



# ***Return on Investment for Primary Prevention: Measuring & Demonstrating Real Cost Savings***

**Providence Health and Services Alaska  
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## U.S. Business Concerns About Healthcare

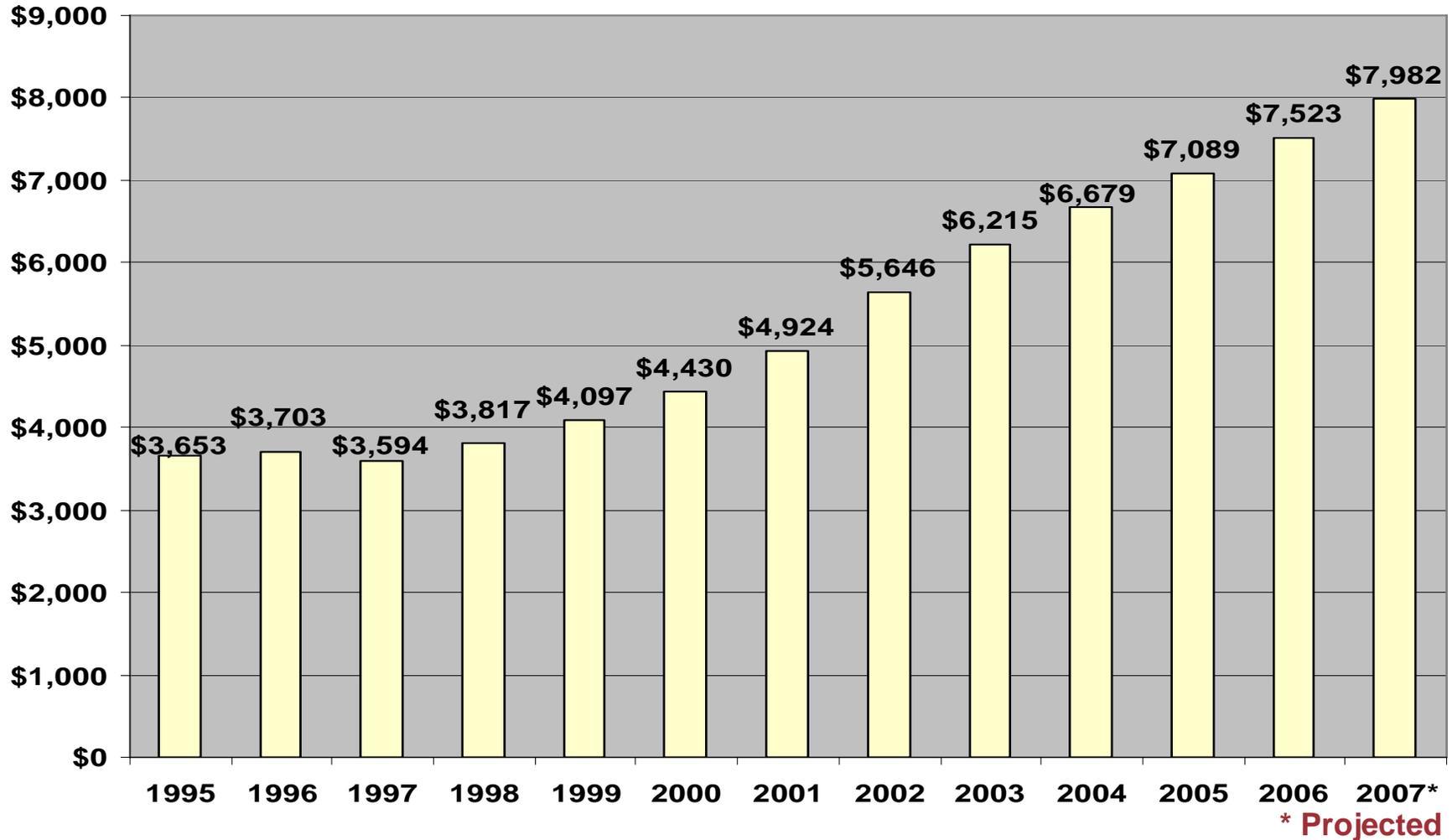
- The United States spent \$2.1 trillion in healthcare in 2006—\$7,092 for every man, woman, and child.
- Employers pay over one-third of these costs.
- National health expenditure growth trends are expected to average about 7% per year through 2015.
- Health expenditures as percent of GDP:
  - 15.3 percent in 2003
  - 16.0 percent in 2006
  - 19.6 percent in 2016 (est)
  - 25.0 percent by 2030 (est)



Source: Poisal et al., *Health Affairs*, 21 February 2007

# Annual Per Employee Costs for Active Employees

Includes all medical, dental, and other health benefits for all covered employees and dependents. Includes employer and employee contributions.



Mercer HR Press Release, 2/9/07, "2006 National Survey of Employer-Sponsored Health Plans, Survey Highlights" Mercer HR Press Release, 11/21/05; Active and retirees for 1988 – 1998; Trends for 1998 – 2006 for actives only; costs include employer and employee contributions

## Why Should Employers Remain in the Game?

- Workers' health and safety impacts their productivity...
  - and productivity impacts organizational performance and competitiveness.
- Bottom line:
  - Employers have an important role to play in managing employee health, safety and productivity.



## Other business forces

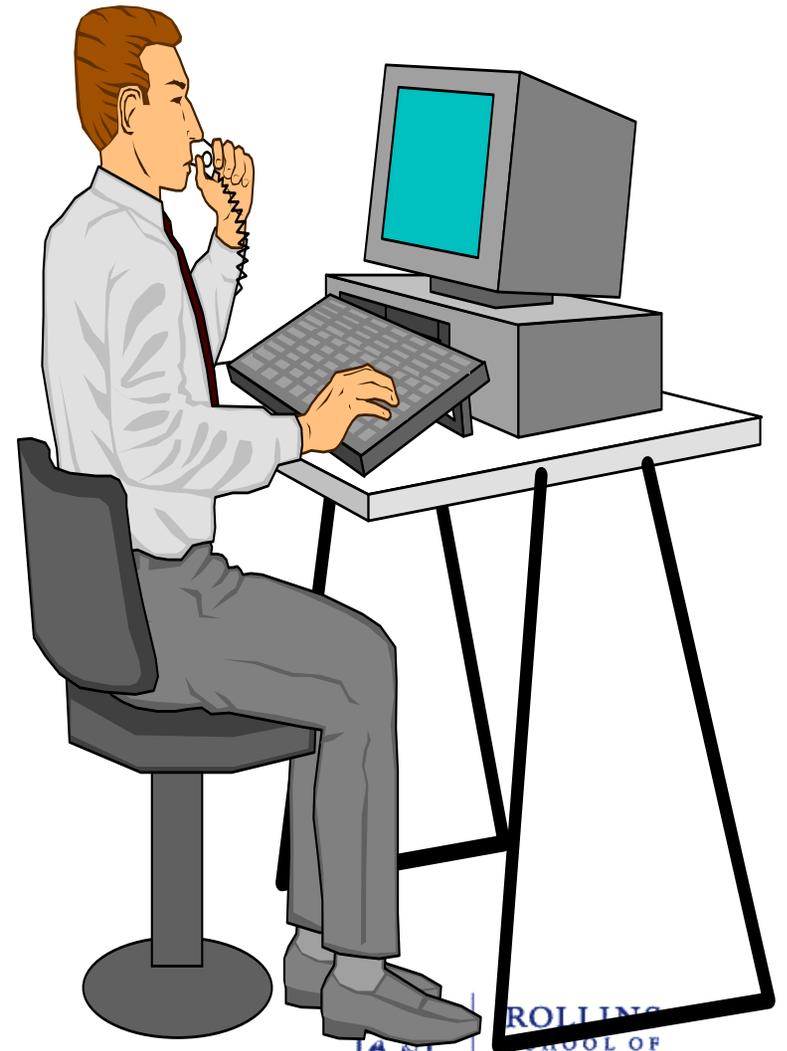
- The new employee is a knowledge worker
- Productivity is at an all time high – holding steady after years of impressive gains
- But, \$260B is spent each year in the U.S. on health-related productivity losses



Source: Mattke et al, *AJMC*, 2007, 13:4, 211-217.

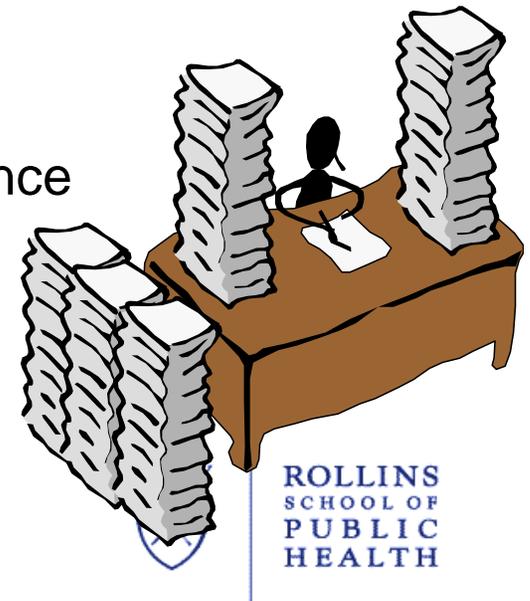
## What else is going on:

- Outsourcing, downsizing, layoffs, reductions in force
- Mergers, acquisitions, consolidations
- Global competition
- Pressure for innovation, adaptation, reengineering
- Increased reliance on technology
- Information overload



## A renewed emphasis on increasing worker productivity

- Introduce new technology
- Get workers to work more hours
- Make sure workers show up for work
- Make sure workers are mentally at work (presenteeism)
- Increase motivation to achieve at peak performance



## The fallout from a push for higher productivity

- Increased job demands
- Detachment and depersonalization
- Increased health care usage
- Increased absenteeism
- Low job morale
- Increased disability rates
- On the job accidents
- Work - life imbalance
- High stress



## Increased Health and Productivity Risks

### Medical

Chest/back pain, heart disease, GI disorders, headaches, dizziness, weakness, repetitive motion injuries

### Psychological

Anxiety, aggression, irritability, apathy, boredom, depression, loneliness, fatigue, moodiness, insomnia

### Behavioral

Accidents, drug/alcohol abuse, eating disorders, smoking, tardiness, “exaggerated” diseases

### Organizational

Absence, work relations, turnover, morale, job satisfaction, productivity

## What To Do?

- Manage disease
- Manage disability and absence
- Manage health and demand
- Manage stress
- Strengthen employee assistance programs
- Re-engineer
- Reorganize
- Create incentives
- Cut pharmacy benefits



## What To Do – National Business Group On Health Ten Steps to Easing Health Care Costs

1. Use coinsurance and point-of-care cost sharing
2. Provide members tools & information to become better consumers
3. Aggressively manage prescription drug use
4. Offer high deductible plan
5. Promote health improvement programs
6. Consolidate plans and audit providers – re-bid contracts
7. Manage utilization
8. Insist on transparency – buy on performance
9. Audit eligibility
10. Carefully analyze Medicare Part D options

**Convince me...**

Why should a business invest in the health and well-being of its workers?

## It seems so logical...

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

...quality of life improves

...health care utilization is reduced

...disability is controlled

...productivity is enhanced



## The Logic Flow:

- **A large proportion of diseases and disorders from which people suffer is preventable;**
- **Modifiable health risk factors are precursors to many diseases and disorders, and premature death;**
- **Many modifiable health risks are associated with increased health care costs and diminished productivity within a relatively short time window;**
- **Modifiable health risks can be improved through effective health promotion and disease prevention programs;**
- **Improvements in the health risk profile of a population can lead to reductions in health costs and improvements in productivity;**
- **Well-designed and well-implemented programs can be cost/beneficial – they can save more money than they cost, thus producing a positive return on investment (ROI).**

## The Evidence

- **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 (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 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).**
- **Modifiable health risks can be improved through workplace sponsored health promotion and disease prevention programs (Wilson et al., 1996, Heaney & Goetzel, 1997, Pelletier, 1999).**
- **Improvements in the health risk profile of a population can lead to reductions in health costs (Edington et al., 2001, Goetzel et al., 1999).**
- **Worksite health promotion and disease prevention programs save companies money in health care expenditures and produce a positive ROI (Johnson & Johnson 2002, Citibank 1999-2000, Procter and Gamble 1998, Chevron 1998, California Public Retirement System 1994, Bank of America 1993, Dupont 1990).**

**Table 1**  
**Leading Causes of Death in the U.S. (2000)**  
**Source: Mokdad et al., JAMA,291:10, March, 2004**

| <b>Cause of Death</b>                   | <b>No. of Deaths</b> | <b>Pct.</b> |
|---|----------------------|-------------|
| Heart disease                           | 710,760              | 30%         |
| Malignant neoplasm                      | 553,091              | 23%         |
| Cerebrovascular disease                 | 167,661              | 7%          |
| Chronic lower respiratory tract disease | 122,009              | 5%          |
| Unintentional injuries                  | 97,900               | 4%          |
| Diabetes                                | 69,301               | 3%          |
| Influenza/pneumonia                     | 65,313               | 3%          |
| Alzheimers                              | 49,558               | 2%          |
| Nephritis                               | 37,251               | 2%          |
| Septicemia                              | 31,224               | 1%          |
| Other                                   | 499,283              | 21%         |
| <b>Total</b>                            | <b>2,403,351</b>     | <b>100%</b> |

