Institute for Health and Productivity Studies

Ron Goetzel, PhD, Director
Enid Chung Roemer, PhD, Deputy Director
Department of Health, Behavior and Society
Introduction to IHPS

The Institute for Health and Productivity Studies (IHPS) was established as a strategic partnership between the Johns Hopkins Bloomberg School of Public Health and Truven Health Analytics (now IBM Watson Health).

MISSION: To bridge the gap between academia, the business community, and healthcare policy world by bringing academic resources into policy debates and day-to-day business decisions, and bringing health and productivity management issues into academia.
Key Personnel

- **Ron Goetzel, PhD**, Director, Senior Scientist
- **Enid Chung Roemer, PhD**, Deputy Director, Associate Scientist
- **Karen Kent, MPH**, Senior Research Program Manager
- **Jeff Berko, MPH**, Research Program Manager
- **Kate McCleary, MS, CHES**, Senior Research Assistant
Our Work

- Empirical research focused on the relationship between employee health and well-being, healthcare utilization and cost, and work-related productivity.

- Studies examining the impact of health and productivity management (HPM) interventions on health and financial outcomes.

- IHPS studies are often published in peer-reviewed journals and cited as “best practice” examples of how to perform rigorous, real-world evaluations.
Sample Client List

**Federal Contracts / Grants**
- Centers for Disease Control and Prevention (CDC)
- Centers for Medicare and Medicaid Services (CMS)
- Department of Defense (DoD)
- National Heart Lung and Blood Institute (NHLBI)
- Office of Personnel Management (OPM), Department of Health and Human Services (DHHS)

**Other Customers**
- **Employers**
  - Johnson & Johnson, Prudential Financial, Lockheed Martin Corporation, Dow Chemical, Boeing, Ford, Chevron, Coca Cola, GE, Northwell Health
- **Health Plans**
  - American Specialty Health, Kaiser Permanente, BCBS MN, HCSC
- **Pharmaceutical / Manufacturing Device Companies**
  - Bristol-Myers Squibb, Novartis, Pfizer, Janssen
- **Associations**
  - HERO, Partnership for Prevention, Bipartisan Policy Center, Robert Wood Johnson Foundation, Transamerica Foundation
- **States / Counties**
  - State of Delaware, State of New York, King County WA
- **International Engagements**
  - South Africa, Brazil (SESI), Israel, Singapore
Rationale Behind Our Work
What is the Evidence Base?

- A large proportion of diseases and disorders is preventable. Modifiable health risk factors are precursors to a large number of diseases and disorders and to premature death.

- Many modifiable health risks are associated with increased health care costs and diminished worker productivity.

- Modifiable health risks can be improved through evidence-based workplace health promotion and disease prevention programs.

- Improvements in the health risk profile of workers can lead to reductions in health costs and increased productivity.

- Workplace health promotion and disease prevention programs save companies money and produce a positive return-on-investment (ROI).
Diseases Caused (at Least Partially) by Lifestyle

- **Obesity:** Cholesystitis/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
The Cost of Chronic Disease - Top 10 Most Costly Physical Health Conditions

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

Overall Cost Burden of Illness by Condition

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

The Vast Majority of Chronic Diseases 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
Fast Track Article

Do Workplace Health Promotion (Wellness) Programs Work?

Ron Z. Goetzel, PhD, Rachel Mosher Henke, PhD, Maryam Tabrizi, PhD, MS, Kenneth R. Pelletier, PhD, MD (hc), Ron Loepke, MD, MPH, David W. Ballard, PsyD, MBA, Jessica Grossmeier, PhD, MPH, David R. Anderson, PhD, LP, Derek Yach, MBChB, MPH, Rebecca K. Kelly, PhD, RD, CDE, Tre’ McCalister, MA, EdD, Seth Serxner, PhD, Christobel Selecky, MA, Leba G. Shallenberger, DrPh, James F. Fries, MD, Catherine Baase, MD, Fikry Isaac, MD, MPH, K. Andrew Crighton, MD, Peter Wald, MD, MPH, Ellen Exum, BS, Dexter Shurney, MD, MBA, MPH, and R. Douglas Metz, DC
Yes – If you do it right…

CDC Community Guide to Preventive Services Review – AJPM, February 2010
86 Studies Reviewed
What About ROI?
Critical Steps to Success

- Awareness
- Participation
- Increased Knowledge
- Improved Attitudes
- Behavior Change
- Risk Reduction
- Reduced Utilization

Financial ROI
Workplace Wellness Programs Can Generate Savings

By Katherine Baicker, David Cutler, and Zirui 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.

For every $1.00 spent on wellness programs:

Medical costs return $3.27
Absenteeism costs return $2.73

Moving from ROI to VOI

**Financial Outcomes**
- Medical costs
- Absenteeism
- Short term disability
- Safety/Workers’ Comp
- Presenteeism

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

**Quality of Life and Productivity Outcomes**
- Improved “functioning” and performance
- Attraction/retention of talent – employer of choice
- Employee engagement
- Corporate social responsibility
- Corporate reputation
- Higher stock price
Where to Begin?
Designing, Implementing, Monitoring, and Evaluating
The Big Picture

**WORKPLACE HEALTH MODEL**

1. **ASSESSMENT**
   - **INDIVIDUAL** (e.g. demographics, health risks, use of services)
   - **ORGANIZATIONAL** (e.g. current practices, work environment, infrastructure)
   - **COMMUNITY** (e.g. transportation, food and retail, parks and recreation)

2. **PLANNING & MANAGEMENT**
   - **LEADERSHIP SUPPORT** (e.g. role models and champions)
   - **MANAGEMENT** (e.g. workplace health coordinator, committee)
   - **WORKPLACE HEALTH IMPROVEMENT PLAN** (e.g. goals and strategies)
   - **DEDICATED RESOURCES** (e.g. costs, partners/vendors, staffing)
   - **COMMUNICATIONS** (e.g. marketing, messages, systems)

3. **IMPLEMENTATION**
   - **PROGRAMS** (e.g. education and counseling)
   - **POLICIES** (e.g. organizational rules)
   - **BENEFITS** (e.g. insurance, incentives)
   - **ENVIRONMENTAL SUPPORT** (e.g. access points, opportunities, physical/social)

