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CONSUMER-DRIVEN HEALTH CARE: BEYOND RHETORIC WITH RESEARCH AND EXPERIENCE

A SPECIAL SUPPLEMENT TO *HSR*

Carolyn M. Clancy and Anne K. Gauthier
Guest Editors

Articles from the conference with additional commentaries

"Consumer Driven Health Care: Evidence From the Field"
September 15, 2003 Washington, DC

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To be the preferred forum for health services researchers, managers, policymakers, providers, and students (1) to exchange ideas; (2) to expand the knowledge and understanding of the financing, organization, delivery, and outcomes of health services; and thereby, (3) to help improve the health of individuals and communities.

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To enhance knowledge and understanding of the financing, organization, delivery, and outcomes of health services through publication of thoughtful, timely, rigorously conducted, state-of-the-art research and thinking.

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- **Methodological Rigor**
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- **Timeliness**
- **Creativity**
- **Clarity of Thought**
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Guest Editors' Introduction

Consumer-Driven Health Care—Beyond Rhetoric with Research and Experience

The search for ways to stem the rising tide of health insurance premiums and improve the value of care being purchased has entered a new era. Bolstered by the explosion of information technology and prompted by the managed care backlash, "consumer-driven" health care in a variety of changing forms has emerged as a possible solution. The promise of greater consumer control over their dollars, greater choice of providers, personalized decision support, and the potential to stem Americans' propensity for more care without anonymous parties assessing its costs and benefits has appeal to many. But fear of adverse risk selection and disproportionately greater out-of-pocket costs for those who are sicker or poorer draws equal opposition. With ideological differences running deep and with the stakes so high in all directions, it is not surprising that rhetoric and anecdote abound.

What do we mean by consumer-driven health care? Many would agree that the term generally refers to a health benefit design where consumers have a high deductible insurance plan, a personal account funded in various ways to pay for care, a gap between the annual amount put into the account, and an internet-based decision support system. But the names and labels differ, and with explicit legal and regulatory changes in 2002 and 2003 (the most recent of which is the Health Savings Account (HSA) provision of the Medicare Modernization Act (MMA)), the ways in which the plans are structured—and the corresponding incentives that accompany them—can vary a great deal, although the direction of change is shared. Because of this, we made the editorial decision not to ask authors in this issue to standardize their definitions and usages. Instead, you will read about slight variants of meanings and terms such as "consumer-driven health insurance," "defined contribution health plans," "medical savings accounts" (a type of plan authorized by HIPAA in 1996 that, like the new HSAs, has some very specific benefit design elements), and "consumer-centric health plans."

In health services research on market changes and new organizational arrangements and incentive systems, it is frequently necessary to conduct initial research that lumps organizations or plans (our area of interest in this case) into frameworks that ignore features or dimensions that may affect the

outcomes of interest differently. Or, as we have in several articles in this issue, research into new areas may especially benefit from a case study approach, to examine in depth one particular plan. In either case, caution is necessary in generalizing the results to the rapidly evolving models in the field.

With health care issues prominent on the national agenda this year, the degree to which consumer-driven health care will work is of high interest to policymakers, employers and consumers alike. Fortunately, from our vantage point as sponsors of research to improve decision making with evidence, there is a growing thirst in the public and private sectors for solid evidence about the potentials and pitfalls of these new plans. This special issue of *Health Services Research* provides the first collection of research papers on the early experiences of consumer-driven health care along with invited commentaries designed to provide a range of perspectives from plans to policy and to the people affected. It is our hope that this collection will help expand the debate from one based largely on beliefs to one informed by evidence.

The idea for the special issue was born in early 2003 during an important collaboration between The Robert Wood Johnson Foundation's Changes in Health Care Financing and Organization (HCFO) program and The Commonwealth Fund. Just as HCFO had awarded a second major project on consumer-driven health care, the HCFO team (in particular, Anne Gauthier, co-Guest Editor of this issue and director of HCFO's program) was approached by Commonwealth grantees, Jon Gabel and Tom Rice, who were aware of additional work underway at the Kaiser Institute for Health Policy. The group of funders and researchers decided to join forces and resources to plan a conference to disseminate the research in a way that would effectively engage policymakers, purchasers, plans, providers, and researchers and policy analysts as active participants. The conference, held on September 15, 2003, was designed to present preliminary results (refined in the papers presented in this special issue) and bring the data to "real-life" situations by featuring reactions not from academics (that would occur in the paper peer review process), but from employers and health plans administrators and employee representatives who had experience with consumer-driven health care plans in action to hear their interpretations of the research in light of their experience. Policy implications were also important, and were considered by a stellar closing panel including policy scholars Karen Davis and Paul Ginsburg, union leader Gerry Shea, and employer/provider Robert Stevens.

While each study presented at the conference was fascinating on its own, the clichéd observation that the "whole is better than the sum of the parts" was clear to all involved—the collaborating sponsors, the researchers, and the

editors-in-chief of *HSR*. The research summaries had the potential to be packaged into a very valuable special issue, but there were some hurdles particular to this topic that had to be overcome. Most important was the desire to not only have each paper be a scholarly publication, but to make the information available first and foremost to the purchaser audience and their consultants, who would need the data early enough in 2004 to make real decisions about their health care benefits for the next year. The aim of this special issue was to combine the merits of the peer review process with the advantages of relevance and timeliness of the information to inform "real-life" decisions.

This ambitious aim inspired a collective commitment among all involved to complete the editorial process within five months of the conference, an unusual and difficult pace. This commitment was bolstered by the dedication of Co-Editors-in-Chief Harold S. Luft and Ann Barry Flood to facilitating the use of research results by those who need them in a timely fashion. In addition to designing processes to foster shorter than usual review and revision times, they facilitated our being able to promote timely access via a web version of the final papers that was available prior to the printed version.

We then sought commentators, all with a keen interest in the results from a range of perspectives, ranging from purchaser to health plan to consumer advocate to policy observer. We were successful in attracting outstanding experts from the latter three roles, but perhaps not surprisingly, the employers we approached who had much to say at the conference or by phone were simply too occupied with their primary business to have time to write a commentary.

The special issue is divided into three major sections, with a concluding commentary. In the first section, the landscape of the early adopters is carefully profiled, covering the range of plan offerings and insights into which employers are choosing these plans—and why. Rosenthal and Milstein use national survey data of health plans to examine the prevalence of consumer-driven products and the degree to which the products sold embrace the concepts of consumerism. As expected, there were fewer enrollees in the models with personal care accounts (although they had grown substantially, primarily because mainstream managed care plans were entering rapidly into the consumer-directed market). While total enrollment comprised a small number of all insured workers, the trend was increasing. These data will provide an important baseline measure as the market continues to change. LoSasso, Rice, Gabel and Whitmore delve in depth into four firms' experiences. While their data are descriptive, the authors offer a rare clear window into risk selection

issues (early favorable selection in these cases), the interactions between the employers and their employees as the plans were adopted, and the early limited use of the decision support tools (a finding consistent with Rosenthal and Milstein). Parente, Feldman, and Christianson investigate the characteristics of employees choosing consumer-driven health care in one large employer offering several health plan and product options. The results were surprising, particularly the fact that consumer-driven health plan enrollees were no younger or healthier than enrollees choosing the HMO option. They were, however, wealthier as was expected.

Commentaries by Scandlen, a policy analyst and known proponent of consumer-driven health care, and Halvorsen, the CEO of Kaiser Permanente, the nation's largest group model HMO, help interpret the findings. Of particular note, Scandlen emphasizes that consumer-driven health care is an innovation of the market, noting that characteristics of early adopters of an innovation differ in predictable ways from later adopters in a mature market, where sellers use the information from the earlier risk takers to change the product as lessons are learned. Halvorson focuses on the distribution of spending in the population and points out that because the vast majority of health care dollars are spent by a small portion of people, the incentives promoted by the existing models of consumer-driven health care (he focuses on MSAs) will be ineffective for the many healthy individuals in the population, will not promote consumer comparisons for the very sick, and may cause the chronically ill to avoid or postpone necessary care.

The second part of the issue concentrates on consumer experiences in their first year in consumer-driven health care. Christianson, Parente and Feldman survey enrollees of consumer-driven plans and more traditional plans in one large employer and compare their satisfaction along a variety of measures. Fowles, Kind, Braun, and Bertko provide a similar assessment in another employer, Humana, which developed consumer-driven health care options and offered them to its own employees before selling in the larger market. Both studies provide insights into features of the plans that were important to enrollees, who in general were a more sophisticated population (and healthier in the Fowles et al. case). They were satisfied with their overall experience and the plan information features, but these were not used to the degree anticipated by plan designers. Shearer, a consumer advocate, highlights the key findings of each paper, emphasizing that the plans have to date drawn only modest enrollment. She lays out a number of areas for further research for this phenomenon in their effects on the health care system that raise for her significant red flags.

The third section of the issue provides evidence about health care utilization and expenditures in consumer-driven health plans compared with more traditional offerings. Tollen, Ross and Poor analyze employment, enrollment and claims data to assess the extent to which risk selection occurred in the Humana Plan also studied by Fowles et al. Their results were dependent on the data: using demographic data, the consumer-driven health plans did not experience favorable risk selection, but using claims data, favorable selection was pronounced. Parente, Feldman, and Christianson provide one of the first in-depth analyses of whether consumer-driven health care actually affects utilization and expenditures, looking at a single employer. They detail the effects across all types of services and spending and conclude (with careful caveats) that at least in the first year, expenditures were lower overall although higher in certain difficult-to-explain categories, such as hospitals. John Bertko, chief actuary for Humana, reviews the evidence in his commentary and observes that this early work offers the possibility for system-wide cost savings with little adverse effect on the average enrollee but concludes the "jury is still out" on the ultimate effects, and the imperative to continue the research is clear.

Karen Davis carefully reviews all of the evidence in this issue and provides four main conclusions from the body of evidence in this issue. She reaches, as we have, the conclusion that the products are too new to reach definitive determinations about their long-term value. She reviews the research underlying some of the premises of the model, and underscores the fact that the model in current forms is a blunt instrument and does not directly address root causes of higher costs. As a result, she posits that consumer-driven health care is not designed to improve health system performance or the quality, safety, and efficiency of care.

The evidence and commentaries in this special issue, while needing to be interpreted with caution, are rich with lessons to help purchasers, policymakers, plans, consumers and researchers as consumer-driven health care continues to evolve. At the moment, the reality of consumer-driven health care appears to be neither the panacea promoters would wish nor the poison opponents fear, and there are still concerns for how the poorer and sicker will fare. With favorable tax treatment offered under the HSA law that became effective January 1, 2004, and with subsequent favorable regulatory guidance issued through the first half of the year, more employers are likely to embrace this model.

Health services researchers have the opportunity to continue to provide evidence to allow a reasoned public debate as the market evolves. They can

contribute to designing effective decision tools that provide good information about care and providers—not just their costs, but about quality, appropriateness and cost-effectiveness. They can continue to contribute to efforts to learn how best to align incentives facing providers so that mutual goals of value are reached, as this movement evolves. But this opportunity brings obligations as well—to understand the questions that decision makers are asking and to transfer knowledge in a timely and effective manner. While the evidence contained within this issue doesn't provide all the answers, it makes important strides toward a discussion based in fact rather than beliefs.

On a final note, two people contributed significantly to this issue in ways that were critical to its success. Jennifer Edwards, Senior Program Officer at the Commonwealth Fund, served as a key participant in designing the September conference and in conceptualizing this issue, and without her contributions, it would surely have a different shape. Bonnie Austin, Senior Manager at AcademyHealth in the HCFO program, helped to manage all aspects of the editorial process, including assisting the Co-Guest Editors in selecting reviewers and in soliciting commentaries. We appreciate their contributions.

Anne K. Gauthier
Carolyn M. Clancy
Guest Editors

Anne K. Gauthier is Vice President, AcademyHealth and Director, RWJF Changes in Health Care Financing and Organization (HCFO) program, she does not necessarily reflect the views of AcademyHealth or The Robert Wood Johnson Foundation. Carolyn M. Clancy, M.D., is Director of the Agency for Healthcare Research and Quality and Senior Associate Editor of *HSR*, she does not necessarily reflect official policy of AHRQ or the Department of Health and Human Services.

Consumer-Driven Plans: What's Offered? Who Chooses?

Awakening Consumer Stewardship of Health Benefits: Prevalence and Differentiation of New Health Plan Models

Meredith Rosenthal and Arnold Milstein

Context. Despite widespread publicity of consumer-directed health plans, little is known about their prevalence and the extent to which their designs adequately reflect and support consumerism.

Objective. We examined three types of consumer-directed health plans: health reimbursement accounts (HRAs), premium-tiered, and point-of-care tiered benefit plans. We sought to measure the extent to which these plans had diffused, as well as to provide a critical look at the ways in which these plans support consumerism. Consumerism in this context refers to efforts to enable informed consumer choice and consumers' involvement in managing their health. We also wished to determine whether mainstream health plans—health maintenance organization (HMO), point of service (POS), and preferred provider organization (PPO) models—were being influenced by consumerism.

Data Sources/Study Setting. Our study uses national survey data collected by Mercer Human Resource Consulting from 680 national and regional commercial health benefit plans on HMO, PPO, POS, and consumer-directed products.

Study Design. We defined consumer-directed products as health benefit plans that provided (1) consumer incentives to select more economical health care options, including self-care and no care, and (2) information and support to inform such selections. We asked health plans that offered consumer-directed products about 2003 enrollment, basic design features, and the availability of decision support. We also asked mainstream health plans about their activities that supported consumerism (e.g., proactive outreach to inform or influence enrollee behavior, such as self-management or preventive care, reminders sent to patients with identified medical conditions.)

Data Collection/Extraction Methods. We analyzed survey responses for all four product lines in order to identify those plans that offer health reimbursement accounts (HRAs), premium-tiered, or point-of-care tiered models as well as efforts of mainstream health plans to engage informed consumer decision making.

Principal Findings. The majority of enrollees in consumer-directed health plans are in tiered models (primarily point-of-care tiered networks) rather than HRAs. Tiers are predominantly determined based on both cost and quality criteria. Enrollment in HRAs

has grown substantially, in part because of the entry of mainstream managed care plans into the consumer-directed market. Health reimbursement accounts, tiered networks, and traditional managed care plans vary in their capacity to support consumers in managing their health risks and selection of provider and treatment options, with HRAs providing the most and mainstream plans the least.

Conclusions. While enrollment in consumer-directed health plans continues to grow steadily, it remains a tiny fraction of all employer-sponsored coverage. Decision support in these plans, a critical link to help consumers make more informed choices, is also still limited. This lack may be of concern in light of the fact that only a minority of such plans report that they monitor claims to protect against underuse. Tiered benefit models appear to be more readily accepted by the market than HRAs. If they are to succeed in optimizing consumers' utility from health benefit spending, careful attention needs to be paid to how well these models inform consumers about the consequences of their selections.

Key Words. Consumer-directed health plans, health reimbursement accounts, consumerism, tiered networks

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Accelerating growth in health insurance premiums coupled with an economic downturn have generated a renewed focus on cost control in the U.S. health benefits sector. The prevailing vision for cost control in the current employer-sponsored health benefit market does not, however, call for increasingly restrictive managed care plans (Galvin and Milstein 2002). Desire for broad choice and rejection of explicit rationing is widespread, a phenomenon that was in part responsible for the managed care backlash. More than 40 percent of adults surveyed nationally do not support any restriction on choices of physicians, hospitals, or treatment options (Employee Benefit Research Institute 2003) even if such restrictions would result in lower health care costs.

A number of employers and health insurers have embraced new health benefit models with increased consumer incentives to select options that reduce health plan spending and possibly also to select higher-quality options, accompanied by more flexibility with regard to provider and treatment choices. Incentives may encourage more economical or higher-quality selections in all health care decisions or may target only a subset. The primary stimulus of this so-called consumer-directed health benefits move-

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ment has clearly been provided by the perceived need to reduce spending, but its stated goals also include enhancing quality or the ratio of health gain to health insurance spending (value). Sponsors of consumer-directed health benefits often suggest that enabling "consumerism" in health care is the primary objective of these new plans. Critics, however, worry that consumer-directed health plans merely shift more costs onto all consumers or to sicker consumers without conferring upon them the necessary tools to select higher value health care options.

Aside from financial incentives for consumers to select lower-cost and possibly higher-quality options, "consumerism" frequently incorporates two additional concepts: (1) informed choice and (2) active consumer participation in managing health and health care decision making (the consumer as "coproducer" of health as described in the literature) (Hibbard 2003). Informed choice of health plans on the basis of reported clinical quality and patient experience has been the primary emphasis of efforts to leverage consumer involvement to improve health care quality over the past several decades. Newer models more heavily emphasize informed selection of provider options. The typical assumption of consumer choice models is that consumers will not only select better (e.g., higher-quality) options resulting in better cost or quality outcomes in the short run but also that health plans, physicians, and hospitals will thereby be encouraged to compete on the basis of the performance measures that are reported. While health plan and provider report cards have met with relatively disappointing results to date (Scanlon et al. 1998; Schneider and Epstein 1998; Hibbard and Peters 2003), there have been improvements in both measurements and their communication to consumers.

Engagement of consumers in managing their own health risks and making informed decisions about treatment options (including not seeking treatment) builds on preexisting managed care methods; these include health risk assessments, information about self-care and management of chronic conditions, information and patient reminders about preventive health measures, nurse-staffed telephone help lines, and shared decision-making programs (Hibbard 2003). A growing literature documents the effectiveness of these methods, such as reminders and self-care education for improving health outcomes for individuals with diabetes, asthma, and depression (von Korff et al. 1997; Clark 2003).

At the present, the extent of these changes in health benefit plans are unknown, despite the abundance of articles on their policy and business implications (Fronstin 2002; Robinson 2002). The only published empirical

analysis of this emerging trend found that, while growing, consumer-directed health plan enrollment remained low in 2002. The study, which relied on key informant interviews, reported a high degree of variation around plan models and features among the class of plans considered to be consumer-directed. It also suggested that large national and regional health plans were beginning to view consumer-directed models as strategically important products, which might consequently lead to wider diffusion in 2003 and beyond (Gabel, LoSasso, and Rice 2002). In addition to assessing the current prevalence of new models, a key puzzle to unravel is whether consumer-directed health plans provide the necessary tools to engage consumers in choosing and participating in managing their own health.

We sought to update and broaden previous research through a national health plan survey in the first quarter of 2003. Our research examines two broad categories of consumer-directed health plans: (1) health reimbursement account models, and (2) tiered benefit models. Our principal goal was to measure the uptake of these consumer-directed products and examine the extent to which they actively support consumerism. For comparison, we also wanted to gauge the extent to which mainstream health plans are incorporating incentives to select more economical health care options and providing information to support those selections ("decision support"). To this end, we examined the prevalence of such incentives and decision-support strategies among mainstream health plans—specifically, health maintenance organization (HMO), point of service (POS), and preferred provider organization (PPO) plans.

Consumer-Directed Health Plan Models

Most of the press and policy discussion about consumer-directed health plans has focused on so-called health reimbursement account (HRA) models. These plans represent the most distinct departure from mainstream managed care plans, presenting consumers with financial incentives to make cost-conscious choices over a wide range of health care spending decisions up to the plan's maximum out-of-pocket limit. Health reimbursement account models typically combine a high-deductible insurance plan (almost always in the form of a PPO) with an employer-funded account (called, variously, the health reimbursement account, personal care account, personal medical fund, and many other similar terms). The employer-funded account may be used to pay for covered health care services and is generally counted toward the

deductible amount. Thus an HRA with a $500 employer-funded account and a $1,500 deductible implies that once the employer-funded account is depleted, the consumer must spend $1,000 out-of-pocket before insurance will begin sharing the costs of treatment. The psychological aim of the HRA is to induce consumer stewardship for the entire $1,500, rather than for $1,000, and perhaps to set in motion a more careful attitude toward all health care spending.[1] Unexpended funds from the employer-funded account within an HRA, unlike a flexible spending account, may be rolled over (at the discretion of the employer). Also unlike flexible spending accounts, many HRA models use debit cards or require providers to file claims rather than ask enrollees to pay up front for services and file claims for reimbursement.

Tiered-benefit model plans include two distinct types: those that tier premium contributions and those that tier point-of-care cost sharing. Premium-tiered model plans require consumers to contribute more if they select a less-restrictive network, looser utilization management features, or more generous insurance coverage (e.g., lower copayments or coinsurance). Health Net's Vivius product and Humana's Smart Suite and Smart Select products are examples of premium-tiered models, which have also been referred to in the literature as "customized" plans. These plans do not necessarily introduce novel insurance models, although some include an HRA or point-of-care tiered model as an option. Point-of-care tiered models reduce point-of-care cost sharing if consumers select a provider deemed by the insurer to be preferred and therefore placed in a less costly tier. In our analysis, we explicitly exclude from this category mainstream PPO and POS products in which copayment differentials are primarily a function of whether the provider has agreed to accept a discounted reimbursement rate from the plan or to cooperate with care management requirements. Point-of-care tiered models typically start with a PPO or POS contracted network and then introduce differential cost sharing within the network based on broader measures of cost, quality, or both. For example, many of the models include responses to the Leapfrog Group safety survey as quality of care criteria for placing hospitals in tiers.

Data and Methods

We analyzed data from a national health plan inventory to describe the prevalence of consumer-directed health benefits in the United States. Mercer Human Resource Consulting collected information in 2003 from 680 health

plans on a total of 986 HMO, POS, and PPO products to assist purchasers in contracting decisions. The plans report on the design and performance of these products for both self-insured and insured options. Mercer Human Resource Consulting attempts to gather information from the universe of commercial health plans in the United States by combining lists of potential respondents from a variety of sources including, but not limited to, Interstudy, state regulatory reports, and the Managed Care Information Center. As is common practice for health plan surveys, for plans that operate in multiple markets, we count each local or regional entity separately (for those that responded with separate information by market). In total, 70 percent of plans responded to Mercer Human Resource Consulting's request for information and completed an extensive web-based instrument.

The main product-line requests for information ask plans to report a wide variety of information on product characteristics and capabilities. Through a supplemental section, we added questions specifically related to consumer-directed health benefits. Questions in the supplemental section were developed with the aid of a panel of national subject matter experts in health economics, consumer decision making, and health policy.

To quantify the prevalence of consumer-directed health plans, we asked plans to report the number of enrollees that were covered by their HRA model and, separately, any premium-tiered or point-of-care tiered models. For the HRA model, we also asked about the dollar amount of the typical employer-funded account and deductible. For the tiered benefit products, we asked the plans to report whether provider-based tiering was a function of cost, quality, or both, and the typical annual cumulative out-of-pocket difference per enrollee between the most preferred and least preferred provider. The survey also included questions about decision support that were targeted to all consumer-directed health plans (HRA or tiered benefit models.) We first asked plans whether they provided enrollees with information: (1) regarding the average cost of procedures/services such as a routine office visit, (2) to help choose an individual physician or medical group based on comparative cost, (3) to help choose an individual physician or medical group based on comparative quality, (4) to help choose a hospital based on comparative cost, (5) to help choose a hospital based on comparative quality, (6) to help choose a drug based on comparative cost, (7) to help choose other types of options based on cost, (8) to help self-manage a chronic condition. We also ascertained the availability of a nurse-staffed telephone help line.

To put in context our findings about consumer-directed health plans, the survey asked respondents to report for their typical HMO, POS, or PPO plan

whether they had raised, lowered, or left unchanged point-of-service consumer cost sharing and by how much. We asked respondents to include total annual estimated copayments, coinsurance, and deductibles in the calculation of increases in cost sharing. In addition, we included a series of questions to capture efforts of these mainstream plans to engage consumers in making informed health care decisions. First, we asked whether there was proactive outreach to help members with identified medical conditions manage their health. We also asked specifically whether reminders were sent to appropriately identified patients for preventive care services (which include both primary and secondary prevention): cervical cancer screening, cholesterol screening, colorectal cancer screening, diabetic retinal exam, influenza vaccine, childhood immunizations, mammograms, and prostate cancer screenings. Plans were also able to write in other services for which reminders were sent to patients. The survey also captured whether members could complete a health risk assessment on the plan's website, and also whether the website allowed members to develop a health profile. Because just offering health management tools may not be sufficient to motivate active participation, we also asked whether plans offered incentives to promote health improvement. Finally, as we did with the consumer-directed health plan models, we asked about the availability of nurse-staffed telephone help lines.

We report the numbers and percentages of respondents that offered consumer-directed products and totals for enrollment and contracting purchasers. For the dollar values of the employer-funded account and deductible portion of HRA models as well as the gap between the most- and least-preferred provider or drug in the point-of-care tiered products, enrollee-weighted mean and modal values are presented. To describe decision-support features, the direction of changes in cost sharing, and the bases for classifying providers into tiers, we report enrollee-weighted frequencies.

RESULTS

Health Reimbursement Account Models

Table 1 reports the number and percent of plans that offered an HRA model and describes enrollment in and selected features of plans. In total, there were 24 active HRA products in our sample as of January 1, 2003. These plans reported 466,039 enrollees. More than half of these enrollees were covered by four plans that offer only HRA models; the remaining half were scattered

Table 1: Health Reimbursement Account Models

Number and % of respondents that reported having an HRA model	33 (5%)
Number and % of respondents that reported >0 enrollees in the HRA model as of January 1, 2003	24 (3%)
Number and % of respondents that reported >1,000 enrollees in the HRA model as of January 1, 2003	13 (2%)
Total HRA enrollment reported by respondents	466,039
Enrollee-weighted mean HRA employer-funded account dollar amount	$824
Enrollee-weighted mean deductible dollar amount	$1,654
Modal HRA employer-funded account dollar amount	$1,000
Modal deductible dollar amount	$1,500

Source: Authors' calculations from Mercer Human Resource Consulting 2003 Health Plan Survey.

across 20 plans that also offer HMO, POS, or PPO products (data not shown). Only 13 plans had enrolled more than 1,000 beneficiaries as of the beginning of 2003. Nine health plans described an HRA product, but did not report any enrollment as of January 1, 2003. These plans may have launched later in the year or have been in the process of contracting for 2004.

The average enrollee received $824 in the employer-funded account and faced a deductible of $1,654 (the modal amounts for the account and deductible were $1,000 and $1,500, respectively).

Premium or Point-of-Care Tiered Models

Table 2 reports the number of employers and enrollees that participated in premium-tiered benefit plans as well as selected features of tiered point-of-care models. While a somewhat larger number of plans reported that they offered a premium-tiered benefit plan, enrollment was greatest in point-of-care tiered plans. Point-of-care tiered plans had enrolled more than 1.5 million

Table 2: Premium-Tiered and Point-of-Care Tiered Models

Number and % of plans offering premium-tiered models	21 (3%)
Number and % of plans with point-of-care tiered models	18 (3%)
Total enrollees in premium-tiered models	488,753
Total enrollees in point-of-care tiered models	1,553,301
Average approximate difference in out-of-pocket for most versus least-preferred provider	$609
Provider tiers based on:	
Cost	3%
Both cost & quality	97%

Source: Authors' calculations from Mercer Human Resource Consulting 2003 Health Plan Survey.

beneficiaries as of January 1, 2003. For the point-of-care tiered plans, in which consumers are asked to pay more at the point of service for lower-tiered providers, we found that the enrollee-weighted average annual cumulative out-of-pocket cost difference between the most and least preferred providers was $609. Almost all enrollees in tiered benefit models were in plans that placed providers in tiers based on both cost and quality measures. No health plan reported that it placed providers (hospitals, physicians, or combinations thereof) in tiers solely on the basis of quality measures.

Decision Support in CDHB Plans

Table 3 presents the percent of HRA and tiered-benefit models (both premium of point-of-care) that offered decision support in the specific categories we identified. More than 90 percent of HRA enrollees had access to information on the typical cost of procedures and services, while only 13 percent of tiered-benefit model enrollees were offered this information. Comparative cost information on providers—information that would allow a consumer to "shop" across providers—was rarely provided even to HRA enrollees (16 percent and 17 percent of HRA enrollees were offered cost information on doctors and hospitals, respectively). In comparison 20 percent of tiered-benefit

Table 3: Decision Support in Consumer-Directed Plans

	HRA Plans (N = 24)	*Tiered-Benefit Models (Premium and Point-of-Care) (N = 37)*
Information on the average cost of procedures/services such as a routine office visit	93%	13%
Information to help choose an individual physician or medical group based on comparative cost	16%	20%
Information to help choose a hospital based on comparative cost	17%	13%
Information to help choose an individual physician or medical group based on comparative quality	91%	9%
Information to help choose a hospital based on comparative quality	99%	57%
Information for self-managing a chronic condition	34%	13%
Information to help choose prescription drugs based on comparative cost	89%	9%
Access to a nurse-staffed telephone help line	99%	51%

Source: Authors' calculations from Mercer Human Resource Consulting 2003 Health Plan Survey.

model enrollees were offered such information for physicians, while only 13 percent were given cost information to help choose a hospital. Comparative quality information was almost universally provided to HRA enrollees, for both hospitals and some physicians or medical groups. While more than half of tiered-benefit model enrollees received comparative quality information for hospitals, less than 10 percent received this information for physicians. Information to help consumers better manage a chronic condition was provided to only 34 percent of HRA enrollees and 13 percent of tiered-benefit model enrollees. The majority of enrollees in HRA models were offered cost information for selecting prescription drugs, while only 9 percent of enrollees in tiered benefit models had access to these tools. Finally, a nurse-staffed telephone help line was provided to virtually all HRA enrollees and 51 percent of tiered-benefit model enrollees.

The enrollment-weighted frequencies of reported decision support mask some differences across subgroups of plans (data not shown). In particular, the few plans that offer only HRA models, in which a large share of HRA enrollment is now concentrated, are more likely to provide most elements of decision support than the mainstream managed care organizations with HRAs.

Consumer-Centered Health Management (and Cost Sharing) in Mainstream MCOs

In Table 4, we report the responses of mainstream HMO, POS, and PPO plans to a series of questions about consumer-centered health management and cost sharing. Nearly all HMO and POS plan enrollees are in plans with proactive outreach programs for members with identified health conditions (most of which are identified through claims data.) Moreover, about half of POS enrollees were in plans that reported using patient reminders for preventive care services. Enrollees in HMOs and PPOs were much less likely to be in plans that reported sending reminders for preventive care (differences significant with a p-value $< .01$.) By far the most common condition for which reminders were sent was asthma (medication reminder); reminders for hemoglobin A1c testing for members with diabetes, and immunizations were also frequently mentioned (data not shown).

Among HMO and POS enrollees, respectively, 71 percent and 51 percent of enrollees had access to an online health risk assessment tool; fewer (69 percent and 28 percent, respectively) were offered the capability to create an online health profile. Among PPO enrollees, 55 percent were offered an online health risk assessment and could also develop a health profile. Almost

Table 4: Consumer-Centered Health Management and Cost Sharing in Mainstream HMO/POS/PPO Plans

Enrollment-Weighted Frequencies

	HMO (N = *257*)	*POS* (N = *309*)	*PPO* (N = *420*)
Proactive member outreach for members with identified conditions	97%	99%	NA
Reminders sent to patients for preventive care	15%[a]	48%[a,c]	12%[c]
Website allows members to complete a health risk assessment	71%[a,b]	51%[a]	55%[b]
Website allows members to develop a health profile	69%[a]	28%[a,c]	55%[c]
Incentives used to promote health improvement activities	47%[a,b]	29%[a]	26%[b]
Nurse Advice Line—in development or current	91%	96%	97%
Cost sharing increased between 2002 and 2003	65%[a]	91%[a]	78%
Cost sharing remained the same between 2002 and 2003	35%[a,b]	9%[a,c]	22%[b,c]

Source: Authors' calculations from Mercer Human Resource Consulting 2003 Health Plan Survey.

Note: The total number of responses exceeds the unique number of respondents because some plans offer products in multiple categories (HMO, POS, PPO).

[a] $p < .01$ between HMO and POS

[b] $p < .01$ between HMO and PPO

[c] $p < .01$ between POS and PPO

half of HMO plans offered consumers incentives to undertake health improvement activities, while only 29 percent and 26 percent of POS and PPO plans respectively did so (pairwise differences between HMO and the other two products are significant with p-values $< .01$). Because such incentives may include discounted equipment or athletic club memberships, they may be designed for the purpose of attracting healthy enrollees or motivating enrollees with risky health behaviors to change. The majority of all plan types reported that they offered enrollees access to a nurse-staffed telephone advice line or were in the process of developing this capability.

Most mainstream managed care plans reported that cost sharing (copayments, coinsurance, or deductibles) increased in their typical plan in 2003 compared to 2002 and no plans reported decreased consumer cost sharing. Health maintenance organization enrollees were the least likely to face increased cost sharing (65 percent) compared to POS (91 percent) and PPO (78 percent) enrollees. The average increase in estimated annual consumer cost sharing, including deductibles, copayments, and coinsurance, among those plans that reported an increase was just under 5 percent (data not shown).

DISCUSSION

Consumer-directed health plans have been presented in the press as both a mechanism to shift the locus of decision making from managed care plans to consumers and as a palatable way for employers to reduce or share with enrollees double-digit premium increases. More mainstream managed care plans have also been reported to be developing updated models with increased choice, financial incentives for consumers to choose lower-cost options, and information to support their decisions.

In this study, we report findings from a national health plan survey that included questions designed to measure the uptake of health reimbursement accounts, premium-tiered and point-of-care tiered model plans, and consumer-centered elements of mainstream MCOs. Despite its high response rate (70 percent), the survey may not have captured all consumer-directed health plans. There may have been plans offering HRAs or tiered benefits that were not identified nor contacted by Mercer Human Resource Consulting and nonrespondents may also offer consumer-directed health benefit products. Naturally, this concern is particularly salient for our estimates of total enrollment. To address this concern we made every effort to compare the responses from our survey with other reports of HRA and tiered-benefit models and to ask that experts on consumer-directed health benefits within Mercer Human Resource Consulting identify any important omissions. In several cases, we contacted plans directly to confirm or amend enrollment data.

Another limitation of our approach is that responses to Mercer Human Resource Consulting requests for information are not primarily elicited for research purposes but rather for employer contracting. This accounts no doubt for the relatively high response rate. It might also be expected that health plans would attempt to cast their products in the most favorable light. This tendency, however, would be tempered by the fact that long-term relationships are at stake and exaggerated claims are likely to be detected.

Finally, because a health plan survey was relied upon by the authors and some models may be tailored in their design (including decision support) to meet the needs of particular purchaser segments, reported differences in features among plan types may reflect differences in the purchasers that selected them rather than characteristics of that plan type. For example, large self-insured employers may be more likely than small employers to offer HRAs. At the same time, these employers may typically contract directly for health management programs for all of their employees, so that the plans

themselves do not provide such additional services. Health plan survey data cannot address this potential confounding.

The best available estimates of the diffusion of HRA models in 2002 suggested that perhaps 100,000 beneficiaries were then enrolled in these plans, most of whom were signed up with one of three plans specializing in consumer-directed health benefits (Definity, Destiny, and Lumenos) (Gabel, Lo Sasso, and Rice 2002). We estimate that in the first quarter of 2003 there were nearly half a million HRA enrollees. Plans that specialize in offering HRA models still dominate the HRA market, although to a lesser degree than previously reported. Large national managed care organizations have entered into the HRA market and some of the earliest entrants in this class enrolled tens of thousands of beneficiaries in HRA models by early 2003. Many more of these large organizations are launching HRA models in 2004, consistent with reports from the field that most health plans view their ability to offer a consumer-directed plan as a strategic necessity.

While the rate of enrollment growth is substantial, HRA enrollees remain an exceedingly small percentage of the roughly 160 million people with employer-sponsored insurance. If HRA models are to play a major role in changing the dynamics of the U.S. health system—either by encouraging consumerism or in controlling the expenditure trend—more dramatic diffusion will need to occur in the future. Perhaps this will ensue in coming years. Early results from the field suggest roughly a doubling of enrollment in 2004 and recently legislated health savings accounts will further stimulate growth of account-based plans. Nonetheless, projections attributed to industry insiders such as "20 percent of the market by 2005," are difficult to reconcile with our survey responses (Gabel, Lo Sasso, and Rice 2002).

Our findings support the notion that there is greater marketability of tiered managed care offerings with increased choice (of either benefit design or point-of-care options) accompanied by incentives to choose lower-cost or higher-quality options. Respondents reported a 2003 enrollment of nearly two million covered lives in premium-tiered or point-of-care tiered models. Point-of-care tiered models comprise the majority of this category, accounting for more than three-quarters of the enrollment.

Rather than simply increase cost sharing, consumer-directed health plans are purported to empower individuals to make informed choices with regard to their health and health care. To meet this goal, point-of-care tiered models offering consumers incentives to select a subset of providers or treatment options must also offer information to help consumers decide whether and when selection of higher-cost options is worth the outlay. We

found, however, that information to support value-based choices of provider or treatment is not universally provided by HRA models and tiered-benefit products. In particular, comparative cost information for both physicians and hospitals is typically lacking. Consumer-directed heath plans frequently make available hospital quality information, possibly because there are some off-the-shelf products that derive quality information from Medicare and state all-payer administrative data. Average costs for services or procedures and drugs are also common elements of decision support for HRA model plans, perhaps because these are relatively easy for companies to provide, although comparisons of the likely cost implications of alternative types of treatment options beyond drugs for a given condition are typically not available.

The RAND Health Insurance Experiment suggested that consumers (without decision support) rationed necessary care to the same degree as unnecessary care in the face of greater cost sharing. Given this result, it may be a concern that more HRA models are not offering information on optimal care for a chronic condition. This is particularly troubling in light of the fact that just over half of HRA plans reported that they screen all claims against evidence-based practice algorithms to detect underuse and only about one-third of HRA plans notify providers and members of deviations from evidence-based practice (data not shown). On the other hand, perhaps it should not be very surprising that decision support for these products is so incomplete. Such systems entail extensive fixed investments and thus require some scale to support.

Alongside the evolving phenomenon of consumer-directed plans, mainstream MCOs also are sharing more costs with consumers, in order to shift costs, create consumer incentives to spend more prudently, or both. Most plans report percentage increases in cost sharing in the single digits. To a limited degree, MCOs, particularly HMOs, also support the consumer "coproducer" role as well, through nurse help-lines, health risk assessments, and health profiles as well as member outreach. The apparent scramble by large health plans to gain a foothold in the consumer-directed health plan market may support the adoption of additional consumer-centered health management tools because of the economies of scale mentioned previously. That is, rolling out a consumer-directed plan offering with complementary programs and decision support to help consumers manage their health and health spending may spill over onto mainstream health plans because of low or zero incremental costs for extending these programs to enrollees in all types of products.

