

The Impact of an Integrated Population Health Enhancement and Disease Management Program on Employee Health Risk, Health Conditions, and Productivity

Ron Loeppke M.D., M.P.H.,¹ Sean Nicholson Ph.D.,² Michael Taitel Ph.D.,³ Matthew Sweeney,²
Vince Haufle M.P.H.,³ and Ronald C. Kessler, Ph.D.⁴

Abstract

This study evaluated the impact of an integrated population health enhancement program on employee health risks, health conditions, and productivity. Specifically, we analyzed changes in these measures among a cohort of 543 employees who completed a health risk assessment in both 2003 and 2005. We compared these findings with 2 different sets of employees who were not offered health enhancement programming. We found that the DIRECTV cohort showed a significant reduction in health risks after exposure to the program. Relative to a matched comparison group, the proportion of low-risk employees at DIRECTV in 2005 was 8.2 percentage points higher; the proportion of medium-risk employees was 7.1 percentage points lower; and the proportion of high-risk employees was 1.1 percentage points lower ($p < 0.001$).

The most noticeable changes in health risk were a reduction in the proportion of employees with high cholesterol; an improvement in diet; a reduction of heavy drinking; management of high blood pressure; improved stress management; increased exercise; fewer smokers; and a drop in obesity rates.

We also found that a majority of employees who improved their risk levels from 2003 to 2005 maintained their gains in 2006. Employees who improved their risks levels also demonstrated relative improvement in absenteeism.

Overall, this study provides additional evidence that integrated population health enhancement positively impacts employees' health risk and productivity; it also reinforces the view that "good health is good business." (*Population Health Management* 2008;11:287–296)

Introduction

EMPLOYERS PROVIDE A SUBSTANTIAL AMOUNT of compensation to their employees in the form of health insurance.¹ Approximately 60% of the US population is covered by employer-sponsored health insurance.² The cost of providing health care benefits continues to be an important issue for companies as indicated by a 2007 survey conducted by Deloitte Consulting and the International Society of Certified Employee Benefit Specialists.³ According to a 2007 Kaiser Family Foundation survey, employers spent an average of \$3785 and \$8824 for a single health plan and a family, respectively, above and beyond the employee's contribution. The average health insurance premium increased 6.1% in 2007, and since 2001 premiums have increased 78%.⁴

Analysis has shown that the rising health care costs in the United States are more related to the growing burden of illness and health risk and subsequent increased utilization of health care services than the increase in unit price for those health care services.⁵ Furthermore, direct medical expenditures are just 1 component of an employer's total health-related costs. Relative to a healthy person, an employee in poor health is more likely to be absent from work and less productive when he or she is at work; both of these situations impose real costs on an employer as well as on employees.^{6,7,8,9,10} Several studies suggest that the costs associated with employee absenteeism and reduced on-the-job productivity due to poor health (presenteeism) are on average 3 times more costly compared to medical and pharmacy claims costs alone.^{6,11,12,13} In an analysis of claims data from 6 large

¹Alere, Marietta, Georgia.

²Cornell University, Ithaca, New York.

³Alere, Rosemont, Illinois.

⁴Harvard University, Boston, Massachusetts.

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US employers, the costs of reduced on-the-job productivity (presenteeism) were 61% of total health-related costs, on average, for 10 different conditions, and presenteeism costs were larger than direct medical expenditures for 9 of the 10 conditions.¹⁴

Employees who have health risks and chronic health conditions tend to have relatively high medical expenditures.^{15,16,17,18,19} Furthermore, health risks and chronic health conditions negatively impact employee absenteeism and presenteeism.^{6,8,9,10,11,20,21,22} Many employers, recognizing the relationship between poor employee health and health-related costs, have responded by implementing health promotion and/or disease management (DM) programs in an effort to improve workers' health behaviors and health, and thereby boost profits. Health promotion programs try to improve the health of the entire employee population, whereas DM programs typically focus on individuals who have a specific disease or condition. In 2007, a national survey of 500 employers found that 82% offered health promotion programs and 68% offered DM programs. The employers indicated that the most important program objectives were to "reduce medical cost," "reduce absence," and "improving health."²³

Although 90% of US worksites with over 50 employees offer at least 1 health promotion program, only a small proportion of employers offer comprehensive health promotion programs.²⁴ Results from the 2004 National Worksite Health Promotion indicate that only 6.9% of the responding worksites offer a comprehensive health promotion program as defined by Healthy People 2010, which by definition includes the following elements: health education, supportive environments, integration into organizational structure, links to employee support services, and health screenings.^{25,26}

In spite of the mounting evidence of a relationship between employee health and medical expenditures as well as health-related productivity, it has been difficult to convince some employers that worksite health promotion programs can have a *causal* impact on employee health, medical expenditures, and productivity. The fundamental problem is that few employers have good data either on their workers' health status or the outputs they produce.^{27,28,29} As a result, few evaluations of employer-sponsored health promotion programs have been scientifically rigorous.

