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Issue BRIEF

Financial Incentives, Workplace Wellness Program Participation, and Utilization of Health Care Services and Spending

By Paul Fronstin, Ph.D., Employee Benefit Research Institute, and M. Christopher Roebuck, Ph.D., RxEconomics, LLC

AT A GLANCE

- This paper analyzes data from a large employer that enhanced financial incentives to encourage participation in its workplace wellness programs. It examines, first, the effect of financial incentives on wellness program participation, and second, it estimates the impact of wellness program participation on utilization of health care services and spending.
- The Patient Protection and Affordable Care Act of 2010 (PPACA) allows employers to provide financial incentives of as much as 30 percent of the total cost of coverage when tied to participation in a wellness program.
- Participation in health risk assessments (HRAs) increased by 50 percentage points among members of unions that bargained in the incentive, and increased 22 percentage points among non-union employees.
- Participation in the biometric screening program increased 55 percentage points when financial incentives were provided.
- Biometric screenings led to an average increase of 0.31 annual prescription drug fills, with related spending higher by $56 per member per year. Otherwise, no significant effects of participation in HRAs or biometric screenings on utilization of health care services and spending were found.
- The largest increase in medication utilization as a result of biometric screening was for statins, which are widely used to treat high cholesterol. This therapeutic class accounted for one-sixth of the overall increase in prescription drug utilization. Second were antidepressants, followed by ACE inhibitors (for hypertension), and thyroid hormones (for hypothyroidism).
- Biometric screening also led to significantly higher utilization of biologic response modifiers and immunosuppressants. These specialty medications are used to treat autoimmune diseases, such as rheumatoid arthritis and multiple sclerosis, and are relatively expensive compared with non-specialty medications. The added spending associated with the combined increase in fills of 0.02 was $27 per member per year—about one-half of the overall increase in prescription drug spending from those who participated in biometric screenings.

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Financial Incentives, Workplace Wellness Program Participation, and Utilization of Health Care Services and Spending

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Introduction

Employer spending on employment-based health benefits in the private and public sectors reached $660 billion in 2013, accounting for one-quarter of national health expenditures.[1] Plan sponsors are increasingly interested in returns that might be generated from this large investment in terms of improved member health and enhanced worker productivity. Recently, there has been growing interest in workplace wellness program as a means to realize these benefits. The Patient Protection and Affordable Care Act of 2010 (PPACA) allows employers to provide financial incentives of as much as 30 percent (up from 20 percent) of the total cost of coverage when tied to participation in a wellness program. This provision of PPACA is expected to drive increased adoption of this strategy, and there is already evidence to suggest that adding wellness program incentives is by far more commonplace among employers than other changes (Fronstin 2014).

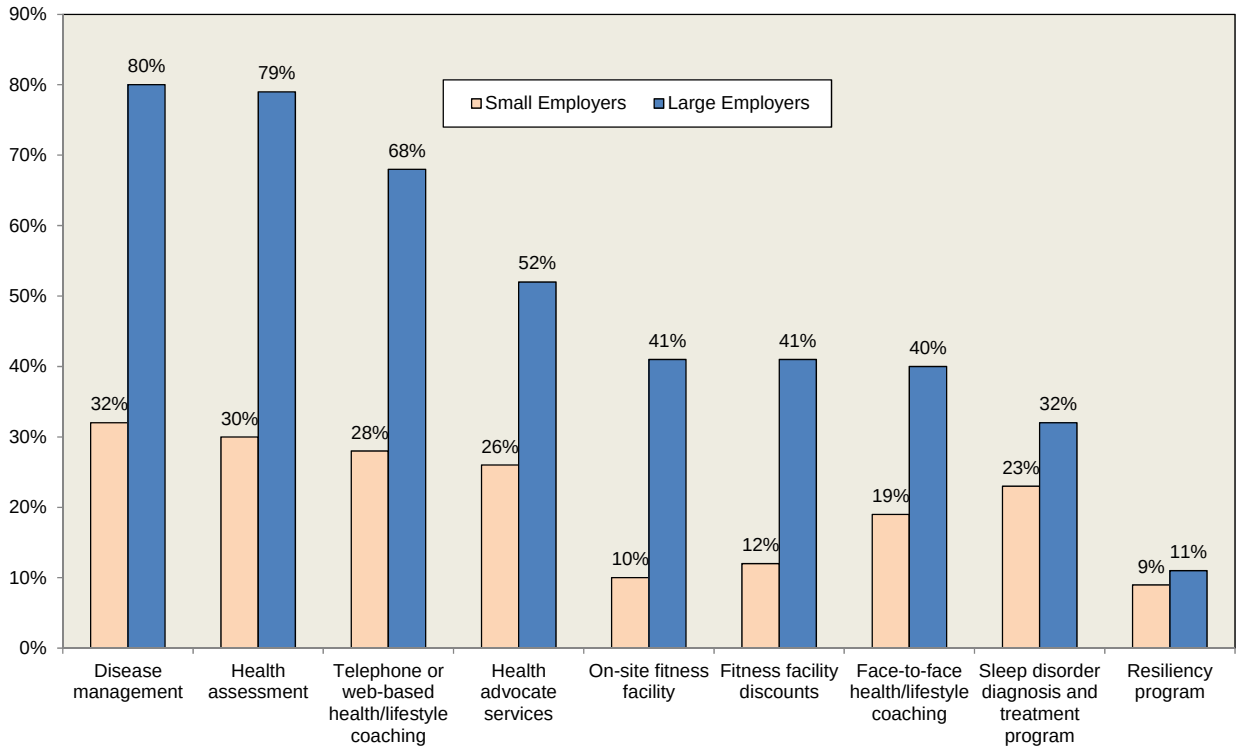
Despite their rise in popularity, workplace wellness programs face challenges. While they may comply with Internal Revenue Service (IRS) and Department of Labor (DOL) rules, wellness programs fall under the umbrella of the Americans with Disabilities Act (ADA). Employers have been waiting years for the Equal Employment Opportunity Commission (EEOC) to provide formal guidance on wellness programs as they relate to the ADA. Yet, in 2014, the EEOC filed its first-ever legal challenges to wellness programs, claiming that they violated the ADA (Pomeranz 2015). A U.S. District Judge denied EEOC's request to block one of the programs from implementation. Although the EEOC recently issued proposed regulations that address wellness programs and the ADA, until final regulations are released there is still uncertainty regarding a number of provisions, which may dampen employers' enthusiasm for wellness programs. Yet, use of financial incentives to encourage participation may continue to grow as employers seek ways to avoid the excise tax on high-cost health plans under PPACA, which takes effect in 2018. Moreover, there is a growing body of evidence that suggests workplace wellness programs may reduce health care spending, although the extant literature on this topic is not without limitations, as will be discussed in greater detail below.

This paper analyzes data from a large employer that enhanced financial incentives to encourage participation in its workplace wellness programs. It has two research objectives: First, to examine the effect of financial incentives on wellness program participation, and second, to estimate the impact of wellness program participation on utilization of health care services and spending. As shown in prior research (Fronstin and Roebuck 2015), voluntary wellness programs disproportionately attract relatively healthy individuals. This selection bias plagues all related observational studies and must be accounted for. A key strength of the present analysis is that it makes use of a quasi-experimental design to derive unbiased results due to this potential confounding.

Background on Wellness Programs

Employers of all sizes utilize various types of health management solutions. These include wellness programs designed to promote health and prevent disease, as well as disease management interventions that are designed to manage patients with chronic conditions. Among larger employers, about four-fifths use disease management and health assessments, two-thirds use telephone or web-based health or lifestyle coaching, one-half employ health advocate services, and about two-fifths offer on-site fitness facilities, gym discounts, and face-to-face health or lifestyle coaching (Figure 1). Smaller employers also employ health management solutions, although they are less likely than larger employers to do so.

Figure 1
Use of Specific Health Management Programs, by Firm Size, 2013



Source: Mercer National Survey of Employer-Sponsored Health Plans, 2014

Wellness programs usually include health-risk assessments (HRAs) and biometric screenings. HRAs are questionnaires that individuals can complete to evaluate their health risks and quality of life. HRAs collect data on health status and behavior, as well as medical history details, including those of the individual's family. It is common practice for employers to contract with third parties to administer HRAs in order to receive de-identified results on their employees in return. The information collected is used to provide custom feedback to participants about their current health risks, and an action plan for addressing them.

Biometric screening programs collect information on physical characteristics of the individual such as height, weight, body mass index, blood pressure, cholesterol, and glucose level. The screenings are used to identify individuals at high risk for chronic conditions such as diabetes, hypertension, and dyslipidemia. Overall, about one-half of larger employers offer HRAs or biometric screening programs, whereas about one-third of smaller employers offer HRAs and one-quarter offer biometric screenings (Figure 2). However, the percentage of smaller employers offering HRAs has been growing recently, while it has been mostly flat for larger employers. Since 2008, the percentage of smaller employers offering HRAs has increased from 8 percent to 32 percent (Figure 3). Among larger employers, 51 percent offered HRAs in 2014, up from 47 percent in 2008—though most of that growth occurred between 2008 and 2009. The large drop in 2012 and subsequent growth in 2013 is likely a statistical anomaly.

