

**Integrating and Analyzing “Big Data” Across Sectors to Improve
the Health and Wellbeing of Populations: An Introduction to the
Institute for Health and Productivity Studies**

**Ron Goetzel, PhD, (רון גצל) Director
Department of Health, Behavior and Society**



JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

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 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
- **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*

IBM Watson Health Data Assets

Healthcare Solutions & Extensive Data Repository



Analytics/
Insights
Platform

Image
Analytics

Cognitive
Tools



200M+
lives



100M+
patient
records



Billions
images
managed



1.2M
medical
abstracts



3B+
reference
points



4M+
drug patents

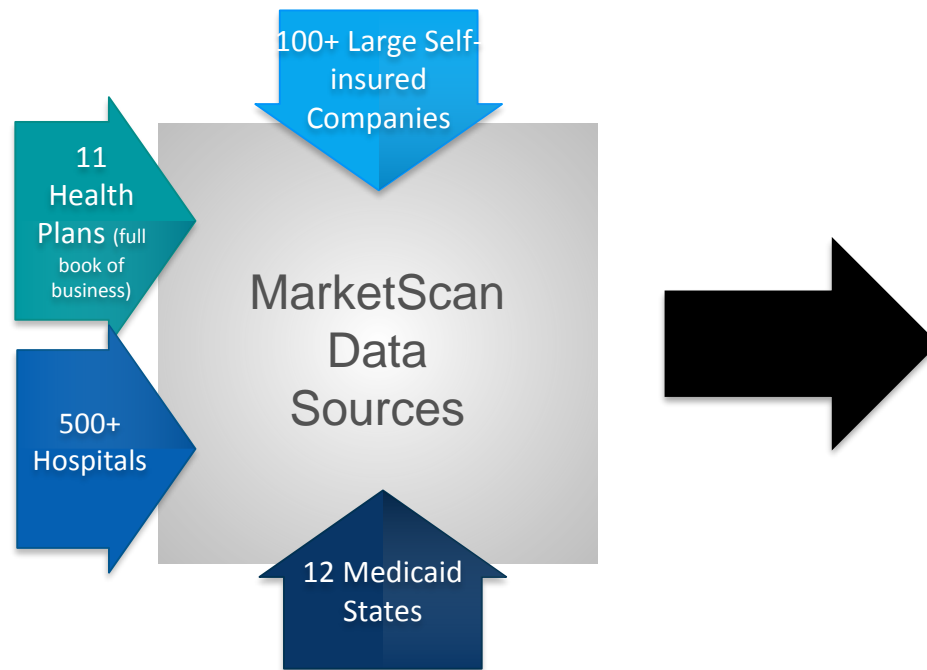


40M+
research
documents



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MarketScan: A family of databases with patient-level data from more than 240 million de-identified US lives with 25 years of history (US HIPAA-compliant)



Key Differentiators:

- Complete U.S. coverage
- Includes more than 25% of all employer-sponsored healthcare beneficiaries in U.S.
- More than 350 unique carriers (health plans, TPAs, PBMs, and carve-outs)
- Fully integrated drug & medical claims
 - Covering all plan designs
 - Includes carve-outs, mail order, injectables, patient co-payments



MarketScan claims fast facts

- **Complete U.S. coverage**
- **Past 3 years**
 - 300 contributing employers
 - Over 25 contributing health plans
 - Over 12 Medicaid states represented
 - Over 350 unique carriers
- **Fully integrated drug & medical claims**
 - Covering all plan designs
 - Includes carve-outs, mail order, injectables, patient co-payments
- **Fully HIPAA compliant**
- **Data available from 1995 forward**

- More than 220 million unique patients*
 - Over 20 billion records
- * 1995 – 2012



Database Overview by Source Most Recent 3 Years

Payer Databases: > 220 million unique patients since 1995	
<i>Commercial (under 65)</i>	59.8M lives
<i>Medicare Supplemental</i>	4.4M lives
<i>Multi-state Medicaid</i>	17.0M lives
Specialty-Payer Databases	
<i>Health and Productivity Management</i>	7.4M lives
<i>Health Risk Assessment</i>	2.5M lives
<i>Lab Results</i>	2.9M lives
<i>Dental</i>	15.1M lives
<i>Benefit Plan Design</i>	7.7M lives
Hospital Databases	
<i>Hospital Drug</i>	11M discharges
<i>Inpatient Drug Link</i>	950K matched admissions 2002-2015





Rationale Behind Our Work

What is the Evidence Base?

A large proportion of diseases and disorders is preventable. **Modifiable** health risks are precursors to a large number of diseases and disorders and to premature death (Healthy People 2000, 2010, Amler & Dull, 1987, Breslow, 1993, McGinnis & Foege, 1993, Mokdad et al., 2004)

Many **modifiable** health risks are associated with increased health care costs and reduced productivity within a relatively short time window (Milliman & Robinson, 1987, Yen et al., 1992, Goetzel, et al., 1998, Anderson et al., 2000, Bertera, 1991, Pronk, 1999, Goetzel 2012)

Modifiable health risks can be improved through workplace sponsored health promotion and disease prevention programs (Wilson et al., 1996, Heaney & Goetzel, 1997, Pelletier, 1991-2011, Soler et al. 2010)

Improvements in the health risk profile of a population can lead to reductions in health costs (Edington et al., 2001, Goetzel et al., 1999, Carls et al., 2011)

Workplace health promotion and disease prevention programs save companies money in health care expenditures and may produce a positive ROI (Citibank 1999-2000, Procter and Gamble 1998, Highmark, 2008, Johnson & Johnson, 2011, Dell 2015, Duke University 2015, Baicker, Cutler & Song, 2010)



Leveraging our Data Assets: HERO II Study

COSTS & QUALITY

By Ron Z. Goetzel, Xiaofei Pei, Maryam J. Tabrizi, Rachel M. Henke, Niranjana Kowlessar, Craig F. Nelson, and R. Douglas Metz

DOI: 10.1377/hta.2011.2819
HEALTH AFFAIRS 31,
NO. 11 (2012): 2474-2484
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The People's Health
Foundation, Inc.

