3º Seminário Promoção de Saúde nas Empresas

Hotel Renaissence – São Paulo

15 de outubro de 2013

Das 13h às 17h

IESS

INSTITUTO DE ESTUDOS DE SAÚDE SUPLEMENTAR

How to Evaluate Workplace Health Promotion Programs

Michael P. O'Donnell, MBA, MPH, PhD
Health Management Research Center, University of Michigan

Format

- Importance of Evaluation
- Types of Evaluation
- Realistic Expectations
- Evaluation Study Methodology
- Typical Evaluation Strategies
- Examples

Importance of Evaluation

- How well is the program being implemented?
- What results are being achieved?

- Should the program be reshaped to…
  - better achieve objectives?
  - ensure that scarce resources are being used in the most cost effective manner?

- What contribution can be made to the knowledge base?

Types of Evaluation

- Structure
- Process
- Outcome

Structure (Formative) Evaluation

- Is the program structured well to achieve program goals?
  - clearly articulated goals
  - appropriate staff in place
  - appropriate programs being offered
  - appropriate evaluation plan in place
- When to conduct structure evaluation
  - as a program is being launched
  - periodically, perhaps every two years.
- Tools
  - HERO Scorecard
  - CDC Worksite Health ScoreCard

HERO Scorecard

(Health Enhancement Research Organization)

- Inventory to catalogue a program's component; an indicator of success in implementing program components; comparative benchmarking tool to compare a program with peer employers

- 62 questions
  - strategic planning (10 questions),
  - leadership engagement (6 questions),
  - program level management (8 questions),
  - programs (22 questions),
  - engagement methods (13 questions), and measurement
  - evaluation (3 questions)
  - optional section on outcomes (participation rates, program costs, health impact medical costs)

- Online scoring: Report with organization score and norm scores

HERO Scorecard website: http://www.the-hero.org/scorecard_folder/scorecard.htm.

CDC Worksite Health Scorecard (Centers for Disease Control and Prevention)

- Help employers determine if they have implemented evidence based interventions and strategies
  - individual program interventions
  - organization level design

- 100 questions, self scoring
  - organizational supports (18 questions)
  - tobacco control (10 questions
  - nutrition (13 questions)
  - physical activity (9 questions)
  - weight management (5 questions
  - stress management (6 questions)
  - depression (7 questions),
  - high blood pressure (7 questions)
  - high cholesterol (6 questions)
  - diabetes (6 questions)
  - signs and symptoms of heart attack and stroke (4 questions
  - emergency response to heart attack and stroke (9 questions)

- Scoring based on relative value; each item is weighted
  1. magnitude of the impact of the approach
  2. quality of published evidence.
  - References to the scientific literature are provided for each topic area

Worksite Health Scorecard website:
http://www.cdc.gov/dhdsp/pubs/worksite_scorecard.htm

Process Evaluation

- Is the program is being implemented as planned?
  - funds are allocated to support the program
  - staff are hired and trained
  - programs being offered to people on schedule
  - programs promoted on schedule
  - health screenings measuring the intended items
  - skill building programs teaching the intended skills
  - facilities being constructed as planned,
  - people signing up for and completing programs
- Conducted
  - as a program is being implemented,
  - periodically, especially when program outcomes are not as good as expected.

Outcome Evaluation

Determine program impact

- participation
- satisfaction
- health-related knowledge
- behaviors
- health conditions
- organization culture
- medical costs
- absenteeism
- productivity

Qualitative versus Quantitative Evaluation

Quantitative

- Objective
- Numbers

Qualitative

- Feelings
- Testimonials

Triangulation: Quantitative + Qualitative

Testimonial from program participant

"I am sending you this note from the hospital. I was involved in a horrendous car crash. I will be in the hospital for a long time and will have months of therapy after I am discharged. But I am alive. When I joined your program, I decided to make one important change. I am not a health nut. I still smoke. I do not exercise very often and I eat more junk food than I should. The change I made was to buckle my seat belt every single time I got in a car. I am alive because of you. I thank you. My mother thanks you."

Setting Realistic Goals

Can we create a masterpiece?

Setting Realistic Goals

- Moderate and growing evidence in the scientific literature to guide setting realistic goals
- Quality of program is primary driver
  - Budgets: $250-$350/eligible
  - Staff: $250-$350/eligible + 1/2000
- HRA participation
  - 20% -40% if good marketing and management support
  - 70% w/$200 incentive
  - 90% if incentive integrated into health plan

Setting Realistic Goals (cont.)

- Tobacco Cessation (27 meta-analyses): 5% -35%
  - optimal number of minutes of behavioral therapy: 300
  - optimal number of therapy sessions: 8
  - optimal mix of staff: a physician plus two other professionals
  - optimal intervention
    - physician giving brief advice to quit
    - referral to a program with behavior therapy + medication
- Medical Care Cost and Absenteeism
  - Medical cost (13 studies) ROI: 3.27:1.00
  - Absenteeism: (15 studies) ROI: 2.73:1.00

Health Assessment with Feedback Plus Intervention

Strong evidence of effectiveness		PP Prevalence	Effect
Tobacco use	*30	-1.5%	-2.3% consumption
Dietary fat consumption	11	-5.4%	
Blood pressure control	31	-4.5%	
Cholesterol management	36	-6.6%	-4.8 mg/dl
Absence from work	10		-1.2 days/year
Sufficient evidence of effectiveness			
Seat belt use	10	-27.6%	
Heavy drinking	9	-2.0%	
Physical activity	18	-15.3%	
Health risk score	21		
Medical utilization	7		
Insufficient evidence of effectiveness			
Fitness	9	Positive outcomes	Small effect sizes, multiple measures
Body composition	27		Small effect size
-BMI	8	-.56 pounds	Small effect size
-Weight	17	-2.2%	
-Fat	6		
Not effective			
Fruit and vegetable consumption	8	Minimal changes observed	

* Number of studies

Evaluation Study Methodology

- Structure (study design)
- Sample
- Measures
- Analysis

Study Designs

Non experimental									
Post test only				X	O				
Pre-post test		O		X	O				
Quasi-experimental		O		X	O				treatment group
		O			O				comparison group
Time series	O	O	O	X	O	O	O		treatment group
	O	O	O		O	O	O		comparison group
Experimental	R	O		X	O				treatment group
	R	O			O				comparison group
R	O	O	O	X	O	O	O		treatment group
R	O	O	O		O	O	O		comparison group

O = Observation or measurement X = Program

Sample Size formula

- Representative of the population studied
- Size (if sample is representative)

$n = (z^2\ PQ) \div (e^2 + z^2\ PQ \div N)$

n = sample size

N = size of the full population

z = standard normal deviate corresponding to the acceptable Type I or false positive error, a situation in which the analysis shows a difference between two groups when such a difference really does not exist. .05 is a normally accepted value, in which case z = 1.96.

P = portion of the population who have the trait being studied, for example the portion who smoke cigarettes; assume .5 if don't know

Q = portion of the population who do not have the trait being studied, for example the portion who do not smoke cigarettes, ie Q =(1- P).

e = confidence interval; ± 5% is often an acceptable confidence error

Sample Size for Population Sizes

Population	Sample
50	44
100	79
200	132
300	168
400	196
500	217
700	248
1000	278
2000	322
5000	357
10,000	370

Measures

- Validity: measure what is intended to be measured
- Reliability: consistency of measures

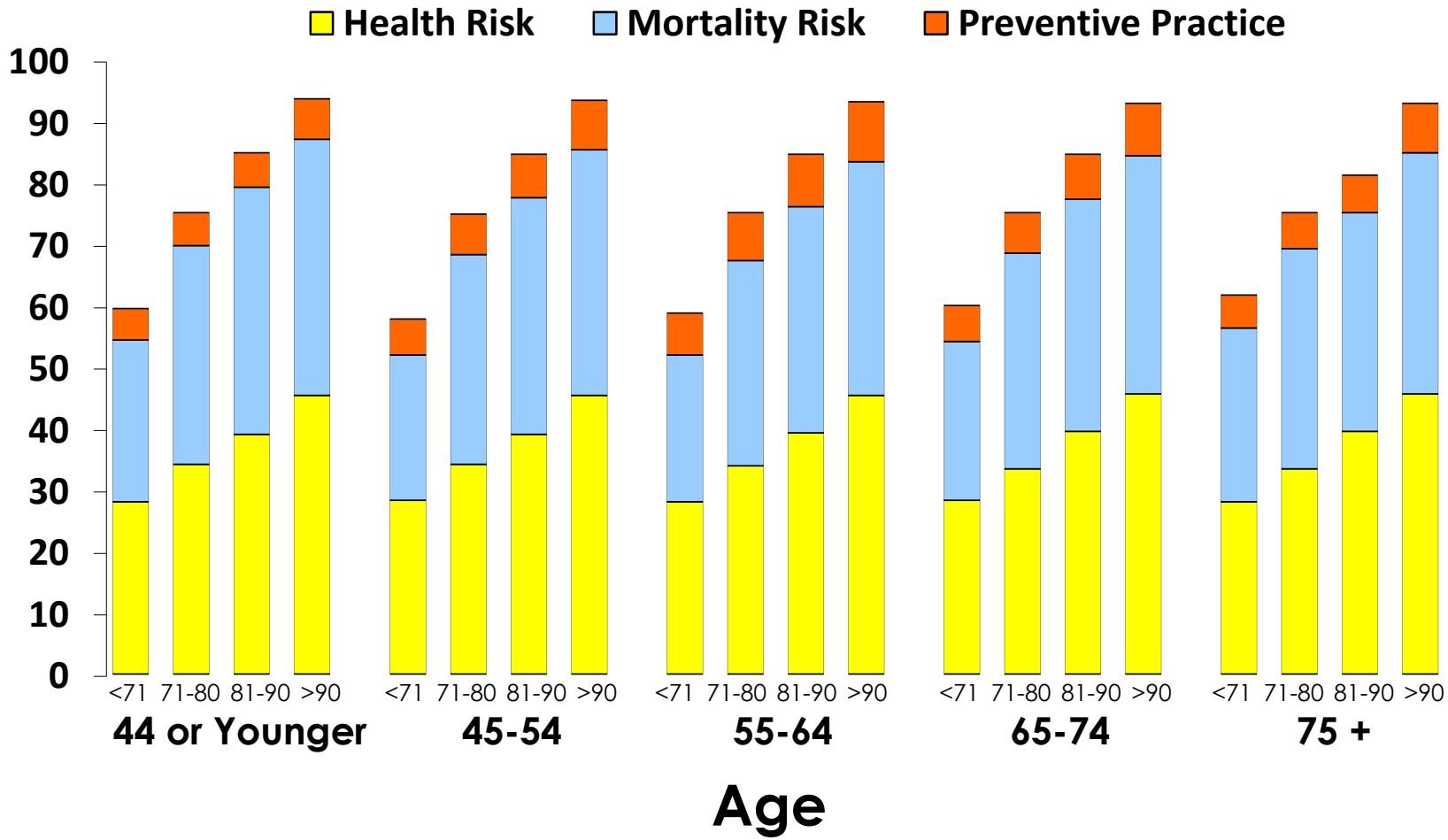
- Eg. HRA from Health Management Research Center at the University of Michigan

Validity Of The Health Risk Appraisal To Predict 20 Year Chances Of Dying (1959-1979) In The Tecumseh Community Health Study (UM-HMRC)

(Actual Age) – (Risk Age)	20 Year Death Rates (Percent)	
	Males	Females
+2 to +5	0.0	3.0
-1 to +1	2.8	2.8
-5 to -2	9.8	8.9
-0 to -6	29.0	15.5
< -10	36.2	30.5
Total	19.3	8.9

From Foxman and Edington, Am. J. Pub. Health 77:971-974, 1987

The Contribution of Component Scores to Total Wellness Scores by Wellness Levels and Age