## Reported Cases in U.S., 2003 (% of population)

|                             |                     |                |
|-----------------------------|---------------------|----------------|
| <b>Pulmonary Conditions</b> | <b>49.2 million</b> | <b>(17.4%)</b> |
| <b>Hypertension</b>         | <b>36.8 million</b> | <b>(13.0%)</b> |
| <b>Mental Disorders</b>     | <b>30.3 million</b> | <b>(10.7%)</b> |
| <b>Heart Disease</b>        | <b>19.1 million</b> | <b>(6.8%)</b>  |
| <b>Diabetes</b>             | <b>13.7 million</b> | <b>(6.8%)</b>  |
| <b>Cancers</b>              | <b>10.6 million</b> | <b>(3.7%)</b>  |
| <b>Stroke</b>               | <b>2.4 million</b>  | <b>(0.9%)</b>  |

# Risk factors for 10 leading causes of death in the United States

## Causes of Death

Heart Disease

Cancer

Stroke

Accidents

Chronic obstructed lung disease

Pneumonia and influenza

Diabetes mellitus

Suicide

Cirrhosis

Atherosclerosis

## Risk factors

smoking, hypertension, hypercholesterolemia, lack of exercise, diabetes mellitus, obesity, stress

smoking, alcohol, diet, environmental carcinogens, obesity

hypertension

alcohol, failure to use seatbelts

smoking

smoking, alcohol

obesity

stress, alcohol, drug use

alcohol

smoking, hypercholesterolemia

Source: National Center for Health Statistics. "Annual Summary of Births, Deaths, Marriage, and Divorces: United States, 1983." NCHS Monthly Vital Statistics, Sept. 1984

## Toll of chronic diseases

- Afflict 133 million Americans and cause 7 out of 10 deaths
- In 2005, cost the nation \$1.5 trillion ~ 75% of every healthcare dollar



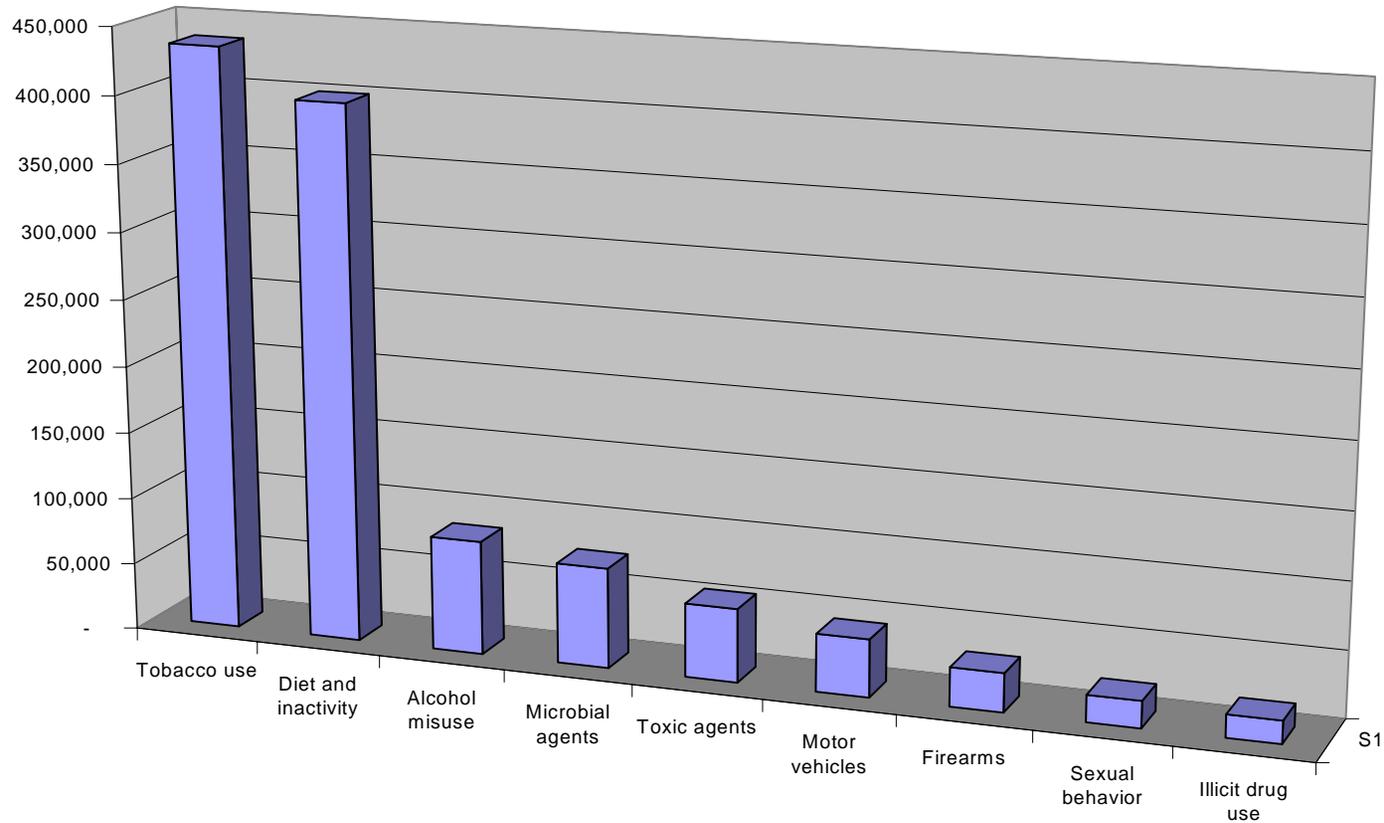
## Trends in the leading causes of death in the U.S., 1970-2002

(Jemal et al, JAMA, 2005;294:1255-1259)

- Overall death rates have declined from:
  - 1242/100,000 in 1970 to 845/100,000 in 2002
- Big declines in:
  - Stroke
  - Heart disease
  - Accidents
- But, big increases in:
  - COPD
  - Diabetes

# Actual Causes of Death in the U.S. (2000)

Source: Mokdad et al., 2004



## Diseases Caused (at Least Partially) by Lifestyle

- **Alcohol Use:** Liver Damage, Alcohol Psychosis, Pancreatitis, Hypertension, Cerebrovascular Disease, and Cancers (Breast, Esophagus, Larynx, Liver)
- **Stress, Anxiety, Depression:** Coronary Artery Disease, Hypertension
- **Obesity:** Cholecystitis/Cholelithiasis, Coronary Artery Disease, Diabetes, Hypertension, Lipid Metabolism Disorders, Osteoarthritis, Sleep Apnea, Venous Embolism/Thrombosis, and Cancers (Breast, Cervix, Colorectal, Gallbladder, Biliary Tract, Ovary, Prostate)
- **Lack of Exercise:** Coronary Artery Disease, Diabetes (non-insulin dependant), Hypertension, Obesity, and Osteoporosis
- **Poor Nutrition:** Cerebrovascular Disease, Constipation, Coronary Artery Disease, Diabetes, Diverticular Disease, Hypertension, Oral Disease, Osteoporosis, and Cancers (Breast, Colorectal, Prostate)
- **Tobacco Use:** Cerebrovascular Disease, Coronary Artery Disease, Osteoporosis, Peripheral Vascular Disease, Asthma, Acute Bronchitis, COPD, Pneumonia, and Cancers (Bladder, Kidney, Urinary, Larynx, Lip, Oral Cavity, Pharynx, Pancreas, Trachea, Bronchus, Lung)
- **Uncontrolled Hypertension:** Coronary Artery Disease, Cerebrovascular Disease, and Peripheral Vascular Disease
- **Uncontrolled Lipids:** Coronary Artery Disease, Lipid Metabolism Disorders, Pancreatitis, and Peripheral Vascular Disease

## Poor Health Costs Money

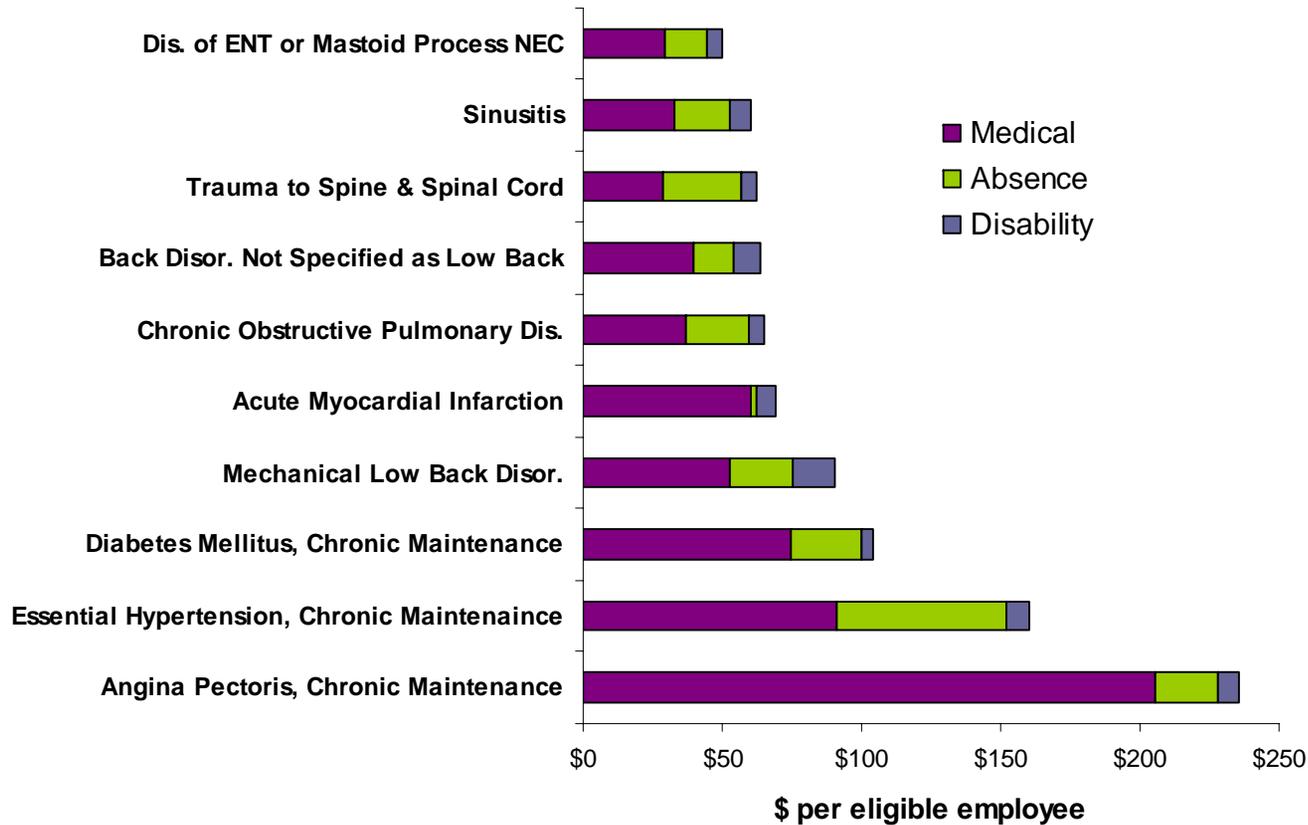
### Drill down...