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.

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Craig F. Nelson is the director of health services research at American Specialty Health, in San Diego, California.

R. Douglas Metz is the chief health services officer and executive vice president at Healthroads and American Specialty Health.

Section 4303 of the Affordable Care Act of 2010 and section 2705 of the Public Health Service Act of 1944, which was amended by the Affordable Care Act, contain provisions that encourage employers to adopt health promotion and risk reduction programs, also known as employee wellness programs. An underlying premise of these provisions is that modifiable health risks, such as obesity and high blood pressure, are associated with increased health care costs in the employed population. Therefore, employers that undertake risk-reduc-

tion programs may save on health care expenditures.

The largest employer-based study that supported the association between higher health risks and higher costs used data that are now seventeen years old. Also, both personal health behavior and health care services have changed over time. We therefore revisited this pivotal assumption using more current data. In doing so, we demonstrated that the relationships shown more than a decade ago between employee health risks and subsequent total health care costs still hold today. These enduring rela-

HERO II Study: Risk-Cost Impacts

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

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

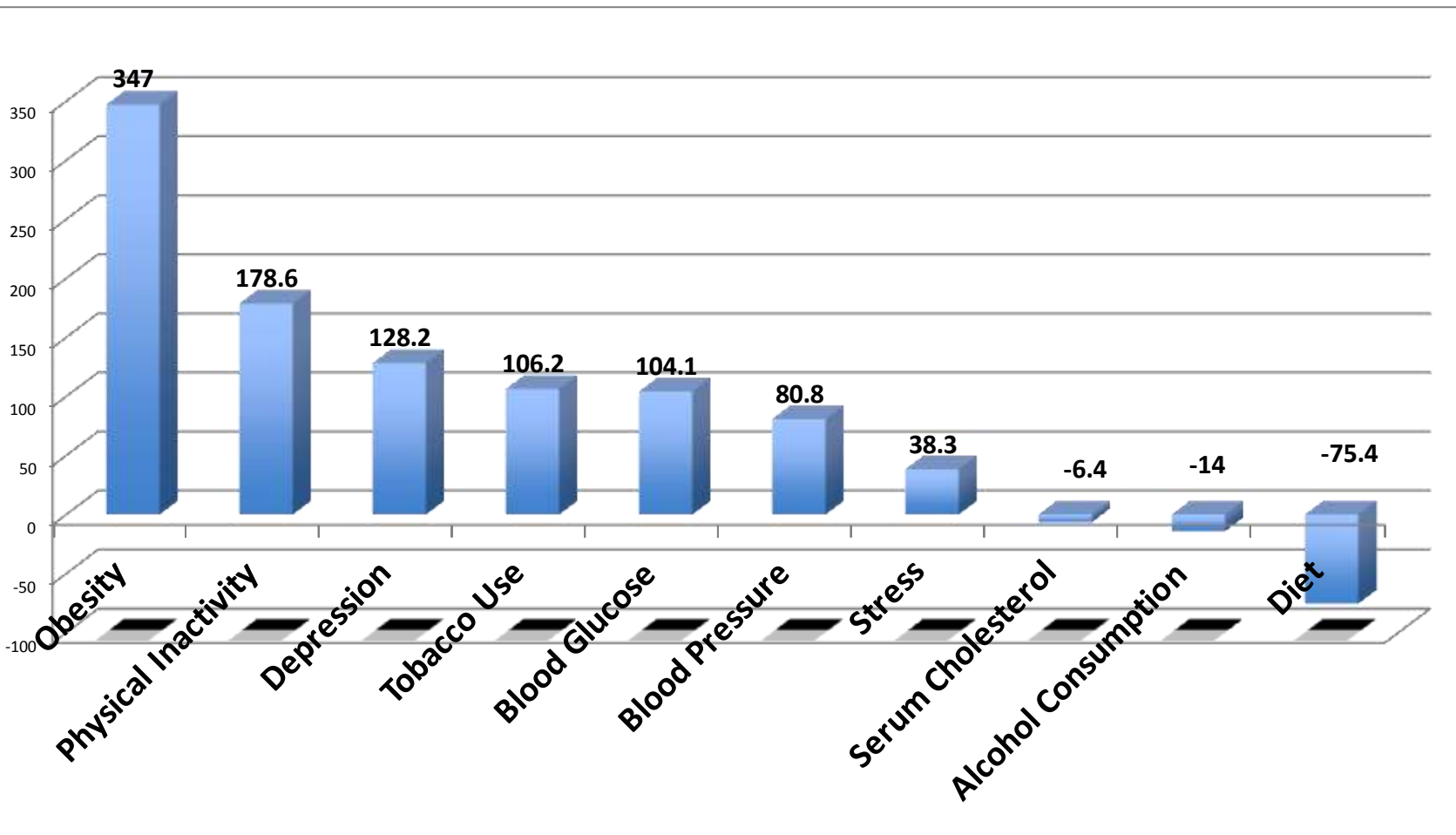
Individual vs. Population-Based Costs

EXHIBIT 3

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

Risk factor	Estimated annual effect per high-risk person (\$)	Prevalence: number of people at high risk	High-risk group annual effect		
			Cost (\$)	% of total annual expenditures	Cost per capita (\$)
High stress	413	8,582	3,544,366	1.0	38.3
Tobacco use	587	16,735	9,823,445	2.7	106.2
Obesity	1,091	29,416	32,092,856	8.8	347.0
Physical inactivity	606	27,251	16,514,106	4.5	178.6
High blood glucose	1,652	5,823	9,625,419	2.6	104.1
Depression	2,184	5,427	11,852,568	3.2	128.2
High blood pressure	1,378	5,423	7,472,894	2.0	80.8
High alcohol consumption	-402	3,213	-1,291,626	-0.4	-14.0
High total cholesterol	-124	4,734	-587,016	-0.2	-6.4
Poor nutrition and eating habits	-179	38,964	-6,974,556	-1.9	-75.4
Total expenditures attributable to high risk	— ^a	— ^a	82,072,456	22.4	887.4

Cost Per Capita of Risk Factors



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.