In order to make a compelling business case for the investment in comprehensive population health enhancement strategies, scientific and economic evidence is needed to confirm that these programs actually improve workers' health, reduce medical expenditures, and increase workers' productivity. In this case study, we examine the impact of an integrated population health enhancement program on the health risks, health conditions, and work performance of employees at DIRECTV. A subsequent paper will examine the financial impact of the program, including the change in medical expenditures.

Description of the integrated population health enhancement program at DIRECTV

With the guidance of their corporate medical director, DIRECTV implemented an integrated population health and enhancement strategy. In April 2003, a health risk assessment (HRA) was distributed to all employees enrolled in a self-in-

sured health plan. Employees received a \$15 gift certificate for taking the HRA. Then, based on the risks identified from their HRA, employees could earn a \$300 credit off their health insurance premium for the following year if they were identified as being low risk, or if they were identified as moderate or high risk and they were willing to participate in the recommended health improvement program. Employees also were encouraged to have their blood pressure, cholesterol, height, and weight measured by a nurse. A total of 2098 DIRECTV employees, or 60% of those eligible, completed the 2003 HRA.

The primary health improvement program in 2003 was a lifestyle management program. An employee was deemed eligible for the lifestyle management program if he or she was defined as high risk based on the HRA responses. For example, a person who had a fasting glucose level over 110 was eligible for the prediabetes program. By October 2003, 721 employees had been deemed eligible for 1 of the 6 different lifestyle management programs and 503 employees had enrolled. The enrollment figures by program were: prediabetes (7), cholesterol (197), stress management (13), blood pressure (63), smoking (92), and weight management (131).

Employees received coaching in person or on-line from a personal coach, who was a registered nurse, a dietician, and/or an exercise physiologist. They also received an individual action plan that specified 6- and 12-month risk reduction goals (eg, quitting smoking in 6 months, losing a specific amount of weight). The intervention included a minimum of 6 educational mailings and 6 phone sessions with the personal health coach.

Also in 2003, DIRECTV decided to implement a more sophisticated population health and productivity management program at its call center in Boise, Idaho. Approximately 1325 people were employed at the Boise Call Center in March 2003; most were customer service representatives. The Boise initiative included all of the programmatic features of the corporate-wide programs but added an innovative incentive system for DIRECTV employees and their physicians in the Boise area in an attempt to focus on quality of care and to foster prevention and wellness initiatives.

The model aligned incentives and engaged physicians as well as patients with feedback and support to meet prevention and treatment, evidence-based medicine guidelines to enhance consistency in the quality of care. For example, based on claims data, physicians were informed of the steps that a patient had yet to accomplish in an evidence-based treatment plan. Physicians and their DIRECTV patients received "quality" points according to how closely they followed certain evidence-based clinical and prevention guidelines. In fact, savings were generated even after taking into account all program costs as well as taking into consideration estimated savings from benefit plan changes. A predetermined percentage of the program savings (medical cost savings plus health-related productivity savings) were allocated to DIRECTV employees and their physicians in proportion to the quality points earned by each of them. The employee and physician quality point incentive program ran from April 2003 through December 2004.

In April 2004, all DIRECTV employees were again offered financial incentives to take the HRA and participate in the programs for which they were identified as suitable candidates. The 2004 integrated population health enhancement

initiative included 2 other significant program enhancements—demand management and DM—that were offered in addition to the lifestyle management program. All employees who took the HRA were eligible for and automatically enrolled in the demand management program. This program offered a 24 hour/7 day a week nurse help line that allowed employees to call with questions or to seek advice (eg, whether their health condition merited seeing a physician on an urgent basis or could wait for a scheduled visit). In addition, employees who had the most complex and costly medical conditions were eligible for telephonic, nurse-based DM.

Eligibility for DM was “refreshed” each month, so that employees with recent, expensive medical treatment would be identified for enrollment on an ongoing basis. The DM program covered multiple chronic conditions and consisted of evidence-based medicine coaching, care management, health education, lifestyle management, and consultation with the employee’s physician or other providers as needed for care coordination. Employees in a DM program were assigned to a primary nurse who would build an ongoing relationship with them and help them manage their symptoms and comply with their medications.

This integrated population health enhancement program of HRAs, lifestyle management, demand management, and DM was offered to all eligible DIRECTV employees in 2004, 2005, and 2006. To the best of our knowledge, no other large-scale health promotion programs were offered in the Boise area during the study period.