4. **EVALUATION**
   - **WORKER PRODUCTIVITY** (e.g. absenteeism, presenteeism)
   - **HEALTHCARE COSTS** (e.g. quality of care, performance standards)
   - **IMPROVED HEALTH OUTCOMES** (e.g. reduced disease and disability)
   - **ORGANIZATIONAL CHANGE, “CULTURE OF HEALTH”** (e.g. morale, recruitment/retention, alignment of health and business objectives)
Logic Model

Health Promotion Program

- Employees
  - Raise Awareness/Increase Participation Rates
    - HRA
    - Health Motivation
      - Condition Management
  - Health Behaviors
    - Health Care Service Use
      - Physiologic Indicators
      - Psychological Indicators
      - Estimated Health Risks
      - Workforce Productivity

- Program Satisfaction

Organizational policies, health promotion activities, senior management support, enhanced access, other

Feedback reports, internet access, counseling, incentives

Individual

Environmental

STRUCTURE

PROCESS

OUTCOMES
Measurement and Evaluation Framework

**Structure**
- **Q:** What is the current status of the program, policies, and environmental support system for health and wellness?
  - What are employees’ health risks, current use of services, needs, and interests?
  - What resources exist in the community that may factor into program design decisions and partnership opportunities?

**Process**

**Fidelity and Dose Delivered**
- **Q:** To what degree are the programs being implemented as planned?
- To what degree is program delivery complete in terms of frequency, intensity, and/or duration as designed?

**Dose Received**
- **Q:** To what degree are employees aware of, engaged in, and satisfied with program offerings?

**Reach**
- **Q:** What is the participation rate for each of the program elements?

**Outcomes**
- **Q:** Is the program impacting employee health and well-being measures, and in turn affecting business, productivity, and other measures of interest?
  - To what degree have target goals and objectives been met?
How to Evaluate Health Promotion Programs in the “Real World”
Guiding Questions for Program Evaluation

1. What do I want to **know**? – Research objective
2. What might the answer/solution **look** like? – Hypotheses
3. How will I **see** it or figure that out? – Study design
4. How will I get and **record** the data? – Measurement tools
5. How will I **categorize** and analyze the data? – Results
6. How can I **avoid bias**, or at least be transparent about it? – Limitations
7. What will I **infer** from the data? – Interpretation, discussion
8. What will I finally **find out** that I didn’t know before? – Conclusions
9. What can / should I **do** with that information? – “So What”
Evaluation “Buckets”

What should be evaluated?

- Structure
- Process
- Outcomes
Structure Evaluation Example: The CDC Worksite Health ScoreCard

The CDC Worksite Health ScoreCard: An Assessment Tool for Employers to Prevent Heart Disease, Stroke, & Related Health Conditions

Health ScoreCard Manual

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Process Evaluation Example -- Survey

1. Did you participate in any of the following Program Offerings?

<table>
<thead>
<tr>
<th>No</th>
<th>Yes</th>
<th>If yes, please rate how helpful you found the program:</th>
<th>Very Helpful</th>
<th>Somewhat Helpful</th>
<th>Neither Helpful or Unhelpful</th>
<th>Somewhat Unhelpful</th>
<th>Completely Unhelpful</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Breakfast Challenge</td>
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<td>10,000 Steps Challenge</td>
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<td></td>
<td></td>
<td>Know Your Numbers Challenge</td>
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<td></td>
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<td>Smoking Cessation Education Challenge</td>
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<tr>
<td></td>
<td></td>
<td>General Health Workshops</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Wellness Resource Center website</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

2. Overall, how would you rate the Worksite Wellness Program at your worksite?

- □ Poor
- □ Fair
- □ Good
- □ Very good
- □ Excellent

3. What effect has the Worksite Wellness Program had on your...

<table>
<thead>
<tr>
<th>Morale</th>
<th>Very Negative Effect</th>
<th>Negative Effect</th>
<th>No Effect</th>
<th>Positive Effect</th>
<th>Very Positive Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with your job</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction with your employer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lifestyle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fitness level</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Since Winter 2005 have you noticed a change in how people feel about health-related programs at your worksite?

- □ Yes
- □ No

8a. If YES, please indicate what you noticed:

___________________________________________________________________________________

5. Do you feel that your worksite is supportive of programs and activities to promote health at work?

- □ Yes
- □ No

9a. Please elaborate:

___________________________________________________________________________________

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Estimating the Return-on-Investment From Changes in Employee Health Risks on The Dow Chemical Company’s Health Care Costs

Ron Z. Goetzel, PhD
Ronald J. Ozminkowski, PhD
Catherine M. Baase, MD, FAAFP, FACOEM
Gary M. Billotti, MS

Learning Objectives

- Recall the risk factors evaluated in the company’s health assessment program, and the effects of advancing age over the 10-year study period on employees’ risk factor profiles.
- Relate the degree of risk reduction to the company’s health care expenditures under three scenarios: a large and a modest impact of risk reduction efforts on health risk, and a “break-even” condition in which the company saves the same amount it invests.
- Conclude whether health risk reduction efforts are worthwhile to companies in terms of the financial pay back.

Medical directors often need to build a business case for investing in health promotion as part of a comprehensive health management strategy. Their business case can be greatly strengthened if it includes a projected return-on-investment (ROI). How to best formulate a compelling ROI analysis has been a challenge, and several investigators have commented on the topic.1–6 This article illustrates an approach used by staff at The Dow Chemical Company (Dow) to develop a credible ROI estimate as a component of their a business case for ongoing investment in the health and well-being of...
BASIC FRAMEWORK FOR ROI CALCULATION

- Employee Demographic Characteristics
- Prevalence of Risk Factors
- Medical and Related Expenditures
- Program Investments
- ROI
Ten Modifiable Health Risk Factors Are Linked To More Than One-Fifth Of Employer-Employee Health Care Spending

