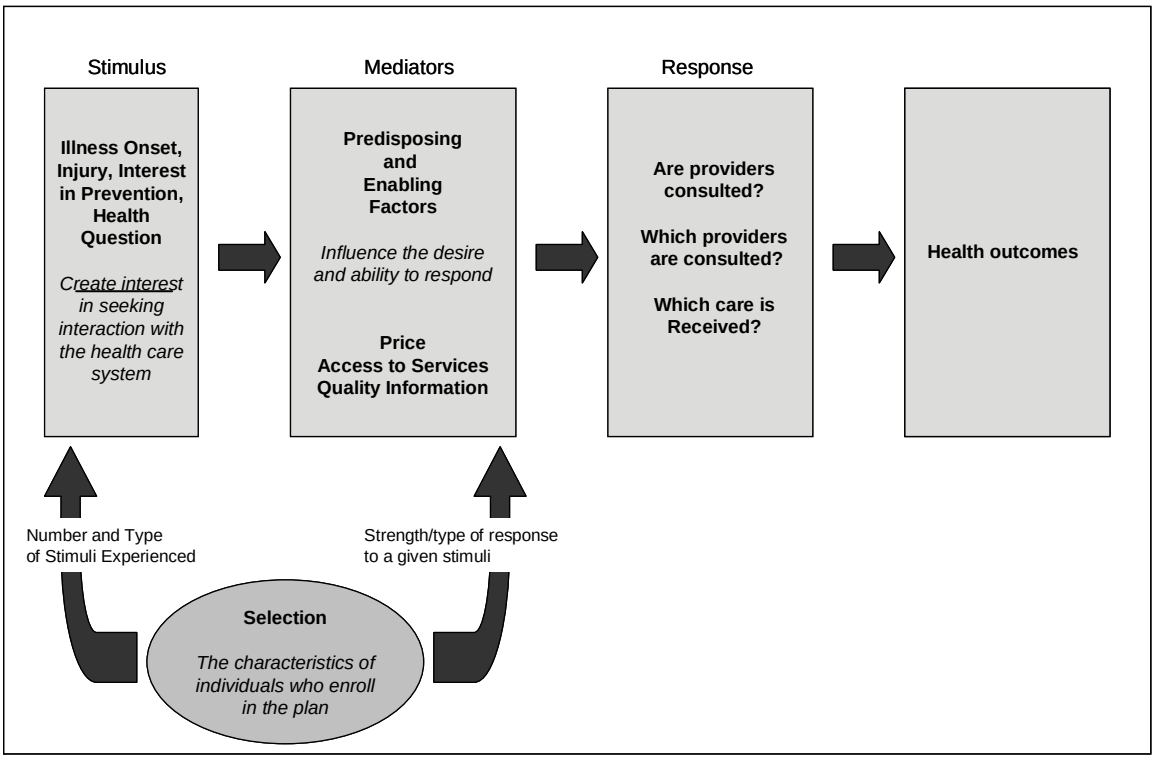
In settings where there are choices of different health plans, or choices of whether or not to join a plan, questions about selection can arise. In this context, one key group of contextual factors thus concerns the groups of people who end up in health plans with different features in settings with some choice. The way an individual will respond to any given stimulus like an illness onset may vary in magnitude according to the characteristics of the individuals making the decision (Figure 4). For example, economic theory would predict that moving people from a standard PPO into a CDHP will tend to raise the prices they face for some of their routine medical care and thus lead them to tend to use less care. However, price effects may be stronger for lower income individuals than higher income individuals, or for persons with mild conditions compared to those with (what at least seem to them like) more pressing problems. If CDHPs or tiered network plans in particular attract individuals that disproportionately reflect certain demographic or health characteristics, the effects of benefit design changes in the CDHP-covered population may be different than might be expected in the general population.

Similarly, the provision of information about quality of care may differentially influence consumers with different health problems, different levels of experience with other health care providers, different levels of education, or other variations in characteristics.

There may also be differences in the rate at which different populations experience the onset of an illness, the occurrence of an injury, or other stimuli. Healthier populations need to see physicians less frequently than sicker populations. If the groups of individuals who join CDHPs or tiered network plans have, on average, different characteristics or preferences than those who do not, there could be differences in the number and type of stimuli experienced in the enrolled

population compared to the general population. This could, in turn, lead to variations in health outcomes or expenditures that are unrelated to the specific incentives that are incorporated into the plan.

Figure 4. Adapted Andersen Model with Selection Characteristics



The characteristics of individuals who ultimately end up enrolled in CDHPs or tiered network plans will be a function of decisions at a number of levels. Achieving a full understanding of the ways that CDHPs and tiered networks could affect care, costs, and outcomes would require investigating the various factors that would affect selection outcomes at each level. Though a complete discussion is beyond the scope of our undertaking here, some key points are evident.

For many Americans, choices by an employer about which plans to offer will determine whether or not they have a realistic choice of joining a CDHP or a plan with a tiered network plan. Economic theory argues that employer choices will be affected by the premiums charged by health plans in their choice set and the benefits they offer as well as the types of workers employed within a firm.[26] Some employers may find the price-benefits tradeoff more attractive than others, and thus it does not seem likely that all firms will be equally likely to offer CDHPs or tiered networks.

At a second level, employees of firms that offer CDHPs or plans with tiered networks along with other plans will make decisions about whether or not to enroll in the plans using consumer-oriented strategies. This will be a function of the costs and benefits of joining these plans, relative to other options. Economic theory suggests choices will be influenced by factors such as the types and characteristics of other plans available, the total premiums charged and the amount of premium paid by the employee out of pocket, consumers' expectations about their healthcare