Methods

Data

The primary sample consists of the 543 DIRECTV employees who completed both the 2003 and the 2005 HRA questionnaires (Table 1). When examining the persistence of changes in health risks, we restrict the sample to the subset of the 58 employees whose risk improved from 2003 to 2005 and who also completed the 2006 HRA.

We use 2 different comparison groups in order to evaluate the impact of the integrated population health enhancement programs at DIRECTV. The first is derived from a “natural flow” model developed by Edington¹⁷ that calculates the health risks from year 1 to year 2 in a population in which employees did not participate in a health promotion program. Based on the baseline age, sex, and risk level distribution of the DIRECTV sample, a natural flow was estimated using Risk-EstimatorTM and a modified Natural Flow Estimator.TM Natural Flow Estimator is based on a longitudi-

nally, non-intervened control population of active employees (N = 180,767) following a Markov Chain Order 2 model.³⁰ The natural flow estimates, appropriately adjusted for baseline risk profile, age, and sex, describes a benchmark health risk trend over time for a population for whom there is no intervention.

Although the DIRECTV data span 3 years (2003 to 2006), we use the 1-year health risk transition results to represent conservatively what may have happened to the DIRECTV employees’ health risks if there had been no intervention.

We also use a separate comparison group to examine the change in health conditions, health-related absences, and presenteeism among employees who are similar to those at DIRECTV but who did not participate in a health improvement program. This comparison group was selected from the nationally representative benchmark database of workers from many different companies who have completed the World Health Organization’s Health and Work Performance Questionnaire (HPQ).^{31,32} Based on the 2003 DIRECTV HRA and payroll data, we matched the baseline characteristics of employees who subsequently completed the 2005 HRA with 1349 randomly selected respondents in the HPQ database who were not enrolled in a health promotion program on age, sex, job type, health risks, health conditions, health-related absences, and presenteeism. Although ideally we would prefer a comparison group that filled out HRAs over a 2-year rather than a 1-year period, we used the HPQ database-matched employees as a counterfactual for the DIRECTV intervention.

Variable description

Information on health risks, health conditions, health-related absences, and productivity were obtained from employees’ responses to the HRA and HPQ questions. We multiplied an employee’s response to the following question by 12 to estimate their annual number of health-related absences: “In the past 4 weeks (28 days), how many days did you miss an entire work day because of your problems with your physical or mental health?”^a The productivity question was worded as follows: “Using the same 0 to 10 scale (where 0 is the worst job performance anyone could have at your job and 10 is the performance of the top worker), how would you rate your overall job performance on the days you worked during the past 4 weeks?”

We count the number of health risks for each employee in 2003, 2005, and 2006 using responses from the HRA and, when available, clinical measures such as a person’s recorded blood pressure, cholesterol level, height, and weight. We adopt health risk definitions that are similar to those used by Edington,¹⁷ Burton et al,¹⁶ and Musich et al.^{b,33} Definitions of the 12 health risks are reported in Table 2. Following Edington,¹⁷ we define employees with 0–2 health risks as “low” risk, those with 3–4 health risks as “medium” risk, and those with 5 or more health risks as “high” risk.

TABLE 1. BASELINE DEMOGRAPHICS OF THE DIRECTV EMPLOYEE SAMPLE

n	543
Percent female	58.9%
Mean age (years)	37.6
Percent <35 years old	42.3%
Percent 35–44 years old	35.8%
Percent 45–54 years old	18.0%
Percent ≥55 years old	3.9%

^aEmployees were also asked to indicate how many days they missed part of a work day, which we interpret as one-half of a full day when estimating annual health-related absences.

^bMusich et al include an indicator for whether a person regularly uses a seatbelt as well as a self-reported measure of a person’s life satisfaction. Although these measures are not available in our study, we do include a measure of whether a person’s diet is healthy.

TABLE 2. DEFINITION OF HEALTH RISKS

<i>Health risk measure</i>	<i>Health risk criteria</i>
Alcohol	More than 14 drinks per week
Blood pressure	Diastolic 89 mmHg or systolic >139 mmHg
Obesity	Body mass index >30
Cholesterol	Total blood cholesterol 239 or self-reported as having high cholesterol
Existing medical problem	Heart condition, diabetes, cancer, or bronchitis
Fatty diet	Person chooses high-fat food most or all of the time
Health-related illness days	Annualized health-related absences >5
Perception of health	Self-reported fair or poor
Physical activity	Person avoids walking or exertion, or occasionally exercises sufficiently to cause heavy breathing, or exercises enough to breathe heavily/perspire for 10–60 minutes per week
Smoking	Currently a smoker
Stress	During past 3 months, person has felt overwhelmed with pressure or stress a “moderate amount of time” or more
Overall risk levels	
Low risk	0–2 individual health risks
Medium risk	3–5 individual health risks
High risk	≥5 individual health risks

Source: Edington DW. Emerging research: A view from one research center. *Am J Health Promot.* 2001;15:341–349.

