The Effect Of Consumer-Directed Health Plans On The Use Of Preventive And Chronic Illness Services

Consumer-directed plan enrollees do not underuse preventive services to any greater degree than do PPO enrollees.

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ABSTRACT: We compared use of preventive, cancer screening, and diabetic monitoring services among 17,411 people who were continuously enrolled in a consumer-directed health plan (CDHP) for three years with a matched group of 128,444 people who were enrolled in a preferred provider organization (PPO). In the CDHPs, preventive and screening services were free. Levels and trends in use were similar between the two groups over the three years of follow-up. These results support varying the degree of cost sharing for services depending on the effect of the service on future health status and costs. [*Health Affairs* 27, no. 1 (2008): 113–120; 10.1377/hlthaff.27.1.113]

HEALTH INSURANCE WITH MUCH HIGHER cost sharing than used in traditional plans has recently started to grow and is attracting market, policy, and political attention.[1] In particular, consumer-driven health plans (CDHPs) with high deductibles and tax-advantaged employer- or employee-funded accounts that can be used to finance the cost sharing, such as health reimbursement arrangements (HRAs) and health savings accounts (HSAs), have begun to spread.[2] If not used to cover the cost sharing, unused funds in both HRAs and HSAs roll over and can be used to finance future medical spending. In HSAs, unused funds can also be used for nonmedical spending, although they are then taxable.

Despite the fact that many CDHPs exempt preventive services from the cost-sharing provisions, the recent growth in CDHPs has sparked a debate regarding

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DOI 10.1377/hlthaff.27.1.113

the behavior of people in such plans. Opponents of CDHPs predict that cost sharing in such plans will discourage people from obtaining preventive services, even if the cost sharing is waived for such services, because consumers will become confused and act as if preventive services were costly.[3] Indeed, the literature suggests that patients' knowledge of cost-sharing amounts declines with the complexity of the cost-sharing structure.[4] In addition, it can be argued that preventive services in CDHPs might not be as exempt from cost sharing as they seem. These services might carry a financial disincentive to the patient to whatever extent their use requires physician visits to receive the exempted service. Such would be the case if a preventive service such as a Pap smear were provided in the context of a more comprehensive visit that required cost sharing or if exempted medications required physician visits and blood tests for follow-up monitoring and prescription renewals.

■ **Data from the RAND experiment.** Much of what is known in the open literature about the effects of large deductibles comes from the RAND Health Insurance Experiment (HIE).[5] In the HIE, some participants, all of whom were under age sixty-five, were randomly assigned to plans that approximated a large deductible for all services, whereas others received all medical care free of charge. The large-deductible plans in the HIE partially mimicked today's consumer-driven plans in that the participants received preset fixed amounts sufficient to hold them harmless relative to the cost sharing in their prior insurance, although they could use those payments for any purpose, medical or nonmedical. They differed, however, in that cost sharing for preventive services was the same as for other services.

The HIE showed that those in the large-deductible plan spent on average about 30 percent less than those with free care; use of preventive services fell by about 20 percent. Despite the reduction in the use of services, for the typical person, health status appeared to be minimally affected, perhaps because those with a large deductible, who were generally healthy, contracted fewer iatrogenic conditions as well as receiving fewer beneficial services. Hypertension was less well controlled with more cost sharing, although this effect was concentrated among low-income people with hypertension, where the poorer control resulted in about a 10 percent increase in the risk of mortality. This finding, however, might not be very relevant to CDHPs, because many low-income people will be eligible for Medicaid and not in a CDHP. And some of the low-income people who do enroll in CDHPs might otherwise have been uninsured, in which case comparisons of use with a CDHP to use with entirely free care are moot.

The RAND HIE results, however, date from the 1970s and early 1980s. Not only has medical technology advanced in the interim, but also the demographics of the population have changed in several ways, including the aging of the baby boomers. And CDHPs intend to have the patient more actively involved in care decisions than was the case with the indemnity insurers of an earlier day. Thus, the results from the RAND HIE might not be replicable today.