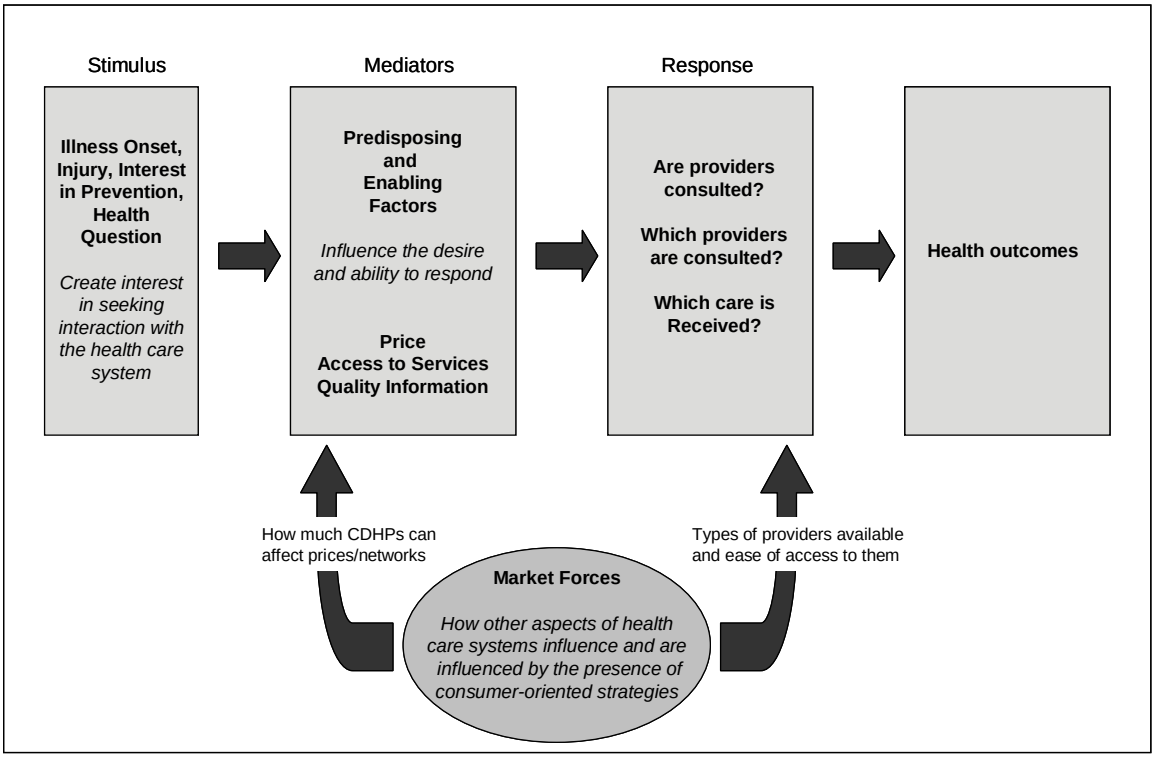
utilization and information about the quality of different plans.[27-30] Different employees would be expected to view these cost and benefit tradeoffs differently, and thus one would not necessarily expect uniform patterns of enrollment in CDHPs across employees in different circumstances.

Market Factors

The impact of benefit design changes will also vary with the features of the insurance and health care delivery market (Figure 5). For example, the number and organization of physicians and hospitals in an area will affect the ways that individuals respond to the incentives in their health plans. Market characteristics may also affect selection into plans. The presence of more or less competition between insurers, for example, may affect the characteristics of competing plans and premiums, which may influence who enrolls in which plans.

It may also be that there are important relationships between the adoption of CDHPs and tiered networks and the characteristics of the insurance and health care delivery markets. Increasing enrollments in CDHPs in an area may, for example, favor some types of physicians or some ways of arranging provider networks over others ultimately leading to changes in delivery system structures.

Figure 5. Adapted Andersen Model with Market Forces



Adequacy and Value of Available Information

The extent to which information about quality of care, prices, or other important factors is easily available and of high quality is likely to be a determinant of the extent to which information can serve as a mediator and the ways in which it does so. Information that is perceived to be of high quality and that is easily accessible seems more likely to mediate decisions about the use of services than lower quality, less accessible information. In addition, the ways that information is presented may also be important. Information that is presented in ways that consumers find informative and salient may have stronger impacts.

Interactions Between Consumer-Oriented Strategies

In practice, consumer-oriented strategies are often considered in combinations, either in a comparative framework in which questions about the relative strength of one type of consumer-oriented strategy relative to another are considered, or in the context of attempts to adopt multiple consumer-oriented strategies that would work well together. Indeed, in the long run developing packages of strategies would seem to be a sensible approach since some strategies seem naturally inclined to work together. Principally, improvements in the collection and dissemination of quality information would seem to be very complementary to the use of CDHPs or tiered network strategies.

Conclusions From the Conceptual Model For Literature Evaluation

One central conclusion of the conceptual model for literature evaluation is that one consumer-oriented strategy need not be the same as the next. CDHPs could vary in their exact provisions and their interaction with other strategies, as could tiered networks or attempts to improve provider quality data collection and dissemination. Understanding the ways that the specific characteristics of consumer-oriented plans influence outcomes will require amassing evidence that compares plans across a range of characteristics. Studying the effects of a given consumer-oriented plan seems likely to provide some, but only some, information about how a different consumer-oriented plan would perform.

A second conclusion is that context is likely to have an important impact on the effects that consumer-oriented strategies ultimately have on health care delivery, costs, and outcomes. The effects that adoption of a CDHP has in one setting may be quite different from effects in other situations. Several aspects of context seem important, including the types of people who enroll in the plans, which will be determined by the types of employers who offer CDHPs, whether they offer only a CDHP or offer a CDHP along with other plans (and if so the number and types of other health plan choices they make available), and the health care market setting in which the plan is offered. Because of the importance of context, studies of consumer-oriented plans in one setting may provide only limited information about how a similar plan would perform in a different setting.

Chapter 3. Review of the Literature on CDHPs

In this section we report results of a review of literature on consumer directed health plans (CDHPs). As defined above, these plans typically pair a high-deductible plan with a tax-advantaged spending account and, in many cases, provide consumers with information about the cost and quality of care to make purchasing decisions. The objective of the literature search was to conduct a comprehensive review of the published scientific literature that provides evidence specific to CDHPs.

Key Questions

We broadly defined the literature of interest as studies of either the prevalence or effects of CDHPs, and we identified the following key questions for which we sought evidence from the literature:

CDHPs Prevalence

- *What are prevalence rates and expected trends for CDHPs?*

Consumer-driven Strategies and Quality-improvement

- *What is the evidence on the effect of CDHPs on quality improvement or lack of improvement?*

Consumer-driven Strategies and Access to Care

- *What is the evidence that consumer directed health plans affect utilization of health care services, including doctors visits, ER visits, medications, and diagnostic tests? Is there evidence to determine whether effects on utilization are related to necessary vs. unnecessary services? What is the evidence that consumer-directed health plans discourage access to appropriate care?*
- *Is there evidence that effects of CDHPs on utilization vary depending on the underlying health status, income or education of individuals?*

Consumer-driven Strategies and Cost-containment

- *What is the evidence that consumer-directed health plans reduce health care expenditures?*

Based on our conceptual model, which indicates that the selection of individuals into CDHPs may affect analyses of their effects, we also included the following research question:

Enrollment in Consumer Driven Health Plans

- Are certain types of individuals more likely than others to enroll in these plans?

Literature Review Methods

Inclusion and Exclusion Criteria

Our literature review included studies of the prevalence or effects of CDHPs. For a prevalence study, the inclusion criteria were that it had to include original survey data that was representative of a defined geographic area. A study of the effects of CDHPs had to be based on the implementation of an actual CDHP with clearly articulated research methods. In other words, we excluded theoretical discussions of the likely effects of CDHPs as well as studies that simulated the effects of CDHPs based on estimates derived from studies not specific to CDHPs. Estimates of the effects of CDHPs, such as those from firms implementing the plans or consultants, were not included if they did not provide adequate information to identify the methods used in the study. We did not restrict our analysis to randomized controlled trials. Although these types of studies provide the highest quality evidence, we felt it was unlikely that any studies meeting this criterion existed. In addition, we also felt that studies that were not randomized could provide valuable evidence. For the purposes of the literature review, we defined a CHDP as a high deductible health plan combined with a spending account.