ABSTRACT
An underlying premise of the Affordable Care Act provisions that encourage employers to adopt health promotion programs is an association between workers' modifiable health risks and increased health care costs. Employers, consultants, and vendors have cited risk-cost estimates developed in the 1990s and wondered whether they still hold true. Examining ten of these common health risk factors in a working population, we found that similar relationships between such risks and total medical costs documented in a widely cited study published in 1998 still hold. Based on our sample of 92,486 employees at seven organizations over an average of three years, $82,072,456, or 22.4 percent, of the $366,373,301 spent annually by the seven employers and their employees in the study was attributed to the ten risk factors studied. This amount was similar to almost a quarter of spending linked to risk factors (24.9 percent) in the 1998 study. High risk for depression remained most strongly associated with increased per capita annual medical spending (48 percent, or $2,184, higher). High blood glucose, high blood pressure, and obesity were strongly related to increased health care costs (31.8 percent, 31.6 percent, and 27.4 percent higher, respectively), as were tobacco use, physical inactivity, and high stress. These findings indicate ongoing opportunities for well-designed and properly targeted employer-sponsored health promotion programs to produce substantial savings.
# HERO II Study: Risk-Cost Impacts

## EXHIBIT 1 Average Unadjusted And Adjusted Medical Expenditures, In 2009 Dollars, By Risk Levels

<table>
<thead>
<tr>
<th>Risk measure</th>
<th>Risk level</th>
<th>Unadjusted means ($)</th>
<th>Adjusted means ($)</th>
<th>Unadjusted difference (%)</th>
<th>Adjusted difference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>High</td>
<td>6,207</td>
<td>6,738</td>
<td>59.1</td>
<td>48.0</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>3,902</td>
<td>4,553</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood glucose</td>
<td>High</td>
<td>6,532</td>
<td>6,849</td>
<td>70.0</td>
<td>31.8</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>3,842</td>
<td>5,196</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood pressure</td>
<td>High</td>
<td>5,264</td>
<td>5,734</td>
<td>27.4</td>
<td>31.6</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>4,132</td>
<td>4,356</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body weight</td>
<td>High</td>
<td>4,956</td>
<td>5,078</td>
<td>41.7</td>
<td>27.4</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>3,498</td>
<td>3,988</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco use</td>
<td>High</td>
<td>4,192</td>
<td>4,184</td>
<td>10.8</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>3,784</td>
<td>3,597</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>High</td>
<td>4,477</td>
<td>4,582</td>
<td>26.6</td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>3,537</td>
<td>3,976</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stress</td>
<td>High</td>
<td>5,024</td>
<td>5,249</td>
<td>13.0</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>4,444</td>
<td>4,836</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholesterol</td>
<td>High</td>
<td>4,780</td>
<td>4,913</td>
<td>2.0</td>
<td>-2.5</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>4,688</td>
<td>5,037</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition and eating habits</td>
<td>High</td>
<td>3,245</td>
<td>3,261</td>
<td>-23.2</td>
<td>-5.2</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>4,226</td>
<td>3,440</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td>High</td>
<td>3,857</td>
<td>3,843</td>
<td>-3.94</td>
<td>-9.48</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>4,015</td>
<td>4,246</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Individual vs. Population-Based Costs

## Exhibit 3

**Estimated Effect Of Each Health Risk On Annual Medical Expenditures By Employers And Employees**

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Estimated annual effect per high-risk person ($)</th>
<th>Prevalence: number of people at high risk</th>
<th>High-risk group annual effect</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost ($)</td>
</tr>
<tr>
<td>High stress</td>
<td>413</td>
<td>8,582</td>
<td>3,544,366</td>
</tr>
<tr>
<td>Tobacco use</td>
<td>587</td>
<td>16,735</td>
<td>9,873,445</td>
</tr>
<tr>
<td>Obesity</td>
<td>1,091</td>
<td>29,416</td>
<td>32,092,856</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>606</td>
<td>27,251</td>
<td>16,514,106</td>
</tr>
<tr>
<td>High blood glucose</td>
<td>1,653</td>
<td>5,823</td>
<td>9,625,419</td>
</tr>
<tr>
<td>Depression</td>
<td>2,184</td>
<td>5,427</td>
<td>11,852,568</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>1,578</td>
<td>5,423</td>
<td>7,472,894</td>
</tr>
<tr>
<td>High alcohol consumption</td>
<td>-402</td>
<td>3,213</td>
<td>-1,291,626</td>
</tr>
<tr>
<td>High total cholesterol</td>
<td>-124</td>
<td>4,734</td>
<td>-587,016</td>
</tr>
<tr>
<td>Poor nutrition and eating</td>
<td>-179</td>
<td>38,964</td>
<td>-6,974,556</td>
</tr>
<tr>
<td>habits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total expenditures attributable to high risk</td>
<td>—*</td>
<td>—*</td>
<td>82,072,456</td>
</tr>
</tbody>
</table>
Cost Per Capita of Risk Factors

- Obesity: 347
- Physical Inactivity: 178.6
- Depression: 128.2
- Tobacco Use: 106.2
- Blood Glucose: 104.1
- Blood Pressure: 80.8
- Stress: 38.3
- Serum Cholesterol: -6.4
- Alcohol Consumption: -14
- Diet: -75.4
The Relationship Between 11 Health Risks and Medical and Productivity Costs for a Large Employer

Niranjana M. Kowlessar, PhD, Ron Z. Goetzel, PhD, Ginger Smith Carls, PhD, Maryam J. Tabrizi, MS, CHES, and Arlene Guindon, MPH

Objective: To evaluate the relationship between modifiable health risks, and health and productivity related expenditures and predict cost savings from improvements in the health risk profile of a large US employer. Methods: Information was collected on 11 modifiable health risks for active employees who completed a health assessment and enrolled in a noncaptitated health plan. These risks were related to employer medical care costs and employee productivity. Multivariate analyses were performed to estimate costs associated with high risk, as well as potential savings from reducing risk prevalence among employees. Results: Health risks with the greatest impact on total medical care costs included obesity, high blood pressure, high blood glucose, high triglycerides, and inadequate exercise. Conclusions: Modifiable health risks are associated with higher employer costs. Targeted programs that address these risks are expected to yield substantial savings.