Health reimbursement accounts and tiered-benefit models viewed together represent the latest vehicles for cost sharing and, potentially, for engaging consumers in stewardship of their health and health benefit costs. What differentiates them from one another is the point in time at which consumers are engaged, the scope of decisions that are targeted, and the degree to which support is provided to inform consumer selections. Health reimbursement account models essentially put consumers fully in charge and at risk for a range of health care decisions until spending reaches the deductible amount, usually about $1,500 per year. Premium-tiered models emphasize consumerism at open enrollment by drawing direct connections between the premium contribution and a variety of plan features including cost sharing and scope of network. Point-of-care tiered models typically engage consumers in making better provider selections, and could be extended to include better treatment option selections particularly for services deemed discretionary. Decision support for all of these models, most importantly for HRAs because of the broad range of choices consumers are expected to manage, does not seem quite up to the task of mobilizing consumers to be successful in making more cost-efficient and health-improving selections. As consumer-directed health benefits grow, it will be of central interest to track the evolution of these decision-support systems and of complementary efforts by plans to monitor underuse and proactively engage both consumers and providers when care falls short of established clinical guidelines.

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NOTE

1. From an incentive perspective, the important question is whether consumers view the account dollars as having the same opportunity cost as out-of-pocket spending. While the rollover provision of most account-based plans would make this more likely, it is unclear whether consumers perceive the account dollars to be fully fungible.

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Tales from the New Frontier: Pioneers' Experiences with Consumer-Driven Health Care

Anthony T. Lo Sasso, Thomas Rice, Jon R. Gabel, and Heidi Whitmore

Objective. To conduct site visits to study the early experiences of firms offering consumer-driven health care (CDHC) plans to their employees and firms that provide CDHC products.

Data Sources/Study Setting. A convenience sample of three firms offering CDHC products to their employees, one of which is also a large insurer, and one firm offering an early CDHC product to employers.

Study Design. We conducted onsite interviews of four companies during the spring and summer of 2003. These four cases were not selected randomly. We contacted organizations that already had a consumer-driven plan in place by January 2002 so as to provide a complete year's worth of experience with CDHC.

Principal Findings. The experience of the companies we visited indicated that favorable selection tends to result when a CDHC plan is introduced alongside traditional preferred provider organization (PPO) and health maintenance organization (HMO) plan offerings. Two sites demonstrated substantial cost-savings. Our case studies also indicate that the more mundane aspects of health care benefits are still crucial under CDHC. The size of the provider network accessible through the CDHC plan was critical, as was the role of premium contributions in the benefit design. Also, companies highlighted the importance of educating employees about new CDHC products: employees who understood the product were more likely to enroll.

Conclusions. Our site visits suggest the peril (risk selection) and the promise (cost savings) of CDHC. At this point there is still far more that we do not know about CDHC than we do know. Little is known about the extent to which CDHC changes people's behavior, the extent to which quality of care is affected by CDHC, and whether web-based information and tools actually make patients become better consumers.

Key Words. Employer-sponsored health insurance, health reimbursement arrangement, cost sharing

Consumer-driven health care (CDHC) has been touted as the salvation of our health care system (Herzlinger forthcoming)—or as the hastening of its demise (Shuit 2003). Proponents point to facets that promote greater choice among health plans and consumer involvement in cost control, whereas opponents

fear it will destabilize the risk pool and result in people forgoing needed services. Until now, analyses have been based more on opinion than fact (see, for example, Gabel, Lo Sasso, and Rice 2002; and Gabel and Rice 2003). This is understandable, however, given the newness of these health plans—there have been few objective data analyses conducted because of the lack of available evidence. Unfortunately, the "big" questions remain not only unanswered, but also infused with ideology. For example, little is known about the extent to which CDHC changes enrollees' behavior, the extent to which quality of care is affected by CDHC, and whether web-based information and tools actually make patients become better consumers.

This issue of *Health Services Research* provides some of the first published data-driven evidence on the impact of consumer-driven products, which has the potential to begin to move the debate away from ideology into the realm of empirical evidence. In this article we present four case studies that were conducted through in-person site visits by one or more of the authors. We conducted the site visits during the spring and summer of 2003. We interviewed benefit directors at all companies, in addition to CEOs, chief actuaries, and human resources personnel at some of the companies. We spoke only with company personnel in order to get an unbiased sense of their experiences with CDHC; that is, not colored by the views of the health plans'. These four cases were not selected randomly. Rather, we contacted organizations that already had a consumer-driven plan in place by January 2002 so as to provide a complete year's worth of experience with CDHC.

Furthermore, we sought cooperation from firms that provided a cross-section of products. Humana is a health insurer and employer that offers its own consumer-driven product to its employees. Countrywide Financial and Woodward Governor represent, respectively, financial and manufacturing firms that offer a Definity Health product. Although we sought other companies that offered health reimbursement arrangement (HRA) plans,

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Definity was the only one that had employer clients accessible to us that dated back to the beginning of 2002. Patient Choice represents a Minnesota-based consumer-driven approach to health care that actually predates what is commonly thought of today as consumer-driven health care. Patient Choice's model differs quite significantly from the HRA-style plans offered by Definity and a number of its competitors. We include Patient Choice among our case studies because its longer lifespan provides important insights into the role of consumer and provider decision making on health care costs. Moreover, we include Patient Choice because it is not clear that the market has made a final determination of what the dominant model of CDHC will be in the future.

In reviewing the case studies that follow, several points should be kept in mind:

- The firms were willing to have their experiences examined and published. Accordingly, they are more likely to have had positive experiences than other firms.
- The data tabulations shown were provided by the firms; the scope of the project did not allow use to collect or analyze claims data.
- The findings presented represent, in most cases, just one year's worth of experience.
- Case studies, by their nature, provide descriptive data about which any generalizations should be made with extreme caution.

Countrywide Financial Corporation

Background

Countrywide Financial Corporation, founded in 1969, specializes in mortgage lending but in recent years has diversified into related areas such as insurance and banking. In the 12-month period ending September 2003, revenues exceeded $7.5 billion with net earnings of more than $2 billion. Its corporate headquarters are located in Southern California. Countrywide has offices nationwide, with just over half of its employees in California. The company has been growing quickly due to its diversification efforts as well as the boom in mortgage financing.

Countrywide offers its employees a menu of health plans that includes both preferred provider organization (PPO) and point-of-service (POS) plans sponsored by Cigna, a variety of health maintenance organizations (HMOs) (with Cigna being the main choice in California), and a consumer-driven

health plan sponsored by Definity Health. In 2002, the monthly employee out-of-pocket costs for the Cigna HMO were $42. The Definity and POS plans both cost $88 with the PPO costing $126. These differences reflect both variation in total costs as well as a differential subsidization policy on part of the company, which provides the greatest subsidy to HMO coverage and the lowest to the PPO. During the site visit, Countrywide reported that it subsidizes HMO coverage the most because it is least expensive and because the company does not experience as much risk because, unlike its other health plans, the HMO is a fully insured product.

Definity Health was first offered to Countrywide employees in January 2002. Unlike the case of many other firms, the antecedent was not so much rising corporate health care costs or the backlash against HMOs. Rather, it was primarily the availability of physicians. In one of its main southern California locations, a bankruptcy in a local physician group, coupled with a perception that some of the other medical groups in the area were no longer accepting HMO patients, led to concern that Countrywide employees might have been having difficulties securing medical care. Management decided to provide another choice to the menu of plans, but sought something that could have cost-savings potential like HMOs but choice of providers like PPOs. Before contracting with Definity, it arranged two focus groups, one of senior managers who worked with staff on benefit issues, and the other of a cross-section of employees. After having the Definity plan explained to them, most reportedly reacted very positively. Attractive features included: a wide network of physicians; a personal care account that provided first-dollar coverage; the relatively small "donut hole" (explained below); and the fact that they would have another health plan choice.

Benefits personnel were concerned about outreach since many Countrywide employees are in branch offices far from the corporate headquarters. To deal with this, they sent both written materials and videos to their offices around the country. This was supplemented by employee meetings at the major locations as well as seminars designed to explain the plan to managers. Enrollment is conducted online, and a variety of other online resources are available. Employees can keep track of their HRA through the Definity website, which is available from Countrywide's website.

Experience

Enrollment in Definity is low and growing slowly. When it was first offered in January 2002, 2 percent of the roughly 23,000 eligible California-based

employees participating in the company's health plans chose Definity. This had doubled to nearly 4 percent during the January 2003 open enrollment period. Comparing enrollment in December 2002 to January 2003, 90 percent of Definity members reenrolled in the plan.

In 2003, individuals who choose Definity receive a $1,000 personal care account (PCA). All covered health care expenses that are incurred are automatically drawn from this account until it is exhausted. The annual deductible is $1,500, so individuals face a $500 "donut hole" before they are eligible for major medical coverage. At that point, in-network services are covered at an 80 percent rate, and out-of-network services, 60 percent. There is an annual out-of-pocket maximum of $2,500 for in-network services and $3,000 for out-of-network. Those with family coverage receive a $2,000 PCA, have a $3,000 deductible leaving a $1,000 donut hole, and have an annual out-of-pocket maximum of $5,000 for in-network services and $9,000 for out-of-network.

Generic prescription drugs are reimbursed at the same percentages (80 percent and 60 percent depending on whether a network pharmacy is used), but for brand name drugs the patient must also pay the difference between the brand name and generic costs. The plan also covers an annual physical exam at no cost to the patient so long as a network physician is used.

Analysis

Countrywide provided some data on selection as well as the use of the PCA. We compared enrollment in Definity versus all other plans with respect to three variables: gender, type of coverage (e.g., individual, family), and income (Table 1). Men are more likely than women to choose Definity, with 4.8 percent of men doing so compared to 3.6 percent of women. Those with family coverage (employee plus one or more dependents) are slightly more likely to choose Definity than those with individual coverage: 4.4 percent versus 3.8 percent. Perhaps the most interesting finding concerns income. Employees are divided into two groups: those with base salaries of $80,000 or more (14 percent) and those who earn less (86 percent). Employees with higher salaries are nearly twice as likely to enroll in Definity: 6.4 percent versus 3.7 percent.

Data are not available to indicate whether the high-income people are healthier or sicker than others. On the one hand, income tends to be positively correlated with health status, but on the other hand, those with higher incomes are also likely to be older. One possible explanation for more higher-income

Table 1: Enrollment of Countrywide Employees into Definity versus Other Plans, 2003

	Definity	*Other Plans*
Total	4.1%	95.9%
Gender		
Male	4.8	95.2
Female	3.6	96.4
Coverage Type		
Individual	3.8	96.2
Family	4.4	95.6
Income		
$80,000 or more	6.4	93.6
Less than $80,000	3.7	96.3

employees choosing Definity relates to the employee premium requirements. Because employees pay more than twice as much for Definity than for the Cigna HMO, one would expect higher-paid employees to be more able to afford this option. It is also possible that higher-income persons are less likely to be concerned with the "donut hole." In addition, such individuals, who have positions of higher responsibility in the firm, tend to be more accustomed to making the types of financial decisions one needs to make in a consumer-driven plan.

Definity also provided data on use of the PCAs. Just less than half (46 percent) of enrollees used their entire PCA in 2002. Others were eligible for rollover if they stayed with the plan. Somewhat surprisingly, those who left the Definity plan used slightly less of the money in their accounts, and thus would have been able to roll over more had they remained with the plan in 2002. Those not renewing used up 69 percent of the PCA, compared to 73 percent for those who stayed with Definity.

Finally, data on the use of the PCA by month in 2002 shows a distinct U-shaped pattern. Enrollees draw heavily on their PCA in the first three months of the year—not surprising since some may have waited until January to obtain services, and because the accounts have more money from which to draw early in the year before medical expenses climb. Over the next several months PCA payments are lower but fairly flat, and there is a significant upsurge in November and December. To illustrate, 60 percent more money was drawn out of PCAs in December than in October; in fact, more was drawn

in December than in any other month. This demonstrates that many Definity members felt the need to use up their accounts, which is surprising since the 90 percent reenrolled and therefore were eligible to rollover any remaining monies.

Assessment

Countrywide has not conducted surveys of its employees to elicit satisfaction with the Definity plan. The fact that almost all of those enrolled in December 2002 chose the plan again in January 2003—when HMO, POS, and PPO plans were available—provides an indication of general satisfaction on the part of enrollees. Benefits personnel reported to us that they have been very pleased with the experience so far, and that customer service has been "exceptional." Offering the plan has not entailed much in the way of additional administrative effort. But with only 4 percent of employees choosing the plan after it had been in place for a year, it does not appeal to everyone. If the plan does become more than a niche player in coming years, management will need to further study enrollment patterns to determine the plan's effects not only on its own enrollees, but on the risk pool faced by the other health plans available to Countrywide employees.

Woodward Governor

Background

Woodward Governor is a company that designs, manufactures, and services energy control systems and components for aircraft and industrial engines and turbines. Their products and services are used in power generation, process industries, transportation, and aerospace markets. Woodward has a long history of being a self-described paternalistic employer. The firm has historically offered generous benefits for retirement coverage and other fringe benefits. As recently as four years ago, for example, employees were not required to contribute to their health insurance premium. Woodward employs approximately 2,600 workers at two major work sites: Rockford, Illinois (its corporate headquarters) and Colorado, though the company also has smaller groups of employees in South Carolina, Buffalo, New York, and Michigan. As a manufacturing firm, the company's employees are 75–80 percent male. Woodward has a nonunionized workforce.

Woodward's health benefit costs were increasing at a rate of 16 to 19 percent per year—a rate of increase that was thought by management to be untenable, particularly during a period of increasing competitive threats from

abroad. This cost trend motivated the company to begin considering other health insurance options. The director of corporate benefits learned of Definity Health and recognized the congruence of Definity's model to Woodward's desires. Definity's model validated the company's idea and the director of benefits championed the idea to Woodward management. The company indicated that the goal of the effort was not cost-shifting to workers, but a genuine desire to create better incentives so that employer and employee could together "shrink the size of the health care pie."

Experience

In January 2002 at the Rockford, Illinois, worksite, Woodward began offering the Definity HRA alongside a PPO option that had been previously offered to employees. Interestingly, the director of benefits and Woodward's CEO believed that the Definity model would be more efficacious in a total replacement setting than as an add-on. However, because Definity only contracted with one of three local hospital-based provider networks, many of the providers available to employees in the PPO were not available to employees. Thus, to avoid controversy among employees it opted to implement Definity as an add-on. By 2003 Definity had contracted with a second provider network. Perhaps as a consequence of this network change, Definity enrollment increased substantially in the Rockford market in 2003.

The Definity options came in two varieties: a higher- and a lower-deductible plan. Option 1 included a $1,000 PCA and a $1,500 deductible for single coverage ($500 donut hole), and $2,000 PCA and a $3,000 deductible for family coverage ($1,000 donut hole). Option 2 included a $1,000 PCA and a $2,000 deductible for single coverage, and $2,000 PCA and a $4,000 deductible for family coverage. Only one employee enrolled in the higher-deductible option. Premium contributions for the Definity plans were $4/$30 (single/family) biweekly for Option 1 and $3/$25 (single/family) biweekly for Option 2. After reaching the deductible, all allowable in-network care services were covered at 100 percent. Out-of-network services were covered at 80 percent. The PPO options were $8/$60 (single/family) biweekly. One important change that was also implemented beginning in January 2002 was an increase in cost sharing for pharmacy benefits under the PPOs: the flat $5 copayment was replaced with 15 percent coinsurance on pharmaceuticals. By contrast, under Definity, pharmaceuticals, like all other health care services, are paid out of the PCA at 100 percent, then completely out of pocket in the donut hole, and again at 100 percent once the deductible is reached.

The company had 12 percent enrollment in the Definity product in 2002, which was generally greater than the initial enrollment levels observed at other companies offering Definity. However, it is unclear the extent to which the pharmacy benefit change in the PPO option caused employees to enroll in Definity. Benefits personnel believed that the increase pharmaceutical cost sharing was at least partly responsible for the relatively high interest in the Definity option. Company benefit personnel stated that the principal impediment in the launching of the plan was getting employees to understand how Definity worked. Employees were not accustomed to first having first-dollar coverage and then subsequently facing out-of-pocket costs via the deductible. Definity employees provided onsite sessions to explain the product to employees during open enrollment. The sessions were believed to be helpful in swaying the employees who attended them.

Data

Definity enrollees in Rockford in 2002 were demographically similar to non-Definity enrollees in terms of age and gender. Benefits personnel pointed out that two diabetics were among the 195 employees who enrolled in the Definity plan, which would appear to suggest that enrollment was not comprised exclusively of healthy persons. Still, health care expenditures for Definity enrollees for the 2002 calendar year were roughly half that of PPO enrollees ($1,492 versus $2,837). It is doubtful that the Definity plan cut health care expenditures by 50 percent, but the company was unable to provide us with 2001 expenditures for each group from which to get a rough estimate of the extent to which Definity enrollees experienced a change in their expenditures as a result of enrollment in the Definity product. Just under 40 percent of Definity enrollees spent through their PCAs. Of those who spent through their PCAs, roughly three-quarters also spent through their deductibles. Approximately 15 percent of the Definity enrollees had total health care expenditures in excess of $5,000. Satisfaction surveys conducted by Definity indicated satisfaction with the plan to be in excess of 90 percent.

Assessment and Future Directions

Benefits personnel at Woodward indicated that they were pleased with the degree of customer support provided by Definity, though some concern was expressed as to whether the level of support would continue as Definity continues to expand to other employers. In addition, because of the large number of subcontractors Definity used at the time, when there were

problems, it was often a time-consuming process to sort out. In general, though, human resource personnel found the administrative burden "much less" for Definity enrollees relative to PPO enrollees, though this could be related to the lower levels of utilization incurred by Definity enrollees.

Beginning in 2003, the company continued to offer Definity as an add-on option in the Rockford market, but also implemented Definity as a total replacement product in its Colorado market. In Colorado, Definity was able to contract with the same provider network that was offered to employees through their PPO in previous years. However, the company reported that after it was announced in October of 2002 that all employees were facing a mandatory switch to Definity in January 2003, the Colorado-based employee group exhibited a pronounced increased in what benefits personnel termed "elective" procedures in the remaining three months of the year. Benefits personnel reported that the company witnessed "two years worth of elective procedures in three months." Commonly cited examples included knee and back operations that were not life threatening and could have been relatively easily postponed. Consequently, pre–post comparisons in the Colorado market (which are not possible at this time) are likely to be clouded by this surge in elective procedures as employees anticipated the new health insurance benefit.

Woodward continued to offer Definity as an add-on option in Rockford and Definity enrollment increased to 25 percent in 2003, perhaps as a consequence of the aforementioned increased size of the Rockford provider network. Only nine employees who had previously enrolled in the Definity plan in 2002 did not reenroll in 2003. Employee premium shares were increased to $6/$35 (single/family) biweekly in Option 1 and $5/$30 (single/family) biweekly in Option 2; the structure of the PCA and deductible was maintained. The PPO premium shares in the Rockford market also increased to $9/$66 (single/family) biweekly. At this time the company plans in 2004 to continue offering Definity as an add-on option in Rockford and as a full-replacement product in Colorado. The company continues to believe that health care expenditures will be better controlled over the longer term by continued use of CDHC products.

HUMANA

Background

Humana Inc., one of the nation's largest insurers, was the site of an early experiment with CDHC. The Louisville-based insurer covers approximately

6.6 million Americans in 18 states including 1.8 million PPO enrollees and 1.2 commercial HMO enrollees. In July 2001, Humana launched their CDHC product "SmartSuite" at its Louisville headquarters with their 4,800 employees and 5,000 dependents as an experimental group.

Humana CEO Mike McCallister described Humana's decision to offer CDHC products, as follows. "We had tried every means for controlling costs except getting consumers involved. We ultimately determined that the solution must involve four factors: (1) greater consumer choice; (2) putting more consumer dollars at stake; (3) improved technology; and (4) a recognition that employees were over insured" (personal communication March 12, 2003).

In another article in this issue, Laura Tollen and Murry Ross describe in greater detail Humana's changes in their health benefits for their Louisville employees. Here we highlight changes in the benefit design the year prior and the first year of adopting SmartSuite.

Prior to adoption of SmartSuite, Humana offered its Louisville workers two PPO plans and one HMO plan. Humana contributed 79 percent of the monthly premium cost of coverage. SmartSuite consisted of five plans offered to Humana employees—two PPOs, an HMO plan, and two HRA-like plans, termed "Coverage First." Humana contributed a fixed amount set at a level less than the lowest-cost plan (an HRA-type plan). Coverage First was not technically an HRA plan because employees could not carry over unspent money in the personal spending account at the end of the year.

Covered benefits and provider networks in the traditional HMO and PPO plans and Coverage First were identical, but cost-sharing requirements differed. In the standard PPO and HMO plans, Humana imposed copayments for hospital stays of $100 per day, increased copayments for prescription drugs, and raised out-of-pocket catastrophic thresholds in the PPO plans. One PPO plan added a tiered hospital benefit. Prescription drugs and mental health benefits were carved out. Coverage First had a $500 use-or-lose spending account that included copayments where allowances must be spent within network. One Coverage First plan had a deductible of $1,000, and another additional deductible of $2,000.

Enrollment in SmartSuite is 100 percent electronic, with software to guide employees' plan selection. To control for potential risk selection, Humana used partial risk rating, thereby raising the employee contribution rate for Coverage First and lowering employee contributions for the HMO and PPO plans. Monthly employee contributions in the first year of SmartSuite for the HMO plan were $39, $44 for the richest PPO plan, and

$13 for the Coverage First plan. Humana changed the contribution formula to discourage "double coverage" in the employee's and spouse's health plans.

Experience

During the first year of SmartSuite, 6 percent of covered workers chose Coverage First (Table 2). In general, as employees faced greater contributions for selecting higher-cost plans, they moved "downstream" to plans with greater cost sharing. In the second year of SmartSuite, enrollment was extended to non-Louisville employees. Differences in the employee contribution rate between Coverage First and the traditional HMO and PPO plans grew to more than $50 per month, and consequently, Coverage First captured 21 percent of the non-Louisville Humana employee market share. Preferred provider organization plans suffered the major loss in market share.

Humana actuaries examined risk selection in SmartSuite and found that Coverage First enrollees were similar in age to those in the traditional HMO and PPO plans, but higher-earning workers are more likely to enroll in Coverage First. Actuaries and other professions who make financial and risk decisions as part of their jobs were most likely to enroll in Coverage First. Most significantly, for the year prior to enrollment, employees who enrolled in Coverage First incurred claims expenses at 50 percent the overall level for Humana employees. In total, Coverage First enjoyed substantial favorable selection. However, Coverage First did experience a 30 percent decline in medical claims expenses relative to previous year claims, despite the fact that members in the previous year incurred claims expenses only 50 percent of the

Table 2: Summary of Premiums and Enrollment in Before and After Humana SmartSuite Introduction for Humana Louisville and Non-Louisville Employees

	Humana Louisville 2001–2002		*Humana Non-Louisville 2002–2003*	
	Monthly Single Contribution	*Enrollment*	*Monthly Single Contribution*	*Enrollment*
Prior Plan HMO	$39	39%	$43	45%
Prior Plan PPO	$44	61%	$50	55%
Richest HMO	$39	35%	$65	49%
Richest PPO	$44	54%	$76	21%
Coverage First	$13	6%	$13	21%

average for Humana employees based in Louisville. Only 31 percent of Coverage First members exceeded the $500 spending account threshold, and only 8 percent exceeded the plan deductibles. Humana actuaries report that there was no substantial rush at the end of the plan year by members to spend remaining balances in spending accounts.

Assessment

Humana's SmartSuite product provided multiple incentives for employees to reduce health care spending. Humana offered up-to-date Internet tools to track spending and provide information on medical decisions and providers. Through a defined contribution formula where the employer contribution was set below the premium of the lowest-cost plan, financial risk was transferred to employees. Cost sharing was increased in the form of hospital copayments and increased deductibles. The firm offered an HRA-like product that imposed cost sharing when using the spending account. With employees bearing greater financial risk for their plans and at the point of service, employees migrated to lower-cost plans and reduced their use of services. Savings appear substantial, largely through the reduced use of hospital services. It is possible that cost sharing within the spending account prevented an end-of-year run on the use-or-lose spending account.

While savings appear substantial, the HRA-like plan enjoyed substantial favorable selection. Medical expenses for Coverage First members were 50 percent of the group average the year prior to enrollment. Humana attempted to use modified risk selection to mitigate selection bias, but nonetheless the plan attracted a disproportionate share of low-cost employees. In general, like any HRA-type plan, if the dollars spent in the spending account exceed average prior year spending for HRA members, the plan is likely to cost the employer additional dollars.

Patient Choice

Background

Patient Choice evolved from a coalition of large employers in Minnesota known as the Buyers Health Care Action Group (BHCAG). Founded in 2000, Patient Choice operates the Patient Choice program, formerly known as Choice Plus, a plan offered since 1997 to the employer members of BHCAG. Patient Choice currently offers its product in Minnesota, Colorado, and Oregon, with other states to follow. At the time of our interview, Patient

Choice had approximately 90,000 members nationwide, mostly in Minnesota. Its customers are comprised mostly of large firms, such as 3M and the University of Minnesota, although they also serve medium-sized firms, typically with a minimum of 200 employees. The product is generally offered as an add-on to other health plan offerings.

Patient Choice views its product as one of the first consumer-driven health plans, which they broadly define as plans where informed health care consumers have financial incentives to make choices about their providers and health plan characteristics. They believe because not all providers are comparable in terms of quality and efficiency, an employee's premium contribution structure should take these differences into account. Discipline to control costs should come from informed consumers, not from health plans.

Patient Choice develops and manages provider networks on the basis of costs and quality. Providers align themselves into networks called "care systems" that include primary care physicians, specialists, hospitals, and other health care providers and facilities. These care systems are assigned by Patient Choice to one of three cost tiers based on costs that are risk adjusted for the health status of the populations they serve. Patient Choice reimburses the care systems on a fee-for-service basis.

With Patient Choice, employers decide what kind of benefit coverage they want to offer. The benefit design is similar to any other health plan, with in- and out-of-network coverage having different levels of employee cost sharing. Firms contribute to premiums no more than what the lowest-cost care system would cost, so employees bear the financial burden of choosing more costly care systems. Employees choose the care system they want, based on cost, satisfaction ratings, and other features.

Once a year Patient Choice provides comparative data to the care systems that reveal how that network is performing compared with others. Employees also have access to data on satisfaction with the various care systems. Historically, Patient Choice has used a Consumer Assessment of Health Plans (CAHPS) type system to measure satisfaction, which includes measures such as how people rate their clinic, their doctor, and the ease of getting referrals. For 2003 open enrollment, Patient Choice will also provide employees with data on quality, such as care systems' performance on some key conditions such as diabetes management, and Leapfrog Group information.

Patient Choice was an early adopter of risk adjustment. Care systems submit their pricing preferences to Patient Choice, which combines this information with the provider network's claims experience along with the care

management structure to arrive at an Ambulatory Care Group (ACG) risk-adjusted, per member, per month cost figure. The objective is to compare one population with another in an effort to negate the impact of illness burden on utilization of health care services in the various care systems. Patient Choice has found risk adjustment to be critical because measures such as age and gender are inadequate in measuring illness burden.

Beyond price, use of techniques such as care management, hospitalists, disease management processes, and internal formularies are essential in predicting total risk-adjusted costs, and subsequent assignment to one of three tiers. Experience has found that the actual costs of the tier groups are usually consistent with expectations based on which cost tier they are in, which suggests the risk adjustment is working.

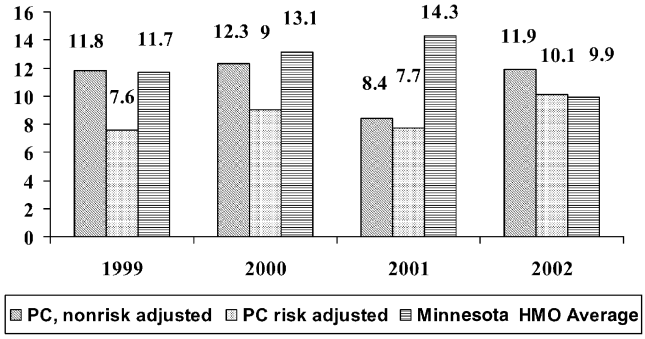
Experience

Patient Choice reports that total cost and illness burdens (ACG scores) vary substantially across care systems, with the range between the highest- and lowest-care system exceeding 50 percent. From year-to-year, care systems that attract sicker patients tend to keep doing so, while those that attract healthier patients continue doing so. Without risk-adjustment, the wrong care systems would be rewarded. For example, in 2003, 8 of the 19 care systems would have been misclassified without risk adjustment. In 1 of these 8 misclassified cases, the error would have placed a highly efficient care system in a high-cost category; in another case, a highly inefficient care system would have been classified as low-cost, if there had been no risk adjustment. Thus, risk rating is important to ward against inefficient care systems.

Employees have demonstrated their sensitivity to monthly contributions by moving from higher- to lower-cost care systems. Patient Choice believes that "switchers" are probably healthier than average, and hence place less value on provider relationships. When care systems are moved to higher cost tiers, these care systems lose enrollment. When care systems move to a lower-cost care system, they gain market share. For example, all five of the care systems that were reclassified down to a low-cost care system gained market share in 2003. All three care systems reclassified into higher-cost tiers in 2003 lost market share. Among care systems whose classification remained the same, three gained market share, and four lost market share.

Premiums have risen slightly more at Patient Choice than the overall average for Minnesota HMO plans (60.7 percent versus 58.7 percent) over the four years of operation (Figure 1). However, Patient Choice believes that its

Figure 1: Annual Growth in Premiums, Patient Choice versus Minnesota HMO Average



changing mix of client firms has resulted in a sicker patient population. If one adjusts premiums for the increased illness burden of its employee population, premium increases at Patient Choice are substantially less than the Minnesota average for HMOs (39.1 percent versus 58.7 percent). What is missing from such comparisons is an adjustment for changes in illness burdens for HMOs in Minnesota over the study period.

Assessment

Patient Choice offers a few lessons for CDHC. The first is the importance of risk rating competing provider networks. Without risk rating, inefficient provider organizations will be rewarded for their perceived efficiency, and efficient organizations will be penalized for their perceived inefficiency. Second, Patient Choice demonstrates that with the right incentives, employee will migrate from higher- to lower-cost care systems. However, work by Harris and colleagues (2002) suggests that there is less price sensitivity when selecting care systems than when selecting competing health plans. The logic here is that switching care systems involves switching providers, and patients are more attached to their physicians than to their health plans. Third, the Patient Choice experience raises the question whether market risk can discipline physicians and care systems when the health plan represents just 15 percent of their business. If one accepts that Patient Choice is serving a population whose illness burden is growing, and that the plan is experiencing adverse selection, then Patient Choice has been very successful in its ability to contain costs. If one does not accept that the trend in illness burden has been worse than that

experienced by other HMOs in Minnesota, then Patient Choice's record controlling health care premiums is little different from the other HMOs in the state.

CONCLUSION

Several key points emerge from our case studies. The experience of Woodward and Humana indicated that favorable selection tends to result when a CDHC plan is introduced alongside traditional PPO and HMO plan offerings. Both Woodward and Humana, for example, reported strong favorable selection with CDHC plan members incurring claims expenses roughly 50 percent of the overall average for the year prior to the introduction of the CDHC plans. This is not a surprising result because early adopters of new health insurance products are not likely to be those seeking treatment for current acute or chronic conditions or those expecting future treatment. Within the context of a large company, if all plans are self-insured and the employer risk adjusts premiums for competing plans, the company can potentially combat selection bias by altering premium sharing or by eliminating plans entirely. Thus, unless employers carefully make efforts to anticipate the risk status of enrollees to health insurance options, risk segmentation will likely occur. For convenience, we include a summary of the employer characteristics and experiences in Table 3.

The Definity-style HRA model places the consumer at risk for making costly health care decisions but does not directly create incentives for providers to become more efficient or improve quality: providers are typically paid discounted FFS. However, when providers are placed at risk in addition

Table 3: Summary of Employer CDHC Plan Offerings

	Countrywide	*Woodward*	*Humana*
Monthly employee-only premium contribution	$88	$8	$13
Percent enrollment, first year	2%	12%	6%
Percent enrollment, second year	4%	25%	21%
Demographics of enrollees	• More men • Older • Higher income • More family coverage	Reported to be "similar" to nonenrollees	• Age similar • Higher income

to patients, selection concerns are even more pressing, as was demonstrated in the case of Patient Choice. Hence risk adjustment was found to be a critical tool that allowed Patient Choice to sort care systems so as not to punish systems that have a greater proportion of sick enrollees and reward systems that do not have the sick enrollees but were nonetheless costly providers. The current lack of engagement of the provider in the now dominant form of CDHC—the HRA—may entail that HRAs represent only a partial step toward the market-based discipline that CDHC proponents envision in the health care sector.

These concerns aside, the Humana and Patient Choice experiences did call attention to the potential of CDHC to reduce the rate of increase in health care expenses. Humana's SmartSuite, which encompassed elements of HRAs, higher cost sharing, tiered networks, and a defined contribution formula, experienced a substantially lower rate of increase in claims expense than other Humana clients in the Louisville area. Patient Choice had distinctly lower risk-adjusted increases in premiums over the study period than other HMOs in Minnesota.

Our case studies also indicate that the more mundane aspects of health care benefits are still crucial under CDHC. Both the Countrywide and Woodward experiences highlight the importance of provider networks. For Countrywide, Definity's product offered a means of accessing a larger provider network for employees. For Woodward, enrollment in Definity's product was hampered by the inability to contract with a sufficient number of providers in the area. The issue of inadequate provider networks is important and could hold back the initial growth and acceptance of CDHC plans. It may also signal a potential advantage that traditional managed care organizations such as Humana might have in relation to upstart CDHC companies: their years of experience contracting with providers. Similarly, the role of premium contributions in the benefit design looms as large as always. Countrywide may not have experienced the same favorable selection in its HRA plan as others because employees faced lower monthly contributions if they chose the traditional HMO. Humana's effort to actuarially predict the appropriate premium-sharing arrangement indicates one approach to this issue. Also, companies highlighted the importance of educating employees about new CDHC products. Employees who understood the product were more likely to enroll. Web-based information tools are frequently mentioned as a critical dimension of CDHC, but our site visits revealed that use of the web was generally limited to checking account balances and billing issues. The role of the web is one area that merits watching, but for now it does not appear to be a

major draw for consumers. Finally, Woodward's experience when rolling out its total replacement Definity product is a cautionary tale for companies planning to implement CDHC products and researchers planning to study CDHC implementations: there may be unintended and unexpected anticipatory effects once company plans are made public.

At this point there is still far more that we do not know about CDHC than we do know. Little is known about the extent to which CDHC changes enrollees' behavior, the extent to which quality of care is affected by CDHC, and whether web-based information and tools actually make patients become better consumers. Clearly, more independent research is needed on these and other questions. Ultimately, employers, by offering the product, and employees, by enrolling in the product, will decide whether CDHC is valuable, or whether it will join the ranks of health care ideas that did not pan out.

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Employee Choice of Consumer-Driven Health Insurance in a Multiplan, Multiproduct Setting

Stephen T. Parente, Roger Feldman, and Jon B. Christianson

Objective. To determine who chooses a Consumer-Driven Health Plan (CDHP) in a multiplan, multiproduct setting, and, specifically, whether the CDHP attracts the sicker employees in a company's risk pool.

Study Design. We estimated a health plan choice equation for employees of the University of Minnesota, who had a choice in 2002 of a CDHP and three other health plans—a traditional health maintenance organization (HMO), a preferred provider organization (PPO), and a tiered network product based on care systems. Data from an employee survey were matched to information from the university's payroll system.

Principal Findings. Chronic illness of the employee or family members had no effect on choice of the CDHP, but such employees tended to choose the PPO. The employee's age was not related to CDHP choice. Higher-income employees chose the CDHP, as well as those who preferred health plans with a national provider panel that includes their physician in the panel. Employees tended to choose plans with lower out-of-pocket premiums, and surprisingly, employees with a chronic health condition themselves or in their family were more price-sensitive.

Conclusions. This study provides the first evidence on who chooses a CDHP in a multiplan, multiproduct setting. The CDHP was not chosen disproportionately by the young and healthy, but it did attract the wealthy and those who found the availability of providers more appealing. Low out-of-pocket premiums are important features of health plans and in this setting, low premiums appeal to those who are less healthy.

Key Words. Health insurance, consumer-driven health plans, health plan choice, adverse selection

"Consumer-driven" health plans (CDHPs) have moved beyond the concept stage and are now available to employees of many large companies. Established insurers, such as Aetna, Humana, Cigna, UnitedHealth Group, and WellPoint are introducing their own CDHPs to compete with products offered by start-up companies such as Definity Health, Luminos, MyHealthBank, and others (Freudenheim 2001). It appears that these products appeal to employers in a period when health insurance premiums are rising at double-digit rates (BNA 2001; Gabel, et al. 2001) and a return to more restrictive forms

of managed care seems unpalatable to employees (Galvin and Milstein 2002; Iglehart 2002).

A database now exists for assessing the early experience of employers and employees with these plans. Using data from a survey of employees at the University of Minnesota, matched to information from the university's payroll system, we address the question: Who chooses to join a CDHP and, specifically, does this plan attract the healthier employees in a company's risk pool? The research provides important, early information on the impact of CDHPs and the research and policy issues that are likely to arise if they become more commonly available as a health benefit option.

SIGNIFICANCE

Consumer-driven health plans differ from traditional insurance and managed care products in design and philosophy (Christianson, Parente, and Taylor 2002; Gabel, Lo Sasso, and Rice 2002; Robinson 2002). In the design of a CDHP plan, a portion of the employer's tax-deductible contribution to health benefits typically is put into a "health spending account" from which the employee purchases services. Major medical insurance or some form of "wrap-around" coverage is also a key part of the benefit design with first-dollar coverage for preventive care often included. If an employee spends all of the dollars in her spending account in a given year, she then spends her own money until the deductible requirement in the major medical coverage is met. Expenditures in excess of the deductible are covered by the major medical plan with an out-of-pocket maximum included in the plan design. The benefit design can be tailored to cover all or a part of these "excess" expenditures.