Search Strategy

The objective of the search strategy was to identify all published articles estimating the prevalence and effects of CDHPs satisfying the search criteria outlined above. We divided the search into 4 sections intended to identify literature using different key concepts. The first search was for studies that explicitly examined consumer driven health plans using a comprehensive list of key words and acronyms. The second search was based on the existence of a reimbursement, saving, or spending account. The third searched for the phrase "high deductible", and the final search was based on acronyms for the spending accounts. Because the acronyms are used for a variety a non-related terms (for example M.S.A. is used for both medical savings account and metropolitan statistical area), we combined these acronyms with search terms intended to limit the results to applicable topic areas.

We searched both Medline (using OVID) and Econlit to incorporate both the medical and economics literatures. Using OVID, we searched Ovid MEDLINE (R) In-Process and Other Non-Indexed Citations (1966-present). For both databases, the searches were current as of January 31, 2006.

Database Searches

We searched Econlit and MEDLINE® using the search terms identified in Tables 1 and 2.

Table 1. Econlit searches and number of articles identified

Search Terms	Citations Retrieved
(("consumer directed" OR "consumer-directed" OR "consumer driven" OR "consumer-driven" OR "consumer health plan*" OR "consumer healthcare plan*" OR "CHDP" OR "CDHC"))	25
((("reimbursement account*" OR "saving account*" OR "savings account*" OR "spending account*") and (health* OR medic*)))	62
(("high deductible*" OR "high-deductible*"))	6
((health OR medic*) And (hsa* OR msa* OR hcra* OR hra*))	46
Number of Unique References	125

Table 2. MEDLINE® searches and number of articles identified

Search Terms	Citations Retrieved
("consumer directed" or "consumer-directed" or cdhp or cdhc or "consumer driven" or "consumer-driven" or "consumer health plan$" or "consumer healthcare plan$").mp.	352
exp "medical savings accounts"/ or "reimbursement account$".mp. or "saving account$".mp. or "savings account$".mp. or "spending account$".mp.	367
("high deductible$" or "high-deductible$").mp.	19
(exp "Health Care Economics and Organizations"/ or exp "Consumer participation"/) and (hsas or hsa or msas or msa or hcras or hcra or hra or hras).mp.	473
Number of Unique References	1096

Results for the Literature Search

Articles Included

Our database searches resulted in 125 citations from Econlit and 1,096 from MEDLINE®. We included for further consideration all materials that were identified in MEDLINE or Econlit. This captured some studies that were indexed, but which did not appear in peer-reviewed journals. We eliminated 87/979 based on either title or abstract review. We evaluated the remaining articles based on a full text review. In the full text review, we eliminated an additional 32/107 articles. After these exclusions, we were left with 6 citations from Econlit and 10 from MEDLINE. The number of unique articles was 10.

Table 3. Identification of reviewed studies

	Econlit	Medline
Total citations retrieved	125	1096
Excluded based on title and/or abstract review	87	979
Excluded based on full text review	32	107
Total articles eligible for review	6	10
Number of unique articles reviewed from literature search	10	
Additional articles identified during review process and retrieved	6	
Additional articles reviewed	1	
Total number of articles included in the literature review	11	

During our full-text review, we identified and attempted to retrieve a number of additional articles or sources of information. In many cases, they were studies produced by private firms that are not publicly available. For example, Lee and Zappert[31] report data from a study produced in 2005 by Harris Interactive, yet we were unable to obtain a copy of the report from the organization. We also searched the websites of select research organizations to identify additional reports not published in the academic literature. These included the California Healthcare Foundation, The Commonwealth Fund, The International Health Economics Association, The American Public Health Association, The National Bureau of Economic Research, The Economic Research Initiative on the Uninsured, The Employee Benefits Research Institute, The Robert Wood Johnson Foundation, and The Kaiser Family Foundation. While we identified work in process through these sources, we did not include them in our review since they were not finalized. The six additional citations identified in Table 3 represent studies we identified through these types of sources. Of these 6 citations, we added 1 which met our review criteria.

Articles Excluded

Ultimately we reviewed a relatively small subset of the articles we identified. In this section, we discuss the major types of reasons articles were excluded:

- Citations were not in the relevant subject area

  Analysts use a variety of different terms to describe the types of health insurance plans that met the study criteria. For example, a plan of this type can be referred to as a "consumer-directed health plan," a "consumer-driven health plan," or a "high-deductible health plan," and each of these terms may have a corresponding acronym (e.g., – CDHP and CDHC). The spending accounts associated with these plans are also identified by a variety of terms and associated acronyms including health savings accounts (HSAs), health spending accounts (HSAs), health reimbursement arrangements or accounts (HRAs), and medical savings accounts (MSAs). Yet, the terms used to describe both the plans and the savings accounts are sufficiently general that they identify research on unrelated topics. As a result, designing a search strategy that incorporated the full range of commonly used terms to describe these plans resulted in a relatively large number of false positives. Although some of these articles were in distinctly different literatures,[32] a significant number represented studies in the area of health services research. For example, our acronym list identified references to Health Systems Agencies (HSAs) established during the 1970s,[33] The New York State Health Care Reform Act (HCRA),[34] metropolitan statistical areas (MSAs),[35] and master settlement agreement (MSA).[36] By including the term "spending account" in our search, we retrieved articles on flexible spending accounts.[37] This was also an issue with respect to the terms used to describe the health insurance plans. For example, our search strategy identified studies of "consumer-directed advertising"[38] and "consumer-directed services."[39] We were able to exclude many of these types of studies based on the abstract review.

- Studies of the implementation of similar types of plans in other countries

A relatively small literature exists describing the experience of the few countries, most notably Singapore, that have adopted a version of medical savings accounts in their health care system.[40] We ultimately excluded these studies because the structure of the plans and the environment in which they were implemented differs significantly from that of the U.S., limiting the applicability of the experience with these plans in other countries for U.S. decision makers. In addition, Dixon,[41] who summarizes this literature, concludes that much of the international literature is theoretical and the empirical studies that exist do not provide strong evidence of the effects of MSAs.

- Studies of hypothetical choices made by either consumers or employers.

We excluded studies based on data from surveys of individuals regarding how they were likely to respond in particular situations due to the uncertainty regarding how these findings translate into actual decisions. This exclusion applied to studies of both potential plan enrollees[42] as well as employers.[43]

- Simulations of the likely effects of adopting these types of plan.

Researchers have also conducted simulations of the likely effects of adopting these types of plans, and much of the literature examining the effects of the implementation of MSAs is based on simulations.[44] Simulations are generally based on behavioral parameters developed from existing studies, making assumptions and conducting sensitivity analyses when necessary, and analyze the adoption of these plans under a particular set of circumstances. In the case of high deductible health insurance accompanied by a spending account, estimating the effects requires estimating both the effect of enrolling in the plan on utilization and outcomes as well as the types of individuals that are likely to enroll in a plan under particular circumstances. Estimating the selection effects requires making assumptions regarding the behavior of employers, insurers and consumers, and the selection effect will ultimately influence estimates of the utilization effects. While these studies have demonstrated that the likely effects of these plans in the form of reduced utilization and higher cost sharing ultimately depends on what types of individuals enroll, they also point to considerable uncertainty in both the types of individuals who would enroll and the ultimate impact on the stability of the insurance market.[44-47] In a similar vein, relatively recent studies simulating the impact of legislation enabling the implementation of health savings accounts have also reached somewhat differing conclusions on their likely effects on the number of uninsured.[48, 49] Studies that incorporate simulation approaches have also been reviewed in the recent report from the Rand Corporation.[4] In summary, we think that the simulation results have relatively limited applicability for purchaser implementation decisions in the current context.