- Medical
- Absence/work loss
- Presenteeism
- Risk factors



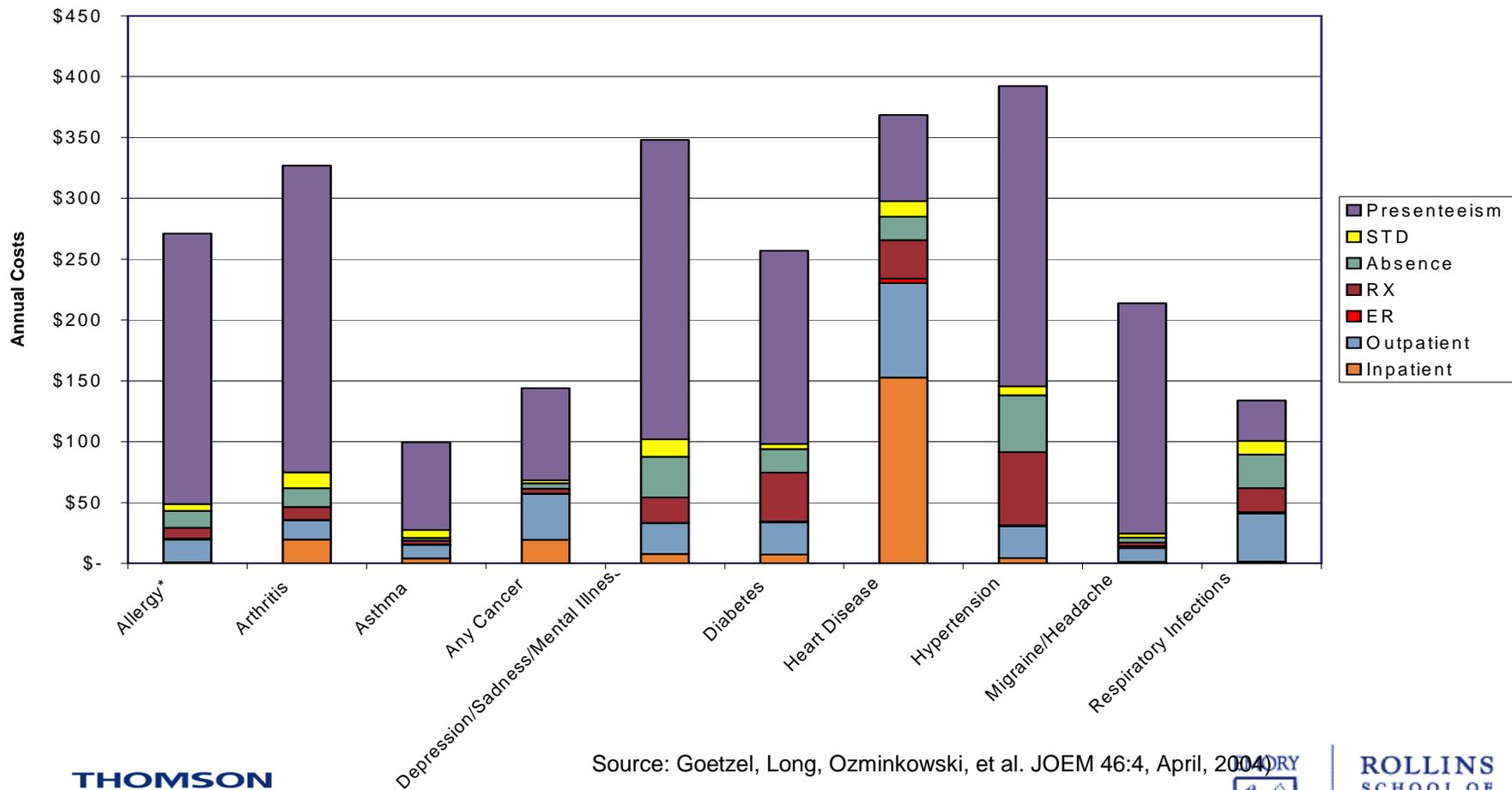
# Top 10 Physical Health Conditions

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



# The Big Picture: Overall Burden of Illness by Condition

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



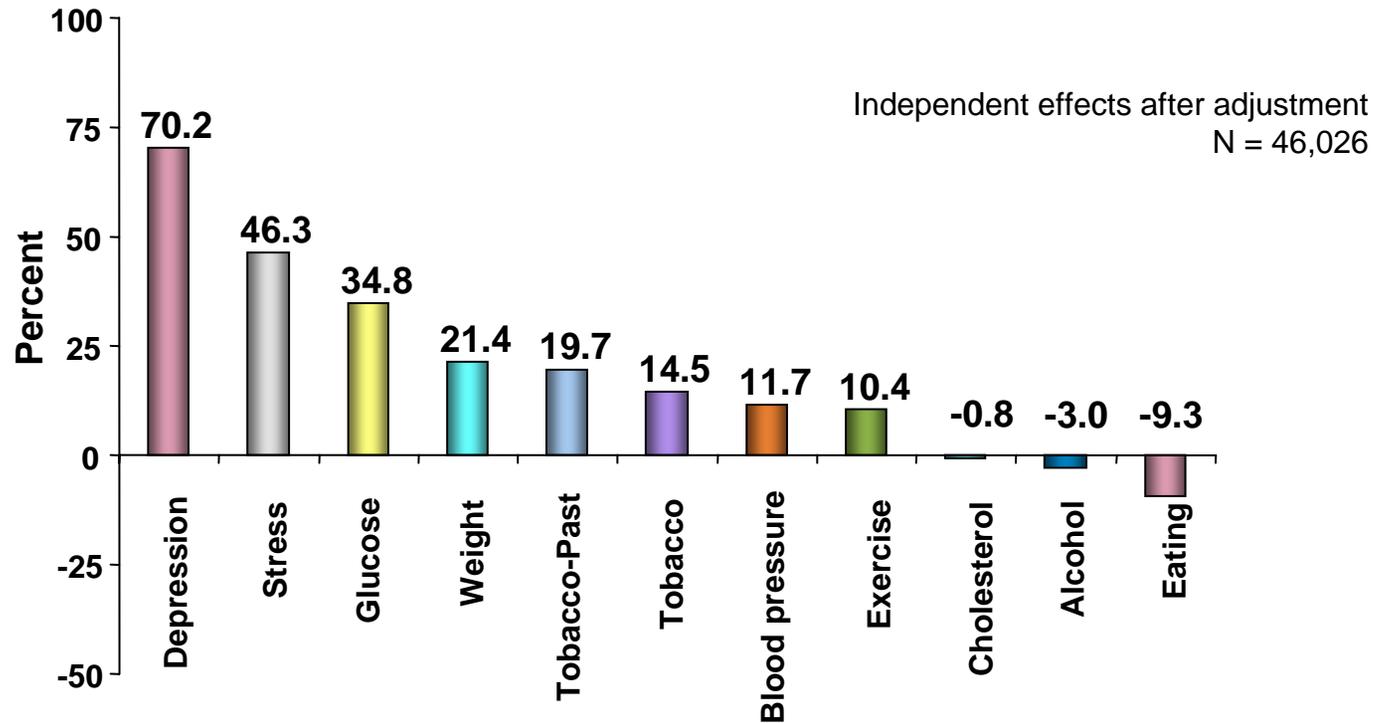
Source: Goetzel, Long, Ozminkowski, et al. JOEM 46:4, April, 2004



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# Incremental Impact of Ten Modifiable Risk Factors on Medical Expenditures

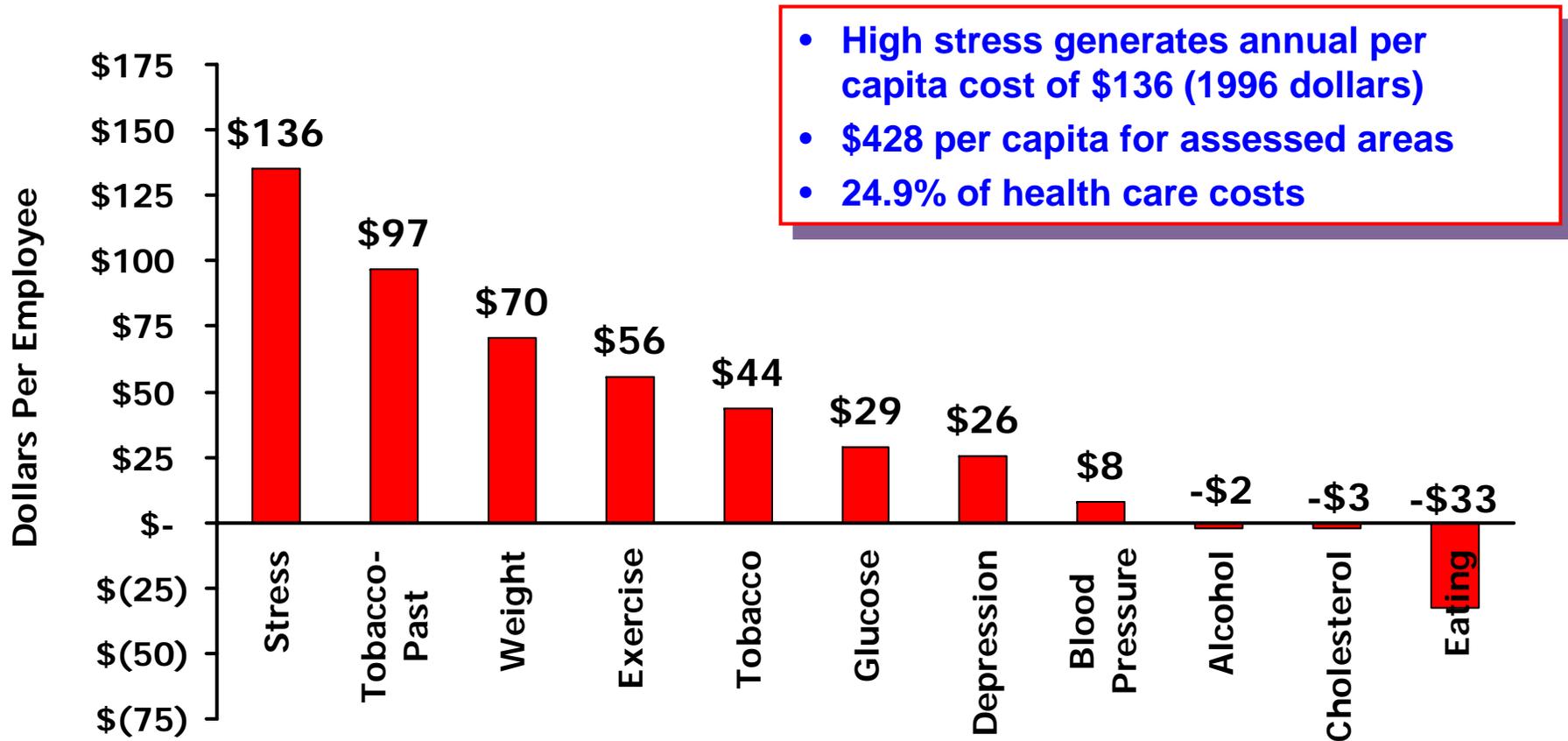
Percent Difference in Medical Expenditures: High-Risk versus Lower-Risk Employees



Goetzel RZ, Anderson DR, Whitmer RW, Ozminkowski RJ, et al., *Journal of Occupational and Environmental Medicine* 40 (10) (1998): 843–854.

# Population Risk and Cost Impact

## Per Capita Cost of High-Risk Status



Ref: Anderson, D.R., Whitmer, R.W., Goetzel, R.Z., et. al, *American Journal of Health Promotion*, 15:1, 45-52, September/October, 2000. Health care expenditures - 1996 dollars. Independent effects after adjustment

## Quiz:

### How many Americans lead healthy lifestyles?

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

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

## Health and Risk Reduction Outcomes of Multi-Component Worksite Health Promotion Programs – Literature Review

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

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

**Findings:**

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

Ref: Heaney & Goetzel, 1997, *American Journal of Health Promotion*, 11:3, January/February, 1997



# Evaluation of Worksite Health Promotion Programs -- February 2007 Analysis

## Worksite Health Promotion Team

Robin Soler, PhD

David Hopkins, MD, MPH

Sima Razi, MPH

Kimberly Leeks, PhD, MPH

Matt Griffith, MPH



## Summary Results and Team Consensus

| Outcome                                    | Body of Evidence | Consistent Results | Magnitude of Effect | Finding           |
|--|------------------|--------------------|---------------------|-------------------|
| <b>Alcohol Use</b>                         | 7                | Yes                | Variable            | <b>Sufficient</b> |
| <b>Fruits &amp; Vegetables</b>             | 7                | No                 | 0.16 serving        | Insufficient      |
| <b>% Fat Intake</b>                        | 11               | Yes                | +8%                 | <b>Strong</b>     |
| <b>% Change in Those Physically Active</b> | 17               | Yes                | +12.7%              | <b>Sufficient</b> |
| <b>Tobacco Use</b>                         |                  |                    |                     | <b>Strong</b>     |
| <b>Prevalence</b>                          | 22               | Yes                | -2.2 pct pt         |                   |
| <b>Cessation</b>                           | 23 (9)           | Yes                | 3.5 pct pt          |                   |
| <b>Seat Belt Non-Use</b>                   | 10               | Yes                | -35.4%              | <b>Sufficient</b> |

