

## 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

\*Includes all active Dow, Dow Agro Sciences, Union Carbide Company and wholly owned subsidiaries

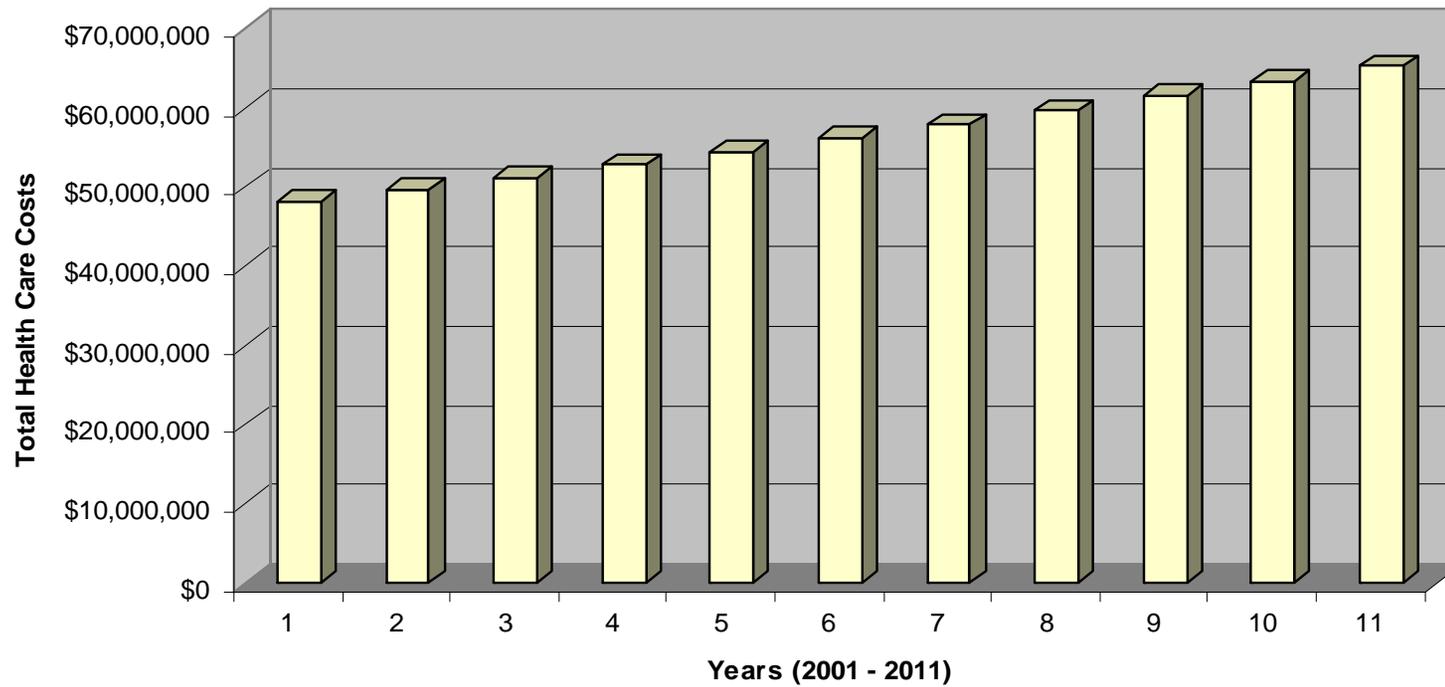


## Step 2: Estimate the Risk Profile of Dow Employees: 2001 – 2011

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%
Deviate from Ideal Body Weight	40%	41%	42%	43%	44%	45%
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%