Procedure

We examined trends in health risks, health conditions, health-related absences, and on-the-job productivity (presenteeism) among DIRECTV employees who completed the HRA in both 2003 and 2005. We performed internal and external comparisons to try to identify the impact of the health improvement program. The internal analysis compared the change in outcomes for employees who experienced an improvement or reduction in health risks to employees who experienced no change in health risks and, separately, employees whose health risks worsened. The specific outcomes of interest are changes in health conditions, health-related absences, and employees' assessments of their on-the-job productivity (presenteeism). The external analysis compared changes in health risks between DIRECTV employees and the “unmanaged” employees from Edington's Natural Flow Estimator,¹⁷ and changes in health conditions, health-related absences, and presenteeism. We conduct 2-sided hypothesis tests and, depending on the statistic, report significance at the .05, .01, or .001 level.

Results

Aggregate health transitions

In Fig. 1, we show the risk level transitions for DIRECTV employees from 2003 to 2005. We find that 87.2% of low-risk employees in 2003 remained low risk in 2005, 11.3% moved to medium risk, and 1.5% moved to high risk. For employees with medium risk at baseline, 30.2% remained at medium risk, 59.5% moved to low risk, and 10.3% moved to high risk. For employees with high risk at baseline, 52.8% remained at high risk, 25.0% moved to medium risk, and 22.2% moved to low risk. These results show a strong population move-

ment from higher to lower risk levels with minimal reverse flow.

In Table 3, we report the distribution of health risk levels among the DIRECTV employees for 2003 and 2005. We also report the modeled risk levels based on the natural flow of risk in a matched comparison group without interventions. In 2003, 391 employees were identified as low risk, 116 as medium risk, and 36 as high risk. In 2005, the overall risk distribution for these employees improved with 418 at low risk, 88 at medium risk and 37 at high risk. The actual DIRECTV risk distribution in 2005 is statistically different from the projected natural flow distribution for the matched comparison group, which was estimated to have 374 low-risk, 127 medium-risk, and 43 high-risk employees. We found that the DIRECTV cohort showed a significant improvement after exposure to the program. Relative to a matched comparison group, the proportion of low-risk employees at DIRECTV in 2005 was 8.1 percentage points higher, the proportion of medium-risk employees was 7 percentage points lower, and the proportion of high-risk employees was 1.1 percentage points lower— χ^2 (2, $n = 543$) = 17.99, $P < .001$. If we accept the Edington data as providing a legitimate benchmark comparison, it appears that the integrated population health enhancement program led to a reduction in the health risks of the DIRECTV employees.

Transitions in specific health risks

In Table 4, we report the percentage of employees who had a particular health risk in 2003 who no longer had that risk in 2005. For example, of the 71 people with high cholesterol in 2003, 84.5% no longer reported high cholesterol in 2005. There were other strikingly large reductions for fatty diet, heavy drinking, high blood pressure, and an overall self-reported health rating of poor.

