CPH-NEW
Center for the Promotion of Health in the New England Workplace

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Integrated health programs, health outcomes and ROI: *measuring WHP and integrated program effectiveness*

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The Case for the Effectiveness of Worksite Health Promotion

- Absenteeism -- ↓ 30.0% (22.3--38.4 %)
- Group Health Costs --↓ 21.8% (12.7– 31.0%)

Chapman L.S. Meta evaluation of worksite health promotion economic return studies. The Art of Health Promotion 2003; 6(6):1-16.

Chapman L.S. Meta evaluation of worksite health promotion economic return studies: 2005 update. The Art of Health Promotion2005: 19:1-15

Chapman L.S. Meta evaluation of worksite health promotion economic return studies:2012 update. The Art of Health Promotion 2012;26:1-12

Statement of the Dilemma

If American enterprise prizes early adaptation and efficiencies from maximized labor time and minimized labor costs, why has WHP failed to transform the business landscape ?

Some Plausible Explanations:

1. slow adoption due to limited dissemination of information, including translation of observations in to programs
2. distractedness of early adapters in a time of economic contraction
3. the long perspective required for return on investment (ROI) in the mediation of chronic disease
4. underdeveloped chronologically concise performance metrics, in contrast to more customary measures of output {monetizing self-assessment when outputs are complex}

1) Reanalysis of the methods and outcomes estimations of major national studies that form a basis for the positive ROI argument

2) Analysis of the effect of WHP and integrated programs on productivity

3) Brief consideration of ROI in incentive allocation

Studies Showing High Rate of Return for WHP Programs

Authors	Population	Intervention	HC Costs	Ann Svg pp^{y-1}	ROI
Lahiri and Faghri 2012	*Hotel Workers*	*Participatory*	*2*	*$719*	*NC*
Mennan et al 2010	*Consumer products*	*On site intstituional*	*1 NS*	*0*	*NC*
Aldana et al 2005	pharmaceutics	Electronic media	3 NS	$214	15.6:1
Dalton and Harris 1991	Insurance corporate offices	Direct services Integrated multi-level	2	ND	7:1
Fries and Mcshane 1998	National brewery	HealthTrack cognitive	3	$87	6:1
Golazewski et al 1992	Telecommunications company	HRA and site specific activities/wellness centers	1	$200	3.4:1
Hall-Barrow et al. 2001	Bank employees citibank	Staff model and educational	4	$50	8:1
Harvey et al 1993	National insurance company	Staff model interventions	3	$207	19:4
Heintze et al 1992	Municipal workers	LIFECHECK and wellness center	2	ND	10:1
Mills et al 2007	School employees	HRA, portal and classes	2	$1,490	6.19:1
Ozminkowski et al 1999	General employed	HealthTrack cognitive	1	$143	4,64:1
Stave et al 2003	Hospital workers	Stagesof change contract	3	$313	6:1
Ozminkowski et al 1999	General employed	HealthTrack cognitive	1	$143	464:1
Shephard et al 1982	Insurance corporate offices	On site fitness program	1	$52♂	4.85:1
Shephard 1992	Hotel Workers	Onsite fitness/cognitive programs	3	$340	--

HCC
1. Econometric Projection
2. No calculation
3. Utilization
4. Surrogacy

Methods Used for Reanalysis

1. For group health costs, the type of measure (direct costs, estimated costs, econometric projections) were included
2. Where long-term health care cost and utilization information was available on a non-intervention comparable population, savings trends were corrected for secular trends
3. Populations were redefined to coincide with the specific target groups for the intervention used to calculate ROI
4. Calculations of ROI that were purely estimates and not directly derived from data were excluded.