Since participation is voluntary, employers sometimes offer financial incentives to persuade employees to take part in workplace wellness programs. These can be provided in a number of different ways, such as discounts and surcharges to premiums, reductions in cost sharing, gift cards, prize giveaways, and contributions to a health savings account (HSA). In 2014, 36 percent of larger employers and 18 percent of small employers offered a financial incentive to participate in a wellness program (Figure 4). Most employers used a combination of premium discounts and giveaways. Some made HSA contributions, while few used altered patient cost-sharing.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) prohibits discrimination against individuals based on health status, but does allow employers to provide rewards or financial incentives for employee participation in a wellness program. While HIPAA allows for incentives up to as much as 20 percent of the total cost of coverage, a maximum of 30 percent is now allowed under PPACA, which also allows up to 50 percent in incentives for interventions designed to prevent or reduce tobacco use. About one-half of large employers offer a financial incentive for completing HRAs at an annual value of less than $500 for nearly two-thirds and more than $500 for one-third of these employers (Figure 5).

The 2014 EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey (CEHCS) addressed a number of questions from the individual perspective regarding participation in HRAs and biometric screening programs. The survey found that 62 percent of individuals reported participating in employer HRAs and 65 percent participated in biometric screenings when they were available (Figure 6). Only about one-half of individuals reported that their employer offered some type of financial incentive for participating (Figure 7). The main reason individuals participated was to improve health—45 percent cited this as a major reason and 35 percent reported this as a minor reason (Figure 8). Other wellness program enrollment reasons included: 1) to maintain current health status, 2) convenience to work, 3) to learn more about own health risks, 4) offered incentive prizes, 5) reduced premiums, and 6) to avoid premium increases. The survey also asked individuals about their reasons for not participating in their employers' wellness programs. About 60 percent responded that they did not participate because they could make changes on their own (Figure 9)—28 percent cited this as a major reason and 33 percent reported it as a minor reason. Lack of time was the second-most-popular reason for not participating, and others stated that they were already healthy.

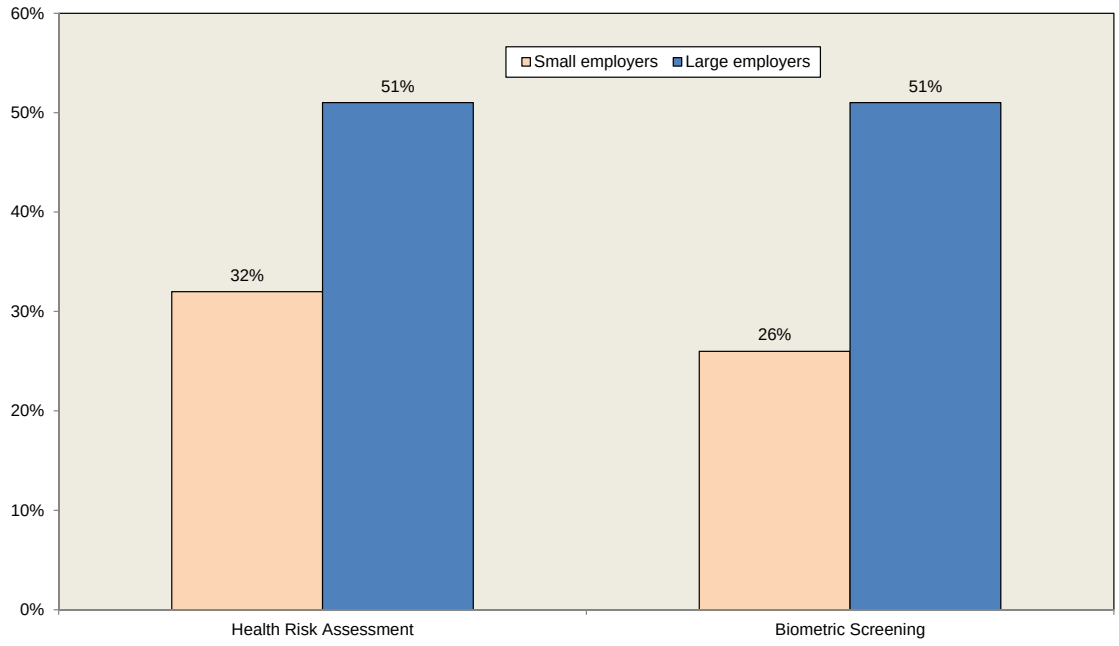
A number of questions were asked of nonparticipants to gauge their likelihood of participating in response to various types of financial incentives. The survey concluded that between 66 percent and 79 percent of individuals would participate if a financial incentive was introduced, and nearly 80 percent would if the employer made additional contributions to an HSA or health reimbursement arrangement (Figure 10). About 7 in 10 would participate if the employer: 1) discounted premiums, 2) offered a $250 cash incentive, 3) increased premiums, 4) reduced contributions to HSAs or health reimbursement arrangements, 5) offered time off, or 6) required participation to enroll in the preferred health plan. Also, as shown in Figure 11, 59 percent to 68 percent of nonparticipants would participate if member cost-sharing for outpatient physician visits or prescription drugs was increased or reduced.

Prior Literature

There is a small (and often controversial) but growing body of literature that has evaluated various aspects of workplace wellness programs. Recent reviews include Baicker, Cutler and Song (2010), Baxter, et al. (2014), Goetzel, et al. (2014), and Mattke, et al. (2013). Published studies include examples of both successful and unsuccessful programs, and main findings from this research are often at odds. For example, two recent reviews examined the return-on-investment (ROI) from wellness programs. The 2010 review estimated that medical spending declined an average of about $3.27 for every $1 spent on wellness programs (Baicker, Cutler and Song 2010). The more recent (2014) paper reported an average ROI of $1.38, and the authors also noted that scientific quality among the papers surveyed had improved over time (Baxter, et al. 2014).

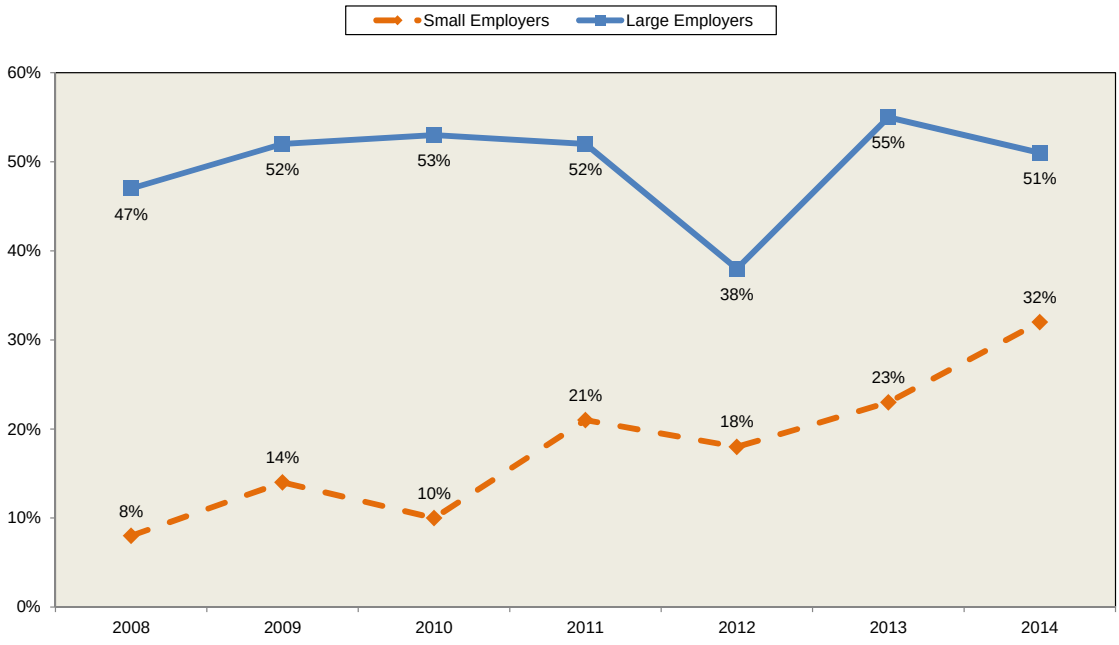
Prior investigators have acknowledged several common methodological challenges of program evaluation. First, many studies have small sample sizes. Evaluations based on too few observations are often underpowered, which leads to few statistically significant results. Furthermore, analyses on subpopulations (e.g., patients with chronic conditions) suffer the same fate. Second, investigations that examine only one employer do not generate results that are generalizable to broader populations. Third, the timing of the evaluation is also often an issue. Sometimes, workplace wellness programs are studied too soon after implementation. Utilization of health care services and related spending may be expected to increase during the first year of a wellness program, when health issues are first identified and treatments and/or preventive services are sought. Goetzel, et al. (2014) and Grossmeier, et al. (2012) suggest that three or more years may be needed in order to detect population health effects. Nyce, et al. (2012) suggest that it may take one year or longer for health spending patterns to change after worker health risks are impacted. Fourth, the

Figure 2
Percentage of Firms Offering Health Risk Assessments or Biometric Screenings, by Firm Size, 2014



Source: Kaiser Family Foundation, 2014.