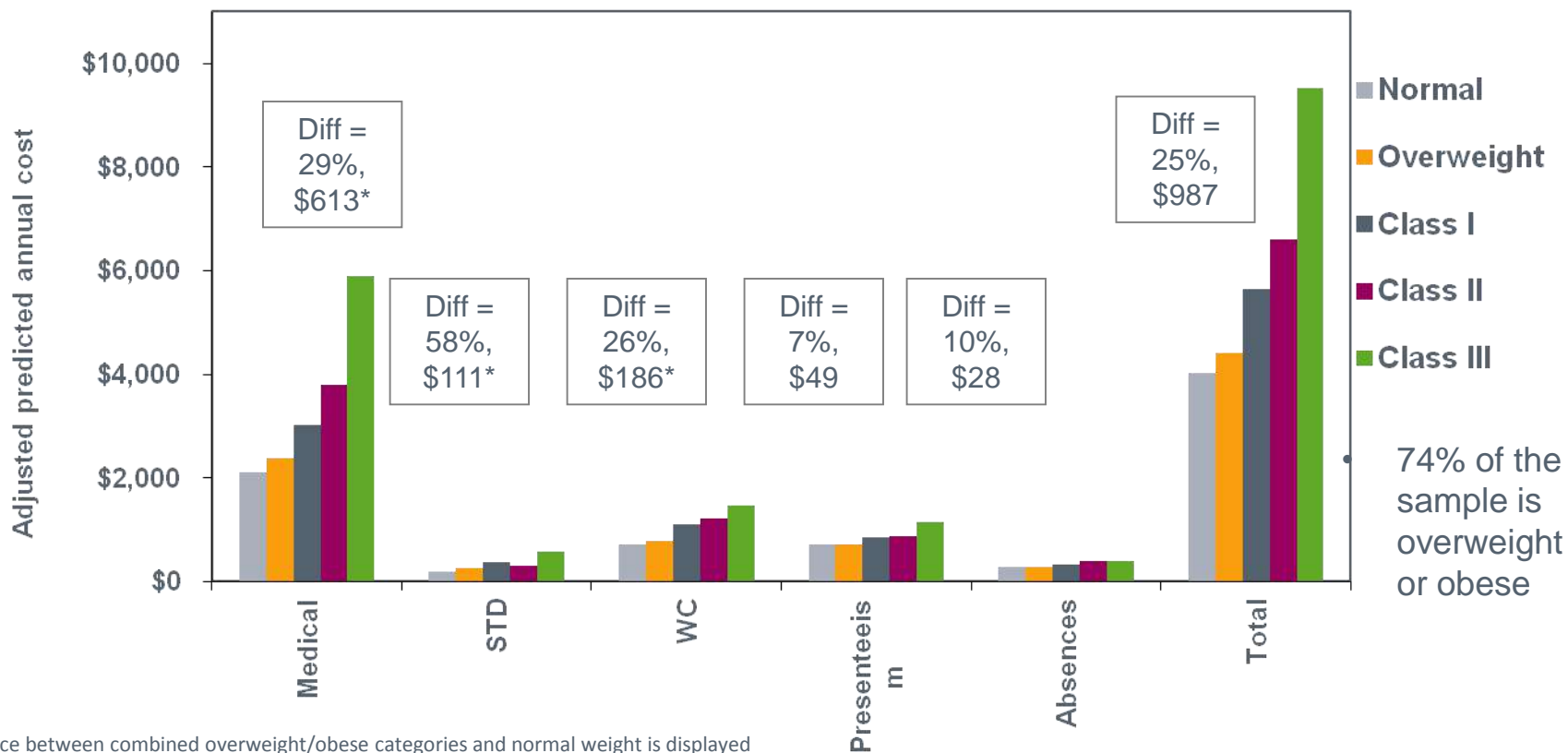
Additional research has found that costs associated with health risks increase when productivity losses are included. Annual costs due to lost productivity have been estimated at \$1392 to \$2592 per employee at risk.⁵ Employees tend to have multiple risk factors, which can impact the magnitude of these productivity costs.^{3,5} 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)

Adjusted predicted annual costs for employees by BMI

**At least one difference significant at the 0.05 level*



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

Source: Henke RM, Carls GS, Short ME, Pei X, Wang S, Moley S, Sullivan M, Goetzel RZ. The Relationship between Health Risks and Health and Productivity Costs among Employees at Pepsi Bottling Group. *J Occup Environ Med.* 52, 5, May 2010.

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 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,^{1–9} and this research suggests that risk reduction among workers may be a practical way to improve these outcomes.^{10–13} 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.

