The Return on Investment (ROI) from Workplace Health Promotion and Disease Prevention Programs: Myth or Reality?

Ron Z. Goetzel, Ph.D., Emory University and Thomson Reuters Healthcare

Workplace Wellness Symposium - Westin BWI Hotel - Tuesday, June 8, 2010
U.S. BUSINESS CONCERNS ABOUT HEALTHCARE

• The United States spent $2.24 trillion in healthcare in 2007, or $7,421 for every man, woman and child.

• Private employers contributed 77% to health insurance premiums, a 6.1% increase over 2006

• Private sector share of total spending is 53.7%

• National health expenditure growth trends are expected to average about 6.6% per year through 2015.

• Health expenditures as percent of GDP:
  – 7.2 % in 1970
  – 16.2 % 2007
  – 19.7 % in 2017 (est)
  – 25.0 % by 2030 (est)

Source: Hartman et al., Health Affairs, 28:1, Jan/Feb, 2009, 246.
EMPLOYER COSTS ARE RISING RAPIDLY

Annual Medical Cost Per Employee

Source: Hewitt, Health Value Initiative, September 2008
Assumptions: Data based on large employers; based on medical, prescription and administrative costs
WHY IS HEALTH CARE SO EXPENSIVE?

Rise in spending for treated diseases (37%)

Innovation/advancing technology (pharmacologic, devices, treatments)

- Newborn delivery costs – five-fold increase from 1987-2002
  - NICU, incubators, ventilators, C-sections

- New/better medicines for treating disease
  - Depression (SSRI introduction – 45% treated in 1987 to 80% treated in 1997
  - Allergies (Claritan, Allegra, …)

- New treatment thresholds
  - Blood pressure
  - High blood glucose
  - Hyperlipidemia

WHY IS HEALTH CARE SO EXPENSIVE? (THORPE - PART 2)

Rise in the prevalence of disease (63%)

- About ¾ of all health care spending in the U.S. is focused on patients who have one or more chronic health conditions
- Chronically ill patients only receive 56% of clinically recommended preventive health services
  
  And 27% of the rise in healthcare costs is associated with increases in obesity rates...
ENVIRONMENTAL CORRELATES OF OBESITY

More driving
- Rise in car ownership
- Increase in driving shorter distances
- Less walking and bicycling

At home, more convenience
- Increase use of “labor saving” devices
- Increase in ready-made foods
- Increase in television viewing, computers, and video games

At work
- Sedentary occupational fields (“knowledge workers”)

In public
- More elevators, escalators, automatic doors and moving sidewalks
AWAY-FROM-HOME FOOD CONSUMPTION HAS DOUBLED

Share of total food expenditures

Calories Consumed

Source: Food Consumption (per capita) Data System, USDA, Economic Research Service
LEADING CAUSES OF DEATH IN THE U.S. (2000)*

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th># of Deaths</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td>710,760</td>
<td>30%</td>
</tr>
<tr>
<td>Malignant Neoplasm</td>
<td>553,091</td>
<td>23%</td>
</tr>
<tr>
<td>Cerebrovascular Disease</td>
<td>167,661</td>
<td>7%</td>
</tr>
<tr>
<td>Chronic Lower Respiratory Tract Disease</td>
<td>122,009</td>
<td>5%</td>
</tr>
<tr>
<td>Unintentional Injuries</td>
<td>97,900</td>
<td>4%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>69,301</td>
<td>3%</td>
</tr>
<tr>
<td>Influenza / Pneumonia</td>
<td>65,313</td>
<td>3%</td>
</tr>
<tr>
<td>Alzheimers</td>
<td>49,558</td>
<td>2%</td>
</tr>
<tr>
<td>Nephritis</td>
<td>37,251</td>
<td>2%</td>
</tr>
<tr>
<td>Septicemia</td>
<td>31,224</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>499,283</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,403,351</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

*Source: Mokdad et al., JAMA,291:10, March, 2004
DRAMATIC RISE IN CHRONIC DISEASE

By Kenneth E. Thorpe, Lydia L. Ogden, and Katya Galaktionova

Chronic Conditions Account For Rise In Medicare Spending From 1987 To 2006

ABSTRACT Medicare beneficiaries’ medical needs, and where beneficiaries undergo treatment, have changed dramatically over the past two decades. Twenty years ago, most spending growth was linked to intensive inpatient (hospital) services, chiefly for heart disease. Recently, much of the growth has been attributable to chronic conditions such as diabetes, arthritis, hypertension, and kidney disease. These conditions are chiefly treated not in hospitals but in outpatient settings and by patients at home with prescription drugs. Health reform must address changed health needs through evidence-based community prevention, care coordination, and support for patient self-management.
% OF ADULT POPULATION TREATED, BY MEDICAL CONDITION 1987-2005: RAPID RISE IN DISEASE PREVALENCE

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>1987</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental Disorders</td>
<td>5.5%</td>
<td>18.8%</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>1.5%</td>
<td>14.4%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>13.6%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4.0%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Pulmonary Conditions (OPD, Asthma)</td>
<td>9.5%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Lupus / Other Related</td>
<td>4.8%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Arthritis</td>
<td>7.8%</td>
<td>13.6%</td>
</tr>
<tr>
<td>Back Problems</td>
<td>5.4%</td>
<td>13.2%</td>
</tr>
<tr>
<td>Upper GI</td>
<td>3.8%</td>
<td>10.7%</td>
</tr>
<tr>
<td>Heart Disease</td>
<td>8.1%</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

DISEASES CAUSED (AT LEAST PARTIALLY) BY LIFESTYLE

- **Obesity:** Choleystitis/Cholelithiasis, Coronary Artery Disease, Diabetes, Hypertension, Lipid Metabolism Disorders, Osteoarthritis, Sleep Apnea, Venous Embolism/Thrombosis, Cancers (Breast, Cervix, Colorectal, Gallbladder, Biliary Tract, Ovary, Prostate)

- **Tobacco Use:** Cerebrovascular Disease, Coronary Artery Disease, Osteoporosis, Peripheral Vascular Disease, Asthma, Acute Bronchitis, COPD, Pneumonia, Cancers (Bladder, Kidney, Urinary, Larynx, Lip, Oral Cavity, Pharynx, Pancreas, Trachea, Bronchus, Lung)

- **Lack of Exercise:** Coronary Artery Disease, Diabetes, Hypertension, Obesity, Osteoporosis