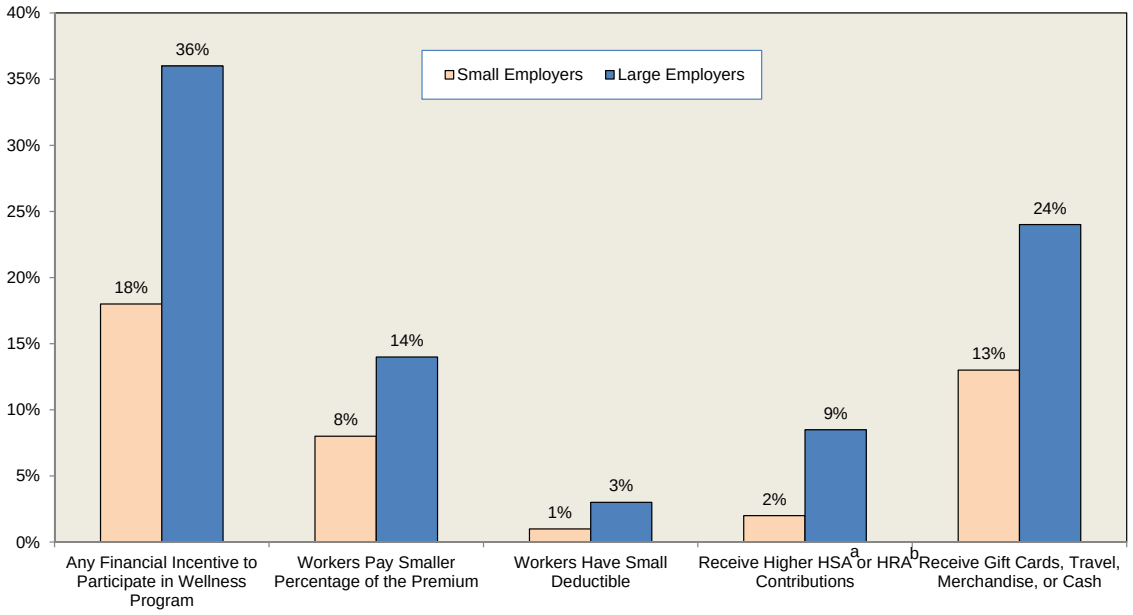
Figure 3
Percentage of Firms Offering Employees the Opportunity to Complete Health Risk Assessments, by Firm Size, 2008–2014



Source: http://kff.org/report-section/ehbs-2014-section-twelve-wellness-programs-and-health-risk-assessments/

Figure 4

Percentage of Firms Offer Specific Financial Incentives to Employees Who Participate in Wellness Programs, by Firm Size, 2014



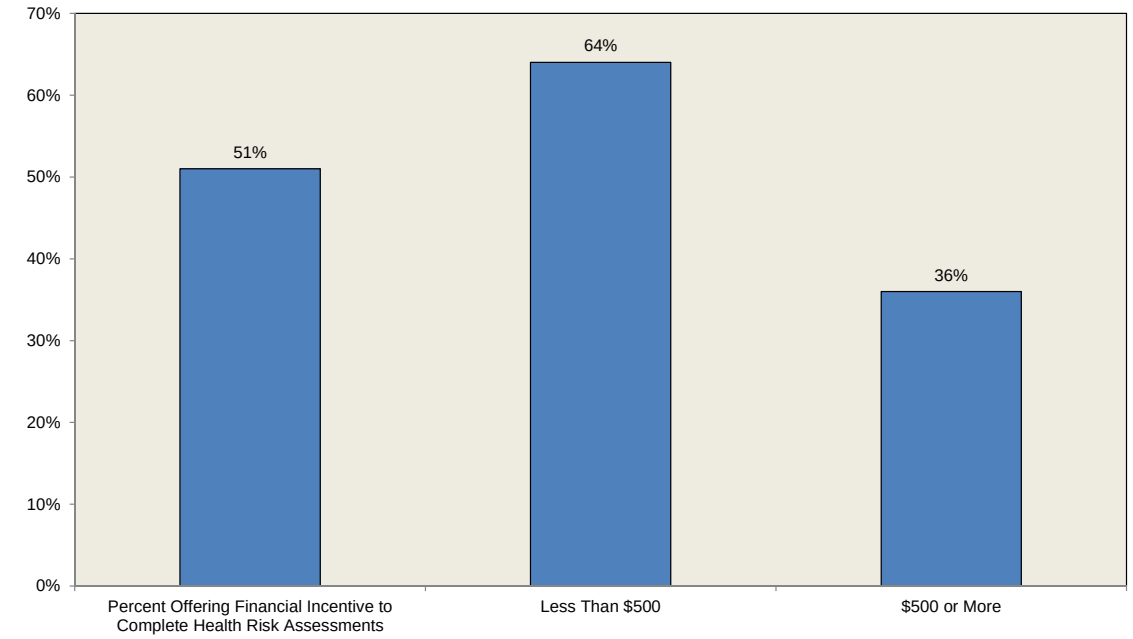
Source: http://kff.org/report-section/ehbs-2014-section-twelve-wellness-programs-and-health-risk-assessments/

[a] Heatlh savings accounts.

[b] Health reimbursement arrangements.

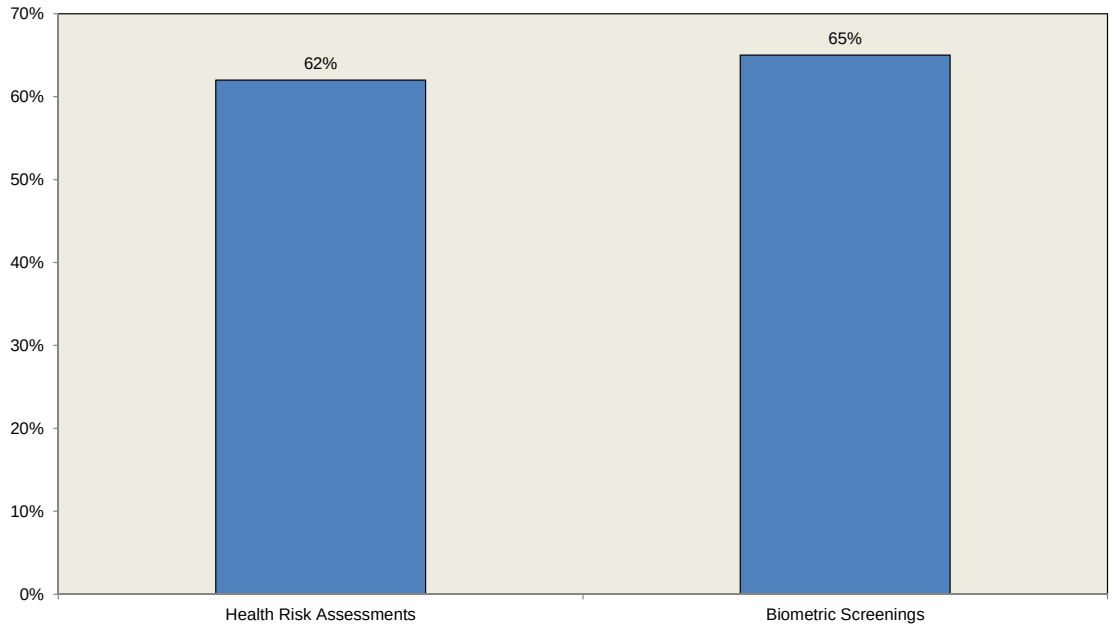
Figure 5

Percentage of Large Employers Offering Financial Incentives for Completing HRAs, and Maximum Value of Incentive, Large Employers, 2014



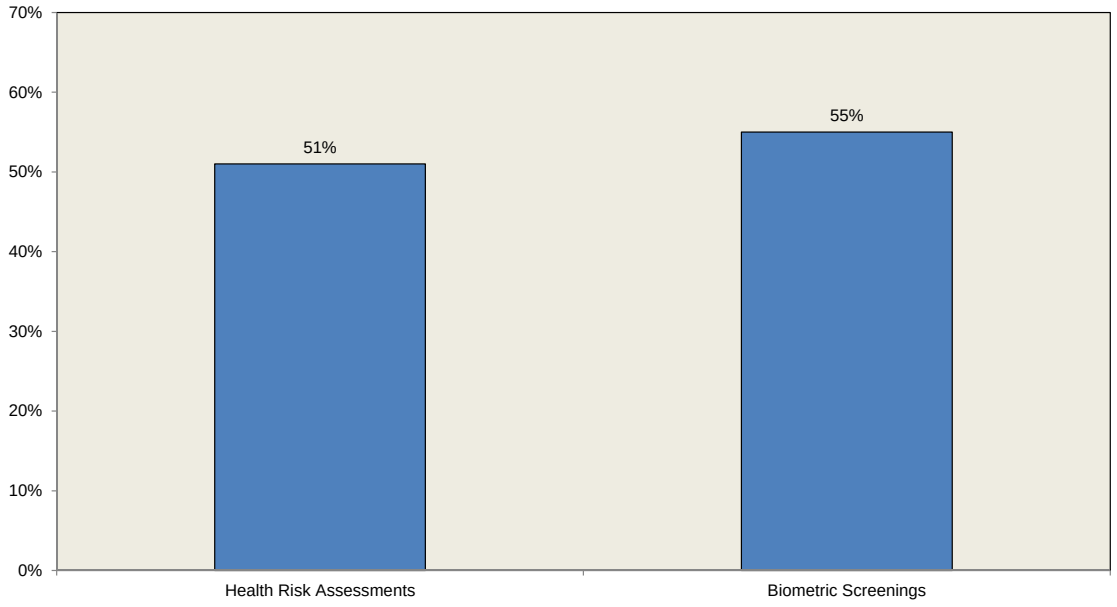
Source: http://kff.org/report-section/ehbs-2014-section-twelve-wellness-programs-and-health-risk-assessments/

Figure 6
Individual Participates in Wellness Program Offered by Employer, Among Those Offered a Wellness Program, 2014



Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.