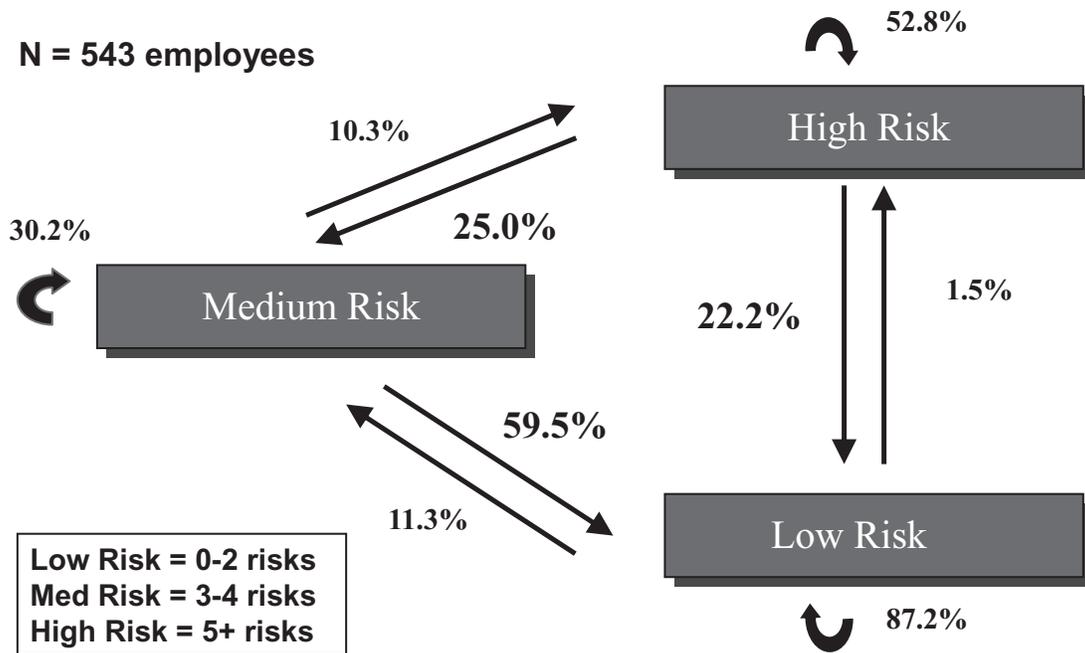


FIG. 1. Risk level transitions for DIRECTV employees from 2003 to 2005.

We now explore whether the improvement in health risks was due to changes in health behaviors. A number of studies in the medical literature have found that improvement in exercise and diet contribute to reductions in obesity, high blood pressure, high cholesterol, and the incidence of depression.^{34,35,36,37,38} In order to shed some light on how DIRECTV employees achieved the reduction in health risks, in Table 5 we examine the relationship between changes in exercise and dieting behavior between 2003 and 2005, on the one hand, and changes in the 4 health conditions mentioned earlier. As reported in the first 2 rows of Table 5, 35 of the 543 DIRECTV employees had a body mass index (BMI) greater than 30 in 2003, and thus were categorized as obese, but were able to reduce their BMI to below 30 by 2005. Among this group, 22.9% did not exercise regularly in 2005, down considerably from 34.3% in 2003 ($P \leq .01$). By contrast, employees who experienced no change in obesity between 2003 and 2005 generally exercised less in 2005 than 2003 (the second row of Table 5).

A similar pattern occurred for blood pressure: Employees experiencing an improvement between 2003 and 2005 were more likely to begin exercising regularly relative to all other

employees. Likewise, people who eliminated high blood pressure or high cholesterol experienced a more substantial improvement in their diet, as measured in percentage points, than people who experienced no change or worsened. This analysis indicates that changes in risk factors are interrelated: An improvement in exercise and/or diet may trigger improvements in obesity, blood pressure, and/or cholesterol management.

Persistence of changes in health risks

Employers will be more likely to invest in worker health if programs are able to achieve permanent, or at least persistent, health improvements. In Table 6 we explore whether the improvements in health risks at DIRECTV persisted beyond 2005. There were 58 employees whose health risks improved between 2003 and 2005 and who completed the 2006 HRA. Seventy-nine percent of the 43 employees who transitioned from a medium risk in 2003 to a low risk in 2005 remained at low risk in 2006 (the “northwest” cell of Table 6). This indicates a considerable degree of persistence. Although the sample sizes are smaller, the same patterns emerge in the

TABLE 3. DISTRIBUTION OF HEALTH RISK LEVELS FOR DIRECTV EMPLOYEES COMPARED WITH THE NATURAL FLOW MODEL

	DIRECTV actual		Natural flow 2005 model	2005 actual vs. 2005 model*	
	2003	2005		Difference (#)	Difference (percentage points)
Low risk	391 (72.0%)	418 (77.0%)	374 (68.9%)	44	8.1%
Medium risk	116 (21.4%)	88 (16.2%)	126 (23.2%)	-38	-7.0%
High risk	36 (6.6%)	37 (6.8%)	43 (7.9%)	-6	-1.1%
Total	543 (100%)	543 (100%)	543 (100%)		

* $\chi^2(2, n = 543) = 17.99 (P < .001)$

TABLE 4. PERCENTAGE OF DIRECTV EMPLOYEES WHO ELIMINATED A HEALTH RISK BETWEEN 2003 AND 2005 (BASED ON HRA SELF-REPORT)

Health risk	Number reporting the risk in 2003	Those without the risk in 2005 (%)
Fatty diet	185	83.8
Obesity	162	22.8
Lack of exercise	150	40.7
High blood pressure	83	68.7
High cholesterol	71	84.5
Trouble sleeping	65	38.5
Smoking	52	34.6
Poor health	32	59.4
Stress	29	44.8
Heavy drinking	23	82.6

HRA, health risk assessment.

second and third rows of Table 6. All 5 people who transitioned from a high risk in 2003 to a medium risk in 2005 remained a medium risk or further improved to a low risk in 2006. Likewise, none of the 6 people who transitioned from high to low risk in 2005 returned to high-risk status in 2006.