- Case studies providing anecdotal evidence from adopters.

We excluded reports of the effects of the adoption of these types of plans by particular organizations if they did not provide adequate information to evaluate the methodology by which the effects were estimated.[50] We also excluded studies in which

researchers have compiled evidence from this "grey literature".[51-53] Although many of the studies provide interesting examples, we excluded them because it was not possible either to evaluate the validity of the findings or to determine in what types of settings the findings would be most applicable.

- Prevalence studies that did not indicate the population represented by the study sample.

  This exclusion applied primarily to sources that we identified by following up on references in reviewed articles. One example is a series of studies by America's Health Insurance Plans (AHIP), a national association of health insurers, which is based on surveys of member organizations of HSA enrollment. We excluded these studies due to uncertainty regarding the extent to which they adequately identify the enrolled population.

- Studies identifying the theoretical effects of these types of plans.

  Finally, we excluded studies which identify the theoretical effects of these types of plans, but did not provide original evidence. These studies provide guidance for considering potential effects but only limited evidence for decision makers interested in knowing the actual effects of these plans.[3, 54, 55]

Review of Articles Identified

We reviewed the 11 articles identified in the literature search. Table 4 summarizes key features of these articles.

Table 4. Summary of key articles

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 1. Parente[56] **O, S**	"To compare medical care costs and utilization in a consumer-driven health plan (CDHP) to other health insurance plans."	Health plan administrative records and demographic data from a single large employer that introduced a CDHP in 2001 were linked to health plan cost and utilization data for workers and dependents.	The study sample included a subset of employees (and their dependents) who were assigned to 1 of 3 cohorts: (1) continuously enrolled in a health maintenance organization (HMO), (2) continuously enrolled in a preferred provider organization (PPO), or (3) enrolled in a CDHP in 2001 and 2002, after previously enrolling in either an HMO or PPO in 2000. While employees had a choice between 2 CDHPs, the majority enrolled in a plan with health spending account/deductible threshold combinations of $1,000/$1,500, $1,500/$2,250 and $2,000/$3,000 for single, 2-person, and family contracts, respectively. The authors present means of demographic, socioeconomic and health status characteristics across cohorts in year 2000, prior to the introduction of the CDHP to assess selection by enrollees into plans. Health status/case mix is measured using diagnosis codes from claims. The authors compare differences in utilization by calculating regression-adjusted estimates of expenditure and utilization, both total and by category (hospital, physician and pharmacy), for each cohort and each year. Controls include time trend, plan choice and interaction with time trend, age, gender, case mix, health shock, income, covered lives, and use of flexible spending account.	The CDHP cohort was healthier, as measured by case mix, and higher income than either the HMO or PPO cohorts in the year prior to enrollment in the CDHP. The case mix in the CDHP deteriorated more rapidly over time than the case mix of the other two plans. Before enrollment in the CDHP, adjusted total expenditures were lower for the CDHP cohort than the other two cohorts. By the second year of enrollment in the CHDP, the CDHP cohort experienced lower adjusted total expenditures than the PPO cohort but higher expenditures than the HMO cohort. The employer-paid portion of adjusted expenditures was highest for the CDHP cohort in 2002 and employee costs in the CHDP were consistently lower than in the PPO and higher than in the HMO. Adjusted hospital expenditures and hospital admissions rose more quickly for the CDHP cohort than the other 2 cohorts during the study period, particularly during the final year.	Significantly higher hospital admissions and costs for CDHP cohort in the final year are consistent with 2 possible explanations: 1) enrollees demonstrated significant moral hazard once the deductible was met, and 2) enrollees reduced their use of preventive care which ultimately resulted in higher future expenditures. The study, however, does not provide evidence to identify the cause of higher spending in the CDHP in the final year. Represents the experience of single employer which may not be representative. In this case, the findings are potentially driven by particular characteristics of the benefit design including a) small gap between PCA and deductible and b) no cost-sharing once deductible met. In addition, the case mix variable, which is linked to claims, may be problematic, particularly as a control for health status in making comparisons over time and across plans in utilization.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 2. Christianson et al.[57] **O, S**	"To assess the experience of enrollees in a consumer-driven health plan."	A 2003 telephone survey of University of Minnesota employees regarding their 2002 health benefits.	Compare enrollee satisfaction with customer services, overall satisfaction, and plan switching behavior between those in CDHPs and those in more traditional plans. The CDHP is the same as in Summary 4[57]. Use multivariate or logistic regression to adjust for differences across plans in enrollee characteristics. Examine use of different CDHP features and assessment of the usefulness of these features among CDHP enrollees.	CDHP enrollees were older, equally likely to report a chronic condition, and higher income than enrollees in other types of plans. CDHP enrollees significantly more likely to call customer service and to have a "paper-work experience." They were significantly more likely to have problems with both. CDHP enrollees had a significantly lower satisfaction rating but the magnitude of the difference was very small. CDHP enrollees were significantly more likely to switch to a different plan at the end of the enrollment year, although the magnitude of the difference was small. 34% of respondents in the CDHP indicated they had used the website with lower proportions indicating they had used it for particular functions. 87% of respondents in the CDHP indicated they would recommend the plan to a friend, 46% indicated they had a particularly positive experience and 24% indicated they had a particularly negative experience.	The results suggest the CDHPs attract high-income and older enrollees, but provide little evidence of favorable selection based on health status. The results overall indicate less satisfaction among enrollees in the CDHP than enrollees in other types of plans, although the differences are small. The information offered by the CDHP was not widely used by enrollees. The limitations of the study are as follows: 1) significant differences between survey responders and non-responders could cause bias; 2) experience represents employees at one firm which may not be representative; and 3) CDHP-enrolled employees are "early adopters" and may not be representative of later adopters.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 3. Gabel et al.[9] **P**	To report employers' knowledge, perceptions, and present and future offerings of consumer driven health plans.	2003 supplement to Kaiser/HRET Survey of Employer-Sponsored Health Benefits, a random sample of 1,856 U.S. firms with three or more workers.	Descriptive statistics, including univariate tables and cross-tabulations. Responses to survey questions were weighted to be representative of U.S. employees. (Survey was in 2003 before MMA authorizing HSAs was signed. CDHP incidence is measured here by an HRA coupled with a high deductible plan.)	In 2003, approx. 2% of workers could choose an HRA plus high deductible plan, 4 % in firms with 5000 or more workers. 82% of employers' were familiar with HRA plans and 31% of employee benefit managers reported being either somewhat or very likely to consider offering an HRA plan in the next two years. HRA plans were about twice as common in large firms as in small firms.	Employers were very familiar with and showed significant interest in consumer driven healthcare, suggesting possible increased growth in CDHP prevalence in the near future. Employers were generally skeptical about HRAs ability to control costs and improve consumers' decision- making and quality of care.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 4. Parente, Feldman and Christianson[58] **S**	To determine who chooses a CDHP in a multiplan, multiproduct setting, focusing on whether the CDHP attracts sicker employees.	2002 data from an employer (University of Minnesota) payroll system supplemented with an employee survey.	Estimated conditional logit models, interacting plan indicators with employee characteristics, to examine the relationship between employee characteristics and the likelihood of choosing the CDHP. Employees could choose from the CDHP, an HMO, a PPO, and a tiered network product based on care systems.	Neither chronic illness nor the employee's age had an effect on the likelihood of choosing the CDHP relative to choosing the traditional HMO. However, the results suggest that the CDHP experienced favorable selection based on both health status and age relative to the PPO. Higher income employees as well as those who had a preference for access to a national provider panel or a plan that included their physician in the panel were more likely to choose the CDP than the HMO.	The results suggest that CDHPs may experience favorable selection based on health status relative to some types of plans but not others. Some people enroll in CDHPs to obtain access to a broader set of providers. This highlights the importance of the specific context in which the CDHP is offered. For example, in this study, people with strong preferences for broader provider access may have preferred the Definity Plan because it provides access to the Mayo Clinic at a lower premium relative to the only other plan that offered this access. Generalizability is limited by the fact that it was the first year of the plan offering, that relatively few people choose the plan, and the measure of health status was based on self-reported chronic conditions.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 5. Fowles et al.[59] **S**	To examine the effect of demographics, health, and stated preferences on the choice of a CDHP and workers' satisfaction with the enrollment process.	2001 mail survey of 4,680 employees in the corporate offices of Humana Inc. who were eligible for health care benefits.	Employees were offered a choice among 2 HRA-type CDHPs as well as 2 PPOs, an HMO, and an out-of-area plan. One CDHP has an allowance of $500, then 80% coinsurance until $2,000 of further out-of-pocket charges were incurred, and finally 100% coinsurance. The other had a $500 allowance, then a $2000 deductible, and finally 100% coinsurance. The plans offered allowances rather than HRAs because the tax-sheltered status of HRAs was unclear when the plans were being designed and implemented. The primary outcome of interest was employee's self-reported choice of a health plan. The authors estimated a logit model of the choice of either one of two offered CDHP plans versus any of the other plans offered. Covariates include gender, education, race, self-reported health status, health care utilization, and stated preferences, among others.	Employees with excellent and very good health (self-reported) were significantly more likely to choose the CDHP than those with worse self-reported health. Employees reporting greater utilization (receiving treatment for chronic condition, physician visit in past 4 weeks, have a personal physician) significantly less likely to choose CDHP. Blacks, non-exempt workers significantly less likely to choose CDHP. Employees reporting "lowest premium" as most important plan characteristic significantly more likely to choose CDHP.	