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

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



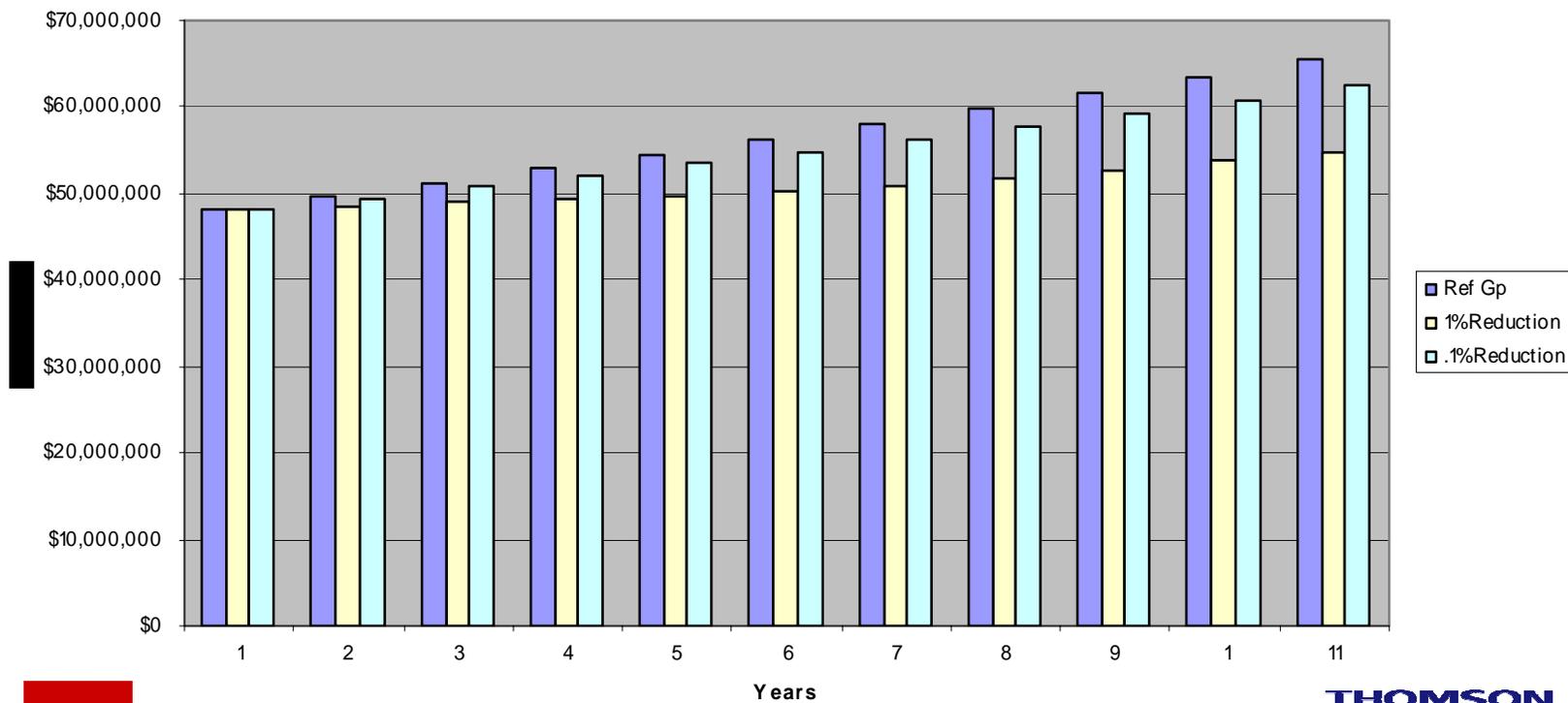
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## Step 4:

### 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)



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## Step 5: Compare Program Benefits Under Alternative Scenarios vs. Program Expenses to Calculate an ROI

	Reference Case	Scenario 2: 10% decrease in risk over 10 years	Scenario 3: 1% decrease in risk over 10 years	Scenario 4: Break-Even Reduce Risks by 0.09% per Year
Increase in Expenditures per Year 2001 - 2011	\$17,194,584	<b>\$6,621,519</b>	<b>\$14,329,106</b>	<b>\$14,445,610</b>
Percent change between first and last years	36%	14%	30%	30%
Sum of Total Expend.	\$620,679,251	\$558,556,378	\$605,019,163	\$605,618,572
Benefits of Risk Management (with a 3% discount rate)	Not applicable -- base case	\$50,799,364	\$12,746,621	\$12,259,896
Dow investment (with a 3% discount rate)		\$12,259,896	\$12,259,896	\$12,259,896
Net Present Value of investment		\$38,539,467	\$486,724	\$0.00
Return on Investment Ratio		4.14	1.04	1.00