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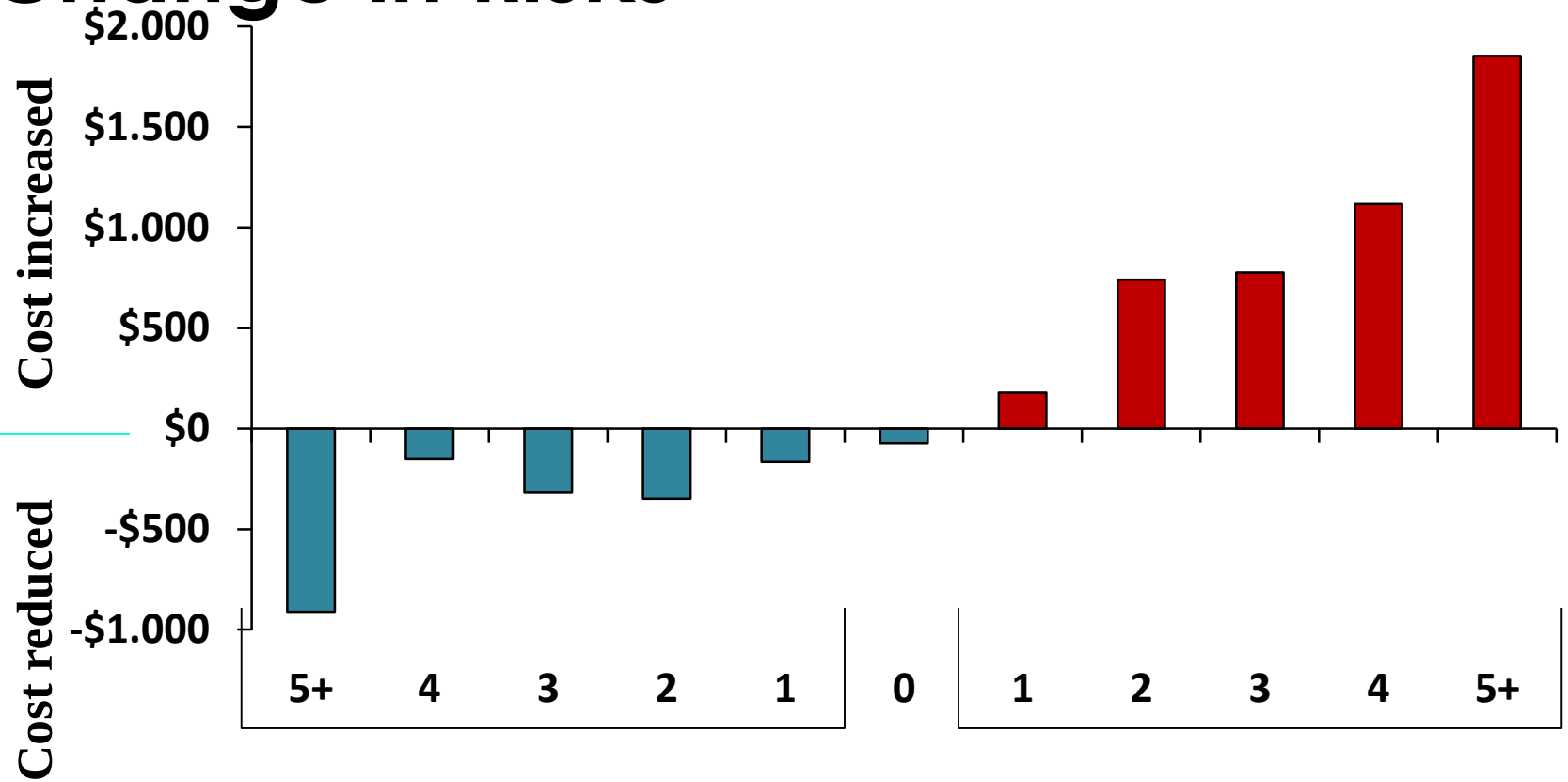
Medical Costs

Health Related Measures	Low Health Risk	High Health Risk	Odds Ratio*
ILLNESS ABSENT	$1,773	$4,168	2.5**
DISEASE			
Heart Disease	$1,875	$8,299	3.6**
Diabetes	$1,975	$4,669	2.4**
Cancer	$1,981	$3,456	2.1**
Other Disease	$1,871	$4,162	2.2**
PSYCHOLOGICAL PERCEPTION			
Physical Health	$1,751	$3,756	2.4**
Life Satisfaction	$2,023	$2,769	1.3
Job Satisfaction	$2,056	$2,298	1.0
Stress	$1,857	$2,571	1.3**
BIO/PHYSIOLOGICAL			
Blood Pressure	$1,810	$3,732	1.8**
Cholesterol	$2,033	$2,276	1.1
Relative Body Weight	$1,881	$2,633	1.5**
LIFESTYLE HABITS			
Smoking	$2,023	$2,290	1.0
Physical Activity	$1,865	$2,462	1.3**
Medication/drug usage	$1,874	$3,034	1.7**
Alcohol Usage	$2,072	$1,695	0.9
Seatbelt Usage	$2,059	$2,007	0.9

* Odds to be in the top 10% high cost group **Significant at P<.05

Yen,Edington,Witting.1991. AJHP.6:46-54.

Change in Costs Associated with Change in Risks



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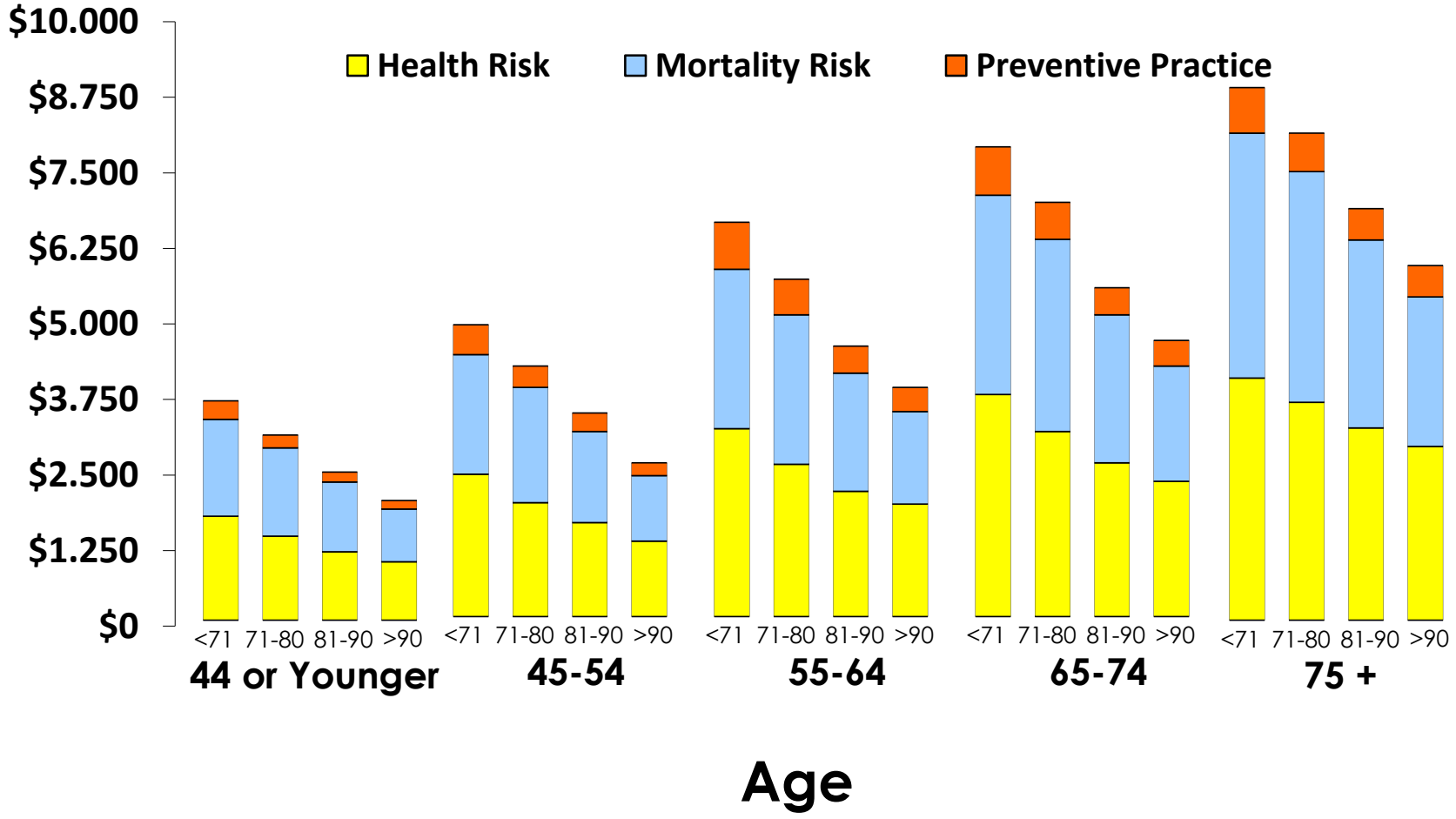
The Contribution of Component Scores to Total Medical Care Costs by Wellness Levels and Age



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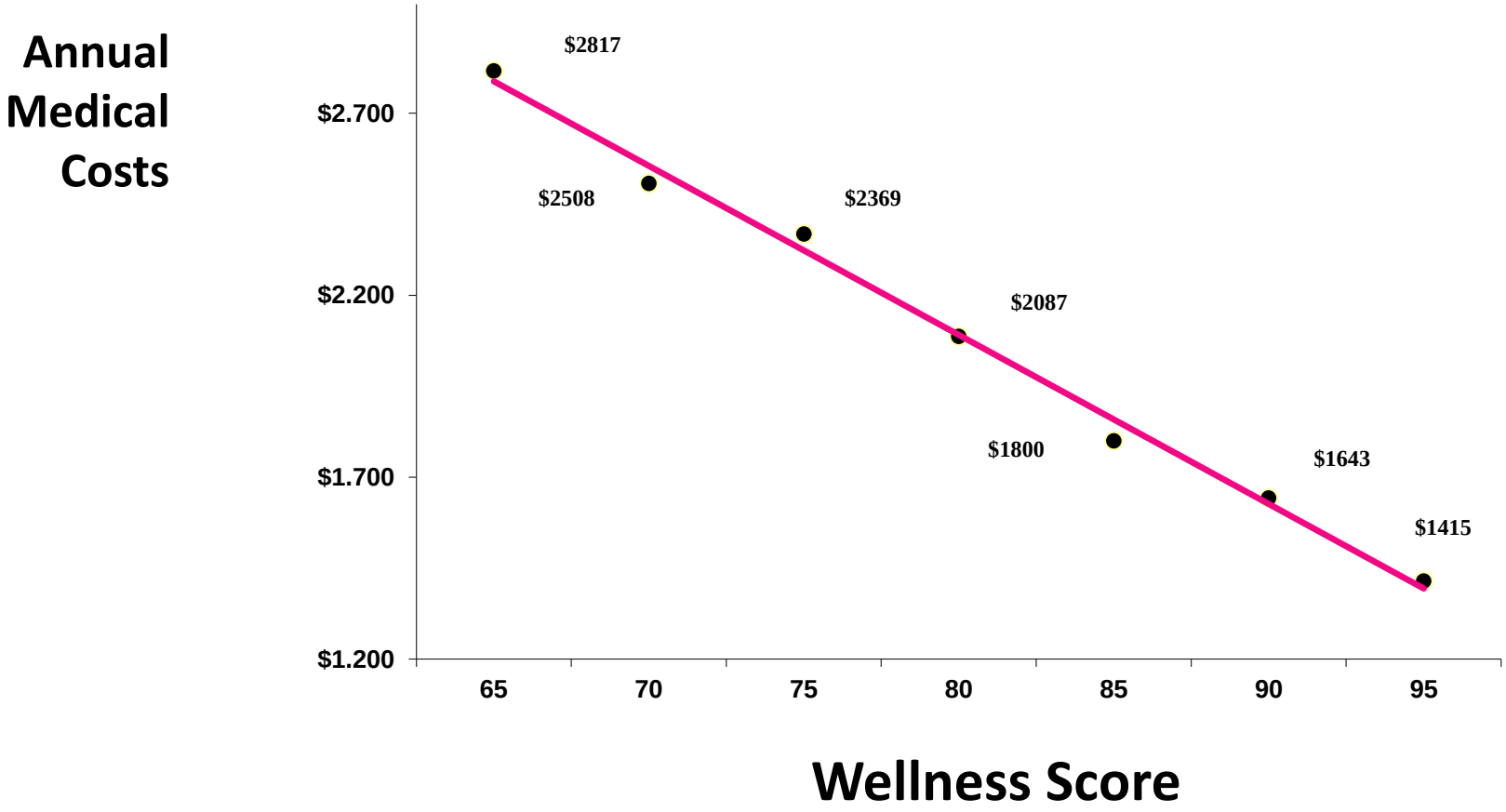
Relationship Between Annual Medical and Pharmacy Costs and HRA Wellness Score



p <.0001 and n=10,172

Yen, McDonald, Hirschland, Edington. JOEM. November 2004

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Analysis

- Appropriate to data distribution
  - normal distribution: parametric statistics
    - Mean, student t test, ANOVA
  - Not normal: nonparametric statistics
    - Median, Kruskal-Wallis non-parametric ANOVA

    (e.g. medical costs are not normally distributed)

Typical Approaches

- Do nothing (80%?)
- HRA Aggregate report (18%?)
- In-depth longitudinal analysis (2%)