Several prior studies have shown that modifiable health risk factors impose a substantial financial burden on employers.¹⁻⁴ Both productivity losses, and generate a positive return on investment.¹¹⁻¹³ As employers develop, evaluate, and justify their budgets for population health management initiatives, they routinely seek to quantify the financial value or return that such initiatives will produce for the organization. Insight into the costs of modifiable health risk factors has been extremely powerful in building a business case for health

Learning Objectives

- Demonstrate familiarity with previous research data on the financial burden of modifiable health risks for employers.
- Summarize the new findings on how specific health risks contribute to medical and productivity costs.
- Discuss how the new findings could help in targeting workplace health promotion programs, including the health risks likely to lead to cost savings.
Productivity Estimates from PepsiCo Study

ORIGINAL ARTICLES

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, Shaohung 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 demographics, and other risks constant. 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 one-percentage point annual reduction in the health risks assessed would yield annual per capita savings of $83.02 to $103.39. Conclusions: Targeted programs that address modifiable health risks are expected to produce substantial cost reductions in multiple benefit categories.

Additional research has found that costs associated with health risks increase when productivity losses are included. Annual costs due to lost productivity have been estimated at $1392 to $2592 per employee at risk. Employees tend to have multiple risk factors, which can impact the magnitude of these productivity costs. 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 health care expenditures 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, seller, and distributor of Pepsi-Cola beverages and has a workforce with 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 its offerings of comprehensive preventive care benefits, on-site medical clinics and screenings...
PEPSICO – OVERWEIGHT / OBESE ANALYSIS (N=11,217)

*At least one difference significant at the 0.05 level

Adjusted predicted annual costs for employees by BMI

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

NHLBI MULTI-CENTER STUDY: ESTIMATED ANNUAL COSTS OF HEALTHCARE UTILIZATION, ABSENTEEISM, AND PRESENTEEISM BY BMI CATEGORY

* P < .05

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

Ron Z. Goetzl, PhD  
Ginger Smith Carls, MA  
Shaohung Wang, PhD  
Emily Kelly, MA  
Edward Mauzeri, MD  
Daniel Columbus, MBA  
Ann Cavuoti, 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)

A healthy and productive workforce is essential to business success. Although much emphasis has been placed on optimal management of acute and chronic disease as a way to contain employer health care costs and lessen employee time lost due to illness, there is growing recognition that a more efficient approach to achieving cost savings is by promoting employee health. Research with employers has documented the relationship between health risk status and important work-related cost and productivity outcomes, and this research suggests that risk reduction among workers may be a practical way to improve these outcomes. Employers are interested in knowing how various risk factors can affect employee health and productivity, and eventually documenting the benefits associated with programs directed at changing these risks.

A body of evidence suggests a clear relationship between common
## RISK FACTORS AND PRESENTEEISM (N = 5,875)

<table>
<thead>
<tr>
<th>Outcomes and group of health risks</th>
<th>Predicted Scenario</th>
<th>Predicted Mean</th>
<th>Impact on dollars or days (95% CI)</th>
<th>Impact as percent difference from scenario without the risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presenteeism</strong></td>
<td></td>
<td></td>
<td>Annual Unproductive Days</td>
<td></td>
</tr>
<tr>
<td>Females</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Biometric Lab Values</td>
<td>Without risk(s)</td>
<td>0.73</td>
<td>0.95</td>
<td>130.3%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>1.69</td>
<td>(0.85, 1.05)</td>
<td>(116.7%, 144.0%)</td>
</tr>
<tr>
<td>Alcohol / Tobacco Use</td>
<td>Without risk(s)</td>
<td>0.77</td>
<td>1.67</td>
<td>217.0%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>2.44</td>
<td>(1.56, 1.78)</td>
<td>(203.1%, 230.9%)</td>
</tr>
<tr>
<td>Emotional Health</td>
<td>Without risk(s)</td>
<td>0.75</td>
<td>0.92</td>
<td>122.5%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>1.66</td>
<td>(0.82, 1.02)</td>
<td>(109.1%, 135.9%)</td>
</tr>
<tr>
<td>Males</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Biometric Lab Values</td>
<td>Without risk(s)</td>
<td>0.49</td>
<td>0.80</td>
<td>162.3%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>1.29</td>
<td>(0.70, 0.90)</td>
<td>(142.2%, 182.3%)</td>
</tr>
<tr>
<td>Alcohol / Tobacco Use</td>
<td>Without risk(s)</td>
<td>0.55</td>
<td>1.43</td>
<td>258.6%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>1.99</td>
<td>(1.16, 1.71)</td>
<td>(209.4%, 307.8%)</td>
</tr>
<tr>
<td>Emotional Health</td>
<td>Without risk(s)</td>
<td>0.53</td>
<td>0.91</td>
<td>171.3%</td>
</tr>
<tr>
<td></td>
<td>With risk(s)</td>
<td>1.44</td>
<td>(0.79, 1.03)</td>
<td>(149.1%, 193.6%)</td>
</tr>
</tbody>
</table>
Applying an ROI Model for Small Employers

Estimating the Return on Investment From a Health Risk Management Program Offered to Small Colorado-Based Employers

Ron Z. Goetzel, PhD, Maryam Tabrizi, MS, PhD, Rachel Mosher Henke, PhD, Richele Benevent, MS, Claire v. S. Brockbank, MS, Kaylan Stinson, MSPH, Margo Trotter, RN, BScN, MHSc, and Lee Newman, MD, MA

Objective: To determine whether changes in health risks for workers in small businesses can produce medical and productivity cost savings. Methods: A 1-year pre- and posttest study tracked changes in 10 modifiable health risks for 2458 workers at 121 Colorado businesses that participated in a comprehensive worksite health promotion program. Risk reductions were entered into a return-on-investment (ROI) simulation model. Results: Reductions were recorded in 10 risk factors examined, including obesity (−2.0%), poor eating habits (−5.8%), poor physical activity (−6.5%), tobacco use (−1.3%), high alcohol consumption (−1.7%), high stress (−3.5%), depression (−2.3%), high blood pressure (−0.3%), high total cholesterol (−0.9%), and high blood glucose (−0.2%). The ROI model estimated medical and productivity savings of $2.03 for every $1.00 invested. Conclusions: Pooled data suggest that small businesses can realize a positive ROI from effective risk reduction programs.

Among the criticisms cited is the lack of a clear connection between health risk reduction and medical care or productivity-related savings.

Measuring program impacts and the ROI from a workplace wellness program is complicated. To establish that the program produced health improvements and cost savings, one must ask a key question: “What would have happened in the absence of this program—that is, what changes would have occurred in the health risk profile of workers and how much would have been spent on health care services and productivity-related events had the organization not invested in workplace health promotion?” Therefore, to evaluate program impact, a “counterfactual” must be established that posits a “do nothing” scenario in which workers’ health is improved or worsened in accordance with prior patterns, absent a program. Against this “do nothing” or “control” condition, the effects of the workplace health promotion can then be compared.