- **Poor Nutrition:** Cerebrovascular Disease, Coronary Artery Disease, Diabetes, Diverticular Disease, Hypertension, Oral Disease, Osteoporosis, Cancers (Breast, Colorectal, Prostate)

- **Alcohol Use:** Liver Damage, Alcohol Psychosis, Pancreatitis, Hypertension, Cerebrovascular Disease, Cancers (Breast, Esophagus, Larynx, Liver)

- **Stress, Anxiety, Depression:** Coronary Artery Disease, Hypertension

- **Uncontrolled Hypertension:** Coronary Artery Disease, Cerebrovascular Disease, Peripheral Vascular Disease

- **Uncontrolled Lipids:** Coronary Artery Disease, Lipid Metabolism Disorders, Pancreatitis, Peripheral Vascular Disease

Source: Mokdad, et al
BOTTOM LINE: THE VAST MAJORITY OF CHRONIC DISEASE CAN BE PREVENTED OR BETTER MANAGED

The Centers for Disease Control and Prevention (CDC) estimates…

- 80% of heart disease and stroke
- 80% of type 2 diabetes
- 40% of cancer

…could be prevented if only Americans were to do three things:

- Stop smoking
- Start eating healthy
- Get in shape
CONVINCE ME…

Why should an employer (or government) invest in the health and well-being of workers?
IT SEEMS SO LOGICAL…

…if you improve the health and well being of your employees…

…quality of life improves

…healthcare utilization is reduced

…disability is controlled

…productivity is enhanced
A large proportion of diseases and disorders from which people suffer is preventable.

Modifiable health risk factors are precursors to many diseases and disorders, and premature death.

Many modifiable health risks are associated with increased health care costs and diminished productivity within a relatively short time window.

Modifiable health risks can be improved through effective health promotion and disease prevention programs.

Improvements in the health risk profile of a population can lead to reductions in health costs and improvements in productivity.

Well-designed and well-implemented programs can be cost/beneficial – they can save more money than they cost, thus producing a positive return on investment (ROI).
THE EVIDENCE


- Modifiable health risks can be improved through workplace sponsored health promotion and disease prevention programs (Wilson et al., 1996, Heaney & Goetzel, 1997, Pelletier, 1999)

- Improvements in the health risk profile of a population can lead to reductions in health costs (Edington et al., 2001, Goetzel et al., 1999)

POOR HEALTH COSTS MONEY

Drill Down…

• Medical
• Absence/work loss
• Workplace safety
• Presenteeism
• Risk factors
TOP 10 PHYSICAL HEALTH CONDITIONS

Medical, Drug, Absence, STD Expenditures (1999 annual $ per eligible), by Component

- Angina Pectoris, Chronic Maintenance
- Essential Hypertension, Chronic Maintenance
- Diabetes Mellitus, Chronic Maintenance
- Mechanical Low Back Disor.
- Trauma to Spine & Spinal Cord
- Back Disor. Not Specified as Low Back
- Chronic Obstructive Pulmonary Dis.
- Acute Myocardial Infarction
- Sinusitis
- Dis. of ENT or Mastoid Process NEC

THE BIG PICTURE: OVERALL BURDEN OF ILLNESS BY CONDITION

Using Average Impairment and Prevalence Rates for Presenteeism ($23.15/hour wage estimate)

INCREMENTAL IMPACT OF TEN MODIFIABLE RISK FACTORS ON MEDICAL EXPENDITURES

Percent Difference in Medical Expenditures: High-Risk versus Lower-Risk Employees

Independent effects after adjustment  \( N = 46,026 \)

The Relationship Between Modifiable Health Risk Factors and Medical Expenditures, Absenteeism, Short-Term Disability, and Presenteeism Among Employees at Novartis

Ron Z. Goetzel, PhD
Ginger Smith Carls, MA
Shaohung Wang, PhD
Emily Kelly, MA
Edward Mauceri, MD
Daniel Columbus, MBA
Ann Cauvoti, CEBS

Objective: To quantify the impact of health risks on medical care and productivity costs in an employed population. Methods: Health risk, medical care, and productivity data were obtained for 5875 Novartis employees in 2005–2006. Factor analysis was performed to identify relationships among health risks. Multiple regression analyses were applied to estimate relationships between combined risk factors and costs. Results: We found a significant and consistent association among three factors (high biometric laboratory values, cigarette and alcohol use, and poor emotional health) and increased presenteeism for both men and women and increased absenteeism for women. Medical care expenditures were 13–22% higher for men and women at risk for the high biometric laboratory values and the emotional health factor. Conclusions: There is a potential for medical and productivity savings for employers able to reduce health risks among their workers. (J Occup Environ Med. 2009;51:487–499)
The Relationship Between Health Risks and Health and Productivity Costs Among Employees at Pepsi Bottling Group

Rachel M. Henke, PhD, Ginger S. Carls, PhD, Meghan E. Short, MPH, Xiaofei Pei, PhD, Shaohong Wang, PhD, Susan Moley, BBA, Mark Sullivan, BA, and Ron Z. Goetzel, PhD

Objective: To evaluate relationships between modifiable health risks and costs and measure potential cost savings from risk reduction programs. Methods: Health risk information from active Pepsi Bottling Group employees who completed health risk assessments between 2004 and 2006 (N = 11,217) were linked to medical care, workers’ compensation, and short-term disability cost data. Ten health risks were examined. Multivariate analyses were performed to estimate costs associated with having high risk, holding demographic, and other risk factors. Potential savings from risk reduction were estimated. Results: High risk for weight, blood pressure, glucose, and cholesterol had the greatest impact on total costs. A percentage-point annual reduction in the health risks assessed would yield annual per capita savings of $30.62 to $103.39. Conclusions: Targeted programs that address modifiable health risks are expected to produce substantial cost reductions in multiple benefit categories.

Employees with modifiable health risks have higher medical care and productivity expenses when compared with lower risk employees.10 Employers seeking to contain health and productivity costs are turning to workplace health promotion programs to reduce the prevalence of risk factors among their workers. Knowledge of the association between health risks and costs can help employers determine where to target workplace programs and estimate cost savings resulting from interventions. This information, in turn, can help them calculate a potential return-on-investment before making program investments.