# ROI Analysis

- Break even (1:1) is achieved if the program reduces risk of employees .09% per year over 10 years – i.e.: Dow spends \$12.26 million and saves \$12.26 million over 10 years
- If Dow can reduce employee risks by 1% per year (10% over 10 years), it will save \$50.8 million – with an investment of \$12.26 million that translates to an ROI of 4.14 to 1.00

# Phase III: Deliver the intervention -- Just Do It!



# Care Management

- Acute/chronic disease management
- Work related injury and illness management
- Disability management
- Medical case management



# Health Promotion/Disease Prevention

- Health Promotion/Disease Prevention
  - Primary, secondary and tertiary prevention programs
  - Immunizations
  - Screenings
  - Behavioral health intervention
  - Self care, consumerism, demand management



# Workplace Environment

- Occupational & environmental medicine
- Ergonomics
- Job design
- Safety
- Medical surveillance
- Return to work
- Job accommodation



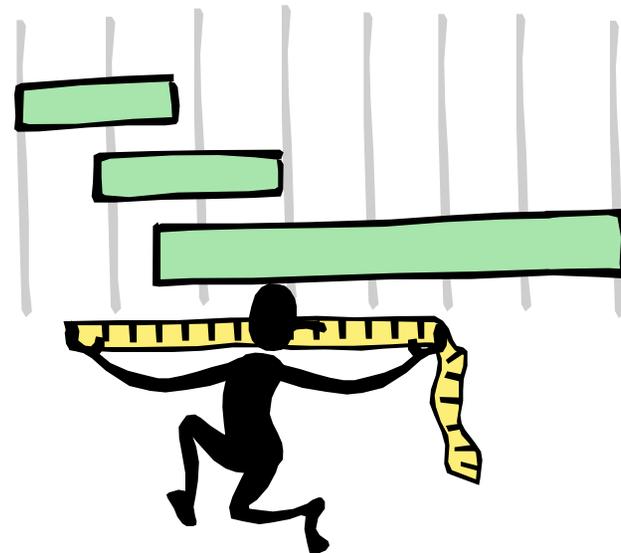
# Corporate culture and organizational health

- Organizational values
- Work-life
- Work climate, morale, employee attitudes
- Coordinated policies and procedures
- Benefit plan design
- Workplace stress reduction