The authors thank the Colorado Coalition for Health Promotion.
Changes in Health Risks

<table>
<thead>
<tr>
<th>Health Risk Factor</th>
<th>Time 1, %</th>
<th></th>
<th></th>
<th>Time 2, %</th>
<th></th>
<th></th>
<th>% Point Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Obesity</td>
<td>2,458</td>
<td>24.04</td>
<td>0.43</td>
<td>2,458</td>
<td>22.05</td>
<td>0.41</td>
<td>-1.99**</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>2,303</td>
<td>2.30</td>
<td>0.15</td>
<td>2,303</td>
<td>1.96</td>
<td>0.14</td>
<td>-0.34</td>
</tr>
<tr>
<td>High total cholesterol</td>
<td>1,911</td>
<td>5.70</td>
<td>0.23</td>
<td>1,911</td>
<td>4.79</td>
<td>0.21</td>
<td>-0.92</td>
</tr>
<tr>
<td>High blood glucose</td>
<td>1,674</td>
<td>1.85</td>
<td>0.13</td>
<td>1,674</td>
<td>1.62</td>
<td>0.13</td>
<td>-0.23</td>
</tr>
<tr>
<td>Poor nutrition/eating habits</td>
<td>2,458</td>
<td>37.43</td>
<td>0.48</td>
<td>2,458</td>
<td>31.61</td>
<td>0.47</td>
<td>-5.82**</td>
</tr>
<tr>
<td>Physical inactivity</td>
<td>2,458</td>
<td>36.33</td>
<td>0.48</td>
<td>2,458</td>
<td>29.82</td>
<td>0.46</td>
<td>-6.51**</td>
</tr>
<tr>
<td>Tobacco use</td>
<td>2,458</td>
<td>8.54</td>
<td>0.28</td>
<td>2,458</td>
<td>7.24</td>
<td>0.26</td>
<td>-1.30**</td>
</tr>
<tr>
<td>High alcohol consumption</td>
<td>2,458</td>
<td>8.34</td>
<td>0.28</td>
<td>2,458</td>
<td>6.59</td>
<td>0.25</td>
<td>-1.75**</td>
</tr>
<tr>
<td>High stress</td>
<td>2,458</td>
<td>43.98</td>
<td>0.50</td>
<td>2,458</td>
<td>40.44</td>
<td>0.49</td>
<td>-3.54**</td>
</tr>
<tr>
<td>Depression</td>
<td>2,458</td>
<td>13.87</td>
<td>0.35</td>
<td>2,458</td>
<td>11.60</td>
<td>0.32</td>
<td>-2.28*</td>
</tr>
</tbody>
</table>

*P ≤ 0.01; **P ≤ 0.001.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulative medical cost, no program</td>
<td>$11,205,538</td>
</tr>
<tr>
<td>Cumulative medical savings, with program</td>
<td>$124,867</td>
</tr>
<tr>
<td>Cumulative productivity savings, with program</td>
<td>$310,040</td>
</tr>
<tr>
<td>Cumulative program cost</td>
<td>$214,347</td>
</tr>
<tr>
<td>NPV, medical care</td>
<td>$−89,480</td>
</tr>
<tr>
<td>NPV, medical + productivity</td>
<td>$220,560</td>
</tr>
<tr>
<td>ROI, medical care</td>
<td>$0.58</td>
</tr>
<tr>
<td>ROI, workplace productivity</td>
<td>$1.45</td>
</tr>
<tr>
<td>ROI, medical care + workplace productivity</td>
<td>$2.03</td>
</tr>
</tbody>
</table>

NPV, net present value; ROI, return on investment.
Research Methods -- Study Design 101

- Pre-experimental
- Quasi-experimental
- True experimental

Validity of results increases as you move down this list.
Case Study Methodology Overview

• **Create samples:**
  • Treatment group = members in the health promotion regions
  • Control group = members in the control regions

• **Balance** the clinical and demographic characteristics of the two groups at baseline to ensure an ‘apples-to-apples’ comparison

• **Compare** the relative trends in expenditures and utilization between the treatment and control regions over time to determine if the program generated savings
Study Population/Sample

- Inclusion criteria:
  - Age 17-64 in January 2012
  - Continuous enrollment in medical plans for 15 quarters (2010 Q1-2013 Q3)

- Exclusion criteria:
  - Total medical + prescription drug allowed amount <$0 in any year
  - Severity score not available in any year

- Treatment group
  - The total number of unique members = 26,054

- Control group
  - The total number of unique members = 35,575
Variables To Predict Program Qualification

- DCG Relative Risk Score, concurrent and prospective, measured annually
- Presence of disease conditions, measured annually
- Baseline total allowed amount
- Prescriptions filled, inpatient admissions, ER visits
- Qualification for disease management programs
- Member age
Propensity Score Weighting Variables

- All variables used to predict qualification
- Gender
- Production/salaried status
- Employee/self vs. spouse/partner or child/other dependent
- Employee status: full-time/part-time, active/retiree
- Annual wage band (as a proxy for socioeconomic status)
- Urban residence (defined as residence within an MSA)
Study Outcomes

- Quarterly medical and prescription drug utilization and expenditures (inflation adjusted)
  - Utilization:
    - Number of inpatient admissions, hospital days, number of emergency department visits, number of outpatient office visits, number of prescriptions filled, days supply
  - Expenditures
    - Acute inpatient stays, emergency department visits, outpatient office visits, total medical, prescription drug
Analytic Approach

• Use the enrollment data in the health promotion eligible regions to estimate the algorithm used to qualify members for the program
  • Run logistic regression to predict probability for program qualification
  • Apply the same algorithm to the non-eligible comparison group
  • Further balance the sample with propensity score weighting
• Use the weighted sample to evaluate differences in utilization and expenditures for predicted qualifiers in the program vs. comparison group members over time (difference-in-differences)
### Treatment vs. Comparison Employees at Baseline