At Humana, CDHPs appear to begin with favorable selection. Experience only of a single employer may not be representative. In this case, the CDHP provider network was "unusually restrictive" and there was no ongoing internet support or decision tools for enrollees. Plans were new and first year enrollment may not be indicative of longer term trends.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 6. Tollen et al.[60] **S**	"To determine whether the offering of a consumer-directed health plan (CDHP) is likely to cause risk segmentation in an employer group."	Administrative data from Humana, Inc. on approximately 10,000 covered employees and dependents from benefit years beginning July 1, 2000 and July 1, 2001.	The company offered 3 plans (2 PPOs and 1 HMO) in the first year of the study, and added 2 CDHPs in the second year. The CDHPs both had $500 HRAs, but differed in their cost sharing and employee premium contributions. Funds in the HRA could NOT be rolled over and could only be applied to utilization within a specified network of providers. Comparisons of average demographic characteristics and prior use claims data for each of the five plans offered by Humana beginning July 1, 2001. Claims for PPO enrollees are likely to be underreported due to unavailability of claims for both out-of-network utilization and utilization prior to reaching the deductible. Comparisons were also made specifically for prior Rx claims since the Rx plan was similar across all offered plans and would therefore be less affected by differences in benefit design.	Most enrollees in the CHDPs had previously enrolled in a PPO. Demographic comparisons do not show any clear pattern of segmentation. CDHP members had higher average income. Claims data show favorable selection into CDHP. For example, prior year Rx claims for CDHP enrollees were approximately 50% of the mean of all enrollees.	"Offering a consumer-directed plan alongside traditional HMO and PPO coverage led to risk segmentation." The CDHP plans attracted healthier members. Claims data were required to see this selection; it was not evident from demographic comparisons. The findings represent the experience of a single, early adopting firm. The Humana arrangement differed from many others in that the HRA was not allowed to rollover and the provider network of the CHDP was relatively restrictive. In addition, there were many simultaneous changes in the benefit package. Some of the analyses are biased toward finding evidence of favorable selection based on health status into the CDHP. This is because the CDHPs drew most heavily from the PPOs, and utilization was under counted in the PPO.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 7. Rosenthal and Milstein[1] **P**	To examine the prevalence of consumer-directed health plans and the extent of decision support in such plans.	Survey of 680 health plans (986 products) by Mercer Human Resource Consulting in 2003, including supplemental questions specific to consumer-directed benefits.	Tabulations of survey data. (CDHP, as defined in this literature review, corresponds to Rosenthal and Milstein evidence on Health Reimbursement Account Models (again, prior to MMA authorization of HSAs)).	3% of surveyed health plans reported offering CDHPs with positive enrollment in 2003, enrolling a total of approximately 466,000. Modal HRA dollar amount was $1000 (mean $824) and modal deductible $1500 (mean $1654). Standard deviations not reported. Greater decision support services in the CDHP plans than in tier-benefit models. For example, quality information on individual physicians or groups was available to 91% in CDHPs but only 9% in tiered models.	High growth in enrollment in CDHPs; "nonetheless, projections attributed to industry insiders such as '20 percent of the market by 2005,' are difficult to reconcile with our survey responses." "Plans that specialize in offering HRA models still dominate the HRA market, although to a lesser degree than previously reported." Survey had 70 percent response rate but some plans may not have been identified or contacted by Mercer. Prevalence may therefore be somewhat underestimated.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 8. Minicozzi [61] **S, O**	To study the characteristics of tax filers reporting MSA enrollment and the effect of characteristics such as income on MSA enrollment.	IRS tax return data from 1997-2001.	Descriptive statistics on the characteristics of the universe of tax units reporting MSA enrollment. Probit model of MSA enrollment for self-employed tax filers in 2001. OLS model of the effect of MSA/high deductible plan on plan premiums.	By tax year 2001, only 247,041 different tax units had ever reported having an account. Approximately 25% of tax filers reporting MSA enrollment reporting being uninsured for the prior 6 months. "In any given year, most taxpayers withdrew less than 60% of what they contributed, but about one-fifth withdrew at least 90%." Income positively associated with MSA account duration. For the self-employed, the probability of choosing an MSA is lower for below-median income and for those over 55 but higher for tax filers between 45 and 55. Marginal tax rate is not significant once income is controlled for. "MSA holders have policies that cost an estimated 40.5% less" than policies of self-insured filers who do not have MSAs. Based on American Academy of Actuaries estimates the higher deductible should account for, at most, a 30% lower premium, suggesting favorable selection into MSAs.	The results suggest that MSAs were disproportionately chosen by high income individuals. While analysis of the relationship between demographic characteristics and MSA holding does not provide clear evidence of favorable selection (middle-aged were more likely than younger individuals to have an MSA), analysis of differences in health insurance premiums for MSA holders and other insured self-employed individuals provides evidence of favorable selection. Long-term MSA account holders built balances suggesting "that there is also a savings component to HSAs." The case of MSAs may not be representative of more recent CDHP developments because 1) MSA regulations allowed either employee or employer, but not both, to make contributions, and this may affect account balances and saving; and 2) MSAs were restricted to small employers and the self-employed. In addition, some of the analyses in the paper focus on the self-employed who may not be representative.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 9. Rosenthal, Hsuan and Milstein [2]	To investigate the early experience of first-generation consumer-directed health plans and the suitability of their design for reducing the growth in health benefit spending and improving the value of that spending.	Case studies of 14 consumer-directed health plans.	Definition of consumer-directed health plans is a plan that includes 1) enhanced tools to support informed choice of providers and treatments; 2) expansion of programs to enable consumers to manage their health and health care; and 3) stronger financial incentives for consumers to control spending. Examined both spending account and tiered consumer-directed plan models. Plans included 7 spending account models, 3 premium-tiered models, one premium-tiered customized-benefit design model, and 3 point-of-care tiered models. Did not include HSAs since they had newly entered the market. Prioritized plans with larger market share and those operating for at least a year. Included plans serving large (mostly self insured) and small (mostly fully insured) employers. Analyzed the implementation of each plan for a specific employer. Interviewed the plan's medical director or marketing executives and the employer's human resource or health benefits director. Asked questions in 6 categories: 1) targeted purchasers; 2) benefit design; 3) consumer decision support and health/health care management; 4) quality of care/ financial protections; 5) observed risk segmentation effects among enrollees; and 6) impact on enrollees' satisfaction, reenrollment rates, services use, plan-paid costs, out-of-pocket costs, and provider behavior.	Summarized results restricted to those relevant to spending account plans. Most of the spending account plans reported internal estimates of reduced service use and total spending because of the introduction of the new models. Plans attributed most savings to service substitutions by consumers rather than reductions in overall rates of service use. (However the methods used to derive this information are not presented in detail.) Several spending account plans reported annual renewal frequency above 90 percent both employers and employees with a choice of plans. No plans adjusted cost sharing by income of enrollee. Only 2 spending-account plans provided any provider-specific cost information and this was limited to unit price. Spending account plans undertook engaging consumers in their managing their own health through the use of nurse-staffed telephone help lines (100%); health risk assessment linked to staffed risk reduction programs (>80%), shared decision support/health coaching (>60%), and case management (100%).	Illustrates the wide variety of CDHP benefit design features available in the market. Does not provide evidence of how specific CDHP design characteristics affects outcomes.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 10. Fronstin and Collins[62] P, S, O	To provide national data regarding the growth of high-deductible health plans with and without savings accounts and their impact on the behavior and attitudes of health care consumers.	Randomly chosen sample from Harris Poll Online, Harris Interactive's online sample of Internet users who have agreed to participate in research surveys. Adults with high-deductible health plans both with and without HSAs or HRAs were oversampled (>=$1,000 for single coverage and >=$2,000 for family coverage). Individuals were surveyed in October 2005.	Descriptive statistics based on survey data. Consumer-driven health plans (CDHPs) were defined as high deductible plans with a spending account. High deductible health plans (HDHP) were defined as high deductible plans that were eligible for, but did not have, savings accounts.	- 1% of the privately insured population ages 21-64 were enrolled in CDHPs and 9% were enrolled in HDHPs. - Individuals in CDHPs and HDHPs are less satisfied than individuals with comprehensive health insurance with their health plan and are less likely to recommend the plan to a friend or work colleague. - People with CDHPs were slightly more likely to be in excellent or very good health than those with comprehensive health insurance though the percentage of people reporting a health problem (either particular condition or fair or poor health) was similar across the 3 groups. Those in CDHPs were less likely to be obese and those in both CDHPs and HDHPs were less likely to smoke and more likely to report exercise. Those in CDHPs were higher income than those in the other 2 groups. - Little difference across health plans in self-reported health care use, although individuals enrolled in CDHPs and HDHPs are more likely to report than they had avoided, skipped, or delayed health care due to costs. - People with CDHPs and HDHPs were more likely to spend a large share of their income on out-of-pocket health care expenses than those in comprehensive plans. - Individuals in CDHPs and HDHPs exhibit more cost-conscious behavior in their health care decision making than individuals with comprehensive insurance. - Individuals in all 3 types of plans were about equally likely to report that their plan provided provider cost and quality information but those in CDHPs and HDHPs were more likely to report that they had used the information.	As of Oct. 2005, a small proportion of the population had a high deductible health plan and even fewer had health savings accounts. People in these plans are less satisfied with their coverage, report higher levels of out-of-pocket spending, and report more financial related constraints on utilization than those in more generous coverage. People in these plans report similar levels of health care utilization as those in more generous plans. Relatively little information is available on provider quality. There is evidence of favorable selection into CDHPs and HDHPs for some, but not all, health measures.