The use of information technology to create "informed consumers" is a distinguishing CDHP feature (Lutz and Henkind 2000; Wiggins and Emery 2001). To facilitate informed decision making, the employee is provided with

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information about health care providers, including physician education and experience, prices, and quality ratings. Usually, this information is available on the Internet to ensure easy access and to promote its use (Christianson, Parente, and Taylor 2002). Many CDHPs have interactive customer support systems that allow subscribers to track medical expenditures deducted from their accounts on the Internet. Consumer-directed health plans offer online linkages to prescription drug benefit programs as well as online benefit eligibility information to ensure prompt payment to medical providers.

Interviews with employees and CDHP managers suggest that larger employers find CDHPs attractive for several reasons (Christianson, Parente, and Taylor 2002). Philosophically, these employers want informed employee decisions to "drive the market." Under the CDHP spending account approach, employers believe their employees have an incentive to seek price information on providers and to carefully consider their need for services, because any unexpended funds "roll over" into next year's account balance (Parrish 2001). This reduces the annual gap between the spending account contribution and the deductible faced by the employee in subsequent years. Also, employers see CDHPs as potentially reducing their administrative expenses. If the CDHP is popular with employees, it may mean that other health plans can be dropped. Finally, some employers may see the CDHP approach as a way to divorce the amount their contribution increases each year from trends in premiums, linking it instead to overall employee compensation increases. In this respect, CDHPs function as "transition vehicles" that could be used to redefine the role of employers as health insurance purchasers, much as defined contribution retirement accounts did with respect to retirement benefits (Trude and Ginsburg 2000).

Health policy analysts and others have expressed concerns about how CDHPs could affect the private health insurance market. As noted in a *New York Times* article, "some health benefits experts…warn that they [CDHPs] could be more unfair than current plans to people who are sick and that they could discourage people who need care from getting it" (Freudenheim 2001). The issue of "selection" when defined contribution plans are offered alongside more traditional plans has also been raised. This is not a new issue; when HMOs were introduced, it was thought that they might attract a healthier mix of enrollees, leaving sicker employees in conventional plans and driving up premiums in these plans until the plans became unaffordable. Now, it is argued that CDHPs could have a similar effect on HMOs and other health plans. If CDHPs attract healthy employees, premiums in competing plans might increase faster than otherwise would be the case. Depending on pricing

strategies and whether or not the employer is self-insured, this could increase total health benefit costs to employers and employees.

Study Setting

This research draws on the early experience of the University of Minnesota, which adopted a CDHP in 2002. The University of Minnesota (UM) is a land-grant university whose main campus is located in the Twin Cities of Minneapolis and St. Paul, with smaller campuses in several other locations throughout Minnesota. The UM has 17,500 employees and annual expenditures of $1.8 billion. Prior to 2002, the UM was part of the State Employees Group Insurance Plan (SEGIP), which covers Minnesota state government employees and their dependents. The SEGIP is the largest employment-based health benefit program in Minnesota, with more than 150,000 covered lives. The SEGIP program offered a variety of health plans—including an HMO and several preferred provider organizations, but it had experienced a period of instability and rising premiums (Sutton, Feldman, and Dowd 2004).

Seeking increased flexibility and a set of stable options, the university decided to withdraw from SEGIP in January 2002. Responding to the needs of a diverse workforce that included clerical, administrative, and professional employees, the university selected an unusually wide set of options: a CDHP, a traditional health maintenance organization (HMO), a preferred provider organization (PPO), and a set of tiered "care systems" that contracted directly with health care providers. The traditional HMO was "HealthPartners Classic," which had been a popular plan among university employees in the SEGIP program. HealthPartners Classic featured generous coverage for network physicians and hospitals, but it did not cover out-of-network care. It was also the "low-cost" plan for the UM employees in the Twin Cities in 2002, with the UM paying the full cost of employee-only coverage for this option and 90 percent of the difference in premiums between family and employee-only coverage.

The PPO was PreferredOne, with nominal copayments for in-network hospital and health care services and 70 percent coverage for eligible out-of-network expenses after the enrollee paid a deductible. Compared with the low-cost HMO, the PPO was significantly more expensive for employees and dependents.

Under the Choice Plus "care system" product offered by Patient Choice Healthcare, consumers can choose among integrated teams of medical care

providers of various structures (basically primary-care-centered health systems with affiliated specialists, hospitals, and allied professionals). Care systems are grouped into three cost tiers with standardized benefits but with different premiums depending on the bids submitted by the care systems in each tier (Christianson et al. 1999; Christianson and Feldman 2002; Schultz 2001).

Finally, the university offered two CDHP products sponsored by Definity Health. Option 1 had deductibles of $1,250 per person and $2,500 per family; Option 2 had deductibles of $2,000 and $4,000. The university allocated $500 for an employee or $1,000 for a family into a personal care account for Option 1; Option 2 had university contributions of $1,000 and $2,000 to the personal care account. Both options featured 100 percent coverage of in-network hospital and health care services once the deductible was met, but Option 2 had 20 percent coinsurance for eligible out-of-network expenses versus 30 percent in Option 1. Both options were available throughout the state, and the total premiums and employee out-of-pocket premiums were priced within a few cents of one another. Table 1 presents 2002 enrollment and premium data for the UM health plans.

Data and Methods

To provide empirical evidence on who chooses a CDHP, we conducted an analysis of health plan choice in the first year that Definity Health was introduced into the health benefit offerings at the University of Minnesota. Data for our analysis were taken from two sources: a survey of UM employees, and information from the university's payroll system. We surveyed all UM enrollees in Definity Health during spring 2003 to obtain information on the employee's entire 2002 calendar year experience with his or her health plan. A random sample of non-Definity Health members also was surveyed. Trained employees of the university's human resources department conducted the interviews by phone, which took approximately 10 minutes for non-CDHP enrollees and 15–20 minutes for CDHP enrollees, who responded to a longer set of questions. There were 430 completed interviews from Definity Health enrollees (63 percent response rate) and 501 from enrollees in other health plans (73 percent response rate). The Definity Health response rate was lower because the interviews were conducted during work hours and proportionately more Definity Health members were administrators or medical care providers with administrative staff managing their communications.

Table 1: 2002 Premium Contributions per Biweekly Pay Period and Enrollment

	Employee-Only Coverage				*Family Coverage*			
	Total Cost	*Less UM Contribution*	*Employee Contribution*	*Enrollment*	*Total Cost*	*Less UM Contribution*	*Employee Contribution*	*Enrollment*
HealthPartners Classic	$137.84	$137.84	$0.00	5,027	$344.59	$323.92	$20.67	3,967
Patient Choice Cost Group I	$137.84	$137.84	$0.00		$344.59	$323.92	$20.67	
Patient Choice Cost Group II	$147.15	$137.84	$9.31	2,091	$363.15	$323.92	$39.23	2,808
Patient Choice Cost Group III	$157.90	$137.84	$20.06		$389.65	$323.92	$65.73	
PreferredOne National	$189.61	$137.84	$51.77	731	$467.83	$323.92	$143.91	997
Definity Health Option 1	$150.52	$137.84	$12.68	349	$375.55	$323.92	$51.63	346
Definity Health Option 2	$150.48	$137.84	$12.64		$375.47	$323.92	$51.55	
Total Single and Family				8,198				8,118
Total Enrollment								16,316

UM = University of Minnesota

Specific questions on the survey drew on our past and ongoing research relating to the Buyers Health Care Action Group (Feldman, Christianson, and Schultz 2000; Schultz et al. 2001) and on other research studies (Schlesinger, Druss, and Thomas 1999; CAHPS™ 1998). We relied on the survey to determine whether the employee or any dependent had a chronic illness. ("Do you or a dependent have a chronic condition such as asthma, hypertension [high blood pressure], diabetes, or arthritis?") We discuss the validity of this measure of health status in more detail in the concluding section.

We also asked employees to rate the importance of several health plan features, including:

1. The health plan has a national network of providers and hospitals;
2. The health plan's network includes my doctors;
3. The health plan covers preventive care services, such as physical exams;
4. The health plan does not require referrals or preauthorizations;
5. The amount of potential out-of-pocket expense (costs in addition to my paycheck contributions) is small, or the health plan has no copayments;
6. The balance in a personal care account or medical savings account rolls over to the next benefit year to pay for out-of-pocket medical expenses;
7. The plan has online tools and resources (such as provider lists or prescription drug prices) that I need to manage my health care.

After rating each feature, the employee selected three that were most important. Previous research (Harris, Schultz, and Feldman 2002; Harris and Keane 1999) has shown that these preference ratings can be interacted with choice-specific indicator variables and included in health plan choice models. The coefficients of such variables represent the average amount of each characteristic embodied in each choice, as perceived by the employees who make the choice. For example, employees with a strong preference for "no preauthorizations" should be more likely to choose plans that offer this feature. A positive plan-specific coefficient in the choice model for this preference variable would indicate that the plan in question is perceived as not requiring preauthorizations.

The second data source for our study was information from the university's payroll system. This indicated which plan the employee chose and whether she had single or family coverage, her 2002 federal taxable wages

from the university, and certain demographic information such as age, sex, and zip code of residence.

The analysis uses methods that the investigators have applied extensively in prior research (Feldman et al. 1989; Dowd and Feldman 1994/1995; Harris, Schultz, and Feldman 2002). The model's specification is as follows. Let $S = (Z_1,\ldots,Z_J)$ be a mutually exclusive and exhaustive choice set of J alternatives, where each alternative j is characterized by a vector of m value-relevant attributes, namely, $Z_j = (z_{j1},\ldots,z_{jm})$. Let $Y_i = (y_{i1},\ldots,y_{in})$ be a vector of n attributes characterizing the ith decision maker (either an individual or family) choosing from choice set S. For any such choice set S, and for any decision maker described by the set of attributes Y_i, choice models generate a vector of probabilities $(P_{i1},\ldots,P_{iJ})$, where P_{ij} is the probability that the decision maker will choose alternative j from choice set S. The probabilities must sum to one.

Our choice model is based on the theory of utility maximization. We assume that the ith decision maker derives "utility" or satisfaction from alternative j, based on a function of its attributes, Z_j, personal attributes, Y_i, and interactions between alternative-specific and personal attributes, X_{ij}. Thus, the utility function is $U_{ij} = f(Z_j, Y_i, X_{ij})$. For example, utility is considered to be a function of personal attributes such as health status, health plan attributes such as price, and the interaction of price and health status.

We use conditional logit techniques to estimate the utility function, based on the observed health plan choices. This method is motivated by a random utility function because there are errors in maximization due to imperfect perception and optimization, as well as errors due to unobserved relevant variables. Conditional logit estimates the effects of choice and decision-maker characteristics on choice probabilities for all decision-making units, $h = 1,\ldots,N$, as:

$$P_{hj} = exp(\alpha_j + \beta' Z_j + \gamma_j{}' Y_h + \theta' X_{hj}) \Big/ \sum_{k=1}^{j} \exp(\alpha_k + \beta' Z_k + \gamma_k{}' Y_h + \theta' X_{hk}),$$

where $U_{hj} = \alpha_j + \beta' Z_j + \gamma_j{}' Y_h + \theta' X_{hj} + e_{hj}$ for the $k = 1,\ldots J$ alternatives in the choice set, α_j is an alternative-specific constant with $\alpha_J = 0$, γ_j is a vector of alternative-specific coefficients with $\gamma_J = 0$, and β and θ are vectors of coefficients that are invariant across alternatives). The random term, e_{hj}, represents unobserved, decision-maker specific aspects of utility from alternative j, which are assumed to be independently and identically distributed with an extreme value distribution.

The price of each health plan (one of the Z_j variables in the model) was measured by its "tax-adjusted" out-of-pocket premium, because the UM lets employees pay their out-of-pocket premiums with tax-free dollars (Dowd et al. 2001). Employee health status (a Y_h variable) was measured by the response to the survey question on chronic illness. Health status was interacted with plan-specific dummy variables, allowing us to estimate the effect of health status on the probability of joining each plan. Favorable selection into the CDHP plan would be indicated by a negative coefficient on the interaction of "chronic illness × CDHP."

We multiplied health status times the out-of-pocket premium for each plan to create a new X_{ij} variable in the choice model. The coefficient of this new variable indicates whether employees with chronic illnesses are less sensitive than are "healthy" employees to price differences among health plans. This finding, if observed, would imply that changes in relative prices lead to changes in plans' costs arising from changes in the distribution of risks (Strombom, Buchmueller, and Feldstein 2002).

Following prior research (Schultz 2001), the choice equation includes a number of other Y_h variables, such as the employee's gender and her age, each interacted with plan-specific dummy variables. The coefficients of these variables stand for unmeasured characteristics of the choices that provide differential utility to men and women, or older versus younger workers.

How to group the employees for analysis of health plan choice is an important issue. Our previous research suggests that employees should be combined with those who face similar choices, and separate choice models should be estimated for each group (Feldman et al. 1989). In particular, separate choice models should be estimated for (1) single employees with no dependents, (2) families who have no other sources of health insurance, and (3) families who have multiple sources of health insurance (because both spouses or both partners work for companies that offer health insurance). However, in this analysis we could not determine whether employees with single coverage were "true" singles (i.e., single employees with no dependents). Similarly, we did not have access to the other choices faced by employees with family coverage. Therefore, we combined employees with single and family coverage, as has been done by some prior research (Short and Taylor 1989).

Another important estimation issue is whether the alternatives in the choice set are really independent. An alternative assumption is that some choices are closer substitutes than others. The most likely close substitutes would be Definity Health Options 1 and 2. The three cost tiers offered by Choice Plus also represent a plausible set of close substitutes. We considered

using the nested logit or multinomial probit models, which impose less-restrictive assumptions about health plan substitution than conditional logit. However, because a low proportion of UM employees chose Definity Health, the sample sizes for Options 1 and 2 were not large enough to estimate the alternative models. Given that nested logit/multinomial probit was not feasible, we also combined the Choice Plus options and assigned the middle-tier premium to this composite product.

The final methodological issue concerns our sampling procedure, which oversampled Definity Health enrollees and undersampled those from other health plans. To correct for this "choice-based" sampling design, we weighted the survey responses by the inverse of the population proportion in each plan. The Manski-Lerman (1977) correction was used at convergence to obtain appropriate standard errors.

RESULTS

In this section we present descriptive statistics, and we discuss the coefficients and marginal effects from the conditional logit model of health plan choice. The descriptive statistics for the data used in the analysis are presented in Table 2. The actual sample means and standard deviations for data on employee plan choice, medical premiums, demographic characteristics, and health plan feature preferences are contrasted to data weighted to approximate the entire employee population's distribution of health plan choices. The average age of the respondents is 46 years, about 44 percent of them are women, and the average employee salary net of taxes in 2002 was $31,702. Thirty-six percent of the respondents or their families have a chronic health condition.

Two specifications of the conditional logit choice model are presented in Table 3. In both specifications, the reference health plan for comparison is HealthPartners, the traditional HMO. The model in the first four columns of Table 3 includes plan choice intercepts but not premiums. The rationale for using plan choice intercepts as a proxy for premiums is explained by the prices associated with the plan choices. Specifically, HealthPartners had a no-cost employee contribution for single contracts and a very small employee contribution for family contracts, making it a popular plan. This means that any plan intercept really serves as a premium variable as well. As proxies for premiums, the plan intercepts perform well with each associated with a statistically significant coefficient (in bold).

Table 2: Variable Names and Descriptive Statistics

Variable	*Description*	*Total (N = 915)* *Sample Mean*	*Standard Deviation*	*Weighted Mean*	*Weighted Standard Deviation*
Plan Choices of Employees					
HMO	In HealthPartners HMO = 1, else = 0	0.314	0.464	0.551	2.101
CDHP	In Definity (consumer-driven plan) = 1, else = 0	0.457	0.498	0.043	0.853
PTC	In Choice Plus = 1, else = 0	0.177	0.382	0.300	1.937
PPO	In PreferredOne PPO = 1, else = 0	0.052	0.223	0.106	1.300
Employee Chararacteristics					
	Employee's tax-adjusted medical insurance annual premium	$ 1,522.77	823.427	$ 1,556.85	3,636.050
	Employee or immediate family member has chronic condition = 1, else = 0	0.360	0.480	0.370	2.040
	Employee elected a family contract = 1, single contract = 0	0.485	0.500	0.514	2.112
	Employee's salary minus tax liabilities	$ 31,702.54	19,642.040	$ 27,250.66	62,359.420
	Employee is female = 1, male = 0	0.447	0.497	0.434	2.094
	Employee age in 2002	45.86	11.712	44.043	50.605
	Employee answered flexible spending account quiz question = 1, else = 0	0.71	0.454	0.725	1.887
Employee Preferences for Health Plan Features: 1 = important feature, 0 = else					
	Health plan has a national network of providers and hospitals.	0.271	0.445	0.210	1.721
	Health plan covers preventive services, such as physical exams.	0.493	0.500	0.515	2.112
	The health plan's network includes my doctors.	0.701	0.458	0.650	2.015
	The health plan does not require referrals or preauthorizations.	0.412	0.492	0.339	2.000
	The health plan has no copayments.	0.420	0.494	0.535	2.107
	The balance in a personal care account or medical savings account rolls over to the next benefit year to pay for medical expenses.	0.242	0.428	0.197	1.679
	The plan has online tools and resources that I need to manage my care.	0.070	0.255	0.070	1.077

Note: Health plan population weights are used in the logit choice model.

Table 3: Health Plan Choice Model Estimates

		Using Plan Intercepts as Proxy for Premium				*Using Plan Intercepts and Premium*			
Variable	*Description*	*Coefficient*	*Standard Deviation*	*T-Statistic*	*Marginal Effect*	*Coefficient*	*Standard Deviation*	*T-Statistic*	*Marginal Effect*
Health Plan Intercepts (Health Partners is the reference category)									
	CDP—Definity Intercept	**−3.707**	1.046	−3.545	−44.354	**−2.572**	0.887	−2.899	−37.191
	PTC—Patient Choice Intercept	**−4.152**	0.341	−12.187	−69.730	**−4.061**	0.348	−11.668	−67.566
	PPO—PreferredOne Intercept	**−8.282**	0.506	−16.375	−58.012	**−7.003**	0.859	−8.151	−45.43
Medical Insurance Tax-Adjusted Premium									
	Employee Medical Insurance Premium-Adjusted					**−0.002**	0.0007	−2.265	
	Premium and Chronic Interaction					**−0.001**	0.0001	−7.878	
	Premium and Family Contract Interaction					0.001	0.0007	1.749	
Employee Chararacteristics Interacted with Health Plan Intercepts									
CDP	Chronic Patient or Family Member	−0.142	0.314	−0.453	−1.7	0.409	0.271	1.507	5.911
PTC		−0.106	0.110	−0.958	−1.774	−0.109	0.117	−0.936	−1.819
PPO		**0.456**	0.108	4.222	3.191	**1.818**	0.219	8.301	11.792
CDP	Family Contract = 1, Single = 0	−0.296	0.295	−1.003	−3.542	−0.418	0.319	−1.31	−6.038
PTC		**0.380**	0.108	3.524	6.381	**0.368**	0.114	3.233	6.126
PPO		0.038	0.110	0.349	0.269	**0.083**	0.649	0.129	0.541
CDP	After-Tax Income (in thousands)	**0.019**	0.006	3.269	0.225	**0.013**	0.005	2.404	0.187
PTC		**0.007**	0.003	2.741	0.121	**0.007**	0.003	2.524	0.109
PPO		0.006	0.002	2.355	0.04	−0.004	0.003	−1.664	−0.029
CDP	Gender, Female = 1, Male = 0	−0.012	0.298	−0.04	−0.143	−0.013	0.251	−0.05	−0.181
PTC		**−0.340**	0.109	−3.128	−5.711	**−0.324**	0.114	−2.856	−5.396
PPO		**−0.375**	0.113	−3.32	−2.625	−0.203	0.119	−1.7	−0.608
CDP	Employee Age	0.021	0.015	1.384	0.247	0.008	0.012	0.621	0.111
PTC		**0.031**	0.006	5.648	0.522	**0.030**	0.006	5.279	0.503
PPO		**0.038**	0.005	7.431	0.269	**0.036**	0.006	6.574	0.235
CDP	Employee Benefit Knowledge	−0.330	0.281	−1.175	−3.946	−0.132	0.248	−0.534	−1.912
PTC		**0.287**	0.115	2.493	4.815	**0.282**	0.119	2.374	4.689
PPO		**−0.567**	0.109	−5.197	−3.97	**−0.636**	0.116	−5.48	−4.123

Employee Preferences for Health Plan Features Interacted with Health Plan Intercepts									
CDP	National Provider Panel	**0.799**	0.360	2.223	9.564	**0.811**	0.322	2.515	11.723
PTC		0.125	0.142	0.881	2.099	0.132	0.147	0.9	2.203
PPO		**0.692**	0.139	4.979	4.846	**0.687**	0.146	4.699	4.456
CDP	Preventive Services Covered	0.273	0.346	0.787	3.262	0.406	0.310	1.311	5.869
PTC		0.187	0.123	1.524	3.136	0.204	0.127	1.608	3.397
PPO		−0.018	0.130	−0.138	−0.125	0.037	0.138	0.266	0.238
CDP	My Doctor Is in the Panel	**0.864**	0.376	2.299	10.343	**0.822**	0.324	2.539	11.889
PTC		**1.785**	0.137	13.067	29.970	**1.777**	0.140	12.727	29.558
PPO		**5.285**	0.394	13.415	37.015	**5.396**	0.398	13.561	35.002
CDP	No Referrals or Preauthorization	0.61	0.36	1.71	7.307	**0.80**	0.31	2.58	11.535
PTC		**0.293**	0.119	2.452	4.915	**0.301**	0.124	2.430	5.013
PPO		**0.97**	0.115	8.455	6.790	**0.96**	0.122	7.828	6.219
CDP	Health Plan Has No Copayments	−0.27	0.431	−0.615	−3.172	−0.07	0.365	−0.185	−0.978
PTC		**0.381**	0.141	2.705	6.398	**0.373**	0.145	2.567	6.206
PPO		−0.185	0.133	−1.390	−1.296	−0.208	0.144	−1.443	−1.351
CDP	Personal Care Account Rolls Over	0.396	0.366	1.080	4.737	0.193	0.329	0.585	2.785
PTC		−0.096	0.135	−0.712	−1.612	−0.092	0.136	−0.671	−1.522
PPO		**−1.039**	0.148	−7.010	−7.277	**−1.124**	0.159	−7.068	−7.292
CDP	Use of Online Tools	0.999	0.577	1.731	11.951	0.884	0.521	1.696	12.776
PTC		**1.211**	0.208	5.811	20.334	**1.214**	0.217	5.587	20.193
PPO		**−2.707**	0.524	−5.168	−18.957	−2.797	0.629	−4.446	−18.143
	Number of observations	915				915			
	Log-L for Choice model	−861.87				−897.19			
	Adjusted R-square	0.31				0.28			

Note: Estimates in bold are significant at $p<.05$

The next four columns include the tax-adjusted premium as well as interactions of premium with employee (or family member) chronic condition and an indicator variable for a family contract. In this model the premium coefficient is effectively identified only through variation in premiums created by differences in the employees' marginal tax rates, because the health plan intercepts control for all individually invariant plan characteristics.

To aid in interpreting the results from these models, we present marginal effects as well as coefficient estimates. Marginal effects are defined as the change in the probability of choosing a health plan (scaled times 100) as a continuous independent variable changes by one unit or a discrete independent variable changes from zero to one. An examination of the marginal effects of employee characteristics interacted with plan-specific dummy variables in Table 3 suggests that chronic illness of the employee or of family members has no effect on choice except for a greater preference for the PPO option, PreferredOne. Employees with family contracts have a greater preference for Choice Plus. Income is positively related to the selection of Definity and is the largest marginal health plan effect in the income group. Income is also positively related to selection of Choice Plus. Age has no statistically significant relationship with Definity Health choice, although the estimated coefficient is positive. Both Choice Plus and PreferredOne attract older employees.

With regard to health benefit knowledge, measured as a correct response to a quiz question on tax-exempt flexible spending accounts, we find the most knowledgeable employees selected Choice Plus, and the least knowledgeable selected PreferredOne.

Employees who chose Definity Health prefer health plans with a national provider panel and a plan that includes their physician in the panel. Employees who chose PreferredOne also preferred these health plan features. Two other positive preferences for Definity Health employees (significant at the .10 level) were that the health plan had no referrals or preauthorization requirements and the plan had online tools to manage one's health and health benefits. Choice Plus enrollees preferred a plan with no copayments and favored lower out-of-pocket expenses.

When premiums are included in the model, we find the sign of the premium coefficient is negative as expected. When premium is interacted with the presence of a chronic illness, we surprisingly find greater price sensitivity for employees and families with a chronic health condition. Premium interacted with family coverage generated a smaller marginal effect suggesting that employees with family coverage may have other family-member

constraints that reduce their sensitivity to differences in health plan premiums. The dummy variable interactions are also negative, though not as large as the results in Table 3, suggesting that they may not account for all the premium variation affecting plan choice. In a conditional logit choice model that excluded the health plan intercepts (results not reported here), premium had an even larger effect on plan choice.

Comparing the effects of employee characteristics, we find only a few differences between the two models. If Definity Health had a greater take-up rate and thus a sample weight greater than .04, we may find that employees with chronic illnesses have a higher likelihood of choosing Definity Health. We observe an even larger positive relationship between chronic illness and PreferredOne plan choice when the model includes premiums.

With premium explicitly controlled, we see larger marginal effects for Definity Health choice associated with health plan features than in the intercept-only model of plan choice. The national provider panel feature and having access to my doctor continue to have strong positive relationships with the choice of Definity Health. One change is a positive and statistically significant association with choice of Definity Health for those who prefer a plan with no referral or preauthorization. Interestingly, the use of online tools, one of the hallmarks of consumer-driven health plans, does not have a very significant role in the choice of Definity Health, though it did play a significant role, with a large effect, for employees choosing Choice Plus.

An advantage of the model that includes premiums is that we can calculate explicit premium elasticity estimates, which are shown in Table 4 for Definity Health and HealthPartners. These estimates are derived using the market share of each plan and the average marginal tax rates of 39 percent and 36 percent for employees selecting Definity Health and HealthPartners, respectively. The "employee-perspective" premium elasticity shows the percentage change in the probability of choosing Definity Health as the tax-adjusted out-of-pocket premium changes by 1 percent. This elasticity is relevant for estimating the decision maker's response to a change in her out-of-pocket premium contribution. The "insurer perspective" premium elasticity shows the percentage change in the probability of Definity Health enrollment as the health plan raises its *total* premium by one percent. This elasticity is more useful for estimating the heightened pressure on health plans from managed competition reforms.

The Definity Health elasticity estimates show that single-contract employees with chronic conditions are more price-sensitive than those without chronic conditions. We observe even larger price elasticity for

Table 4: Premium Elasticity Estimates

	Employee-Only Coverage		*Family Coverage*	
	Employee Perspective	*Health Plan Perspective*	*Employee Perspective*	*Health Plan Perspective*
Definity Health				
No chronic condition	− 0.387	− 4.584	− 0.786	− 5.375
Chronic condition	− 0.58	− 6.876	− 1.572	− 10.749
HealthPartners HMO				
No chronic condition	N/A	− 2.064	− 0.155	− 2.58
Chronic condition	N/A	− 3.097	− 0.309	− 5.161

Notes:

Formula for premium elasticity: $n = B(1 - P)X$

B = coefficient, P = probability of choosing this plan, X = tax-adjusted out-of pocket (total) premium for employee (health plan) perspective elasticity

Marginal tax rates for employees: HealthPartners = 0.36, Definity Health = 0.39

employees selecting family contracts in Definity Health, with chronically ill employees or their family members having a greater premium response. We observe no single-contract employee price elasticity for HealthPartners, since there is no employee premium for the benefit. The family elasticity estimates from both the employee and insurer perspectives are less for HealthPartners than for Definity Health.

Conclusion and Limitations

The analysis in this paper provides new knowledge on preferences of employees who are offered a consumer-driven health plan for the first time. Our results do not suggest that the CDHP was disproportionately chosen by the young and the healthy. At the very least, employees who choose Definity Health appear no healthier or younger than those who chose an HMO.

We do find that income and employee preferences for several health plan features were strongly positively associated with the choice of Definity Health. Most notably, access to a panel that included a desired provider as well as the availability of a national panel of physicians and hospitals is appealing. For example, Definity Health offers access to the Mayo Clinic in Rochester, Minnesota. Only one other plan explicitly permits access to Mayo, and then at a premium nearly three times the required employee premium contribution for Definity Health. Income is a consistent factor associated with Definity

Health choice, suggesting that those with the ability to easily fund the deductible in the case of emergency are more willing to choose a consumer-driven health plan. If income continues to be a factor in health plan choice, consumer-driven plans may acquire a reputation for being the choice for the "well-to-do." However, in other survey results there was no apparent difference in consumer-perceived quality between Definity Health and other health plans, suggesting that, if higher-income individuals choose to pay more for greater provider choice, it does not appear associated with an appreciable difference in perceived quality of care.

As in many previous studies, we find that employees are sensitive to out-of-pocket premium differences among competing health plans. However, employees with chronic conditions themselves or in their family are more price-sensitive than those without chronic conditions. Our conjecture for the cause of this surprising result is that three UM plans—Definity Health, PreferredOne, and Choice Plus—featured larger provider networks and more open access to providers than did HealthPartners. If chronically ill employees and families prefer these features, they may perceive more close substitutes in the choice set than employees and families without chronic illnesses. As the number of close substitutes for a product increases, the own-price elasticity of demand rises.

Our conclusions are subject to several important limitations. The first of these concerns the generalizability of the results. We observe only employees and families who switched into a consumer-driven heath plan during its first year. No one at the UM had experience with this type of plan, which is quite different from the offerings during the prior years. One would expect that employees who chose Definity Health for themselves and their families in 2002 might be different from those who select the plan in subsequent years. We plan to continue the analysis by examining the patterns of selection into Definity Health in 2003.

Second, the study is limited by the small sample size of 430 Definity Health members. Some of the insignificant results may be due to this limitation. The small number of enrollees in Definity Health Options 1 and 2 also prevented estimation of nested logit/multinomial probit health plan choice models. A Hausman test (Hausman and McFadden 1984) indicated that we could not drop one of the alternatives without violating the assumption of "independence of irrelevant alternatives" or IIA ($\chi^2 = 132.109$, $df = 31$). Therefore, our finding that chronically ill employees are more price-sensitive than those without chronic conditions may be dependent on the particular set of choices offered by the UM.

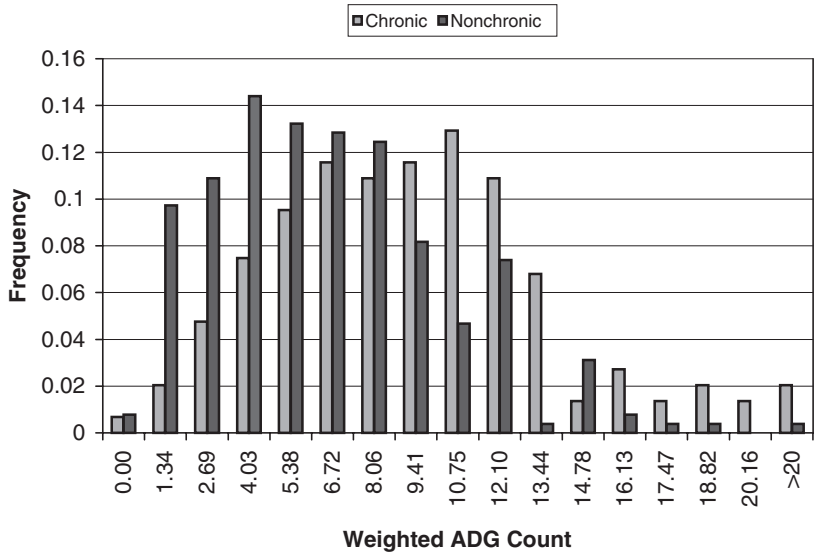
Third, our analysis of selection relies heavily on a self-reported indicator of chronic illness that counts all chronic conditions equally and classifies the whole family as having a chronic condition if only one family member has such a condition. Because of concerns about the validity of this measure, we performed three tests using the survey responses for Definity Health respondents matched to 2002 medical claims data for the respondent's contract. First, we created a count of the number of Adjusted Diagnosis Groups (ADGs) for each contract in the claims data. Each ADG is a grouping of ICD-9 diagnosis codes that are similar in terms of the severity and likelihood of persistence of the health condition treated over a relevant period of time (Weiner et al. 1991). The ADGs are also predictive of the need for health care services. Just as individuals may have multiple ICD-9 diagnosis codes, they may have multiple ADGs (up to 34). The correlation coefficient between the ADG-count variable and the survey-based chronic condition indictor was .362, which was statistically significant at $p < .0001$.

Second, we created a weighted ADG count using claims cost weights for each ADG from a large employer population (not the University of Minnesota, for which claims data were unavailable). This is a different and arguably better representation of what each family is likely to cost. The correlation coefficient between this weighted ADG count and the survey responses is .311, slightly lower than the first test but significant at $p < .0001$. A graph of the distribution of weighted ADGs among chronic and nonchronic respondents is shown in Figure 1. The distribution has a single peak in both populations, but the chronically ill population peaks at a higher illness burden than the nonchronic population. In addition, the weighted ADG count does not appear to be driven by unusually low- or high-cost outliers in either population.

Finally, we created an ADG-count variable based only on progressive and chronic diseases (ADGs 9–19 and 23–25). This measure was correlated at $p < .001$ with the survey-based chronic condition indicator. Thus, while the chronic condition indicator is not perfect, our tests demonstrate that it correlates highly with a conceptually and statistically valid measure of health status.

We plan to examine the choices of employees in other employed groups to test the stability of the results reported in this paper. In these groups, we will use claims data to measure illness burden, using ICD-9 diagnosis codes. Most importantly, we will address the question of whether consumer-driven health plans result in appreciable differences in cost and utilization subsequent to enrollment. This work lays the groundwork for future research by providing

Figure 1: Frequency of Weighted ADG Count among Chronic and Nonchronic CDHP Respondents



the first empirical examination of the health plan features most preferred by consumers considering the choice of a consumer-driven health plan. Continuing this analysis over several years might yield different results. Observing subsequent rounds of consumer health plan selection would also be desirable to examine whether early adopters of CDHPs differ from later adopters in their decision making. Our results suggest the options offered by Definity Health to the University of Minnesota did not receive favorable risk selection relative to the most popular and lowest-cost option in the first round of employee choice.

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Commentary—How Consumer-Driven Health Care Evolves in a Dynamic Market

Greg Scandlen

This volume presents an enormous amount of information that will take students of consumer-driven health care a very long time to read and digest. It will be tempting for both advocates and opponents of the movement for greater consumer control to browse through the work and pick out and trumpet those nuggets of information that suit their predispositions.

This would be unfortunate because the information that runs counter to our biases is the most important information to understand. Good policy can be developed only when we listen closely to honest criticism and respond accordingly—as difficult as that may be.

Still, the work presented here requires some context. Consumerism in health care is in its infancy. We do not yet know what the optimal approach is and we are in a period of experimentation and trial and error. Like most other new ideas, the initial models will need to be revised and improved. Prototype designs are almost never without flaw.

One of the marvels of any market-based system is the ability to make those corrections and revisions quickly as more information becomes available.

Too many health policy analysts take a governmental program approach to design questions—the model must be irrefutably effective before it is ever implemented. Once a program is "the law of the land" it is nearly impossible to change. Witness the protracted debate over adding prescription drug coverage to Medicare.

Fortunately, consumer-driven health care (CDHC) was born in the market and will be revised in the market. To the extent there has been governmental involvement (such as the IRS guidance on Health Reimbursement Arrangements), it has been extraordinarily flexible and permissive.

Vendors and employers are free to refine their products in accordance with changing conditions and growing knowledge. In that context, identifying problems is seen not as an attack on cherished ideas, but as a welcome opportunity to improve the product offerings. Criticism is valued as product

feedback. A company that wants to succeed in the market is eager to hear what the problems may be.

Market approaches have some other advantages over a governmental orientation, as well. Government programs are essentially political. They are aimed at pleasing 50 percent+1 of the population. Opinion surveys are conducted to see how close a new idea is to achieving that goal.

Few companies in the private market think in those terms. If a new product or a new company feels it can reasonably attract even just 10 percent of a market, it views the prospects as very promising. Hertz is not the only success in the rental car business. Avis and National and Budget and Alamo and many others manage to succeed without being Number One.

Readers of the papers in this volume will likely conclude that the experience at Humana was not very favorable, the experience of the Definity-covered University of Minnesota was more favorable, and the large, unnamed Definity-covered employer was very favorable. What does that mean? Clearly different locations and different designs lead to different results. If CDHC were a government program, this might be worrisome—have we chosen "the right" model? But because CDHC is a market-oriented approach, it is not discouraging at all. Definity is doing something right and will build on it. Humana may revise its approach or drop the program altogether. It does not matter in the slightest. Humana is not disadvantaged because Definity is succeeding. And Humana's problems do not detract at all from Definity's success.

Certainly there are things to be learned in both cases, and market-oriented companies will study these experiences closely. But no company—including Humana—is stuck with a problematic design. Humana's product did not allow rollovers and the funds in the "allowance" could be spent only on in-network provides and for covered services. These features remove the most promising elements of consumer-driven health designs—consumer choice and the opportunity to save money for future needs. It is simple enough for Humana to incorporate those features in its next round of offerings.

Market-oriented companies also know that early adopters are different than the rest of the market. The people who are the first to sign up for a new product or service tend to be risk-takers. They accept risking the unknown for the privilege of trying something new. They also tend to be younger and better educated than the rest of the market. They volunteer to be "test cases" and

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product developers rely on them to refine their offerings. People oriented toward government programs may view this as a selection problem, but innovators expect this to occur in the first couple of years of new-product roll out. If the product is successful at this stage, word gets out and the new idea attracts a wider market segment.

The research presented here does not address the "early adopter" phenomenon very effectively. We are told that the enrollees in the Humana program tended to be actuaries and financial service personnel. These individuals are presumably better educated than most Humana employees, and they certainly know their way around a benefits program better than the average person. It is interesting, for instance, that the studies report no end-of-year rush to consume unspent dollars in the allowance, even though Humana included a use-it-or-lose-it provision characteristic of flexible spending accounts (FSAs). This contrasts with the Countrywide Financial experience that did have an FSA-type year-end rush, even though those employees were able to roll over unspent balances. It is possible that the self-selected Humana employees understood the dynamics of forfeited balances and did a better job of spending their money through the course of the year, while less-savvy Countrywide employees stuck to their FSA-induced spending habits.