Initial research on the association between health risks and costs has focused on medical expenditures. Anderson et al examined health care costs among six large employers, finding that approximately 23% of total health care costs could be attributed to 10 modifiable risk factors. Notably, the magnitude of the effects of each risk factor varied and depended on the prevalence of the conditions and its incremental cost.11 Employees who reported being depressed, for example, were found to incur 76% higher medical care costs compared to employees not depressed.11 Another analysis of the relationship between health risks and costs at Novartis showed that certain clusters of risk factors produced higher medical care costs, most notably for employees with high biometric laboratory values and with poor emotional health.12

From Thomson Reuters, 1115 16th Street NW, Washington, DC; Pepsi Bottling Group Inc (Pepsi), 1115 16th Street NW, Washington, DC; and John Hopkins Bloomberg School of Public Health, Baltimore, MD.

Address correspondence to: Ron Z. Goetzel, PhD, Thomson Reuters, 4010 Connecticut Avenue, NW, Suite 330, Washington, DC; E-mail: rmg@thomsonreuters.com

Copyright © 2010 by American College of Occupational and Environmental Medicine. DOI: 10.1097/DCC.0b013e3181d861e5

Additional research has found that costs associated with health risk increase when productivity losses are included. Annual costs due to lost productivity have been estimated at $1392 to $2962 per employee at risk.13 Employees tend to have multiple risk factors, which can impact the magnitude of these productivity costs.14 As the direct and indirect costs associated with having health risks can be high, further research on workplace programs that aim to lower health risks and better manage care expenditure is warranted.

This study examined the relationship between modifiable health risks and health and productivity costs among U.S. employees at the Pepsi Bottling Group (PBG). PBG is the world’s largest manufacturer, marketer, and distributor of Pepsi-Cola beverages and has a workforce of a large number of male, blue-collar employees. PBG has implemented various health improvement programs over the years and was awarded the C. Everett Koop National Health Award for its “Healthy Living Program” in 2007. Among PBG’s Healthy Living initiatives are on-site medical clinics and screenings, lifestyle management programs, flu shot campaigns, and a local wellness champion program that works with volunteer employee leaders at each worksite to facilitate local engagement. Meaningful incentives have enhanced participation rates, and marketing and branding techniques are used to sell “health” as a product.

Study Objectives

We sought to determine the relationships between individual health risks and costs across multiple benefit program categories and to predict the cost savings from improvement in the health risk profile of PBG employees.

MATERIALS AND METHODS

Study Design

This study was a cross-sectional analysis using an integrated database created for PBG by the Healthcare business of Thomson Reuters, an information and research company. The database linked PBG employees’ health risk assessment (HRA) data with their medical and pharmaceutical claims, workers’ compensation claims, and short-term disability (STD) claims from October 2003 through September 2007. The HRA provided data on the prevalence of 10 modifiable health risks. The cost associated with each of the 10 risks was estimated using multivariate models that control for other risks and demographic variables.

Data Sources

Medical and pharmaceutical claims, workers’ compensation claims, STD claims, and StayWell HealthPath HRA data for PBG employees were extracted from the Thomson Reuters MasterFiles and Advantage Site Database, which provide standardized and quality-checked data. All data were linked at the employee level.

Selection Criteria

Active PBG employees ages 18 to 64 who completed an HRA between October 2004 and September 2006 were eligible for inclusion in the study sample. Employee enrolled in fully insured
PEPSI BOTTLING GROUP - OVERWEIGHT/OBESE ANALYSIS

Adjusted predicted annual costs for employees by BMI

*At least one difference significant at the 0.05 level

<table>
<thead>
<tr>
<th>BMI Category</th>
<th>Medical Cost</th>
<th>STD Cost</th>
<th>WC Cost</th>
<th>Presenteeism Cost</th>
<th>Absences Cost</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>$2,000</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
<td>$2,000</td>
</tr>
<tr>
<td>Overweight</td>
<td>$4,000</td>
<td>$2,000</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$1,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Class I</td>
<td>$6,000</td>
<td>$4,000</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Class II</td>
<td>$8,000</td>
<td>$6,000</td>
<td>$4,000</td>
<td>$4,000</td>
<td>$4,000</td>
<td>$32,000</td>
</tr>
<tr>
<td>Class III</td>
<td>$10,000</td>
<td>$8,000</td>
<td>$6,000</td>
<td>$6,000</td>
<td>$6,000</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

Difference between combined overweight/obese categories and normal weight is displayed

74% of the sample is overweight or obese

ESTIMATED ANNUAL COSTS OF HEALTHCARE UTILIZATION, ABSENTEEISM, AND PRESENTEEISM BY BMI CATEGORY

* P < .05

Quiz: How many Americans lead healthy lifestyles?

1. Non-smokers
2. Healthy weight (BMI of 18.5-25.0)
3. Consume 5+ fruits/vegetable per day
4. Exercise regularly (30 min – 5 days/week)

*Bottom Line: practice healthy lifestyle across all four categories*
Results:

1. Non smokers: 76%
2. Healthy weight (BMI of 18.5-25.0): 40%
3. Consume 5+ fruits/vegetable per day: 23%
4. Exercise regularly (30 min – 5 days/week): 22%

All of the above: 3%

OUTCOMES OF MULTI-COMPONENT WORKSITE HEALTH PROMOTION PROGRAM

- **Purpose:** Critically review evaluation studies of multi-component worksite health promotion programs.

- **Methods:** Comprehensive review of 47 CDC and author generated studies covering the period of 1978-1996.

- **Findings:**
  - Programs vary tremendously in comprehensiveness, intensity & duration.
  - Providing opportunities for individualized risk reduction counseling, within the context of comprehensive programming, may be the critical component of effective programs.

EVALUATION OF WORKSITE HEALTH PROMOTION PROGRAMS — FEBRUARY 2007 ANALYSIS

Worksite Health Promotion Team
Robin Soler, PhD
David Hopkins, MD, MPH
Sima Razi, MPH
Kimberly Leeks, PhD, MPH
Matt Griffith, MPH
A Systematic Review of Selected Interventions for Worksite Health Promotion
The Assessment of Health Risks with Feedback


Background: Many health behaviors and physiologic indicators can be used to estimate one’s likelihood of illness or premature death. Methods have been developed to assess this risk, most notably the use of a health-risk assessment or biometric screening tool. This report provides recommendations on the effectiveness of interventions that use an Assessment of Health Risks with Feedback (AHRF) when used alone or as part of a broader worksite health promotion program to improve the health of employees.