Table 4. Summary of key articles (continued)

Reference/ Article Category*	Research Question	Data Source	Study Design	Results/Findings	Comments and Conclusions
Summary 11. Claxton, Gabel et al.[63] (P)	To document the availability, enrollment, premiums, and cost sharing for high-deductible health plans that are offered with HRA or HSA qualified plans.	A 2005 survey of employer health benefits conducted by Kaiser/HRET based on a random sample of firms with 3 or more workers.	A high deductible health plan (HDHP) is defined as a health plan option that has a deductible of at least $1,000 for single and $2,000 for family coverage.	1/5 of employers offering health benefits offered a high deductible health plan. Jumbo firms (5,000+ workers) were more likely than smaller firms to offer and HDHP. About 4% of firms offering a HDHP offered either and HRA with the plan, and HDHP that is HSA-qualified or both. Nearly 4% of employers that offered health benefits offered one of these arrangements. Deductibles average $1,870 for single and $3,686 for family coverage in HRA plans and $1,901 for single and $4,070 for family coverage in HSA-qualified plans. 1 in 3 employers offering an HSA qualified high-deductible health plan do not contribute to workers' HSAs. 1.6 million employees are enrolled in HDHPs with an HRA – representing more than 2% of covered workers. 810,000 workers are covered by an HSA-qualified HDHP offered by their employer – about 1.2% of covered workers.	Results are not necessarily comparable to earlier KFF/HRET employer surveys due to changes in the questionnaires. One explanation for the relatively low offer rate of HSA-qualified HDHPs is that although they were authorized in 2003, the Treasury Deparment didn't issue regulations for the implementation of HSAs until summer 2004. This might have discouraged emploers from offering HSA-qualified HDHPs in 2005.

*Category:

O = Outcomes (Cost, Quality, Expenditures, Satisfaction)
S = Selection
P = Prevalence

Conclusions From Literature Review

Summary of Evidence Available in the Existing Literature

The existing literature published literature on CDHPs is limited in size and scope in some important ways, and not fully able to address the research questions of strongest interest. Nonetheless, the available evidence does provide useful information about the performance of some CDHPs in some dimensions, albeit with a number of limitations. This section summarizes the information that is available in existing literature. The next section outlines key limitations in the current literature.