Most of the studies report income disparities between CD-selectors and nonselectors. It will be interesting to see if this difference continues over the years, but it is also possible that income is a proxy for education. This should certainly be the case at the University of Minnesota where educational attainment should correlate closely with income. If it is true that early adopters tend to be more highly educated, we would need to control for differences in education before concluding there is an income effect unique to CD health.

We also think of early adopters as being younger, but that does not seem to be the case here. If anything, CD-selectors appear to be somewhat older than nonselectors (though age is another underreported variable in these studies). Is it possible that early adopters for electronic gadgets are different from those for health insurance programs? Perhaps younger people pay so little attention to their health care needs that a choice of benefits plan is of little interest to them.

Since we cannot yet distinguish between the behavior of early adopters and a more mature market for consumer-driven health, the research presented here is of limited (but not unimportant) value. Most of this work looks at baseline information in 2001, first enrollment in 2002, and renewals in 2003. That means there is only a single year's worth of data. Given that the IRS did not issue guidance until June 26, 2002, the products were very tentative and in

some cases did not incorporate the more attractive features of the approved health reimbursement arrangement (HRA) model. It was not at all clear at the start of 2002 that the IRS would allow year-to-year rollover and buildup of unspent balances.

Even more importantly, none of the pioneer models anticipated that postemployment access to the funds would be allowed. The prospect of saving money for future needs even after leaving one's current employer could very well skew enrollment decisions from what this research presents. Lower-income workers in particular might find that prospect more attractive.

The body of research presented, then, is looking at a moment-of-time of an extremely fluid and dynamic environment. Much of the experience studied predates the IRS guidance. And, while Humana and Definity are both very serious and credible players, they are not the only vendors, nor the only models available. Destiny Health, for instance, takes a radically different approach to the market and to product design. It distinguishes between "discretionary" and "nondiscretionary" spending and applies the cash account only to the former. It also requires portability for account balances. Its market targets fully insured smaller companies, rather than the larger self-funded employers studied in this research. It would be worthwhile knowing the experience of this different design and different market segment.

It is impossible to know ahead of time if the Destiny model is superior to the Definity model or the Humana model (or the models from Aetna, HealthMarket, Lumenos, or dozens of other variations). Clearly, behind each design are a number of credible and serious people who believe their approach is superior to all others. It will not be academia that answers the question of which approach is best, but the market.

Another example of the limitation of the research is the role of consumer support. Critics have complained that good comparison data does not yet exist, so it is difficult for individuals to become smart shoppers in the health care marketplace. That is unquestionably true—at this point in time. The research in this volume touches on what information services and customer support were available during the study period, and it all seems pretty rudimentary.

But 10 years ago the Internet was rudimentary, too. One thing we have learned beyond doubt is that information systems explode once the right incentives are in place. It is probable that the support services available to companies buying consumer-directed plans in the winter of 2004 have evolved considerably from what were available in 2002. We cannot begin to imagine what health systems information may look like 10

years from now. All we really know is that for the first time in history, individual consumers of health care services have a reason to demand having reliable and accessible information and the tools to make use of this information.

The context of this information revolution is important. For at least two decades policymakers have bemoaned the lack of quality incentives, patient education programs, transactional efficiency, price competition, and so on. We have created massive government agencies, behavioral modification programs, public service announcements, efficiency initiatives, and health education efforts. We have Institute of Medicine studies, and those from the Agency for Health Care Research and Quality, and the Leap Frog Group. We have worksite wellness programs, quality assurance requirements, and certificates of need. All an endless string of well-intentioned badgering at a system that is largely indifferent. And still we have epidemic-sized obesity problems, diabetes, smoking, HIV infections, physicians writing prescriptions in illegible handwriting, and massively inefficient hospitals. For all of the effort invested, nothing we have done has been very effective.

Consumer-directed health care supposes a new formulation—one driven by consumers with cash-in-hand, demanding to know for themselves who is the best urologist in town, what are my treatment alternatives, why is this hospital billing so much for a Tylenol, why can't I read this prescription, where is the nurse when I need one, how do I get the most value for the money I'm spending?

Information systems to support this movement will grow exponentially. But the information is only ammunition. It is not an end to itself. The real revolution will come when health care consumers use that information to reward higher quality and punish the mediocre, to demand efficiency in the use of their health care dollars, to educate themselves about their treatment alternatives and become invested in the decisions they have made, and to learn that their own behaviors are what drives their need for health care services.

Nothing we have tried in the past has accomplished this transformation. If we keep repeating the same old patterns, we will keep getting the same old results. Consumer-driven health care gives us an opportunity to change the pattern.

But it will take a little patience to get there. Already the environment has changed dramatically from what was in place in early 2002 when these programs started. As mentioned, the IRS put its imprimatur on HRAs in June of 2002. Legacy companies like Aetna, Cigna, United Healthcare, and even

the Guardian have entered the market, bringing legitimacy and marketing clout to the movement. Costs for traditional coverage continues to rise and employers everywhere are increasing cost sharing with employees. The IRS now allows FSAs and other cash accounts to pay for over-the-counter drugs and weight-loss programs, and to use debit cards. Even more recently (January 1, 2004) Health Savings Accounts have been made available to all 250 million nonelderly Americans.

The coming twelve months could see additional changes, such as refundable tax credits for people who do not get coverage on the job, FSA rollovers, and possibly some form of association health plan or joint purchasing for individuals and small employers.

By all means, let the research continue. Let's dig deep into the experience we've had and learn as much from that as we can. But let's also understand that the process of research necessarily means looking backward into what has already happened. We are white-water rafting here and the river changes by the minute. The experience of two years ago is important, but it is already out-of-date.

Commentary—Current MSA Theory: Well-Meaning but Futile

George C. Halvorson

Medical savings accounts (MSAs), in their current form, generally represent an increasingly visible and well-meaning, but potentially futile and sometimes counterproductive, attempt to include consumers in the major costs of care in any meaningful way.

One key part of the underlying theory is valid. Advocates of MSAs say that if consumers lose their current financial insulation from the direct costs of care, then those consumers will tend to make different decisions at some level about the nature and scope of their care. That is probably true. The problem is that the MSA benefit packages, as they are currently designed, tend to ignore the practical reality of what health care actually costs today as well as the reality of who actually uses that care. These particular realities are fairly important and have a major impact on the real-world practical value of current MSA models.

The numbers speak for themselves. Look at the actual distribution of health care costs across the population. The vast majority of people use almost no care. Seventy percent of the population, in fact, uses less than 10 percent of all care dollars. Twenty percent in any given year use no care at all.

On the other end of the expense continuum, use levels are heavy and expensive for a very small number of people. One percent of the people use up to 40 percent of all care dollars, and 5 percent use an absolute majority of all monies spent on care.

Why are these particular numbers relevant to a discussion about MSAs? Again, look at the actual economic design of MSA products. A typical medical savings account benefit package has a $1,000 upfront cash amount that can be spent on any eligible care by the recipient. When the first thousand dollars in the account is spent, a "deductible" kicks in—and the next thousand dollars comes directly from the patient's pocket.

Then, if and when the second thousand dollars is spent, a "catastrophic" insurance plan kicks in, and that insurance plan pays for the patient's remaining health care expenses. The MSA theory is, of course, that patients will spend the first thousand dollars very carefully because it is, in effect, their

money. Then, theorists believe, the next thousand dollars of out-of-pocket expenses will create real market-based purchasing incentives and consumers will make decisions that will, in their full scope and practice, create a value-based market for care.

That's the theory. How would it work in the real world of health care costs? Let's look at hospital care. Everyone knows that the prices charged at two adjacent hospitals may vary widely. With full coverage, it is also true that consumers have no reason to choose the less-expensive hospital and may even prefer the more-expensive one because it costs more and might, therefore, be seen as more "valuable."

People with an MSA plan will, we are told by the theorists, choose the less-expensive hospital over the more-expensive facility if their own money is at stake. Is that true? Not as MSAs are now designed. Think about what care actually costs and who is using the vast majority of our care dollars. That thousand-dollar deductible will buy, at best, four hours in the more-expensive hospital. It might buy five hours of care at the less-expensive hospital. Will people really shop between two hospitals if the same thousand dollars buys four hours of care at one and five hours of care at another? No—we don't buy hospital care by the hour. An MSA is actually functionally irrelevant relative to the costs of hospital care.

So what about over the other major expense area—surgery? Do we buy any significant surgery for the amount of the deductible? Not often, if at all. That much money typically will not pay for the pre-op outpatient-facility surgery support unit preparation fee—much less the actual surgeon.

What about CT scans? MRIs? Chemotherapy? All cost a lot more than the MSA benefit package deductible. Consumers would have no economic reason to price shop for any service where the base price immediately blows through the full deductible.

So who would be influenced by the $1,000 MSA deductible? Relatively few people. The 70 percent of people who already use less than 10 percent of all care dollars would be, at best, marginally affected because they will still find themselves fully insulated from any personal cost impact by the upfront $1,000 MSA cash fund. These patients have no real reason to make any different care decisions about any basic care. (They may even feel flush with

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the new money and decide to use services they might not have used otherwise.)

The really expensive people who use the vast majority of all care dollars are also not affected. These patients are the catastrophic acute care cases (heart attacks, cancer, etc.) and the chronic care patients suffering from the complications of their disease (diabetes, asthma). These are the people who spend nearly all health care dollars.

The thousand-dollar deductible is irrelevant to both of these categories of patients for obvious reasons. It is too little, too late, for both sets of patients.

But, to be fair, there is a distinct category of patients who would be consistently, directly, and personally affected by the deductible—the chronic care patients whose expenses exceed $1,000 a year. These patients would have to decide whether to spend their own money to buy their hypertension drugs, asthma drugs, and so on. These patients would, in fact, often decide to save money by avoiding care.

But do we really want these particular people to avoid their medications? Is that good medicine in any way? An early MSA study indicated that up to 20 percent of patients did not refill prescriptions under an MSA. Which 20 percent? It is important to know. These prescriptions were all written to fill a patient need—many were written to avoid later, much more expensive complications. Are these the people whose care decisions we should be disincenting?

The MSA theory makes sense only until you add the actual cost data to the equation. Then the MSA approach runs into a real problem if you assume that the goal is to actually reduce health care costs. The typical MSA benefit package is irrelevant to expensive patients; irrelevant to cheap patients; and a potentially painful disincentive for chronic care patients. Despite its undoubted good intentions, that is not really a good care-based approach.

The real opportunity in health care today is to provide best care. The real opportunity is to identify the patients who are at high risk of becoming the most expensive 5 percent of health care users. The real opportunity is to strategically intervene with each of those patients to reduce the likelihood that they will become the 40 percent users of all health care.

That is the best focus for our health care energies. That is where the real dollar opportunities are.

That is not to argue for the old benefit sets. In fact, the right benefit incentives can make a positive difference in patient care. Copays, and even reasonable deductibles, have their place. Full insulation from all care costs is obviously problematic. Medical savings account benefit packages, well

designed and targeted to support chronic disease preventive care, can soften the blow of a pure-deductible benefit set. But only if the plan is built on medical reality, not data-deficient economic theorizing.

Let's design the next generation of benefit plans based on real data, not academic theory and ideological speculation. And let's focus our maximum energy on best care—not disincenting chronic care treatment plans.

Evidence about Consumer Experiences

Consumer Experiences in a Consumer-Driven Health Plan

Jon B. Christianson, Stephen T. Parente, and Roger Feldman

Objective. To assess the experience of enrollees in a consumer-driven health plan (CDHP).

Data Sources/Study Setting. Survey of University of Minnesota employees regarding their 2002 health benefits.

Study Design. Comparison of regression-adjusted mean values for CDHP and other plan enrollees: customer service, plan paperwork, overall satisfaction, and plan switching. For CDHP enrollees only, use of plan features, willingness to recommend the plan to others, and reports of particularly negative or positive experiences.

Principal Findings. There were significant differences in experiences of CDHP enrollees versus enrollees in other plans with customer service and paperwork, but similar levels of satisfaction (on a 10-point scale) with health plans. Eight percent of CDHP enrollees left their plan after one year, compared to 5 percent of enrollees leaving other plans. A minority of CDHP enrollees used online plan features, but enrollees generally were satisfied with the amount and quality of the information provided by the CDHP. Almost half reported a particularly positive experience, compared to a quarter reporting a particularly negative experience. Thirty percent said they would recommend the plan to others, while an additional 57 percent said they would recommend it depending on the situation.

Conclusions. Much more work is needed to determine how consumer experience varies with the number and type of plan options available, the design of the CDHP, and the length of time in the CDHP. Research also is needed on the factors that affect consumer decisions to leave CDHPs.

Key Words. Consumer-driven, personal care account, enrollee satisfaction, health plan rating

The label "consumer-driven health plan" (CDHP) has been used to describe a wide variety of different health benefit designs that shift more health care costs to consumers at the point of service, on the presumption that it is desirable to give consumers incentives to pay greater attention to the cost and quality consequences of their health care choices (Shaller et al. 2003). Recently, however, the most common use of the term has been in reference to benefit

plans with three core features: a personal care account; insurance coverage designed to create a "gap" between the dollars in the account and the level at which a deductible is reached; and various Internet support tools intended to facilitate more extensive, better-informed consumer involvement in health care decisions (Christianson, Parente, and Taylor 2002). These features distinguish CDHPs from other benefit designs, such as tiered hospital networks, that also are intended to provide incentives for consumers to consider cost and quality in selecting providers.

Consumer-driven health plans with these core features are offered now by a relatively small number of employers, but they seem to be gaining momentum, with several large national firms recently adding them as benefit options and established insurers expanding their product lines to include CDHPs (Davis 2003a). Consumer-driven health plans generally are not marketed to employers as an immediate "solution" to their rising health care costs, but rather as a constructive employer response to employee demands for more choice, fewer restrictions, and less involvement on the part of employers and health plans in health care decisions. Employer advocates of CDHPs believe the plans have the potential to moderate employer cost increases in the long run, as employees become more involved in their health care decisions, more conscious of prices and better equipped to make price–quality trade-offs (Gabel, Lo Sasso, and Rice 2002).

From a broader perspective, some analysts forecast a "consumer revolution" in health care with CDHPs and similar insurance arrangements in the vanguard. They expect this revolution to eventually change traditional relationships between consumers and health care providers resulting in a more efficient, more responsive health care system (Davis 2003c). In contrast, skeptics see CDHPs as simply being vehicles for shifting a greater share of health care costs to consumers, especially consumers with high medical care

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needs (Swartz 2001/2002), and doubt the ability of a diffuse, consumer-driven market to create change in an increasingly concentrated provider system (Devers et al. 2003). They also point to the complexity of the CDHP benefit design as potentially impeding the ability of enrollees to act as aggressive, informed health care consumers, and they question whether consumers actually want to play this role (Gabel, Lo Sasso, and Rice 2002).

Clearly, assumptions about consumers and their behaviors are central to how one views CDHPs and their potential impact on America's health care system. However, at this time, little data are available that relate directly to the experience of enrollees in CDHPs. How satisfied are they with these plans? How do they use the plan features touted by CDHPs, and how satisfied are they with these features? How does the experience of CDHP enrollees vary by individual characteristics? In this article, we begin to address these issues using data collected through a survey of employees at the University of Minnesota.

Because our analysis is based on employees from one employed group enrolled in a single CDHP in one health care market at a specific point in time, it should be viewed as a first, limited attempt to shed light on the important consumer issues raised by CDHPs. In the concluding discussion, we suggest directions for future research, based on the results of our analysis.

Background

As indicated above, CDHPs attempt to distinguish themselves from competitors in part through innovative product features directed at consumers (Christianson, Parente, and Taylor 2002; Gabel, Lo Sasso, and Rice 2002). Perhaps the CDHP feature that deviates the most from features offered by other health plans is the personal care account (PCA) (sometimes called a personal spending account, health spending account, or health care reimbursement account). The amount of money in the account varies by type of contract (e.g., individual versus family). The employee uses the account to pay for health care expenses. Money left in the account at the end of the contract year is carried forward into the next year, if the employee continues in the plan. If the employee retires, leaves the company, or stays with the company, but switches health plans, employers have different rules regarding disposition of any dollars left in the account.

A second important feature of CDHPs is their flexibility with respect to benefit design (Davis 2003b). The personal care account (PCA) is paired with rather traditional high-deductible health care coverage, typically featuring

coinsurance for expenses above the deductible and an "out-of-pocket" limit on expenses to protect the enrollee against the financial consequences of a catastrophic health care event. The plan deductible is set at a level greater than the amount of dollars put in the PCA by the employer. If the enrollee exhausts the PCA during the contract year, he or she must bear the entire cost of any further services used, until the deductible is reached, and the coinsurance feature takes hold. Typically, however, CDHPs provide "first-dollar" reimbursement for preventive services, so that enrollees do not need to use PCA dollars to pay for these services. Clearly, benefit coverage under CDHPs can be "customized" along a number of dimensions (size of PCA and deductible, level of coinsurance, out-of-pocket maximum, PCA rollover rules, and reimbursement for preventive services) in order to achieve the combination of employee premium and point-of-service cost sharing desired by the employer.

The third core feature of CDHPs is a reliance on Internet tools to help employees "manage" their health care expenses and treatment options (Gabel, Lo Sasso, and Rice 2002). Three types of tools are commonly found in CDHPs. First, there are tools aimed at helping enrollees track expenditures in their PCAs, analogous to tools used in "online" banking. Enrollees can access their accounts through the plan's website and monitor expenditures charged against the account. The idea is that, because enrollees see expenditures accumulate, and see the prices attached to different services as they are charged against the account, they will become more cost conscious in their purchase decisions; this is reinforced by the ability to "roll over" unused dollars in the account into the next year. Second, there are tools designed to help enrollees "shop" for medical care, including price lists and comparisons of physician qualifications and hospital performance measures. Typically, these tools are made available through contracts with other Internet health care "content" providers. Third, CDHP websites provide links to other Internet educational resources (sometimes "rebranded" under the plan's name) relating to health promotion, disease management, and general medical information. These last two sets of tools are becoming relatively common features of health plans, but play a more central role in CDHPs, with their emphasis on achieving greater consumer involvement in the selection of providers and in decisions around the treatment process itself.

In our analysis, we take two general approaches to examining the experience of CDHP enrollees. First, we compare enrollee experience in CDHPs with experiences of enrollees in more traditional health plans. We begin by examining satisfaction with customer service; because CDHPs

market themselves as "consumer-driven," and many CDHP features may be new to enrollees, this is a particularly relevant dimension of CDHP performance. Second, we compare CDHPs to other health plans on overall enrollee satisfaction, employing a measure used in the Consumer Assessment of Health Plans (CAHPS) survey. Third, we contrast plan-switching behavior on the part of CDHP and other health plan enrollees after one year.

In the second part of our analysis, we focus only on CDHP enrollees. We examine their use of different CDHP features and their assessment of the usefulness of those features, controlling for enrollee characteristics. This helps us understand how CDHP enrollees with different characteristics experience their health plan. We also assess their overall experience in the CDHP using three different measures: willingness to recommend the plan, having a particularly positive experience in the plan and having a particularly negative experience in the plan.

Study Setting

Our study setting is the University of Minnesota, which had about 16,000 covered employees in its health plans in 2002. Previous to 2002, university employees were part of the State of Minnesota employee health insurance program where they had six health plan options. There was standardized benefit coverage across these options. However, one option was structured like a typical preferred provider organization (PPO), with the enrollee facing a deductible and coinsurance for use of nonnetwork providers. Among the other five options, there was some variation in network size and composition. An important distinguishing feature among these options was that, in two plans, the enrollee could self-refer to an in-network specialist, while three plans were more restrictive, requiring a referral from a primary care physician.

The university split from the State of Minnesota program to become self-insured and to be able to tailor its benefit plan more closely to the needs and demands of its employees. The health benefits plans offered by the university during the fall 2001 open-enrollment period, including two CDHP options, are described in Parente, Feldman, and Christianson (2004, this issue). Under both CDHP options, enrollees had access to a nationwide provider network and no referrals were required to see any provider in or out of the network. First dollar coverage was provided for preventive health services, including routine physical and gynecological examinations, cancer screening, laboratory tests, diagnostic imaging, immunizations, and routine hearing and eye

examinations. At the end of the year, any dollars left in the PCA would be carried forward to the next year. Enrollees leaving employment at the university or switching from the CDHP to another plan would lose the money accumulated in their PCA.

Employee Survey and Respondent Characteristics

During the fall 2001 open enrollment period, only 349 individuals and 346 families selected the CDHP plan. The most popular plan was the HealthPartners HMO, with 5,027 individual enrollees and 3,967 families. The Patient Choice product enrolled 2,091 individuals and 2,808 families.

A telephone survey was administered from April through June 2003, in which employee respondents were asked to report on their own experiences in their health plans during calendar year 2002. They were not asked to provide information about family members, nor were they asked about the experience of family members in the chosen health plan. The only exception was that the employee respondent was asked if he or she or any family member had a chronic illness. The survey yielded 430 completed interviews of CDHP enrollees (a 63 percent response rate) and 501 of enrollees in other health plans (a 73 percent response rate). The details of this survey are found in Parente, Feldman, and Christianson (2004, this issue).

There were several statistically significant differences between the CDHP respondents and respondents who were enrolled in other plans (Table 1). For example, CDHP respondents were older (48.3 versus 43.9 years), less likely to purchase a family contract (44 percent versus 52 percent), and less likely to be in a civil service bargaining unit (23 percent versus 50 percent), but more likely to be academic professionals/administrators (31 percent versus 23 percent) or faculty (36 percent versus 14 percent). Not surprisingly, given these differences, CDHP enrollees also reported much higher incomes than enrollees in other plan options. CDHP respondents were also more likely to have been enrolled in a PPO option previously and less likely to have been in one of the more restrictive plan options. Because of these significant differences, we used multivariate regression or logistic regression to control for employee characteristics in subsequent analyses. We note that the proportion of respondents who said they or a family member had a chronic illness was not significantly different in the CDHP versus other plans. Based on our survey question, it would appear that the CDHP was neither more nor less attractive to people with chronic illness than other plan options.

Table 1: Characteristics of Survey Respondents

	Responders		*Nonresponders*	
Variable	*CDHP*	*Other*	*CDHP*	*Other*
Age (in years)	48.3	43.9*	49.3	44.7
Female	46%	44%	58%	53%#**
Chronic Illness	35%	37%	N/A	0
Family Contract	44%	52%*	46%	52%
Income	$71,406	$48,148*	$83,533	$49,344#
Job Classification				
Academic Professionals and Administrators	31%	23%*	24%	25%
Civil Service V Class	10%	13%	4%	7%#**
Civil Service/Barg Unit	23%	50%*	18%	43%**
Faculty	36%	14%*	54%	25%#**
Prior Health Plan				
Type 1: Standard PPO	17%	3%*	21%	4%
Type 2: No self-referral to in-network specialist	59%	79%*	60%	76%
Type 3: Self-referral to in-network specialist	13%	8%*	7%	7%#
No Prior Plan	12%	11%	12%	12%
Response Rate	63%	67%		
Sample	433	504	259	248

*Statistically significant difference between mean values of respondents for CDHP and Other at the .01 level (t-test).

#Statistically significant difference between mean values of CDHP respondents and nonrespondents the .01 level (t-test).

**Statistically significant difference between mean values of other plan respondents and nonrespondents at the .01 level (t-test).

Table 1 also provides data on the general characteristics of plan respondents and nonrespondents. There were statistically significant differences between these groups by gender and by job classification. Females made up a larger proportion of nonrespondents, as compared with respondents, and civil service workers were a smaller proportion of nonrespondents, while faculty were a larger proportion, as compared with respondents.

Comparisons across Health Plans: Results

Table 2 contains comparisons of CDHP enrollees and enrollees in other plans in three areas: service experience, overall satisfaction with their plan, and decision to switch plans at the end of the contract year. Regarding experience, survey respondents were requested to answer with respect to the previous calendar year (2002). It is possible that experience in the plan during the first

Table 2: Service Experience, Satisfaction, and Plan Switching: All Survey Respondents

	CDHP	*Other Health Plans*
Services		
Called customer service = 1, else 0	63%	48%*
If yes, then problem getting answer = 1, else 0	36%	33%*
Health plan paperwork experience = 1, else 0	52%	43%*
If yes, then problem with paperwork = 1, else 0	50%	43%*
Overall Satisfaction with Health Plan (Scale: 0 = worst to 10 = best)	7.46	7.55*
Switched Health Plan after Year 1 (e.g., CDHP to HMO)**	8%	5%*

Notes:

All results are regression adjusted means by health plan choice.

Regression covariates include: age, gender, chronic illness, contract type, income, job type, prior health plan.

*Statistically significant difference at the .01 level (t-test) between regression adjusted mean values.

**Subset of respondents; omits respondents who changed jobs or failed to elect health insurance for 2003.

part of that year might not be recalled with the same degree of accuracy as experience in the latter part of the year. However, unless this potential problem occurs to a different extent in the two comparison groups, it should not influence tests of differences between the groups. Throughout the survey, respondents were reminded of the period addressed by the survey questions.

Service Experience

With respect to service experience, we expected CDHP enrollees to be more likely to contact a customer service representative, because the plan design was new to them and, in particular, because managing the personal care account could raise questions. This expectation was supported by the data, as 63 percent of CDHP respondents contacted a representative versus 48 percent of respondents in other plans. Female respondents were less likely to contact a service representative while holders of family contracts were more likely to do so. This latter finding could reflect contacts made by the enrollee on behalf of family members as well as herself. In the CDHP, 36 percent of respondents reported that they had a problem getting the help they needed when they contacted a service representative, versus 33 percent of respondents in other

plans. Supporters of CDHPs could view this as a favorable finding, given that enrollees are new in these plans and have no experience in managing personal care accounts. On the other hand, CDHPs often emphasize superior customer service when marketing to employers, which suggests that their enrollees should experience fewer problems having their questions answered than enrollees in other plans.

We also asked respondents if they had any experience with health plan paperwork (e.g., getting an ID card, having records changed, processing forms and other paperwork related to getting care). If they did, we asked if they encountered any problems related to plan paperwork. Health plan paperwork is a commonly reported consumer irritant. In fact, in their early years, HMOs emphasized a reduction in health plan paperwork hassles as an attractive feature when marketing to potential enrollees. Because CDHPs are relatively new organizations, and because their benefit design features a deductible and coinsurance, we expected CDHP respondents to be more likely to report experience with paperwork. The survey responses indicate that more CDHP enrollees did have experience with paperwork (52 percent versus 43 percent), and that they were more likely to report a problem with paperwork (50 percent of CDHP respondents with paperwork experience versus 43 percent of respondents in other plans). Again, respondents with family contracts were more likely to report experience with paperwork.

Overall Satisfaction

In addition to questions about customer service and health plan paperwork experience, we asked all survey respondents to rate their health plans. We used the scaling approach of the Consumer Assessment of Health Plans survey instrument: a score of 0 indicates the worst plan possible and 10 equals the best. There was a significant difference in the average CDHP value (7.46) and the average value for respondents in other plans (7.55), although the absolute difference was quite small. These values are similar to averages reported in other studies (Fowler, Gallagher, and Nederland 1999; Carlson et al. 2000; Morales et al. 2001; Roohan et al. 2003). Again, interpretation of this finding depends on one's prior views of CDHPs. Skeptics would argue that early enrollees in CDHPs, in a multiple plan option environment, would be heavily predisposed to like the plan. That being the case, the fact that their average rating was lower than the ratings for other plans could indicate more dissatisfaction with the CDHP than expected. In contrast, CDHP supporters might consider the small difference as favorable, given that at least some who

selected this new option may not have fully understood its implications and therefore could be expected to rate the plan poorly.

Plan Switching

The decision to switch plans also could be seen as a measure of overall enrollee satisfaction with the plan. Of our CDHP respondents, 8 percent switched from the CDHP to another plan at the end of the contract year. This did not include people who left the university or declined benefits. Among respondents in other plans in 2002, 5 percent moved to a different plan at the end of the contract year. In absolute terms, the percent of enrollees switching plans at the end of the year was not large for either CDHP or other plan enrollees, which could be viewed favorably by CDHP supporters. However, the difference between CDHP and other plan enrollees in percent switching was statistically significant and, in relative terms, substantial. CDHP skeptics could interpret this difference as evidence that early CDHP enrollees are less happy with their plans than other employees.

CDHP Enrollee Results

In this section we examine the experience of CDHP enrollees with the features of the CDHP. For this analysis, we note where there are statistically significant differences in the experiences of subgroups of CDHP enrollees defined by age, gender, presence of chronic illness in the family, family versus individual contract, and income. In assessing overall experience in the plan we also control for whether or not the enrollee had a PCA account balance at the end of the year and enrollee assessment of the quality of the information provided by the plan.

CDHP Members: Experience with Specific Plan Features

We asked survey respondents who were CDHP enrollees about their use of Internet support tools offered by the plan (Table 3). In marketing to employers, CDHPs emphasize the availability of these tools to provide consumers with the information they need to make informed decisions regarding their care. Specifically, we asked CDHP enrollees whether they had visited the CDHP website in 2002 for the provider directory, disease management information, or pharmacy pricing information. For individuals who had used each information source, we asked how useful that source was (1 = very useful; 4 = not useful at all).

Table 3: Experience with Specific CDHP Features: CDHP Enrollees Only

		Demographic Factors				
		Coefficient Signs & Significance				
Feature Use and Ranking	*Mean Response*	*Age*	*Gender*	*Chronic Illness*	*Family Contract*	*Income*
Use of CDHP's Web Site	34%	–	ns	ns	ns	ns
Provider Directory (1 = used, 0 = not used)	30%	–	ns	ns	ns	ns
Usefulness Rating (1 = Very Helpful – 4 Not Useful)	1.91	ns	ns	ns	ns	ns
Disease Management (1 = used, 0 = not used)	8%	ns	ns	ns	ns	ns
Usefulness Rating (1 = Very Helpful – 4 Not Useful)	2.38	ns	ns	ns	ns	ns
Pharmacy Pricing (1 = used, 0 = not used)	12%	–	ns	ns	ns	ns
Usefulness Rating (1 = Very Helpful – 4 Not Useful)	2.12	ns	ns	ns	+	ns
Satisfaction with CDHP Features (1 = Very Satisfied – 4 = Very Dissatisfied)						
Amount and Quality of Information Provided by the CDHP	1.87	ns	ns	ns	ns	ns
Limitations on Which Healthcare Services Can Be Paid by the CDHP	1.79	ns	ns	ns	ns	ns

Overall, 34 percent of CDHP enrollees indicated that they had visited the CDHP website at some time during the year. The provider directory, accessed by 30 percent of respondents, was the most commonly used tool and also was rated the most useful of the tools (mean scale score = 1.91). Logit regression analyses indicated that older respondents were less likely to use the online provider directory. There was no statistically significant association between any respondent characteristics and their rating of usefulness of the directory. The disease management and pharmacy pricing tools were less likely to be used (8 percent and 12 percent of respondents, respectively). This is not surprising, as these tools presumably would be of greatest value to the

minority of respondents (35 percent) reporting that they or a family member had a chronic illness. It is surprising, however, that no measured characteristics, including having a chronic illness, are associated with use of the disease management site or ratings of its usefulness (mean scale score = 2.38). With respect to pharmacy pricing, older respondents are less likely to use the tool. Although holders of family contracts were not more likely to use the pharmacy pricing tool than other contract holders, they were more likely to find the online pharmacy pricing information to be useful (mean scale score = 2.12).

Respondents also were asked about their satisfaction with two general aspects of their CDHP: amount and quality of information provided by the CDHP and limitations on which health care services were paid for by the CDHP (1 = very satisfied; 4 = very dissatisfied). In each case, the responses were favorable, with a scale score of 1.87 for the former and 1.79 for the latter. No respondent characteristics were significantly associated with these satisfaction measures (Table 3).

CDHP Members: Overall Experience

We analyzed three measures of enrollee overall experience in the CDHP: whether or not the respondent would recommend the plan to a friend, family member, or colleague; whether the respondent had a particularly positive experience with the plan; and whether the respondent had a particularly negative experience with the plan. Response options for the first measure were: yes, would definitely recommend; yes, would recommend depending on their friend's situation; and no. Thirty percent said they would definitely recommend the plan, while 87 percent said they definitely would recommend the plan or would recommend it depending on the situation. In addition to enrollee characteristics, we included two other variables in our logit analysis of this response: whether the respondent had dollars left in his or her personal care account (1 = dollars left, 0 = otherwise) and satisfaction with the amount and quality of information provided by the plan. Satisfaction with limitations on services paid for by the plan was not included because it was highly correlated with satisfaction with information. We estimated logit equations for both specifications of the "recommend" variable: 1 = definitely, 0 = otherwise; and 1 = definitely or depending on situation and 0 = otherwise, with the latter findings reported in Table 4. In each equation, no demographic characteristics were significantly associated with whether the respondent would recommend the plan to a friend, family member, or colleague.

Table 4: Overall Experience with Plan: CDHP Enrollees Only

		Demographic Factors						
		Coefficient Signs & Significance						
	Mean Response	*Age*	*Gender*	*Chronic Illness*	*Family Contract*	*Income*	*Account Balance*	*Information Quality*
Would Recommend to Friend	87%	ns	ns	ns	ns	ns	+	+
Had a Particularly Positive Experience	46%	ns	ns	ns	ns	ns	−	+
Had a Particularly Negative Experience	24%	ns	ns	ns	ns	ns	−	−

Respondents who were satisfied with the information provided by the plan, or who had an account balance, were *more* likely to recommend the plan.

Forty-six percent of CDHP enrollees reported that they had a particularly positive experience with the plan, while 24 percent said they had a particularly negative experience. Again, there was no significant relationship between any of the demographic variables and this response. However, individuals who rated highly the quality of the information provided by the plan were more likely to report a positive experience, and less likely to report a negative experience. Having dollars left in the personal care account was associated with a lower probability of reporting a positive experience and also a lower probability of reporting a negative experience. This result could occur because enrollees with dollars left in their PCA had relatively little "contact" with the CDHP during the study year, and thus little opportunity to report either a particularly positive or negative experience.

DISCUSSION

In the University of Minnesota employed group, employees with higher education levels (as proxied by job classification) and incomes make up a much larger share of CDHP enrollees, as compared with other plans. The enrollment decision is examined in depth in another paper in this issue of HSR (Parente, Feldman, and Christianson 2004), but this single comparison is striking. It may be that these individuals are more comfortable assuming

greater decision-making responsibility under the CDHP, or that they are less concerned about incurring out-of-pocket expenses if they exhaust their PCA.

We also found that respondents reporting that they or a family member had a chronic illness were represented in roughly the same proportions in the CDHP and other plans. More importantly, the self-reported chronic illness measure we used was not statistically significant in any of the analyses reported in this paper, suggesting that people with chronic illnesses had similar experiences across health plan types (CDHP versus other) and, for CDHP enrollees only, experienced the CDHP similarly to enrollees not reporting a chronic illness. In this particular employed population, it did not appear that chronically ill enrollees perceived that they were disadvantaged in a CDHP, contrary to concern expressed by some analysts.

Another result that bears discussion is the greater likelihood that CDHP enrollees will contact a plan customer service representative. Clearly, CDHPs will need to devote resources to assuring that their representatives meet the needs of enrollees, or they risk the loss of enrollees to other plans. This finding also underscores the importance to employers of conducting a careful assessment of customer service performance when contracting with a CDHP.

Consumer-driven health plan enrollees rated their plan at approximately the same level as the ratings of enrollees in other plans. And, their rating was very similar to plan ratings in other settings as well. However, a cautious approach regarding this finding seems warranted. It is based on the responses of a relatively small number of high-income, highly educated "early adopters" in an enrollment situation with multiple, diverse health plan choices. Additional comparative ratings of CDHPs versus other health plans in other settings clearly are needed.

Finally, we found that CDHP enrollees were more likely to switch health insurance, although the switching rate was relatively small. More analysis clearly needs to be done regarding enrollees who leave CDHPs, because our findings are based on a small number of switchers.

The portion of our analysis that focused only on CDHP enrollees suggests that their experience in the plan was generally favorable, and therefore supports the comparative plan ratings. A substantial portion of CDHP enrollees said they would recommend the plan to a family member, friend, or colleague, and about half reported a particularly favorable experience in the plan—twice as many as reported a particularly unfavorable experience. The most striking finding of the analysis focused on CDHP enrollees is that, for the most part, the characteristics of enrollees are not

significantly related to self-reported experience in the plan. For instance, while incomes are higher on average for CDHP enrollees versus enrollees in other plans, *within* the group of CDHP enrollees, income is not a significant predictor of experience with plan features.

Future Research

More research is needed to examine whether the findings in this paper can be generalized to enrollees in other CDHP plans or other CDHP plan designs. As pointed out at the beginning of the paper, a hallmark of CDHPs is their flexibility with respect to benefit design. The overall satisfaction of consumers in a CDHP may depend critically on plan design features, such as the amount of money contributed by the employer to the PCA; the level of the deductible relative to that amount; and the clarity with which plan features are communicated by employers and CDHPs to potential enrollees prior to enrollment.

Second, it will be important to examine consumer experience across settings where there is variation in the plan options available to employees. The broader the selection of options, the more likely that employees will sort into plans that best fit their preferences, a priori (Moran, Chernew, and Hirth 2001). When this occurs, one might expect comparable levels of satisfaction for employees across plans, as our findings suggest. Where employees are "forced" into CDHPs because there are no (or very few) other options, or the other options are unattractively priced, one would expect lower levels of overall satisfaction for CDHP enrollees and more negative assessments of CDHP features. Along these same lines, consumer assessments of experience in CDHPs relative to other plans depends in part on the quality of the comparison plans. If these plans are generally well regarded by consumers, it will be harder for CDHPs to demonstrate significant improvements over these plans. For example, in the Twin Cities (our study site) various surveys have found HealthPartners enrollees to be relatively satisfied with their plan.

A third potentially fruitful area of research involves tracking changes in CDHP enrollee perceptions over time. As CDHP enrollees become more familiar with the unique features of their plans, and possibly experience years when they spend all of the dollars in their PCAs, as well as years where money is left to roll over to the next year, will they regard PCAs more or less favorably? Will they make more frequent use of Internet support tools over time, and how will they rate these tools as they become more facile in their

use? Panel data on CDHP enrollees would be useful in addressing these questions.

Fourth, our survey was limited to employees, for both logistical and budget reasons. We did not collect information on the characteristics of family members or on family members' experience in CDHPs. This raises the possibility that the survey responses of employees under family contracts could reflect not only their own experience but that of family members as well. We controlled for contract type (individual versus family) in our analyses, but it clearly would be desirable in future survey research to control for differences in the characteristics of family members and to compare experiences of members in the same family.