Changes in health conditions

A person who reduces his or her health risks may experience fewer acute episodes of a chronic condition, and/or less severe acute episodes of a chronic condition. In Table 7 we report the percentage of DIRECTV employees who reported having each of 11 different health conditions in 2003 and 2005, based on self-reports from the HRA. Most of the conditions are chronic. If a person reports having the condition in 2003 but not in 2005, we interpret this as a situation in which the severity of the condition has improved sufficiently that the person is not experiencing debilitating symptoms or effects. Between 2003 and 2005 the self-reported prevalence for 8 of the 11 conditions decreased. We found a substantial decrease in prevalence for allergy, asthma, and depression; a modest decrease for migraine, obesity, gastroesophageal reflux disease (or GERD), cancer, and bronchitis/emphysema; and an increase for diabetes, anxiety, and arthritis.

We present the trend in health condition prevalence in the matched comparison group on the right-hand side of Table 7. In the comparison population, prevalence rates decreased for 6 of 10 measured health conditions, increased for 3 conditions and one condition (migraine) remained the same. It is notable that the decreases in condition prevalence rate among the comparison population were generally smaller in magnitude than the DIRECTV population. Further analysis reveals that the change in health condition prevalence rates among the DIRECTV workers is statistically different at the 1% significance level from the change among the comparison population for each condition except diabetes.

Diabetes was one of the conditions that became more prevalent. Although we cannot determine with certainty, this finding may actually represent a positive effect of the intervention. The program identified previously undiagnosed individuals who had health risks for diabetes. This may have prompted them to visit their physician and subsequently to obtain an early diagnosis of diabetes rather than presenting with an acute event or breakthrough symptoms.

Effect of health improvements on work performance

In Fig. 2 we report the mean number of estimated annual health-related absences per DIRECTV employee for 2003 and 2005 separately for groups based on the change in their risk level between 2003 and 2005, as well as for employees in the comparison group for 2005 and 2006. Health-related absences remained constant between 2005 and 2006 in the matched comparison group. By contrast, DIRECTV employees whose risks decreased between 2003 and 2005 experienced a reduction of 3.5 health-related absence days per year, on average, during that time period. Health-related absences increased among DIRECTV employees whose risks remained the same (from 11.0 days to 24.1 days, on average) or whose risks increased (from 5.4 days to 24.2 days, on average) between 2003 and 2005. The reduction in absences among the DIRECTV workers whose risks decreased is statistically different at the 1% significance level from the change among DIRECTV workers who remained a medium or a high risk.

We present results for presenteeism in a similar format in Fig. 3. As with absences, there was little change in employees' self-assessed on-the-job productivity among the com-

TABLE 5. RELATIONSHIPS BETWEEN CHANGES IN HEALTH RISKS BETWEEN 2003 AND 2005*

Change in status between 2003 and 2005	Number of people	Lack of exercise		Fatty diet	
		2003 (%)	2005 (%)	2003 (%)	2005 (%)
No longer obese (based on BMI)	35	34.3	22.9	48.6	11.4
Everybody else	508	25.4	29.5	31.9	6.9
Eliminated high blood pressure	56	44.6	39.3	53.6	7.1
Everybody else	479	24.0	28.4	30.5	7.1
Eliminated high cholesterol	53	28.3	32.1	47.2	1.9
Everybody else	483	25.9	29.0	31.5	7.9
No longer report being depressed	54	48.1	48.1	46.3	11.1
Everybody else	476	23.7	27.3	31.7	6.9

* = the change between 2003 and 2005 in the proportion of people who have a lack of exercise or have a fatty diet is statistically different from the change for "everybody else" at the $P \leq .01$ significance level.
BMI, body mass index.

TABLE 6. PERSISTENCE OF RISK TRANSITIONS FOR EMPLOYEES WHOSE RISKS IMPROVED BETWEEN 2003–2005 (% OF EMPLOYEES, BY 2003–2005 TRANSITION, WHO ACHIEVED A SPECIFIC 2006 RISK LEVEL)

2003 to 2005 transition	Low	Medium	High
Medium to low (n = 43)	79%	19%	2%
High to medium (n = 5)	40%	60%	0%
High to low (n = 6)	67%	17%	17%

parison group over a 1-year period. Although DIRECTV employees whose risks improved or stayed the same experienced smaller on-the-job productivity reductions than employees whose risks worsened between 2003 and 2005, the productivity changes are not statistically significant between any of these groups of employees.