■ **Early data on CDHPs.** Recent but early data on CDHPs suggest that there is modest favorable selection, lower costs, and lower cost increases than under other types of health plans.[6] Effects on quality are mixed. Susan Busch and colleagues, in the paper most similar to ours, analyzed the experience of a single employer with one year of follow-up and found that exempting preventive services from cost sharing did not reduce their use.[7]

In this paper we add to the modest stock of results based on recent data by comparing the use of preventive services and cancer and diabetic screening services between a matched sample of those continuously enrolled in CDHPs for a period of three years and those in a traditional preferred provider organization (PPO) with low copayments for in-network use. We singled out cancer and diabetic screening services because of their efficacy and importance; they are, for example, among the Health Plan Employer Data and Information Set (HEDIS) measures used to rate health plans.

Study Data And Methods

■ **HRA group.** We divided the study population into two groups. One group consisted of all people continuously enrolled in the Aetna Health Fund–HRA product from 1 January 2003 through 31 December 2005. Of these 17,411 people, 89 percent received their health insurance through an employer that provided options for the employee to choose from, including the HRA product and other traditional products, such as a PPO with modest cost sharing. The remaining 11 percent received their insurance through employers that had chosen a complete replacement of the prior health insurance products with the HRA so that employees had no choice of plans.

The HRA combines an employer-funded account linked to a high-deductible, PPO-type health plan. For the period covered by this analysis, the deductibles in the plans we studied varied from $500 to $2,000 for an individual and from $1,000 to $4,000 for a family. The employer contribution to the account intended to fund the deductible was typically around $2,500 for an individual and $5,000 for a family. The HRA plan provided complete coverage for preventive care services such as annual physicals, mammograms, immunizations, and routine preventive services for diabetes including measurement of HbA1c, retinal exams, lipid screening, and urinary microalbuminuria. Funds in the HRA account could only be used for qualified medical expenses permitted under Section 213(d) of the Internal Revenue Code. Unused balances could be carried over from year to year, as long as the employee remained eligible under the plan. After termination of employment, balances could be used at the sole discretion of the employer. Within the plan, employees had the right to choose referral-free access to an expansive network of physicians, hospitals, and other health care professionals as well as the ability to seek out-of-network care. The plan had an out-of-pocket maximum, which was typically $2,500 for individuals and $5,000 for families, after which most services

were fully covered. Thus, the employer contributions did not fully cover the potential out-of-pocket expense, providing an incentive to cut back on nonpreventive services. Employees had access to a variety of tools that offered health and benefit information both online and via telephone, including health care pricing and quality tools, online claim filing, fund activity, balance tracking, and health risk assessments.

■ **PPO group.** The control group for these analyses included 128,444 people continuously enrolled in a PPO plan, providing a 7.4/1.0 match for the HRA group. It was selected from the approximately 3.9 million members with an Aetna PPO plan during the study period. We matched controls with HRA study members on age, sex, geographic location (three-digit ZIP code), family status, and risk of use of health care resources using the Characteristic Profile-Matching Algorithm (CPMA) method, an algorithm developed internally by Aetna. This method estimates the health care resources expected to be used by an individual or group, as compared to a normal population, with the Symmetry Health Data Systems Episode Risk Group and Episode Treatment Group software.[8] The resulting risk scores are based on episodes of care for individuals during the previous twelve months as well as their pharmacy claims. For matching controls and study participants, six levels of progressively higher risk scores, from values less than or equal to 0.10 (healthiest) to values over 7.0 (sickest) were used.

■ **Regional concentration of the study populations.** For geographic location, the HRA and PPO populations were drawn from 500 individual three-digit ZIP codes. In 97.6 percent of these ZIP codes, which included 63 percent of the people in the study populations, the difference in the percentage of the HRA and PPO populations in the ZIP code was less than one percentage point. For instance, ZIP code 605 in Illinois included 1 percent of the HRA members and 1.38 percent of the PPO members, a difference of 0.38 percentage points. In 2.2 percent of the ZIP codes, which included 31.1 percent of the members of the study groups, reflecting Aetna's membership concentration in certain regions, the difference in the percentage of the HRA and PPO populations in any ZIP code was between one and five percentage points. In one ZIP code, the difference in the percentage of the HRA and PPO populations was six percentage points.