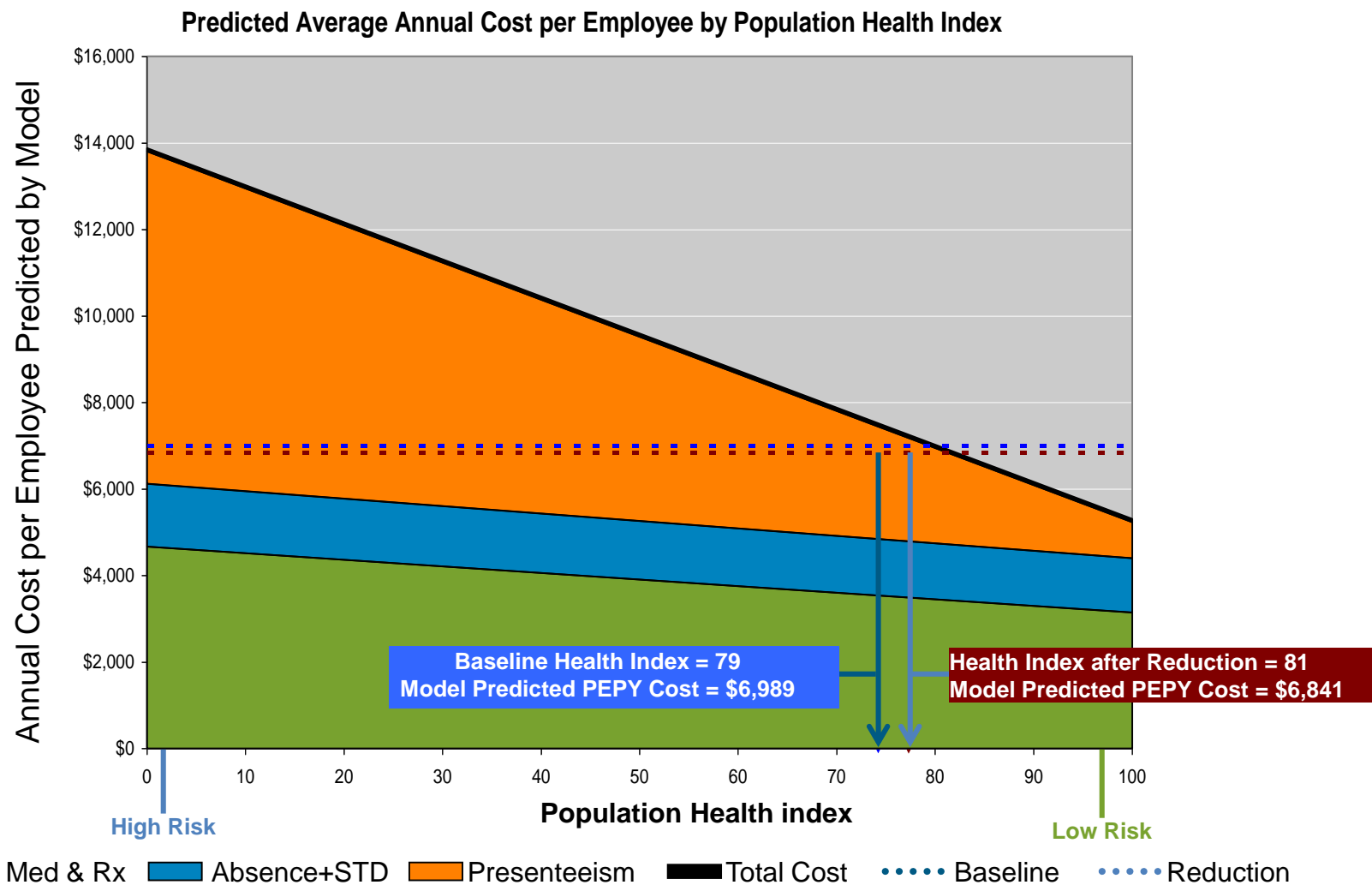
A body of evidence suggests a clear relationship between common

RISK FACTORS AND PRESENTEEISM (N = 5,875)

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



MODEL OUTPUT: HEALTH INDEX



Now What?



Peer-Reviewed Evaluation Studies



CME Available for this Article at ACEM.org

The Impact of the Highmark Employee Wellness Programs on 4-Year Healthcare Costs

Barbara L. Naydeck, MPH
Janine A. Pearson, PhD
Ronald J. Ozminkowski, PhD
Brian T. Day, EdD
Ron Z. Goetzel, PhD

According to Thompson¹, about a quarter of the increase in health care spending in the United States between 1987 and 2002 can be explained by health conditions attributable to life-style changes among Americans, especially the dramatic rise in obesity.



Methods, Issues, and Results in Evaluation and Research

A Return on Investment Evaluation of the Citibank, N.A., Health Management Program

Ronald J. Ozminkowski, Rodney L. Dunn, Ron Z. Goetzel, Richard I. Cantor, Jan Murnane, Mary Harrison

Abstract

Objectives. Citibank, N.A., initiated a comprehensive health, dental, and disease management program in 2004, using program service efforts by HealthTrust, Inc., of Menlo Park, California. Program components included an initial screening of employees, computerized diary of subjects into higher and lower risk interventions programs, extensive follow-up with the higher risk subjects, and general health education and awareness building. The objective of this study was to estimate the financial impact of the program on medical expenditures.

Methods. A quasi-experimental design was applied comparing medical expenditures before vs. after the intervention for program participants and non-participants. The 22,839 subjects (1,194 program participants and 11,644 non-participants) were followed for an average of 38 months before and after administration of a HealthTrust health risk appraisal (HRA) instrument that triggered the start of the program. Its adjust for selection bias to the extent possible with these data, multiple regression models were used to estimate the savings or medical expenditures associated with program participation. The resulting dollar savings were compared in program costs to estimate the economic return on the company's investment in the program.

Results. The return on investment (ROI) was estimated to be between \$4.56 and \$4.73

PURPOSE

Corporate worksite health management, health promotion, and wellness programs have often been sold to senior management with the promise that they will save money. The rationale for savings is derived from the intuitive belief that if employees improve their health habits and lead healthier lifestyles, they will become sick less often, use health care benefits infrequently, and spend more time at work being productive.

Increasingly, program supporters recognize the need for better research to support this economic argument for corporate health management. There are, however, several obstacles that stand in their way.



By Rachel M. Henke, Ron Z. Goetzel, Janice McHugh, and Fib Isaac

Recent Experience In Health Promotion At Johnson & Johnson: Lower Health Spending, Strong Return On Investment

DOI: 10.1093/occ/kfn030
HEALTH PROMOT 30,
NO. 3 (2008), 346-350
© 2007, Health Promotion
The Drug Manufacturers Health
Foundation, Inc.

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NO. 3 (2008), 346-350
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Fib Isaac is executive director
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Johnson & Johnson and chief
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Pharmaceuticals, Inc.—Johnson &
Johnson.

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 \$365 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.