Finally, we believe an important area of consumer research will emerge if CDHPs experience significant enrollment growth within specific employed groups. Research in other fields suggests that there can be important differences between "early adopters" of an innovation and later adopters (Rogers 1995), with early adopters more likely to be risk-takers in general. At present, in most employed groups, including the University of Minnesota, CDHP enrollees could be considered "early adopters." Later enrollees might evaluate their experiences in CDHPs quite differently than these early risk-takers.

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Early Experience with Employee Choice of Consumer-Directed Health Plans and Satisfaction with Enrollment

Jinnet Briggs Fowles, Elizabeth A. Kind, Barbara L. Braun, and John Bertko

Objective. To assess the initial impact of offering consumer-defined health plan (CDHP) options on employees.

Data Sources/Study Setting. A mail survey of 4,680 employees in the corporate offices of Humana Inc. in June 2001.

Study Design. The study was a cross-sectional mail survey of employees aged 18 and older who were eligible for health care benefits. The survey was conducted following open enrollment. The primary outcome is the choice of consumer-directed health plan or not; the secondary outcome is satisfaction with the enrollment process. Important covariates include sociodemographic characteristics (age, gender, race, educational level, exempt or nonexempt status, type of coverage), health status, health care utilization, and plan design preferences.

Data Collection Methods. A six-page questionnaire was mailed to the home of each employee, followed by a reminder postcard and two subsequent mailings to nonrespondents.

Principal Findings. The response rate was 66.2 percent. Seven percent selected one of the two new plan options. Because there were no meaningful differences between employees choosing either of the two new options, these groups were combined in multivariate analysis. A logistic regression modeled the likelihood of choosing the novel plan options. Those selecting the new plans were less likely to be black (odds ratio [OR] 0.46), less likely to have only Humana coverage (OR 0.30), and more likely to have single coverage (OR 1.77). They were less likely to have a chronic health problem (OR 0.56) and more likely to have had no recent medical visits (OR 3.21). They were more likely to believe that lowest premiums were the most important plan attribute (OR 2.89) and to think there were big differences in the premiums of available plans (OR 5.19). Employees in fair or poor health were more likely to have a difficult time during the online enrollment process. They were more likely to find the communications very helpful (OR 0.42) and the benefits information very understandable (OR 0.38). They were less likely to feel that they had enough time to make their enrollment decision (OR 0.47).

Conclusions. Employees who were attracted to the new CDHP plan options valued the attributes that distinguished these plans from other choices. The shift to consumer-defined plans and to the electronic provision of information, however, requires a significant increase in the communication support for all employees, but particularly for those in fair or poor health whose information needs are the most complex and individualized.

Key Words. Consumer-defined health plans, health plan choice, employee satisfaction

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Employers feel increasing pressure to address rising health care costs. One option to help reduce employer costs is to shift from a defined health care benefit, in which the employer provides and subsidizes one or more health plans, to a consumer-directed health plan (CDHP), in which the employer provides a defined payment linked to one plan option, and the employee selects a health plan, either paying any incremental premium difference or receiving credit for a lower-priced option (Bureau of National Affairs 2001). In theory, a CDHP model of health benefits encourages greater employee accountability, offers more flexibility in plan design options, and gives employees greater choice (Employee Benefit Research Institute 2003). It may also reduce cost growth (Nichols 2002).

Many types of CDHP options are emerging. The designs vary in the degree of employee responsibility, from health plans at one extreme that are Internet-based, in which the employees construct their own panel of care providers, to personal care accounts with a high deductible, to traditional plan choices in which only the financing method is changed (Christianson, Parente, and Taylor 2002; Robinson 2002; Jacob 2001). Although these various CDHP options have received extensive publicity, we know little about employees' responses to them (Kelly 2003; Halterman, Camero, and Maillet 2003; Reinhardt 2001).

In June 2001, Humana Inc. offered a new health care benefit program for the nearly 5,000 employees in its corporate headquarters in Louisville, Kentucky. Humana's rationale for the change of health care benefit coverage was three-fold: to provide employees with a greater choice of plans, to give them greater financial responsibility for their choice, and to contain costs to the employer. This new benefit structure had a CDHP design in which the corporation paid a fixed amount—79 percent of the reference plan. The reference plan was a preferred provider organization (PPO), the most popular health plan option with the highest premium. Employees could apply the

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corporate contribution to one of six health care options, keeping the difference if they selected an option other than the PPO. All the other options had less expensive premiums than the PPO.[1]

The two CDHP plan options were similar to health reimbursement arrangements (HRAs) (Gabel, Lo Sasso, and Rice 2002). Gabel defines health reimbursement accounts as plans that "establish an account from which consumers draw to make health care purchases. When the account is exhausted, enrollees must typically pay out of pocket until the annual deductible is met, after which the plan becomes a traditional major medical plan." One of these CDHP options provided an allowance of $500, then 80 percent coinsurance until $2,000 in further out-of-pocket charges were incurred, and finally 100 percent coinsurance. The second CDHP option was similar to the previous one with a $500 allowance, then a $2,000 deductible, and finally 100 percent coinsurance. These options were offered in lieu of HRAs because the tax-sheltered status of HRAs was unclear when the plans were being designed and implemented.

The provider networks overlapped widely across these options. The HMO Plan had the most restrictive network and was also used as the first tier of the Tiered PPO, PPO Standard, and the two CDHPs. Although the enrollment process was supported with web-based information and decision-support tools, there was no ongoing Internet support to monitor expenses or evaluate care choices for employees who enrolled in the CDHP options.

All health care coverage options covered the same benefits, including pharmacy benefits. Concomitant with the change in structure, however, were two significant changes in benefits. The pharmacy benefit was restructured from a three-tier to a four-tier program (Tier 1: $10 copayment: included lower-cost generic drugs and some brand name drugs; Tier 2: $20 copayment: included higher-cost generic drugs and some brand name drugs; Tier 3: $40 copayment: included higher-cost, mostly brand-name drugs that may have generic or therapeutic equivalents in Tier 1 and 2; and Tier 4: 25 percent coinsurance for high-technology drugs with a $2,500 out-of-pocket maximum). The other major benefit change was the addition of a $100 per day inpatient hospital copayment for both the Tiered PPO and HMO options.

The Enrollment Process

Employees had no systematic comparative information on the quality of the options, such as a report card. For the first time, they had access to an online

decision support tool that queried the employee about their coverage needs and preferences. This tool then ranked the plan options according to the employee's responses.

The enrollment design originally called for all employees to enroll electronically (positive enrollment). The design was revised, however, to include a default option, in which employees who did not enroll online were assigned to the new plan option most similar to their previous plan option. Employees could also decline coverage.

The designers of the health plan options had estimated that 5 percent to 10 percent of employees would select one of the two new options that would save them $15 per pay period ($400 per year) for employee-only coverage and upward of $45 per pay period for family coverage (approximately $1,200 per year). (The employee plus spouse rate was roughly 2 times the employee-only rate; the family rate was 3.2 times; and the employee plus child[ren] rate was 1.9 times the employee-only rate.)

Evaluation Questions

The evaluation focused on two questions: (1) How did employees who chose the CDHP options compare with those who did not? (2) Which employee characteristics were related to their perceived ratings of the enrollment process?

Outcomes of Interest

The primary outcome was the employee's self-reported choice of health plan option, specifically selection of either of the two CDHP options. For comparative analyses, employees were combined into two categories: (1) employees who selected the CDHP options, and (2) employees who selected any of the other plan options. The four secondary outcomes related to satisfaction with the enrollment process included: helpfulness of corporate communications, adequacy of time to review materials and enroll, understandability of benefits information, and ease of finding needed information.

Data and Methods

We used a cross-sectional study design and surveyed all benefit-eligible employees ($N = 4{,}680$) immediately after the open enrollment period,

excluding those who helped with the questionnaire. The survey content areas covered: sociodemographic characteristics, health insurance coverage, health care utilization, importance of plan characteristics for plan choice, health information-seeking behavior, the employee's relationship with a primary care physician, and the employee's perceptions of the new online benefits information and enrollment process. Relevant questionnaire items that had been tested and used in previous surveys (Braun et al. 2003; Fowles et al. 2000; Knutson et al. 1998) were incorporated into the questionnaire. New items were pretested by cognitive testing of the questionnaire with a convenience sample of five Humana employees by telephone. The authors developed the questionnaire with advice from Humana project staff in the human resources department. The study protocol and questionnaire were reviewed by an Institutional Review Board for the protection of human subjects.

The survey was conducted between July 27 and October 1, 2001. Following an initial letter from the Humana chief executive officer alerting employees to the forthcoming survey, the evaluator mailed the survey and followed it with a postcard reminder and two additional complete mailings to nonrespondents.

The Plan Choice Model. The model predicts that plan choice will be dependent on four domains: sociodemographic characteristics (including coverage type), health status, previous and anticipated health care utilization (including relationship with primary care physician), and the perceived importance of various plan characteristics. As described by Scanlon and colleagues in their review of health plan choice (Scanlon, Chernew, and Lave 1997), we used logistical regression analysis to model dichotomous plan choice. We tested for collinearity among the health status variables and found none. The results, using a phi coefficient as a measure of correlation between dichotomous variables (Fleiss 1981), can be found in Appendix 1.

The Satisfaction with Enrollment Model. Using a multivariate logistic regression, we modeled responses to each of four attributes of the enrollment process: helpfulness of communications in preparing for enrollment, having enough time to review enrollment information and enroll at work, understandability of benefits information, and ease of finding needed information. The independent variables used in these analyses were education, race, and health status.

FINDINGS

The response rate was 66.2 percent. Using administrative data to compare respondents with nonrespondents, we found that respondents were significantly different from nonrespondents on several characteristics: respondents were older (mean age 40 years versus 35 years), more likely to hold exempt positions (56 percent versus 37 percent), less likely to have employee-only coverage (38 percent versus 43 percent), or to enroll in the HMO option (29 percent versus 40 percent).

Question 1: How Did Those Who Chose the Consumer-Defined Health Plans Compare with Those Who Did Not?

Two-hundred-four employees selected one of the CDHP options (7.3 percent). At the bivariate level (Table 1), the employees who selected the CDHPs differed from those who selected other plan options in sociodemographic characteristics, health status, health care utilization, preferences for plan attributes, and responses to the enrollment process. Those selecting the CDHPs were more often college educated, white, male, and in exempt positions than employees who selected other plan options. They more frequently had employee-only coverage from Humana and also additional coverage from another source. Those selecting a CDHP option were significantly healthier on every dimension measured. They more often reported excellent health status, and less often had a covered member receiving regular medical treatment. They less often had a personal physician. Although they less frequently believed that the health plan decision was extremely important, they more often found the decision difficult, probably because of the novelty of the choice. Those who selected a CDHP option more frequently rated premiums as the most important feature of the plan. They more often used the decision support tool and agreed with how it ranked the plan options. An analysis of the comments made by those who selected the CDHPs reflected the widespread need to have more detailed information about these novel options. A common concern was how the initial $500 allowance would be calculated.

Results from Multivariate Logistic Regression Analysis. In the multivariate analysis, variables from each of the four domains (sociodemographic characteristics, health status, health care utilization, and perceived importance of plan attributes) were related to plan choice (Table 2). Among the sociodemographic characteristics, employees who were black

Table 1: Characteristics of Employees Who Chose an HRA-like Option with Those Who Chose Another Plan Type (%)

Independent Variables	*Chose an HRA-like Plan (n = 204)*	*Chose a Different Plan Type (n = 2,580)*	P-*value*
Sociodemographic Characteristics			
Gender: Female	59	71	.0007
Education			<.0001
High school graduate or less	7	13	
Vocational or junior college graduate	26	43	
College graduate	35	25	
Post-baccalaureate	31	18	
Race			.0002
White	88	76	
Black	6	17	
Other	5	6	
Job Classification: Exempt	77	55	<.0001
Coverage Source: Humana only (no dual coverage)	90	96	.0002
Coverage Type			.0003
Employee only	51	37	
Employee and spouse	14	15	
Employee and children	10	17	
Employee and family	24	31	
Health Status			
Functional Health Status			<.0001
Poor	0	1	
Fair	2	6	
Good	17	32	
Very good	51	43	
Excellent	31	18	
Think about Own Health			<.0001
Never	1	1	
Rarely	23	10	
Sometimes	34	34	
Often	31	40	
Very often	11	15	
Health Utilization			
Receiving Treatment for Chronic Condition	21	44	<.0001
Hospitalized in Past 12 Months	12	22	.0004
Visits in Past 4 Weeks			<.0001
No medical visits	60	37	
1 or 2 visits	34	44	
3 or more visits	5	19	
Anticipated Medical Care			.0011
Same as this year	73	69	
More in next year	8	17	
Less in next year	20	14	
Have a Personal Physician	67	79	<.0001

Table 1. (Continued)

Independent Variables	*Chose an HRA-like Plan (n = 204)*	*Chose a Different Plan Type (n = 2,580)*	P-*value*
Importance of Plan Characteristics			
Deductible			<.0001
Extremely important	27	50	
Very important	46	37	
Somewhat important	23	11	
Not very important	3	2	
Hospitals Available			<.0001
Extremely important	16	34	
Very important	39	37	
Somewhat important	31	25	
Not very important	15	4	
Physicians Available			<.0001
Extremely important	29	48	
Very important	40	36	
Somewhat important	25	13	
Not very important	6	3	
Freedom to Choose Specialists			.0003
Extremely important	33	48	
Very important	31	26	
Somewhat important	23	18	
Not very important	13	8	
Knowledge of Humana Plan Options			.0595
A lot	41	32	
Fair amount	44	53	
A little	13	14	
Nothing	1	1	
Most Important Characteristic of Plan for Choice			<.0001
Lowest premium	43	16	
Lowest copayment	4	14	
Lowest deductible	4	8	
Hospitals available	0	1	
Physicians available	20	24	
Freedom to choose any specialist	18	23	
Multiple reasons, including premium	4	6	
Multiple reasons, not including premium	7	8	
Perceived Differences among Plan Options			
Premiums			<.0001
No difference	74	34	
Small difference	25	59	
Big difference	1	7	
Deductibles			.0303
No difference	63	54	
Small difference	34	39	
Big difference	3	6	

Table 1. (Continued)

Independent Variables	*Chose an HRA-like Plan (n = 204)*	*Chose a Different Plan Type (n = 2,580)*	P-*value*
Physician Networks			.0325
No difference	19	28	
Small difference	58	53	
Big difference	22	20	

Source: Park Nicollet Institute's Survey of Humana Benefits Enrollment Medical Plan Selection, 2001.
N = 2,784

Table 2: Adjusted Odds Ratio of Factors Related to Choice of HRA-like Options

Independent Variables	*Odds Ratio*	*95% Confidence Interval*	P-*value*
Sociodemographic Characteristics			
Gender (Ref: Male)			
Female	1.01	0.70, 1.45	.9688
Education (Ref: Less than college graduate)			
College graduate or more	1.13	0.75, 1.70	.5591
Race (Ref: White)			
Black	**0.46**	**0.23, 0.85**	**.0186**
Other than black	0.49	0.22, 0.99	.0609
Job Classification (Ref: Nonexempt)			
Exempt	**1.60**	**1.02, 2.55**	**.0426**
Coverage Source (Ref: Dual-coverage)			
Humana only	**0.30**	**0.16, 0.55**	**<.0001**
Coverage Type (Ref: Employee+dependent)			
Employee only	**1.77**	**1.25, 2.53**	**.0014**
Health Status			
Functional Health Status (Ref: good, fair, or poor)			
Excellent	**1.64**	**1.01, 2.68**	**.0465**
Very good	1.45	0.95, 2.24	.0931
Think about Own Health (Ref: Never, rarely, sometimes)			
Often or very often	0.72	0.52, 1.00	.0534
Health Utilization			
Receiving Treatment for Chronic Condition (Ref: No)			
Yes	**0.56**	**0.37, 0.84**	**.0053**
Hospitalized in Past 12 Months (Ref: No)			
Yes	0.70	0.41, 1.16	.1822

Table 2. (Continued)

Independent Variables	*Odds Ratio*	*95% Confidence Interval*	P-*value*
Visits in Past 4 Weeks (Ref: 3 or more visits)			
No medical visits	**3.20**	**1.65, 6.80**	**.0012**
1 or 2 visits	2.00	1.03, 4.23	.0518
Anticipated Medical Care (Ref: Same as this year)			
More in next year	0.79	0.43, 1.39	.4319
Less in next year	1.47	0.92, 2.31	.0961
Have a Personal Physician (Ref: No)			
Yes	**0.68**	**0.47, 0.99**	**.0420**
Plan Characteristics			
Importance of Plan Feature (Ref: Very important, somewhat important, not very important)			
Deductible is extremely important	**0.56**	**0.38, 0.84**	**.0046**
Hospitals available are extremely important	0.76	0.43, 1.33	.3400
Physicians available are extremely important	0.83	0.50, 1.34	.4526
Freedom to choose any specialist is extremely important	1.05	0.68, 1.64	.8145
Knowledge of Humana Plan Options (Ref: A fair amount, a little, nothing at all)			
A lot	**1.54**	**1.10, 2.17**	**.0127**
Most Important Characteristic of Plan for Choice (Ref: Multiple reasons, not including premium)			
Lowest premium	**2.89**	**1.55, 5.68**	**.0013**
Lowest copayment	**0.34**	**0.13, 0.85**	**.0243**
Lowest deductible	0.49	0.18, 1.24	.1429
Hospitals available	0.25	0.01, 1.53	.2123
Physicians available	0.88	0.46, 1.79	.7240
Freedom to choose any specialist	0.84	0.42, 1.73	.6197
Multiple reasons, including premium	1.05	0.39, 2.70	.9167
Perceived Differences among Plan Options (Ref: No differences, small differences)			
Big differences in premiums	**5.18**	**3.60, 7.55**	**<.0001**
Big difference in deductibles	1.12	0.79, 1.61	.5185
Big difference in physician networks	**0.44**	**0.29, 0.66**	**<.0001**

Source: Park Nicollet Institute's Survey of Humana Benefits Enrollment Medical Plan Selection, 2001.

Note: Adjusted odds ratio for values in boldface type are significant at $p < .05$.

$N = 2{,}784$

were half as likely to select the CDHP options (OR 0.46). Those having only Humana Inc. coverage were also less likely to select the CDHP options (OR 0.30). In contrast, those with exempt job classifications and those electing employee-only coverage were more likely to select the CDHP options (OR 1.61 and 1.77, respectively).

Health status remained a predictive characteristic; those in excellent health were more likely to select a CDHP (OR 1.45). Health utilization was also related to plan choice. Employees with a covered family member receiving treatment for a chronic disease were half as likely to select a CDHP. Those with no visit to a provider in the last four weeks were three times more likely to select one of the new plans compared with those who had at least one visit.

The perceived importance of several plan attributes remained significantly related to the selection of a CDHP. Employees who thought premiums were the most important plan feature were more likely to select a CDHP option (OR 2.89). Those who thought there were big differences in the plan premiums were more than five times as likely to select a CDHP. Those who thought the deductible was extremely important were half as likely to select these options. Similarly, those who thought that there were big differences in the networks of the plans offered were half as likely to select a CDHP.

Question 2: Which Employee Characteristics Were Related to Their Evaluation of the Enrollment Process?

Employees evaluated four aspects of the enrollment process: helpfulness of communications in preparing for enrollment, having enough time to review enrollment information and enroll at work, understandability of benefits information, and ease of finding needed information. These factors are somewhat interrelated; phi coefficients range from 0.1925 to 0.4776, the highest between finding needed information very easily and finding the benefits information very understandable. We include each dependent variable because of the content validity and utility to Humana program planners. The correlation matrix can be found in Appendix 2.

Overall, more employees found communications from Humana, such as articles in their in-house communications, very helpful in preparing for the enrollment process (45 percent very helpful) than in understanding why Humana was offering new products (33 percent very helpful).

The online enrollment process and the accompanying tools were new to Humana employees. The three tools included: a web site that provided benefits information on plan options, provider networks, and rates; a decision support tool that allowed employees to answer questions about their preferences and provided a list of plans ranked according to these preferences; and an enrollment tool for making the enrollment selection online. In evaluating the three tools, more employees reported that the enrollment tool was very easy to use and understand (40 percent) than considered the benefits

web site very easy or the decision support tool very easy (27 percent and 28 percent, respectively).

Results from Multivariate Logistic Regression Analysis. In the multivariate analyses, educational level was inversely related to the evaluation of enrollment (see Table 3). That is, employees with higher educational levels were less likely to find the materials very helpful (OR 0.80), benefits information very understandable (OR 0.78), or find it very easy to obtain needed information (OR 0.70). This result may reflect the efforts to prepare communications at a lower reading level. The materials were more successful for those with a lower educational level than those with higher educational attainment.

Employees' health status was strongly related to their assessment of the enrollment process. Those in fair or poor health were less likely than those in very good or excellent health to find the written communications very helpful in preparing for enrollment (OR 0.42), benefits information very understandable (OR 0.53), or find it very easy to obtain needed information (OR 0.38). They were less likely to believe they had enough time at work to review materials and enroll (OR 0.47). Even those with good health were less satisfied with enrollment than those in excellent or very good health.

CONCLUSIONS

Employees who chose the new plan options place high importance on the attributes that distinguished these plans from other options. They were more likely to find the lowest premium the most important attribute and less likely to find the lowest copayment most important. They were more likely to perceive big differences in the premiums. Although they were more likely to express difficulty with the plan decision, they were also more likely to believe they knew a lot about the plan options and to be satisfied with the variety of plan options. The inclusion of stated preferences in choice models is relatively uncommon, but has been demonstrated to significantly improve the fit of choice models (Harris and Keane 1999; Harris, Schultz, and Feldman 2002). The role of stated preferences in this study is consistent with that of Harris and colleagues who also found that consumer preferences corresponded with the explicit premium structure.

Table 3: Adjusted Odds Ratio of Employee Characteristics to Their Evaluation of the Enrollment Process

	Communications in Preparing for Enrollment Were Very Helpful			*Employee Had Enough Time to Review and Enroll at Work*			*Benefits Information Was Very Understandable*			*Finding Needed Information Was Very Easy*		
Employee Characteristic	*OR*	*95% CI*	P-*value*	*OR*	*95% CI*	P-*value*	*OR*	*95% CI*	P-*value*	*OR*	*95% CI*	P-*value*
Educational Level:												
Less than college	1.00			1.00			1.00			1.00		
College or more	**0.80**	**0.68, 0.93**	**.0051**	**1.24**	**1.02, 1.51**	**.0289**	**0.78**	**0.67, 0.92**	**.0032**	**0.70**	**0.58, 0.83**	**<.0001**
Race:												
White	1.00			1.00			1.00			1.00		
Black	**1.53**	**1.24, 1.89**	**<.0001**	0.88	0.68, 1.12	.2909	1.19	0.96, 1.48	.1072	1.01	0.79, 1.28	.9483
Other	1.02	0.75, 1.40	.8868	**0.65**	**0.46, 0.93**	**.0158**	1.01	0.73, 1.39	.9476	0.97	0.67, 1.38	.8657
Health Status:												
Very good or excellent	1.00			1.00			1.00			1.00		
Good	**0.72**	**0.60, 0.85**	**.0001**	0.93	0.76, 1.14	.4902	**0.74**	**0.62, 0.88**	**.0008**	**0.66**	**0.54, 0.80**	**<.0001**
Fair or poor	**0.42**	**0.30, 0.58**	**<.0001**	**0.47**	**0.34, 0.66**	**<.0001**	**0.53**	**0.37, 0.74**	**.0003**	**0.38**	**0.24, 0.58**	**<.0001**

Source: Survey of Humana Benefits Enrollment Medical Plan Selection, 2001.
Note: Adjusted odds ratio for values in boldface type are significant at $p<.05$.

This analysis also suggests that Humana's new CDHP plans may have segmented the risk pool. Employees who were receiving treatment for a chronic condition were less likely to select the CDHP options, whereas those who had received no care in the previous four weeks were more likely to select these options. The impact of this segmentation is a critical factor, not for self-insured plans like Humana, but for employers using multiple insurance carriers. Employers need to consider the impact of risk segmentation on the long-term survival of multiple plan options (Taylor 2002). A fuller analysis of the risk selection issues awaits a more detailed claims analysis.

The study findings highlight a previously unexplored characteristic in plan choice—that of race. In our review of the plan choice literature, we found no research that included race as a variable. The emergence of race as an independent predictor of plan choice was unexpected, and what construct underlies the relationship of race and choice is not understood. It may be that employees who were not white reacted with distrust for the novel new plans, based on their experience with health care generally (Smedley, Stith, and Nelson 2002).

Two factors may have contributed to limited enrollment in the CDHPs by Humana employees. First, these plan options used the most restrictive provider network, and employees whose provider was not included may have disregarded this option. Second, providing a default enrollment option meant that employees did not have to consider all the available plan options. It is unclear how many of the survey respondents who used the default option (22 percent) reviewed all the plan options. Because they responded to the survey and answered the evaluation questions, it is probable that many allowed the default option to eliminate the final task of enrolling.

The new options and switch to online enrollment posed a special information burden on the sickest employees. Those employees with poorer health status who would be most in need of detailed information did not find it very easy to locate. This evaluation stimulated a torrent of comments. Almost one-quarter of respondents made at least one comment, and many took the opportunity to write extensively. The volume and intensity of comments may reflect the importance of benefit coverage to employees. This intensity may be a relatively new phenomenon. Less than 25 percent of employees in 1995 and 1996 reported that the health plan decision was extremely important (Fowles et al. 2000; Knutson et al. 1998). In contrast, almost two-thirds (63 percent) of Humana employees stated that the decision was extremely important. These results, particularly the comments, point to the need for extensive product support. Employees need to be able to find detailed information; they also

need readily available and knowledgeable staff to answer questions relating to individual circumstances. Previous research on the understandability of enrollment materials has highlighted the information needs and confusion that those selecting health plans may experience (Gibbs, Sangl, and Burrus 1996; Lubalin and Harris-Kojetin 1999; McCormack et al. 2001). These results are also consistent with other findings that many employees struggle with online benefits (Cigna 2002; Landro 2002).

The reader should keep in mind study characteristics that may limit the generalizability of these findings. The study was conducted in one company at a time when consumer-directed plans were not generally known, and no special web support was available to enrollees in these plan options. Furthermore, the provider network was unusually restrictive compared with other consumer-directed plan options. This study represents an early assessment of the impact of consumer-defined health plans on employees.

The results of this evaluation underline the fact that conversion to a CDHP plan can be most challenging for those who are the sickest. Their plan decision is more important, more complex, and has more severe financial consequences. If their inquiries cannot be readily answered, they are unlikely to make changes in their current coverage. At the same time, employees appeared to have made logical decisions. Employers who consider adding CDHP options should be aware that many employees select plans appropriately if offered the choice between traditional and CDHP plans. Healthier people were more likely to choose the CDHP plans with account balance options, while those needing chronic care were more likely to choose traditional plans.

NOTE

1. Plan options and benefits. The six health care options, ranked from most to least expensive, were:
   a. Tiered PPO. A new PPO with some modifications from the previous PPO. It had an inexpensive network (with a $20 copayment), a more expensive network (with a $30 copayment), and out-of-network options (60 percent coinsurance).
   b. HMO Plan. An independent practice association (IPA) HMO, with a gatekeeper design similar to the one previously offered.
   c. PPO Standard Plan. A standard PPO with a $250 deductible ($20 copayment for primary care visits; $30 copayment for specialist visits; 90 percent in-network coinsurance).
   d. An option for any out-of-area employees or dependents.

e. A plan with a $500 allowance feature, next a $1,000 deductible, then 80 percent coinsurance until $2,000 in further out-of-pocket charges were incurred, and finally 100 percent coinsurance.
f. A plan similar to the previous one with a $500 allowance feature, then a $2,000 deductible, and finally 100 percent coinsurance.

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Appendix 1. Early Experience with Employee Choice of Consumer-Directed Health Plans and Satisfaction with Enrollment

Correlation Matrix of Health Status Measures (phi coefficient)

	Have Personal Physician	*Anticipated Care in Next Year*	*Think about Own Health*	*Receive Treatment for Chronic Condition*	*Visits in Last Four Weeks*	*Self-Reported Health Status*	*Hospitalized in Past Year*
Have personal physician	1	0.0388	0.1202	0.1670	0.1231	0.0858	0.0761
Anticipated care in next year		1	0.0850	0.1270	0.2795	0.0990	0.2428
Think about own health			1	0.0729	0.0700	0.0727	0.0173
Receive treatment for chronic condition				1	0.2899	0.2677	0.1477
Visits in last four weeks					1	0.1705	0.2380
Self-reported health status						1	0.0810
Hospitalized in past year							1

Appendix 2. Early Experience with Employee Choice of Consumer-Directed Health Plans and Satisfaction with Enrollment

Correlation Matrix among Dependent Variables Assessing the Enrollment Experience (phi coefficient)

	Helpfulness of Communication in Preparing For Enrollment	*Enough Time to Review and Enroll at Work*	*Understandability of Benefits Information*	*Ease of Finding Needed Information*
Helpfulness of communication in preparing for enrollment	1	0.2005	0.3312	0.3014
Enough time to review and enroll at work		1	0.1925	0.1836
Understandability of benefits information			1	0.4776
Ease of finding needed information				1

Commentary—Defined Contribution Health Plans: Attracting the Healthy and Well-Off

Gail Shearer

Driven by a philosophy that favors unbridled faith in the free marketplace, the year 2003 may well go down in health care history as the year that the health care system officially abandoned the premise that the community has a responsibility to care for each member, replacing it with the philosophy that individuals should each look after themselves.

The most visible change that nudges the system toward self-insurance is the provision in the Medicare bill that expands and makes permanent "health savings accounts" (HSAs) (formerly known as "medical savings accounts" or MSAs). This provision allows most Americans to set up tax-advantaged savings accounts (no tax is paid when money is paid in or when paid out, an unprecedented new tax loophole), when they also have a high-deductible health insurance policy. These new accounts are likely to favor the healthy (who stand to benefit financially from a new tax shelter since their accounts need not be depleted on health care expenses) and the wealthy (the higher tax brackets mean higher tax benefits).[1] In his State of the Union address, President George W. Bush's proposal for a new tax deduction for premiums for high-deductible policies introduced the possibility that health savings accounts' penetration of the marketplace—and the demise of the employer-based health care system—will be accelerated.[2]

The second development is the encroachment of so-called consumer-driven health care plans (CDHC) into the employer-based health insurance marketplace. This new approach is dressed up with a consumer-friendly name, but in reality, as noted in Christianson, Parente, and Feldman (2004, this issue), this new approach is characterized by higher deductibles for employees. A more apt label, and one that seems to have been overtaken by CDHC, is "defined contribution health care." As a gentle reminder to health researchers and policymakers that a consumer-friendly name should not be used to mask a marketplace change that may be harmful to consumers, I will use the "defined contribution health plan" (DCHP) label to refer to these new plans. "Defined contribution" accurately connotes limited employer liability

for health care costs. "Consumer-driven" implies that the consumer exerts considerable control—hardly an accurate portrayal of high-risk consumers' likely experience with a high-deductible plan.

The two studies raise red flags about the potential for these new plans to appeal disproportionately to the healthy and those with high income. They contribute to the dangerous distraction of policymakers from the goal of working toward a health care system that provides affordable, quality health care to all by spreading costs broadly and fairly across the community.

Comments on Study 1 (University of Minnesota)

Study 1 (Christianson, Parente, and Feldman 2004, this issue) considers the experience at the University of Minnesota, when 16,000 employees were offered several health insurance choices, including policies that combine relatively high-deductible health insurance coverage, a personal care/health care savings account check, and a gap between the amount contributed to the account and the deductible, assuring that employees would face some out-of-pocket costs before their health insurance policy provided coverage. This study does nothing to make DCHP appear to be consumer-friendly and confirms concerns about what a shift toward DCHP will mean for the health care system. This section summarizes and considers some of the key findings.

DCHP Appeals Disproportionately to People with Relatively High Income

The average income for employees who enrolled in DCHP (and responded to the survey) was 48 percent higher than the income for employees who did not enroll in DCHP ($71,406 versus $48,148) (Christianson, Parente, and Feldman 2004, Table 1, this issue). This wide disparity lends strong support to the notion that higher-income individuals are more likely to enroll in a high-deductible health insurance plan in which they could be at risk of large out-of-pocket costs before meeting a deductible.

DCHP Appeals Disproportionately to a Relatively Sophisticated Population of Faculty Members and Does Not Appeal to Union Members

Thirty-six percent of DCHP enrollees were faculty members; only 14 percent of non-DCHP enrollees were faculty members. Participants in the civil

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service/bargaining unit were more likely to favor non-DCHPs: 50 percent of enrollees in non-DCHPs were civil service/bargaining unit members, while only 23 percent of DCHP participants were. The DCHPs appeal disproportionately to relatively sophisticated participants (Table 1).

An Overwhelming Majority (96 percent) of Employees Favor Low-Deductible Coverage to DCHP, Based on Their Choices in the Marketplace

The low participation rate in DCHPs indicates that there is no groundswell of consumer demand favoring a health care system centered on high-deductible health insurance: 4.3 percent of the eligible population participated in the DCHP program. (This assumes that families do not have more than one employee eligible for this coverage. A total of 695 employees—349 individuals and 346 families—enrolled, out of a total population of 16,000 employees.)

The Study Design Is Inadequate to Allow Conclusions about Risk Segmentation by DCHPs

The study uses a self-reported measure of chronic illness to study the potential for risk fragmentation, and finds no significant difference among DCHP and non-DCHP enrollees. This measure is insufficient to draw a conclusion on risk fragmentation. A more in-depth measure of health care costs, possibly a time-series, for all covered individuals in each family is needed. The measure used does not take into account whether employees might anticipate certain health care costs in the future (e.g., a planned pregnancy, elective surgery), which would discourage enrollment in a DCHP for fear of high out-of-pocket costs. Some health conditions might have regular costs associated with them, but respondents might not consider them to be a chronic illness (e.g., back pain) but more of a chronic condition. This is an area where further expansion of the underlying health status of respondents is critical.

The Satisfaction Level with DCHPs Is Not Impressive

While respondents in DCHPs were somewhat less satisfied than respondents in other plans (7.46 versus 7.55, on a scale of 0 to 10, 10 is best), the difference can be considered trivial even if technically statistically significant.

Internet Support Tools, a Key Selling Point of DCHPs, Were Used Only Moderately

While 30 percent of respondents in DCHPs used provider directories, only 8 percent used disease management information, and only 12 percent used

pharmacy-pricing tools. These numbers do not support the premise that DCHPs mobilize employees to comparison shop and access Internet resources to manage their care and control costs.

Overall, the first study paints a picture of highly educated and high-income faculty members gaming the health care system by selecting into the high-deductible plan if they believe that they will come out ahead financially. The limited measure of health status precludes drawing conclusions about the segmentation of the health risk pool, but overall there is nothing in this study to dispel the concern about risk fragmentation. Perhaps the strongest conclusion from this study is that DCHPs appeal disproportionately to highly educated, high-income members of an employee group. They appeal to a tiny portion of employees. The small fraction of employees who enroll do not make full use of the tools that they offer, and are not particularly satisfied with the plans' performance.

Comments on Study 2: Humana Employees

Study 2 (Fowles et al. 2004, this issue) reports the results of a survey of 4,680 employees of Humana Inc., 7 percent of whom selected a new "consumer-defined health plan option" (referred to as DCHC below). This is the epitome of a "defined contribution health plan": the employer would pay a fixed amount, 79 percent of the reference plan, for each employee. This study provides troubling confirmation of the potential of DCHPs to fragment the health risk pool to the detriment of the less healthy.

Those Selecting DCHP Are More Likely to Be Healthy

The study found that enrollees in DCHP were "significantly healthier on every dimension measured." This study used a more comprehensive measure of health status, including measures such as reported health status, likelihood of a covered member receiving regular medical treatment, likelihood of having a personal physician, and existence of a chronic health problem. Those who selected the DCHP were less likely to have a chronic health problem (54 percent) and more likely to have had no recent doctor visits (3.07). Enrollees in DCHPs were more likely to be in excellent health (31 percent versus 18 percent) (Table 1). The study found that employees reporting that a family member had a chronic health problem were half as likely as others to select the DCHP.

Enrollment in the New Plans Was Modest

Like the University of Minnesota employees, the Humana employees did not flock to the high-deductible coverage (despite the annual premium savings of $400 per year for an individual and $1,200 per year for a family): only 7 percent enrolled in the new plan. Individuals were more likely to enroll in a DCHP than families.

Sociodemographic Findings

Those enrolling in DCHPs were more likely to be college-educated, white, male, and in positions exempt (from a union) than those who enrolled in other plans. The finding that blacks are about half as likely to enroll in DCHPs is troubling, and suggests that just as policymakers are waking up to the magnitude of disparities in our health care system, yet another policy that separates blacks (and presumably other minorities) from whites is created. Income is not listed as an independent variable, ruling out the ability to estimate the relative importance of race and income.

This study clearly demonstrates that widespread expansion of DCHPs within the employer marketplace will fragment the risk pools in the employer-based health insurance marketplace, one by one. Employer-based health insurance coverage has been held up as the one place in which risk pools tended to be unified, with costs spread among employees (albeit paid directly in large part by employers). DCHP's have the potential to unravel this important risk-spreading role. This study clearly demonstrates that risk segmentation, to the advantage of the healthy and the disadvantage of the less healthy, will be a reality should the role of DCHPs expand in the health insurance marketplace.

Implications of the Studies for Public Policy

Members of the public and policymakers should view these two studies as the proverbial canary in a coal mine. They raise red flags about the potential that DCHPs (like their cousins Medical Savings Accounts) appeal disproportionately to the wealthy and healthy. The first study shows that the income level of employees selecting DCHPs is 48 percent higher than those not selecting them. The second study finds that those selecting DCHPs are healthier "on every dimension" than those not selecting them. The concern that this new model of health care will appeal more to the sophisticated who can "game the

system" and shift costs to the sick becomes greater after reviewing these studies. They should set off alarm bells about the potential long-term threat to our health care system.