Figure 7
Employer Offers Cash Incentive or Reward for Participating in Wellness Program, Among Workers Whose Employer Offers Wellness Program, 2014



Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.

existing literature is replete with problems of incomplete data. In some cases, prescription drug claims were not available, and reversals and adjustments occurring after claims were submitted were not reconciled. One study did not have health care claims, so average spending was imputed based on utilization. And, in some studies, data on HRAs and biometric screenings were often missing.

Arguably the most critical methodological challenge that plagues the field derives from the voluntary nature of workplace wellness programs. Employees who opt to take part in HRAs or biometric screenings are likely to be different from those who choose not to participate. Economists call this selection bias. If those differences in individual characteristics are unmeasured and also correlated with outcomes of interest such as utilization of health care services and worker productivity, naïve observational analysis of wellness program impacts will yield incorrect estimates. In the absence of a randomized controlled trial, advanced econometric techniques might be used in an attempt to correct for this selection bias, but understanding the differences between participants and nonparticipants is of great importance in such pursuits.

Data and Methods

Study Sample

For this study, data were used from a large manufacturing employer headquartered in the Midwest, with employees located throughout the United States. The study received health insurance enrollment information, medical and prescription drug claims, as well as wellness-program-participation data covering the period 2011–2013. The employer had been offering HRAs since at least 2004 and introduced biometric screenings in 2007. Individual responses to HRAs as well as results from the biometric screenings were also obtained.

The study examined the set of employees who were full-time active workers, 18–64 years of age (as of Dec. 31, 2013), and continuously enrolled in the company health plan during the three-year period 2011 through 2013. Employees in health plans that paid claims on a prepaid or capitated basis were excluded, since monetary amounts were necessary for the analyses, which included health care services spending as outcomes. Spouses, partners, and other dependents were also excluded from the analysis. After applying these criteria, the final analytical file was comprised of 71,982 members, which included both union and non-union employees.

Study Design

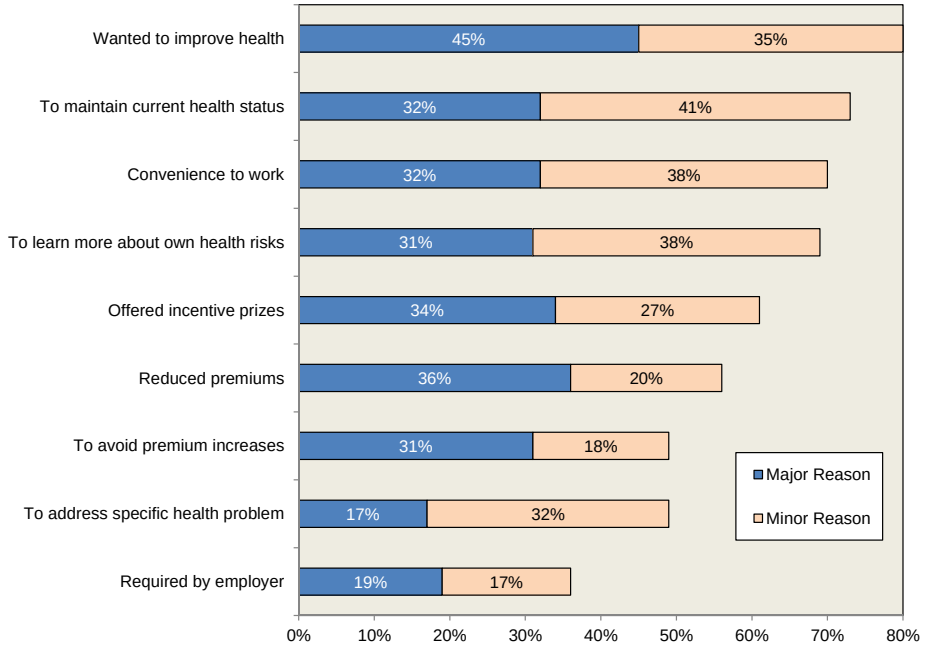
Activity in the employer's HRAs and biometric screening programs occurred primarily during open enrollment season—the months of October, November, and December preceding a new benefit year.[2] Although the employer had these wellness programs in place for several years prior, the firm markedly altered the incentives offered to members for their participation during the 2012 and 2013 plan years.

When HRAs were first introduced, employees were offered a $50 gift card to complete one. Beginning with the 2012 plan year, the annual financial incentive was effectively raised to $240 in the form of a $20/month reduction in the person's health insurance premium for non-union employees. The intent was to increase participation in HRAs. Additionally, a subset of unions bargained in the premium discount for its workers beginning with plan year 2013. Other union members continued to receive the $50 gift card when HRAs were completed.

Prior to 2013, all employees were offered a nominal reward for their participation in biometric screenings including books and random drawings for movie tickets. One year after the $20/month reduction in health insurance premiums was introduced for HRAs (in 2013), non-union employees were also required to complete biometric screenings to continue to receive the discount. Union employees did not receive financial incentives in plan year 2013 to complete biometric screening, though they did receive giveaways in prior years.

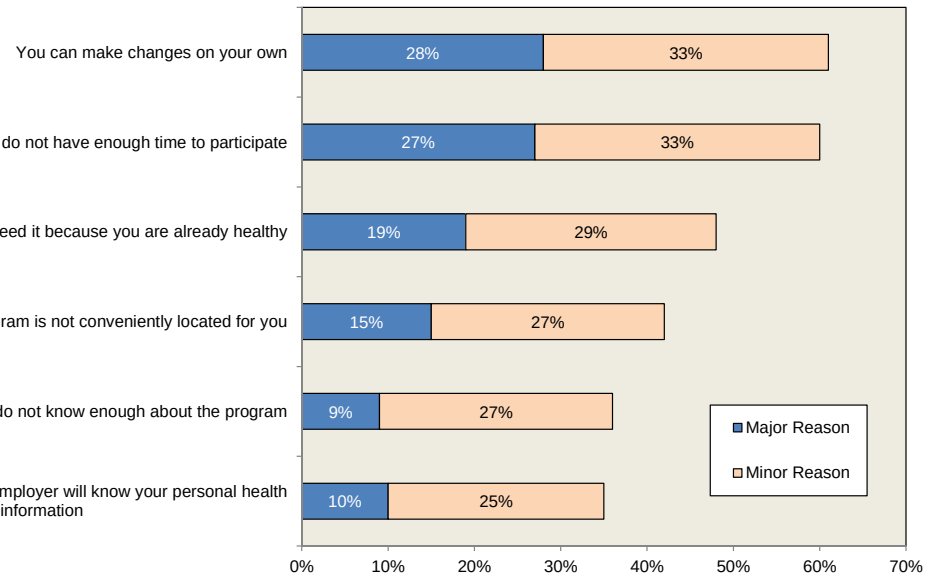
Given that the changes in financial incentives for participation in HRAs and biometric screening programs occurred for different groups in different years, this study constructed three cohorts for use in the ensuing analysis. Test Group 1

Figure 8
Reasons for Participating in Employer Wellness Program, 2014



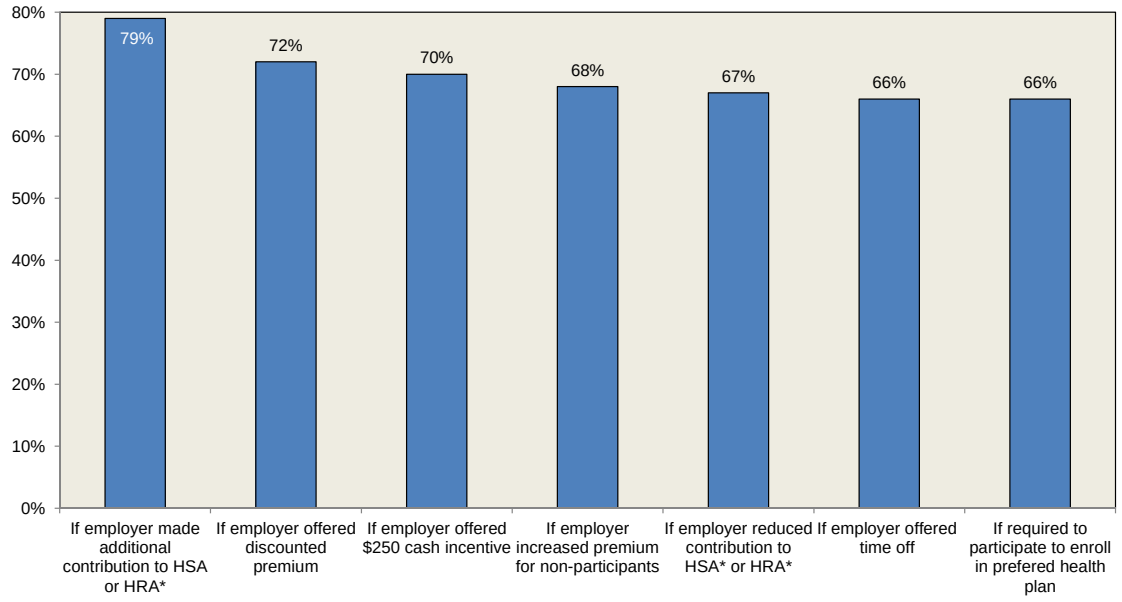
Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.