Second-Year Results of an Obesity Prevention Program at The Dow Chemical Company

Ron Z. Goetzel, PhD, Enid C. Roemer, PhD, Xiaojie Pei, PhD, Meghan E. Short, MPH, Maryann J. Tabrizi, MS, Mark G. Wilson, HSD, David M. DeJoy, PhD, Beth A. Crum, AS, Karen J. Tully, BS, John M. White, PhD, and Catherine M. Boase, MD

Association of IBM's "A Plan for Life" Health Promotion Program with Changes in Employees' Health Risk Status



Health Care Costs of Worksite Health Promotion Participants and Non-Participants

Goetzel, Ron Z. PhD; Jacobson, Bert H. EdD; Aldana, Steven G. PhD; Vardell, Kris MS; Yee, Leslie MD, MPH

Journal of Occupational & Environmental Medicine, April 1998 - Volume 40 - Issue 4 - pp 341-346
161 Articles

New Research



American Heart Association Study – Feb 2017

WELLNESS PROGRAMS

By Ron Z. Goetzel, Rachel Mosher Henke, Michael A. Head, Richele Benevent, and Chris Calitz

Workplace Programs, Policies, And Environmental Supports To Prevent Cardiovascular Disease

DOI: 10.1377/hlthaff.2016.1273
HEALTH AFFAIRS 36,
NO. 2 (2017): 229-236
©2017 Project HOPE—
The People-to-People Health
Foundation, Inc.

ABSTRACT Using a novel approach, we provide a preliminary “snapshot” of how the comprehensiveness of workplace cardiovascular health initiatives is related to measures of employees’ health risks, disease prevalence, and medical expenditures. We linked scores for the twenty large organizations that voluntarily completed the American Heart Association’s newly launched Worksite Health Achievement Index (WHA) for 2015 to individual-level MarketScan® data for 373,478 of their workers with employer benefits that year. Higher aggregate WHAI scores were associated with lower values for four of seven modifiable indicators of cardiovascular risk and a higher value for one. Although also associated with lower prevalence of cardiovascular disease, higher aggregate scores were associated with higher spending on the condition. These and other findings provide useful benchmarks and norms for employer practices related to cardiovascular disease prevention. As employers continue to

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Michael A. Head is a senior research analyst at Truven Health Analytics in Cambridge.

Richele Benevent is a



Data Sources

- American Heart Association[®] (AHA) Workplace Health Achievement Index* (WHA) Survey
- Truven Health MarketScan[®] Database**
- Individual Workers – N= 373,478
 - Seven health risks for heart disease
 - Heart disease prevalence
 - Medical and drug expenditures for CVD

* AHA Index: http://www.heart.org/HEARTORG/HealthyLiving/WorkplaceHealth/What-Is-the-Workplace-Health-Achievement-Index_UCM_481057_Article.jsp#.WJx2TbhrB8



Heart Health Risk Profile

Employees of 20 large U.S. organizations and their risk factors for cardiovascular disease in 2015, by risk factor

Variable	No. with risk data	No. at risk	% at risk
Unhealthy weight	366,521	263,455	71.9
Poor diet	236,913	167,277	70.6
High blood pressure	253,535	168,170	66.3
Physical inactivity	205,671	97,096	47.2
High cholesterol	196,811	55,729	28.3
High blood glucose	142,682	35,858	25.1
Tobacco use	325,524	17,948	5.5



Connecting Organizational and Individual Health

	Total score	Leadership commitment	Organizational policies and environment	Strategic communications	Health-promoting programs	Employee engagement practices	Community partnerships	Measurement and reporting of outcomes
CVD and health care expenditures								
CVD expenditures ^a	+	-	+	-	-	+	-	-
CVD prevalence ^a	-	-	NS(+)	NS(-)	NS(-)	NS(0)	NS(-)	NS(-)
Risk factor								
High blood pressure ^b	-	NS(-)	NS(0)	-	NS(+)	-	NS(-)	NS(+)
High cholesterol ^c	-	-	-	-	+	+	+	+
Unhealthy weight ^d	NS(-)	NS(-)	+	-	-	NS(-)	NS(-)	-
Tobacco use ^e	-	NS(+)	NS(-)	NS(-)	-	NS(+)	NS(-)	NS(+)
Physical inactivity ^f	-	+	-	-	+	+	-	+
High blood glucose ^g	NS(+)	NS(+)	-	NS(-)	-	+	+	-
Poor diet ^h	+	-	-	+	+	+	-	+

Moving from ROI to VOI



Financial Outcomes

Return-on-Investment (ROI)

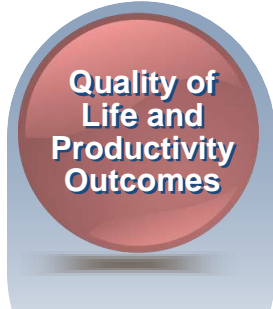
- Medical costs
- Absenteeism
- Short term disability
- Safety/Workers' Comp
- Presenteeism



Health Outcomes

Population Health

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



Quality of Life and Productivity Outcomes

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

FAST TRACK ARTICLE



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. Pelletier, 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 235% compared with the market average appreciation of 105%. **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.

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.¹ Initiation and 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.²

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 program will lead to improved health, more engaged

workplace health promotion programs are designed to improve

- Goetzel RZ, Fabius R, Fabius D, et al. The Stock Performance of C. Everett Koop Award Winners Compared With the Standard & Poor's 500 Index. *J Occup Environ Med.* 2016 Jan;58(1):9-15.
- Grossmeier J, Fabius R, Flynn JP, et al. Linking Workplace Health Promotion Best Practices and Organizational Financial Performance: Tracking Market Performance of Companies With Highest Scores on the HERO Scorecard. *J Occup Environ Med.* 2016 Jan;58(1):16-23.