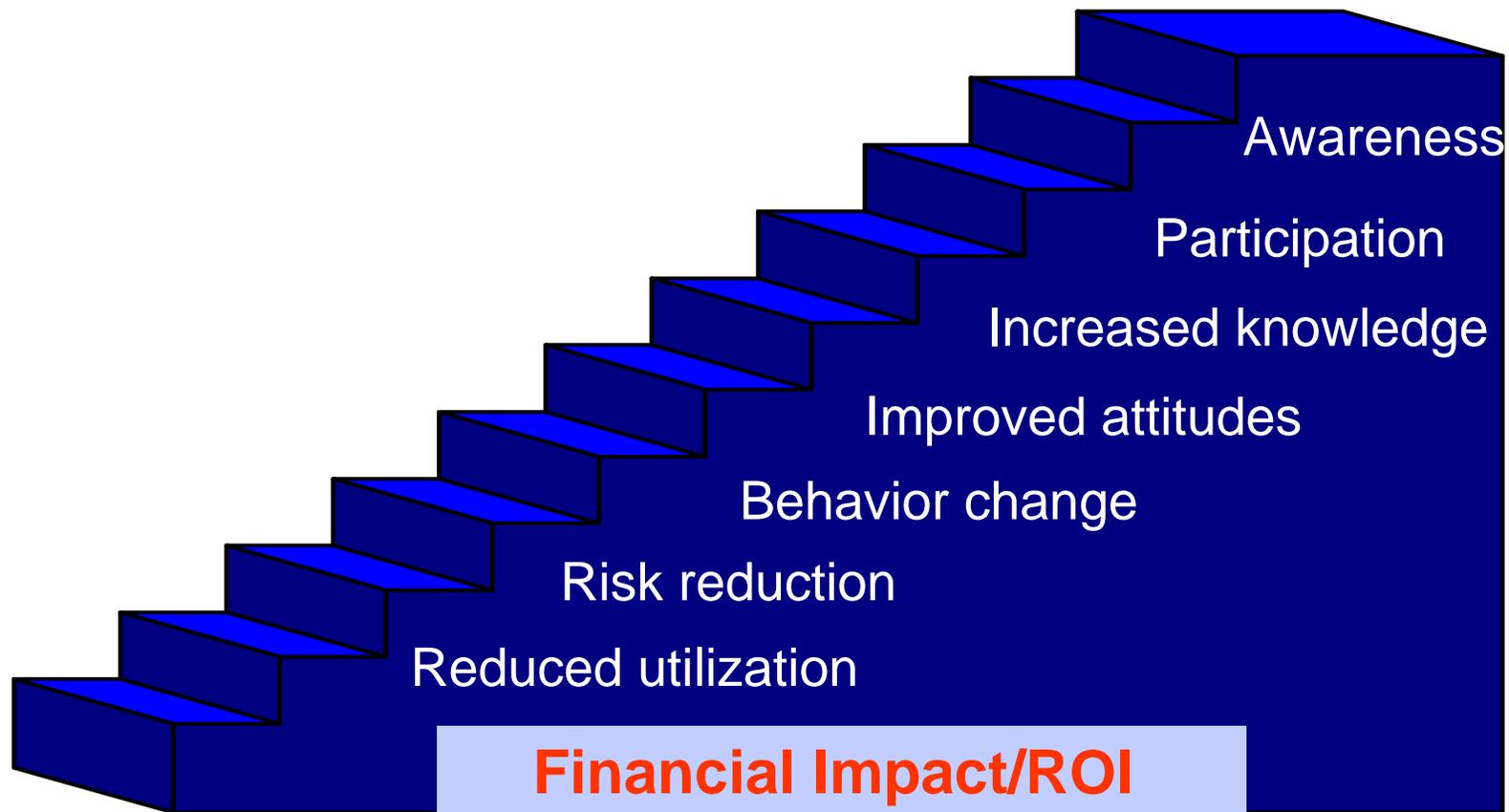
## Phase IV: Measure and report results

- **Descriptive studies**
  - Tracking/monitoring systems
  - Dashboards/report cards
- **Rigorous evaluation studies**
  - Return on investment (ROI) studies
  - Use of multivariate statistics/econometric methods



# Program Evaluation

Understand the sequence of critical success factors:



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

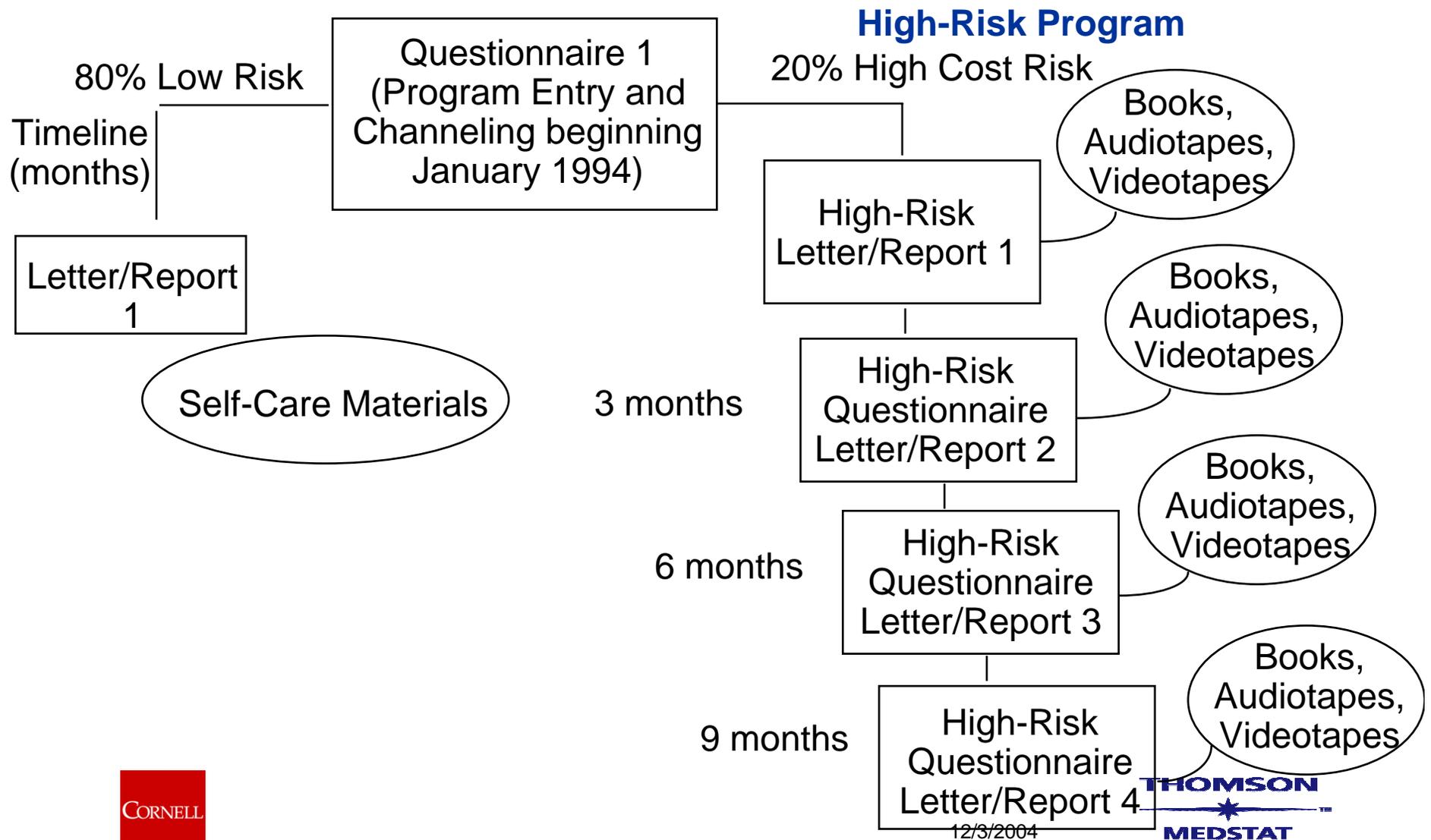
Ozminkowski RJ, Dunn RL, Goetzel RZ, Cantor RI, Murnane J, Harrison M.  
*American Journal of Health Promotion* 14(1) (1999): 31–43.



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# Program Components



# Citibank High Risk Program Modules

- **Arthritis**
- **Back pain**
- **Smoking**
- **Diabetes**
- **Smoking**
- **Obesity**
- **High BP**
- **Heart conditions and other chronic conditions**
- **Combinations of risky behaviors**



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# Program Participation

- All 47,838 active employees were eligible to participate
- 54.3% participation rate
- 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