Variables used in ROI calculations

Variable Name	Variable Description
Population	Characterization of the workforce by site and industry
Design	Key Characteristics: onsite or off-site, cognitive or practice driven, national HRA or instrument or locally designed
Goal	A priori single or multiple expected outcomes
Number	Number of workers participating
Duration	Length of the intervention
Absenteeism	Whether measured or included as an outcome
Productivity Measure	Whether and how productivity was included as an outcome measure
Medical Cost Reduction	Whether and how group health costs were assessed
Costs Annualized per person	Annualized WHP per person costs in the target population
Productivity Savings	Estimated monetization of productivity savings where calculated
Avoided Costs	Health and productivity costs that were reduced during the intervention
Savings per person annualized	Calculable net costs on a person person basis
ROI (Am J Hlth Prom)	The reported ROI in the Chapman reviews
ROI (recalc)	Recalculated ROI based on revisions explained in this text

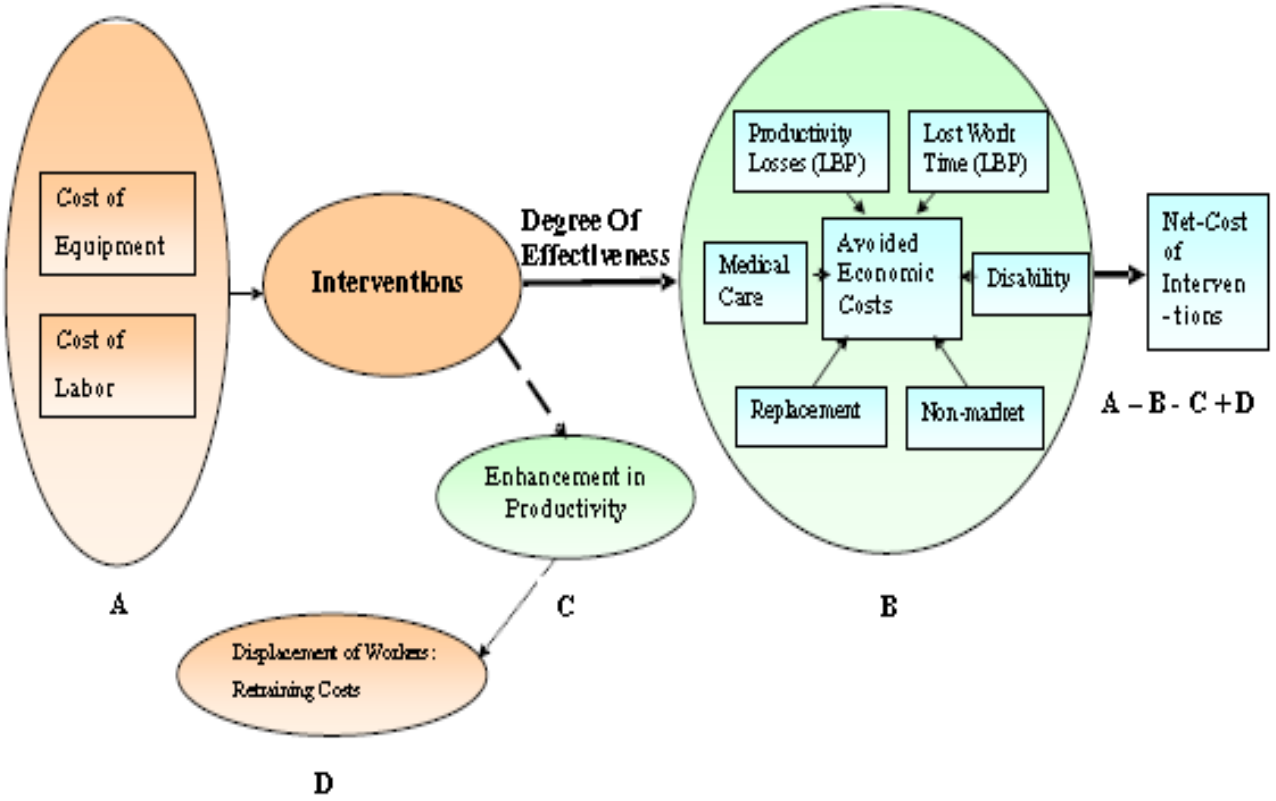
Variability in ROI

Author	Program Type	Annualized Costs	PP Annualized Cost	Annualized Savings/pp	ROI (Chapman)	Recalculated ROI
Harvey et al 1993	Staff model interventions	$600,000	$150	$207	19.4	1.5
Aldana et al 2005	Electronic media	<$100,OOO	$42	$214	15.6	5
Heintze et al 1992	LIFECHECK &wellness center	$42,678	$60	ND	10.0	ND
Hall-Barrow et al. 2001	Staff model &educational	$102,000	$34	$50	8	1.4-8.0
Dalton and Harris 1991	Direct services Integrated and multi-level	ND		ND	7.0	ND
Mills et al 2007	HRA, portal and classes	$85,300	$138	$1,490	6.19	1.9
Fries and Mcshane 1998	HealthTrack cognitive	$1,500,000	$30	$87	6.0	2.9
Stave et al 2003	Stagesof change contract	~127,500	$100	$313	6.0	2.6
Shephard et al 1982	On site fitness program	ND		$52♂	4.85	6.85
Ozminkowski et al 1999	HealthTrack cognitive	$590,000	$53	$143	4.64	3.7

Parameters that Influence Inference in ROI Estimations

1. Cost utility vs. fully monetized ROI
2. Program implications of low per person estimates of cost
3. Congruence between monetized outcomes and health outcomes