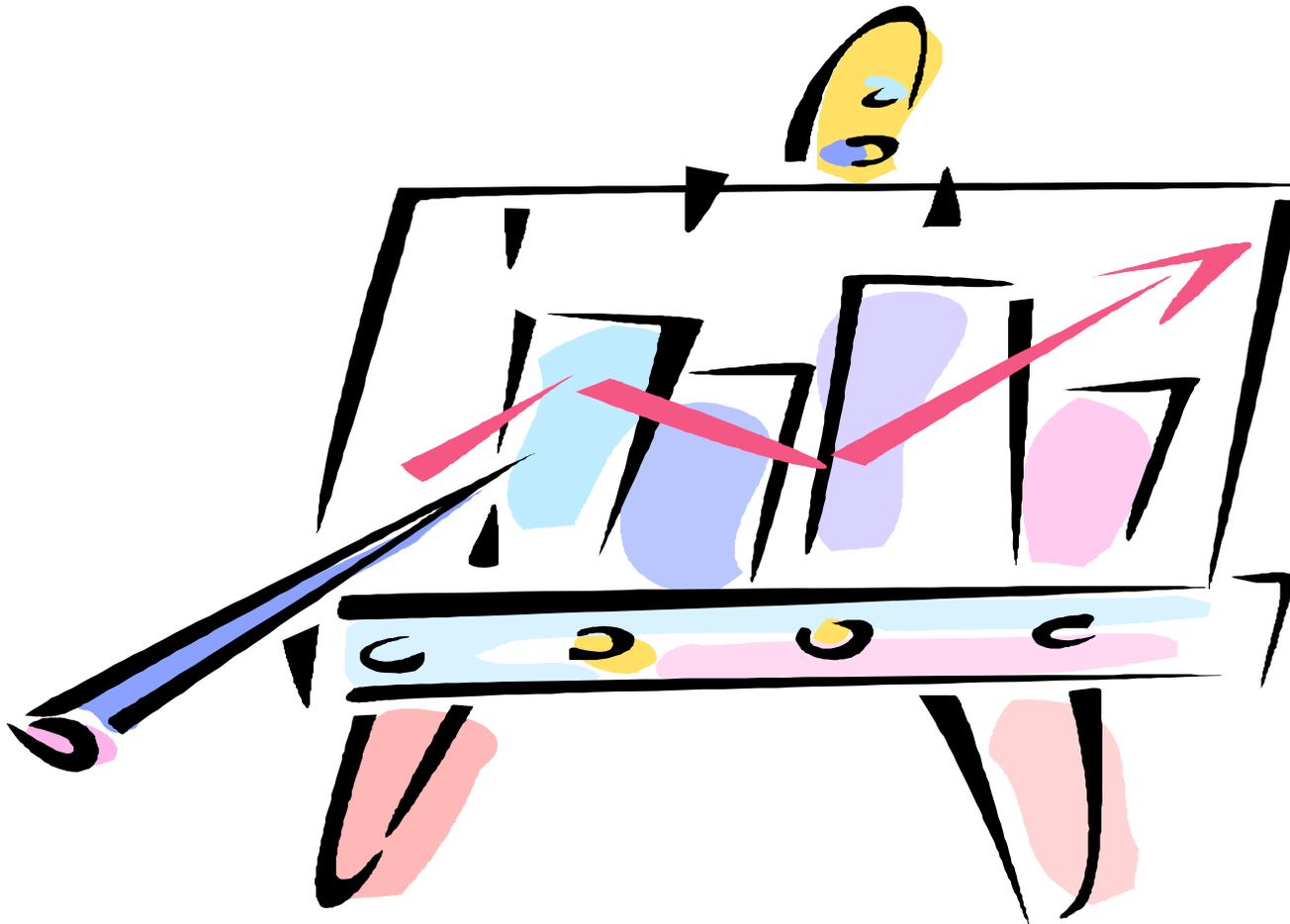
## Summary Results and Team Consensus

| Outcome                         | Body of Evidence | Consistent Results | Magnitude of Effect   | Finding       |
|---------------------------------|------------------|--------------------|-----------------------|---------------|
| <b>Diastolic blood pressure</b> | 16               | Yes                | Diastolic: -1.9 mm Hg | <b>Strong</b> |
| <b>Systolic blood pressure</b>  | 18               | Yes                | Systolic: -3.0 mm Hg  |               |
| <b>Risk prevalence</b>          | 11               | Yes                | -3.4 pct pt           |               |
| <b>BMI</b>                      | 6                | Yes                | -0.5 pt BMI           | Insufficient  |
| <b>Weight</b>                   | 12               | No                 | -0.56 pounds          |               |
| <b>% body fat</b>               | 4                | Yes                | -2.2% body fat        |               |
| <b>Risk prevalence</b>          | 5                | No                 | -2.2% at risk         |               |
| <b>Total Cholesterol</b>        | 18               | Yes                | -5.0 mg/dL (total)    | <b>Strong</b> |
| <b>HDL Cholesterol</b>          | 7                | No                 | +1.1 mg/dL            |               |
| <b>Risk prevalence</b>          | 11               | Yes                | -6.6 pct pt           |               |
| <b>Fitness</b>                  | 5                | Yes                | Small                 | Insufficient  |

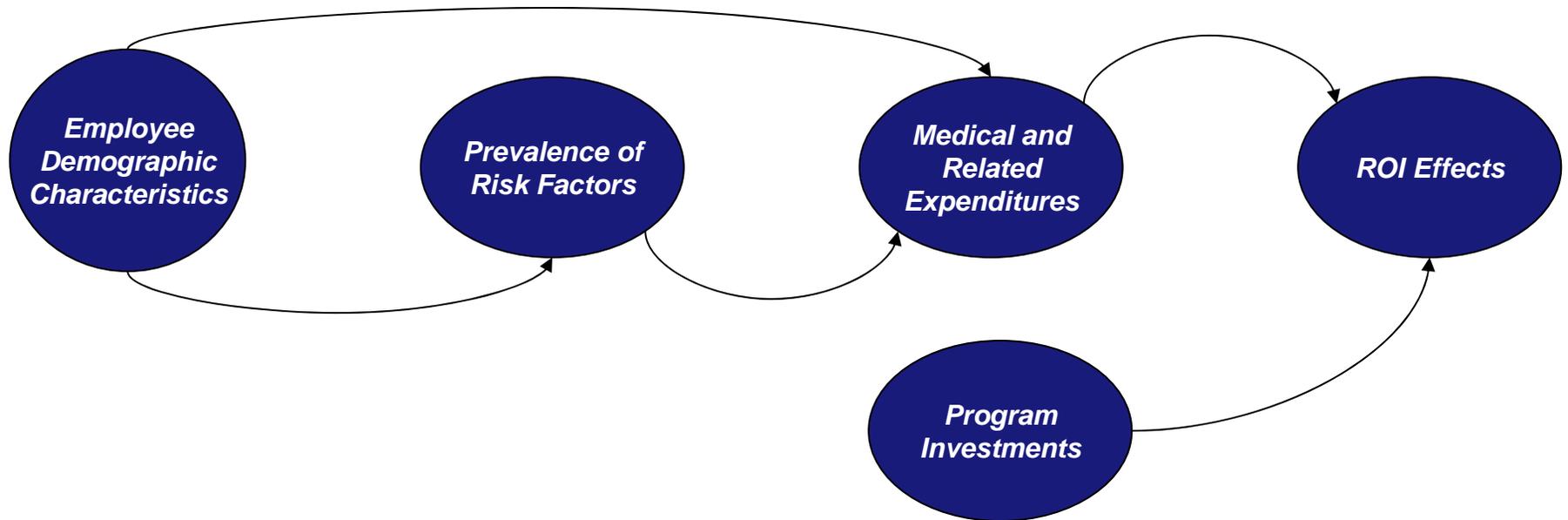
## Summary Results and Team Consensus

| Outcome             | Body of Evidence | Consistent Results | Magnitude of Effect | Finding    |
|---------------------|------------------|--------------------|---------------------|------------|
| Estimated Risk      | 15               | Yes                | Moderate            | Sufficient |
| Healthcare Use      | 6                | Yes                | Moderate            | Sufficient |
| Worker Productivity | 10               | Yes                | Moderate            | Strong     |

## Prospective ROI – The Dow Chemical Company



# Basic Framework for Prospective ROI Calculation



## Dow Econometric Forecasting Model:

Modeling different risk reduction scenarios – based on the organization's ability to reduce employee health risks:

1. No program in place – demographics drive risk profile
2. Program lowers risk .1% per year (1% over ten years)
3. Program lowers risk 1% per year (10% over ten years)



## Methods

### Step 1: Estimate Dow's Demographic Profile: 2001 - 2011

- Start with Dow's demographics for 2001:
  - ⇒ Population: 25,828 employees\*
  - ⇒ Mean Age: 43
  - ⇒ Male: 75%
  - ⇒ White: 82%
  - ⇒ Professional/Managerial: 44%
- Project 2002 – 2011

## Methods

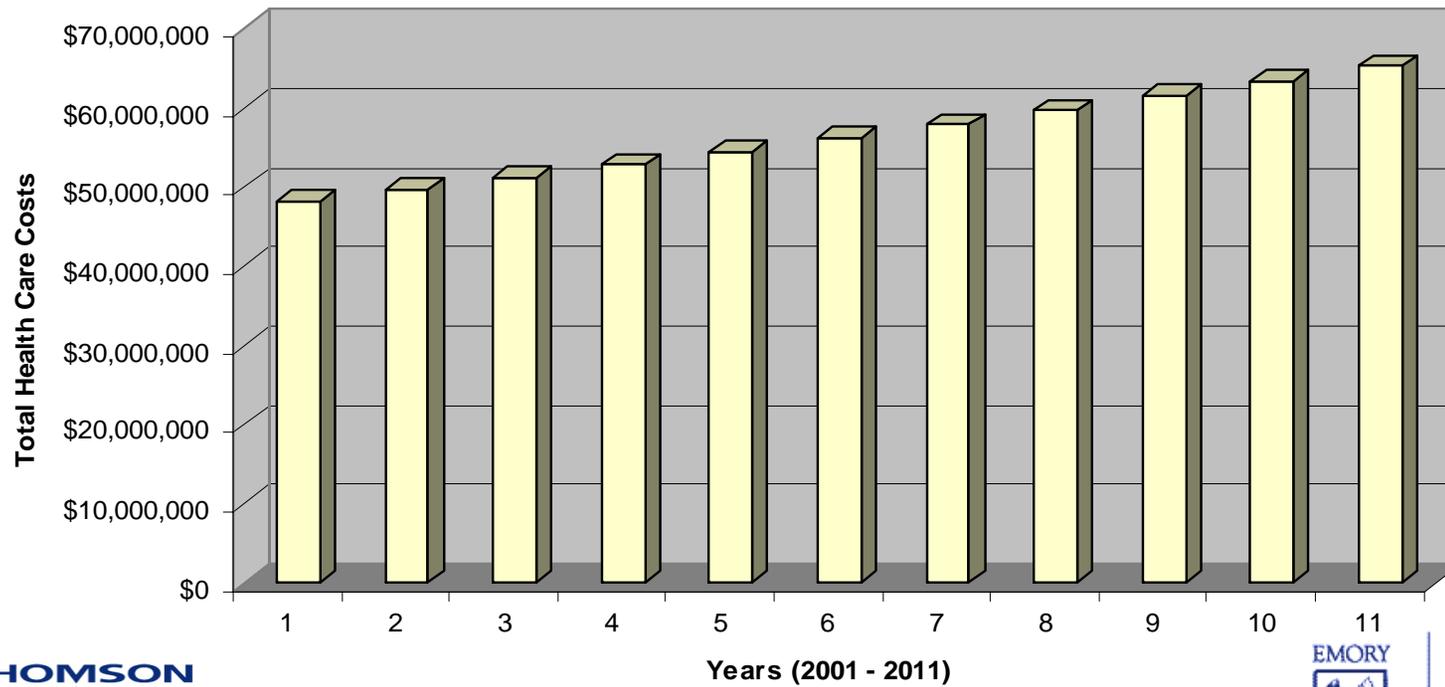
### Step 2: Estimate the Risk Profile of Dow Employees: 2001 – 2011

| Summary of Adjusted Probabilities of Being at High Risk Over Time |            |            |            |            |            |            |
|---|------------|------------|------------|------------|------------|------------|
| Variable  | 2001 Risk  | 2003 Risk  | 2005 Risk  | 2007 Risk  | 2009 Risk  | 2011 Risk  |
| Poor Exercise Habits  | 23%        | 24%        | 25%        | 26%        | 27%        | 28%        |
| Poor Eating Habits  | 20%        | 17%        | 16%        | 15%        | 14%        | 14%        |
| <b>Obesity</b>  | <b>40%</b> | <b>41%</b> | <b>42%</b> | <b>43%</b> | <b>44%</b> | <b>45%</b> |
| Current Smoker  | 19%        | 19%        | 19%        | 19%        | 19%        | 19%        |
| Former Smoker   | 31%        | 31%        | 31%        | 31%        | 31%        | 31%        |
| High Cholesterol  | 14%        | 15%        | 17%        | 18%        | 20%        | 21%        |
| High Blood Glucose  | 7%         | 8%         | 9%         | 11%        | 12%        | 14%        |
| High Blood Pressure   | 2%         | 2%         | 3%         | 3%         | 3%         | 4%         |
| High Stress   | 7%         | 7%         | 7%         | 7%         | 7%         | 7%         |
| Depression  | 5%         | 5%         | 5%         | 5%         | 5%         | 5%         |
| Heavy Alcohol Use   | 4%         | 3%         | 3%         | 3%         | 3%         | 2%         |