Table 6: Comparison of Buy-Up vs. Standard Member Characteristics, Unweighted and Propensity Score Weighted (characteristics at baseline)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unweighted</th>
<th>Propensity Score Weighted</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Buy-Up</td>
<td>Standard</td>
</tr>
<tr>
<td>Age</td>
<td>49.8</td>
<td>50.3</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>57.0%</td>
<td>58.7%</td>
</tr>
<tr>
<td>Male</td>
<td>43.0%</td>
<td>41.3%</td>
</tr>
<tr>
<td>Relationship Code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee/Self</td>
<td>54.2%</td>
<td>53.5%</td>
</tr>
<tr>
<td>Spouse/Partner</td>
<td>41.0%</td>
<td>42.1%</td>
</tr>
<tr>
<td>Child/Other Dependent</td>
<td>4.8%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Clinical Flags - 12 month baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heart Disease</td>
<td>11.7%</td>
<td>12.5%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>15.8%</td>
<td>15.7%</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>3.2%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>55.1%</td>
<td>55.7%</td>
</tr>
<tr>
<td>Mental Health</td>
<td>18.0%</td>
<td>15.3%</td>
</tr>
<tr>
<td>DCG Relative Risk Scores - 12 month baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concurrent Nonrescaled</td>
<td>356</td>
<td>352</td>
</tr>
<tr>
<td>Prospective Explanatory Nonrescaled</td>
<td>298</td>
<td>300</td>
</tr>
<tr>
<td>Utilization - 12 month baseline PMPY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute Admissions</td>
<td>0.20</td>
<td>0.20</td>
</tr>
<tr>
<td>Emergency Department Visits</td>
<td>0.39</td>
<td>0.45</td>
</tr>
<tr>
<td>Office Visits</td>
<td>15.01</td>
<td>14.83</td>
</tr>
<tr>
<td>Number of Prescriptions</td>
<td>25.42</td>
<td>25.05</td>
</tr>
<tr>
<td>Days Supplied</td>
<td>1122.30</td>
<td>1098.40</td>
</tr>
<tr>
<td>Expenditures - 12 month baseline PMPY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical and Prescription Drug</td>
<td>$16,342</td>
<td>$16,935</td>
</tr>
</tbody>
</table>
Descriptive Results

Trends in Mean Quarterly Medical and Prescription Allowed Amounts Among Predicted Qualifiers
Multivariate Results

Total PMPM Allowed Amount

Pre-Period (2010-2011) 
Comparison Group: $1,219 
Treatment Group: $1,214

Post Period (2012-2013q3) 
Comparison Group: $1,653 
Treatment Group: $1,547

Changes (Post - Pre) 
Difference-in-Differences: $434

Comparison Group: $333 
Difference-in-Differences: $101

Legend:
- Comparison Group
- Treatment Group
- Difference-in-Differences
Enhanced Care Program (ECP) Overview

- NIHCR (National Institute for Health Care Reform) commissioned Johns Hopkins and Truven Health Analytics to evaluate the ECP Pilot
- ECP Pilot: July 1, 2013 – June 30, 2015
- Final evaluation based on two-year experience of all members, matched to a Control Group
Return on Investment (ROI) Evaluation

- Calculated the total expenses and savings over the two years of the Pilot

- Used an “Intent-to-Treat” (ITT) study design
  - ECP group includes all Ford/Trust members who were recruited for ECP, regardless of whether they participated
  - Total of 2,915 people (38% participation)

- Included a one-to-one match of ECP Pilot members to a Control Group in the ITT study design
Each patient was matched to a Control Group patient.
Patients drawn from Ford & Trust members who would have been eligible for ECP except that they were not in a participating practice.
Used propensity score matching to “twin” treatment and Control Group patients.
Final sample: 2,915 treatment and 2,915 Control Group patients.
Criteria For Recruited-Control Group Match at Baseline

- Ages 18-63
- Non-Medicare
- Active or Retired Spouse, Employee, or Dependent
- Does not have End Stage Renal Disease
- Not pregnant
- No recent organ transplants
- High Risk Score

Matching Variables

- Age
- Gender
- Total Costs
- ER, Inpatient, and Office Visit Use
- Drug Days Supply
- Risk Score
- Charlson Comorbidity Index
- Psychiatric Diagnostic Groups
Why Use Intent-to-Treat?

- To assess program impact on all ECP eligibles (not just participants) and avoid bias.
- Flaw of “participant only” analyses: participants may differ from non-participants, skewing results...
  
  Participants may do worse, making estimated effect too small.

  Participants may do better, making estimated effect too large.

- Intent-to-treat analysis provides the best estimate of the effect on a broader population.
The two year Pilot resulted in a total unadjusted per member claims savings of $2,574 when comparing ECP Members to the Control Group.
Moving from ROI to VOI

Return-on-Investment (ROI)
- Medical costs
- Absenteeism
- Short term disability
- Safety/Workers’ Comp
- Presenteeism

Population Health
- Adherence to evidence based medicine
- Behavior change, risk reduction, health improvement

Value-on-Investment (VOI)
- Improved “functioning” and performance
- Attraction/retention of talent – employer of choice
- Employee engagement
- Corporate social responsibility
- Corporate reputation
- Stock price
Wall Street Studies

The Stock Performance of C. Everett Koop Award Winners Compared With the Standard & Poor's 500 Index

Ron Z. Goetzel, PhD, Raymond Fabius, MD, Daniel Fabius, DO, Enid C. Roemer, PhD, Nicole Thornton, BA, Rebecca K. Kelly, PhD, RD, and Kenneth R. Pelleiter, PhD, MD (hc)

Objective: The aim of the study was to explore the link between companies investing in the health and well-being programs of their employees and stock market performance. Methods: Stock performance of C. Everett Koop National Health Award winners (n = 26) was measured over time and compared with the average performance of companies comprising the Standard and Poor's (S&P) 500 Index. Results: The Koop Award portfolio outperformed the S&P 500 Index. In the 14-year period tracked (2000–2014), Koop Award winners' stock values appreciated by 233.9% compared with the market average appreciation of 165.8%. Conclusions: This study supports prior and ongoing research demonstrating a higher market valuation—an affirmation of business success by Wall Street investors—of socially responsible companies that invest in the health and well-being of their workers when compared with other publicly traded firms.