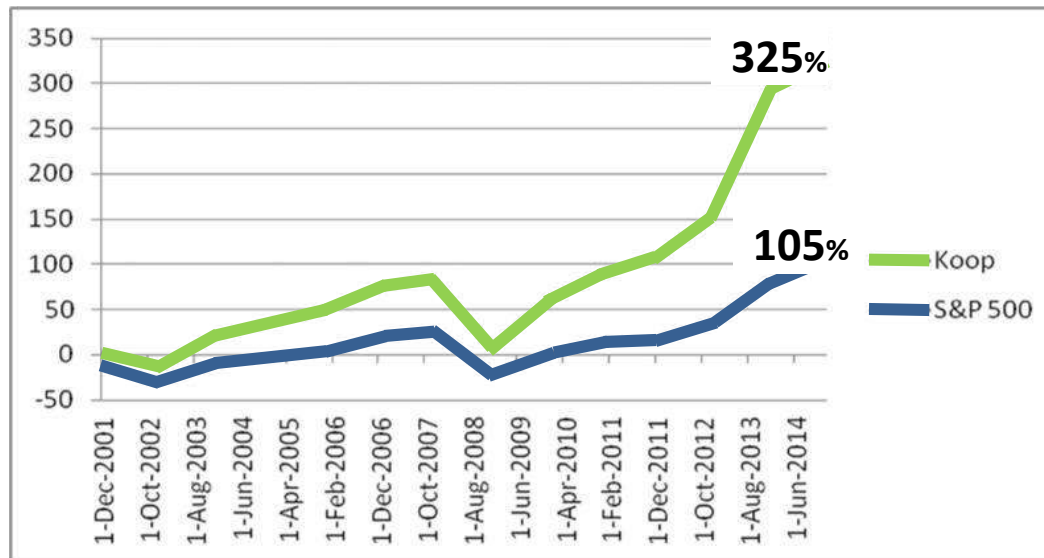
Wide Variety of Companies and Industries

Koop Winners 1999–2014, By Year					
BP America	BP	2014	FedEx Corp.	FDX	2002
Eastman Chemical	EMN	2011	Motorola Solutions Inc.	MSI	2002
Prudential Financial	PRU	2011	Citibank	C	2001
Pfizer, Inc.	PFE	2010	Union Pacific Railroad	UNP	2001
The Volvo Group	VOLVF	2010	Northeast Utilities	NU	2001
Alliance Data Systems Corp	ADS	2009	Caterpillar Inc.	CAT	2000
Dow Chemical Company	DOW	2008	Cigna Corp.	CI	2000
International Business Machines	IBM	2008	DaimlerChrysler Corporation	DDAIF	2000
Pepsi Bottling Group	PBG	2007	Fannie Mae	FNMA	2000
WE Energies	WEC	2007	Aetna	AET	1999
Union Pacific Railroad	UNP	2005	Pfizer, Inc.	PFE	1999
UAW-GM	GM	2004	Glaxo Wellcome	GSK	1999
Johnson & Johnson Services, Inc	JNJ	2003	UNUM/ Provident	UNM	1999

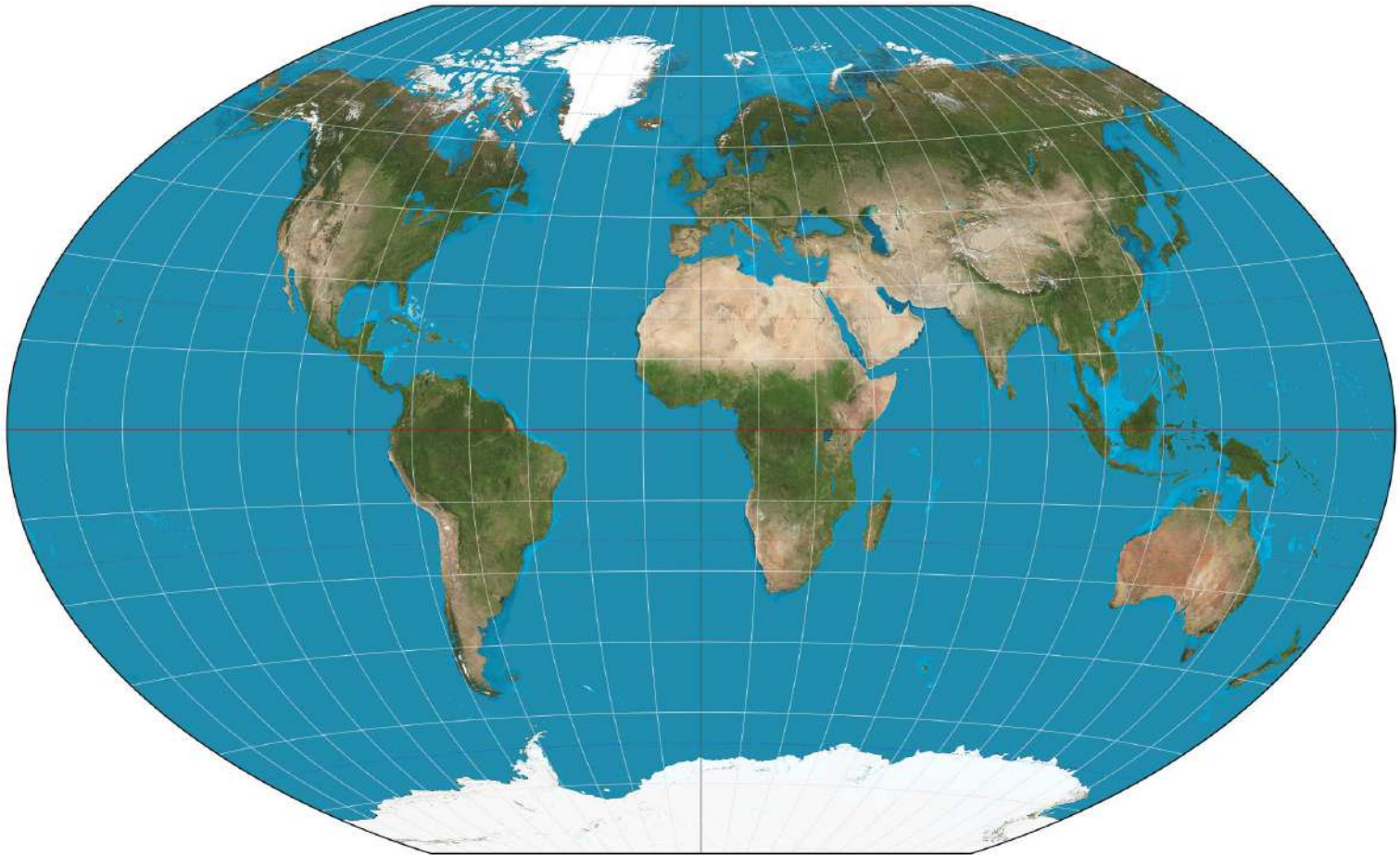


Koop Winners Outperformed the S&P 500 – 3:1

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



International Initiatives



Data and Metrics Approach

An Essential Part of the Value Proposition

Chevron International Health Index Project



Operational Excellence Objectives

ROI (VOI)