The scope and design of these studies did not allow consideration of some of the most important issues that will affect the long-term impact of this new type of plan. Some important areas for future research include:

- To what extent will DCHPs merely shift cost to sicker employees, instead of truly lowering health care spending?
- Over time, will sophisticated employees "game the system," opting out of DCHPs when they anticipate high health care expenses related, for example, to pregnancy or elective surgery?
- To what extent will employer's health care premium dollars be diverted from paying for health care expenses to paying to build health reimbursement accounts?
- To what extent do these new health plans create new financial barriers to health care for low-wage workers?
- Do consumers have the necessary information about quality of providers on which to make informed decisions?
- What are true consumer/employee preferences regarding deductible levels?
- To what extent will the gap between the health reimbursement account and the deductible pose a financial barrier to getting needed health care?
- Will anticipated cost savings occur, or will they fail to materialize since so much health spending is concentrated among those with catastrophic expenditures?
- Will the new high deductibles and sense of spending one's own money deter preventive care and early treatment for illness, ultimately leading to worse health outcomes and higher costs?

The findings from these two studies are troubling for another reason: because of the nature of adverse selection, over time, DCHPs may drive lower-deductible health insurance options out of the marketplace (Zabinski et al. 1999). Bolstered in the health care market with the enactment of the health savings account provision in the Medicare bill, in a few short years, it is very possible that unpopular high-deductible health insurance coverage will be the *only* choice that many employees may face for their coverage in

the employer-based market. Those with high health care expenses will face higher out-of-pocket costs than they would in the absence of DCHPs. It is troubling that this type of change in the health care marketplace will take place *in the absence of a public debate.* Advocates of medical savings acccounts, for example, maintain that there should be a choice of plans. The reality is that over time, as adverse selection pushes the next "relatively healthy" group toward high-deductible plans, an insurance marketplace death spiral will result and ultimately will remove the very choice (a low-deductible plan) that employees want.

Both studies contribute to the body of knowledge about DCHPs, "as a first, limited attempt to shed light on the important issues" (Christianson, Parente, and Feldman 2004, this issue). In considering the health policy expertise and money devoted to these studies, it is important for health researchers and policymakers to ask fundamental questions about priorities for future health research. The buzz about DCHPs in health policy circles creates a sense that valuable dollars are being spent in an effort to rearrange the deck chairs on the Titanic. More resources should be devoted to charting the course to guarantee all U.S. consumers have guaranteed, quality, affordable health care. We should be moving full-steam toward this vision, not spending countless hours and resources analyzing new models that promise to split the healthy from the sick, shift costs to the sick, favor the highly educated and high-incomed, and grow the inequities on our system. The two studies confirm that DCHPs are a dangerous distraction from this mission; they undermine the important value of a community-wide approach to looking after one's neighbor in a health care system that would spread costs broadly in an effort to achieve affordable, quality health care for all.

NOTES

1. In addition to benefiting from a higher tax bracket (and higher tax benefit from HSAs), the wealthy are more likely than the nonwealthy to be able to risk the out-of-pocket costs of a high-deductible policy.
2. Because healthy individuals may be able to get a lower premium for a catastrophic policy in the individual market, the new tax deduction available to individuals, when combined with the possibility that employers will increasingly "cash-out" health benefits when the healthy opt-out of coverage, could lead to rapid erosion of the employer-based health insurance market.

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Evidence about Utilization and Expenditures

Risk Segmentation Related to the Offering of a Consumer-Directed Health Plan: A Case Study of Humana Inc.

Laura A. Tollen, Murray N. Ross, and Stephen Poor

Objective. To determine whether the offering of a consumer-directed health plan (CDHP) is likely to cause risk segmentation in an employer group.

Study Setting and Data Source. The study population comprises the approximately 10,000 people (employees and dependents) enrolled as members of the employee health benefit program of Humana Inc. at its headquarters in Louisville, Kentucky, during the benefit years starting July 1, 2000, and July 1, 2001. This analysis is based on primary collection of claims, enrollment, and employment data for those employees and dependents.

Study Design. This is a case study of the experience of a single employer in offering two consumer-directed health plan options ("Coverage First 1" and "Coverage First 2") to its employees. We assessed the risk profile of those choosing the Coverage First plans and those remaining in more traditional health maintenance organization (HMO) and preferred provider organization (PPO) coverage. Risk was measured using prior claims (in dollars per member per month), prior utilization (admissions/1,000; average length of stay; prescriptions/1,000; physician office visit services/1,000), a pharmacy-based risk assessment tool (developed by Ingenix), and demographics.

Data Collection/Extraction Methods. Complete claims and administrative data were provided by Humana Inc. for the two-year study period. Unique identifiers enabled us to track subscribers' individual enrollment and utilization over this period.

Principal Findings. Based on demographic data alone, there did not appear to be a difference in the risk profiles of those choosing versus not choosing Coverage First. However, based on prior claims and prior use data, it appeared that those who chose Coverage First were healthier than those electing to remain in more traditional coverage. For each of five services, prior-year usage by people who subsequently enrolled in Coverage First 1 (CF1) was below 60 percent of the average for the whole group. Hospital and maternity admissions per thousand were less than 30 percent of the overall average; length of stay per hospital admission, physician office services per thousand, and prescriptions per thousand were all between 50 and 60 percent of the overall average. Coverage First 2 (CF2) subscribers' prior use of services was somewhat higher than CF1 subscribers', but it was still below average in every category. As with prior use, prior claims data indicated that Coverage First subscribers were healthier than average, with prior total claims less than 50 percent of average.

Conclusions. In this case, the offering of high-deductible or consumer-directed health plan options alongside more traditional options caused risk segmentation within an employer group. The extent to which these findings are applicable to other cases will depend on many factors, including the employer premium contribution policies and employees' perception of the value of the various plan options. Further research is needed to determine whether risk segmentation will worsen in future years for this employer and if so, whether it will cause premiums for more traditional health plans to increase.

Key Words. Consumer-directed health plans, cost sharing, risk segmentation, risk selection

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In this article we examine what happened when one employer expanded its employee health benefit offerings to include a "consumer-directed" option—a benefit design that gives enrollees some first-dollar coverage but asks them to accept greater financial risk, often in return for lower monthly premiums. Our analysis is restricted to this single employer and its early experience with the consumer-directed option. The richness of the data allows us to examine the characteristics of those who chose this option in a comprehensive manner not usually possible.

Because consumer-directed plans may be most attractive to employees who expect to have relatively low health care costs, offering such plans may cause risk segmentation. If such segmentation occurs and plan sponsors do not adjust their contributions to counteract it, premiums for comprehensive health insurance products could become less affordable to the extent that those products primarily attract less-healthy employees. In this analysis, our question is not whether risk segmentation is problematic for the specific employer we studied, but whether it occurred.

BACKGROUND

Consumer-directed health plans (CDHPs) are a relatively new form of health care benefit design, hailed by some as a solution to two problems. The first problem is the pinch felt by employers who face rising health benefit costs and are desperate for something that will help them bring their health care

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expenditures under control (without seeming to shift the entire cost burden back to their employees). The second problem is that the quality of care Americans receive is far from what it could or should be, according to a consensus of health care stakeholders, including the Institute of Medicine (2001). For example, a recent groundbreaking report notes that Americans are likely to receive appropriate and necessary care just half the time (McGlynn et al. 2003). Consumer-directed health plans are meant to address both these problems by encouraging consumers to make more cost- and quality-conscious health care choices.

To understand the attractiveness of CDHPs, we must be clear about the position in which employers find themselves. Employers sponsor health insurance for more than half the population of the United States—161 million adults and children in 2002 (Fronstin 2003). Premiums have risen at a double-digit average annual rate in recent years (Mercer Human Resource Consulting 2003; Hewitt Associates 2003), putting significant pressure on labor costs at a time of generally weak consumer demand. But what are employers to do? Broadly speaking, effecting change in markets means putting pressure on the supply side (physicians, hospitals, and other providers), on the demand side (employees and their families), or on both. In the early 1990s, employers faced cost trends similar to today's and chose a supply-side solution—managed care. However, many argue that managed care, if not dead, is in critical condition (Robinson 2001; Draper et al. 2002). It is the victim of a semantics battle in which neither employers nor employees could separate appropriate care management from the heavy-handed utilization review and provider negotiation tactics of many insurers who called themselves "HMOs" and their products "managed care."

If employers believe that restraining costs through supply-side managed care techniques is no longer a viable strategy, they have little choice but to turn to the demand side of the market. Here, however, they must tread carefully, because health benefits are a highly visible and personal element of employee compensation. As recent collective-bargaining strikes—both threatened and actual—attest, increasing the share of costs borne by employees can raise the possibility of significant morale problems (see, for example, Armour and Appleby 2003). Moreover, we have not yet found a demonstrably superior way to shift costs. Simply increasing employees' share of premiums does little by itself to address underlying cost trends. Furthermore, the strategy may backfire (from a policy perspective) if it leads employees to drop coverage. Increasing point-of-service cost sharing will generally reduce employees' use of services—and thus premiums—but not necessarily in a desirable way.

To fill the void left by the retreat of managed care—and to put a "kinder, gentler" face on increased employee cost sharing through the promise of lower premiums—insurers have developed the so-called consumer-directed health plan. The origins and types of CDHPs have been well documented elsewhere (Gabel, Lo Sasso, and Rice 2002). These plans differ in their details but share three common elements:

- Greater point-of-service cost sharing—usually in the form of a much higher deductible—than in the typical PPO or HMO product;
- Reimbursement arrangements (sometimes called "allowances" or "accounts") that give enrollees at least some shelter from high cost sharing and that may or may not allow unspent dollars to be used for other purposes or carried forward to subsequent years; and
- Improved decision-making tools (often web-based) that ostensibly help enrollees spend their money more wisely.

The proponents and detractors of the CDHP concept have been both numerous and vocal. Proponents argue that CDHPs will slow growth in health care costs by reducing cost-unconscious demand for services, as well as improve quality of care as informed consumers use fewer unnecessary services and seek out higher-quality providers. Consumer-directed health plans may also provide a politically acceptable way for employers to cap their overall exposure to health care costs by establishing a low-cost benchmark plan and requiring employees choosing more expensive health plans to pay for that choice.[1]

Opponents view CDHPs—and high-cost-sharing plans generally—as fostering risk selection. They express concern that degradation of risk pools could leave older or sicker employees, who might prefer comprehensive coverage, to face much higher premiums. (Premiums would be higher not just because of richer coverage, but also because of the enrollees' worse health status.) Further, although CDHP enrollees might be healthier than average, those who do get sick may be exposed to unaffordable out-of-pocket expenses. Finally, CDHPs may not be as effective in constraining costs as some would hope. In most designs, the very sickest patients (who account for the lion's share of health care costs) will continue to have the bulk of their care paid for by fairly conventional insurance.[2]

Whether CDHPs will be widely adopted and, if so, whether the outcome will reflect proponents' hopes or opponents' fears remains to be seen. Drawing on the experience of Humana Inc.—a major national health insurer that

began offering a CDHP to its own employees in 2001—we begin to address these questions. We examine the potential for risk segmentation by comparing the people who chose the new option with those who did not.

METHODS

The study population comprises about 10,000 people (employees and dependents) enrolled as members of the employee health benefit program of Humana Inc. at its headquarters in Louisville, Kentucky, during the benefit years starting July 1, 2000, and July 1, 2001. This analysis is based on claims, enrollment, and employment data for those employees and dependents. Claims data provided measures of members' prior use of services and associated costs. Enrollment data provided information about subscriber and member demographics and premium contributions. Employment data provided information about subscribers' salary, used here as a proxy for family income.

Further detail about the claims data may be useful. Prior claims were available for all Humana products studied, but *only* for in-network use (in the case of HMO products, out-of-network use was not permitted). Humana Chief Actuary John Bertko estimates that typically 10 percent of use under preferred provider organization (PPO) products is out-of-network.[3] In addition, for the PPO products studied, claims data were not available for use that occurred before the deductible was reached. As a result, PPO claims may be slightly underreported relative to HMO claims.

To simplify our analysis, the study population was restricted to employees and their dependents who were members of any of the offered health benefit plans for the full 24-month study period. Because dependents are not given a unique member identifier that would allow us to distinguish them from subscribers (employees) themselves, we assumed that all dependents of 24-month subscribers were also enrolled for the full 24 months. Therefore, the total member-months used in this analysis may be somewhat overcounted, to the extent that subscribers added or subtracted dependents from coverage at times other than during open enrollment (for example, for the birth of a child, a marriage, or a divorce). We do not believe that this small uncertainty in member-months detracts from our conclusions.

By restricting our study to 24-month employees and dependents, we eliminated from the analysis about one-quarter of total members in each year. The percentage of excluded members was similar across all plan types (HMOs, PPO, and consumer-directed). Therefore, we do not believe that this

restriction biased our analysis of the characteristics of one plan's membership versus another. It does mean that we cannot comment on whether the risk segmentation and other patterns observed in this study are also found among people who were enrolled for fewer than 24 months, for example, new hires and those who left employment during the study period.

THE HUMANA CASE

In study year one—the benefit year that began July 1, 2000—Humana employees had three health plan options from which to choose: a health maintenance organization and two preferred provider organizations. In study year two—the benefit year that began July 1, 2001—Humana modified these options (see below) and also introduced two new consumer-directed health plans, Coverage First 1 (CF1) and Coverage First 2 (CF2). Both Coverage First options included higher deductibles than the traditional options and both incorporated a "health reimbursement arrangement" (HRA) that effectively provided enrollees with first-dollar coverage for their first $500 worth of care. The employee share of the premium for the Coverage First options was also significantly lower than for other plans.

Humana introduced the entire set of new options, labeled "SmartSuite," to its employees primarily to rein in its own employee health benefits costs.[4] A second, but no less important, reason for introducing SmartSuite internally was to test the product before offering it to customers in the midsize employer market. This practice is not uncommon among health insurers because it allows them to iron out operational problems associated with a new product.

The introduction of SmartSuite was accompanied by other changes intended to help control employee health benefit costs. These changes, summarized in Table 1, complicate our interpretation of employees'

Table 1: Major Changes to Employee Health Benefit Choices

Year One	*Year Two*
• 3 choices	• 5 choices
• 2 PPOs, 1 HMO	• 2 PPOs, 1 HMO, 2 "consumer-directed" plans
• Employer contribution: 79% of chosen plan	• Employer contribution: fixed at 79% of richer PPO
• All plans have 3-tier drug benefit	• All plans have 4-tier drug benefit
	• Increased cost sharing at the point of service; out-of-pocket maximum increased in some plans
	• Introduction of online "Wizard"

enrollment decisions, but we do not believe that they alter our fundamental conclusions. Key among these was a change in Humana's premium contribution. In study year one, before the introduction of SmartSuite, Humana contributed 79 percent of the premium for each employee's chosen plan. In effect, employees were exposed to only 21 percent of the difference in premium among plans, potentially making them less sensitive to cost in choosing a plan. In study year two, the company made a fixed-dollar contribution equal to 79 percent of the premium for the richer PPO. Employees choosing the more expensive plans therefore had to pay 100 percent of the difference in premium (between the employer's fixed contribution and the premium of the chosen plan) out of their own pocket. This change did not have a large impact on employees' share of premium in year two, but its impact could increase over time, as total premium costs increase.

Other changes from year one to year two included moving from a three-tier to a four-tier prescription drug benefit, as well as general increases in point-of-service cost sharing across the board. One other notable difference was the addition of the "Wizard" in year two. This online decision-making tool helped employees choose an appropriate health plan from among the SmartSuite options, guiding them through a series of questions about their preference for paying premiums versus cost sharing and about their expected health care use (and that of their family) in the coming year. The Wizard then recommended the health plan that would best meet an employee's preferences and needs.

The Appendix to this paper (available online) summarizes the major cost sharing and other changes made to the PPOs and the HMO between year one and year two. In general, cost sharing at the point of service increased, including the introduction of a $100 per day hospital copayment in all three plans.[5] The "Standard PPO" was the thinner of the two PPOs in both years. The richer PPO—known in year one as the "Enhanced PPO"—went from a dual-option to a triple-option plan and was renamed the "Tiered PPO" in year two. (The three options were: remaining within the Humana provider network; choosing a provider within an expanded ChoiceCare network; or, going out-of-network.) Cost sharing in the HMO product stayed fairly constant, other than the per diem hospital copayment and a $5 increase in the office visit copayment. Although benefits under all three plans declined somewhat, premiums remained flat, ranging from $15 to $20 per semimonthly pay period for single coverage.

The two Coverage First plans featured similar mechanics but the particulars differed somewhat (see Table 2). Employees choosing either plan

Table 2: Major Features of the Coverage First Plans*

	Coverage First 1	*Coverage First 2*
Allowance for first-dollar coverage^	$500 per year (member also pays $20 for each nonpreventive office visit)	$500 per year (member also pays $20 for each nonpreventive office visit)
Deductible (in/out)*	$1,000/$1,000	$2,000/$2,000
Preventive care (in/out) after deductible	80%/60%	100%/80%
Office visit (in/out)	$20/60%	$20/80%
Hospital (in/out) after deductible	80%/60%	100%/80%
Pharmacy	4-tier: in-network copays — $10 for low-cost drug, $20 for high-cost drug, $40 for nonpreferred drug, 25% coinsurance for injectables. Additional 30% surcharge for nonnetwork pharmacies.	4-tier: in-network copays — $10 for low-cost drug, $20 for high-cost drug, $40 for nonpreferred drug, 25% coinsurance for injectables. Additional 30% surcharge for nonnetwork pharmacies.
Out-of-pocket maximum (in/out)*	$2,000/$3,000	NA/$3,000
Premium^^	$5.00	$6.62

*Where indicated, cost sharing is shown as "in-network/out-of-network" for a single person.

**Family deductibles and out-of-pocket maximums are three times the single person's rate.

^Allowance may not be spent out of network and does not roll over.

^^Premiums shown are semimonthly for a single employee. Premiums for employee plus spouse, employee plus child(ren), and family are calculated by multiplying the single premium by 2.0, 1.9, and 3.2, respectively.

received an allowance that could be used to pay for health care services. Once that allowance was spent, Coverage First enrollees paid for 100 percent of their care out of pocket until a deductible was satisfied. After that, traditional PPO coverage kicked in. The deductible amount and the depth of coverage beyond the deductible differed between the two plans.

Two features distinguish the Coverage First plans from many other consumer-directed plans built around health reimbursement arrangements (HRAs). First, unspent Coverage First allowance funds could not be rolled over to the next year. Second, the allowance could be used only *within the Humana network* and only *for covered services.* (Many HRAs permit payment for services from any licensed provider, including those such as chiropractors who may not otherwise be covered by the plan.) This lack of fungibility runs counter to the notion of making enrollees price sensitive—because allowance

dollars cannot be stored up and have no alternative use, enrollees have no incentive to conserve them. The Coverage First plans create true price sensitivity only after the HRA is exhausted and before the higher deductible is met (when coinsurance kicks in).[6]

Employees choosing the CF1 plan received a $500 allowance, meaning that other than paying $20 copays for nonpreventive office visits, their first $500 of care was covered at 100 percent. Enrollees whose costs exceeded that amount then had to meet a $1,000 deductible, meaning that they paid out of pocket for their *next* $1,000 in claims (or until their *total* claims reached $1,500). After that, they were responsible for 20 percent of any additional in-network claims (40 percent out of network), up to an out-of-pocket limit of $2,000, after which all care was once again covered at 100 percent. The CF2 plan also had a $500 allowance, but its deductible was higher ($2,000), and its cost sharing lower (none in-network, and 20 percent out of network).

Mental health and pharmacy benefits were not paid for out of the Coverage First allowance, nor did they count toward deductibles or out-of-pocket limits. As with the PPOs and HMO that Humana offered, pharmacy and mental health benefits under Coverage First were administered under freestanding benefit plans. Other things being equal, this should have reduced segmentation because it meant none of the plans would have been differentially more attractive than others based on members' expected use of mental health or pharmacy services.

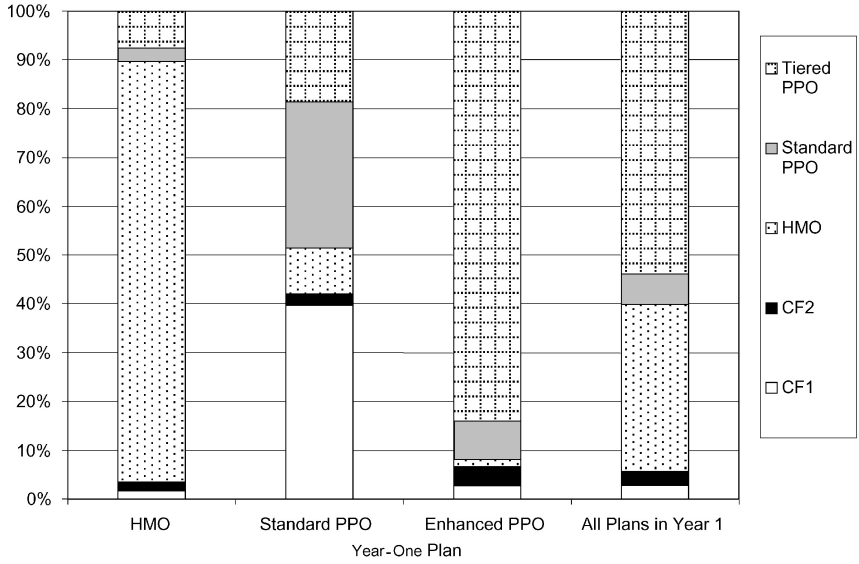
FINDINGS

Enrollment Patterns

On average over the two-year study period, there were about 4,300 subscribers (employees), and about 10,000 total members (employees plus dependents). In year one, the Enhanced PPO was the most popular plan (with nearly 60 percent of total enrollment), followed by the HMO (with nearly 40 percent), and the thinner of the two PPOs, the Standard PPO (with just over one percent).

In year two, the Coverage First products were introduced, and each attracted just under 3 percent of members. These members were drawn from both the Enhanced (now called "Tiered") PPO and the HMO, so that membership in these two plans fell to 53 percent and 34 percent, respectively. In year two, enrollment in the Standard PPO increased to 7 percent of the total. We believe this increase reflected members switching from the richer

Figure 1: Where Did Year-One Members Go in Year Two (by Percent of Members)?



PPO once they saw that the latter's benefits had been reduced, while the premium had remained the same.

Figure 1 illustrates the "migration" of members from year one plans to year two plans, in percentages. Table 3 shows the same information in both percentages and absolute numbers. Despite—or perhaps because of—all the changes in benefits, most enrollees stayed where they were: about 85 percent of HMO and Enhanced PPO members (2,479 and 3,795 members,

Table 3: Where Did Year One Members Go in Year Two (by Percent and Number of Members)?

	Year-Two Plan									
	CF1		*CF2*		*HMO*		*Standard PPO*		*Tiered PPO*	
Year One Plan	%	#	%	#	%	#	%	#	%	#
HMO	1.6	47	1.8	51	86.3	2,479	2.8	81	7.5	215
Standard PPO	39.7	34	2.3	2	9.3	8	30.1	26	18.5	16
Enhanced PPO	2.8	125	3.8	170	1.6	71	7.9	357	84.0	3,795
All Plans	2.8	206	3.0	223	34.2	2,559	6.2	464	53.8	4,025

respectively) reenrolled in the same plan in year two. The exception is the Standard PPO—in which enrollment was initially very low—where only 30 percent of members (26 people) reenrolled in year two.

Members who left the HMO or the Enhanced PPO to enroll in Coverage First split fairly evenly between CF1 and CF2. Of those who were enrolled in the HMO in year one, 1.6 percent (47 members) left to enroll in CF1 and 1.8 percent (51 members) in CF2. Of those who were enrolled in the Enhanced PPO in year one, 2.8 percent (125 members) left to enroll in CF1 and 3.8 percent (170 members) in CF2. By contrast, 39.7 percent of year one Standard PPO members (34 members) chose CF1 in year two, while only 2.3 percent (2 members) chose CF2. Notwithstanding the small numbers involved, this disparity is notable.

Risk Segmentation: Are Coverage First Enrollees Healthier?

We looked at two types of information to help determine whether healthier-than-average people had chosen the Coverage First plans: demographic characteristics and claims data. Demographic characteristics are a poor predictor of health risk compared with claims and diagnostic data, but they are often used as a proxy for health status when clinical data are not available (Lee and Rogal 1997; Kronick et al. 1996; Wilson et al. 1998). Moreover, a number of CDHP sponsors have used demographic data to suggest that these plans have not disproportionately attracted low-risk members. Having access to both types of data allows us to see whether they yield the same conclusions. We found that although demographic data did not reveal favorable risk selection in the Coverage First plans, better measures of risk based on prior use and prior cost unanimously indicated risk segmentation taking place, to greater or lesser degrees, depending on the measure chosen.

Demographic Data. We compared the age, sex, family size, and salary of Coverage First subscribers with those of other plans (recall that "subscribers" refers to employees, while "members" refers to both employees and dependents). These characteristics suggested only a small degree of difference among the subscribers in the various plans and no clear evidence of risk segmentation.

As shown in Table 4, CF1 subscribers were slightly younger than the entire group (an average of 37.4 years versus 38.2 years), while CF2 subscribers were the same age as the entire group average of 38.2 years. The HMO subscribers were the youngest, averaging 36.1 years. Taken together, Coverage First subscribers were relatively less likely to be women than were

Table 4: Demographic Overview of Year-Two SmartSuite Plans

Plan	Subscribers	Members	Average Subscriber Age	Percent of Subscribers Female	Average Family/ Contract Size	Average Subscriber Salary Grouping
CF1	135	273	37.4	57.7	2.0	2.5
CF2	136	276	38.3	55.7	2.0	2.7
HMO	1,479	3,340	36.1	74.9	2.3	2.0
Standard PPO	293	700	36.4	63.4	2.4	2.3
Tiered PPO	2,239	5,168	39.8	68.5	2.3	2.4
All Plans	4,282	9,757	38.2	69.7	2.3	2.2

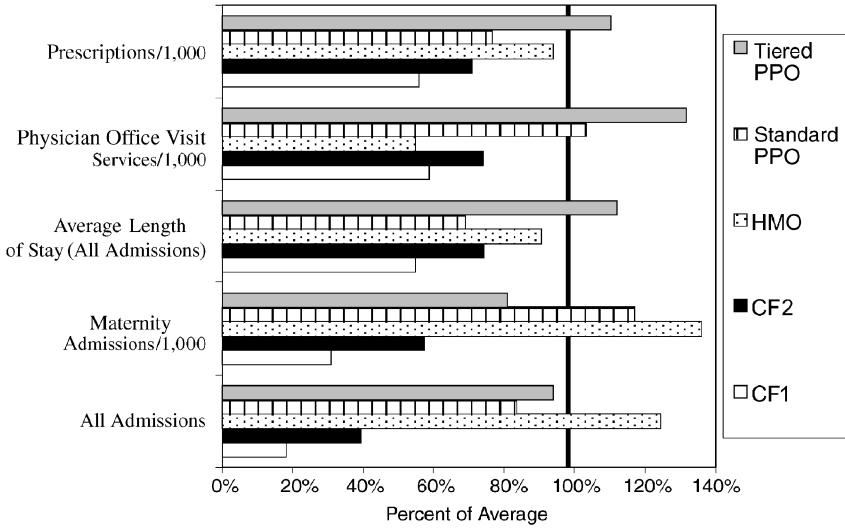
subscribers in other plans. Although the majority of subscribers were women across all plan types (reflecting the fact that Humana's workforce is more female than average for American employers), the percentage female was lower in CF1 and CF2 (58 percent and 56 percent, respectively) than in the group as a whole (70 percent). Again, the HMO option stood out—this time for having the highest percentage (75) of female subscribers.

Compared with the average, Coverage First subscribers were less likely to cover children or a spouse under the plan. The average contract size under both Coverage First plans was 2.0, reflecting a higher than average number of single subscribers. In contrast, the average family size for the group as a whole was 2.3, as was the average contract size for both the HMO and Tiered PPO.[7]

Finally, Coverage First subscribers had slightly higher salaries than average. We classified employees' annual salaries using a four-category scale: a salary of less than $25,000 received a 1; a salary from $25,000 to $50,000 received a 2; a salary from $50,000 to $100,000 received a 3; a salary of more than $100,000 received a 4. The group average was 2.2, while CF1 and CF2 subscribers had average salaries of 2.5 and 2.7, respectively. HMO subscribers had the lowest average salaries (2.0), while PPO subscribers were slightly above average (2.3 and 2.4 for the Standard and Tiered plans, respectively). These data are consistent with higher-income workers being more apt to take on greater financial risk.

Claims Data. To address the issue of health risk more directly, we analyzed enrollees' use of services and spending prior to the introduction of SmartSuite. Specifically, we characterized the health risk of enrollees in study year two according to their use of services and spending during study year one (in whichever plan they were enrolled at that time). We tracked people according to their unique enrollment number and examined claims

Figure 2: Prior Year Use of Services, by Year Two Plan

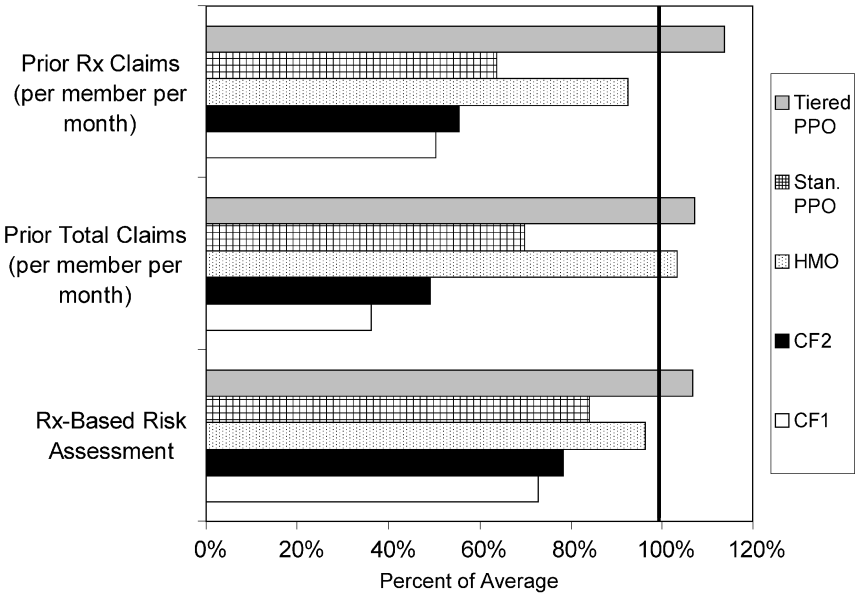


experience for people continuously enrolled in both years. Because the prior year's use and spending reflect both health risk and benefit design, we also examined pharmacy use, which was less likely to be influenced by benefit design, as all enrollees' pharmacy benefits were similar in year one.

Figure 2 shows that Coverage First enrollees' use of services in study year one was unambiguously lower than that of their counterparts in other plans. For each of five services, usage in year one by people who subsequently enrolled in CF1 was less than 60 percent of the average for all people in year one (represented in Figure 2 as 100 percent). Hospital and maternity admissions per thousand were less than 30 percent of the overall average; length of stay per hospital admission (a crude measure of case complexity), physician office services per thousand, and prescriptions per thousand were all between 50 and 60 percent of the overall average. The CF2 subscribers' prior use of services was somewhat higher than CF1 subscribers', but it was still below average in every category. Interestingly, CF2, the Coverage First plan that might appear to provide less protection against risk (as reflected in its lower premium and larger deductible), attracted the relatively higher-use group of enrollees.[8]

The disparity of Coverage First enrollees' prior-year service use is seen clearly by noting that enrollees in each of the other three plans exceeded the average in at least one category of prior use, while neither of the Coverage

Figure 3: Pharmacy-Based Risk Assessment Scores and Prior Claims, by Year Two Plan



First plans exceeded the average in any category. For example, HMO members had the highest previous rate of hospital admissions (including maternity admissions), and Tiered PPO members had the highest use of physician-related services (including prescriptions per thousand).[9] The higher rate of maternity admissions among HMO enrollees is unsurprising given their younger age, greater likelihood of being female, and relatively larger families; it is less clear why HMO enrollees also had a higher rate of hospital admissions overall, particularly because HMOs have traditionally been known for keeping members of out hospitals by substituting outpatient for inpatient care.

Figure 3 shows prior spending as measured by paid claims, which reflect both Humana's and the member's share of costs. As with prior use, these data suggest that Coverage First subscribers were healthier than average, as evidenced by lower prior total claims. Their claims spending was, on average, less than 50 percent of the group total. (As in Figure 2, total spending by the whole group is shown as 100 percent.)

Some of the difference in prior spending across plans could be attributable to differences in the way plans priced their services in year one.

However, any such effect would be minimized by the fact that all year-one members were in plans administered by Humana and subject to its fee schedules and other reimbursement arrangements—at least to the extent that members used Humana, rather than out-of-network, providers. Such out-of-network use was prohibited under the HMO, but may have taken place to greater or lesser degrees under the two PPOs. To verify this conjecture—and to gain additional perspective on prior year service use—we also looked at prior spending under the pharmacy plan, which had a similar design for all members in year one. These results (also shown in Figure 3) are consistent with those based on prior total spending, with Coverage First members having prior-year pharmacy spending about 50 percent of average.

The availability of data on pharmacy use also allowed us to explore a more sophisticated measure of health risk using a pharmacy-based risk assessment tool.[10] Much has been written elsewhere about the validity of such tools, which use pharmacy data from one year as a marker for conditions that are expected to be high cost in the future (Roblin 1998; Gilmer et al. 2001; Fishman et al. 2003). A prescription for insulin, for example, signals that a person has diabetes, which in turn allows a future predicted cost to be imputed to that person. By comparing future expected costs of a subgroup to costs for the group as a whole, a risk assessment score can be developed. A score of 1.0 indicates a group of average risk; a score less than 1.0 indicates a healthier than average group; and a score greater than 1.0 indicates a group that is less healthy than average.

The distribution of pharmacy-based risk assessment scores across plan types is much tighter than the distribution of raw service use (pharmacy or other), as shown in Figure 3. This narrowing of the distribution is subject to different interpretations. It could simply reflect the loss of measured variation that occurs when individual values are replaced by group averages. (That is, prior use of services for the relatively small numbers of Coverage First enrollees is likely more variable than the use of services by the larger population on which the risk assessment tool is calibrated.) Alternately, it could mean that apparent segmentation is not as large when measured with a sophisticated risk measure than when measured by use of services. In either case, our conclusion that risk segmentation is pronounced stands: CF1 and CF2 members' risk assessment scores were 73 percent and 78 percent, respectively, of the average risk score for all enrollees.

Readers may wonder why we did not test whether the observed differences in prior use and spending were statistically significant. Briefly, when one has a census of a population (as we did for Humana's headquarters

employees and their dependents), any uncertainty about differences in characteristics of population subsets will be attributable to nonsampling error (bookkeeping mistakes, for example), not sampling error (drawing a sample of CF enrollees that is unrepresentative of an underlying CF population). There is no underlying population at Humana against which to test significance, nor are we generalizing the results to a broader population. Therefore, a test of statistical significance would not be meaningful. Instead we simply offer the caution that while our results accurately reflect what happened for this employer during this specific time period, we cannot say with certainty that the observed differences in prior use and spending are attributable *only* to differences in health status, nor that the same differences would be observed in subsequent years or in other settings.

The "Switcher" Effect

Some would argue that the risk segmentation we observed is to be expected in the initial years of the offering of a new product. We could hypothesize that those most likely to leave a plan with which they are familiar and switch to another tend to be people with few health care needs. We wondered whether "switchers" in general tend to be a healthy group, and if so, whether the risk segmentation effect we saw was simply due to the fact that Coverage First subscribers were, by definition, switchers.

To answer this question, we looked at prior costs for two sets of people: those who switched from any plan in year one to a Coverage First plan in year two (by definition, all CF subscribers are included); and those who switched from any plan in year one to any other *non-CF* plan in year two. We also compared both these groups of switchers to all year-two members (both switchers and nonswitchers). While switchers did have lower prior spending than average for year-two enrollees, regardless of which plan they had switched into, prior spending for non-CF switchers was double that of CF switchers. From this we can conclude that switchers in general appear to be healthier than average, but that this is insufficient to explain the disproportionately healthier-seeming status of CF1 and CF2 enrollees.

DISCUSSION

The finding that offering a consumer-directed plan alongside traditional HMO and PPO coverage led to risk segmentation—with healthier-seeming people

choosing the high-deductible option—raises two questions. First, what should we make of the apparent contradiction between our results and the claims of proponents of CDHPs or the findings of other researchers? Second, should we care about the degree of risk segmentation we found?

That CDHPs of the kind offered by Humana may attract a relatively healthier enrollment pool should come as no surprise; in return for lower premiums, the Coverage First options provide less financial protection against significant illness. Notwithstanding the claims of some proponents that CDHPs should be more attractive to sicker enrollees because they offer maximum choice of provider, the "bridge" between the allowance and the point when traditional coverage kicks in can be daunting to people with predictably higher health spending. Moreover, in the Humana case, funds in the reimbursement account do not roll over as they do in some other HRAs, so there is no opportunity to increase financial protection over time.

Where we found significant risk segmentation, other researchers have not. For example, Stephen Parente and his colleagues studied the University of Minnesota's experience in offering a CDHP, concluding that no risk segmentation occurred and that the consumer-directed plan was not disproportionately chosen by the young and healthy (see Parente, Christianson, and Feldman 2004, this issue). One issue is that the methods used to measure risk segmentation in that study differed from ours. We used prior use and spending as proxies for health status; the Parente team used self-reports of chronic illness (a measure that was highly correlated with the Adjusted Diagnosis Group measure of health status). A debate about the best tool for measuring health status is well beyond the scope of this paper, but clearly, no tool is perfect. Therefore, we are not surprised to see different results based on the use of different tools—prior claims, self-reports, and demographic characteristics. (Indeed, the Humana experience illustrates this clearly: there is little if any evidence of segmentation on the basis of age or sex, while measures of prior use and spending provide solid evidence of segmentation.) In addition, as noted before, the evidence in this and other articles is drawn from case studies of early adopters and should be viewed with appropriate caution.

To determine whether the degree of risk segmentation we found matters, we must answer two questions. First, do we care about the possible consequences of risk segmentation? Second, at what point does segmentation trigger those consequences?

We should care about the consequences of risk segmentation for two reasons. First, it creates inequity by making it difficult (or impossible) to pool

people with predictably different health risks. Therefore, whether segmentation is a problem depends on one's views about the appropriateness of having people with predictably low health care costs (for example, young employees) subsidize people with predictably high health care costs (for example, older employees or those with chronic illnesses). Second, because insurers' ability to offset segmentation through risk adjustment is imperfect, consumers' ability to choose efficient plans will be confounded by premiums that reflect differences in efficiency *and* in risk profile. Thus, there is a potential efficiency loss as well.