Figure 9
Reasons for Not Participating in Employer Wellness Program Among Those Offered but Not Participating in Program, 2014



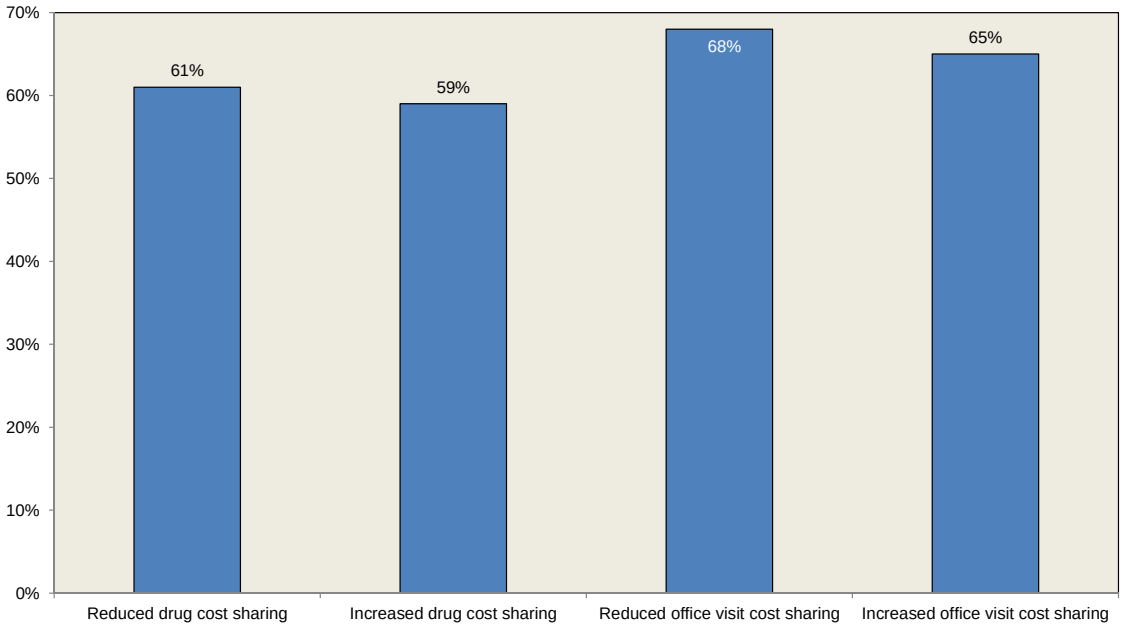
Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.

Figure 10
Percentage of Individuals Reporting that They Would Probably Participate in Employer Wellness Program, by Various Financial Incentives, 2014



Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.
* Asked only of health savings account (HSA)/health reimbursement arrangement (HRA) enrollees.

Figure 11
Percentage of Individuals Reporting that They Would Probably Participate in Employer Wellness Program, by Various Cost-Sharing Incentives, 2014



Source: EBRI/Greenwald & Associates Consumer Engagement in Health Care Survey, 2014.

included the 15,312 union members exposed to the new financial incentive for participation in HRAs only, beginning in plan year 2013. Test Group 2 consisted of the 40,547 non-union employees who were offered the new financial incentive for participation in HRAs in plan year 2012, and for both HRAs and biometric screenings in plan year 2013. Finally, the cohort of 16,123 union employees who never received the $20/month reduction in health insurance premiums during the three-year study period comprised the Control Group (Figure 12).

Figure 12

Financial Incentives for Health Risk Assessments (HRAs) and Biometric Screenings (BIO), by Employee Group and Plan Year, 2011–2013

Study Group	Plan Year 2011	Plan Year 2012	Plan Year 2013
Test Group 1:	HRA:	HRA:	HRA:
Select Union Employees	$50 gift card	$50 gift card	Premium Incentive ($20/month)
(n=15,312)	BIO:	BIO:	BIO:
	Book	Movie Tickets Drawing	No Incentive
Test Group 2:	HRA:	HRA:	HRA + BIO:
Nonunion Employees	$50 gift card	Premium Incentive ($20/month)	Premium Incentive ($20/month)
(n=40,547)	BIO:	BIO:	
	Book	Movie Tickets Drawing	
Control Group:	HRA:	HRA:	HRA:
Other Union Employees	$50 gift card	$50 gift card	$50 gift card
(n=16,123)	BIO:	BIO:	BIO:
	Book	Movie Tickets Drawing	No Incentive

To examine the effects of financial incentives on wellness program participation, the analysis estimated multivariate regression models using a difference-in-differences (DiD) analytical approach with person-level fixed effects. As previously noted, the three groups were exposed to the enhanced financial incentives for different programs at different times. Moreover, members did not choose which group to belong to—the decision to bargain in the incentives was not made by individuals, but collectively at the union level. Therefore, the study design is quasi-experimental in that members were essentially randomized to the three groups. The estimate approach, which is explained in detail in the Appendix, should yield unbiased estimates of the impact of the enhanced financial incentives on HRAs and biometric screening participation.

The study also investigated wellness program participation impacts on utilization of health care services and spending. Dependent variables included six utilization-of-health-care-services count variables. These were the annual number of: 1) inpatient hospital admissions, 2) inpatient hospital days, 3) emergency department visits, 4) specialist physician visits, 5) primary care physician visits, and 6) prescription drug fills (30-day adjusted)—including overall and therapeutic class-specific medication use. The study also examined seven spending measures derived using allowed amounts from claims data. These were spending on: 1) inpatient hospitals, 2) emergency departments, 3) specialist physicians, 4) primary care physicians, 5) other outpatient, 6) prescription drugs, and 7) total healthcare.

As previously discussed, a key concern in this analysis was selection bias. To safeguard against obtaining biased estimates of the impact of the wellness program, this study conducted two analyses. First, it estimated linear fixed effects models, a method that has the advantage of controlling for any time-invariant personal characteristics that may confound the analysis. Unmeasured variables that change over time such as a person's diet and exercise, however, may still pose a problem under this approach. Consequently, the study also estimated instrumental variables (IV) regression models. In this analysis, explicit use is made of the quasi-experimental design of the financial incentives rollout in order to derive effect estimates unbiased in the presence of all confounders whether fixed over time or not. Surprisingly, the IV coefficients were quite similar in both magnitude and significance to their naïve counterparts, suggesting that confounding due to time-varying factors was not at issue. For brevity and since IV estimators are less efficient, the study presents only the linear fixed effects results. See the Appendix for more details.

Note: All models included the following covariates: geographic region, household size, health insurance plan type, annual wage amount, number of years of tenure with the employer, and the Charlson Comorbidity Index score.

Descriptive Statistics

Sample means are shown in Figure 13 for each of the three cohorts as of the beginning of the baseline year (2011). The sample was predominantly male (86–88 percent of union; 71 percent of non-union employees). Mean age was comparable across the three cohorts at about 47 years, and the majority of subjects resided in the western part of the United States. Household size averaged 2.5–2.7 individuals per family, and tenure was in the range of 15–17 years. Health status was essentially the same across the three cohorts when measured by the Charlson Comorbidity Index (CCI), a proxy measure of health status derived from diagnosis codes from medical claims data (Charlson, et al. 1987) (Deyo, Cherkin and Ciol 1992) (Quan, et al. 2005).[3]

All three cohorts had relatively high earnings in 2011. Non-union employees earned an average of $98,346 in 2011. Members of unions that did not bargain in the enhanced financial incentives earned an average of $94,542, whereas those who did earned an average of $62,731.

With respect to enrollment by type of health plan by the three cohorts in 2011, regardless of cohort, the majority of employees were covered under a preferred provider organization (PPO) (Figure 14). However, among members of unions with the incentive, those enrollees not in the PPO were in the point of service (POS) plan. In contrast, among non-union members and the Control Group, very few were enrolled in the POS plan. Instead they were enrolled either in the exclusive provider organization (EPO) or a health maintenance organization (HMO). Overall, very few employees chose the consumer-directed health plan (CDHP) in 2011.

Despite there being no differences in the CCI by cohort, there were some small differences in utilization of health care services. There were 14.2 (per 1,000 individuals) hospital admissions among members of unions that bargained in the incentive; 15.2 admissions among non-union employees; and 15.4 admissions among members of unions without the incentive (i.e., the Control Group) (Figure 15). The number of hospital days (per 1,000 individuals) was highest among non-union employees (41.8), compared with 38.3 among members of unions without the incentive and 37.6 among members of the unions with the incentive. Utilization of emergency departments was also highest among non-union employees (122.4 per 1,000 individuals), compared with 111.6 among members of unions without the incentive and 106.7 for the Control Group. Visits to specialists and primary care physicians were about the same across the three cohorts. The number of prescription drug fills was highest among non-union employees (16.2), compared with 15 among members of unions without the incentive and 14.8 among members of unions with the incentive.

Total spending and spending by type of health care service is shown in Figure 16. On average, baseline annual spending was highest among non-union employees ($3,679), compared with $3,588 among members of unions that did not bargain in the financial incentive and $3,382 among members of unions that did bargain it in. Otherwise, the distribution of total spending was about the same across all three cohorts.