# Methods

## Step 3: Estimate Healthcare Expenditures: 2001 - 2011

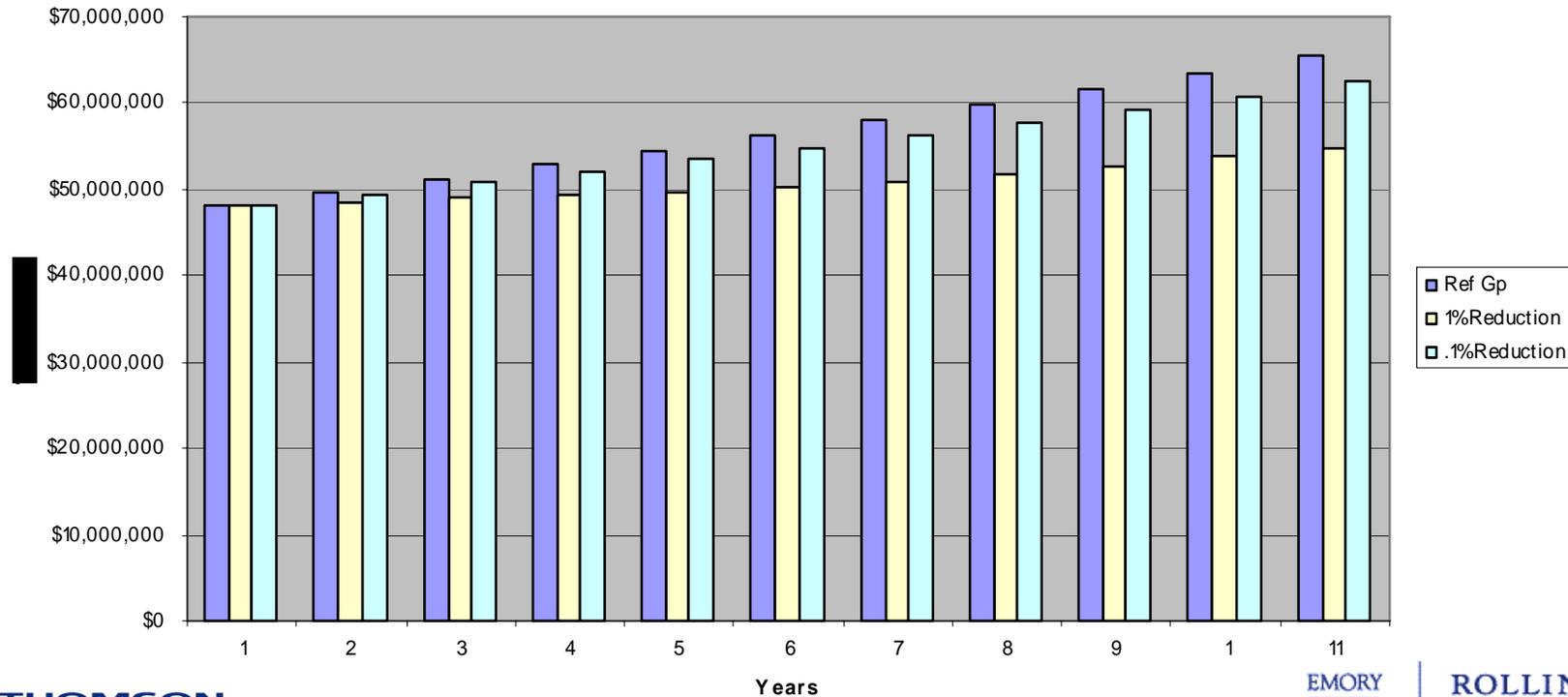
**Dow Chemical**  
**Projected Health Care Costs for 2001 - 2011 (inflation -adjusted)**



# Methods

## Step 4: Simulate the Impact of Alternative Population Risk Profiles: 2001 - 2011

Comparison of 1% and .1% Annual Reductions in Risk vs. Reference Group, 2001 - 2011 (Inflation-Adjusted)



Years



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# Results Obtained from Dow Application

| Year   | Reference Case:<br>Total<br>Expenditures<br>with<br>demographics<br>and risk shifting<br>as forecasted<br>(i.e., pre-existing<br>trends remain) | Scenario 2: Total<br>Expenditures<br>with 10%<br>decrease in<br>risk over 10<br>years (1% per<br>year) and<br>demographics<br>change as<br>forecasted | Scenario 3: Total<br>Expenditures<br>with 1%<br>decrease in<br>risk over 10<br>years (0.1%<br>per year) and<br>demographic<br>s change as<br>forecasted | Scenario 4: Break-<br>Even (Reduce<br>Risks by 0.17% per<br>Year) |
|--|---|---|---|---|
| Increase in Expenditures From<br>2001 - 2011                       | \$17,094,174.26   | \$6,608,877.16  | \$14,324,879.51   | \$13,434,028.14   |
| Percent change between first and last years                        | 35.48   | 13.72   | 29.73   | 27.88   |
| Sum of Total Expend.   | \$617,074,003.89  | \$556,469,544.50  | \$602,640,734.47  | \$598,059,428.40  |
| Potential Benefits of Risk Management (with a<br>3% discount rate) | Not applicable --<br>base case  | \$49,512,590.66   | \$11,705,745.61   | \$15,426,727.88   |
| Dow investment (also with a<br>3% discount rate)                   |   | \$15,426,671.88   | \$15,426,671.88   | \$15,426,671.88   |
| Return on Investment   |   | \$3.21  | \$0.76  | \$1.00  |

Return on Investment is calculated relative to scenario in which demographics and risk shift as according to pre-existing trends.

Dow investment based on \$70.02 per person per year for 10 years, all in 2001 Year Dollar Equivalents, then discounted by 3% per year to adjust for the changing value of money over time

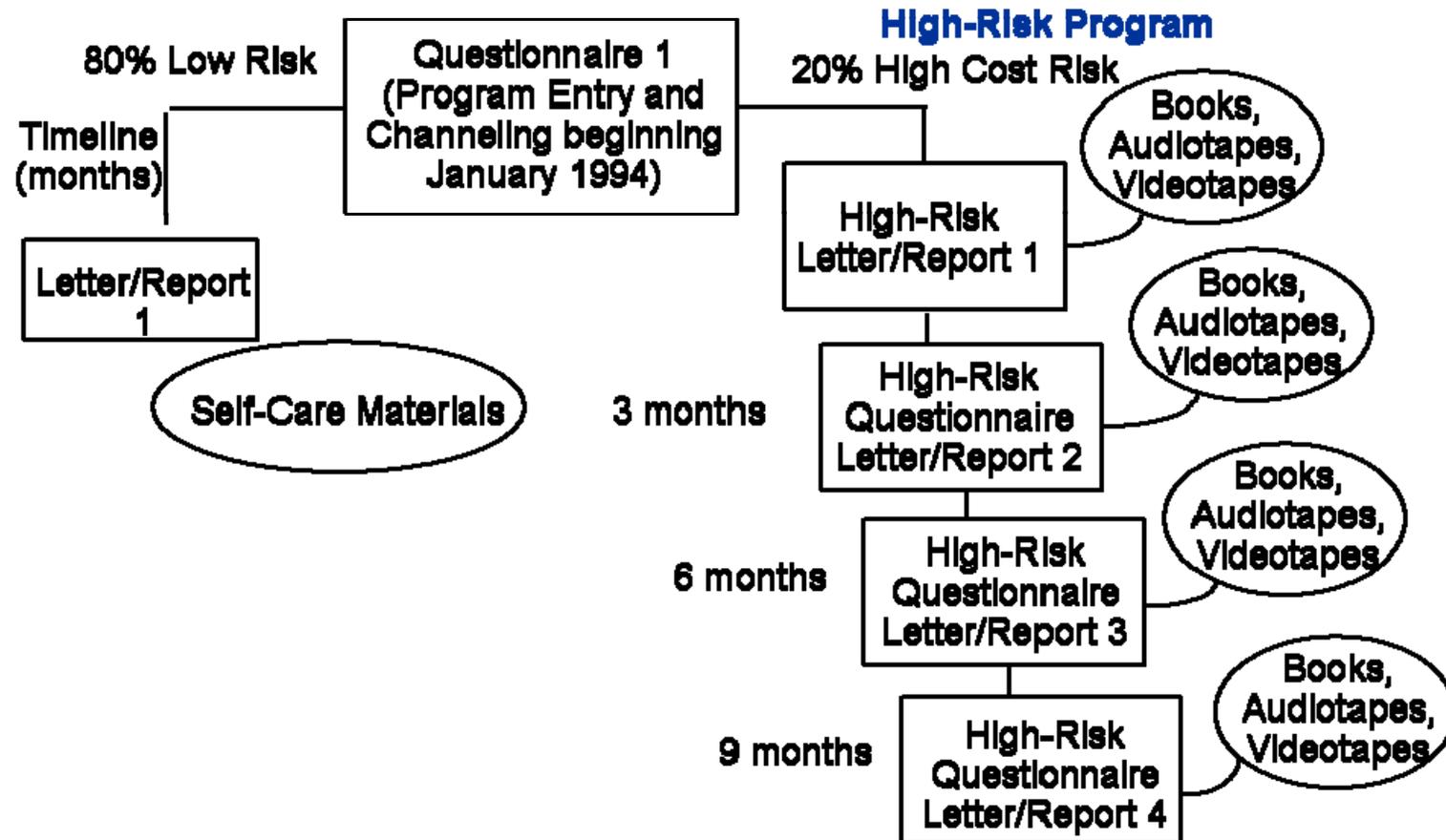
# Case Studies

# Citibank, N.A.

## Health Management Program Evaluation

- **Title:** Citibank Health Management Program (HMP)
- **Industry:** Banking/Finance
- **Target Population:** 47,838 active employees eligible for medical benefits
- **Description:**
  - A comprehensive multi-component health management program
  - Aims to help employees improve health behaviors, better manage chronic conditions, and reduce demand for unnecessary and inappropriate health services,
  - And, in turn, reduce prevalence of preventable diseases, show significant cost savings, and achieve a positive ROI.
- **Citations:**
  - Ozminkowski, R.J., Goetzel, R.Z., Smith, M.W., Cantor, R.I., Shaunghnessy, A., & Harrison, M. (2000). The Impact of the Citibank, N.A., Health Management Program on Changes in Employee Health Risks Over Time. *JOEM*, 42(5), 502-511.
  - Ozminkowski, R.J., Dunn, R.L., Goetzel, R.Z., Cantor, R.I., Murnane, J., & Harrison, M. (1999). A Return on Investment Evaluation of the Citibank, N.A., Health Management Program. *AJHP*, 44(1), 31-43.

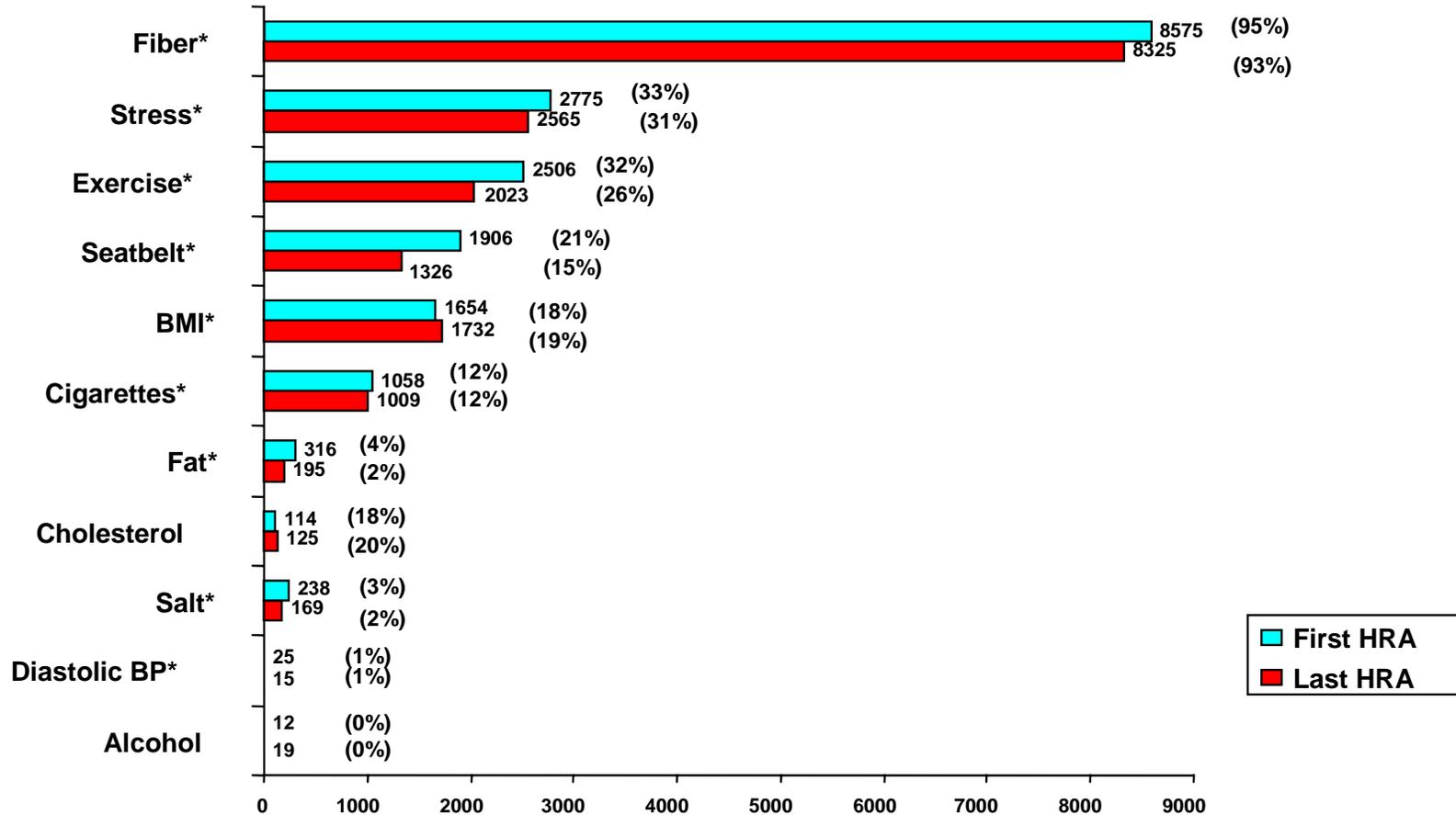
# Program Components



## Program Participation

- All 47,838 active employees were eligible to participate.
- The participation rate was 54.3 percent.
- Participants received a \$10 credit toward Citibank's Choices benefit plan enrollment for the following year.
- Approximately 3,000 employees participated in the high risk program each year it was offered.
- High risk modules: arthritis, back pain, smoking, diabetes, obesity, high blood pressure, heart conditions and other chronic conditions, combinations of risky behaviors.