Results

Retention

Reach



Wellness Scorecard		
Organization:		QTR/YR:
Qualitative Descriptions (Green, Yellow, Red)		
Implemented and in progress (Avg. score 4-5)	Being developed but not completely implemented (Avg. score 1-3)	Does not exist (Avg. score 0)
Key Measure		Color Codes
1	Leaders are fully engaged and supporting well defined wellness efforts	Yellow
2	Workplace policies and environment support wellness	Yellow
3	Best practice health and wellness programming	Green
4	Robust data and evaluation approach	Yellow

South Africa

ORIGINAL ARTICLE

The *Healthiest Company Index* A Campaign to Promote Worksite Wellness in South Africa

Deepak Patel, MD, MSc, Ron Z. Goetzel, PhD, Meghan Beckowski, MPH, Karen Milner, MA, PhD,
Mike Greyling, MSc, Roseanne da Silva, BScHons, FIA, Tracy Kolbe-Alexander, BSc, PhD,
Maryam J. Tabrizi, MS, and Craig Nossel, MBChB, MBA

Objective: To describe a 2010 initiative to encourage companies in South Africa to adopt workplace health promotion programs. **Methods:** Data documenting organizational efforts to improve workers' health were collected from 71 participating employers and 11,472 workers completing health assessments. Organizational and employee health were scored on the basis of responses to the surveys that asked about facilities and programs offered, leadership support for health promotion, and employees' health status. **Results:** In its first year, the initiative recruited 101 organizations and 71 qualified for the award. Results aggregated across these companies focus on elements constituting organizational and individual health, with specific measures that companies can review to determine whether they and their employees are "healthy." **Conclusions:** The *Healthiest Company Index* provided useful baseline data to support employers' efforts to develop and implement effective and impactful health promotion programs.

Across the globe, and more recently in South Africa, the workplace is being recognized as an important setting for initiating health promotion programs aimed at improving the health and well-

achieve population health improvements and cost savings.¹² Furthermore, recent evidence suggests that worksite health promotion programs can achieve a positive return-on-investment of approximately \$3.00 saved to \$1.00 invested for both medical- and absenteeism-related costs.¹⁰ Other benefits include improved worker morale and positive company branding.

Although there is substantial research being performed on this topic in the United States,¹²⁻¹⁴ very little information is currently available on the prevalence of health promotion initiatives at workplaces in other countries and on the state of health and well-being of international workers.

Against this background, Discovery Health, a South African private health insurer, initiated a joint project with researchers from the Departments of Psychology and Statistics and Actuarial Science at the University of the Witwatersrand in Johannesburg, the Human Biology Department at the University of Cape Town, and the Institute for Health and Productivity Studies at Emory University to identify and study the "healthiest" companies in South Africa, on the basis of a set of metrics that evaluated individual employee and overall company "wellness." This article describes the initial launch of the

Singapore



Israel -- Lifestyle Survey

כן תשמור על בריאות עובדיך גם בזמן משבר

- « ניר פרימון מנכ"ל חברת B-Well המציעה תוכניות בריאות מולטימדיה, נותן כמה עצות למניעת פריזם נפיים בחברה.
1. בריאות העובדים צריכה להיות חלק בלתי נפרד מאסטרטגיית הארגון.
 2. תוכנית בריאות לעובדים אמורה להיות ארוכת טווח ומרובת-מרכיבים, אך פתרונות אינסטנט.
 3. התפישה צריכה להיות הוליסטית ולכלול את כל החומים הארגון ופעילויותיו.
 4. על התנהלה להיות מחויבת לעניין ולהוכיח דוגמה אישית.
 5. נחוץ שיווק פנים-ארגוני נכון כדי להתגבר על פחדים והתנגדויות.
 6. יש להעניק לעובדים כלים בתחום - למשל סדנאות, הרצאות, קבוצות פעילות, חדר כושר והיגיינה.
 7. אפשר לתגמל עובדים פעילים באמצעות בונוס כספי או מתנות.
 8. כדאי למנות אדם בארגון שיהיה אחראי על התחום של בריאות העובדים ויקדם אותו.



תצלום: יו"ר ב

רון גוטצל: "אדם חולה שמגיע למקום עבודתו מבזבז 5% מזמנו בשל האי-נוחות הנגרמת לו כתוצאה מהמחלה. כשתשליכים את זה על שוק עבודה שלם - מדובר במספרים גבוהים"

באחד החיים בריא ואף להציע לאנשים ייעוץ ייחודי בתחומים של הפסקת עישון, הריוח ופעילות גופנית. זה יעלה להן פחות מהתקפיסם הפוטנציאליים סתראה ממחלות העובדים".

תחום נוסף שבו יכולות החברות לפעול כדי להגביר את המודעות לבריאות העובדים הוא האוכל. "תנו לעובדים אוכל בריא במקום ג'אנק פוד - הן בחדר האוכל והן בישיבות", ממליץ גוטצל. "זה יחזק את המסר".