Results

Financial Incentives Effect on Wellness Program Participation

As described above, financial incentives for HRAs were changed from a $50 gift card to a $20/month premium discount for non-union employees in 2012, and for members of unions that bargained in the incentive starting in 2013. There was no change in financial incentives for HRAs for members of unions that did not bargain in the premium discount. According to the bivariate results, participation in HRAs increased from 66 percent in 2011 to 95 percent in 2012 among non-union employees (Test Group 2), and was 93 percent in 2013—an effect that would be expected (Figure 17).

Figure 13

Sample Means, by Cohort, 2011

Variable	Test Group 1: Select Union Members (n=15,312)	Test Group 2: Non-Union Employees (n=40,547)	Control Group: Other Union Members (n=16,123)
Male	86%	71%	88%
Age (years)	47.2	47.1	46.5
Region			
Northeast	0%	2%	2%
Midwest	1%	23%	9%
South	0%	17%	1%
West	99%	58%	88%
Household size (individuals)	2.5	2.7	2.6
Tenure (years)	15.3	16.7	17.3
Charlson comorbidity index	0.19	0.19	0.19
Annual earnings	$62,731	$98,346	$94,542

Source: EBRI analysis based on administrative claims data.

Notes:

Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.

Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.

Control Group = No incentive for biometric screening, no incentive for health risk assessments.

Figure 14

Distribution by Type of Health Plan, by Cohort, 2011

Variable	Test Group 1: Select Union Members (n=15,312)	Test Group 2: Non-Union Employees (n=40,547)	Control Group: Other Union Members (n=16,123)
PPO[a]	61%	73%	75%
EPO[b]	0%	11%	16%
HMO[c]	0%	13%	8%
POS[d]	39%	0.2%	0.3%
CDHP[e]	0%	3%	1%

Source: EBRI analysis based on administrative claims data.

Notes:

Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.

Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.

Control Group = No incentive for biometric screening, no incentive for health risk assessments.

[a] Preferrred provider organization.

[b] Exclusive provider organization.

[c] Health maintenance organization.

[d] Point of service health plan.

[e] Consumer-driven health plan.

Figure 15

Mean Utilization of Health Care Services, by Cohort, 2011

Variable	Test Group 1: Select Union Members (n=15,312)	Test Group 2: Non-Union Employees (n=40,547)	Control Group: Other Union Members (n=16,123)
Inpatient hospital admissions (per 1,000 individuals)	14.2	15.2	15.4
Inpatient hospital days (per 1,000 individuals)	37.6	41.8	38.3
Emergency department visits (per 1,000 individuals)	111.6	122.4	106.7
Specialist physician visits	1.2	1.7	1.4
Primary care physician visits	2.3	2.0	2.0
Prescription drug fills	15.0	16.2	14.8

Source: EBRI analysis based on administrative claims data.

Notes:

Test Group 1=No incentive for biometric screening, incentive for health risk assessments in 2013.

Test Group 2=Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.

Control Group=No incentive for biometric screening, no incentive for health risk assessments.

Figure 16

Mean Spending on Health Care Services, by Cohort, 2011

Variable	Test Group 1: Select Union Members (n=15,312)	Test Group 2: Non-Union Employees (n=40,547)	Control Group: Other Union Members (n=16,123)
Total healthcare spending	$3,382	$3,679	$3,588
Inpatient hospital	251	251	262
Emergency department	142	102	117
Specialist physician	155	177	182
Primary care physician	309	216	260
Other outpatient	1,515	1,785	1,733
Prescription drug	1,009	1,147	1,034
	(distribution by cohort)		
Total healthcare spending	100%	100%	100%
Inpatient hospital	7%	7%	7%
Emergency department	4%	3%	3%
Specialist physician	5%	5%	5%
Primary care physician	9%	6%	7%
Other outpatient	45%	49%	48%
Prescription drug	30%	31%	29%

Source: EBRI analysis based on administrative claims data.

Notes:

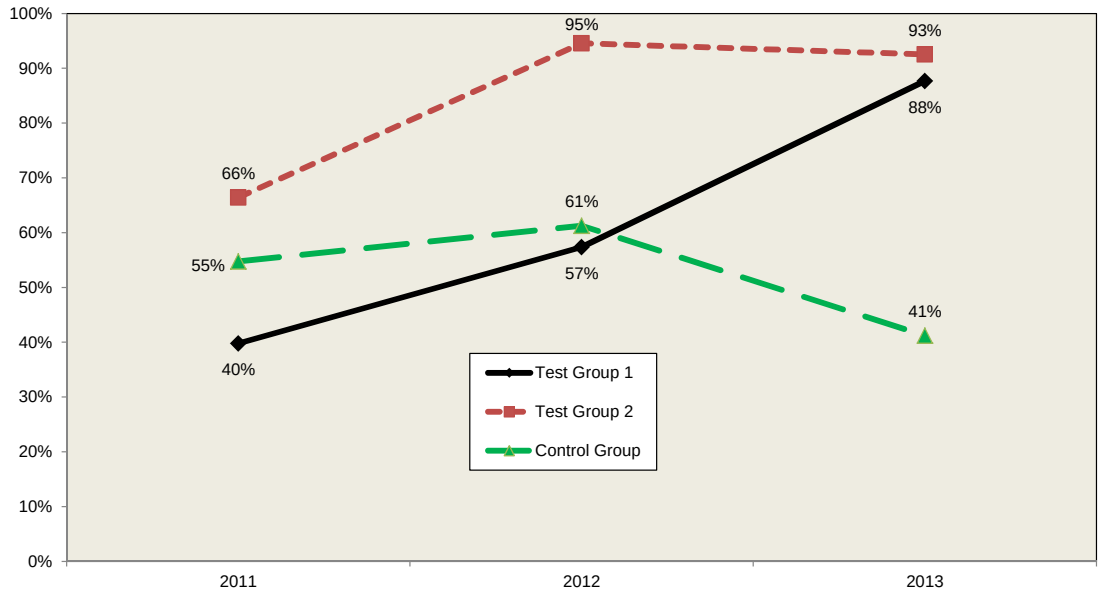
Test Group 1= No incentive for biometric screening, incentive for health risk assessments in 2013.
Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and
Control Group = No incentive for biometric screening, no incentive for health risk assessments.

Participation in HRAs increased from 57 percent in 2012 to 88 percent in 2013 among members of unions that bargained in the incentive (Test Group 1). Interestingly, participation increased from 40 percent in 2011 to 57 percent in 2012, even before the change in the financial incentive took place. This may have occurred because of stepped-up communication efforts that reached all employees through banners, posters, internal mail pushes, supervisor crew meetings, and other means, which likely brought about a greater focus on health. Participation in HRAs among members of unions that did not bargain in the premium discount also increased from 55 percent in 2011 to 61 percent in 2012 (Control Group). However, participation fell to 41 percent in 2013, a finding that is yet unexplained.

To continue receiving the $20/month premium discount in 2013, non-union employees not only had to continue participating in HRAs, but they also had to participate in the biometric screening program. According to the bivariate findings, participation in the biometric screening program increased from 22 percent in 2012 to 89 percent in 2013 among non-union employees. Again, this was the kind of effect that would have been expected from the change in financial incentives (Figure 18). Members of unions did not receive any financial incentive for participating in the biometric screening program, yet there was a slight increase in participation rates. The participation rate increased from 9 percent in 2012 to 17 percent among members of unions that bargained in the $20/month premium discount for participation in HRAs. It increased from 17 percent to 29 percent among members of the Control Group. Increased member-communication efforts that reached all employees may have contributed to these higher participation rates.

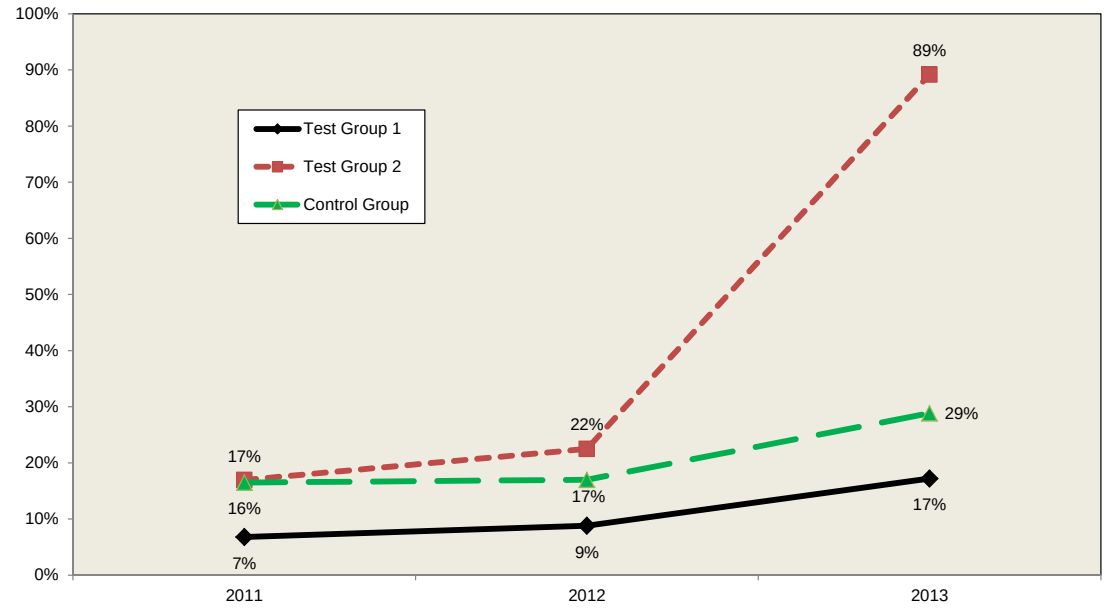
Figure 19 shows results from the multivariate regression model of participation in HRAs. Separate estimates are presented for members of unions that bargained in the $20/month premium discount for participation in HRAs starting in 2013 (Test Group 1), and non-union employees who started receiving the premium discount in 2012 (Test Group 2). Both the 2012 and 2013 effects are relative to 2011. Only the coefficients from the regression related to the impact of the financial incentive on participation are presented. Participation in HRAs increased by 50 percentage points among members of unions that bargained in the incentive for plan year 2013 (Test Group 1), and increased 22 percentage points among non-union employees for plan year 2012 (Test Group 2). Note again this was expected, since there was no change in financial incentives in plan year 2012 for members of unions that bargained in the premium discount for plan year 2013. However, it was found that participation increased 11 percentage points in 2012. As mentioned above, stepped-up communications efforts that reached all employees may have contributed to this higher participation rate.