Workplace health promotion programs are designed to improve businesses, partly fueled by a specific provision of the 2010 Affordable Care Act (Section 2705) that encourages employers to implement comprehensive worksite health promotion programs. Currently, approximately half of all employers with more than 50 employees offer wellness programs of varying comprehensiveness, with large employers being more likely to have a complex program. Furthermore, expansion of these programs has been spurred by the belief that organizations will benefit at the business or enterprise level by reducing the company’s operating costs, in the form of medical expenditures, as well as improving worker productivity, although that assumption has been challenged by some critics. The connection between a company's health promotion program and overall business results assumes high employee awareness of and engagement in workplace health promotion and disease prevention programs. A further assumption is that participation in the workplace programs will lead to improved health, and improved health will lead to lower medical expenditures and improved productivity, thereby improving overall business results.


## Wide Variety of Companies and Industries

<table>
<thead>
<tr>
<th>Koop Winners 1999–2014, By Year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BP America</strong></td>
</tr>
<tr>
<td><strong>Eastman Chemical</strong></td>
</tr>
<tr>
<td><strong>Prudential Financial</strong></td>
</tr>
<tr>
<td><strong>Pfizer, Inc.</strong></td>
</tr>
<tr>
<td><strong>The Volvo Group</strong></td>
</tr>
<tr>
<td><strong>Alliance Data Systems Corp</strong></td>
</tr>
<tr>
<td><strong>Dow Chemical Company</strong></td>
</tr>
<tr>
<td><strong>International Business Machines</strong></td>
</tr>
<tr>
<td><strong>Pepsi Bottling Group</strong></td>
</tr>
<tr>
<td><strong>WE Energies</strong></td>
</tr>
<tr>
<td><strong>Union Pacific Railroad</strong></td>
</tr>
<tr>
<td><strong>UAW-GM</strong></td>
</tr>
<tr>
<td><strong>Johnson &amp; Johnson Services, Inc</strong></td>
</tr>
</tbody>
</table>

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Koop Winners Outperformed the S&P 500 – 3:1

Cumulative Stock Performance (%) of Koop Award Winners Compared With the S&P 500 Index, 2001–2014
Assessment (Structure Evaluation)

Consulting / Research Capabilities (~3-6 months)

1. Review and provide feedback on existing program and measures:
   - Program plans/strategies/goals/objectives
   - Measurement and evaluation (M&E) framework
   - Data sources

2. Conduct formative research to help:
   - Formulate program plan/strategies/goals/objectives
   - Identify data availability and gaps
   - Develop a M&E plan (short, mid, long-term)

3. Execute baseline assessment based on a defined M&E plan/framework to determine
   - Individual health risks, behaviors, healthcare utilization and costs
   - Current level of organizational practices, policies and environmental support for workplace health promotion
   - Other metrics of interest (e.g., job satisfaction, employee engagement)
Developing Two Culture of Health Measurement Tools

Examining Employers’ Efforts to Influence Population Health Inside and Outside Company Walls

Karen B. Kent, MPH, Ron Z. Goetzel, PhD, Enid Chung Roemer, PhD, Katherine McCleary, MS, CHES, Rachel Mosher Henke, PhD, Michael A. Head, MS, and Raymond Fabius, MD

Objective: The aim of the study was to develop tools that quantify employers’ investment in building cultures of health (COH)—inside and outside company walls. Methods: Two COH instruments were developed through literature reviews and expert consultation. The first focused on internal culture of health (COH-INT), that is, programs, policies, and attributes of the physical and social environments that support employees’ health and well-being. The second focused on external culture of health (COH-EXT), that is, programs, policies, and environmental supports that promote communities’ health. We administered these tools to 32 employers and examined instrument reliability, distribution of scores, and correlation between the two instruments. Results: Both tools demonstrated adequate reliability. COH-EXT scores changed minimally over the 3-year study timeframe. There was little correlation between the COH-INT and COH-EXT scores. Conclusions: More research is needed to further develop and validate COH-EXT instruments.

talent to the enterprise and retain experienced staff.9,10,14,15 These hypothetical long-range benefits may provide adequate incentive for some businesses to promote community health, but many other business leaders may hesitate because they lack the evidence establishing a connection between community health and business results. This dearth of research presents an important barrier to many companies wishing to establish meaningful community engagement.10

In a series of studies, we explore the relationship between employers’ investment in building cultures of health—both inside and outside the walls of a company—and salient business results. Specifically, our ultimate aim is to determine whether companies that invest more in employee and community health outperform companies that invest less so, as shown by trends in their employees’ health risk profile, medical expenditures, and company stock price.

This paper discusses the first phase of this research: the
Implementation (Process Evaluation)

Consulting / Research Capabilities (~6-12 months)

1. Assessing Fidelity and Dose Delivered
   • Design and administer tailored instruments to assess program quality and completeness at both enterprise and business unit levels
   • Conduct analysis, prepare findings and recommendations

2. Assessing Dose Received and Reach
   • Consult, review, and/or design a tailored employee feedback survey to determine awareness of, participation in, and satisfaction with the program
   • Consult, review, and/or assist with designing objective participation rate data collection methods
   • Obtain employee opinion on other dimensions of interest (e.g., perceptions of health improvements, culture of health, supportiveness of leadership, job satisfaction, morale) via survey or focus group interviews
   • Conduct analysis, prepare findings and recommendations
Results From the Bipartisan Policy Center’s CEO Council Physical Activity Challenge to American Business

Jeff Berko, MPH, Ron Z. Goetzel, PhD, Enid Chung Roemer, PhD,
Karen Kent, MPH, and Janet Marchibroda, MBA

Objective: The aim of this study was to describe findings from a survey of employees at 10 businesses participating in the “Building Better Health: Physical Activity Challenge,” an effort led by the Bipartisan Policy Center’s CEO Council on Health and Innovation. Methods: Employers provided employees with pedometers as part of an 8-week Physical Activity Challenge (Challenge). Employees were then asked to complete a survey about their awareness of, participation in, and satisfaction with the Challenge. Results: One hundred three thousand three hundred eighty-three employees participated in the Challenge, averaging 6886 steps per day per participant. Of the 3820 respondents to an employee survey sent to all workers, 62% reported enrolling in the program, and of those, the majority reported positive impacts on health (76%), fitness (73%), and lifestyle (70%). Conclusion: A brief, workplace-based physical activity challenge can achieve positive self-reported health impacts when supported by senior management of the company.