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Value of HRA's

Individual participants

- Feedback on the link between health behaviors and future health
- Identify important health behaviors to change
- Help participant prioritize risks to address
- Monitor changes over time

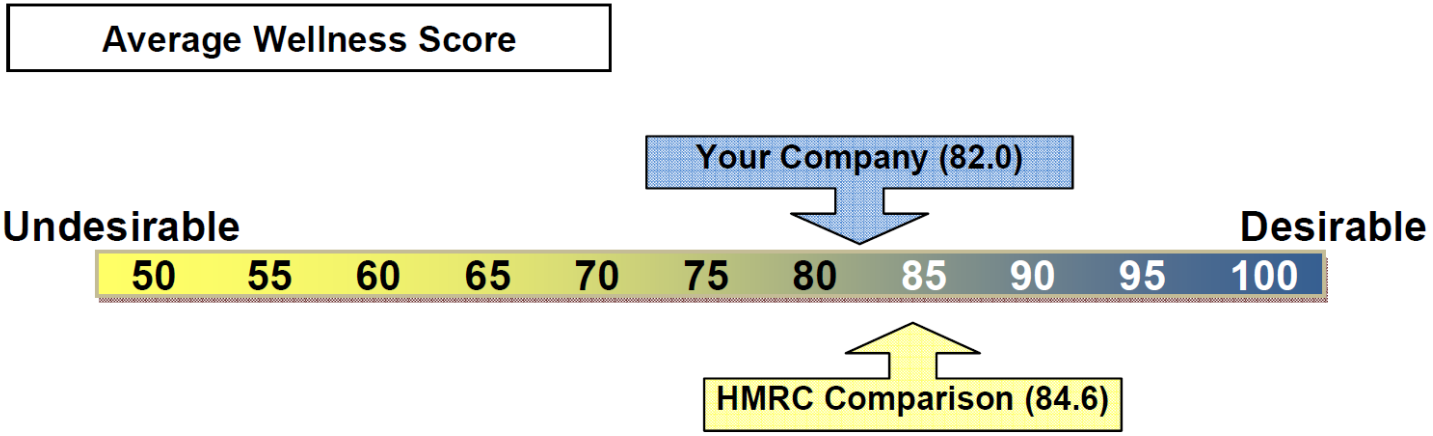
Group

- Identify prevalence of health risks for program planning
- Track changes in health risks and costs over time for evaluation

Change in HRA Values as Outcome Measure

- **Advantages**
  - Low cost
  - Automatic in HRA aggregate report
- **Challenges**
  - Need time 1- time 2 comparison in aggregate report
  - Need strong participation rate of a cohort: time 1 –time 2
  - Need HRA validated on health and cost
  - Need HRA with strong algorithms for projecting costs

HRA Summary Report
HMRC Wellness Score



This graphic represents the overall average Wellness Score for those who completed an HA within the given time period.

- The HMRC Wellness Score is a combination of three components: use of preventive services; the total number of risk factors; and the interaction of the risk factors that lead to disease.
- The wellness score is reflective of a person's health behavior more than health status. A person can have a high wellness score despite having a chronic disease by taking measures to lead a healthy lifestyle. An individual can alter their score by changing their health-related behaviors.
- Extensive research has linked wellness score to disease development and chances of an individual's use of the health care system over the next several years. A low wellness score is

HRA Summary Report-T1T2 Executive Summary

Demographic Information in T1 (p. 4)

Male Participants: 65.6%
Female Participants: 34.4%
Average Age of Participants at Time 1: 44.7
The largest group is 45-55 (52.7%).

Average Wellness Score (p. 8)

	Time 1 (2004)	Time 2 (2005)	Change
Average Wellness Score	81.4	82.9	1.5*

Risk Status (p. 8)

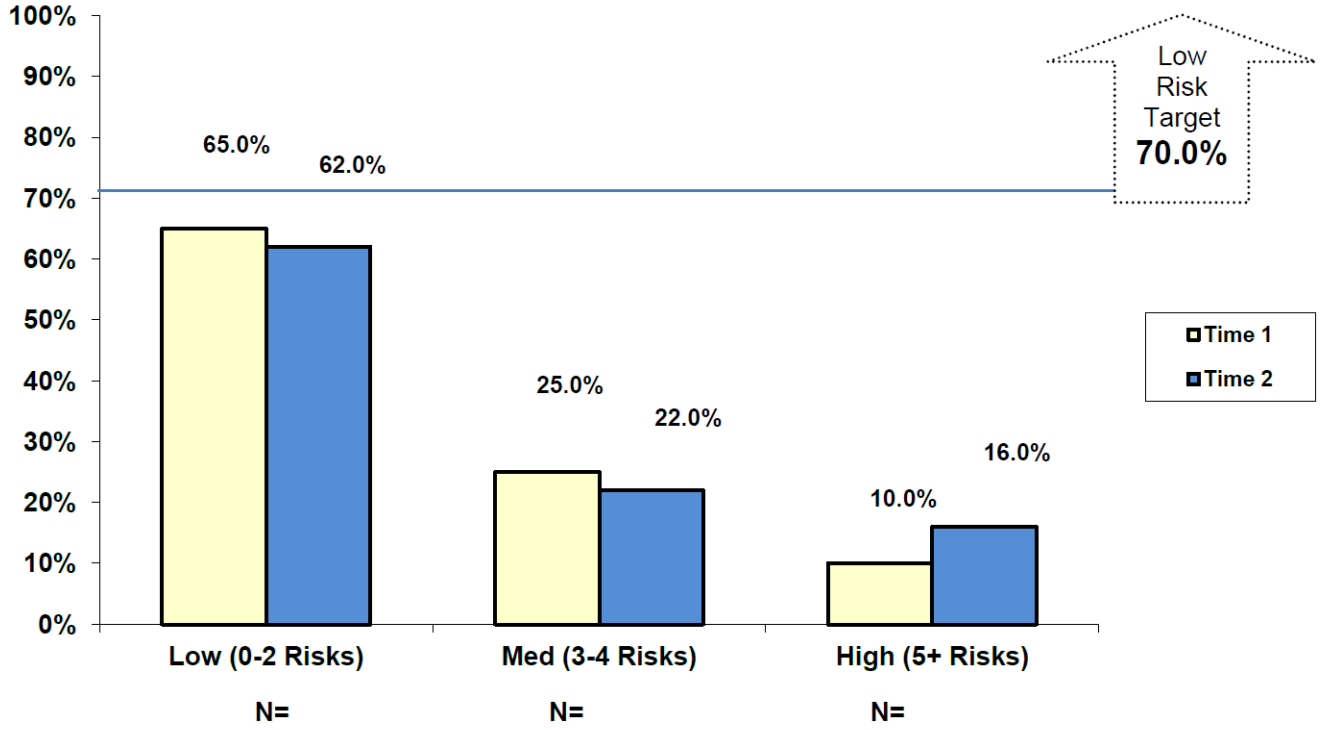
	T1	T2	Change
Low (0 - 2 risks)	53.0%	60.7%	7.7*
Medium (3 - 4 risks)	32.2%	26.3%	-5.9
High (5+ risks)	14.7%	13.0%	-1.7*
Average Number of Risks	2.7	2.4	-0.3*

Top Three Health Risks Prioritized for an Individual based on 2004 (p. 5)

	T1	T2	Change
Body Weight	33.3%	34.3%	1.0
Physical Activity	20.1%	14.7%	-5.4*
Smoking	10.7%	9.9%	-0.8*

Top Three Health Risks by Prevalence in the Population (p. 6)

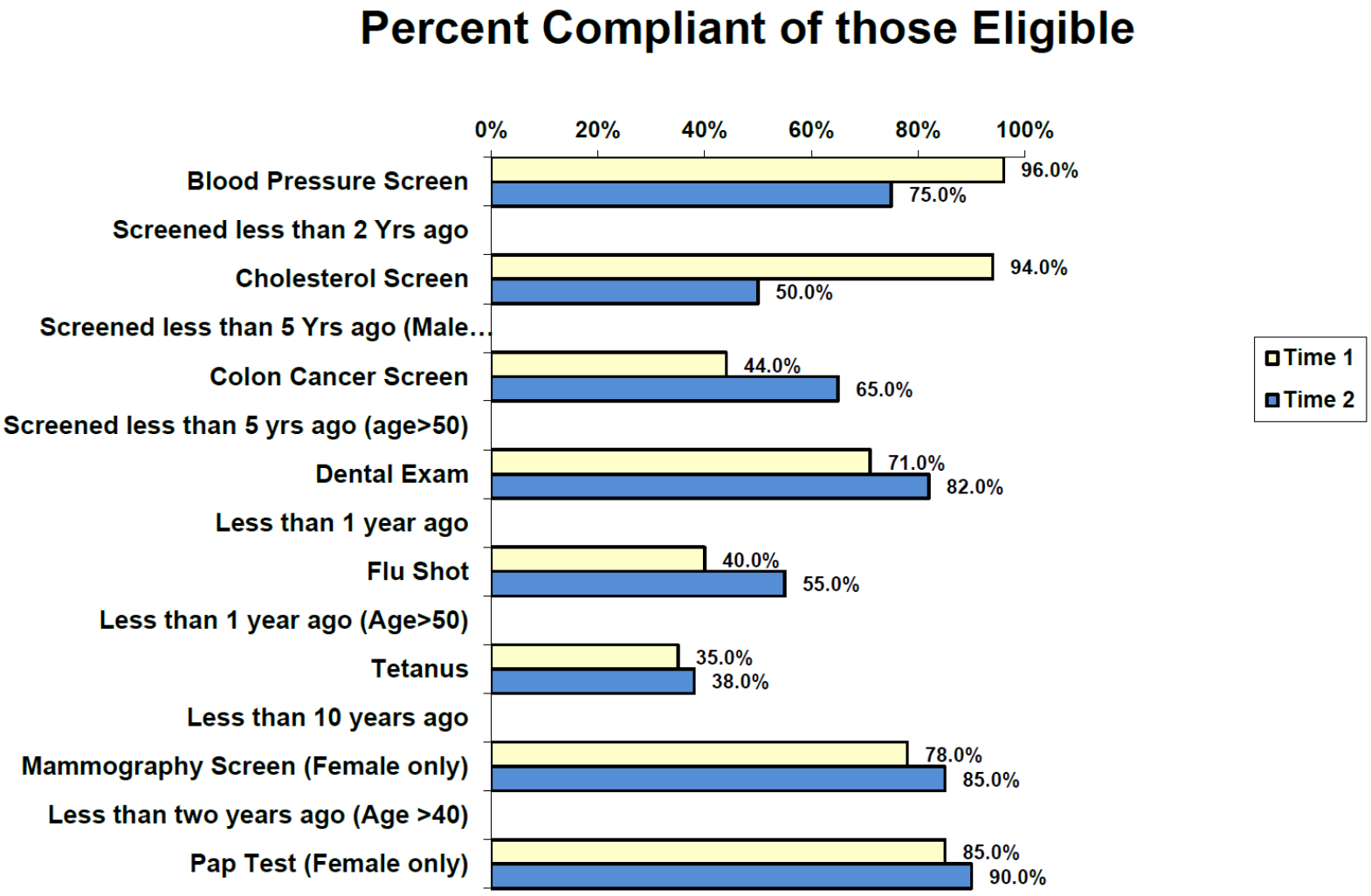
HRA Summary Report-T1T2
Risk Status



Risk Factors

Risk factors can be viewed individually or as components of risk status (low, medium or high). A complete list of the risk factors is found on page 2, along with the risk cuts. Decreasing the number of risks is important, but so is the maintenance of good health and low risk.