To the extent that people have different tastes for financial risk (unrelated to their health status), the availability of multiple products is superior to having only a one-size-fits-all product. From this perspective, variation in benefit design is good because it encourages efficiency. The problem arises when variation in benefit design encourages people to sort themselves not just by their taste for risk, but also by their likelihood of incurring a loss (that is, their health risk). Such adverse selection can lead to "death spirals" that make some benefit designs unsupportable.

The challenge, then, is how to obtain the efficiency gains of variation in benefit design (more choices) without incurring the equity costs (the loss of cross-subsidization). For a self-insured employer such as Humana—or an employer purchasing a "total replacement" product from a third-party insurer—the effects of risk segmentation can be mitigated by adjusting the employer contribution or plan payments, effectively subsidizing employees who choose higher-cost plans and taxing those who choose lower-cost plans. (Humana does intend for SmartSuite to be a total replacement product.) However, if the only answer to increasing market segmentation is a move toward total replacement strategies (with or without risk adjustment), we have to ask whether this type of competition is desirable for all market stakeholders. We do not attempt to answer this question here but rather note that such competition stands in stark contrast to the "managed competition" model of consumer choice advocated by Enthoven (1988, 1993, 2003) and others (Enthoven and Kronick 1989), and its potential implications are not well understood.

While total replacement may be one possible solution for a single employer, the same does not necessarily hold for the broader insurance market where there is no entity to risk-adjust payments. Thus, the introduction of a consumer-directed plan (or any plan with substantial cost sharing), which primarily attracts employers with relatively healthy employees, would result in the employees of other firms paying higher premiums to maintain comprehensive coverage or accepting lower benefits to maintain premiums. In the limit, some employers might well be priced out of the market.

Is the degree of risk segmentation we saw with Humana's consumer-directed plan sufficient to cause concern? On one hand, one must be careful not to read too much into a case study, particularly one limited to the initial experience with a new plan offering.[11] As time passes, regression to the mean will likely offset some of the initial selection. On the other hand, the magnitude of the differences in apparent health status we found was large, with Coverage First enrollees having prior-year use of services and risk scores 25 to 50 percent lower than enrollees in Humana's other plans. This compares with a difference in total premiums of about 15 percent.

If the differential in health status persists, and if Humana were to price the SmartSuite offerings on an actuarially fair basis, then premiums for the Coverage First options would fall, and premiums for the traditional options would rise. To counteract this effect and to maintain the fundamental concept of group insurance, however, Humana plans to price SmartSuite premiums with a tighter spread than the actual claims experience. While this type of cross-subsidization of premiums across benefit type is feasible under the single carrier replacement model, it is nevertheless not clear whether other insurers—or self-insured employers—will follow Humana's lead. Over time, therefore, one would expect the risk profile of enrollees in the traditional options to deteriorate.

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NOTES

1. This third hoped-for impact of CDHPs is not necessarily unique to them, but rather to the employer contribution strategy known as "defined contribution." Defined contribution can be compatible with any type of benefit design, but it is seen as being particularly compatible with CDHPs.
2. The structure of most CDHPs—first-dollar coverage, followed by a gap in coverage up to a deductible, followed by traditional coverage—provides little or no change in incentives once a person requires hospitalization. A single, typical hospitalization will put someone well beyond the deductible in most plans.

3. Personal communication with Humana Chief Actuary John Bertko, 2004.
4. Personal communication with Humana Chief Actuary John Bertko, 2003.
5. The $100 daily hospital copay is limited to the first 10 days, after which there is no further cost sharing under the HMO, and there is coinsurance under the PPOs.
6. The situation is similar to what is observed with Section 125 flexible spending accounts. Faced with using or losing funds at the end of a calendar year, people may make discretionary health care purchases (for example, eyeglasses) whose value to them is well below their cost. Lack of fungibility may thus have the perverse effect of encouraging greater consumption of services than would otherwise have taken place.
7. The data do not necessarily indicate that Coverage First subscribers actually *have* smaller families than other subscribers, but rather that they *cover* fewer family members under their own plan. It is possible that they have the same size families as others but that they choose to cover their dependents under a spouse's plan, or not to cover them at all. Our data did not allow us to make this determination, as Humana does not collect information about dependents not covered under its own employee plans.
8. In fact, CF1 and CF2 were actuarially equivalent—according to Humana—and provided the same amount of protection against hospitalization. However, an employee choosing among them would most likely not understand this.
9. We include prescriptions per thousand in "physician-related" use because we assume that in most cases, the writing of a prescription involves a visit to a physician or other physician service.
10. Specifically, we used the Pharmacy Model of the Ingenix Predictive Model™. See http://www.ingenix.com.
11. Enrollment in the Coverage First plans was fairly low during our study period—5.6 percent of total membership—but take-up was close to 20 percent the following year, when Humana offered the CF plans to their employees outside of Louisville. That suggests a degree of satisfaction among CF enrollees. It also offers the chance for further study.

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Evaluation of the Effect of a Consumer-Driven Health Plan on Medical Care Expenditures and Utilization

Stephen T. Parente, Roger Feldman, and Jon B. Christianson

Objective. To compare medical care costs and utilization in a consumer-driven health plan (CDHP) to other health insurance plans.

Study Design. We examine claims and employee demographic data from one large employer that adopted a CDHP in 2001. A quasi-experimental pre–post design is used to assign employees to three cohorts: (1) enrolled in a health maintenance organization (HMO) from 2000 to 2002, (2) enrolled in a preferred provider organization (PPO) from 2000 to 2002, or (3) enrolled in a CDHP in 2001 and 2002, after previously enrolling in either an HMO or PPO in 2000. Using this approach we estimate a difference-in-difference regression model for expenditure and utilization measures to identify the impact of CDHP.

Principal Findings. By 2002, the CDHP cohort experienced lower total expenditures than the PPO cohort but higher expenditures than the HMO cohort. Physician visits and pharmaceutical use and costs were lower in the CDHP cohort compared to the other groups. Hospital costs and admission rates for CDHP enrollees, as well as total physician expenditures, were significantly higher than for enrollees in the HMO and PPO plans.

Conclusions. An early evaluation of CDHP expenditures and utilization reveals that the new health plan is a viable alternative to existing health plan designs. Enrollees in the CDHP have lower total expenditures than PPO enrollees, but higher utilization of resource-intensive hospital admissions after an initially favorable selection.

Key Words. Health insurance, consumer-driven health plans, administrative data, managed care

Consumer-driven health plans (CDHPs) have moved beyond the concept stage and are now health benefit options available to employees in many large companies. Mainstream insurers, such as Aetna, UnitedHealth Group, and Wellpoint have introduced their own CDHPs to compete with products offered by start-up companies such as Definity, Luminos, and others. Health policy analysts have expressed concerns that CDHPs could create adverse selection problems and have unintended impacts on service use. These concerns are motivated by analyses of plan designs and philosophical beliefs,

but have been largely uninformed by empirical research. In this research project, we used a claims dataset to compare the medical service use and expenditures of employees who were enrolled in a CDHP in 2001 and 2002 to employees enrolled in a health maintenance organization (HMO) and a preferred provider organization (PPO). Our analysis addressed the following questions:

1. What was the impact of the CDHP on payments to providers (i.e., total expenses)?
2. What was the impact of the CDHP on employee out-of-pocket expenses for medical care?
3. Was service use different for CDHP enrollees compared with enrollees in the other health plans?
4. Was the illness burden different in the CDHP versus other plans, and how did it change over time?
5. Were the CDHP effects different in the first year of enrollment, compared with the second year?

BACKGROUND

Consumer-driven plans differ from traditional insurance and managed care products in philosophy and design. Philosophically, they seek to involve the consumer more directly in health care decision making. Typically, in these products, a "health spending account" is created from which the employee purchases services. Some form of major medical or "wrap-around" coverage is also a key part of the benefits design. If an employee spends all of the dollars in the health spending account in a given year, she then spends her own money until the deductible requirement in the major medical coverage is met.

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Expenditures in excess of the deductible are covered by the major medical plan. The benefit design can be tailored to cover all or part of these "excess" expenditures. To facilitate informed decision making, the employee is provided with information about health care providers, including physician education and experience, prices, and quality ratings. Usually, this information is available on the Internet to ensure easy access and promote its use (Christianson, Parente, and Taylor 2002).

Consumer-driven health plans are often compared to medical savings accounts (MSA). MSAs first became available in the mid-1980s; they were later regulated by the 1996 Health Insurance Portability and Accountability Act (HIPAA) as a tax-exempt health insurance product offered primarily to employers with 50 or fewer workers and individuals in Medicare (Bunce 2000). Consumer-driven health plans differ from MSAs in several important ways. Most CDHPs are Internet-enabled health plans that were originally financed by venture capitalists during the dot.com boom of the late 1990s (Christianson, Parente, and Taylor 2002). The use of information technology in an effort to create "informed consumers" is a distinguishing CDHP feature (Lutz and Henkind 2000; Wiggins and Emery 2001). In contrast, MSAs typically instruct subscribers to "shoe-box" their medical bills for later reimbursement from their accounts, as long as they are under the deductible. For many CDHPs, the Internet has an interactive customer support system to allow a subscriber to track medical expenditures deducted from her account online. Consumer-driven health plans offer online linkages to prescription drug benefit programs as well as online benefit eligibility information to ensure prompt payment to medical providers. Because CDHPs are much more sophisticated in their product delivery to consumers and employers, they are attractive to many medium-to-large employers. In contrast, HIPAA-regulated MSAs contain a number of restrictive provisions that can make these plans difficult to describe to consumers and intimidating for health benefits managers and insurance brokers.

Interviews with employees and CDHP managers suggest several reasons why larger employers are attracted to CDHPs (Christianson, Parente, and Taylor 2002). Philosophically, these employers want informed employee decisions to "drive the market." Under the CDHP spending account approach, employers believe their employees have an incentive to seek information on providers' prices and to carefully consider their need for services, because any unexpended funds "roll-over" into next year's account balance (Parrish 2001). This potentially reduces the annual "gap" between the spending account contribution and the deductible amount faced by the

employee. Also, employers see CDHPs as possibly reducing their administrative expenses. If the CDHP is popular with employees, it may mean that other plan options can be dropped. Finally, some employers may see the CDHP approach as a way to divorce the amount their contribution to health insurance increases each year from trends in premiums, linking it instead to overall employee compensation increases. In this respect, CDHPs would function as "transition vehicles" that could be used to redefine the role of employers in the purchase of health insurance, much as defined contribution retirement accounts did with respect to retirement benefits (Trude and Ginsburg 2000).

Research Approach

In theory, by combining a high-deductible health insurance plan with a health spending account, a CDHP creates incentives for enrollees to economize on their utilization of medical care. However, there is very little empirical evidence from the MSA experience to inform our research design. Simulation analyses indicate that an employer-funded MSA may have moderate effects on health care spending, depending on who joins (Keeler et al. 1996). A mandatory MSA might reduce spending by 6 percent to 13 percent. The RAND Health Insurance Experiment found that a high-deductible health insurance plan (about $5,000 per family in current dollars) would reduce spending by one-third compared with comprehensive fee-for-service insurance (Manning et al. 1987). But, the RAND study did not examine what would happen if the high-deductible plan were combined with a health spending account.

Some experts have questioned the ability of deductibles in consumer-driven plans to constrain medical spending (American Academy of Actuaries 2003). This criticism is based on the observation that, because a majority of medical costs exceed the plan's out-of-pocket limit and thus are typically covered by the major medical plan, the insured person has no financial incentive to control his or her medical care utilization. For example, only 7.7 percent of the U.S. population under age 65 with private health insurance (similar to the population in our study) spent more than the RAND Health Insurance deductible of $5,000 in 2000; yet these people accounted for 56.8 percent of all medical spending among the reference population (Agency for Healthcare Research and Quality 2003). The average medical expenditure among this group was almost $13,000.

However, most Americans are not in high-deductible health plans, and therefore the data cited to "prove" that deductibles will not work are, in fact, suggestive that low-deductible health insurance may produce skewed medical expenditures. In order to test the effect of deductibles on medical expenditures it would be necessary, as in the RAND experiment, to *change* the level of deductibles and observe the resulting change in expenditures. Nevertheless, it is possible that the deductibles in CDHP plans will not have a significant impact on medical expenditures because, in most cases, the deductible is considerably less than $5,000.

It is even possible that the CDHP health spending account could lead to an *increase* in medical care use, compared with a plan that has only a deductible. For example, if the employer contributes 50 percent of the deductible each year to the account, employees who use only preventive services could bank two years of spending account dollars to reach first-dollar coverage by year three. In this case, employees who never exceed their annual personal care account (PCA) allocations from year three forward could have first dollar coverage up to two million dollars for a lifetime, indefinitely. Whether consumers actually act this way is a conjecture, as there is no empirical evidence that addresses the issue.

For this analysis, we used health insurance claims and benefits data from a large, self-insured employer that offered a CDHP for the first time in 2001. The employer previously offered an HMO and a PPO to employees at its main corporate location. (The employer retained these options when it offered the CDHP.) Worldwide, the employer has more than 20,000 employees and over $5 billion in annual revenue. With its products positioned in a rapidly growing sector of the economy, the company is adding employees each year through internal growth and acquisitions.

We conducted two types of analyses on the data: (1) an employee-level examination of inter-temporal variation in cost and use, employing up to three years of data, and (2) an employer-level analysis of the differences in cost and use among the plans, with and without case-mix adjustment. The presence of a large and significant case-mix effect in the aggregate would be evidence of differential selection among the health plans based on personal health care consumption preferences or health status. If the aggregate case-mix adjusted results are not statistically different from the unadjusted results, we can conclude that use differences are not likely due to differences in health status.

The distribution of health care utilization (or expenses) in populations typically is characterized by a large proportion of people who use no services at all, and a highly skewed distribution among users. As a result, we employed

a two-part model in our analysis (Manning et al. 1981). First, we estimated probit equations for the probability of using any service (or having any expense) during the year, specified as:

$$Prob\,(\text{visit}>0) = B_x X_i + B_c C_i + e_i, \tag{1}$$

where e_i is a random person-level error term, X_i represents a vector of person i variables influencing use such as health status, age, gender, family status, location, and C_i represents a vector of health plan choices. Second, we estimated regression models for medical care expenditures and use. For expenditures, we used a log-linear regression model. Using expenditures as an example, part two of the model takes the form:

$$Ln\,(\text{covered expenditures})|\text{expenditures}>0) = G_x X_i + G_c C_i + e_i, \tag{2}$$

where X_i and C_i are the same vector of variables used in equation one. Specifying C as a set of categorical dummy variables representing health plans will provide estimates of the marginal effect of the CDHP plan choice on an enrollee's cost and use.

Health plan choice can affect both equations (1) and (2). For example, in equation (1), a health plan may influence the use of any service. In equation (2), health plans may directly affect the reimbursement levels through fee schedules and denial of services. We examined the impact of health plan choice on both equations to determine the most appropriate modeling strategy. In addition, in some model specifications, we added interaction terms representing the combination of personal characteristics (e.g., family status) and health plan choice.

There are several benefit design features that are likely to influence service use and expenditures for CDHP enrollees. For example, if sufficient dollars in the health spending account are "rolled over," eventually the accumulated amount could exceed the "gap" between the annual contributions to the account and the deductible. Care then costs the enrollee nothing out-of-pocket, creating a potential for "moral hazard." There are several benefit-design "fixes" for this moral hazard problem, such as implementing coinsurance above the deductible or limiting how much money can be banked. However, 100-percent-covered expenses after meeting the deductible is a current feature of CDHP products in many early-adopter employers, including the one in our study.

Other features include 100 percent coverage for preventive care, so that expenditures for preventive services do not affect the spending account balance or the deductible. Also, there are limitations on what pharmaceutical and provider expenses can be applied to the deductible if they are outside the

scope of what the CDHP and employer consider a normal range of payment. For example, a physician outside the CDHP's contracted panel would be reimbursed using spending account dollars, but only the usual, customary, reasonable equivalent in pricing the physician's services would be applied to the insured's deductible. With regard to the pharmacy benefit, prescription drug costs are paid directly from the account at the full allowed price negotiated by the CDHP and a pharmaceutical benefit management (PBM) firm. Thus, a CDHP participant would never face a copayment and would have the equivalent of first-dollar coverage for pharmaceuticals until the dollars in the PCA are exhausted, at which point he or she would pay out-of-pocket until the deductible for all health care expenses is reached. If the price of a drug is outside the allowed amount negotiated by the PBM, the prescription still would be paid in full by the PCA but, like the provider payment example, only the allowed amount for the drug would be applied to deductible. In both instances, the CDHP is designed to encourage enrollees to be price-conscious; if they deviate from what the employer and CDHP consider a fair provider payment structure, enrollees will pay the difference. It is important to note that benefit design for CDHPs is a joint employer/CDHP decision. We have found in employer interviews that these designs can vary considerably by employer and over time.

DATA

This analysis required obtaining data from the employer as well as from three different health plans, including the CDHP, over three years. Person-level identification over time was necessary. In order to make the analysis compliant with new HIPAA regulations effective on April 14, 2003, we enlisted the services of a "trusted third party" whose roles in the analysis were: (1) to collect data from the employer and the health plans, identified by social security numbers of the employees in the study; (2) to merge all data by social security number; and (3) to replace all social security numbers with a unique study ID that had no relationship to an individual's actual identity. The trusted third party then prepared the resulting data sources, minus personal identifiers, for the investigators' analysis. In this capacity, the trusted third party served as an agent to the employer willing to participate in this study and signed a Business Associate Agreement with the employer as required by HIPAA.

Employer personnel data on the employees' health plan elections in 2000, 2001, and 2002 were used to identify three study population cohorts.

The CDHP was first offered in 2001. Our objective was to identify prior medical care utilization under employee contracts in 2000, as well as utilization in the first and second year in which the CDHP was offered. Thus, the CDHP cohort identified employees who chose this plan in 2001 and 2002. The CDHP cohort's experience in 2000 provides insight on the extent to which CDHP enrollees might have been relatively high, or low, users of services prior to enrollment. The 2001 CDHP experience represents the first year after enrolling in the new plan. The 2002 CDHP experience provides an opportunity to assess medical care use and expenditures after any remaining balance in the personal care account had been rolled over from 2001 to 2002. The HMO and PPO cohorts consisted of employees who chose these plans in 2000 and remained enrolled in them through 2001 and 2002.

The final sample size for our analysis was 3,636 contracts. This sample reflects more than a 40 percent reduction in the number of contracts offered by all three health plans for the employer in the metropolitan area. The reduction occurred due to plan switching and the firm's addition of new employees in 2001 and 2002, for whom data were not available in 2000.

To supplement the claims data, we abstracted annual information from the employer's database on the employee/subscriber's number of dependents, after-tax income from the firm, share of medical costs paid, and flexible spending account contribution. Flexible spending account information is important because dollars in these accounts can be used to finance the gap between the employer's PCA contribution and the deductible limit where 100 percent coverage begins.

The key variables constructed from the claims data, after claims adjudications and denials were accounted for, included total provider reimbursement as well as reimbursement for physician, hospital, and pharmacy expenses. In addition, total expenditures were partitioned into those costs borne by the employee and the employer. Employee costs included deductibles and copayments in all of the three health plans. For the CDHP plan, in our analysis, expenditures paid by the personal care account and those paid after the deductible was met both were treated as employer expenses. Consumer-driven health plan employee expenses were primarily payments for services when the spending account was exhausted and before the deductible was met. Expenses also were incurred by some employees after the deductible was met; for example, if a prescription was purchased whose cost exceeded allowable reimbursement levels, or a specialty provider was seen whose cost was outside the scope of payment in the CDHP's panel of 500,000+ providers nationally. It is important to note that a significant source

of employee costs—contributions toward their health benefits—is not included in this analysis because our focus is on the cost and use associated with the different health plan designs and their operations.

The utilization variables developed from the claims data were hospital admissions, physician office visits, and pharmacy prescriptions filled. In addition, diagnosis codes from the claims data were used to assign case-mix variables based on the Johns Hopkins ACG software. Specifically, we utilized the "ambulatory diagnostic groups" (ADGs) and developed resource intensity estimates for each ADG to approximate severity (Weiner et al. 1991). These severity-adjusted ADGs were used to develop a composite baseline case-mix measure. We also constructed a contemporaneous "health shock" categorical variable to account for random events that degrade health, including acute major illnesses, injury, and malignancies. This variable is constructed as the union of the occurrence of five ADGs (3, 4, 21, 22, 32) at the employee contract level. Gender and age variables for the employee also were used to complement the case-mix variables in the statistical models of expenditure and utilization.

All variables used in the analysis were measured by cohort and year at the employee contract level. Thus, for example, the utilization variables could reflect physician office visits by a single female employee, or an employee with a spouse and four children. Ideally, we would have liked to have person-level data for all people covered by an employee's contract. However, there was no consistent, unique patient ID to permit this level of analysis. As a result, we used a unique encrypted employee ID as our unit of analysis and controlled for the number of dependents in a family contract; for single and two-person contracts, we assumed the number of lives per employee ID to be one and two, respectively.

RESULTS

Descriptive statistics (for the 2000 calendar year) for the CDHP, HMO, and PPO study population cohorts are presented in Table 1. There was little difference with regard to age, with average employee age ranging between 39.5 and 41.6 years. Proportionately more male employees (61 percent) chose the CDHP than the HMO (57 percent) or the PPO (51 percent). The difference in the number of estimated covered lives per employee health benefit contract was relatively small, with a range of approximately 2.6 lives per contract in the CDHP and HMO cohorts to 2.5 lives per contract for the PPO.

Table 1: Study Population Descriptive Statistics

Demographic Variable of Study Population Cohorts in 2000	*(N = 531) CDHP Sample Mean*	*(N = 1,551) HMO Sample Mean*	*(N = 1,544) PPO Sample Mean*
Employe age (in years)	40.9	39.5	41.6
Percent male	62%	57%	51%
Case-mix index of entire employee's contract	6.493	6.831	7.136
Case-mix index of each person covered under the employee's contract	2.691	2.961	3.221
Income Distribution			
<25th percentile or below of employer	12%	28%	27%
Between 25th and 75th pecentile of employer	52%	53%	47%
>75th percentile of employer	36%	20%	27%
Employee's health insurance premium contribution	$4,228.56	$3,524.84	$4,395.14
Employee's health care flexible spending account contribution	$407.84	$203.52	$236.42
Estimated number of covered lives including the employee	2.58	2.60	2.49
Reported number of dependents excluding employee	1.81	1.82	1.68

The two largest differences between the CDHP population and other cohorts at baseline were income and case mix. The CDHP population had the highest share of employees with incomes above the 75th percentile for the entire firm. On the other end of the distribution, the CDHP had less than half the share of lower-income employees, with only 13 percent of CDHP enrollees with salaries below the 25th percentile. Clearly, the CDHP was relatively attractive to higher-paid employees. Regarding case mix, the CDHP cohort began with the lowest average calculated illness burden, 6.5 per employee contract. This result contrasts with higher case-mix indices in the HMO and PPO populations with values of 6.8 and 7.1, respectively. The case-mix variable reflected the number of significant medical diagnoses that an employee contract might have in a year. The higher this number, the higher the extent of illness burden, including both acute and chronic conditions. This result suggests that the CDHP cohort had initial favorable selection, although the differences are not as substantial as the income differences.

The findings in Table 2 suggest that the CDHP cohort's initial favorable selection did not continue over time. The CDHP case-mix index per employee contract grew from 6.49 in 2000 to 7.45 in 2001 and to 7.94 in 2002. The HMO cohort index started at 6.83 in 2000, rose to 7.47 in 2001, and then fell slightly to 7.29 in 2002. The cohort with the highest case-mix index value

Table 2: Case-Mix Comparisons over Time by Health Plan Cohort

Health Plan Cohorts	*Year 2000 Sample Mean*	*Year 2001 Sample Mean*	*Year 2002 Sample Mean*
CDHP Cohort $N = 531$			
Case-mix index of entire employee's contract	6.49	7.45	7.94
Case-mix index of each person covered under the employee's contract	2.69	3.14	3.38
HMO Cohort $N = 1{,}551$			
Case-mix index of entire employee's contract	6.83	7.47	7.29
Case-mix index of each person covered under the employee's contract	2.96	3.20	3.09
PPO Cohort $N = 1{,}554$			
Case-mix index of entire employee's contract	7.14	7.84	8.16
Case-mix index of each person covered under the employee's contract	3.22	3.48	3.64

in 2002 was the PPO, with case mix increasing from 7.14 in 2000 to 8.16 in 2002. It is important to note that the indices are entirely dependent on the diagnosis codes presented in the claims data, and that higher service utilization tends to be correlated with the presentation of more diagnosis codes.

Table 2 also presents the case-mix indices on a calculated per-person basis for each person covered by the employee's contract. The same patterns apparent in the contract-level case-mix indices are observed at the person level.

Medical care expenditures and utilization for the CDHP enrollees are contrasted with the experience of HMO and PPO enrollees in Tables 3 through 5. The results presented in each of the tables are regression-adjusted means for each cohort by calendar year experience. These means are adjusted by employee-level variables presented in Table 1 including age, gender, contract case mix in 2000, taxable income (in dollars), number of covered lives in the contract, flexible spending account (FSA) election, health shock (represented as a categorical variable), plan choice, calendar year, and the interaction of plan choice and calendar year.

Table 3 shows that all three cohorts exhibited strong increases in medical expenditures over time in both the adjusted and the raw data. Total adjusted contract expenditures in the CDHP cohort were the lowest among the three groups in 2000 ($4,396.22) when the CDHP cohort was enrolled in either the PPO or HMO). In 2002, expenditures for the PPO cohort were the highest

Table 3: Total Expenditure
Regression-Adjusted Means by Plan Cohort and by Year

Health Plan Cohorts	*2000 Mean*	*2001 Mean*	*2002 Mean*
CDHP Cohort $N = 531$			
Total expenditure	$4,396.22	$6,154.36	$8,149.26
Employer expenditure	$4,005.28	$5,903.61	$7,807.39
Employee expenditure	$416.51	$634.38	$792.01
HMO Cohort $N = 1,551$			
Total expenditure	$5,284.53	$6,773.62	$7,197.50
Employer expenditure	$4,895.75	$6,227.81	$6,428.83
Employee expenditure	$394.70	$549.32	$702.49
PPO Cohort $N = 1,554$			
Total expenditure	$5,228.42	$7,050.59	$8,377.78
Employer expenditure	$4,688.28	$6,349.99	$7,330.94
Employee expenditure	$511.84	$657.16	$881.47

Notes:

Regressions adjusted by annual trends, health plan choice, health plan choice interacted with annual trends, age gender, case mix, income, number of covered lives in contract, use of an healthcare flexible spending account. Estimates are based on a two part model.

The unadjusted total expenditure amounts were: CDHP—$3,921 (2000), $5,155 (2001), $7,738 (2002); HMO—$4,745 (2000), $5,244 (2001), $5,654 (2002); PPO—$4,671 (2000), $5,701 (2001), $8,080 (2002).

($8,377.78), followed by the CDHP cohort ($8,149.26), and then the HMO ($7,197.50) group. An examination of the employer's cost for the health plans presents a different order of total expenditures: by 2002 the CDHP was highest at $7,807.39, followed by the PPO at $7,330.94, and the HMO at $6,428.83. This is reflected in the difference in employee expenditures; CDHP enrollees have lower out-of-pocket expenses than enrollees in the other two health plans. It is important to note that these employee expenditures are highly dependent on the plan design of the CDHP. In this firm, more than 80 percent of the CDHP cohort faced an out-of-pocket expenditure gap between their health spending account and complete coverage of only $1,000.

These results were generated from two-part models where the first stage estimated the probability of any expenditure and the second stage estimated expenditure controlling for employee demographics and the results of the first stage. Total expenditures were positively related to case mix, as well as age, number of covered lives, and FSA election. There were strong time-trend effects indicated by calendar year dummy variables. The only significant

Table 4: Hospital, Physician, and Pharmacy Expenditure by Employer and Employee
Regression-Adjusted Means by Plan Cohort and by Year

Health Plan Cohorts	*Year 2000 Mean*	*Year 2001 Mean*	*Year 2002 Mean*
CDHP Cohort $N = 531$			
Hospital expenditure	$1,369.97	$1,999.25	$3,468.53
Physician expenditure	$2,093.70	$2,935.84	$3,510.83
Pharmacy expenditure	$935.29	$1,103.72	$1,341.78
HMO Cohort $N = 1,551$			
Hospital expenditure	$1,842.80	$1,796.37	$1,956.83
Physician expenditure	$2,381.08	$2,959.90	$3,088.22
Pharmacy expenditure	$1,107.64	$1,498.54	$1,640.25
PPO Cohort $N = 1,554$			
Hospital expenditure	$1,779.06	$2,049.76	$2,367.17
Physician expenditure	$2,245.22	$2,834.32	$3,294.47
Pharmacy expenditure	$1,007.95	$1,484.91	$1,789.26

Notes:

Regressions adjusted by annual trends, health plan choice, health plan choice interacted with annual trends, age gender, case mix, income, number of covered lives in contract, use of a health care flexible spending account. Estimates are based on a two-part model.

negative relationship aside from plan choice was whether the contract holder was male.

In Table 4, average total expenditures faced by the employer and employee combined are decomposed into three categories: hospital, physician, and pharmacy expenditures. The most striking result was the substantial increase in hospital expenditures, including both institutional inpatient and outpatient services, for CDHP enrollees. For the CDHP cohort, costs increased from $1,369.97 to $1,999.25 between 2000 and 2001, but then dramatically increased an even larger amount (73 percent) to $3,468.53 in 2002. The HMO and PPO cohorts also saw substantial growth in hospital expenditures, but not to the degree of the CDHP cohort. For physician expenditures, including the costs for office visits, preventive services, specialist consults, and surgical procedures, there also was a substantial increase in all three cohorts, with the highest 2002 expenditure associated with the CDHP cohort ($3,510.83), followed by the PPO ($3,294.47), and then the HMO cohort ($3,088.22). With regard to pharmaceutical expenditures, the CDHP cohort consistently had lower drug costs over all three years compared with the HMO and PPO populations.

Table 5: Utilization: Physician Visits, Hospital Admission Rate, and Prescriptions Filled
Regression-Adjusted Means by Plan Cohort and by Year

Health Plan Cohorts	*2000 Mean*	*2001 Mean*	*2002 Mean*
CDHP Cohort *N*= 531			
Hospital admission rate	0.05	0.10	0.16
Physician visits	5.74	7.49	7.15
Prescriptions filled	18.89	22.23	25.25
HMO Cohort *N*= 1,551			
Hospital admission rate	0.07	0.06	0.09
Physician visits	6.75	7.56	7.29
Prescriptions filled	22.23	22.59	30.89
PPO Cohort *N*= 1,554			
Hospital admission rate	0.07	0.07	0.11
Physician visits	5.78	6.54	6.95
Prescriptions filled	20.63	23.79	24.50

Notes:
Regressions adjusted by annual trends, health plan choice, health plan choice interacted with annual trends, age gender, case mix, income, number of covered lives in contract, use of a health care flexible spending account. Estimates are based on a two-part model.

Table 5 contains a comparison of utilization measures. Corresponding to the hospital expenditure results, the CDHP population experienced dramatic annual increases in hospitalization rates during the study period, while increases in admission rates for the other plans were smaller. All three cohorts experienced significant increases in office visits, particularly between 2000 and 2001. We also found that the nurse line utilization for the CDHP cohort increased dramatically over this same period and was much higher than use of similar services offered by the HMO and PPO. With regard to prescriptions filled, the results mirror the pharmaceutical expenditure results; the CDHP cohort had significantly lower increases in scripts compared to the HMO cohort. Interestingly, by 2002, the CDHP had more scripts filled than the PPO, but the PPO had a higher pharmaceutical expenditure annualized increase (39 percent) compared with the CDHP (22 percent).

DISCUSSION

This study presents early empirical data on expenditures and use of medical care for enrollees in a CDHP versus employees enrolled in other plan options.

There are five key results from this analysis. First, enrollees in CDHP contracts had lower total expenditures than enrollees in PPO contracts, but higher than HMO enrollees after a two-year period, controlling for a variety of enrollee characteristics. However, this result is not consistent across different types of medical expenditures, and there are differences by employer versus employee payment.

Second, we found that enrollees in CDHP contracts consistently had lower out-of-pocket expenditures than enrollees in PPO contracts. This result may be a function of this employer's design of the CDHP plan. The majority of the CDHP population chose an option with health spending account/deductible threshold combinations of $1,000/$1,500, $1500/$2250, $2000/$3000 for single, two-person, and family contracts, respectively. Thus, the out-of-pocket gaps for the three plans were $500, $750, and $1,000. These amounts are relatively low, based on interviews with other employers as part of a more general study of consumer-driven plans. In contrast to the HMO cohort, the CDHP cohort had higher employee expenditures, possibly reflecting lower cost-sharing requirements in the HMO, including low copayments for in-network provider access and prescription drugs.

A third finding relates to significant growth in hospital use by the CDHP cohort. Hospital admissions are not considered an area likely to be affected by the CDHP, other than through a possible reduction in use due to online access to disease management tools. One possible explanation for the increase is that CDHP employees were more price conscious as a consequence of the plan, and therefore were reluctant to seek care until they were very ill and in need of hospital services. However, there is insufficient evidence to determine the causal factors leading to increases in admission rates for the CDHP cohort. Given that preventive services, including physical exams, were covered 100 percent outside of the PCA and there were similar office visit trends in the HMO and PPO cohorts, it is difficult to characterize a lack of access to physician consults and evaluation as the driver for higher admission rates in the CDHP population.

Fourth, we found the CDHP had initial favorable selection, but that it concluded the study period with a significantly higher illness burden. This may indicate a genuine decrease in health status, or simply reflect the more complex diagnosis codes associated with the greater use of hospital and physician services experienced by this cohort. If the latter explanation is found in subsequent work to be valid, the initial favorable selection may actually be a proxy for "pent-up" medical care demand by the CDHP cohort that was not realized until enrollees had an expanded choice of providers. For example,

people who expected to have elective surgery in the future may have selected the CDHP to give them a wider selection of providers for that surgery.

Finally, we find some indication of different CDHP effects between the first year the plan was offered and the second year, with total expenditures accelerating dramatically during this period. Much of this increase is due to increases in admissions and their related expenditures. Given the quasi-experimental differences-in-differences study design employed, it is possible that this increase is a genuine CDHP effect. What remains speculative is whether this is an indication of a moral hazard problem. One scenario where moral hazard could occur is if the CDHP employees have enough money in their health spending account during the second year (2002) to make the deductible gap small enough to encourage utilization, particularly because, after the deductible was paid, there was no coinsurance under this employer's benefit design to act as a disincentive to service use. In the case of hospital services, we also may be seeing pricing differences among providers, because the change in admission rate year two to year three (60 percent) is less than the related hospital expenditure increase (73 percent). A contributing factor may be that the CDHP used a different firm to price provider services in 2002 versus 2001.

Although this study is too limited, with only a CDHP two-year data window, to fully ascertain if moral hazard may be influencing utilization, we know the proportion of the CDHP population that had money left over in a health spending account in 2001 (40 percent) and 2002 (28 percent). These data suggest that the benefit design did not discourage the majority of the population from consuming health care resources to the extent that expense accounts were exhausted. In 2002, 57 percent of the CDHP population—the majority—exceeded the deductible threshold and consumed medical care, at the margin, without any out-of-pocket cost above the deductible. The benefit design of the employer in this study suggests that a substantial incentive was provided for consumption. As suggested earlier, if moral hazard is present it can be tempered by changes in the spending account, the deductible gap, or the coinsurance level once the deductible has been met.

Our study has several limitations, some of which we have already noted. First, it examines the experience of only one employer. The effects of a CDHP may depend not only on the design of the CDHP itself, but also on the types of other plans that the employer offers. However, the non-CDHP health plans (an HMO and PPO) offered by this employer are relatively common in their design; therefore, we would expect the experience of these options, after introduction of a CDHP, to be representative. The advantage of focusing on

one employer is that it allows a quasi-experimental design that would be difficult to replicate in a multi-employer setting. The intention of this work is to provide early evidence, which can be expanded by analysis of other early-adopting employers. It is also important to reaffirm that the CDHP benefit design is strongly influenced by employer preferences and comparisons across employers would need to explicitly account for variation in benefit components. With regard to this study, the employer evaluated could be characterized as providing a more generous health benefit design than most.

A second limitation is that our results may be influenced by regression to the mean, where unusually low spending in the year prior to offering the CDHP (2000) was associated with joining the CDHP in 2001. If spending returned to more normal levels in 2001 and 2002, some of the differences attributable to the CDHP would be due to expenditure and utilization patterns returning to their mean. To address this possibility, we performed a sensitivity analysis. The results suggest that regression to the mean is not a major problem that would adversely affect our 2002 results as much as it might affect our 2001 results. A summary of our sensitivity analysis is provided in the Appendix.

A third limitation is that the data systems of the three health plans were not completely consistent. This required certain assumptions to be made based on discussions with health plan data staff regarding data capture and record design. To mitigate this problem, we chose to construct relatively simple utilization and cost measures that could be verified easily with the experience of an employer or health plan. Future research will need to look for differences in disease-specific utilization patterns. We believe that the data from this employer are sufficiently detailed to complete these more specific analyses, but to enable benchmarking to future employers with uncertain data system structures we chose measures that would allow more valid comparisons.

As part of a larger research effort, we plan to extend our results through comparison with five other employers. As a study design, this project is entirely dependent upon the commitment and resources of the participating employers and their contracting third party administrators. In several cases, we have found HIPAA to emerge as a significant disincentive for employer collaboration. The employers participating in the larger study recognize the potential value of benchmarking their experience as early adopters of CDHPs.

In summary, this early empirical study of medical care expenditures and utilization in a CDHP suggests that the new health plan is a viable alternative to existing health plan designs. We found that CDHP enrollees had lower total expenditures than PPO enrollees, but higher expenditures than enrollees in an

HMO after two years. However, we found that hospital admissions and expenditures increased relatively dramatically for the CDHP study cohort. Relatively high utilization of resource-intensive hospital admissions after an initially favorable selection suggests that much more detailed analysis is needed to disentangle the experience of different types of enrollees in the CDHP. Also, more analysis clearly is needed to ascertain long-term trends and effects.