Figure 17
Participation in Health Risk Assessments, by Cohort, 2011–2013



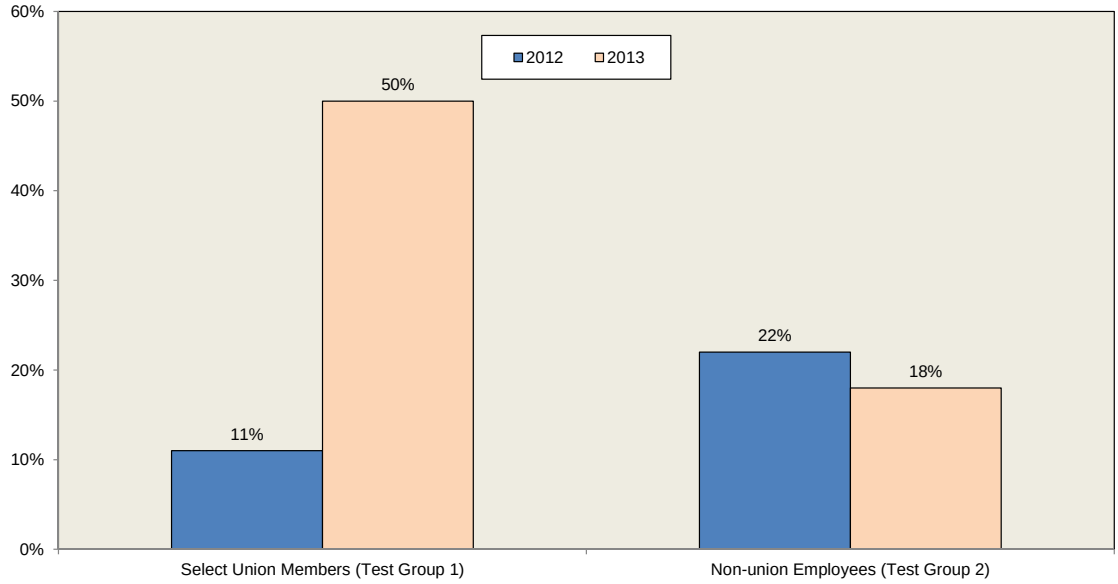
Source: EBRI analysis based on administrative claims data.
Notes:
Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.
Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.
Control Group = No incentive for biometric screening, no incentive for health risk assessments.

Figure 18
Biometric Screening Participation, 2011–2013



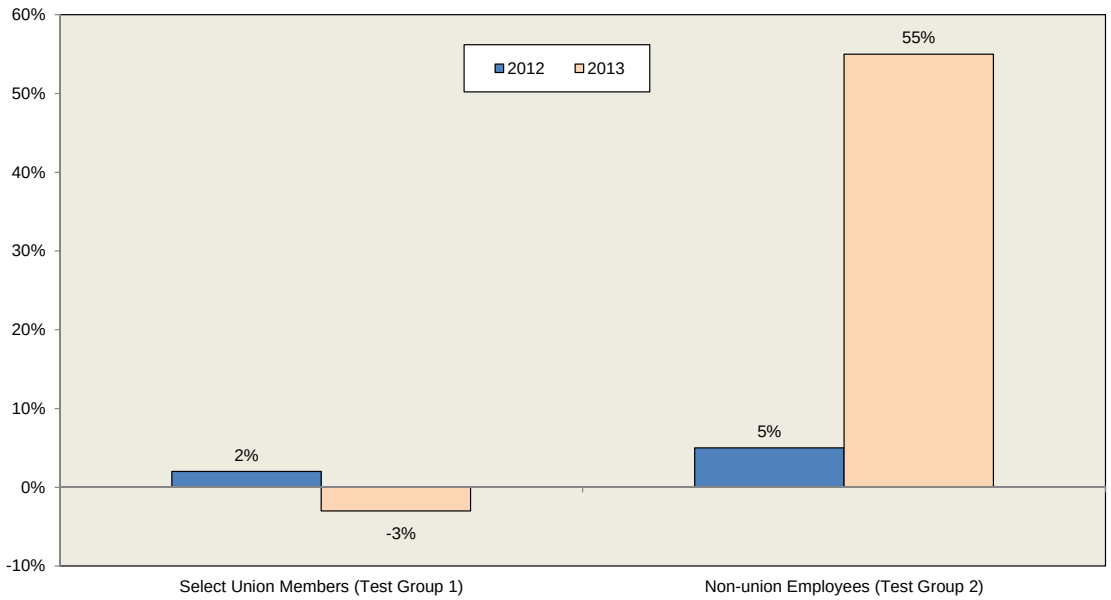
Source: EBRI analysis based on administrative claims data.
Notes:
Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.
Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.
Control Group = No incentive for biometric screening, no incentive for health risk assessments.

Figure 19
Impact of Financial Incentives on Participation in Health Risk Assessments (HRAs)



Source: EBRI analysis based on administrative claims data.
Notes:
Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.
Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013.

Figure 20
Impact of Financial Incentives on Biometric Screening Participation



Source: EBRI analysis based on administrative claims data.
Notes:
Test Group 1 = No incentive for biometric screening, incentive for health risk assessments in 2013.
Test Group 2 = Incentive for biometric screening in 2013, incentive for health risk assessments in 2012 and 2013

Figure 20 shows the regression model results for biometric screening participation. As expected, requiring non-union employees to participate in biometric screenings in addition to HRAs in order to receive the $20/month premium discount resulted in a 55-percentage-point increase in participation. As expected, the change in financial incentives had a small impact (5 percentage points) the year before the requirement to get the premium discount took effect. Similarly, union members did not receive any financial incentive to participate in the biometric screening program. The regression results show the financial incentives increased participation by 2 percentage points in plan year 2012, and reduced participation by 3 percentage points in 2013—findings perhaps also attributed to changes in member messaging.

Wellness Program Effects on Utilization of Health Care Services and Spending

Figure 21 reports the impacts of HRAs and biometric screenings on utilization of health care and spending as estimated by the multivariate regression models. No significant effects of participation in HRAs on utilization of health care services and spending were found; that is, all coefficients were statistically indistinguishable from zero. To assess whether these non-findings were potentially due to the study's use of ordinary least squares models with the non-normal distributions of the dependent variables, the study also estimated non-linear fixed effects Poisson models, but results were not meaningfully different. Results from the models estimating the impacts of biometric screenings on utilization of health care services and spending were similar with one exception: Biometric screenings led to an average increase of 0.31 annual prescription drug fills ($p<0.01$), with related spending higher by $56 per member per year ($p<0.01$).

To investigate the main finding further, the prescription drug fills and spending models were re-estimated by therapeutic class, and the coefficients sorted according to magnitude (where statistically significant). Figure 22 presents selected results from this exercise. The largest increase in medication utilization was for statins, which are widely used to treat high cholesterol. This therapeutic class accounted for one-sixth of the overall increase in prescription drug utilization. Second were SSRIs/SNRIs (for depression and anxiety), ACE inhibitors (for hypertension), followed by thyroid hormones for hypothyroidism. Also significantly higher was the utilization of biologic response modifiers and immunosuppressants. These specialty medications are used to treat autoimmune diseases, such as rheumatoid arthritis and multiple sclerosis, and are relatively expensive compared with non-specialty medications. In fact, the added spending associated with the combined increase in fills of 0.02 was $27 per member per year—about one-half of the overall increase in prescription drug spending from biometric screenings.

Conclusions

This paper confirms that financial incentives—on the order of $240 per employee per year—were successful at encouraging widespread participation in this employer's workplace wellness program, specifically health risk assessments and biometric screenings. In other work, EBRI has reported that these incentives brought in less-healthy individuals—those arguably in most need of the program (Fronstin and Roebuck 2015). This finding is not surprising, given that reluctant enrollees may require compensation for their opportunity cost of time.