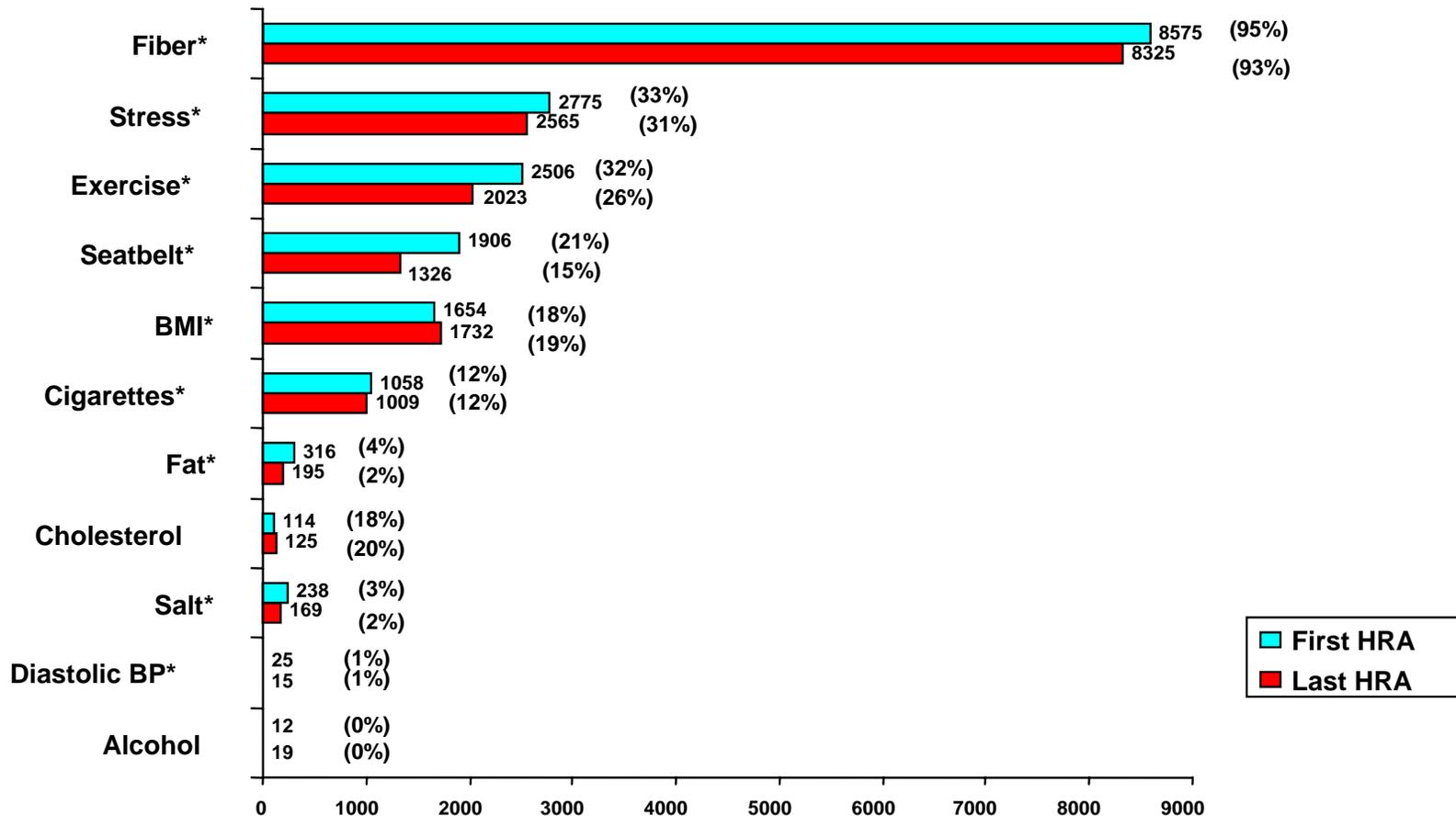
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# But...Can You Change Risks? Can You Affect Costs?