HRA Summary Report-T1T2



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Typical Approaches

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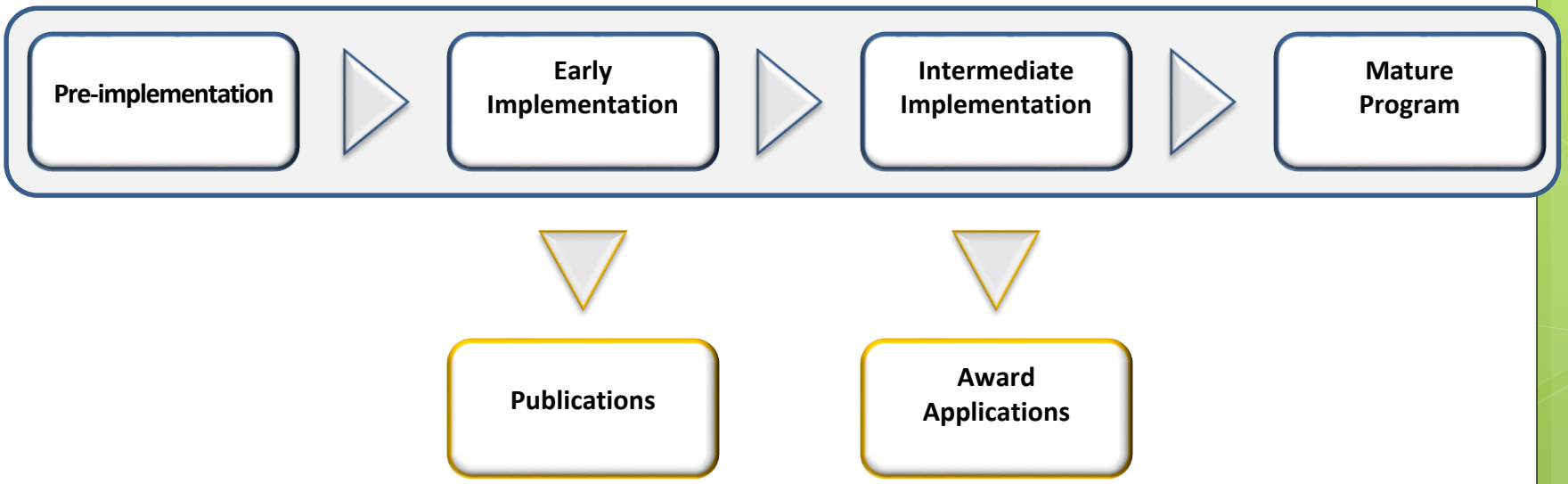
Stages of Program Evolution



Analysis at Different Stages of Evolution

Pre-implementation

- Excess Health Care Costs
- Assessing Factors Associated with Company Health-related Costs

Early Implementation

- Health Risks Associated with Short Term Disability Incidence
- Participation Rate by Location
- Self Reported Health Conditions Associated with On-the-Job Work Loss
- Prevalence and Distribution of Employee Health Risks
- Prevalence and Distribution of Employee Health Risks: Top 3 Prioritized Health Risks
- Early Impact of Program on OSHA Incidence Rates
- Early Impact of Program on Weight

Intermediate Implementation

- Early Indications of Program Impact on Risk Status
- Early Indications of Program Impact on Health Care Costs
- Early Indications of Program Impact on Illness Absenteeism

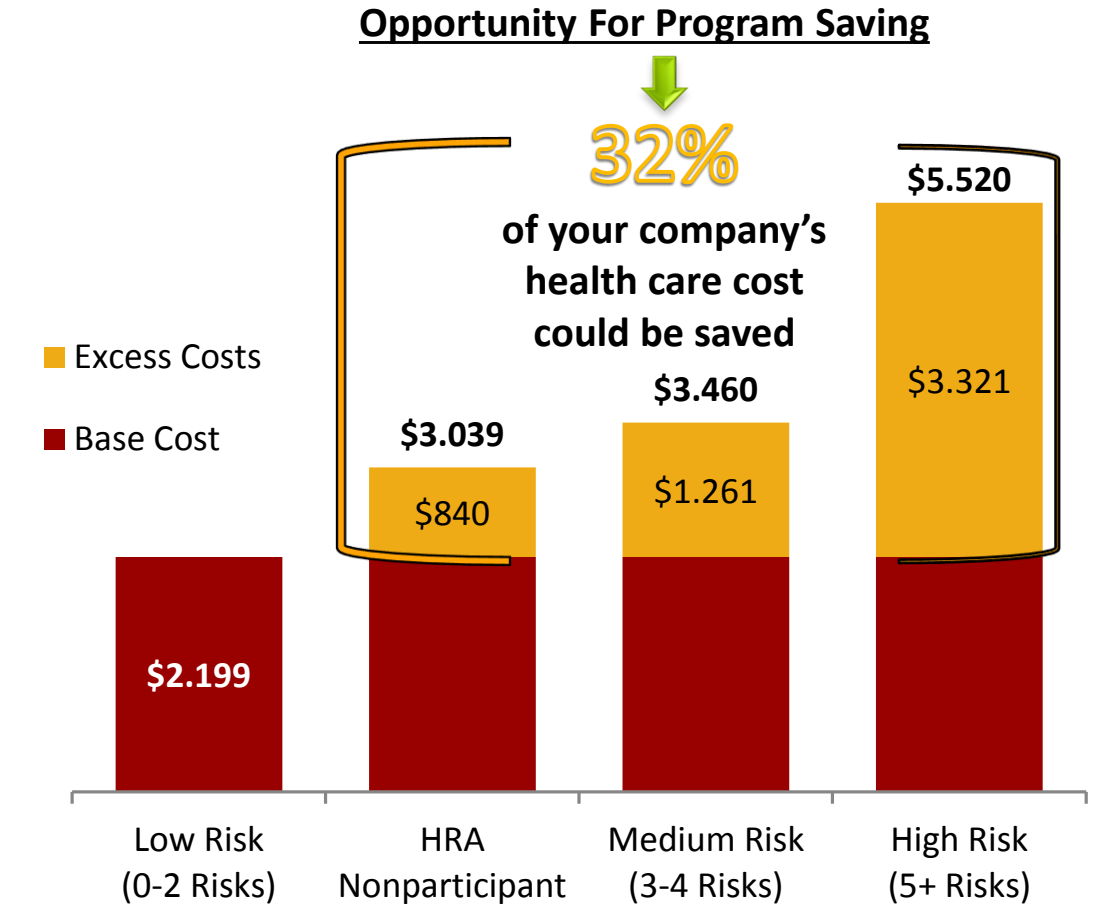
Mature Program

- Return on Investment (ROI)

Custom Studies

Pre-implementation

Excess Health Care Costs



Gain insight into the relationship between your employees' health risks and healthcare costs and how this relationship affects your bottom line.

Percentage of excess costs is a theoretical maximum amount of your company's annual medical costs that could be moderated by controlling excess risks among your employees.

Base cost is the average cost for participants who have low (0-2 risks) risks.

Excess cost is the difference between the base cost of those at low risk and the average costs of those in the medium (3-4 risks) risk group, the high risk (5+ risks) group and the non-participants.

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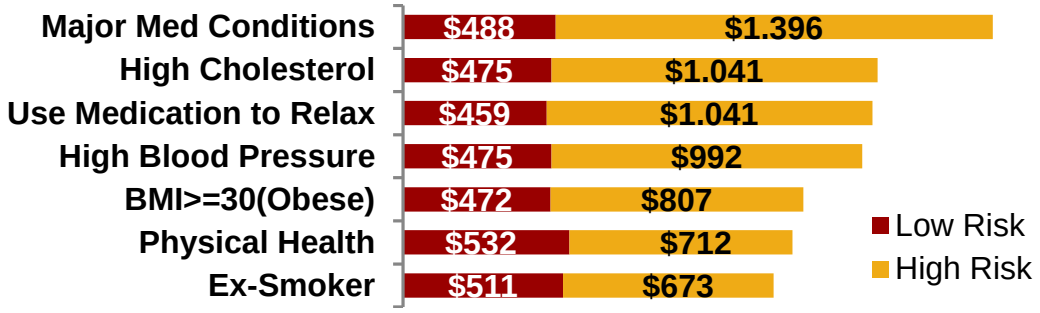
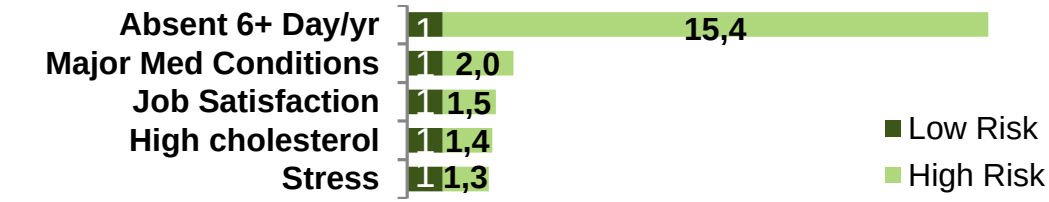
Pre-implementation

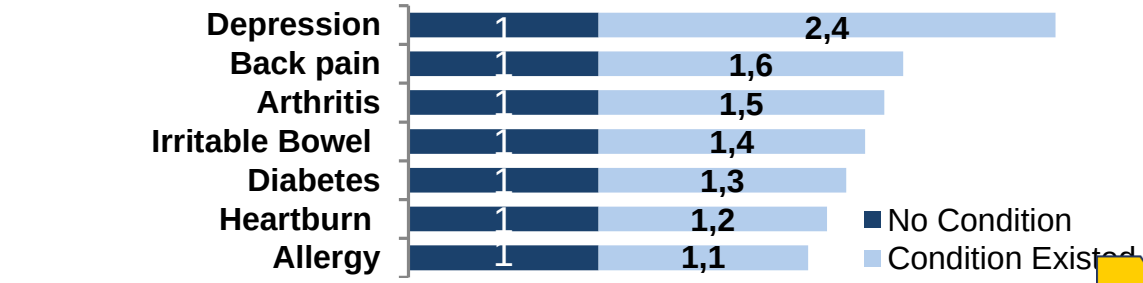
Health risks associated with pharmaceutical costs



Health risks associated (Odds) with STD incidence



Health conditions associated (Odds) with on-the job work loss



Assessing the factors associated with company health-related costs

Multiple regression models are used to identify factors that are associated with the targeted outcome measures, while taking into consideration possible confounding variables (e.g., age, gender, medical plan, employee type, and disease conditions).

Stage of Evolution

Early Implementation

- Health Risks Associated with Short Term Disability Incidence
- Participation Rate by Location
- Self Reported Health Conditions Associated with On-the-Job Work Loss
- Prevalence and Distribution of Employee Health Risks
- Prevalence and Distribution of Employee Health Risks: Top 3 Prioritized Health Risks
- Early Impact of Program on OSHA Incidence Rates
- Early Impact of Program on Weight

Early Implementation

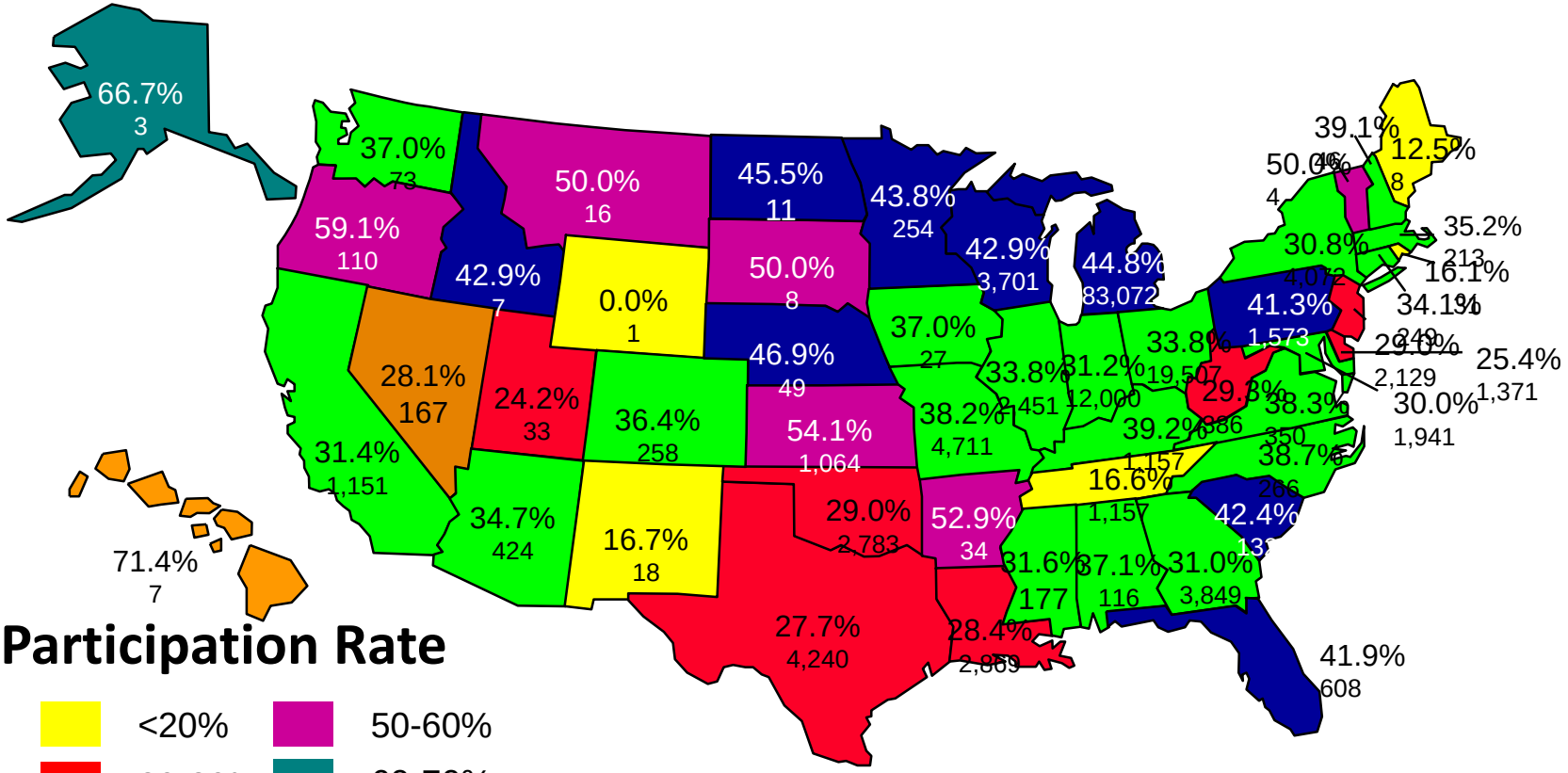
Health Risks Associated with Short Term Disability Incidence