Discussion

This paper examines the impact of DIRECTV’s integrated population health enhancement program on its employees’ health risks, health conditions, and productivity between 2003 and 2005. Overall, the program appears to have improved the health of the workforce and mitigated a company-wide increase in health-related absences. Specifically, after exposure to the program, DIRECTV employees had improved health risks as demonstrated by a large shift in health risks from higher to lower risk levels. Furthermore, they had a significantly better health risk profile than a matched comparison group. A higher number of employees were in the low-risk level and fewer employees were in the medium- and high-risk levels than would have been expected by a nat-

ural flow of risk transition without intervention. Furthermore, the improvement is persistent; almost 80% of the employees who transitioned from medium to low risk between 2003 and 2005 maintained a low-risk status in 2006.

The most noticeable changes in health risks were: a reduction in the proportion of employees with high cholesterol, an improvement in diet, a reduction in heavy drinking, management of high blood pressure, improved stress management, increased exercise, fewer smokers, and a drop in obesity rates. We also found some evidence that employees who began exercising more regularly and/or reduced their fatty intake were more likely to experience an improvement in obesity, blood pressure, cholesterol management, and/or depression.

For reasons that were beyond the scope of the study, self-reported productivity decreased between 2003 and 2005 for DIRECTV employees relative to an external benchmark matched control group. However, among DIRECTV employees, health-related absences decreased among the subset of workers whose health risks improved between 2003 and 2005 relative to workers whose risks stayed the same or worsened.

The results of this case study are consistent with other research projects that demonstrate the positive impact of integrated population health enhancement strategies^{39,40} on lowering health risks in a workforce. The DIRECTV corporate-wide integrated population health enhancement program included HRA, lifestyle management, demand management, and DM, along with the alignment of financial incentives around quality and prevention for employees and physicians at the Boise call center site. Our assessment is that this type of integrated population health enhancement program can yield sustained health behavior change and health-risk reduction.

Some additional elements of the DIRECTV integrated population health enhancement program have not been analyzed yet. Further insights regarding the trends in total health-related costs (including medical/pharmacy costs, pre-

TABLE 7. CHANGE IN HEALTH CONDITIONS AMONG DIRECTV EMPLOYEES AND A MATCHED COMPARISON GROUP*

	DIRECTV employees (n = 532)			Comparison group (n = 1349)		
	2003	2005	Change (Pct pts)	2003	2005	Change (Pct pts)
Allergy	49.40%	23.60%	-25.80%	36.25%	34.54%	-1.71%
Asthma	13.50%	7.30%	-6.20%	3.34%	2.97%	-0.37%
Migraine	15.10%	10.70%	-4.40%	9.71%	9.71%	0.00%
Depression	17.90%	10.00%	-7.90%	9.34%	8.67%	-0.67%
Obesity	28.60%	25.70%	-2.90%	33.95%	36.55%	2.60%
GERD	8.30%	6.40%	-1.90%	12.23%	13.57%	1.34%
Cancer	2.50%	0.40%	-2.10%	2.30%	2.08%	-0.22%
Bronchitis/Emphysema	3.40%	0.80%	-2.60%	N/A	N/A	N/A
Diabetes	5.10%	5.80%	0.70%	4.82%	5.86%	1.04%
Anxiety	7.90%	10.20%	2.30%	4.97%	4.67%	-0.30%
Arthritis	7.10%	12.20%	5.10%	15.05%	13.57%	-1.48%

* = the change in prevalence between 2003 and 2005 among the DIRECTV workers is statistically different from the change among the comparison group at the P ≤ .01 significance level.
GERD, gastroesophageal reflux disease.