- *CDHP's Experience Favorable Selection (at Least in the First Round)*

  Most of the studies that have examined worker choices among plans at firms that offered a choice of plans including a CDHP have found favorable selection in a number of dimensions for the CDHP relative to one or all of the other offered plans. Evidence of favorable selection based on income is particularly strong: higher incomes are found to be associated with CDHP choice by authors listed above in Table 3.4, Summaries 1, 2, 4, 6, and 11.

  The research also tends to find, although not unanimously, favorable selection by health status. For example, in Summary 1, Parente et al. find initial favorable CDHP selection based on their case mix measure. Fowles et al. (Summary 5) report that employees with excellent and very good self-reported health were more likely than those who reported worse health to choose the CDHP. Fronstin et al. (Summary 10) find that, although there are only small differences across plan types in self-reported health, CDHP enrollees are less likely to report being obese, less likely to report that they smoke, and more likely to report regular exercise than those in more comprehensive plans. However, Christianson et al. (Summary 2) find no significant differences in self-reports of health by type of plan. Tollen et al. (Summary 6), using the less subjective measure of Rx claims in the year prior to enrollment, find that Rx claims for (future) CDHP enrollees were approximately 50 percent of the mean of all enrollees, though their simple demographic comparisons did not show evidence of any segmentation. Parente et al (Summary 4) distinguish between types of plans and find no evidence of selection against the HMO plan but favorable selection for the CDHP by health and age relative to the PPO plan. Indirect evidence of favorable selection into MSA/high deductible plans is provided by Minicozzi (Summary 8) based on lower premiums for MSA plans than American Academy of Actuaries estimates would be warranted simply due to their lower deductibles.

  Although the evidence of favorable selection is relatively strong, some caveats must be kept in mind. Because of data limitations, most of these studies report results based on

only one year of CDHP experience. CDHP early adopters may have different characteristics than later adopters. Perhaps more importantly, the CDHP experience itself may also affect selection either as enrollees leave the plan or experience different outcomes or incentives over time. In fact, one study does provide evidence of changes in the composition of the CDHP population over a two-year period. While Parente et al. (Summary 1) report initial favorable selection for the CDHP, the case mix in the CDHP deteriorated more rapidly over time than the case mix of the other two plans. In addition, as we also discuss below, the degree of selection may be affected by aspects of the benefits design such as the breadth of the provider network. Of these early studies, for example, Fowles et al. (Summary 5) point out that the Humana CDHP network was "unusually restrictive," while Parente et al. (Summary 4) suggest that the employees in their study may have been attracted to the CDHP because of its access to providers at the Mayo Clinic. The stronger favorable selection found at Humana could therefore be due to the restrictiveness of the provider network, relative to the network of the plan in the Parente study. Finally, selection issues are likely to be most prominent when there are multiple plans to choose from, and will depend on the specific choice sets available where there is choice. Extrapolation of this evidence to other settings where there may not be other choices, or may be different choices, would be difficult.

- *There are Frequent Reports of Lower Expenditures in CDHP's but More Convincing Evidence is Needed*

Most of the reported evidence on the effect of CDHP's on health care expenditures suggests that expenditures are lower in CDHP's than in more comprehensive plans. In most cases, however, these reports do not provide strong evidence, primarily because it is difficult to assess the methods used to identify the cost savings.[2, 52] One important exception is the finding by Parente et al. (Summary 1) that by the second year CDHP enrollees had substantially higher hospital expenditures and admission rates than enrollees in the other plans. They suggest that this could be due to moral hazard once the deductible was met or reduced use in prior years of preventive care which ultimately resulted in higher expenditures. The study does not provide evidence to identify which, if either, of these explanations is correct. Finally, Fronstin and Collins (Summary 10) provide somewhat conflicting evidence. While they find little difference between individuals enrolled in CDHPs health plans in self-reported health care use, they also find that individuals enrolled in CDHPs and HDHPs are more likely to report than they had avoided, skipped, or delayed health care due to costs. In summary, strong evidence on the effects of CDHPs on utilization and health expenditures is sparse and the evidence that exists is somewhat conflicting.

- *Satisfaction with CDHP's Appears Lower but Lack of Understanding due to Newness of Plans Could Be the Cause*

There is some evidence that CDHP enrollees are less satisfied with their health plan than enrollees in other types of plans. For example, Christianson et al. (Summary 2) report a very small but statistically significant lower overall satisfaction rating for CDHP enrollees than those in other plans. Fronstin and Collins (Summary 10) report larger

differences, with CDHP enrollees again being relatively less satisfied with their plan. It is also important to note that the University of Minnesota employees surveyed in Christianson et al (Summary 2.) had a choice of health plans that included a CDHP, while the respondents to the Commonwealth Survey reported on in Claxton and Gabel et al. (Summary 11) may or may not have had a choice among plans.

As Christianson et al. (Summary 2) point out, it is difficult to know how to interpret small differences in satisfaction. They consider, on the one hand, the possibility that early-adopters might be expected to be *more* satisfied with the plans. But, they also raise the important point, given the newness of these plans, that "some who selected this new option may not have fully understood its implications and therefore could be expected to rate the plan poorly." Long-term measures of satisfaction could well differ from these early reports if a substantial number of CDHP early enrollees were not well informed prior to their choice.

- *One Study Provides Evidence that CDHP Precursor (MSA+High Deductible Plan) Enrolled the Previously Uninsured*

There is very little evidence as to whether CDHP-type plans are providing viable insurance options to those who would otherwise have been uninsured. However, one study does provide some evidence that, in the case of MSA-type plans, a CDHP precursor, this is the case. Using tax return data, Minicozzi (Summary 8) reports that approximately 25 percent of tax filers reporting MSA enrollment also reported being uninsured for the prior 6 months. Minicozzi reports substantial non-response on the question of prior insurance status which could affect this conclusion. When evaluating this evidence, it should be noted that one would expect some fraction of the individuals purchasing any type of insurance to have been formerly uninsured, and it is not clear whether the share reported here is higher or lower than might be found for other types of insurance.

- *Benefit Design Specifics Matter but No Evidence Yet About Optimal Design*

Several studies provide suggestive evidence that specific aspects of the CDHP benefit design may have important consequences for outcomes ranging from expenditures to selection. However, none of these studies tests the effects of particular aspects of benefit design, such as the size of the deductible, size of the "doughnut hole," or copayment levels, due to lack of appropriate data. Estimating the effects of plan characteristics and providing convincing evidence on optimal plan design will require data on outcomes for CDHP enrollees enrolled in plans with variation in these characteristics as well as some way to account for possible differential selection into plans with varying characteristics.

Suggestive evidence that particular design characteristics matter is provided by several of the reviewed studies. For example, Parente et. al. (Summary 1) suggest that their finding of dramatic increases in expenditures for CDHP enrollees in year 2 over year 1 could be a result of a very small "doughnut hole" (especially once there were rollover funds from the previous year) and no coinsurance once the deductible was met. Parente et al. (Summary 4) and Fowles et al. (Summary 5) suggest that the restrictiveness of the provider network may influence the degree of selection experienced by the CDHP,

and a comparison of their results supports this interpretation. Fowles et al. report both a much more restrictive network and much more favorable selection as compared to the results of Parente et al. Although Fronstin and Collins (Summary 10) illustrate that there are a wide variety of plans with substantial variation in plan characteristics, none of the studies had access to detailed data on CDHP plans with varying characteristics and thus none estimated the effects of changing plan characteristics.