Of course, the pressing question is: Are these incentives worth it for employers? In the one year following the completion of health risk assessments, no effect was seen on utilization of health care services and spending. Biometric screenings, on the other hand, increased prescription drug utilization and spending in the first year post-participation. Unsurprisingly, statins were the most positively affected therapeutic class, which one might expect since cholesterol levels were included in the biometric screening. Other evidence of chronic disease may also have been uncovered during the biometric screening process, leading to initiation or improved adherence on pharmacotherapy.

As yet, this study is unable to examine the wellness program's effect beyond one year. As more data become available, it will be possible to detect whether or not HRAs and biometric screenings lead to changes in member behavior, improvements in health, and ultimately, reductions in utilization of health care services and spending.

Figure 21

Impact of Wellness Program on Utilization of Health Care Services and Spending

	HRA	Biometric Screening
Utilization of Health Care Services		
Inpatient hospital admissions	0.001	-0.0002
Inpatient hospital days	0.002	-0.003
Emergency department visits	0.002	-0.003
Specialist physician visits	0.01	0.002
Primary care physician visits	0.01	-0.001
Prescription drug fills	0.08	0.31***
Spending		
Total	-$2	$53
Inpatient hospital	6	8
Emergency department	1	-4
Specialist physician	1	1
Primary care physician	2	-2
Other outpatient	-1	-6
Prescription drug	-11	56***

Source: EBRI analysis based on administrative claims data.

Notes:

*** Statistically significant at the 0.01 level.

Figure 22

Impact of Biometric Screening Participation on Prescription Drug Utilization and Costs by Therapeutic Class

Prescription Drug Fills	Statistical Impact
Therapeutic Classes (Treatment Conditions)	
Statins (Dyslipidemia)	0.05 ***
SSRIs/SNRIs (Depression, Anxiety)	0.03 ***
ACE inhibitors (Hypertension)	0.03 ***
Thyroid hormones (Hypothyroidism)	0.02 ***
Biologic response modifiers (Some Cancers and Autoimmune diseases such as Rheumatoid arthritis and Crohn's)	0.01 ***
Immunosuppressants (Autoimmune diseases such as rheumatoid arthritis, multiple sclerosis, and Crohn's)	0.01 ***
Prescription Drug Spending	
Immunosuppressants (Autoimmune diseases such as rheumatoid arthritis, multiple sclerosis, and Crohn's)	$15.31 **
Biologic response modifiers (Some Cancers and Autoimmune diseases such as rheumatoid arthritis and Crohn's)	$12.10 **

Source: EBRI analysis based on administrative claims data.

Notes:

SSRI = Selective serotonin reuptake inhibitors; SNRI = Serotonin-norepinephrine reuptake inhibitors; ACE = Angiotensin-converting enzyme.

*** Statistically significant at the 0.01level.

** Statistically significant at the 0.05 level.

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Endnotes

[1] See Sponsor highlights spreadsheet Table 1 at http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html

[2] Although health risk assessments and biometric screenings were generally completed during the fourth quarter of a given calendar year (e.g., 2011), participation in those programs resulted in premium discounts in the following plan year (e.g., 2012). Using the latter notation, a contemporaneous model structure was adopted because HRAs and biometric screening results received by the member at the end of the previous year can be expected to largely impact utilization of health care services and spending in the next plan year.

[3] The CCI is an index that theoretically ranges from 0 to 37, with higher scores indicating greater disease burden.

[4] Given that the dependent variables had non-normal distributions, fixed effects Poisson models were also run, but results were quantitatively similar.

Appendix–Econometric Analysis

Financial Incentives Effects on Wellness Program Participation

To examine the effects of financial incentives on wellness program participation, a difference-in-differences (DiD) analytical approach was used with person-level fixed effects. Specifically, the following models were specified:

$$HRA_{it} = \alpha_i + \beta_1(TEST1_i * t_{2012}) + \beta_2(TEST2_i * t_{2012}) + \beta_3(TEST1_i * t_{2013}) + \beta_4(TEST2_i * t_{2013}) + \gamma_1 t_{2012} + \gamma_2 t_{2013} + X_{it}\theta + \varepsilon_{it} \quad (1)$$

$$BIO_{it} = \delta_i + \overline{\beta_1}(TEST1_i * t_{2012}) + \overline{\beta_2}(TEST2_i * t_{2012}) + \overline{\beta_3}(TEST1_i * t_{2013}) + \overline{\beta_4}(TEST2_i * t_{2013}) + \overline{\gamma_1} t_{2012} + \overline{\gamma_2} t_{2013} + X_{it}\bar{\theta} + \omega_{it} \quad (2)$$

Individuals and time are indexed using *i* (from 1 to N) and *t* (years 2011, 2012, and 2013). The dichotomous dependent variables, *HRA* and *BIO*, indicate whether or not person *i* for plan year *t* received a health risk assessment or biometric screening, respectively. *TEST1* and *TEST2* record the individual's Test Group assignment (as previously described). The Control Group and year 2011 are the excluded categories. *X* represents a vector of time-varying, person-level covariates including geographic region, household size, health insurance plan type, annual wage amount, number of years of tenure with the employer, and the Charlson Comorbidity Index score. Individual fixed effects are included in the models as denoted by α_i and δ_i. Moreover, ε_{it} and ω_{it} are the idiosyncratic error terms. Finally, β_1, β_2, β_3, β_4, γ_1, γ_2, and θ are parameters to be estimated. Note that bar accents are used to distinguish coefficients in the BIO equation from their counterparts in the specification of HRAs. Ordinary least squares was used to estimate the models with robust standard errors clustered by person.

Since the financial incentive for participation in HRAs was implemented in 2013 for Test Group 1, and was in effect in 2012 and 2013 for Test Group 2, then β_2, β_3, and β_4 are estimates of the impact of the financial incentive on participation in HRAs. An underlying assumption of DiD modeling is that the trends in the dependent variable are equivalent across groups prior to treatment. Thus, $\beta_1 = 0$ represents a test of our identification approach, since both Test Group 1 and the Control Group still had the same incentive structure for HRAs in 2012. Similarly, the financial incentive for BIO participation was only in place for Test Group 2 in 2013. Thus, $\bar{\beta}_4$ reports the incentive effect on BIO participation; and $\bar{\beta}_1$, $\bar{\beta}_2$, and $\bar{\beta}_3$ are each expected to be equal to zero.

Wellness Program Participation Effects on Utilization of Health Care Services and Spending

To investigate wellness-program-participation impacts on utilization of health care services and spending, the study used the following model to estimate using ordinary least squares with robust standard errors clustered by person.[4]

$$Y_{it} = \pi_i + \rho HRA_{it} + \sigma BIO_{it} + \delta_1 t_{2012} + \delta_2 t_{2013} + X_{it}\vartheta + u_{it} \quad (3)$$

Y_{it} is a vector of six health care services utilization count variables: 1) inpatient hospital admissions, 2) inpatient hospital days, 3) emergency department visits, 4) specialist physician visits, 5) primary care physician visits, and 6) prescription drug fills (30-day adjusted)—including overall and therapeutic class-specific medication use. Y_{it} also contains the following seven spending measures derived using allowed amounts from claims data: 1) inpatient hospital spending, 2) emergency department spending, 3) specialist physician spending, 4) primary care physician spending, 5) other outpatient spending, 6) prescription drug spending, and 7) total healthcare spending. As noted above, *X* represents a vector of time-varying, person-level covariates including geographic region, household size, health insurance plan type, annual wage amount, number of years of tenure with the employer, and the Charlson Comorbidity Index score. Individual fixed effects are included in the model as denoted by π_i, and u_{it} is the idiosyncratic error term. All other variables are as previously defined.

HRA and BIO are indicators for whether an individual completed either program. Because HRA and BIO are completed prior to the start of a given plan year, the study model precludes obtaining incorrect estimates of ρ and σ due to reverse causality. However, because HRA and BIO are voluntary programs, participants may differ from nonparticipants on unobserved characteristics, which if correlated with utilization of health care services and spending may lead to

biased estimates of the effects of HRA and BIO. While the inclusion of individual fixed effects in the model safeguards against this potential endogeneity due to time-invariant unobservables, dynamic confounders may remain. Therefore, an instrumental variables (IV) analysis was also conducted to obtain unbiased estimates of ρ and σ. Specifically, since financial incentives were implemented for selected cohorts in certain years, individuals were essentially pseudo-randomized to HRA and BIO. Hence, time-by-group interaction terms served as instruments in a two-stage IV estimation framework. Models (1) and (2) comprised the first stage, and the second stage is given below.

$$Y_{it} = \overline{\pi_i} + \rho_{IV}\widehat{HRA_{it}} + \sigma_{IV}\widehat{BIO_{it}} + \overline{\delta_1}t_{2012} + \overline{\delta_2}t_{2013} + X_{it}\bar{\vartheta} + \overline{u_{it}} \qquad (4)$$

Equation (4) differs from (3) in that predicted—rather than actual—values of HRA and BIO obtained from (1) and (2) enter the model. The IV estimates are ρ_{IV} and σ_{IV}. Again, bar accents distinguish coefficients in (4) from their counterparts in (3), and ordinary least squares was employed to estimate the model with robust standard errors clustered by person. Surprisingly, the IV coefficients were quite similar in both magnitude and significance to their naïve counterparts, suggesting that confounding due to time-varying factors was not at issue. For brevity and since IV estimators are less efficient, only the (non-IV) linear fixed effects results from equation (3) are presented in the paper.

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