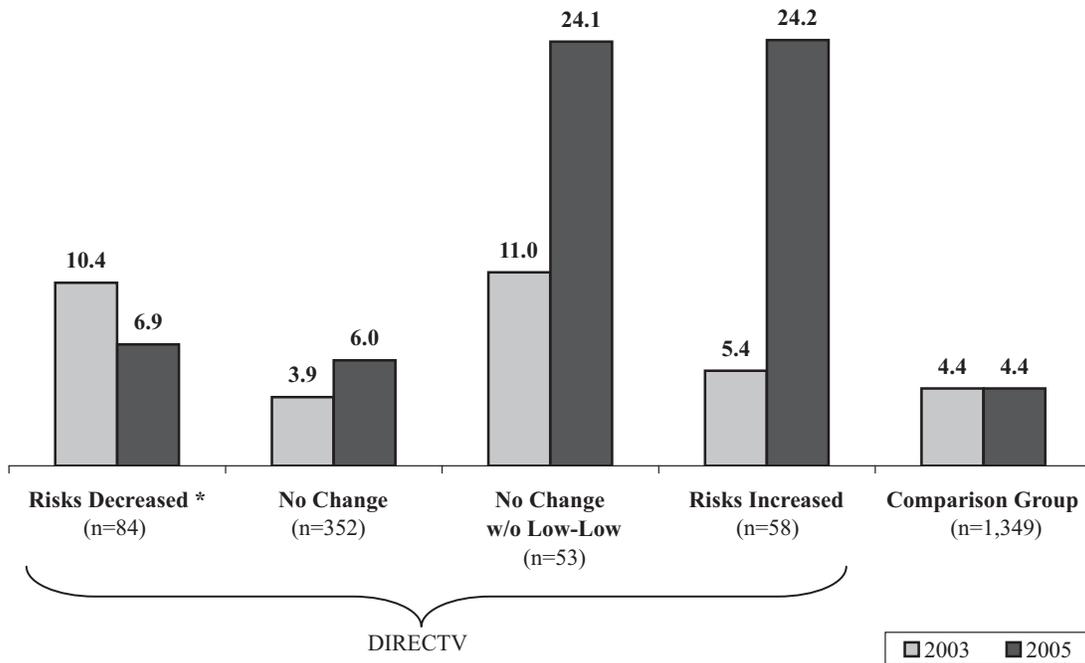


FIG. 2. Annual health-related absences by change in risk level (2003 to 2005 for DIRECTV; 2005 to 2006 for Comparison Group). Note: “Low-Low” refers to employees who were low risk in both 2003 and 2005. *Change in absences between 2003 and 2005 is statistically different than the change among the “no change without low-low” group ($P < .01$).

senteism, absenteeism, disability, and workers’ compensation costs) for DIRECTV will be reported in a subsequent paper.

Overall, this study provides additional evidence that integrated population health enhancement positively impacts

employee health risks and productivity. To the extent that the DIRECTV results can be generalized, employers can use this study to support the business case for investing in the health of their workforce as it will translate into improved productivity, which is a leading indicator of business per-

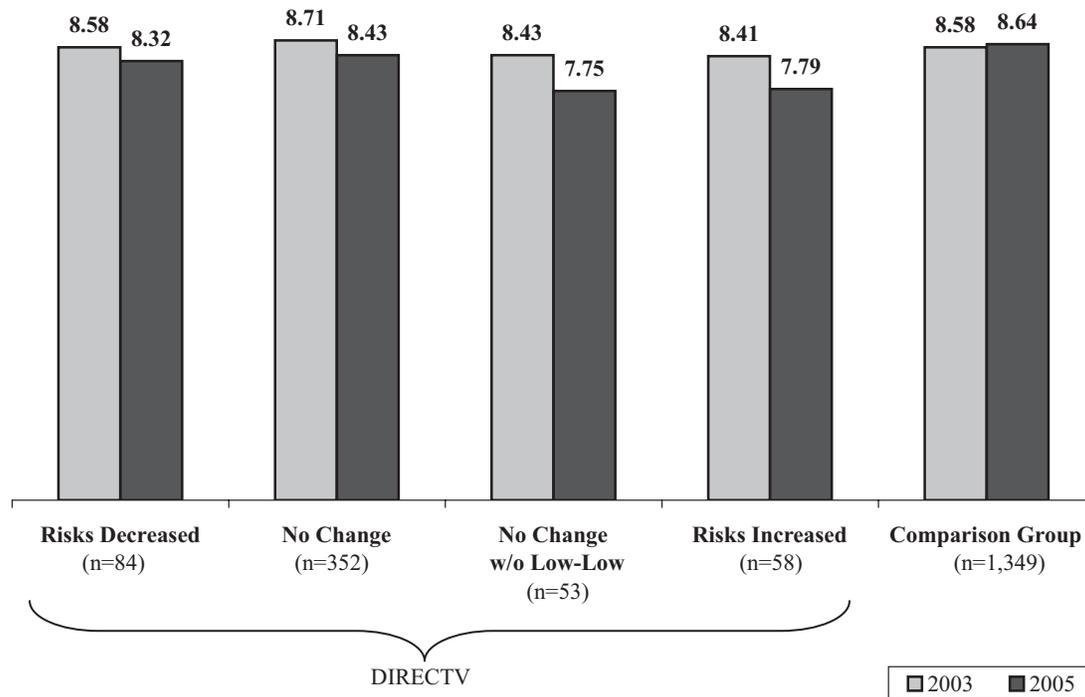


FIG. 3. Self-reported productivity by change in risk level (2003 to 2005 for DIRECTV; 2005 to 2006 for Comparison Group). Note: “Low-Low” refers to employees who were low risk in both 2003 and 2005

formance. Furthermore, it reinforces the view that “good health is good business.”

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Disclosures

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Address reprint requests to:

Ron Loeppke, M.D.

Alere

5166 Remington Dr.

Brentwood, TN 37027

E-mail: Ron.Loeppke@Alere.com