Physical inactivity is a major public health threat: inactive adults the importance of physical activity, improve the health and well-being of employees, and identify strategies that support successful program implementation by other businesses. A more modest aim of the Challenge was to pilot test the feasibility of a multi-employer initiative aimed at improving the health and well-being of workers, with an initial emphasis placed on promoting physical activity. The initiative was designed as a “call to action” by CEOs of large companies and structured flexibly to encourage broad engagement of companies’ health promotion staffs, all of whom were already managing their unique programs.

BACKGROUND

Bipartisan Policy Center

BPC (http://bipartisanpolicy.org/) is a nonprofit organization
Evaluation (Outcomes Assessment)

Consulting / Research Capabilities (~6-12+ months)
Examining Trends Over Time: Baseline to T1, T2 and beyond

1. Financial Analysis
   - Healthcare utilization and costs, absenteeism, presenteeism, short term disability, workers’ compensation
   - Return-on-Investment (retrospective and prospective)

2. Population Health Analysis
   - Behavior change, health risk reduction, health improvements

3. Value-on-Investment Analysis
   - Morale, job satisfaction, attitude toward employer, engagement
   - Attraction/retention of talent rate
   - Stock price performance, company reputation, employer of choice status

Design study plan, conduct analysis, prepare findings/trends, make recommendations for future directions and inform review/update of target goals
   - Written reports, dashboards, webinar or in-person presentations
Recent Experience In Health Promotion At Johnson & Johnson: Lower Health Spending, Strong Return On Investment

ABSTRACT Johnson & Johnson Family of Companies introduced its worksite health promotion program in 1979. The program evolved and is still in place after more than thirty years. We evaluated the program’s effect on employees’ health risks and health care costs for the period 2002–08. Measured against similar large companies, Johnson & Johnson experienced average annual growth in total medical spending that was 3.7 percentage points lower. Company employees benefited from meaningful reductions in rates of obesity, high blood pressure, high cholesterol, tobacco use, physical inactivity, and poor nutrition. Average annual per employee savings were $565 in 2009 dollars, producing a return on investment equal to a range of $1.88—$3.92 saved for every dollar spent on the program. Because the vast majority of US adults participate in the workforce, positive effects from similar programs could lead to better health and to savings for the nation as a whole.
HEALTH RISKS – BIOMETRIC MEASURES -- ADJUSTED

Results adjusted for age, sex, region * p<0.05 ** p<0.01
HEALTH RISKS – HEALTH BEHAVIORS -- ADJUSTED

Results adjusted for age, sex, region * p<0.05 ** p<0.01
HEALTH RISKS – PSYCHOSOCIAL -- ADJUSTED

Results adjusted for age, sex, region * p<0.05 ** p<0.01
## PROPENSITY SCORE MATCHING RESULTS

### Exhibit 1

<table>
<thead>
<tr>
<th>Characteristic/sample</th>
<th>Before match</th>
<th>Standardized difference</th>
<th>After match</th>
<th>Standardized difference</th>
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<tr>
<td><strong>NUMBER</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Johnson &amp; Johnson</td>
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<td><strong>AGE (YEARS)</strong></td>
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<td><strong>PERCENT IN EACH REGION</strong></td>
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<td><strong>PERCENT ENROLLED IN POINT-OF-SERVICE WITHOUT CAPITATION OR PREFERRED PROVIDER ORGANIZATION</strong></td>
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<tr>
<td>Comparison</td>
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</table>
ADJUSTED MEDICAL AND DRUG COSTS VS. EXPECTED COSTS FROM COMPARISON GROUP

Average Savings 2002-2008 = $565/employee/year

Estimated ROI: $1.88 - $3.92 to $1.00
Additional Research Capabilities

1. Conducting scientific research (along with partners) and preparing manuscripts for publication in peer-reviewed journals
2. Designing and conducting feasibility studies of pilot programs prior to general launch
3. Conducting effectiveness studies using various designs (pre-post, quasi-experimental, experimental)
   • Examine impact of specific program elements
   • Explore differences across populations of interests (e.g., union vs. non-union, high risk vs. low risk, demographics)
4. Providing guidance and analytic support to submit applications for workplace health awards
   • C. Everett Koop National Health Awards
   • WELCOA Well Workplace Awards
   • National Business Coalition of Health Best Employers for Healthy Lifestyles
   • American Heart Association Workplace Health Achievement Recognitions
Health Risk Factor Modification Predicts Incidence of Diabetes in an Employee Population

Results of an 8-Year Longitudinal Cohort Study

Lori Rolando, MD, MPH, Daniel W. Byrne, MS, Paula W. McGown, MSN, Macc, RN, FNP-BC, CPA, Ron Z. Goetzel, PhD, Tom Elasy, MD, MPH, and Mary I. Yarbrough, MD, MPH, FACOEM, FACP

Objective: To understand risk factor modification effect on Type 2 diabetes incidence in a workforce population. Methods: Annual health risk assessment data (N = 3125) in years 1 through 4 were used to predict diabetes development in years 5 through 8. Results: Employees who reduced their body mass index from 30 or more to less than 30 decreased their chances of developing diabetes (odds ratio = 0.22, 95% confidence interval: 0.05 to 0.93), while those who became obese increased their diabetes risk (odds ratio = 8.85, 95% confidence interval: 2.53 to 31.0). Conclusions: Weight reduction observed over a long period can result in clinically important reductions in diabetes incidence. Workplace health promotion programs may prevent diabetes among workers by encouraging weight loss and adoption of healthy lifestyle habits.

With results from clinical studies as background, many employers have introduced workplace health promotion programs to support their workers who wish to improve their health, with the ultimate aim of preventing unnecessary health care spending and boosting productivity.11-18 Nevertheless, a challenge faced by practitioners and researchers alike is documenting the scalability of risk-reduction programs and their ability to prevent chronic diseases such as diabetes in large populations. Few long-term studies have been performed in workplace settings in which workers are observed over several years in an attempt to determine whether changes in certain health habits and biometric measures lead to the onset of diseases or, alternately, their prevention. One exception is a 7-year study of Vanderbilt University employees, whose changes in health risks were
Questions?
Thank You

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Millions at a Time