Evidence acquisition: The Guide to Community Preventive Services’ methods for systematic reviews were used to evaluate the effectiveness of AHRF when used alone and when used in combination with other intervention components. Effectiveness was assessed on the basis of changes in health behaviors and physiologic estimates, but was also informed by changes in risk estimates, health care service use, and worker productivity.

Evidence synthesis: The review team identified a small evidence of effectiveness of AHRF when used with health education without other intervention components for five outcomes. There is insufficient evidence of effectiveness for four additional outcomes assessed. There is insufficient evidence to determine effectiveness for others such as changes in body composition and fruit and vegetable intake. The team also found insufficient evidence to determine the effectiveness of AHRF when implemented alone. These reviews form the basis of the recommendations by the Task Force on Community Preventive Services presented elsewhere in this supplement.

Conclusions: The results of these reviews indicate that AHRF is useful as a gateway intervention to a broader worksite health promotion program that includes health education lasting 24 hour or repeating multiple times during 1 year, and that may include an array of health promotion activities.

### SUMMARY RESULTS AND TEAM CONSENSUS

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Use</td>
<td>7</td>
<td>Yes</td>
<td>Variable</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Fruits &amp; Vegetables</td>
<td>7, 11</td>
<td>No, Yes</td>
<td>0.16 serving, +8%</td>
<td>Insufficient, Strong</td>
</tr>
<tr>
<td>% Fat Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Change in Those Physically Active</td>
<td>17</td>
<td>Yes</td>
<td>+12.7%</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Tobacco Use</td>
<td></td>
<td></td>
<td></td>
<td>Strong</td>
</tr>
<tr>
<td>Prevalence</td>
<td>22, 23 (9)</td>
<td>Yes, Yes</td>
<td>−2.2 pct pt, 3.5 pct pt</td>
<td></td>
</tr>
<tr>
<td>Cessation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seat Belt Non-Use</td>
<td>10</td>
<td>Yes</td>
<td>−35.4%</td>
<td>Sufficient</td>
</tr>
</tbody>
</table>
### SUMMARY RESULTS AND TEAM CONSENSUS

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diastolic blood pressure</td>
<td>16 18 11</td>
<td>Yes</td>
<td>Diastolic:–1.9 mm Hg</td>
<td>Strong</td>
</tr>
<tr>
<td>Systolic blood pressure</td>
<td></td>
<td>Yes</td>
<td>Systolic:–3.0 mm Hg</td>
<td></td>
</tr>
<tr>
<td>Risk prevalence</td>
<td></td>
<td>Yes</td>
<td>–3.4 pct pt</td>
<td></td>
</tr>
<tr>
<td>Risk prevalence</td>
<td></td>
<td>Yes</td>
<td>–0.5 pt BMI</td>
<td>Insufficient</td>
</tr>
<tr>
<td>% body fat</td>
<td>6 12 4 5</td>
<td>Yes</td>
<td>–2.2% body fat</td>
<td></td>
</tr>
<tr>
<td>Risk prevalence</td>
<td></td>
<td>No</td>
<td>–2.2% at risk</td>
<td></td>
</tr>
<tr>
<td>Total Cholesterol</td>
<td>18 7 11</td>
<td>Yes</td>
<td>–5.0 mg/dL (total)</td>
<td>Strong</td>
</tr>
<tr>
<td>HDL Cholesterol</td>
<td></td>
<td>No</td>
<td>+1.1 mg/dL</td>
<td></td>
</tr>
<tr>
<td>Risk prevalence</td>
<td></td>
<td>Yes</td>
<td>–6.6 pct pt</td>
<td>Insufficient</td>
</tr>
<tr>
<td>Fitness</td>
<td>5</td>
<td>Yes</td>
<td>Small</td>
<td></td>
</tr>
</tbody>
</table>
### SUMMARY RESULTS AND TEAM CONSENSUS

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Body of Evidence</th>
<th>Consistent Results</th>
<th>Magnitude of Effect</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated Risk</td>
<td>15</td>
<td>Yes</td>
<td>Moderate</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Healthcare Use</td>
<td>6</td>
<td>Yes</td>
<td>Moderate</td>
<td>Sufficient</td>
</tr>
<tr>
<td>Worker Productivity</td>
<td>10</td>
<td>Yes</td>
<td>Moderate</td>
<td>Strong</td>
</tr>
</tbody>
</table>
PROGRAM EVALUATION: CRITICAL STEPS TO SUCCESS

- Awareness
- Participation
- Increased Knowledge
- Improved Attitudes
- Behavior Change
- Risk Reduction
- Reduced Utilization
- ROI
CASE STUDIES
CITIBANK, N.A.
HEALTH MANAGEMENT PROGRAM EVALUATION

<table>
<thead>
<tr>
<th>TITLE</th>
<th>Citibank Health Management Program (HMP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDUSTRY</td>
<td>Banking/Finance</td>
</tr>
<tr>
<td>TARGET POPULATION</td>
<td>47,838 active employees eligible for medical benefits</td>
</tr>
</tbody>
</table>
| DESCRIPTION    | • A comprehensive multi-component health management program  
                • Aims to help employees improve health behaviors, better manage chronic conditions, and reduce demand for unnecessary and inappropriate health services,  
                • And, in turn, reduce prevalence of preventable diseases, show significant cost savings, and achieve a positive ROI. |
PROGRAM COMPONENTS
HIGH-RISK PROGRAM

80% Low Risk
Questionnaire 1 (Program Entry and Channeling beginning January 1994)

20% High Cost Risk
High-Risk Letter/Report 1

Books, Audiotapes, Videotapes

Timeline (months)
Letter/Report 1

Self-Care Materials

3 MONTHS
High-Risk Questionnaire Letter/Report 2

Books, Audiotapes, Videotapes

6 MONTHS
High-Risk Questionnaire Letter/Report 3

Books, Audiotapes, Videotapes

9 MONTHS
High-Risk Questionnaire Letter/Report 4

Books, Audiotapes, Videotapes
PROGRAM PARTICIPATION

**47,838**
All 47,838 active employees were eligible to participate.

**54.3%**
The participation rate was 54.3 percent.

**$10**
Participants received a $10 credit for Citibank's Choices benefit plan enrollment for the following year.

**3,000**
Approximately 3,000 employees participated in the high risk program each year it was offered.
CITIBANK RESULTS

Percent of Program Participants at High Risk at First and Last HRA by Risk Category
(N=9,234 employees tracked over an average of two years)

## CITIBANK RESULTS

### Impact of improvement in risk categories on medical expenditures per month

<table>
<thead>
<tr>
<th>Impact of improvement</th>
<th>Unadjusted Impact**</th>
<th>Adjusted Impact**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net improvement* of at least 1 category versus others (N = 1,706)</td>
<td>-$1.86†</td>
<td>-$1.91</td>
</tr>
<tr>
<td>Net improvement* of at least 2 categories versus others (N = 391)</td>
<td>-$5.34</td>
<td>-$3.06</td>
</tr>
<tr>
<td>Net improvement* of at least 3 categories versus others (N = 62)</td>
<td>-$146.87†</td>
<td>-$145.77 ‡</td>
</tr>
</tbody>
</table>

*Net Improvement refers to the number of categories in which risk improved minus number of categories in which risk stayed the same or worsened.