Factors Associated with STD incidence

Health risk factors	Estimated OR	95% LCI	95% UCI
Absence	15.38	12.87	18.39
Medical Conditions	1.98	1.51	2.60
Job satisfaction	1.46	1.30	2.52
High Cholesterol	1.38	0.99	1.92
Stress	1.26	1.02	1.56
Smoking	1.16	0.54	2.47
Safety Belt Use	1.15	0.90	1.46
Perceived Health	1.11	0.80	1.55
BMI	1.09	0.86	1.38
Physical Activity	1.00	0.71	1.40
Drug Use	0.99	0.87	1.23
High BP	0.99	0.81	1.21
Alcohol	0.84	0.46	1.53
Life satisfaction	0.79	0.62	1.01

Early Implementation

Participation Rate by Location



Participation Rate

- <20%
- 20-30%
- 30-40%
- 40-50%
- 50-60%
- 60-70%
- >70%

Overall rate: 39.2%

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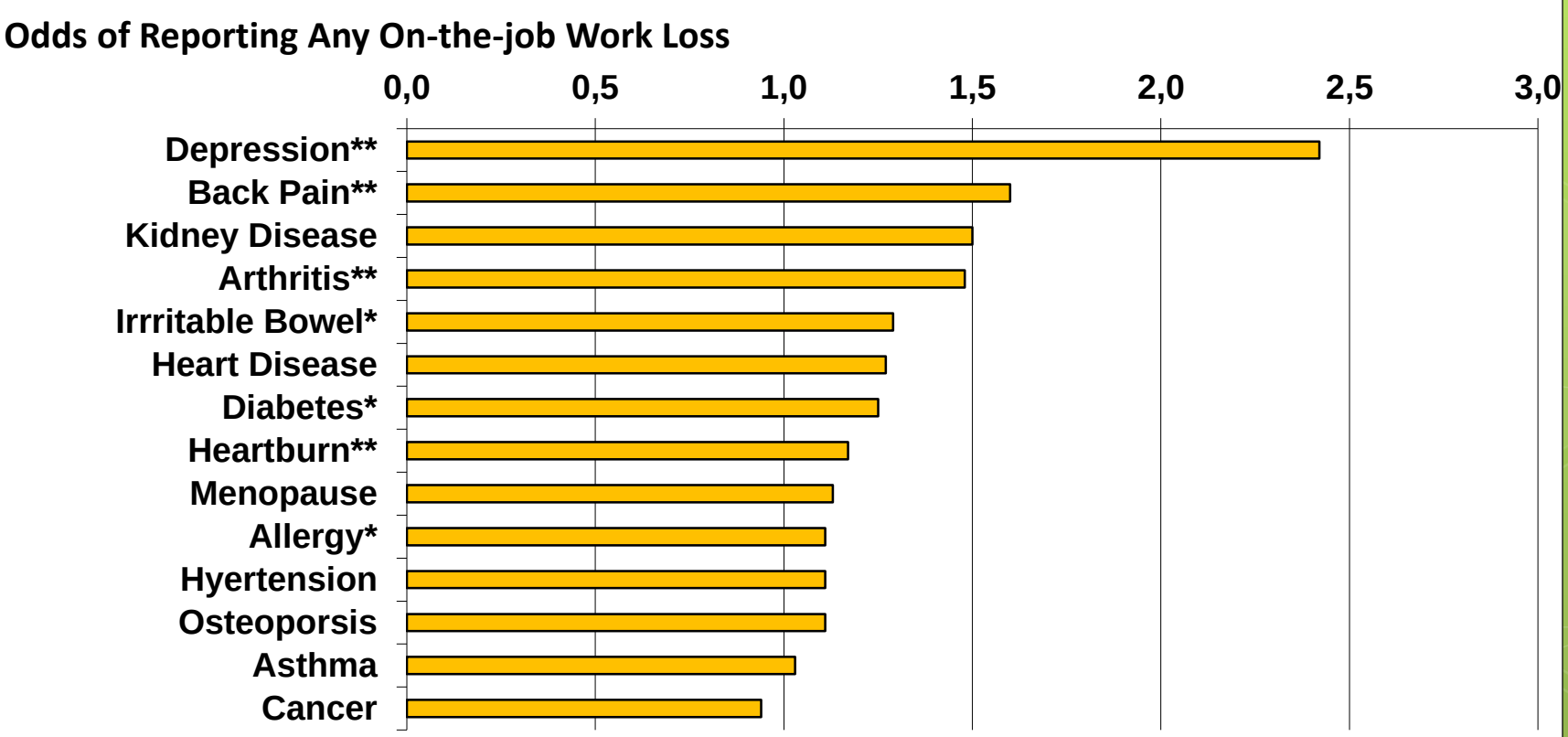
Early Implementation

Self Reported Health Conditions Associated with On-the-Job Work Loss



*P <0.05 **P<0.01 (adjusted for age, gender, and other diseases)

Odds of reporting Any On-the job Work Loss was measured by responses from WLQ-8

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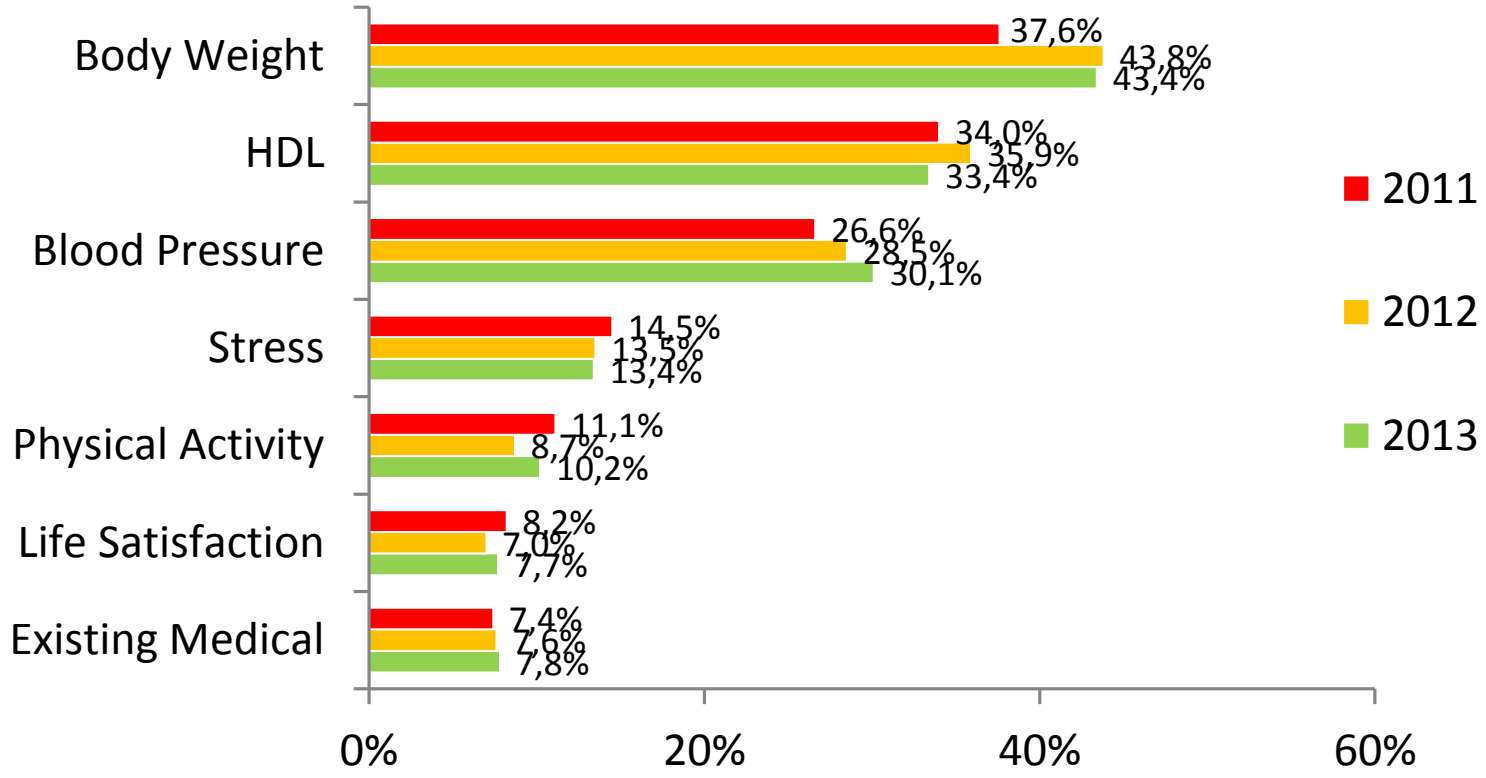
Early Implementation

Prevalence and Distribution of Employee Health Risks



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Early Implementation

Prevalence and Distribution of Employee Health Risks

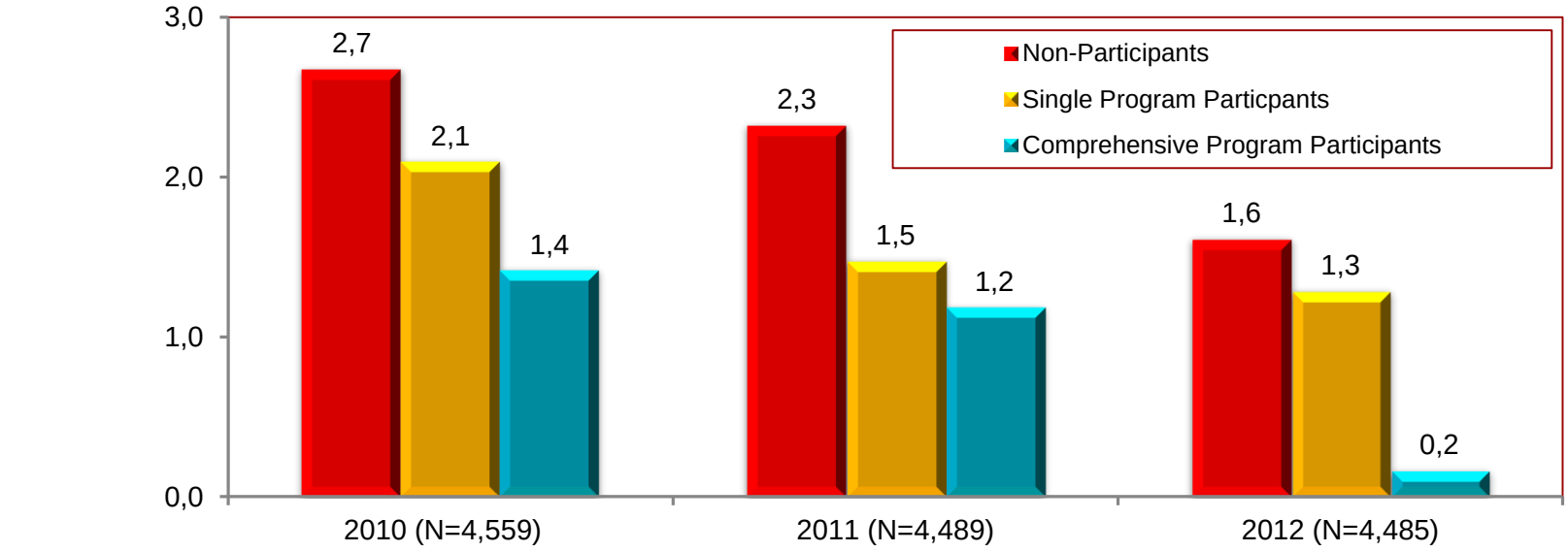
Top 3 Prioritized Health Risks

2011 (n=2,450)	2012 (n=2,670)	2013 (n=2,452)
Body Weight 29.6%	Body Weight 33.6%	Body Weight 32.9%
Blood Pressure 10.4%	Physical Activity 8.5%	Physical Activity 10.2%
Physical Activity 10.0%	Blood Pressure 8.0%	Blood Pressure 8.5%

Early Implementation

Early Impact of Program on OSHA Injury Incidence Rates

Association of OSHA Incidence Rates & Wellness Program Participation



There is an overall reduction in the OSHA incidence rate, when safety and wellness programs jointly promoted. In each year, the more engagement in wellness programs, the lower the incidence rate ($p<.05$).