## 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).



# 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‡

Total Sample Size = 5,143 employees for whom claims data were available

\*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

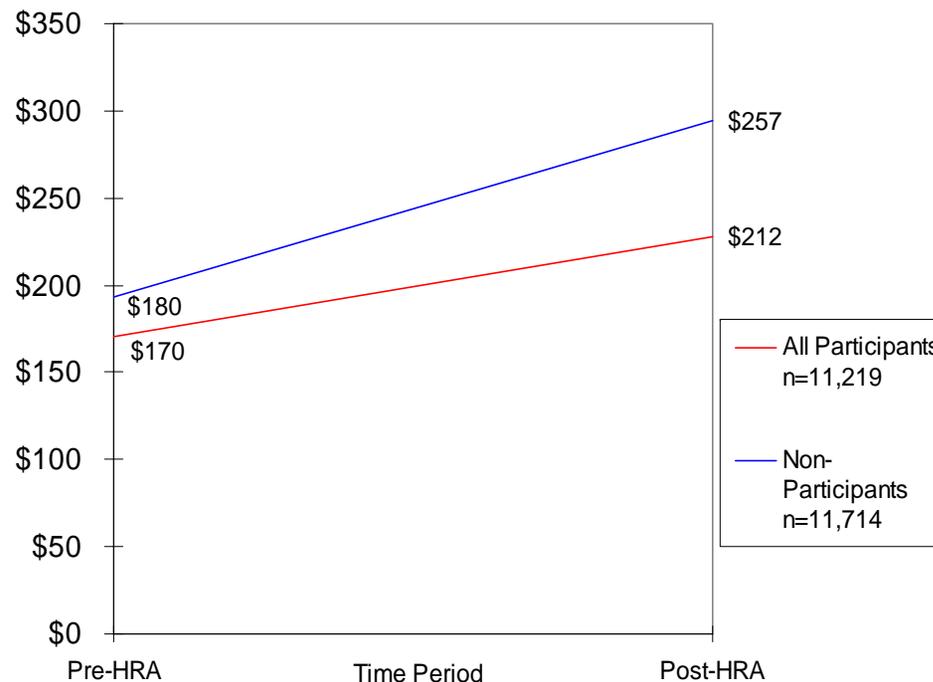


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# Medical—Adjusted Mean Net Payments

## 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\*

CORNELL

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

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THOMSON  
MEDSTAT

# Citibank Health Management Program Return on Investment

- 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***

\* 1996 dollars @ 0 percent discount

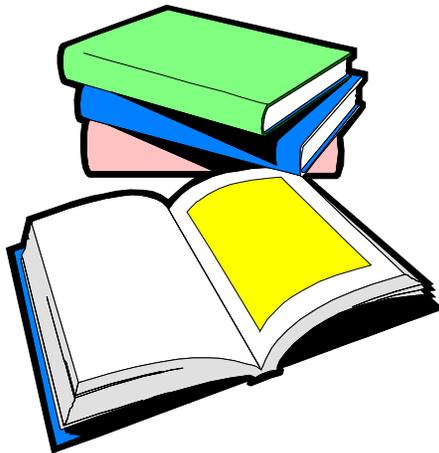


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# What's the ROI?

## A Systematic Review of Return on Investment (ROI) Studies of Corporate Health and Productivity Management Initiatives



Ron Z. Goetzel, Ph.D.

Timothy R. Juday, MPA

Ronald J. Ozminkowski, Ph.D.