**Impact = change in expenditures for net improvers minus change for others. Negative values imply program savings, since expenditures did not increase as much over time for those who improved, compared to all others.

† p < 0.05, ‡ p < 0.01
CITIBANK: MEDICAL SAVINGS-ADJUSTED MEAN NET PAYMENTS

Citibank Medical Population
Adjusted Mean Net Payments for the Pre- and Post-HRA periods

Total savings associated with program participation for 11,219 participants over an average of 23 months post-HRA is $8,901,413*

* Based on $34.03 savings and 23.31054 months post-HRA for 11,219 participants
CITIBANK HEALTH MANAGEMENT PROGRAM ROI

PROGRAM COSTS: $1.9 million*
PROGRAM BENEFITS: $8.9 million*
PROGRAM SAVINGS: $7.0 million*

ROI = $4.7 in benefits for every $1 in costs

Notes:
1996 dollars @ 0 percent discount.
Slightly lower ROI estimates after discounting by either 3% or 5% per year.
## JOHNSON & JOHNSON
### HEALTH AND WELLNESS PROGRAM EVALUATION

<table>
<thead>
<tr>
<th><strong>TITLE</strong></th>
<th>J &amp; J Health and Wellness Program (H &amp; W)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INDUSTRY</strong></td>
<td>Healthcare</td>
</tr>
<tr>
<td><strong>TARGET POPULATION</strong></td>
<td>43,000 U.S. based employees</td>
</tr>
</tbody>
</table>
| **DESCRIPTION**    | • Comprehensive, multi-component worksite health promotion program  
                      • Evolved from LIVE FOR LIFE in 1979 |
LIFESTYLE BENEFIT INCENTIVE

- All employees offered Health Profile
- Employees assessed to be at risk for smoking, blood pressure or cholesterol were invited to participate in a health management program
- Health care prices discounted by $500
- Employees not participating in Health Profile or follow-up health improvement program lose the $500 discount
- Result: 94% Participation Rate
HEALTH & WELLNESS PROGRAM
IMPACT ON EMPLOYEE HEALTH RISKS (N=4,586)

After an average of 2¾ years, risks were reduced in eight categories but increased in four related categories: body weight, dietary fat consumption, risk for diabetes, and cigar use.

- High Cholesterol: 66.2% Time 1, 43.2% Time 2
- Low Fiber Intake: 49.6% Time 1, 41.0% Time 2
- Poor Exercise Habits: 45.8% Time 1, 35.1% Time 2
- Cigarette Smoking: 32.7% Time 1, 23.9% Time 2
- High Blood Pressure: 9.7% Time 1, 1.3% Time 2
- Seat Belt Use: 4.5% Time 1, 2.7% Time 2
- Drinking & Driving: 3.5% Time 1, 2.9% Time 2
JOHNSON & JOHNSON HEALTH & WELLNESS PROGRAM
IMPACT ON MEDICAL COSTS

$225 Annual Medical Savings/ Employee/Year since 1995

Source: Ozminkowski et al, 2002 — N=18,331
INFLATION-ADJUSTED, DISCOUNTED HEALTH AND WELLNESS PROGRAM CUMULATIVE SAVINGS

Per Employee Per Year, 1995 – 1999 -- Weighted by sample sizes that range from N = 8,927 – 18,331, depending upon years analyzed

<table>
<thead>
<tr>
<th>Years Post Implementation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP days</td>
<td>$60.76</td>
<td>$94.25</td>
<td>$164.72</td>
<td>$195.80</td>
</tr>
<tr>
<td>MH visits</td>
<td>$78.42</td>
<td>$55.05</td>
<td>$51.49</td>
<td>$103.43</td>
</tr>
<tr>
<td>OP visits</td>
<td>$1.54</td>
<td>$23.57</td>
<td>$186.03</td>
<td>$181.27</td>
</tr>
<tr>
<td>ER visits</td>
<td>$(12.15)</td>
<td>$(14.33)</td>
<td>$(7.27)</td>
<td>$(8.06)</td>
</tr>
</tbody>
</table>

Years Post Implementation

$500.00
$400.00
$300.00
$200.00
$100.00
$(-)
$(100.00)
PROCTER & GAMBLE

Total Annual Medical Costs For Participants and Non-Participants In Health Check (1990 - 1992) Adjusted for age and gender; Significant at p < .05

*In year 3 participant costs were 29% lower producing an ROI of 1.49 to 1.00

HIGHMARK ROI STUDY

- Regional health plan with approximately 12,000 workers
- Headquartered in Pittsburgh, with a major operating facility in Camp Hill, PA and other locations in Johnstown, Erie, and Williamsport, PA.
- Worksite Health Promotion Program (introduced in 2002)
  - health risk assessments (HRAs)
  - online programs in nutrition, weight management and stress management
  - tobacco cessation programs
  - on-site nutrition and stress classes
  - individual nutrition and tobacco cessation coaching
  - biometric screenings
  - six- to twelve-week campaigns to increase fitness participation and awareness of disease prevention strategies
  - state-of-the-art fitness centers (Pittsburgh and Camp Hill, PA)