Gaps in Existing Literature

Several important gaps in the existing literature were pointed out in the previous section. Perhaps the most important general source of those limitations is the fact that existing literature is focused on a small number of cases. Since the effects of CDHPs are likely to vary substantially with their circumstances, it is thus difficult to compare existing studies and very difficult to draw generalized lessons that could be applied to predict the effects of new implementations. In addition, existing literature has not addressed the full range of treatment, cost, and outcomes that may be of interest, including important questions about the relationships between CDHPs and quality improvement, access to care, the use of needed vs unneeded care, and health outcomes. It seems likely that these gaps exist largely because of the early stage of development of this literature. We expect that as the literature develops further these gaps will be narrowed.

Some of the questions put forward at the outset of this project concerned the ability of the literature to support comparisons between different consumer-oriented approaches. For example, one might wonder whether the more useful strategy is to adopt a CDHP or introduce tiered networks into other types of health plans. Or, one might wonder about synergies between different strategies, such as a comparison of the potential effects of a CDHP alone as opposed to a CDHP in conjunction with expanded provider quality data collection and dissemination. Our review of existing literature found no instances of empirical studies that evaluated the effects of CDHPs relative to other types of consumer-oriented strategies. We also found no studies that provide a basis for drawing conclusions about the differential effects of CDHPs with and without expanded quality data collection and dissemination, or about other synergies between CDHPs and consumer-oriented strategies.

Existing literature is also insufficient to develop guidance about the optimal parameters for CDHP design, such as the optimal level at which to set the deductible, the optimal contributions to the PHA, or other features.

Chapter 4. Observations on the Size and Content of Literature on Tiering

In addition to reviewing of the CDHP literature, we conducted a preliminary investigation into the state of the literature on tiered networks. We searched OVID MEDLINE® using the following search string:

> (exp Health Maintenance Organizations/ or exp Health Benefit Plans, Employee/ or exp Insurance, Health/ or exp State Medicine) and ("tier$").mp

This search yielded 218 articles. We reviewed the titles and abstracts of these 218 articles, and found that almost all of them were something other than studies of the effects of tiered health care provider networks on health care use, costs, or outcomes. Most of the excluded articles fell into one of three categories: studies of tiered pharmacy benefit designs, studies of health care systems in other countries in which there are different tiers of health care coverage, and studies of the U.S. health care system in which the term "tier" is used to refer to different levels of coverage or access to health care providers (e.g., the uninsured getting "second tier" access). Only about 10 studies appeared to be suitable for further investigation. Based on the titles and abstracts, we assume that a reasonably large percentage of these would ultimately be found not to report the results of scientific studies that investigated the impacts of tiered networks on health care use, costs, or outcomes.

In this preliminary investigation, we observed no indication that this literature would provide a basis for comparisons between tiered networks and other consumer-oriented strategies, or information about the ways that tiered networks interact with other consumer-oriented strategies. The Rand Corporation report on consumer-oriented strategies also reported finding limited evidence about the effects of tiered network plans.

Chapter 5. Observations on the Literature on Comparative Quality Reporting About Providers

In general, the literature on quality of care and related issues is very large, encompassing a wide range of topics from identification of appropriate things to measure, to empirical strategies for measurement, to the design of statistical models and risk adjustment methods, to the methods for reporting results, to the ultimate impact that collecting information has on the behavior of health care providers and patients. Quality improvement efforts have been focused on different providers including doctors and groups of doctors, hospitals, long term care settings, and other entities. Some efforts focus on specific health care conditions while some are more general. Efforts to disseminate quality data have targeted individual consumers, groups of consumers, employers, and others. The collective inquiry by numerous researchers and others into issues related to quality has produced a very large literature. Indeed, an Ovid MEDLINE® search on the keyword "quality" in the subject headings Quality Indicators, Health Care, Quality Control, Total Quality Management, Quality Assurance, Health Care, and "Quality of Health Care" yields more than 200,000 citations between 1966 and the present.

Sifting through this literature would be a daunting task without serious efforts to focus the inquiry. In the context of CDHPs, it seems likely that the most valuable searches would target literature on the effects of the dissemination of information about health care providers. However, there are no MESH subject headings related specifically to this area yet. Thus, culling through the quality literature to comprehensively identify the set of articles related to this specific literature seems likely to be a significant undertaking. A report on public reporting of quality data was produced about three years ago by Patrick Romano and Julie Rainwater for AHRQ, and summarized the state of current efforts at the time and evaluative evidence about public reporting of health care performance data.[64] The report aimed to provide salient background for guidance to the AHRQ Quality Indicators program on what indicators might be more or less suitable for public reporting.

Chapter 6. Concluding Observations and Policy Questions

A full understanding of the effects of different consumer-oriented strategies will require extensive additional analysis. Our conceptual model points out the need to study these types of activities in a range of settings in order to fully determine their likely effects. Existing studies are sparse and do not yet provide the needed breadth. This is quite understandable, given the short time that CDHPs and other strategies have been around. Literature on these activities will undoubtedly develop further in coming years.

This report was not intended to serve as a policy setting document. Its scope is to identify conceptual issues related to the interpretation of literature on consumer-oriented strategies, and to provide information from initial inquiries into the state of the literature. Developing a framework for advancing research and policy development in the area of consumer-oriented strategies would, in many ways, be a different undertaking. At the same time, the findings in this report do suggest some important areas for potential future inquiry. Perhaps the overriding policy question in this area is the extent to which new policies should be developed that would encourage or discourage further development of consumer-oriented strategies. More refined questions might focus on which specific strategies should be emphasized or deemphasized, and the extent to which policies should be specific to particular patients or settings.

Existing work is insufficient to answer these questions. Developing well-informed policy will require additional analysis of the cost implications of different strategies, including effects on premiums, out-of-pocket spending by consumers, and spending by health plans. In the case of CDHPs, longer term effects of the PHAs, such as the implicit savings for future medical needs when funds are rolled over, on behavior and future health care consumption would also have to be examined, as would the impacts of increasing the amount of risk borne by consumers. Sound policymaking would also require an understanding of the implications on health care consumption and quality of care, including issues such as the extent to which increased financial responsibility deters consumers from seeking preventive care and other appropriate care.

While some work on these topics has been undertaken, available literature addresses only some of the important underlying questions. More importantly, existing literature addresses these questions in specific circumstances. While, almost by definition, studies will speak most clearly to the specific context within which they are conducted, we believe that the impacts of consumer-oriented strategies could vary substantially from one setting to the next. Ultimately, a range of studies that investigate the impacts of consumer-oriented strategies in different contexts, with different kinds of consumers facing different choice sets, will be required to fill in the picture to the point where the landscape will be sufficiently clearly visible for truly informed policymaking. At this point further primary studies appear to be a priority, and further systematic synthesis less valuable.

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