■ **Preventive services included in the study.** We included preventive services provided by either a primary care physician or a specialist. We studied two forms of cancer screening—mammograms and Pap smears. We included only tests performed for screening and excluded follow-up examinations based on abnormalities or questionable findings on screening exams.

We also analyzed the proportion of diabetics and matched controls who obtained HbA1c determinations, retinal exams, lipid screening, or screening for urinary microalbuminuria, both before and after enrollment in the HRA and during the course of thirty-six months' continuous HRA enrollment. Diabetics were identified through claims data, including pharmacy claims.

■ **Claims analysis.** At the time of data analysis, the claims experience was complete for 2003 and 2004 and essentially complete for 2005 (99 percent). We calculated means and standard deviations using SAS, version 9. We used a standard F test to test the null hypothesis of no difference among means. Because we were making multiple comparisons, we applied a Bonferroni correction to determine if any of the HRA-PPO pairwise comparisons of means across three years differed significantly from each other.[9]

Study Findings

The distributions of the HRA and PPO (control) populations on the demographic variables and risk scores were similar (Exhibit 1). The differences that remained after matching suggest that if anything, the CDHP group was slightly sicker than the comparison group because the proportion of the sample in the six highest-risk groups was higher in the CDHP group.

■ **Changes in overall preventive services use.** Comparison of the pre- (2002) and the post- (2003) HRA preventive visit rates for those enrollees for whom 2002

EXHIBIT 1
Demographics And Health Care Risk Characteristics Of Nonelderly Health Reimbursement Arrangement (HRA) And Preferred Provider Organization (PPO) Populations, 2003–2005

Characteristic	HRA	PPO
Number	17,411	128,444
Sex		
Male	52.1%	51.4%
Family status		
Family coverage	86.3%	88.0%
Single coverage	13.7	12.0
Age (years)		
Mean age	31.2	31.2
<10	13.5%	13.7%
10–19	23.0	23.8
20–29	7.6	7.1
30–39	15.4	14.5
40–49	25.5	25.6
50–59	14.2	14.6
60–64	0.8	0.8
Retrospective risk scores		
Mean score	0.55	0.47
<0.10	47.6%	50.1%
0.10–0.65	29.7	29.5
0.66–1.50	13.3	12.4
1.51–3.00	5.2	4.7
3.01–7.00	3.8	3.2
>7.00	0.5	0.2

SOURCE: Authors' calculations.

data were available showed that visits per thousand members per year went from 435 to 462 in the HRA group (N = 6,242, standard error = 5.84, $p = 0.02$) during this period, compared to 437 to 440 in the PPO control group (N = 32,248, SE = 2.61, not significant). This change in service use before and after adoption of the HRA was significantly greater in the HRA group ($p < 0.001$), consistent with the likely fall in cost sharing among the HRA group for these services.

Use of preventive service visits for the HRA and PPO members over thirty-six months of continuous enrollment is shown in Exhibit 2. The reduction in preventive service visits was slightly greater for the PPO group than the HRA group for both 2003–2004 (PPO –12.2 percent, HRA –11.1 percent) and 2004–2005 (PPO –1.0 percent, HRA –0.4 percent) ($p < 0.01$).

■ **Cancer screening rates.** As can be seen in Exhibit 3, insurance product design had no substantial effect on the pattern of use over time for either mammograms or Pap smears. For the first year, cervical cancer screening rates were higher and mammogram rates lower in the HRA group ($p < 0.01$). Thereafter, levels of use converged in the two groups and did not significantly differ in year 3.

■ **Diabetes prevention.** For diabetes there was no substantial effect of plan design on use of any of four major diabetes-specific preventive services before and after HRA enrollment (Exhibit 4). Four of the HRA-PPO comparisons within a year that are statistically significant favor the PPO plan; three favor the HRA plan (results not shown). The two statistically significant year 1–year 3 differences, retinal screening and lipid screening, favor the HRA plan (results not shown).