4. Estimating costs of integrated programs in large organizations

Net Cost Model for WHP



Net-cost model for weight loss in the nursing home sector (Lahiri and Faghri,2012)				
	Avg Subject Cost	Avg wgt loss lbs	ROI (productivity and absenteeism)	ROI (absenteeism only)
Incentivized Group n=51	**$129**	**7.3**	**6.5**	**0.2**
Non-Incentivized Group n-48	**$ 97**	**2.1**	**6.6**	**0.6**

Incentivized Weight Loss Programs					
Authors	Occupation	Maximum	duration	Weight loss lbs incentivized	Weight loss lbs no incentive
Lahiri and Faghri 2012	Nursing home	$420	28 weeks	7.3	2.1
Volpp et al 2008	VA staff	$252(monthly)	16 weeks	14.0	13.1
Jeffrey et al 1983	General population	$630*	52 weeks	13.8	11.8
Jeffrey et al 1998	General population	$491	78 weeks	7.6	5.1
Forster et al 1985	University staff	$120 (monthly)*	26 weeks	12.2	NA

**adj 2008$*

Estimating cost effectiveness of cognitive interventions

Authors	Population	Design	#	Yrs	Productivity Measure	Medical cost↓	Cost/pp/ annualize	Productivity savings	SVGS/pp/ annualized	ROI AJHP	RO1 revised	Incent $100
Aldana et al 2005	School employees	Electronic media	1407	5	ND	3 NS	$42	ND	$214	15.6	5.0	2.5
Fries and Mcshane 1998	General employed	Health Track cognitive	50,576	1	ND	3	$30	ND	$87	6.1	2.9	0.7
Ozminkowski et al 1999	Bank employees	Health Track cognitive	11,194	~3	ND	1	$53	ND	$143	4.6	3.7	1.3
Mills et al 2007	Consumer products	HRA, portal and classes	618	1	Self- report	2	$138	91%	$1,490	6.2	1.9	1.1

1. **Not calculated**
2. **Econometric projection from reduced risk factors**
3. **Group health utilization, estimated**

Approaches to Productivity Measurement in ROI Calculations

Category of Variables	Contents
• Generalizable passively accounted consensus measures	• Lost work time • Worker's compensation claims • Sick days • Absenteeism
• Directed semi-quantitative measures	• Diagnosis specific lost work-time • Self assessed job satisfaction • Self assessed work performance • Self-assessed health status • Self-assessed work capacity/workability • Quality of work life (QWL) surveys
• Health Risk Assessments (HRAs)	• Risk profiling • Risk reduction monetization