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Early Implementation

Early Impact of Program on Weight

Relationship between Weight Change and Weight Control Program Participation

	N	2009 Weight	2010 Weight	Adjusted+ Weight Changes
Non-Participants	**365**	**190.4**	**191.9**	**+1.4***
Participants	**1,252**	**182.8**	**182.1**	**-0.6***
Intervention	1198	181.9	181.0	-1.0*
Weight Watch 10 wk	36	207.7	201.0	-4.2*
Weight Watch 17 Wk	100	202.2	197.6	-3.2*
Weight Healthy Credit	674	159.8	159.0	-0.8*
Weight lost challenge	942	188.7	187.1	-1.6*
Education	**535**	**186.7**	**185.3**	**-0.4**
Educational module	**289**	**184.2**	**183.1**	**-0.4**
Seminar	**347**	**186.3**	**184.0**	**-1.3**
One Program	744	190.5	190.9	+0.2
Two Program	471	168.5	166.2	-2.3*
Three Program	28	197.0	190.1	-6.9*
Four or More Program	9	177.3	165.9	-11.4*

+Adjust for age, gender, weight/nutrition programs and fitness program participation

* Significant at p=0.05

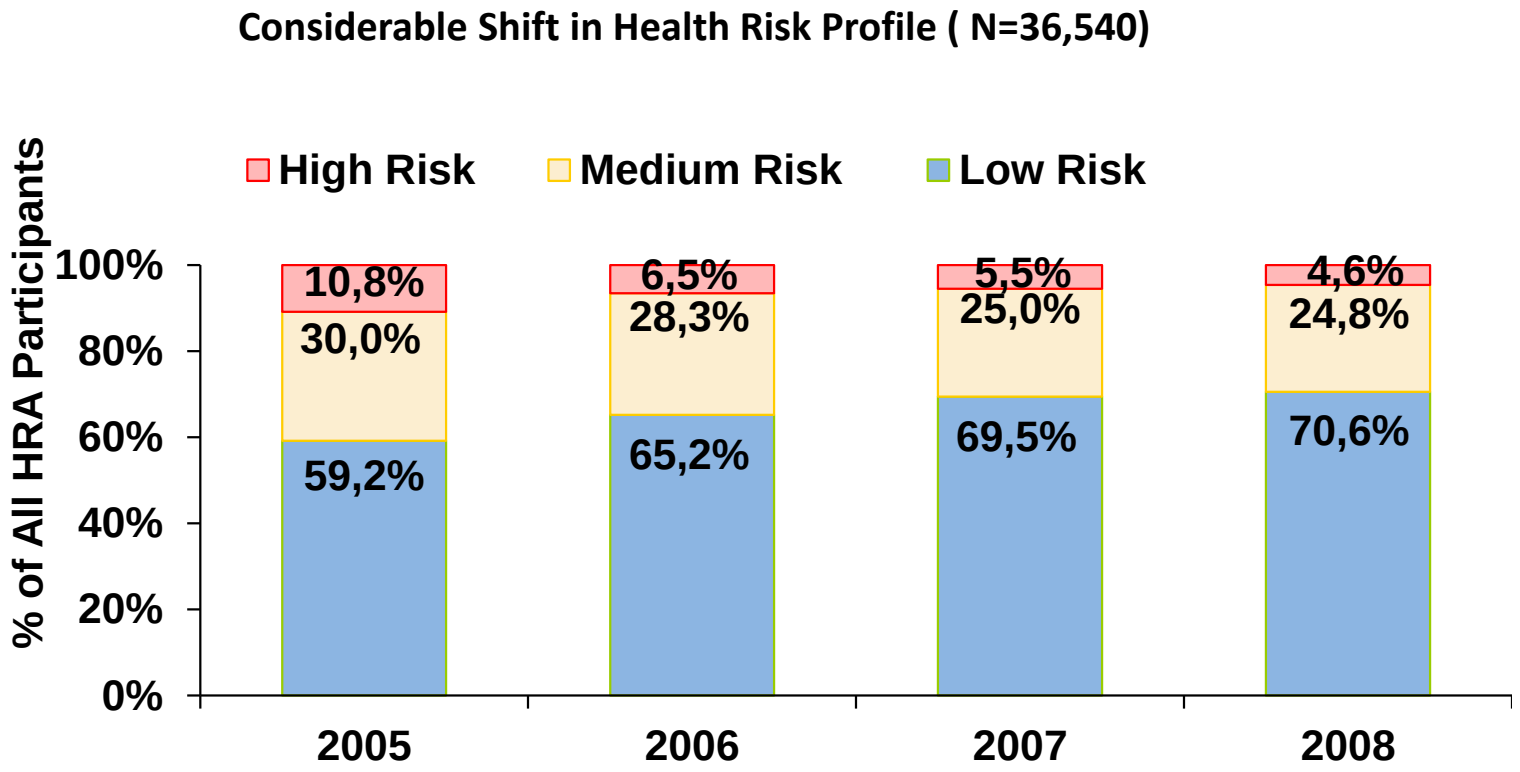
Stage of Evolution

Intermediate Implementation

- Early Indications of Program Impact on Risk Status
- Early Indications of Program Impact on Health Care Costs
- Early Indications of Program Impact on Illness Absenteeism

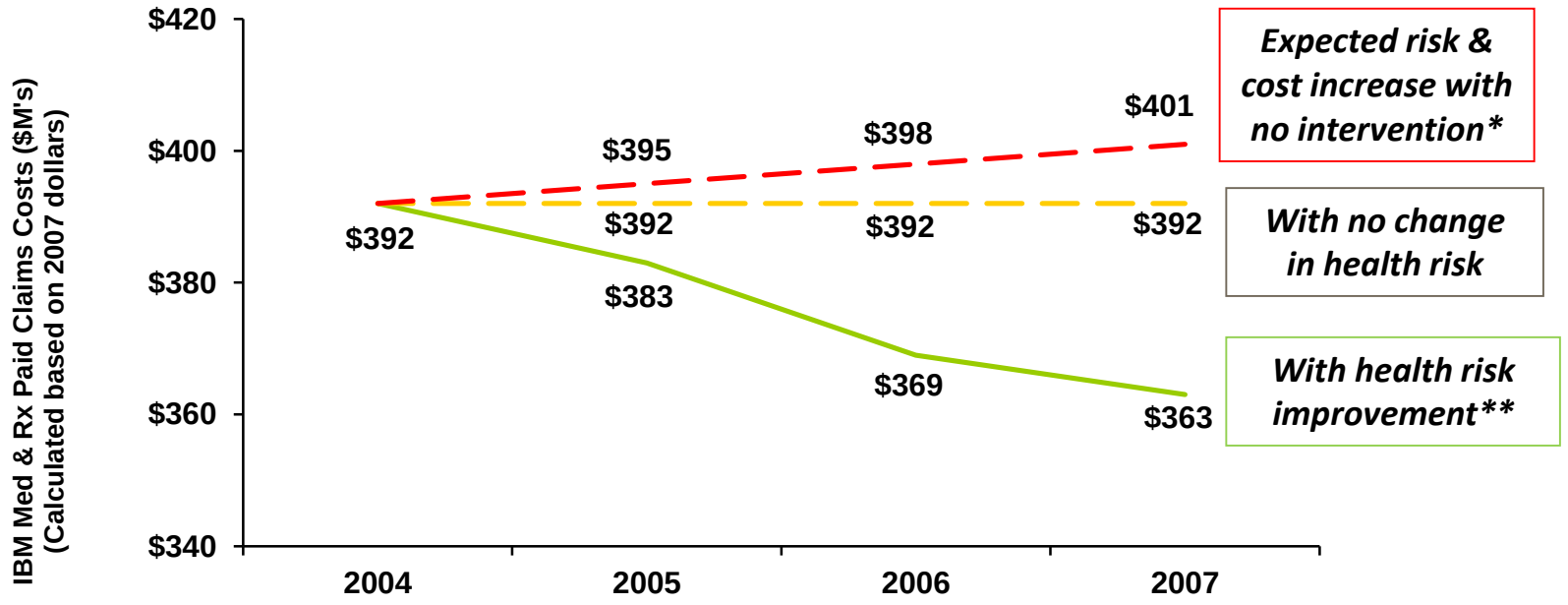
Intermediate Implementation

Early Indications of Program Impact on Risk Status



Intermediate Implementation

Early Indications of Program Impact on Health Care Costs



	2005	2006	2007	3 Year Totals
Savings between risk improvement & no risk change	$9M	$23M	$29M	***$61M Total***
Savings between risk improvement & expected risk increase	$12M	$29M	$38M	***$79M Total***

*Based on Edington, American Journal of Health Promotion. 15(5):341-349, 2001

**2007 dollars applied to 2004-2007 health risk profiles

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Intermediate Implementation

Early Indications of Program Impact on Illness Absenteeism

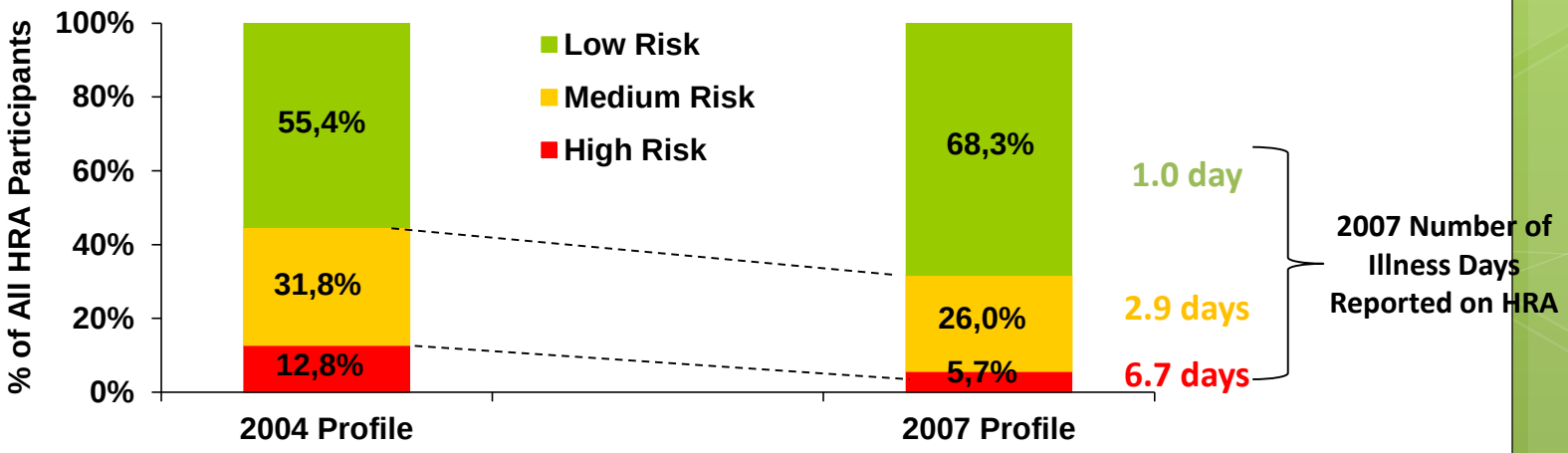
*What absenteeism **would have been** in 2007 with no health risk improvement*