CHARACTERISTICS USED IN MATCHING SUBJECTS – AIM IS TO SHOW PARTICIPANTS AND NON-PARTICIPANTS ARE SIMILAR

Overall Comparison

<table>
<thead>
<tr>
<th>Calendar Year 2001</th>
<th>All Participants</th>
<th>Non-Participants</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 1890</td>
<td>N = 1890</td>
<td></td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>484 (25.6)</td>
<td>484 (25.6)</td>
<td>0.98</td>
</tr>
<tr>
<td>Age, 2001 mean years</td>
<td>41.7</td>
<td>41.6</td>
<td>0.94</td>
</tr>
<tr>
<td>Net payments for healthcare expenditures in 2001, mean</td>
<td>$1,414</td>
<td>$1,318</td>
<td>0.94</td>
</tr>
<tr>
<td><strong>Comorbidity Prevalence, %</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart disease, n(%)</td>
<td>183 (9.7)</td>
<td>184 (9.7)</td>
<td></td>
</tr>
<tr>
<td>Diabetes, n(%)</td>
<td>13 (0.7)</td>
<td>13 (0.7)</td>
<td>0.99</td>
</tr>
<tr>
<td>CCI Group 1 comorbidity, n(%)</td>
<td>849 (44.9)</td>
<td>849 (44.9)</td>
<td>0.98</td>
</tr>
<tr>
<td>CCI Group 2 comorbidity, n(%)</td>
<td>528 (27.9)</td>
<td>528 (27.9)</td>
<td>0.98</td>
</tr>
<tr>
<td>CCI, median (range)</td>
<td>1.75 (0-17)</td>
<td>1.75 (0-18)</td>
<td>0.97</td>
</tr>
</tbody>
</table>

CCI = Charlson comorbidity index; Group 1 comorbidity includes presence of any of these: chronic obstructive pulmonary disease, rheumatologic disease stomach ulcer or dementia, all as coded by using the Charlson index; Group 2 comorbidity includes presence of any of these: cancer, renal failure, liver disease or cirrhosis, autoimmune disease.
ANNUAL GROWTH IN NET PAYMENTS

Annual growth in costs, Highmark, Inc.
For matched-participants and non-participants over four years – resulting in crude savings of ~$200/employee/year
## ESTIMATED ANNUAL SAVINGS AFTER FOUR YEARS OF FOLLOW-UP — PARTICIPANTS VERSUS NON-PARTICIPANTS — ADJUSTED FOR CONFOUNDERS

### Participants versus Non-participants

<table>
<thead>
<tr>
<th></th>
<th>Net Payments ≤ Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>-964.51</td>
</tr>
<tr>
<td>All participants, (n=1892)</td>
<td>-176.47</td>
</tr>
<tr>
<td>Male gender</td>
<td>497.09</td>
</tr>
<tr>
<td>Age, per year</td>
<td>46.05</td>
</tr>
<tr>
<td>Heart disease at baseline</td>
<td>576.59</td>
</tr>
<tr>
<td>Diabetes at baseline</td>
<td>1704.01</td>
</tr>
<tr>
<td>Group 1 comorbidity</td>
<td>1133.20</td>
</tr>
<tr>
<td>Group 2 comorbidity</td>
<td>397.80</td>
</tr>
<tr>
<td>4-year savings estimate from participation (β*n)</td>
<td>$333,881</td>
</tr>
<tr>
<td><strong>Per person estimate</strong></td>
<td><strong>176.47</strong></td>
</tr>
</tbody>
</table>
## Cost-Benefit (ROI) Analysis

<table>
<thead>
<tr>
<th></th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>GD Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># Used</td>
<td>Total</td>
<td># Used</td>
<td>Total</td>
<td># Used</td>
</tr>
<tr>
<td>HRA &amp; Incentive</td>
<td>1892</td>
<td>$243,731</td>
<td>1303</td>
<td>$143,111</td>
<td>1308</td>
</tr>
<tr>
<td>Online</td>
<td>201</td>
<td>$1,142</td>
<td>247</td>
<td>$1,372</td>
<td>248</td>
</tr>
<tr>
<td>Group</td>
<td>34</td>
<td>$1,544</td>
<td>56</td>
<td>$3,077</td>
<td>56</td>
</tr>
<tr>
<td>Nutrition Coaching</td>
<td>2</td>
<td>$66</td>
<td>23</td>
<td>$740</td>
<td>51</td>
</tr>
<tr>
<td>10,000 Steps</td>
<td>244</td>
<td>$2,441</td>
<td>413</td>
<td>$3,851</td>
<td>223</td>
</tr>
<tr>
<td>Fitness Center</td>
<td>407</td>
<td>$25,603</td>
<td>495</td>
<td>$29,939</td>
<td>879</td>
</tr>
<tr>
<td>Highmark Challenge</td>
<td>112</td>
<td>$348</td>
<td>910</td>
<td>$2,766</td>
<td></td>
</tr>
<tr>
<td>Maintain Don't Gain Newsletter</td>
<td>85</td>
<td>$182</td>
<td>93</td>
<td>$192</td>
<td></td>
</tr>
<tr>
<td><strong>Wellness Program Costs</strong></td>
<td><strong>$246,483</strong></td>
<td><strong>$176,343</strong></td>
<td><strong>$181,000</strong></td>
<td><strong>$204,577</strong></td>
<td><strong>$808,403</strong></td>
</tr>
<tr>
<td>Cost per participant</td>
<td><strong>$130.28</strong></td>
<td><strong>$135.34</strong></td>
<td><strong>$138.38</strong></td>
<td><strong>$150.98</strong></td>
<td><strong>$333,881</strong></td>
</tr>
<tr>
<td>Estimated Annual Savings from Model $176.47/person</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Net Savings (Estimated Savings - Wellness Program Costs)</strong></td>
<td><strong>$87,398</strong></td>
<td><strong>$157,538</strong></td>
<td><strong>$152,881</strong></td>
<td><strong>$129,304</strong></td>
<td><strong>$527,121</strong></td>
</tr>
</tbody>
</table>

Wellness Program Costs, Highmark, inflation-adjusted to 2005 dollars

Total Savings Estimated 4 Ye $1,335,524
Total Costs 4 Years $808,403
Return on Investment $1.65
Health Reform Initiative

http://www.metrokc.gov/employees/M_E_Report/
HEALTH CARE ENVIRONMENT

- 13,000 employees
- 30,000 plan members
- Strong Labor Unions – 92 separate bargaining units
- Dwindling tax base, rising public expectations
- Comprehensive medical, dental, vision
- 2012: Health plan costs will double under status quo to $300+ Million
HEALTHY INCENTIVES℠ – HOW IT WORKS

Did you take the wellness assessment by January 31 AND complete your individual action plan by June 30?