Discussion

Consumer-directed health plans have begun to spread, in part as a health care cost containment effort and in part as a benefit buy-down strategy, as employers have sought to keep health insurance benefits in some form for their workforce, provide suitable cash wage increases, and keep total compensation or payroll within a defined limit. Despite the exemption of preventive services from cost sharing in many such plans, including those analyzed here, critics have continued to predict underuse, based on the fear that people in a high-deductible plan will reduce their use of all services and will not discriminate between those services that are subject to the deductible and those that are not. Our results indicate that

EXHIBIT 2
Preventive Care Visits Per Thousand Members Per Year, Nonelderly Health Reimbursement Arrangement (HRA) And Preferred Provider Organization (PPO) Enrollees, 2003–2005

	2003	2004	2005
HRA (n = 17,411)	315	280	279
PPO (n = 128,444)	260	228	226

SOURCE: Authors' calculations.

EXHIBIT 3
Cancer Preventive Screening For Members In Health Reimbursement Arrangement (HRA) And Preferred Provider Organization (PPO) Over Three Years (2003–2005)

	Women eligible for screening in 2003	Screenings per 1,000			Change in screenings, year 1–year 3
		Year 1	Year 2	Year 3	
Mammogram					
HRA[a,c]	1,029	404	446	460	+56 (8.33)**
PPO[a,c]	7,600	446	465	465	+19 (3.06)***
HRA versus PPO		42 (5.42)***	19 (4.99)	5 (4.62)	
Pap smear					
HRA[b,c]	4,574	166	163	148	−18 (3.11)**
PPO[b,c]	31,934	143	154	145	+2 (1.13)**
HRA versus PPO		23 (1.86)****	9 (1.88)	3 (1.79)	

SOURCE: Authors' calculations.

NOTE: Standard errors are in parentheses.

[a] The breast cancer screening data reflect women ages 50–64 and exclude women who have had a mastectomy.

[b] The cervical cancer screening data reflect women ages 21–64 and exclude women who have had a hysterectomy.

[c] Data for all years include only women enrolled in HRA or PPO, respectively, continuously for the period 1/1/03–12/31/05.

**$p < 0.05$ ***$p < 0.01$ ****$p < 0.001$

EXHIBIT 4
Preventive Services Use By Diabetics In Health Reimbursement Arrangement (HRA) And Preferred Provider Organization (PPO) During Thirty-Six-Month Continuous Enrollment (Percentage Of Members Obtaining Preventive Service Per Year), 2003–2005

	Year 1	Year 2	Year 3	Change, year 1–year 3
HbgA1C				
HRA	66%	68%	66%	0.91 (2.57)
PPO	66	67	68	0.63 (0.63)
HRA versus PPO	0.90 (1.07)	0.72 (1.06)	0.81 (1.05)	
Retinal screening				
HRA	25%	23%	32%	0.28 (2.40)
PPO	25	26	28	0.08 (0.59)
HRA versus PPO	0.96 (0.97)	0.52 (0.98)	0.34 (1.01)	
Lipid screening				
HRA	57%	61%	65%	0.47 (2.66)
PPO	64	66	69	0.01 (0.63)
HRA versus PPO	0.11 (1.08)	0.24 (1.07)	0.39 (1.05)	
Microalbuminuria				
HRA	30%	34%	34%	0.81 (2.55)
PPO	26	29	32	0.001 (0.61)
HRA versus PPO	0.36 (0.99)	0.25 (1.02)	0.73 (1.05)	

SOURCE: Authors' calculations.

NOTES: For HRA, n = 113; for PPO, n = 1,861. Standard errors are in parentheses.

these concerns are not valid and that, initially and over time, people enrolled in CDHPs such as those we studied do not underuse preventive services to any greater degree than do those in traditional PPOs.

Our results, along with those of Busch and colleagues and Mark Fendrick and colleagues, thus support the case for "smarter" cost sharing—that is, varying the degree of cost sharing for many types of services according to the effect of the use of the service on future medical costs and future health.[10] Employing smarter cost sharing, in effect, makes any disease management program to improve compliance and the health benefit package work together.

Joseph Newhouse received financial support from the Alfred P. Sloan Foundation. The foundation does not necessarily endorse any of the conclusions. John Rowe is a former chairman and chief executive officer of Aetna. Newhouse is a director at Aetna. Both hold equity positions in Aetna.

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