Actual absenteeism

Avg 2.3 days lost per year*

0.5 day difference

Avg 1.8 days lost per year



*2.3 days lost = 2007 reported absenteeism applied to 2004 health risk profile

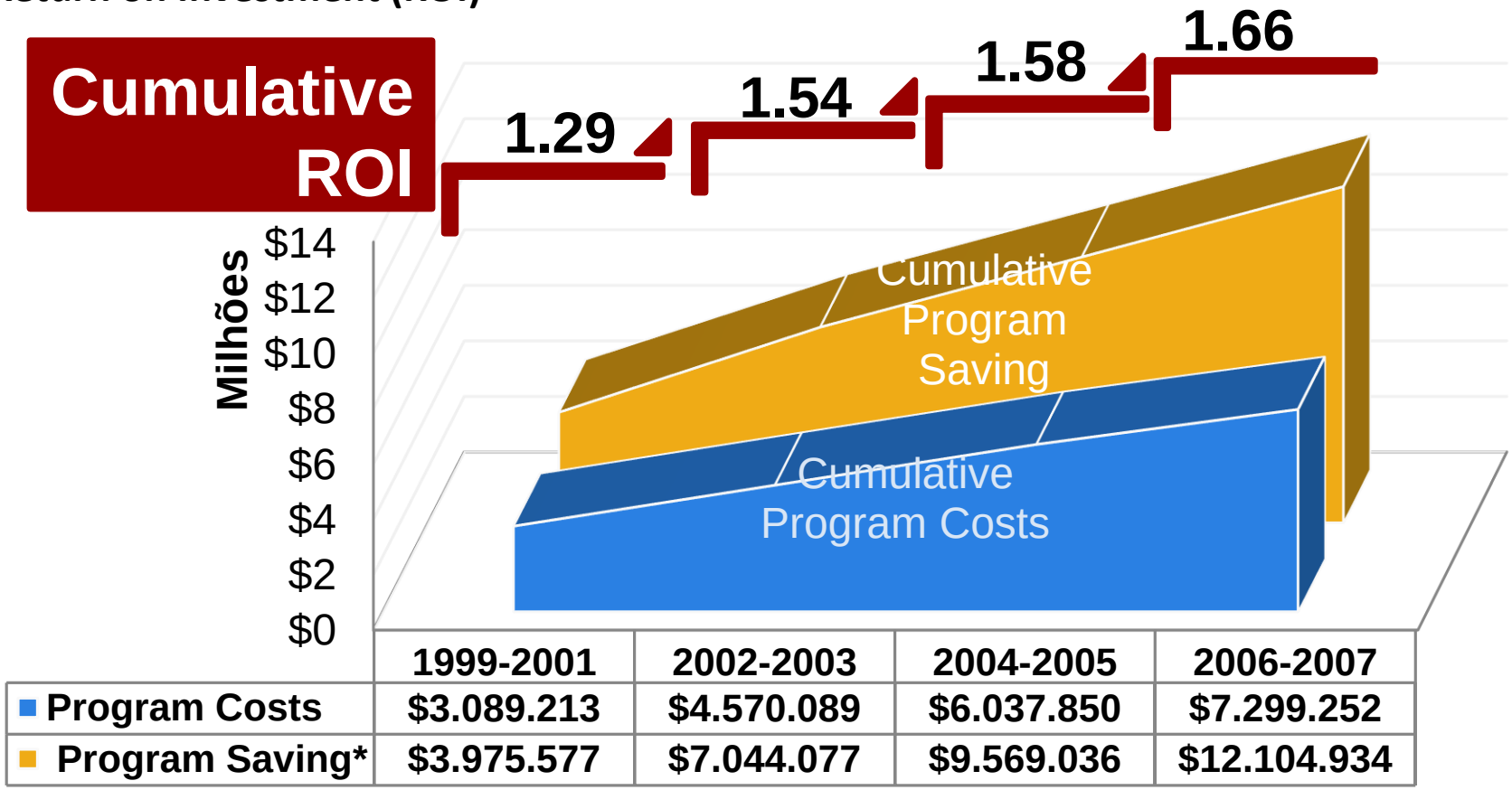
Stage of Evolution

Mature Program

- Return on Investment (ROI)

Mature Program

Return on Investment (ROI)



	1999-2001	2002-2003	2004-2005	2006-2007
Program Costs	$3.089.213	$4.570.089	$6.037.850	$7.299.252
Program Saving*	$3.975.577	$7.044.077	$9.569.036	$12.104.934

**Saving from Medical/pharmacy and productivity*

Source: Yen L, Schultz AB, Schaefer C, Bloomberg S, Edington DW. Long-term return on investment of an employee health enhancement program at a Midwest utility company from 1999 to 2007. *International Journal of Workplace Health Management* 2010; 3(2): 79-96

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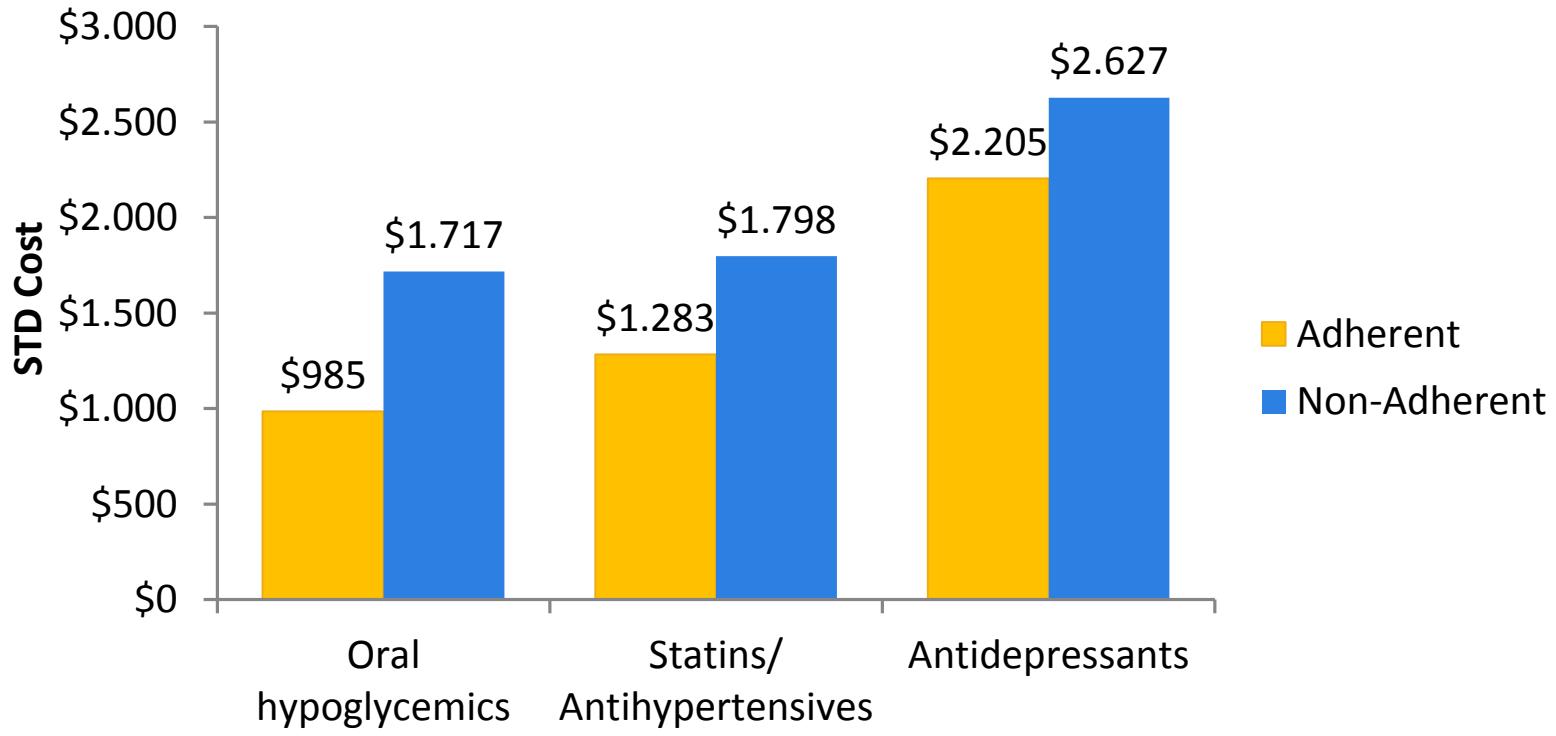
Stage of Evolution

Custom Studies

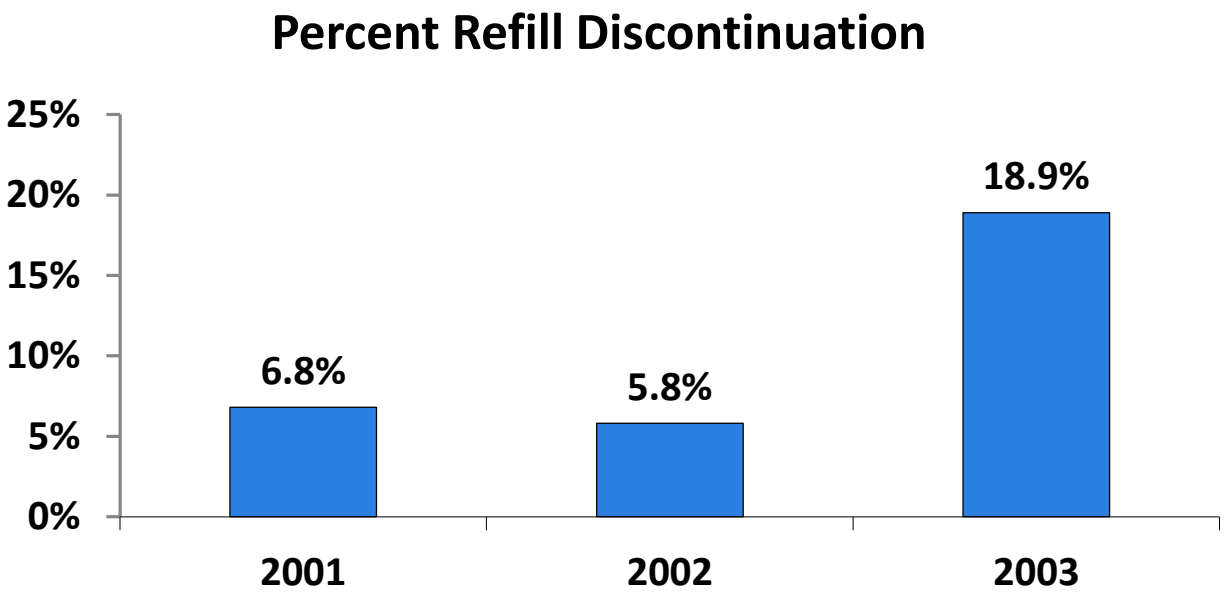
Custom Studies

Drug Adherence is Associated with Lower Short Term Disability Cost



Custom Studies

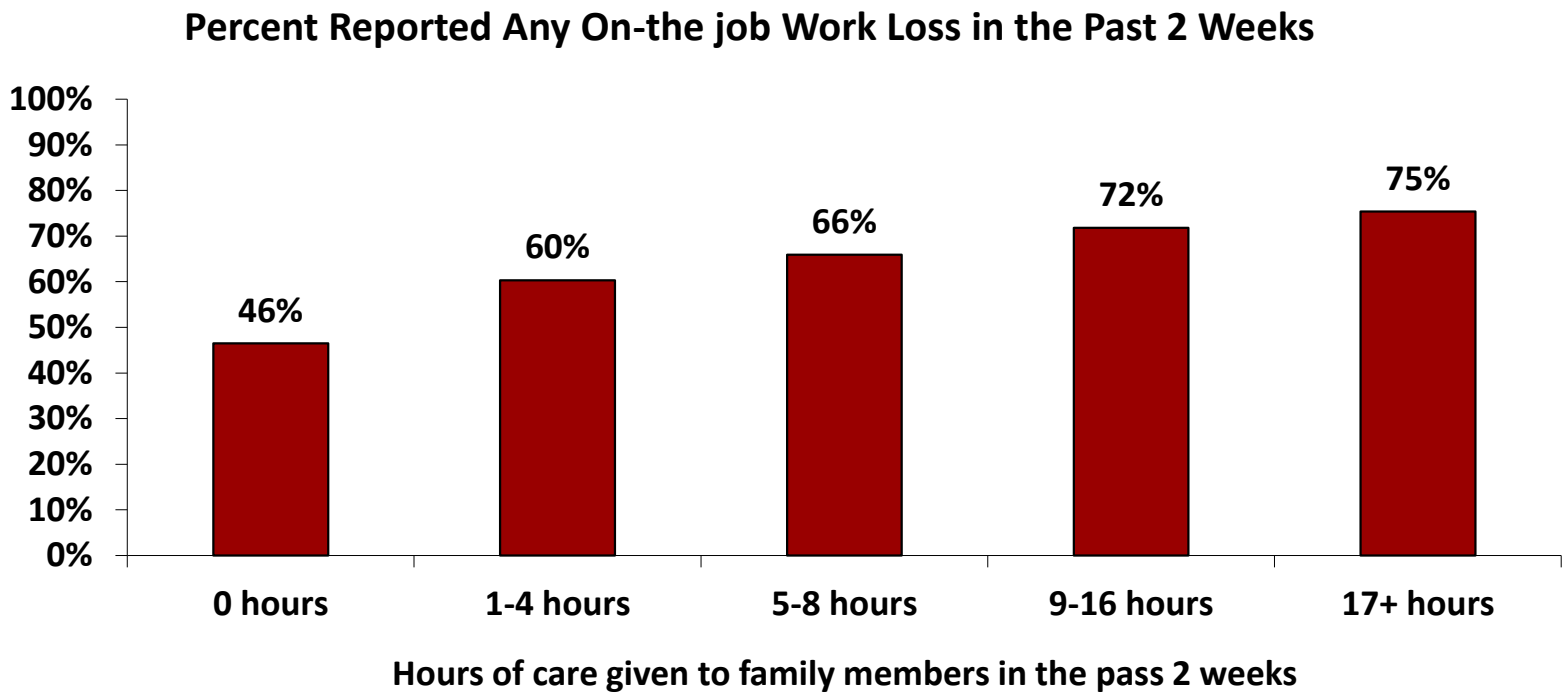
Pharmacy Benefits Changed Pharmacy Utilization Among Diabetic Employees
- more of them discontinued their medication



- In 2003, pharmacy benefit plan changed from 2-tier formulary to 3-tier formulary.
- Diabetic medication discontinuation rate among employees with existing diabetes increased after benefit plan changed.