- NO
  - Did you take the wellness assessment by June 30?
    - NO
      - YES
        - GOLD
    - YES
      - SILVER
  - YES
    - BRONZE
Healthy Incentives™ - how it works

Out-of-pocket expense levels

<table>
<thead>
<tr>
<th></th>
<th>Gold</th>
<th>Silver</th>
<th>Bronze</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual deductible</strong></td>
<td>$100</td>
<td>$300</td>
<td>$500</td>
</tr>
<tr>
<td>Individual</td>
<td><strong>$300</strong></td>
<td><strong>$900</strong></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>$300</strong></td>
<td><strong>$500</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Coinsurance</strong></td>
<td>10%</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>(in-network provider)</td>
<td>(King County</td>
<td>(King County</td>
<td>(King County</td>
</tr>
<tr>
<td></td>
<td>pays 90%)</td>
<td>pays 80%)</td>
<td>pays 80%)</td>
</tr>
</tbody>
</table>
## Program Effect on Health Risks: Aggregate 2006, 2008 (Employees and Spouses/Partners)

2006, 2008 all respondents - Employees and Dependents (N=16549 in 2006, N=17068 in 2008)

<table>
<thead>
<tr>
<th>Health risks</th>
<th>Program effect</th>
<th>Adjusted Odds Ratio 95% Confidence Interval</th>
<th>p-value</th>
<th>adjusted prevalence</th>
<th>Adjusted change (Reference= 2006)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lower CI</td>
<td>Upper CI</td>
<td></td>
<td>2006</td>
</tr>
<tr>
<td>Alcohol Use</td>
<td>-0.25</td>
<td>0.71</td>
<td>0.85</td>
<td>&lt;.0001</td>
<td>4.70%</td>
</tr>
<tr>
<td>Depression</td>
<td>-0.28</td>
<td>0.71</td>
<td>0.81</td>
<td>&lt;.0001</td>
<td>10.97%</td>
</tr>
<tr>
<td>Injury Prevention</td>
<td>-0.42</td>
<td>0.63</td>
<td>0.69</td>
<td>&lt;.0001</td>
<td>18.16%</td>
</tr>
<tr>
<td>Mental Health</td>
<td>-0.31</td>
<td>0.7</td>
<td>0.77</td>
<td>&lt;.0001</td>
<td>25.72%</td>
</tr>
<tr>
<td>Nutrition</td>
<td>-0.45</td>
<td>0.61</td>
<td>0.66</td>
<td>&lt;.0001</td>
<td>75.19%</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>0.01</td>
<td>0.97</td>
<td>1.05</td>
<td>0.7084</td>
<td>37.42%</td>
</tr>
<tr>
<td>Sun Damage Behavior</td>
<td>-0.41</td>
<td>0.64</td>
<td>0.69</td>
<td>&lt;.0001</td>
<td>25.95%</td>
</tr>
<tr>
<td>Smoking Behavior</td>
<td>-0.47</td>
<td>0.59</td>
<td>0.66</td>
<td>&lt;.0001</td>
<td>10.98%</td>
</tr>
<tr>
<td>Stress Behavior</td>
<td>-0.32</td>
<td>0.69</td>
<td>0.76</td>
<td>&lt;.0001</td>
<td>22.49%</td>
</tr>
<tr>
<td>BMI risk</td>
<td>-0.15</td>
<td>0.84</td>
<td>0.89</td>
<td>&lt;.0001</td>
<td>64.52%</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td>0.01</td>
<td>0.93</td>
<td>1.1</td>
<td>0.86</td>
<td>33.21%</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>-0.35</td>
<td>0.66</td>
<td>0.75</td>
<td>&lt;.0001</td>
<td>35.43%</td>
</tr>
<tr>
<td>Systolic BP</td>
<td>-0.51</td>
<td>0.53</td>
<td>0.67</td>
<td>&lt;.0001</td>
<td>6.88%</td>
</tr>
<tr>
<td>Diastolic BP</td>
<td>-0.32</td>
<td>0.65</td>
<td>0.82</td>
<td>&lt;.0001</td>
<td>6.24%</td>
</tr>
</tbody>
</table>

Last column green cells indicate significant decrease, white cells indicate insignificant changes.
Baseline, Targeted and Actual Employee Health Care Costs – 2003 - 2008

Growth of King County & Employees’/Families’ Health Care Costs


Projected Health Care Cost Trend for ’03-’04 (Pre-HRI): 10.8%
Council-approved Health Care Cost Trend Target after 2006: 8.9%
Actual Health Care Cost
Actual Health Care Cost Trend for ’05-’08 (Post-HRI): 8.8%
LITERATURE REVIEWS
Health Promotion Program Studies

- ROI studies of health management programs at:
  - Canada and North American Life
  - Chevron Corporation
  - City of Mesa, Arizona
  - General Mills
  - General Motors
  - Johnson & Johnson
  - Pacific Bell
  - Procter and Gamble
  - Tenneco

- ROI estimates in these nine studies ranged from $1.40 - $4.90 in savings per dollar spent on these programs.

- Median ROI was $3 in benefits per dollar spent on program.

- Sample sizes ranged from 500 - 50,000 subjects in these studies.

Source: Goetzel, Juday, Ozminkowski. AWHP’s Worksite Health, Summer 1999, pp. 12-21
Financial Impact – Literature Review


- Focus: Peer reviewed journals (English Language) – 196 studies pared down to 72 studies meeting inclusion criteria for review

- Scoring Criteria:
  - A (experimental design)
  - B (quasi-experimental – well controlled)
  - C (pre-experimental, well-designed, cohort, case-controlled)
  - D (trend, correlational, regression designs)
  - E (expert opinion, descriptive studies, case studies)

- Health promotion program impact on health care costs:
  - 32 evaluation studies examined – Grades: A (4), B (11), other (17)
  - Average duration of intervention: 3.25 years
  - Positive impact: 28 studies
  - No impact: 4 studies (none with randomized designs)
  - Average ROI: 3.48 to 1.00 (7 studies)
Meta Evaluation of Worksite Health Promotion Economic Return Studies: 2005 Update
Larry Chapman, Art of Health Promotion, July/August, 2005

- Analysis includes a review of 56 peer reviewed studies
- Study methods are scored using 10 criteria
- Median year of publication – 1994
- Number of combined subjects in all studies – 483,232
- Average study duration - 3.66 years
- Primary outcomes examined: health care utilization/cost (28 studies) and absenteeism (25 studies)
- Results:
  - Average reduction in health care costs – 26%
  - Average reduction in absenteeism – 27%
DO EMPLOYEE HEALTH MANAGEMENT PROGRAMS WORK?