ארגונים מסוימים עושים צעד נוסף, ומכניסים אף לשלם לעובדיהם כדי שישמרו על בריאותם. "יש חברות שמשלמות בונוס קטן לעובדים שחולכים לסדנאות", מספר גוטצל, "כך שהעובד גם משתלם באופן קבוע מקבוצת הליכה או רכיבה על אופניים, וגם מקבל עוד מאה

בתן, לא יצליח לשכנע את עובדיו שכדאי להם לעשות זאת בעצמם", מסביר גוטצל. "לדוגמה, שניים מכל שלושה אנשים בארה"ב סובלים ממשקל יתר. מנהל שמעודד את עובדיו לאמץ אורח חיים בריא יותר, אף סובל בעצמו ממשקל גבוה, צריך ללכת עם עובדיו לסדנאות הריוח שתארגן החברה".

לדברי גוטצל, הכלים העומדים בפני מנהלי החברות רבים ומגוונים. "ראשית, הם צריכים לדבר על העניין, לעודד את העובדים לשמור על בריאותם ולשכח אותם על פעילותם בתחום. בנוסף, עליהם לאפשר גמישות קטן בשעות העבודה - כך שעובדים יוכלו ללכת להודי בחוץ במקום העבודה או באופן פרטי. חברות יכולות גם לארגן לעובדים סדנאות העוסקות

שמנהלים יגבירו את המודעות שלהם לעניין".

האח הגדול ישמור עליכם בריאים

הפתרון לבעיות שיוצר הפרזיטוזום, לפי גוטצל, אינו מורכב נמוח וצריך להגיע היישר משורת הניחול. "בריאות העובדים צריכה להיות חלק אינטגרלי מהאסטרטגיה של החברה", הוא אומר. "כל מנהל צריך להעביר את המסר הבא: 'כולנו לרוצים, כולנו עובדים, קשה יותר - אך חשוב לנו לשמור על בריאות תקינה'".

אך עושים זאת בשני מישורים מקבילים - מתן כלים לעובדים ומתן דוגמה אישית. "מנהל שסובל בעצמו מבעיות כרוניות ולא מטפל



Brazil



SESI

*Iniciativa da CNI - Confederação
Nacional da Indústria*

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Employee Survey

Employee Engagement Sur... *
https://co1.qualtrics.com/jfe/preview/SV_87YfwnZTk30Rlu7j7Q_CHL=preview

Previewing Survey Restart Survey Place Bookmark

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BLOOMBERG
SCHOOL of PUBLIC HEALTH**

English

Employee Engagement Survey—Consent Form

Thank you for your interest in participating in this study. Before beginning the survey, please read and complete this informed consent form.

Purpose of the study:
Johns Hopkins University has partnered with the Social Service of Industry (SESI) Institute for Health Metrics to create a study that hopes to better understand ways to improve employee health. The study will evaluate the effectiveness of health promotion programs and document the relationship between changes in workers' health and safety, industry actions, and cost savings.

Procedures:
We are asking you to complete this survey as an employee of your company. The questions ask about programs and activities that your company offers with the goal of improving the health of its employees. There are also questions that ask about your health. We expect this survey to take about 20-30 minutes. If you are willing to volunteer for this study, please check the box below to indicate your informed consent. After completing this consent form, you may advance to complete the survey.

Risks:
There is minimal risk to participating in this study. All survey responses will be collected anonymously; we will not collect your

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BLOOMBERG
SCHOOL of PUBLIC HEALTH**

English

Employee Engagement Survey
—Consent Form

Thank you for your interest in participating in this study. Before beginning the survey, please read and complete this informed consent form.

1:53 PM 11/13/2017

Organizational Survey

Employee Engagement Sur... * +

https://co1.qualtrics.com/jfe/preview/SV_cTU5foxmaoPhy57Q_CHL=preview

Previewing Survey Restart Survey

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English

Organizational Health and Engagement Survey - Consent Form

Thank you for your interest in participating in this study. Before beginning the survey, please read and complete this informed consent form.

Purpose of the study:
Johns Hopkins University, in collaboration the Social Service of Industry (SESI) Institute for Health Metrics, is conducting a study to gain a better understanding of ways to improve employee health. Specifically, the study objective is to develop a tool to identify opportunities for improving employee health and safety, evaluate the effectiveness of health promotion programs, and document the relationship between changes in workers' health and safety, industry actions, and cost savings.

Procedures:
We are asking you to complete this survey as a representative of your company. One survey should be completed for each selected worksite individually. The questions inquire about programs and activities that your company has conducted in recent years with the goal of improving the health of its employees. We expect this survey to take about 20 minutes. If you are willing to volunteer for this study, please check the box below to indicate your informed consent. After completing this consent form, you may advance to complete the survey.

Risks:


English

Organizational Health and Engagement Survey - Consent Form

Thank you for your interest in participating in this study. Before beginning the survey, please read and complete this informed consent form.

12:39 PM
3/15/2018

ROI Calculator



Model of Cost Management for Occupational Health

Summary of results

	No Program	With Program	Savings or (Cost)	Return on Investment (ROI)
Cumulative cost, savings, ROI:				
Cumulative cost of medical care				R\$ 1.23
Cumulative cost of absenteeism				R\$ 1.79
Cumulative cost of presenteeism				R\$ 2.53
Cumulative cost of safety				R\$ 1.44
Cumulative program cost	R\$ 94,500,000		Total ROI	R\$ 6.99

Current model settings:		
Total employees at baseline	10,000	
Annual program cost per employee	R\$ 945	
Average employee participation rate	62%	
Time horizon for simulation (years)	10	

Annual risk change:	No Program	With Program
Obesity	0.7%	-0.5%
Blood pressure	-0.2%	-2.8%
Blood glucose	-0.5%	-0.5%
Poor nutrition	0.3%	-0.3%
Exercise	-0.1%	-6.6%
Tobacco use	-0.3%	-3.7%
High alcohol	-0.3%	-1.2%
Poor sleep	0.1%	-2.0%
High stress	0.2%	-3.4%
Depression	0.2%	-1.9%

Discussion

- Top 2-3 challenges to better integrate social determinant and medical "big data" to improve health and welfare?
- Top 2-3 untapped opportunities?
- Ideas for collaboration across US and Israeli organizations?





Thank You

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Millions at a Time



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