Custom Studies

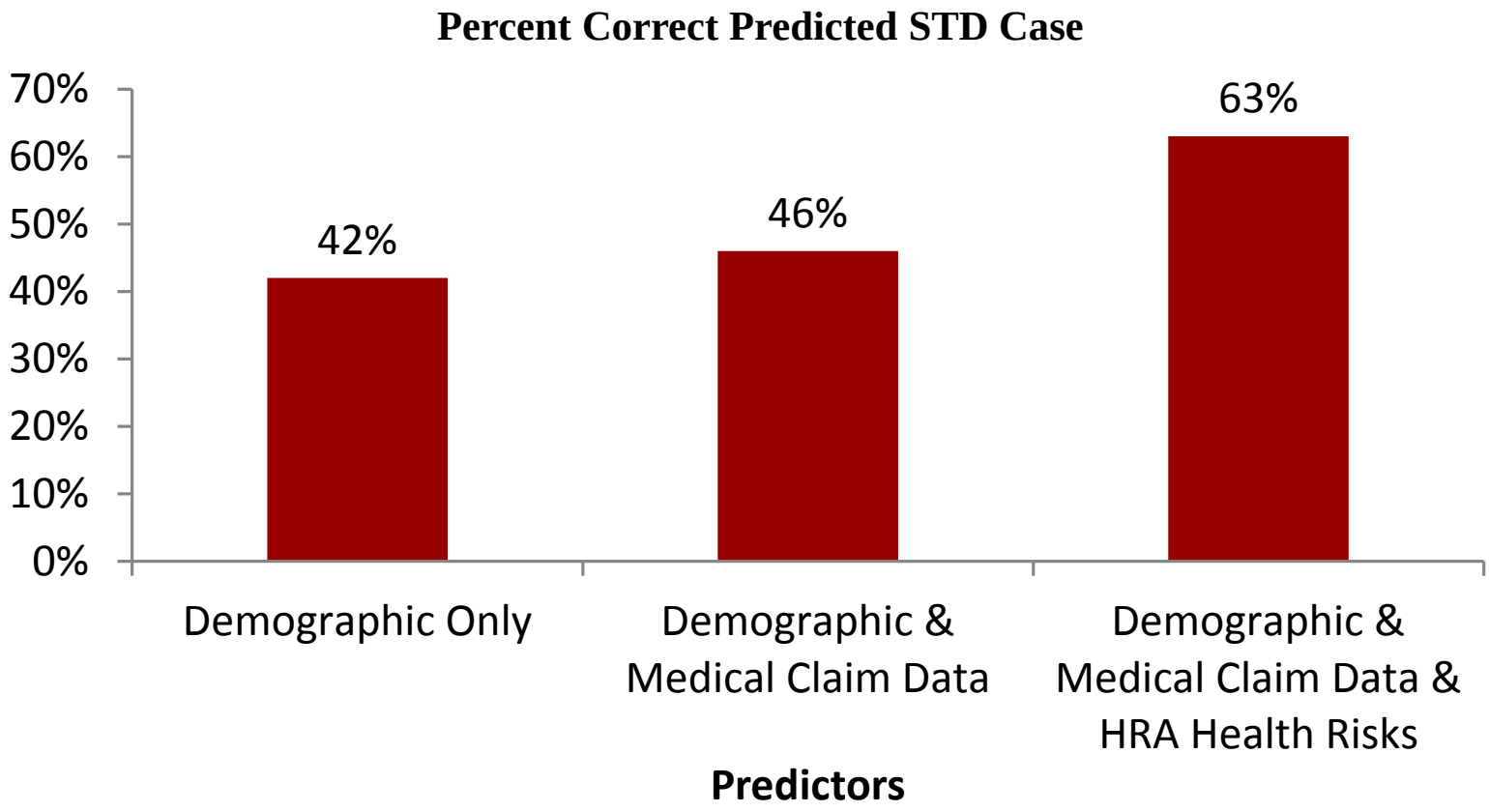
Family Care Giving Hours Associated with On-the-Job Work Loss



- Time period of work and care-giving were based on the same past 2 weeks.
- Any on-the-job work loss was measured by responses from WLQ-8.

Custom Studies

Health Risks (HRA) Improve the Prediction of STD Cases



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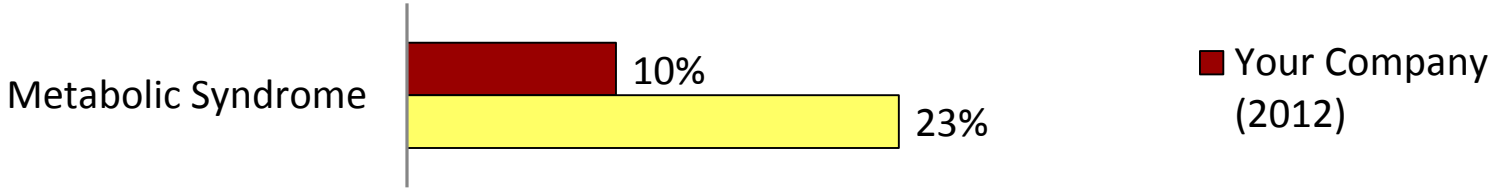
Custom Studies

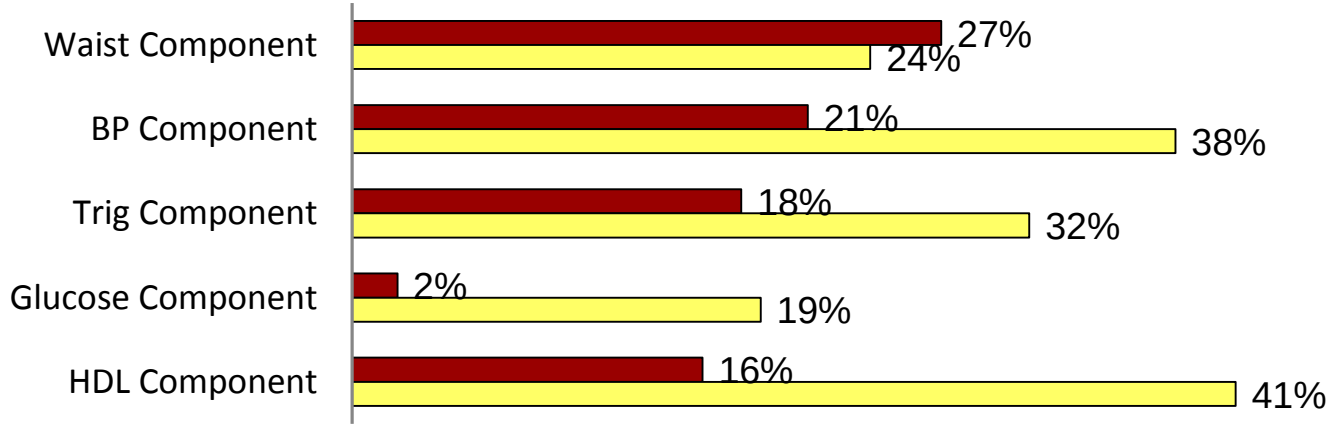
Prevalence of Metabolic Syndrome Risks

- Low metabolic syndrome prevalence (10%) compare to benchmark
- Body weight (waist component) as areas of focus

Metabolic Syndrome Prevalence



Prevalence of Metabolic Syndrome Risk Factors



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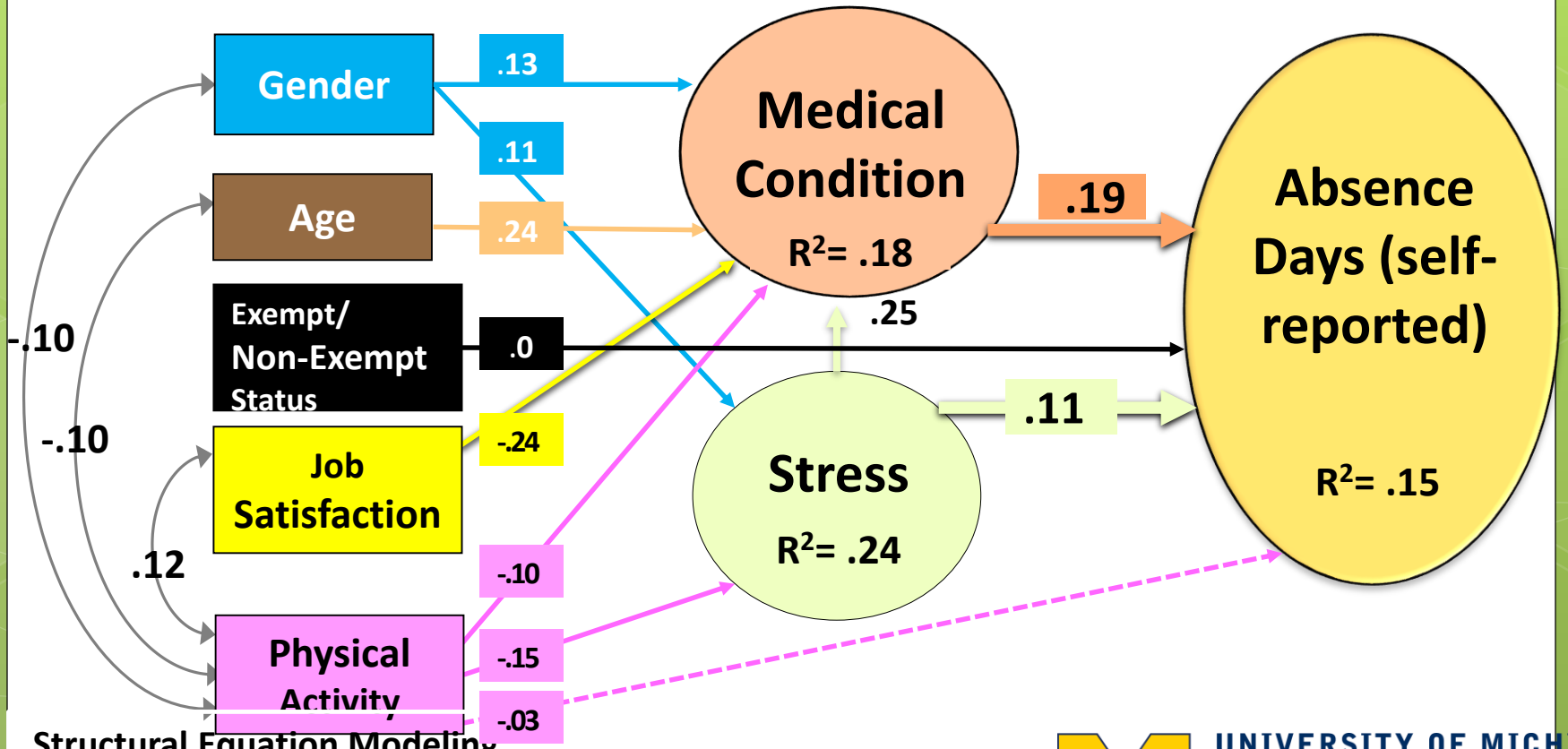
Custom Studies

Health Risks Associated with Illness Absence Days

- Stress and medical conditions direct determinants of absence days
- Practice of evaluating programs according to decreased absenteeism. Improved health or decreased stress may be more appropriate.



Structural Equation Modeling

Chi sq: 16, GFI: 0.96, CFI:0.999 (near 1), RMSEA: 0.04 (<0.05)

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Different Strategy for Each Organization

- Level of precision and accuracy required for your audience
- Access to detailed data
- Funding available

Thank You