*Ref: AWHP's Worksite Health, Summer 1999, pp. 12-21*



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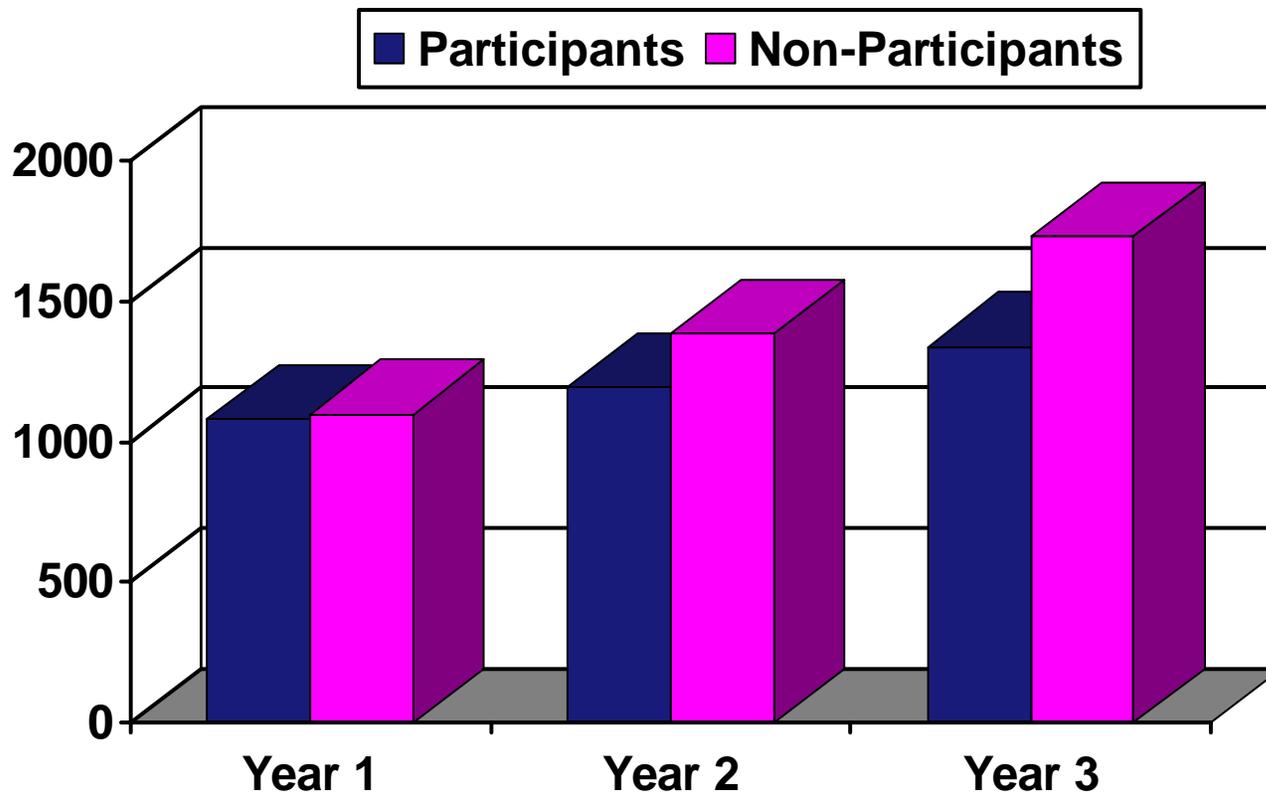


# Health Promotion Program Studies

- 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.



# 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  $p < .05$

\*Participant costs were 29% lower

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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# 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)



# Generic Study Limitations - Health and Productivity Management Research

**Self-Selection**

**High Attrition**

**Treatment Diffusion**

**Poor Instrumentation**

**“Wish Bias”**



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# Conclusions (1)

## “Practical” Research Questions (*in situ studies*)

- What does it take for employers to adopt a health, safety and productivity management mindset?
- What types of data are necessary to convince senior managers to invest in improved employee health, safety and productivity?
- What forms do organizational health, safety and productivity management programs take – what are the similarities and differences among programs?
- Which investments in health, safety and productivity management are easiest to justify ("no brainers") and which are more difficult?
- How can employers involve their health plan providers as partners in health, safety, and productivity management efforts?
- What outcomes have employers achieved from integration efforts – how have they measured these outcomes and how credible are the results?
- What are the lessons learned and what advice would employers offer to businesses that are first contemplating health, safety and productivity management initiatives?

## Conclusions (2)

### Knowledge Dissemination

- Publish in the *New England* and *Wall Street Journals*
- Highlight the organizational costs and projected benefits
- Encourage public and private dialogue
- Share best practices
- Honor and reward outstanding organizational achievements in health, safety and productivity management
- Make integration a “no brainer” – make sure interventions are evidence-based

# Conclusions (3)

## Implementation

- Provide financial incentives to get things started
  - Tax breaks/credits for employers
  - Incentives for employees to participate
- Encourage health plan and employer cooperation
  - Highlight accomplishments via dashboards and report cards
  - Focus on health, safety and productivity outcomes, not processes
- Provide technical assistance
- Act as role models
- Encourage pilot testing demonstrations and then roll-out

# Questions/Discussion