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



Percentages represent the proportion of total participants for whom data are available, by category. \* Statistically significant at the  $p < 0.05$  level (McNemar Chi-square).

Ozminkowski, R.J., Goetzel, R.Z., et al., *Journal of Occupational and Environmental Medicine* 42: 5, May, 2000, 502–511.

## Citibank Results: Impact of Improvement in Risk Categories on Medical Expenditures per Month

|   | Unadjusted Impact** | Adjusted Impact** |
|---|---------------------|-------------------|
| Net improvement* of at least 1 category versus others (N = 1,706) | -\$1.86†            | -\$1.91           |
| Net improvement* of at least 2 categories versus others (N = 391) | -\$5.34             | -\$3.06           |
| Net improvement* of at least 3 categories versus others (N = 62)  | -\$146.87†          | -\$145.77 ‡       |

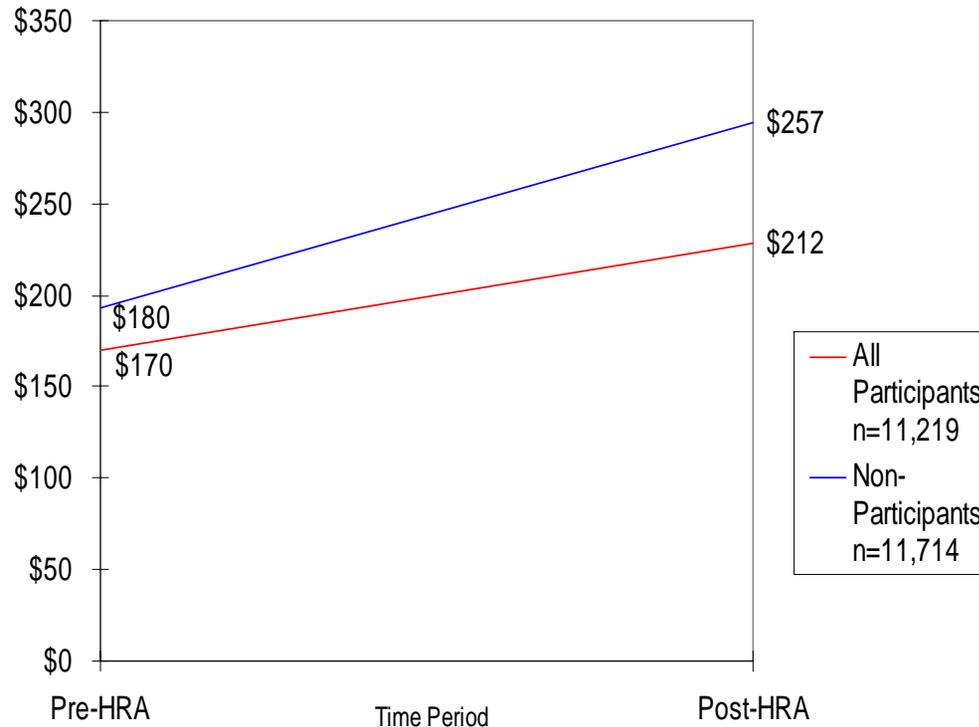
\*Net Improvement refers to the number of categories in which risk improved minus number of categories in which risk stayed the same or worsened.

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

† p < 0.05, ‡ p < 0.01

# Citibank: Medical Savings-Adjusted Mean Net Payments

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



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

\* Based on \$34.03 savings and 23.31054 months post-HRA for 11,219 participants

## Citibank Health Management Program ROI

- Program costs = \$1.9 million\*
- Program benefits = \$8.9 million\*
- Program savings = \$7.0 million\*

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

### Notes:

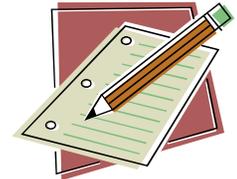
- 1996 dollars @ 0 percent discount
- Slightly lower ROI estimates after discounting by either 3% or 5% per year.
- Results very similar to RCT conducted of same Healthtrac program, by Fries, et al.

# Johnson & Johnson

## Health and Wellness Program Evaluation

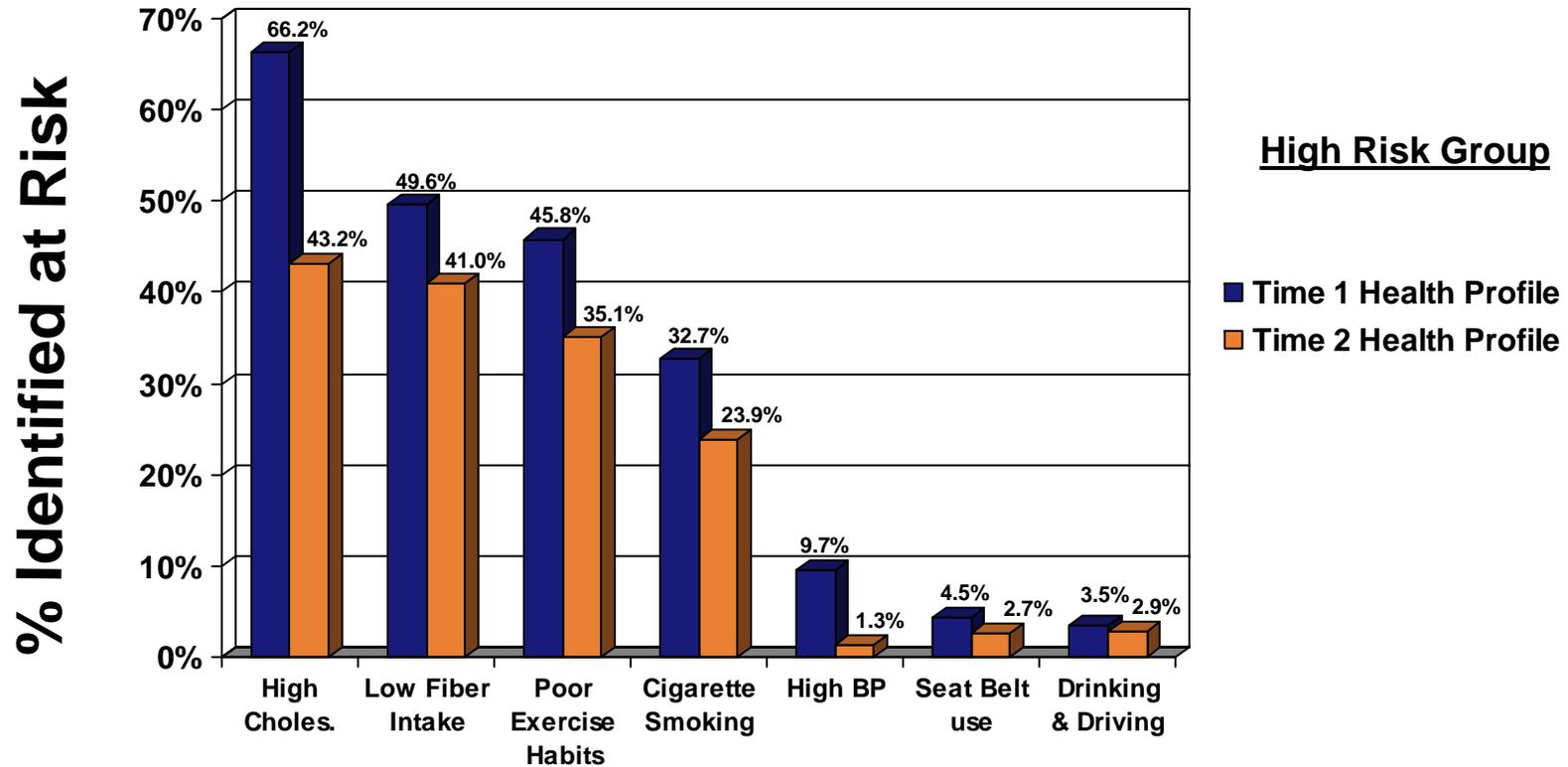
- **Title:** J & J Health and Wellness Program (H & W)
- **Industry:** Healthcare
- **Target Population:** 43,000 U.S. based employees
- **Description:**
  - Comprehensive, multi-component worksite health promotion program
  - Evolved from LIVE FOR LIFE in 1979
- **Citations:**
  - Goetzel, R.Z., Ozminkowski, R.J., Bruno, J.A., Rutter, K.R., Isaac, F., & Wang, S. (2002). The Long-term Impact of Johnson & Johnson's Health & Wellness Program on Employee Health Risks. *JOEM*, 44(5), 417-424.
  - Ozminkowski, R.J., Ling, D., Goetzel, R.Z., Bruno, J.A., Rutter, K.R., Isaac, F., & Wang, S. (2002). Long-term Impact of Johnson & Johnson's Health & Wellness Program on Health Care Utilization and Expenditures. *JOEM*, 44(1), 21-29.

## Lifestyle Benefit Incentive



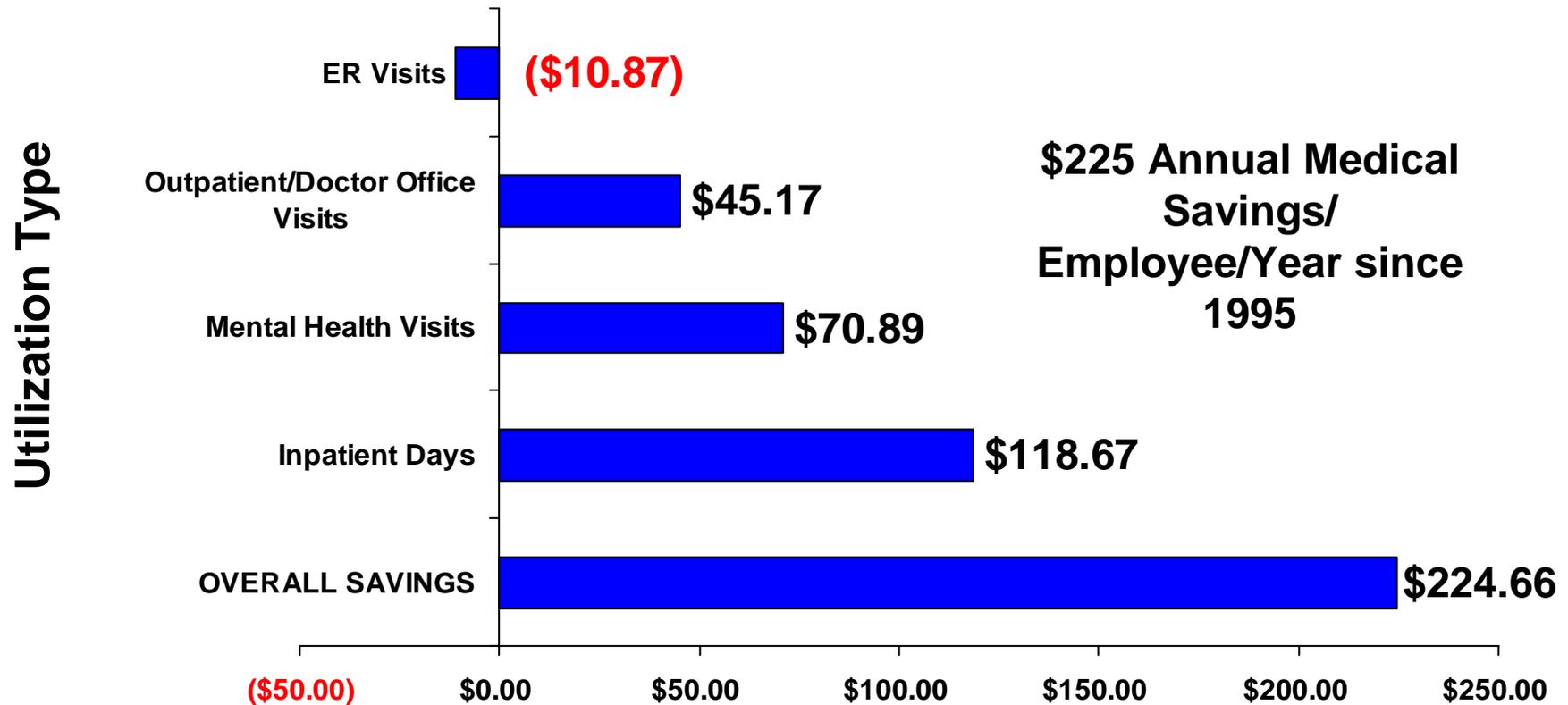
- All employees offered Health Profile
- Employees assessed to be at risk for smoking, blood pressure or cholesterol were invited to participate in a health management program
- Health care prices discounted by \$500
- Employees not participating in Health Profile or follow-up health improvement program lose the \$500 discount
- Result: 94% Participation Rate