### Annual Estimated Program Impacts on Self-Insures Employee Populations

<table>
<thead>
<tr>
<th></th>
<th>Health Promotion</th>
<th>Disease Management</th>
<th>Employee Health Management</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Range</td>
<td>High Range</td>
<td>Low Range</td>
</tr>
<tr>
<td>Average savings (% impact on medical costs)</td>
<td>2.20</td>
<td>2.76</td>
<td>1.01</td>
</tr>
<tr>
<td>Average return on investment</td>
<td>3.0:1.0</td>
<td>2.0:1.0</td>
<td>2.5:1.0</td>
</tr>
</tbody>
</table>
HEALTH AFFAIRS ROI LITERATURE REVIEW


Prevention

Workplace Wellness Programs Can Generate Savings

By Katherine Baicker, David Cutler, and Zidong Song

ABSTRACT Amid soaring health spending, there is growing interest in workplace disease prevention and wellness programs to improve health and lower costs. In a critical meta-analysis of the literature on costs and savings associated with such programs, we found that medical costs fall by about $3.27 for every dollar spent on wellness programs and that absenteeism costs fall by about $2.73 for every dollar spent. Although further exploration of the mechanisms at work and broader applicability of the findings is needed, this return on investment suggests that the wider adoption of such programs could prove beneficial for budgets and productivity as well as health outcomes.

In an environment of soaring health care spending, policymakers, insurers, and employers express growing interest in methods of improving health while lowering costs. Much of the discussion has taken place around investment in disease prevention and health promotion as a way of achieving better health outcomes at lower costs. President Barack Obama has highlighted prevention as a central component of health reform, as have major congressional reform proposals.3 Workforce-based wellness programs, which could facilitate prevention, have been showcased in these reform proposals, the popular press, and congressional hearings.4

This enthusiasm for workplace programs stems in part from the fact that more than 60 percent of Americans get their health insurance coverage through an employment-based plan, as well as from the recognition that many employers spend the majority of their working hours in the workplace—which makes it a natural venue for investments in health. There are several reasons that employers might benefit from investments in employee wellness. First, such programs might lead to reductions in health care costs and thus health insurance premiums. Second, healthier workers might be more productive and miss fewer days of work. These benefits may accrue at least partially to the employer (such as through improved ability to attract workers), even if the primary benefits accrue to the employee.

These factors may motivate the increasing interest in such programs among employers—and especially large employers. In 2006, 19 percent of companies with 500 or more workers reported offering wellness programs, while a 2008 survey of large manufacturing employers reported that 77 percent offered some kind of formal health and wellness program.5 Consistent with the evidence presented below, small firms seem slower to offer such programs, and many of the programs offered are still quite limited in scope.6 Several well-publicized case studies have suggested a positive return to employers’ investment in prevention. For every dollar invested in the program, the employer saves more than the dollar spent. The California Health Management Research Program estimated savings of $4.50 in medical expenditures per dollar spent on the program.7 Studies from the California Public Employees Retirement System (CalPERS), Bank of America, and Johnson and Johnson have similarly estimated a sizable health care saving from wellness programs.8,9 Despite the universal enthusiasm for workplace wellness programs, our review found that the evidence base for their effectiveness has been weak.10,11

Conclusion

The findings of this meta-analysis are consistent with the view that workplace wellness programs are effective in reducing medical costs and absenteeism costs and may be a meaningful cost-saving strategy for employers. However, the magnitude of these savings may be less than expected. Further research is needed to determine the mechanisms at work and the broader applicability of the findings.12

Katherine Baicker (kbaicker@hsph.harvard.edu) is a professor of health economics at the School of Public Health, Harvard University, in Boston, Massachusetts.

David Cutler is a professor of economics at Harvard University.

Zidong Song is a doctoral candidate at Harvard School of Public Health.
## RESULTS - MEDICAL CARE COST SAVINGS

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Average ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies reporting costs and savings</td>
<td>15</td>
<td>$3.37</td>
</tr>
<tr>
<td>Studies reporting savings only</td>
<td>7</td>
<td>Not Available</td>
</tr>
<tr>
<td>Studies with randomized or matched control group</td>
<td>9</td>
<td>$3.36</td>
</tr>
<tr>
<td>Studies with non-randomized or matched control group</td>
<td>6</td>
<td>$2.38</td>
</tr>
<tr>
<td>All studies examining medical care savings</td>
<td>22</td>
<td>$3.27</td>
</tr>
</tbody>
</table>
# RESULTS – ABSENTEEISM SAVINGS

<table>
<thead>
<tr>
<th>Description</th>
<th>N</th>
<th>Average ROI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Studies reporting costs and savings</td>
<td>12</td>
<td>$3.27</td>
</tr>
<tr>
<td>All studies examining absenteeism savings</td>
<td>22</td>
<td>$2.73</td>
</tr>
</tbody>
</table>
SO, WHAT IS IMPORTANT WHEN EVALUATING HEALTH AND DISEASE MANAGEMENT PROGRAM OUTCOMES?

**Financial Outcomes**
Cost savings, return on investment (ROI) and net present value (NPV).

Where to find savings:
- Medical costs
- Absenteeism
- Short term disability (STD)
- Workers’ compensation
- Presenteeism

**Health Outcomes**
Adherence to evidence based medicine.
Behavior change, risk reduction, health improvement.

**QOL and Productivity Outcomes**
Improvement in quality of life.
Improved “functioning” and productivity.
SUMMARY

Focusing on improving the health and quality of people’s lives will improve the productivity and competitiveness of our workers and citizens.

A growing body of scientific literature suggests that well-designed, evidence-based health management programs can:

• Improve the health of workers and lower their risk for disease;

• Save businesses money by reducing health-related losses and limiting absence and disability;

• Heighten worker morale and work relations;

• Improve worker productivity; and

• Improve the financial performance of organizations instituting these programs.
THANK YOU!

CONTACT INFORMATION

Ron Z. Goetzel, Ph.D.
Research Professor and Director
Rollins School of Public Health
Emory University

Vice President, Consulting and Applied Research
Thomson Healthcare
4301 Connecticut Avenue, NW – Suite 330
Washington, DC 20008

(202) 719-7850 (voice)
(202) 719-7801 (fax)
(202) 285-6728 (cell)
ron.goetzel@thomsonreuters.com