APPENDIX

AN ANALYSIS OF REGRESSION TO THE MEAN

Regression to the mean was considered as a possible concern affecting our expenditure results. To ascertain the extent of the problem we completed a two-step process. First, we wanted to test for the *potential* of regression to the mean to be a problem. This would be the case if unusually low spending in the year prior to offering the CDHP—2000—was associated with joining the CDHP in 2001. To examine this possibility, we estimated an equation for total expenditures in 2000 and calculated the residuals from that regression. Next, we estimated a multinomial logistic regression for the probability of joining the CDHP in 2001 (as well as in 2002, given the way our cohort was structured) or staying in the HMO or PPO from 2000 through 2002. This model included the following predictors: case mix in 2000, age, gender, income, and number of dependents, as well as the predicted and residual estimates of 2000 expenditures.

The results of this analysis, presented in Table A1, provide a conservative test of the influence of prior expenditure on joining the CDHP because some of the factors that we put into the residual expenditure may be known to the employee and thus not "unusual" to him or her. Examining the impact of the residuals on plan choice, we find a significant negative relationship for CDHP and PPO choice relative to the HMO, indicating that regression to the mean may affect our results.

In the second step, we developed a set of total expenditure regressions to estimate the extent of regression to the mean, using the following specification:

Let

$$E_t = y + u_t \tag{A1}$$

and

$$u_t = \rho u_{t-1} + v_t \tag{A2}$$

Table A1: Regression to the Mean Identification
Multinomial Choice Regression to Identify if Prior Expenditure Experience in 2000 Influenced Subsequent 2001 Plan Choice

	Coefficient	*T-statistic*
Plan Intercepts (HMO is reference)		
PPO	− 1.0457	− 3.832*
CDHP	− 1.4460	− 3.774*
Plan–Employee Age Interactions (HMO is reference)		
PPO	0.0188	4.817*
CHHP	0.0107	1.888
Plan–Gender Interactions (HMO and male is reference)		
PPO	− 0.3534	− 4.63*
CDHP	0.0163	0.151
Plan–Income Interactions (HMO is reference)		
PPO	0.0000	4.996*
CDHP	0.0000	6.873*
Plan–Dependents on Contract Interactions (HMO and single person contracts are reference)		
PPO	− 0.1539	− 1.753
CDHP	0.0391	0.307
Plan–Predicted Estimated Interactions		
PPO	0.0392	1.11
CDHP	− 0.0784	− 1.575
Plan–Residual Estimated Interactions		
PPO	− 0.0904	− 2.154*
CDHP	− 0.1925	− 3.306*

Notes:

Coefficients significant at the $p < .05$ level.

Predicted and residual estimated generated from a expenditure regression where total expenditures in 2000 were regressed on 2000 case mix, gender, age and contract size.

Where E = expenditure, y = mean, and u and v = errors. Time is denoted by subscript t. Lagged values of E are multiplied by the constant ρ to create:

$$\rho E_{t-1} = \rho y + \rho u_{t-1} \tag{A3}$$

Substitute (A2) and (A3) into (A1) to get

$$E_t = (1 - \rho)y + \rho E_{t-1} + v_t \tag{A4}$$

Therefore, expenditure at time t is a weighted average of mean and lagged expenditure, where the weight ρ depends on the autocorrelation of the errors in the expenditure model over time:

$$\text{If } E_{t-1} < y, \text{ expenditures regress up to the mean}$$

If $E_{t-1} > y$, expenditures regress down to the mean.

If y is not a constant then:

$$E_t = y_t - \rho y_{t-1} + \rho E_{t-1} + v_t \quad \text{(A5)}$$

Using equation (A5), we can directly estimate the autocorrelation parameter ρ by regressing current expenditure on lagged expenditure and variables that influence mean expenditure. This procedure generates the following estimates:

	2000–2001	*2001–2002*
No plan choice	0.192	0.129
Plan choice	0.184	0.132

"No plan choice refers" to an expenditure model that excludes plan choice as a determinant of mean expenditures, because plan choice is clearly endogenous. These estimates can be viewed as a reduced-form model, where expenditure depends only on exogenous or predetermined variables (e.g., employee age). However, for comparison we also estimated ρ using an expenditure model that includes plan choice. In both approaches, we found estimates of ρ less than 0.2, and in 2001–2002 the estimates were closer to 0.1.

The correlation between u_t and u_{t-s} is ρ^s (Welch 1985). Using the estimates above, the correlation over two years ranges from 0.0166 to 0.0369, assuming that the autoregressive process follows a simple first-order pattern. These results lead us to believe that regression to the mean could be an issue if we had only one year of data after the CDHP was offered. However, the effect of unusually high or low prior-year expenditures disappears fairly quickly from our data, and most of the effect is gone by 2002. Consequently, estimates of the "CDHP effect" based on comparing expenditures in the CDHP and other plans in 2001 versus 2002 will be more reliable than the 2000–2001 comparison.

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Commentary—Looking at the Effects of Consumer-Centric Health Plans on Expenditures and Utilization

John Bertko

Consumer-centric health plans are now emerging as one of the possible solutions to the inappropriate use of health services and the high cost of health insurance in the United States. Labeled variously as "consumer-directed health plans," "choice plans," or plans with reimbursement or savings accounts, these health benefit options are currently a small but rapidly growing health insurance segment. Large companies like Aetna, Humana, and the Blues have insured offerings, while start-up companies like Definity and Lumenos offer self-insured options to large employers.

Defining "Consumer-Centric" Health Plans

While there may be many "flavors" of consumer health plans, one might define a "consumer-centric" health plan as having the following necessary components:

- An optional health account or savings account of some defined value (e.g., a health reimbursement account of $1,000 per year per covered individual).
- A "gap" in coverage that is the responsibility of the insured individual, generally anywhere from $1,500 to $3,000 per year.
- Catastrophic coverage at a high level of insurance (employer payments of 90 percent or 100 percent) after sufficient charges are incurred to exceed the "gap."
- Decision-support tools and related price and quality information available (generally via the Internet) to help the insured individual choose between providers, alternative therapies, or places of service.
- A high level of communication from both the employer sponsor and the health carrier to enable the insured individual to understand his or her choices.

- An employer philosophy regarding company contributions that gives employees the ability to choose between lower cost-sharing options (with higher payroll deductions) or higher cost-sharing options (with lower payroll deductions).

While this definition is somewhat more restrictive, a consumer-centric option is more likely to be effective if it has all of these characteristics. For Humana, the consumer-centric solution is comprised of a total replacement product that offers traditional plans—health maintenance organizations (HMOs) and preferred provider organizations (PPOs)—and the new options with the consumer-centric characteristics. This product offers individuals the decision-support tools needed to make informed choices when balancing payroll deductions and point-of-service cost sharing and has adjustment for the projected health-risk characteristics of individuals enrolling in the various options.

When Will Robust Data Become Available?

The first large employers began to offer consumer-centric plans in 2001. Each year since, the absolute number of employees covered has remained a small percentage of the total U.S. insured population under age 65 (perhaps reaching between 1 million and 1.5 million as of January 1, 2004), but the growth rate has been geometric, doubling or more each year. Consultant and industry projections indicate that this level of growth will continue into 2005.

The definition of robust actuarial data and the time period involved changes depending on the question being asked. For example, in determining employee acceptance of the new consumer-centric options, an analyst needs the experience of perhaps 50,000 to 100,000 individuals given those choices, but the information is known almost immediately upon completion of the open enrollment period. In contrast, understanding utilization at the service-specific level (e.g., hospital admission utilization), one needs at least a full 12 months of data, plus 3 months of "run-out" of claims on at least 100,000 members. These data are generally not available until 15 months (or more) after open enrollment.

In the article, "Evaluation of the Effect of a Consumer-Driven Health Plan on Medical Care Expenditures and Utilization" (Parente, Feldman, and

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Christianson 2004, this issue), the authors review approximately 3,600 contracts (assumed to be about 7,200 members at the common rate of two members per contract) over a three-year period. This amount of experience is generally thought to be "actuarially credible" for overall premium trends (i.e., how much cost per contract increased one year over the prior year), but should be viewed cautiously as an indication of changes in utilization. For example, a single long hospital admission for a high-cost event, such as a 30-day admission for a serious auto accident, could distort any year-to-year comparisons for a group of this size.

Data are now emerging and being reported by insurers and start-up companies on the larger blocks of business. Reports indicate that Definity had more than 175,000 covered members during 2003 and Humana enrolled approximately 150,000 members during the same time period. However, important information on expenditure trends and the underlying utilization changes is just now emerging. Even with these blocks of data, analysts should treat the results cautiously since the "early adopters" of consumer-centric solutions may have different characteristics or approaches than the rest of the employer community.

Discussion of Results of the Study

The authors of the "Evaluation" study have made an important contribution to the initial understanding of the effects of consumer-centric health plans. By evaluating a large single-employer over a three-year period, including the pre- and postimplementation phase, an analyst can find good indications of the likely effects that should be measured on larger populations.

Five results of this study can be compared with Humana's early experience with consumer-centric products. In general, these results are consistent with the outcomes observed for the Humana employees' pilot and with the block of 150,000 insured Humana customers.

First, Humana's SmartSuite product (a total replacement package that includes both a consumer-centric CoverageFirst option and four other traditional HMO and PPO options) lowered cost trends from the mid-teens for traditional products (HMOs or PPOs offered in the same markets) to the 5 percent range in each of the first two years. Interestingly, this is a counterintuitive result, since most "choice" offerings (multiple products offered as a part of a flexible benefit employee option at time of enrollment) generally result in slightly (3 percent to 5 percent) higher overall costs.

Second, this study looks only at employee cost sharing for deductibles, coinsurance, and other copayments at the time of service. Equally important to employee choice and family financial status is the payroll deduction cost of an option. In Humana's pilots, employees appear to have made intelligent choices, with healthier employees choosing higher cost-sharing options in exchange for much lower payroll deductions. It also appears that lower-paid employees chose to minimize their household financial risk by "pre-paying" through higher payroll deductions to obtain low cost-sharing plans (e.g., PPOs with low deductibles and copayments). Overall, in Humana's pilots, the combined effect of changes in cost sharing and reduced payroll deduction was a *net* reduction in employee cost in the first year. To see the total effect of consumer-centric solutions, analysis should include both cost sharing for services and payroll deductions.

Third, this study shows a variety of changes in utilization over the three-year period. The first observation is that utilization on a population this size (3,600 contracts) for relatively low-frequency services such as hospital admissions is highly variable from year-to-year. Hence, the uptick in utilization in year three of the study might be an actual increase in utilization from pent-up demand, a change due to lack of familiarity with a new health plan, or simply the chance that only one or two catastrophic injuries created a unusual amount of usage. This is especially true when looking solely at the CDHP sample ($N = 531$ contracts).

In general, the Humana pilot experience with about 5,000 contracts (just less than 10,000 covered beneficiaries) showed a decrease in hospital admissions, no increase in hospital outpatient services, and an increase in physician office visits. In contrast to the measurement of only the CDHP option in the study, these results include utilization in all options (600 beneficiaries in the CoverageFirst product, about 4,000 in the HMO, and the remaining 5,400 in one of several PPO options) (see Table 1). For Humana, a second year is not directly comparable since the pilot option was significantly changed to an advanced product design. Still, results of this group showed an equally low mid-single digits trend in the second year after implementation. When measuring only the CoverageFirst option, findings indicated a significant year-one decline in various utilization categories, but the low number of members ($N = 600$) was too small to be credible.

Fourth, the study found favorable selection in year one in the CDHP option, as measured using the Johns Hopkins ACG software, which uses ambulatory diagnostic groups along with gender and age variables. Since this was measured at the employee contract level, changes in family status (i.e.,

Table 1: SmartSuite—Evidence of Behavioral Change

Type of Service	*Utilization/1,000 Change*
Inpatient	– 14%
Outpatient	0%
Office Visits—Total	13%
Rx	5%

adding or deleting dependents) can have an impact on health-risk measures. This measure found higher risk levels in the HMO and PPO options, but only about 6 percent to 10 percent higher. Since ACGs are more focused on ambulatory encounters and diagnoses than some other measures, these risk measurements could potentially understate the actual risk differences in the population.

In Humana's pilot, favorable risk selection in the CoverageFirst enrollees was also found, but on a much greater level. Using the simplest measure, prior use, analysis revealed that CoverageFirst enrollees in the year preceding implementation had average per member per month (PMPM) claims that were approximately 50 percent of the average PMPM cost for the whole 10,000-member group. Hence, favorable selection is a very significant factor. On the other hand, PPO members had higher than average claims in the prior period.

Age appears to be an insufficient predictor of health status difference. Similar to this study, Humana found that there was little difference (less than one year) in the average age of members enrolled in the CoverageFirst option versus traditional PPO and HMO options.

Income appears to be an important factor. The average salary of Humana members enrolled in the CoverageFirst option was significantly higher than the average salary of the overall workforce. This result mirrors that of the study, which showed a higher concentration of CDHP members in the 75th or higher percentile. It is believed that Humana's workforce made "good choices" where lower-income employees minimized the insurance risk of high deductibles in exchange for paying higher payroll deductions. A future analysis of this study's employer might want to include this component.

Fifth, it appears that the study restricted the members of the employer group analyzed to only those in the group for all three years by removing any new entrants or terminations. While this clearly provides the best

measurement of a stable cohort of individuals, it misses the "real world" effect on dynamic employee populations. Most employers have turnover in the 5 percent to 10 percent range annually, with certain employers having 30 percent to 50 percent turnover. In managing health care benefit costs, it is the systemwide payroll and benefit funding cost that counts, not just the cost of the stable cohort of longer term employees.

For example, in measuring the Humana pilot, analysis found that new hires were much more likely to enroll in the new CoverageFirst option than were longer-term employees at open enrollment. One might hypothesize that newly hired enrollees were more likely to scrutinize the new benefits offerings and make an informed decision while longer-term employees were more likely to be satisfied with the status quo and thus, default into the same plan as the prior year. This aspect of employee decision making warrants more study.

Limitations of the Study

The study's authors appropriately describe the limitations of their work. Several additional comments may be relevant. The authors note that a study of a single employer should be viewed cautiously. In addition to earlier comments about the need for more members to attain actuarially credible results, there may be other significant factors related to geography (where the employees are located), original plan design, employees' preferences (e.g., the greater preference of California residents to enroll in HMOs), and industry (e.g., whether manufacturing employees have different preferences than service workers).

"Regression to the mean" in calculation of differences in expenditures is another important issue. Individuals with either very high costs or very low costs will frequently have costs closer to the average ("regression to the mean") in the years following the high- or low-cost year. However, Humana's analysis has seen some evidence of much lower regression to the mean in the healthiest quintile of members. Other quintiles generally exhibit both directions of "regression to the mean" but the healthiest quintile may remain in "healthy" status for a longer period.

The authors remark that an issue is whether data are consistent across different insurers for this employer. While this issue deserves some consideration, the relatively small sample size, particularly of the CDHP enrollment, probably is a much more important factor.

Table 2: SmartSuite—Allowed Charges before (2000) and after (2001) SmartSuite for Humana Louisville Associates

	Average Out-of-Pocket		
Eligible Charge Range	*2000*	*2001*	*Out-of-Pocket Change*
$1–$999	$60	$75	$15
$1,000–$1,999	$215	$263	$48
$2,000–$4,999	$397	$532	$135
$5,000–$9,999	$707	$1,036	$329
$10,000+	$2,313	$2,210	$(103)
Total	$322	$411	$89

DISTRIBUTIONAL EFFECTS

One key component was apparently not included in this study: the distributional effect of the new consumer-centric plans on individuals in different illness/spending categories. An important question is how low-, middle-, and high-expenditure individuals are affected. In Humana's pilot, analysis was completed on the cost-sharing changes (i.e., from deductibles, and so forth) from the pre-implementation period to the postimplementation year. As somewhat expected, analysis found that cost sharing increased modestly for low- and middle-expenditure categories, with the highest increase being approximately $300 per year in greater cost sharing. However, a surprising result was that high expenditure individuals apparently made excellent choices by opting for lower cost-sharing products, with a resulting *decrease* in their cost sharing from year-to-year (see Table 2).

CONCLUSIONS

Based on both the similarities and differences in various outcome measures and the small sample size of observed populations, one should conclude that the "jury is still out" on the ultimate effects of consumer-centric plans. Early results, however, give indications that real, systemwide cost savings are possible with relatively little adverse effect on the average beneficiary. Encouragement should be given to the academic and policy community to continue to study these early consumer-centric models directly (using "raw data") as well as to draw inferences from the "gray literature" available from

various sources, such as employer disclosures, insurer studies, and data accumulated by employee benefits consultants.

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Concluding Commentary

Consumer-Directed Health Care: Will It Improve Health System Performance?

Karen Davis

The excellent set of papers contained in this issue provides important insight into early experience with consumer-directed health care plans. While more experience and research are required to reach definitive conclusions, the evidence to date raises major cautions about relying on a consumer-directed health care movement to address fundamental problems in the health care system. Longer-term solutions aimed directly at the root causes of higher costs are needed to improve health system performance and to achieve better quality, safety, and efficiency of care provision.

The Theory Underlying Consumer-Directed Health Care

The consumer-directed health care strategy is predicated on the notion that health care services are overutilized, and that giving financial incentives to patients will reduce use of services of marginal or no value. It also will give patients an incentive to seek out lower-cost providers of care. While there is certainly evidence of overutilization of some services, underutilization appears to be a far greater problem (McGlynn et al. 2003). Even clear instances of overutilization are often the result of provider decisions and may not be responsive to consumer incentives. About one-fifth of sicker patients report receiving duplicate tests from different physicians, and medical records and tests not being readily available when needed (Blendon et al. 2003).

While there are different versions of "consumer-driven health care," most interest has centered on combining a high-deductible health insurance plan (e.g., $1,500) with a health reimbursement account (HRA) to cover part of the out-of-pocket cost of health care expenses (e.g., $500). The unused balance in the HRA can be carried over into future years, but employees forfeit the balance if they leave the employer. Typically, consumer-driven health care plans are an additional option for employees; a few employers, however, use it as a "replacement product" and offer only the high-deductible plan coupled with an HRA. Other forms of consumer-directed health plans

include "tiered point of care" with variable cost sharing for hospital or physician services based on the cost or cost and quality of provider selected, and "tiered premium" strategies that let consumers pick their own package of benefits and networks of providers, with varying employee premiums based on comprehensiveness of benefits and costliness or cost and quality of providers (Rosenthal 2004; Gabel, Lo Sasso, and Rice 2002).

There is very little debate that if patients pay more health care bills directly out-of-pocket that they will consume less care. It is deeply rooted in economic theory and empirical studies finding that the quantity of health care services demanded varies inversely with price. A quantity of a service that is relatively "price elastic" (e.g., discretionary care such as plastic surgery) will vary markedly with price while the quantity of a service that is relatively "price inelastic" (e.g., trauma care for accident victims) will vary little with price. Insurance has the effect of reducing the "net price" paid by the consumer, resulting in higher utilization than would otherwise be the case. Increases in utilization as a result of insurance coverage are greater for those services that are "price elastic." Or conversely, increasing patient cost sharing can be expected to increase the "net price," reduce utilization especially of discretionary services, and lower total health spending, as well as the cost of insurance (both because a lower percent of the bill is covered and because utilization declines).

The major empirical test of the effect of cost sharing was the RAND Health Insurance Experiment (HIE). The HIE in 1973 randomly assigned 7,706 individuals in six geographic markets to health insurance plans with varying cost sharing: free care for all services, and plans with differing coinsurance (25 percent, 50 percent, 95 percent), all subject to a total ceiling on out-of-pocket costs of $1,000 ($4,150 in 2003 dollars) or a ceiling based on income if lower (5, 10, or 15 percent of income). Its primary conclusion confirmed the economic theory that when consumers face higher cost sharing they will consume fewer services (Newhouse 1981).

The RAND experiment excluded persons aged 62 and older and those who were permanently and totally disabled at the time of the demonstration. Its results, therefore, are particularly fitting for employer-based coverage. Further, to avoid making anyone participating in the plan worse off, everyone given a cost-sharing plan was also given a lump sum payment of the maximum out-of-pocket costs ($1,000) less the maximum out-of-pocket under their

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current coverage. In some ways, therefore, it was an early forerunner of consumer-directed health plans that combine a high deductible with a health reimbursement account—although in the RAND HIE consumers could use the lump sum payment for any purpose, not just health care.

The HIE found that use of physician services was more sensitive to cost sharing than use of hospital services. Total spending was 60 percent higher for patients in "free care" plans than for patients with cost sharing. Patients with cost sharing had one-third fewer visits to a physician and were hospitalized about one-third less often. While the RAND results were not particularly surprising to economists, they disproved the argument that cost sharing, by reducing preventive and early primary care, would lead to higher hospitalization and higher costs in the long term. These results, however, are qualified in that the sample excluded aged and disabled individuals, and set an income-related ceiling on out-of-pocket payments such as 5, 10, or 15 percent. Higher out-of-pocket costs or inclusion of sicker patients may have led to different effects.

What is perhaps less well known about the HIE is its effects on health status and use of clinically appropriate or inappropriate services. Is it only "discretionary" or "nonessential" health utilization that is affected by cost sharing? Sometimes the HIE has been characterized as finding no adverse effect on health status, but a closer reading of the results shows that there were adverse effects on health for lower-income and high-risk individuals (Rassell 1995). For example, for low-income persons with high blood pressure, free care brought better control of blood pressure (Brook et al. 1983). Free care reduced the risk of early death among those at high risk. Coverage of services such as vision care also made a difference; free care individuals with poor vision were more likely to have vision correction.

Lohr (1986) found that cost sharing in the HIE reduced the likelihood of receiving effective medical care. These effects were particularly marked for low-income children and adults. For example, the probability that low-income children in cost-sharing plans received effective medical services for acute conditions was 56 percent of that of low-income children in plans with no cost sharing; the rate for low-income adults was 59 percent. Even for higher-income children and adults, those with cost sharing had a lower probability of receiving effective services than those in "free care" plans (85 percent for higher-income children and 71 percent for higher-income adults compared to higher-income children and adults with no cost sharing). Lurie et al. (1987) found that cost sharing in the HIE reduced use of preventive services. For example, among women 45 to 65 years of age, cost sharing reduced the use of

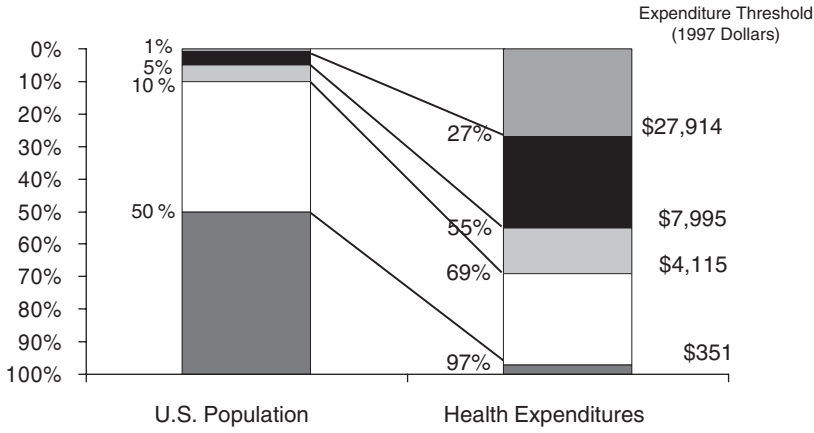
Pap smears from 65 percent to 52 percent over a three-year period. Siu et al. (1986) also found that cost sharing reduced appropriate hospital admissions by 22 percent, and reduced inappropriate hospital admissions by 27 percent—using blinded clinician ratings of hospital admission records to determine appropriateness. Thus, cost sharing was not a sensitive technique for discriminating between appropriate and inappropriate use of hospital services.

Over the years a number of studies have confirmed the RAND findings. Lurie et al. (1984) found that low-income individuals suffered adverse health effects when they lost Medi-Cal insurance coverage. Tamblyn et al. (2001) found that prescription drug cost sharing in Canada led to both a reduction in use of essential drugs (15 percent for elderly and 22 percent for low-income individuals) and an increase in adverse events (117 percent increase for elderly and 97 percent for low-income). Moving to three tiers and increased cost sharing for prescription drugs by one employer in the United States led to failure to fill needed prescriptions such as ACE inhibitors (16 percent discontinued compared to 6 percent in control group) and statins (21 percent discontinued compared to 11 percent in control group) (Huskamp et al. 2003). The Medical Outcomes Study followed 3,589 chronically ill patients for four years and concluded that cost sharing reduced the use of care for both minor and serious symptoms, although no differences in self-reported health status were observed (Wong et al. 2001).

These studies suggest the importance of looking beyond whether consumer-directed health care leads to a reduction in utilization or total spending on health care services—to examining whether the reduction in utilization is appropriate or inappropriate and whether there are adverse health consequences. It should not be surprising based on the empirical evidence over the past three decades as well as more recent studies that increased cost sharing will lead to reduced use, lower total health spending, and slower increases in insurance premiums or expenses covered by insurance. What matters is whether it discourages patients from getting effective or appropriate services, or simply reduces use of services that are inappropriate or overused, but have no effect on health outcomes.

There are even greater concerns for the effect of financial incentives on lower-income populations and those with serious illnesses. The RAND HIE set lower ceilings for lower-income individuals, for example, plans limited cost sharing to 5, 10, or 15 percent of income. Most employer plans do not include reduced cost sharing for lower-wage workers. Recent studies of cost sharing underscore this concern. Studies of prescription drug utilization that imposed

Figure 1: Health Care Costs Concentrated in Sick Few
Distribution of Health Expenditures for the U. S. Population, by Magnitude of Expenditure, 1997



Source: Monheit 2003.

copayments or set limits on covered drugs by low-income patients indicate quite high sensitivity that can lead to reduced use of essential medicines and increased use of hospital and emergency department care, and increased institutionalization in nursing homes (Soumerai et al. 1994, 1987, 1991). Similarly Stuart and Zacker (1999) found that in states that imposed copayments on Medicaid beneficiaries, the likelihood of filling prescriptions was reduced, and the burden fell disproportionately on those in poor health.

In assessing the value of consumer-directed health plans it is particularly important to bear in mind that 10 percent of individuals account for 69 percent of health care costs (see Figure 1) (Monheit 2003). Furthermore, high cost tends to persist over time, subjecting the same individuals to continuing high costs. Such individuals would quickly exhaust a health reimbursement account and be subjected to sustained, high out-of-pocket costs. At the other end of the spectrum, Monheit finds that 50 percent of individuals account for only three percent of health care outlays, all with expenditures under $350 in 1997. Giving such individuals a $500 or $1,000 health reimbursement account will increase costs to employers—since such individuals would not have used that level of services. This could lead employers to reduce the health reimbursement account amount or eliminate it completely over time.

Early Experience with Consumer-Directed Health Care

The papers in this issue lend preliminary support to four main conclusions about consumer-directed health care:

- Enrollment is relatively limited when offered as an option.
- Healthier and higher-income individuals are more likely to enroll.
- Enrollees tend to reduce utilization and health care expenses, although evidence is skimpiest on this point.
- Most enrollees are relatively satisfied with the choice and reenrollment rates are high.

Enrollment in Consumer-Directed Health Plans (CDHP)

Rosenthal (2004) estimates that consumer-directed health plans are still in their infancy, and constitute a relatively small part of the employer health insurance market. Only about 270,000 individuals are in an HRA, out of over 160 million people covered by employer plans. Point-of-care tiered plans enrolled an estimated 1.7 million beneficiaries, and 500,000 people were enrolled in premium-tiered plans in 2003.

Enrollment in firms offering HRAs as a choice is also relatively low—usually less than 10 percent of those offered a high-deductible CDHP product along with other insurance plans enroll. Tollen, Ross, and Poor (2004) found that a total of six percent of Humana employees enrolled in two consumer-directed health plan options; other employees picked the HMO or one of the two PPO options. In their four employer case studies Lo Sasso et al. (2004) found that enrollment ranged from 4 percent to 25 percent of employees, with enrollment typically increasing in the second year offered.

Favorable Risk Selection by Consumer-Directed Health Plans

The primary concern is that CDHP will primarily attract healthier and higher-income individuals, leaving sicker and lower-wage employees in higher-cost

alternatives (McNeill 2004). Studies tend to measure health status either by demographics—such as age, gender, or family size—or by utilization of services prior to enrollment. Tollen, Ross, and Poor (2004) find no evidence of favorable risk selection based on demographic data, but better measures of risk based on prior use and health expenditures indicate risk segmentation took place. For each of five health care services, prior year usage was 60 percent of the average for all enrollees. Tollen, Ross, and Poor also found that those selecting the CDHP options had slightly higher salaries.

These findings were confirmed by Lo Sasso and colleagues' (2004) case studies of four employers. In one case, employees with higher salaries were more likely to enroll in the Definity CDHP product (6.4 percent versus 3.7 percent). In the case of another employer, prior-year enrollment claims expenses for those who enrolled in the CDHP product were 50 percent of the overall level for all employees.

Fowles and colleagues' (2004) survey of Humana employees found that 7 percent of employees selected one of the two CDHP options. They were less likely to be African American, less likely to have a chronic health problem, and more likely to have had no recent physician visits.

Parente, Feldman, and Christianson (2004b) also found that higher-income employees were more likely to enroll in a CDHP option with the CDHP having less than half their share of lower-income employees. Initially the CDHP had the lowest average calculated illness burden case-mix index, but their favorable selection did not continue over time. Hospitalization rates of the CDHP rose markedly by the third year, as did the overall case-mix index. These results were confounded, however, because a major medical center only participated in the CDHP plan, and was an "out-of-network" provider in the HMO and PPO options; the authors suggest that those individuals desiring care at the medical center may have opted for CDHP coverage to have access to the medical center.

Christianson, Parente, and Feldman (2004) also found that University of Minnesota faculty, academic professionals, and administrators were more likely to select the CDHP than other employees; those covered by a civil service bargaining unit were less likely to enroll in the CDHP. Parente, Feldman, and Christianson (2004a) confirmed that higher income employees at the University of Minnesota were more likely to choose the CDHP, but they found no differences by chronic illness of the employee or family members on choice of plan. Employees with a chronic health condition themselves or in their family were more price-sensitive, and more likely to choose plans with lower out-of-pocket premiums.

Effect on Utilization of Services

Tollen, Ross, and Poor (2004) found that more than 85 percent of CDHC enrollees spent less than $1,000 on health care, compared with two-thirds of enrollees in the HMO and PPO options. Most of this difference, however, they attributed to better health status, rather than price sensitivity. Humana did not permit employees to carry over their HRA balance, or to apply the allowance toward noncovered services. It is not clear that as an employer that Humana "saved" money, given its combined outlays for the insurance product and the HRA allowance.

Lo Sasso et al. (2004) similarly did not have evidence on change in utilization as a result of enrollment. Although they also found that less than half of enrollees used their HRA allowance of $1,000, and expenditures were less than half that of PPO enrollees, they suspected that this was attributable to the favorable risk selection rather than the effect of the financial incentives.

Parente, Feldman, and Christianson (2004b) analyzed the CDHP experience of one large employer over a three-year period. Initially the CDHP had lower spending, lower prescription drug use, and fewer physician visits, which may have been related to "nurse line coaching services" or comparative information on pharmaceutical prices. However, hospital admissions for CDHP enrollees doubled by the third year from when first introduced, eliminating any cost advantage for the employer by the third year. While the jump in hospitalization might have been caused by "underuse" of physician services to control conditions at an early stage, it may also be an anomaly based on the fact that a major medical center only participated in the CDHP, and was only available to HMO and PPO enrollees with substantial out-of-pocket, out-of-network cost sharing.

Satisfaction with CDHP

Reenrollment in CDHP products is relatively high, usually on the order of 90 percent, and a similarly high proportion of enrollees report satisfaction (Lo Sasso et al. 2004). This suggests that those who choose such plans because they believe they are a "better deal" for them continue to do so. It is interesting, however, that while voting with their feet to continue in the plan only a relatively small percentage—30 percent—would unqualifiedly recommend them to others (Christianson, Parente, and Feldman 2004). This may suggest that they perceive their own circumstances to be relatively unique, and may

not make the plan the best choice for others. Interestingly, however, some walk away from the plan after one year, even though by doing so they lose balances that could have been carried forward.

Christianson et al. (2004) found that University of Minnesota employees enrolled in the CDHP were significantly less likely to rate their plan well, but the differences were small (CAHPS score of 7.46 versus 7.55). Forty-six percent of CDHP enrollees reported they had a particularly positive experience with the plan, while 24 percent said they had a particularly negative experience. However, only 8 percent switched from the CDHP to another plan at the end of the contract year. Thirty percent said they would definitely recommend the plan, while another 57 percent said they would recommend it depending on the situation.

There is also some indication in the studies that few people find the CDHP easy to understand or the Internet-based tools easy to use. Those professionals who are more apt to use the Internet in their professional or personal life, or who routinely make financial and risk decisions are more attracted to the plans.

IMPLICATIONS

These studies are too preliminary and the consumer-directed health plan products too new to reach firm conclusions about their long-term value. However, concerns are raised by the initial experience. It seems clear that they are relatively more attractive to higher-income individuals. When health status is measured by prior utilization—rather than demographic characteristics such as age or presence of chronic conditions—CDHP plans appear to experience favorable risk selection. The downside of the growth of CDHP is likely to be increasing market segmentation, with lower-income and sicker individuals served by managed care plans and higher-income, healthier individuals enrolled in CDHP products. Without risk adjustment, sicker and lower-income individuals will pay higher premiums, and HMOs may eventually face a "death spiral" as unfavorable risk selection worsens.

The studies provide almost no evidence about the effect on use of appropriate or inappropriate care. Rosenthal and Milstein (2004) report that few CDHP plans advise patients who are underusing services. Some plans do exclude preventive services from the deductible, but financial incentives to avoid seeking care even in the face of serious symptoms could contribute to underutilization of essential services—as other cost-sharing studies have

found. Nor is anything known about the financial burden on lower-wage employees with greater out-of-pocket costs not covered by health reimbursement accounts.

The studies do suggest that CDHP products have high information requirements in order for enrollees to understand the plans and use them effectively. Quality and even cost information are often not available (Rosenthal and Milstein 2004).

Is There a Better Alternative?

Employers offer health insurance to their employees for a variety of reasons, including attracting and retaining high quality employees, improving employee morale, and enhancing employee productivity. To the extent that employers effectively reduce benefits and increase employee out-of-pocket costs, or pressure employees to enroll in plan options that don't work for them, these advantages of employee health benefits will be undermined.

Further, by fostering favorable selection into CDHP products, integrated health care delivery systems with good performance on cost and quality are likely to experience a long-term decline in enrollment as their premiums rise as a result of enrolling "sicker" enrollees (Tollen, Ross, and Poor 2004).

The real goal should be to promote the spread of high-performing health systems, hospitals, and physicians. A number of new studies are finding wide variation in cost over an episode of illness across hospitals and physicians and even wider variation in quality performance (Grossbart 2003; Milstein 2003; Institute for Healthcare Improvement 2003). Yet, few private insurers, managed care plans, or public programs reward hospitals or physicians with superior quality or efficiency (Davis 2004; Maio et al. 2003; Goldfarb et al. 2003). Public information on comprehensive measures of quality at the individual hospital or physician level is extremely limited and rudimentary. Little is known about the "best practices" that lead some providers to achieve high performance, nor are the tools such as electronic medical records, clinical guidelines, patient reminders, and physician decision support systems that might spread their adoption in place.

If we are to achieve a truly high-performance health system, bold action is required. The following steps would start us on this course:

- **Public reporting of cost and quality data on physicians, hospitals, nursing homes, other health care providers, and**

health plans. The Centers for Medicare and Medicaid Services has been a leader in posting nursing home quality data on its website, but this is just a modest beginning. The new Medicare prescription drug legislation also spurs reporting by hospitals of a limited set of quality indicators. If we are serious about doing better, we need to know where we stand, routinely collecting comprehensive quality measures across a broad range of providers.

- **Investment in health information technology.** Other countries are quickly surpassing the United States in the adoption of electronic medical records and electronic prescribing. They are doing so because the government has been willing to invest in the infrastructure and establish the standards required to make this potential a reality.
- **Development and promulgation of clinical guidelines and quality standards.** It is long past time to simply pay for services rendered without establishing a scientific basis for effectiveness—not just for new drugs, but for consultations, procedures, and tests. This could be accomplished through establishment of a new National Institute on Clinical Excellence and Effectiveness (Schoenbaum, Audet, and Davis 2003).
- **Paying for performance.** Medicare and private insurers tend not to vary payment rates with quality. They pay for defects, whether those defects are surgeries that need to be repeated; infections that arise from failing to use state-of-the-art technology, such as catheters impregnated with antibiotics for heart valve patients; or medication errors. The Center for Medicare and Medicaid Services has embarked on some modest initiatives to begin testing paying-for-performance rewards. Medicare can and should be a leader in promoting quality. These efforts need to be substantially expanded and best practices documented and disseminated. Medicare's leadership can be instrumental in moving private payers as well; to date, very few private insurers have instituted "value-based purchasing" strategies.
- **Investment in research.** We urgently need to gather evidence on what works to improve care, eliminate waste and ineffective care, and promote greater efficiency, including use of modern information technology, teamwork, and improved care processes. Any industry that fails to invest in research to improve quality and efficiency is going to be a backward industry. The federal government pays $455

billion for health care in the United States but devotes only $300 million to the budget of the Agency for Healthcare Research and Quality (AHRQ) for learning effective ways to improve the performance of the U.S. health system. The quality report on U.S. health care recently issued by AHRQ is an important starting point (Agency for Healthcare Research and Quality 2003). But it needs to be followed with an investment in research up to the task of ensuring that the United States is a high-performing health system worthy of the twenty-first century.

These strategies go to the root causes of poor performance in the health care system, rather than turning to the blunt instrument of consumer financial incentives. They would speed the adoption of modern information technology, and provide powerful financial incentives to hospitals, physicians, and integrated health care delivery systems to improve quality, safety, and efficiency performance.

Better public information could also be helpful to consumers in choosing providers, and could be used to reward patients for choosing such providers, rather than penalizing those who do not. For example, Medicare and private plans could designate providers in the top quartile on quality and efficiency measures, and provide discounted premiums or cost sharing to beneficiaries choosing such provider networks. PacificCare provides "HealthCredits" good toward the purchase of treadmills or mountain bikes for enrollees who enroll in disease management programs or take other steps to improve their health (Ho 2004).

Consumer-directed health care—if it is primarily a tool for shifting costs from employers to employees—will quickly be discredited. A strategy aimed primarily at providers to identify, demand, and reward high performance, with positive incentives for consumers in a complementary role, is likely to have greater long-term success and acceptability.

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