# Health & Wellness Program Impact on Employee Health Risks (N=4,586)

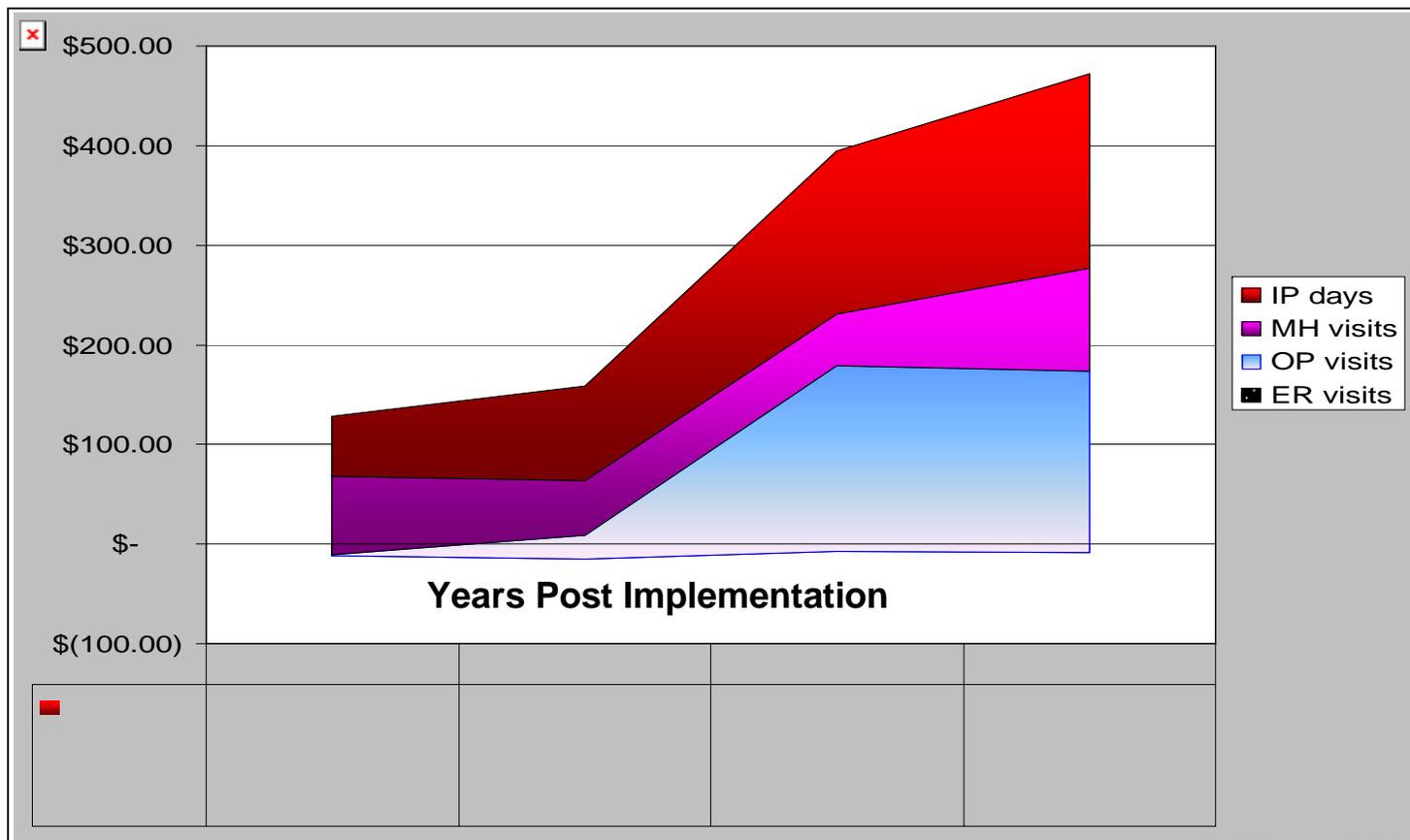


After an average of 2¾ years, risks were reduced in eight categories but increased in four related categories: body weight, dietary fat consumption, risk for diabetes, and cigar use.

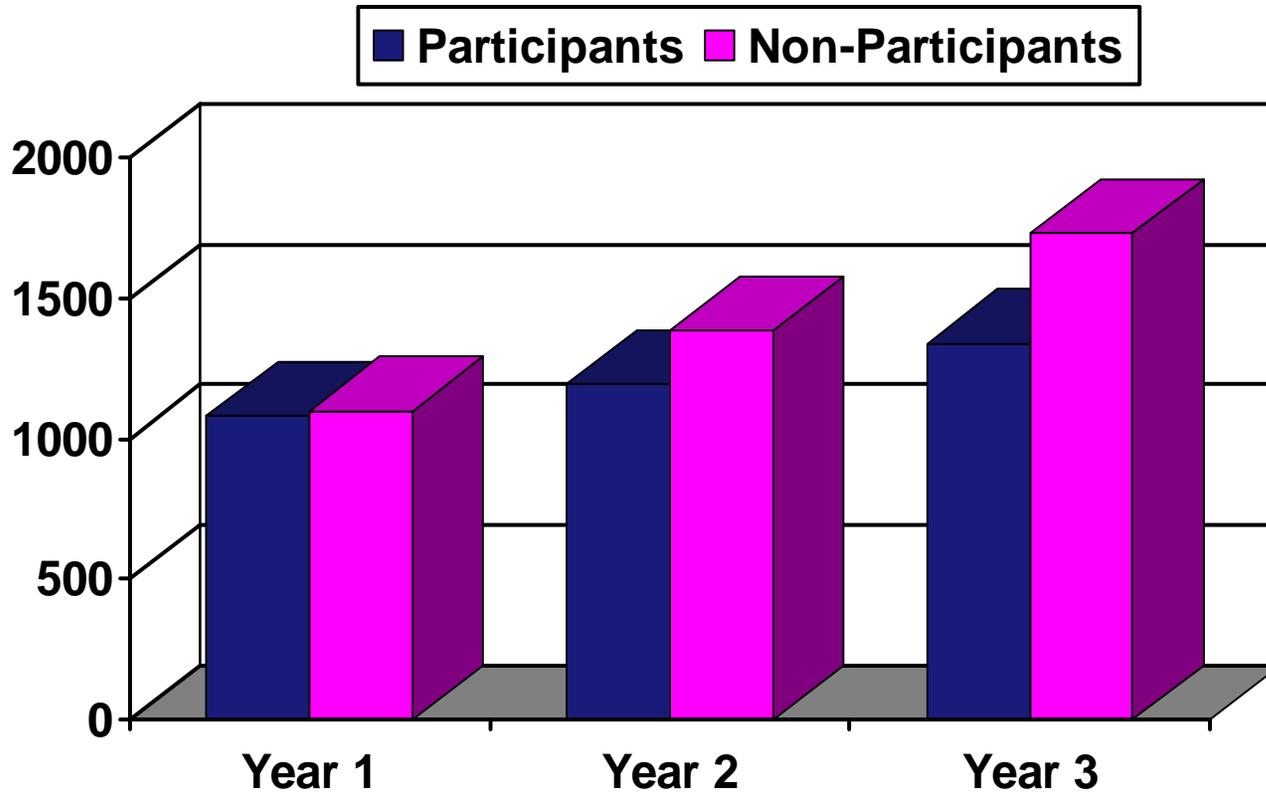
**Johnson & Johnson (N=18,331 – Ozminkowski et al, 2002)  
Health & Wellness Program Impact on Medical Costs**



## Inflation-Adjusted, Discounted Health and Wellness Program Cumulative Savings Per Employee Per Year, 1995 – 1999 -- Weighted by sample sizes that range from N = 8,927 – 18,331, depending upon years analyzed



# Procter & Gamble: Total Annual Medical Costs For Participants and Non-Participants In Health Check (1990 - 1992) (N=8,334)



Adjusted for age and gender; Significant at  $p < .05$

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



Ref: Goetzel, R.Z., Jacobson, B.H., Aldana, S.G., Vardell, K., and Yee, L. *Journal of Occupational and Environmental Medicine*, 40:4, April, 1998.



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## Highmark ROI Study

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

Source: Naydeck, Pearson, Ozminkowski, Day, Goetzel.

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

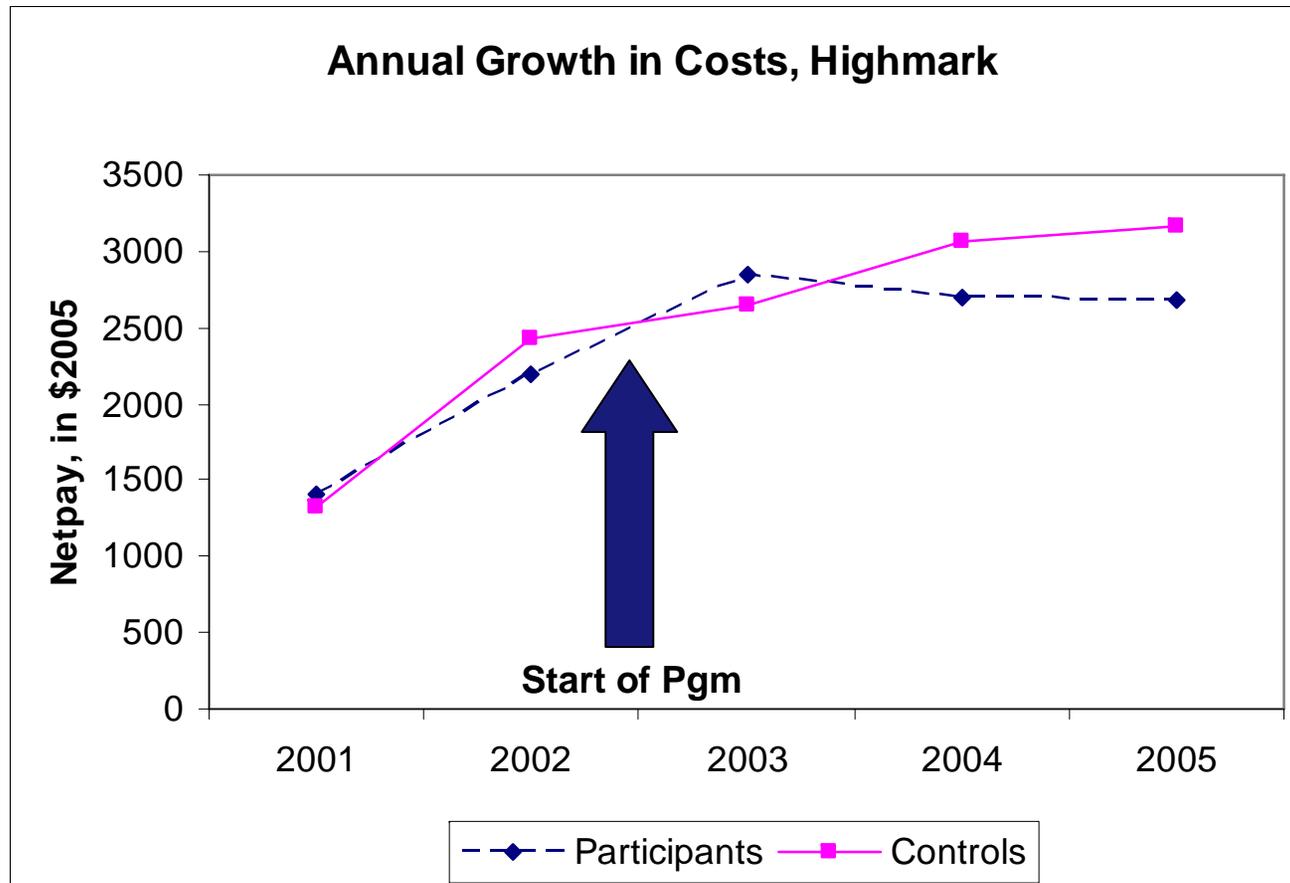
*JOEM*, 50:2, February 2008

## Characteristics used in matching subjects at baseline

| Calendar Year 2001                                     | Overall Comparison                |                                   |                |
|--|-----------------------------------|-----------------------------------|----------------|
|  | All Participants<br><b>N=1890</b> | Non-participants<br><b>n=1890</b> | <b>p-value</b> |
| Male, n (%)  | 484 (25.6)                        | 484 (25.6)                        | 0.98           |
| Age, 2001 mean years                                   | 41.7                              | 41.6                              | 0.94           |
| Net payments for healthcare expenditures in 2001, mean | \$1,414                           | \$1,318                           | 0.94           |
| <b>Comorbidity Prevalence, %:</b>                      |                                   |                                   |                |
| Heart disease, n(%)                                    | 183 (9.7)                         | 184 (9.7)                         |                |
| Diabetes, n(%)   | 13 (0.7)                          | 13 (0.7)                          | 0.99           |
| CCI Group 1 comorbidity, n(%)                          | 849 (44.9)                        | 849 (44.9)                        | 0.98           |
| CCI Group 2 comorbidity, n(%)                          | 528 (27.9)                        | 528 (27.9)                        | 0.98           |
| CCI, median (range)                                    | 1.75 (0-17)                       | 1.75 (0-18)                       | 0.97           |