Comparison of WLQ and Other Scales			
WLQ reduced questions (Lerner et al 2003)	**Equivalent or Similar Questions**		
	Scale 1	**Scale 2**	**Scale 3**
See your work or read clearly	NHIS [1]		
Hear clearly what other people are saying	NHIS [1]	4th Eur SurveyWork Conditions[2]	
Adjust to pace changes	WAI[3]		
Keep track of more than one task	Performance Scale[4]		
Remain alert	Performance Scale[4]		
Concentrate on work	Performance Scale [4]	Work Stress[5]	JCQ[6]
Control temper	Work Stress[5]		

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2. Parent-Thirion, Agnès, Enrique Fernández Macías, John Hurley, and G. Vermeylen. "Fourth European survey on working conditions 2005." Luxembourg: Office for Official Publications of the European Communities (2007).
3. Ilmarinen J, Tuomi K, Eskelinen L, Nygard CH et al. Background and objectives of the Finnish research project on aging workers in municipal occupations. Scand J Work, Environ Hlth 1991; 17 (S1): 7-11).
4. Schoorman RD, Meyer RC. The value of common perspectives in self-reported appraisal: You get what you ask for. Org Res Methods 2008; 11:148-159.
5. Stanton JM, Balzer WK, Smith PC, Parra LF, Irnson G. A General measure of work stress: The Stress in General scale. Educ Psychol Meas 2001; 61: 866-888.
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Contributions to ROI in studies using productivity estimators					
Study Identification	**Productivity Measure**	**Calculation**	**Result**	**Net Effect**	**Effect on ROI**
Meenan et al 2010	Self report	Presenteeism+Absenteeism	Presenteeism ↓ Y2 Y1 ± ↑	No net effect	No effect
Lahirir et al 2012	Self-report	Productivity+Absenteeism	Productivity 80% of avoided cost	↑↑	80% of effect based on productivity
Mills 2007	Observed absenteeism Self-report Productivity	Productivity+Absenteeism	↓0.36 days lost ↑10.4% productivity	↑↑	72% of effect based on productivity
Golazewski 1992	Productivity based on literature	Sensitivity @ 4% productivity gain (std), 0% and 25%	ROI 4.0 @ 4% ROI 1.4 @ 0 % ROI 14 @ 25%	↑↑	65% of ROI based on productivity

Barriers to Integration that may Elude Cost Attributions

INTERVENTION	SUPERFICIAL STRUCTURE	DEEP STRUCTURE
HRAs and Workforce Surveys	Questionnaire translated and at reading level	Privacy of all health information and benefit neutrality
Time Allocation	Meetings and surveys at convenient times	Separation of work life and personal life; time flexibility
Compensation Differentials	Compensation for participation	Disparities in pay and labor grades
Identifying Champions and Line Worker Leaders	Employee and management representatives who are mutually respected	Disparities in authority over decision making and budgeting
Effecting Individual Health and Organizational Change	Recognition of differing perceptions of attributable risk from workplace and non-workplace factors	Cultural, class and professional differences between employees and managers
Integration and Pariticpation	Participatory Health and Safety; Group meetings	Process for decision making for health promotion investment
Changing the Benefit Structure	Food offerings, incentivized deductible plans	Income and Security Guarantees, Non-discrimination

Some Methodological Considerations

- Productivity measures in the service sector are difficult to monetize
- Productivity in the commodities sector is technology and staffing driven
- It is premature to monetize comparative effectiveness, unless restricted to semi-quantitative measures
- Absenteeism has different economic translations in different sectors
- High return that depends on low per person cost is principally influenced by investment, not outcome
- Benchmark studies on large corporations are generally workplace agnostic or atheist
- Integrated programs require multiple cost-benefit analyses
- Cross-workplace comparisons should be sector specific