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

**Annual growth in net payments –  
for matched-participants and non-participants over four years –  
resulting in crude savings of ~\$200/employee/year**



## Highmark:

Estimated annual savings after four years of follow-up -- participants versus non-participants – adjusted for confounders

|  | Net<br>Payments<br>$\beta$ Estimate |
|--|-------------------------------------|
| <b>Participants versus Non-participants</b>                              |                                     |
| Intercept  | -964.51†                            |
| All participants, n=1892   | <b>-176.47*</b>                     |
| Male gender  | 497.09‡                             |
| Age, per year  | 46.05‡                              |
| Heart disease at baseline  | 576.59‡                             |
| Diabetes at baseline   | 1704.01‡                            |
| Group 1 comorbidity  | 1133.20‡                            |
| Group 2 comorbidity  | 397.80‡                             |
| <b>4-year savings estimate from participation (<math>\beta*n</math>)</b> | <b>\$333,881</b>                    |
| <b>Per person estimate</b>   | <b>176.47</b>                       |

# Cost-Benefit (ROI) Analysis

|  | <u>2002</u>   |              | <u>2003</u>   |              | <u>2004</u>   |              | <u>2005</u>   |              | <u>GD Total</u>    |
|--|---------------|--------------|---------------|--------------|---------------|--------------|---------------|--------------|--------------------|
|  | <u># Used</u> | <u>Total</u> |                    |
| HRA & Incentive  | 1892          | \$243,731    | 1303          | \$143,111    | 1308          | \$140,785    | 1355          | \$142,605    |                    |
| Online   | 201           | \$1,142      | 247           | \$1,372      | 248           | \$1,300      | 512           | \$2,575      |                    |
| Group  | 34            | \$1,544      | 56            | \$3,077      | 56            | \$3,010      | 0             | \$0          |                    |
| Nutrition Coaching                                       | 2             | \$66         | 23            | \$740        | 51            | \$1,585      | 111           | \$3,420      |                    |
| 10,000 Steps   |               |              | 244           | \$2,441      | 413           | \$3,851      | 223           | \$2,061      |                    |
| Fitness Center   |               |              | 407           | \$25,603     | 495           | \$29,939     | 879           | \$50,958     |                    |
| Highmark Challenge                                       |               |              |               |              | 112           | \$348        | 910           | \$2,766      |                    |
| Maintain Don't Gain Newsletter                           |               |              |               |              | 85            | \$182        | 93            | \$192        |                    |
| Wellness Program Costs                                   |               | \$246,483    |               | \$176,343    |               | \$181,000    |               | \$204,577    |                    |
| Cost per participant                                     |               | \$130.28     |               | \$135.34     |               | \$138.38     |               | \$150.98     | <b>\$808,403</b>   |
| Estimated Annual Savings from Model \$176.47/person      |               |              |               |              |               |              |               |              |                    |
|  |               | \$333,881    |               | \$333,881    |               | \$333,881    |               | \$333,881    | <b>\$1,335,524</b> |
| Net Savings (Estimated Savings - Wellness Program Costs) |               | \$87,398     |               | \$157,538    |               | \$152,881    |               | \$129,304    | <b>\$527,121</b>   |

Total Savings Estimated 4 Ye **\$1,335,524**  
 Total Costs 4 Years **\$808,403**  
 Return on Investment **\$1.65**

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



# Literature Reviews

## Health Promotion Program Studies

- ROI studies of health management programs at:
  - Canada and North American Life
  - Chevron Corporation
  - City of Mesa, Arizona
  - General Mills
  - General Motors
  - Johnson & Johnson
  - Pacific Bell
  - Procter and Gamble
  - Tenneco
- ROI estimates in these nine studies ranged from \$1.40 - \$4.90 in savings per dollar spent on these programs.
- Median ROI was \$3 in benefits per dollar spent on program.
- Sample sizes ranged from 500 - 50,000 subjects in these studies.

# Financial Impact – Literature Review – Steven G. Aldana, Ph.D.

*American Journal of Health Promotion, May/June, 2001, 15:5.*

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

## **Scoring Criteria:**

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

## **Health promotion program impact on health care costs:**

- **32 evaluation studies examined – Grades: A (4), B (11), other (17)**
- **Average duration of intervention: 3.25 years**
- **Positive impact: 28 studies**
- **No impact: 4 studies (none with randomized designs)**
- **Average ROI: 3.48 to 1.00 (7 studies)**

## Meta Evaluation of Worksite Health Promotion Economic Return Studies: 2005 Update – Larry Chapman (Art of Health Promotion, July/August, 2005)

- Analysis includes a review of 56 peer reviewed studies
- Study methods are scored using 10 criteria
- Median year of publication – 1994
- Number of combined subjects in all studies – 483,232
- Average study duration- 3.66 years
- Primary outcomes examined: health care utilization/cost (28 studies) and absenteeism (25 studies)
- Results:
  - **Average reduction in health care costs – 26%**
  - **Average reduction in absenteeism – 27%**
  - **Average ROI – 5.81 : 1.00 (22 studies)**



## Identifying “Best Practices” in Health and Productivity Management: What Works?

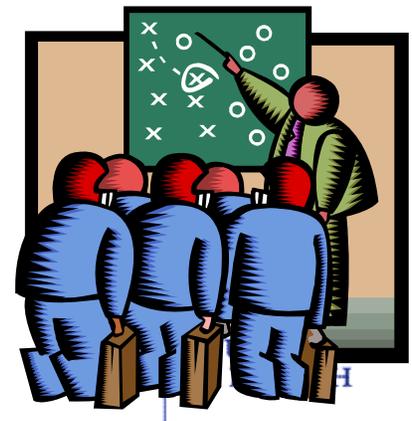
Goetzel RZ, Shechter D, Ozminkowski RJ, Reyes M, Marmet PF, Tabrizi M, Chung Roemer E. Critical success factors to employer health and productivity management efforts: Findings from a benchmarking study. Journal of Occupational and Environmental Medicine. (2007) February; 49:2, 111-130.

## Summary:

# Health Promotion Programs -- What Works? (1)

## Leadership Commitment

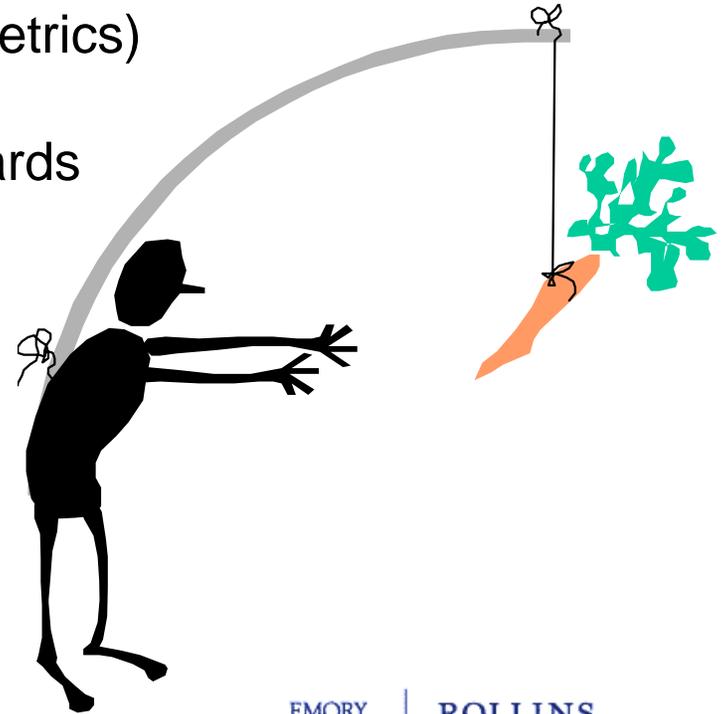
- Leading by example – with buy-in by middle managers
- “Healthy company” norm/culture
- Explicit connection to the core principles of the organization
- Employee-driven advisory board
- Specific program goals and objectives – with realistic expectations
- Alignment of organizational, HR and health promotion policies/practices
- Sustainability – future orientation



## Health Promotion Programs -- What Works? (2)

### Incentives

- Incentives to participate (not change biometrics)
- Accountability at all levels – linked to rewards
- Effective marketing and communication (multi-channel)



## Health Promotion Programs -- What Works? (3)

### Effective Screening and Triage

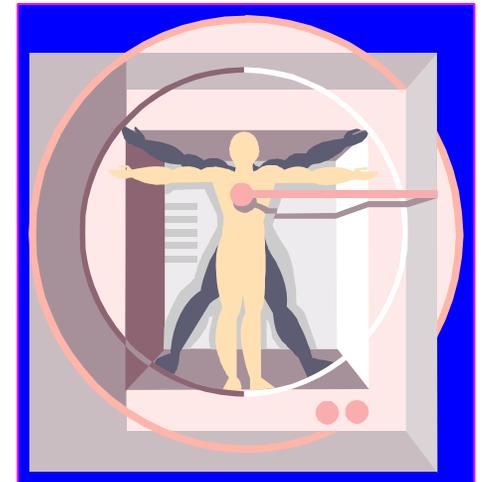
- Casting a wide net to identify the highest risk individuals
- Providing “public health” interventions to keep people at low risk
- Triaging individuals into programs that produce greatest impact/payoff
- Protecting confidentiality
- Coordinating with providers and community resources



## Health Promotion Programs -- What Works? (4)

### State-of-the-Art Intervention Programs

- Theory and evidence-based (e.g., Bandura, Prochaska, Lorig, Strecher, Glasgow)
- Tailored and individualized interventions
- Balancing high touch with high tech
- Environmental/ecological interventions
- Effective, reliable, valid tools



## Health Promotion Programs -- What Works? (5)

### Effective Implementation

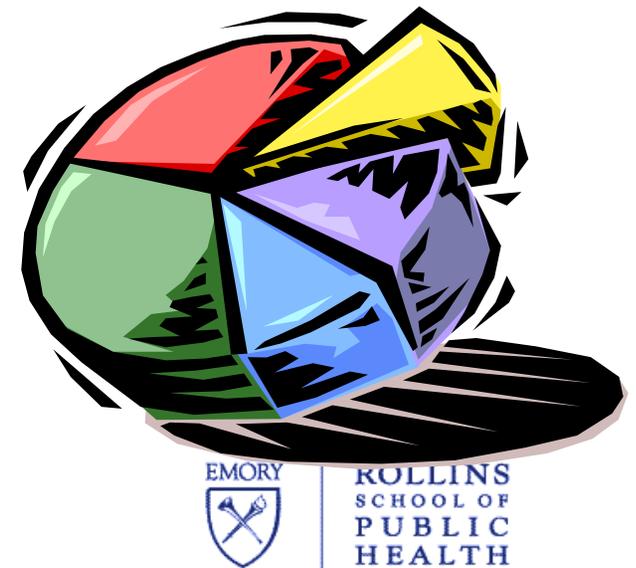


- Integrate programs – insure vendor (stakeholder) engagement
- Accessible/attractive programs
- Start simple – pilot – grow on success
- Multi-component -- variety of topics and engagement modalities
- Integrate staff into the fabric of the organization
- Spend the right amount of money to achieve a desired ROI

## Health Promotion Programs -- What Works? (6)

### Excellent Evaluation

- Integrated data systems
- Rigorous methods that stand up to peer review
- Measure, manage, and measure again
- Regular communication of results
- Explicit connection of results to core values



## So, what is important to employers?

- Financial outcomes
  - Cost savings, return on investment (ROI) and net present value (NPV)
  - Where to find savings:
    - Medical costs
    - Absenteeism
    - Short term disability (STD)
    - Workers' Compensation (safety)
    - Presenteeism
- Health outcomes
  - Adherence to evidence based medicine
  - Behavior change, risk reduction, health improvement
- Quality of life (humanistic) and productivity outcomes
  - Improvement in quality of life
  - Improved “functioning” and productivity

## Summary

- **Focusing on improving the health and quality of people's lives will improve the productivity and competitiveness of our workers and citizens.**
- **A growing body of scientific literature suggests that well-designed, evidence-based Health and Productivity Management Programs can**
  - **Improve the health of workers;**
  - **Lower their risk for disease;**
  - **Save businesses money by reducing health-related losses and limiting absence and disability;**
  - **Heighten worker morale and work relations;**
  - **Improve worker productivity; and**
  - **Improve the financial performance of organizations instituting these programs.**





**Thank You!**

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