

Good Health is Good Business - the Return on Investment of Worksite Health Promotion

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Content of the presentation

Economic evaluations

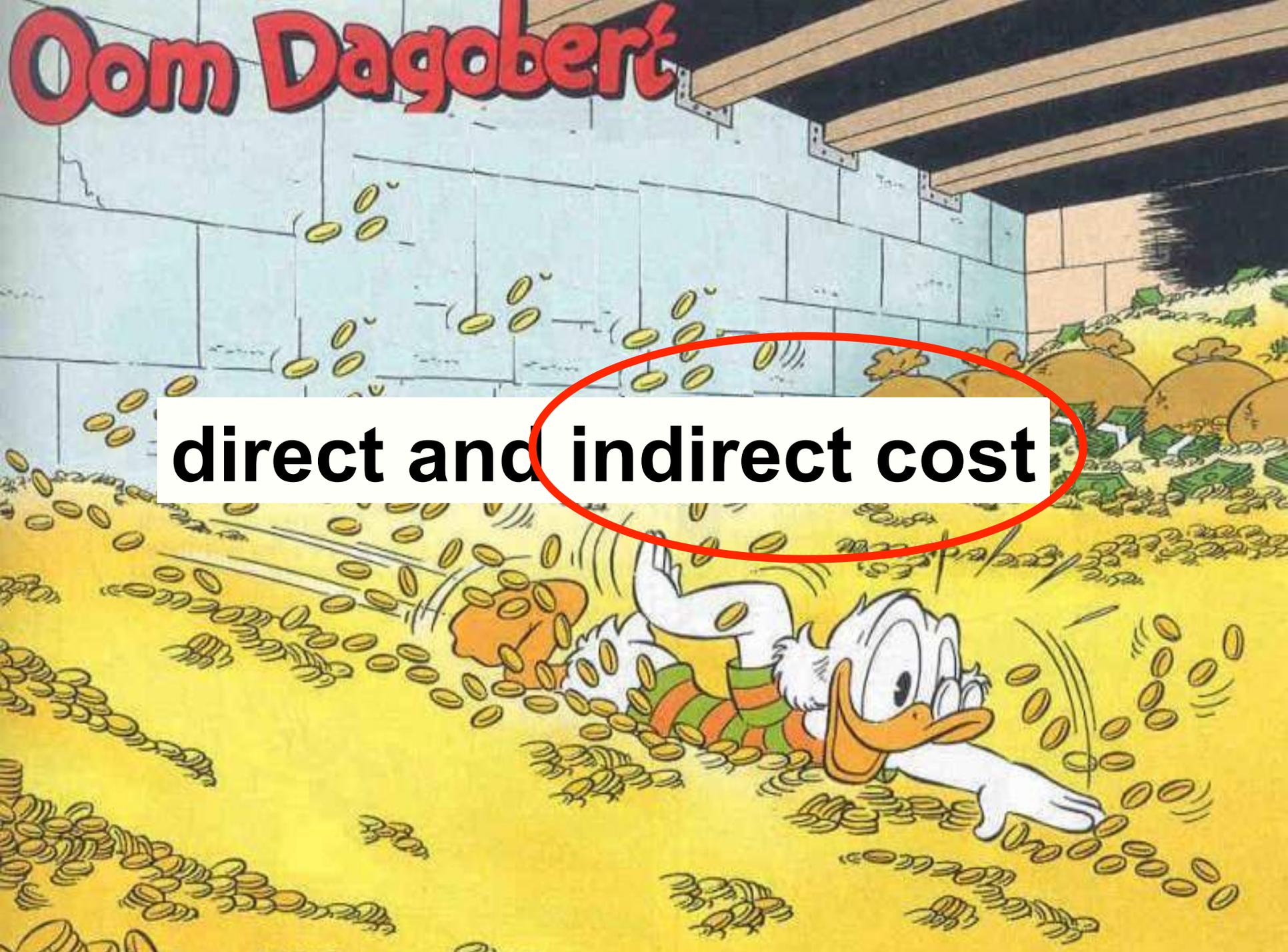
Research examples

- **Worksite health promotion programs (Nutrition / Phys. Act.)**
 - Individual counselling
 - Alife@Work
 - Health under construction
 - Systematic review



Oom Dagobert

direct and indirect cost



Annual cost of obesity in the Netherlands:

- **direct cost:** Euro 0.5 billion per year
- **indirect cost:** Euro 2.0 billion per year

RVZ, 2002

The relationship between overweight and obesity, and sick leave: a systematic review

International Journal of Obesity (2009) 1–10
© 2009 Macmillan Publishers Limited All rights reserved 0307-0565/09

DC van Duijvenbode¹, MJM Hoozemans², MNM van Poppel¹ and KI Proper¹

¹Department of Public and Occupational Health and the EMGO Institute for Health and Care Research, VU University Medical Center Amsterdam, Amsterdam, The Netherlands and ²Research Institute MOVE, Faculty of Human Movement Sciences, VU University Amsterdam, Amsterdam, The Netherlands

13 studies overweight long-term (>7 days) sickness absence:
- 4 out of 7: overweight predictor of long-term sick leave
- 3 out of 7: positive trend, but no significance

5 studies overweight short-term sick leave: inconsistent results

8 studies obesity long-term sickness absence:
- 7 out of 8: obesity significant predictor of long-term sick leave

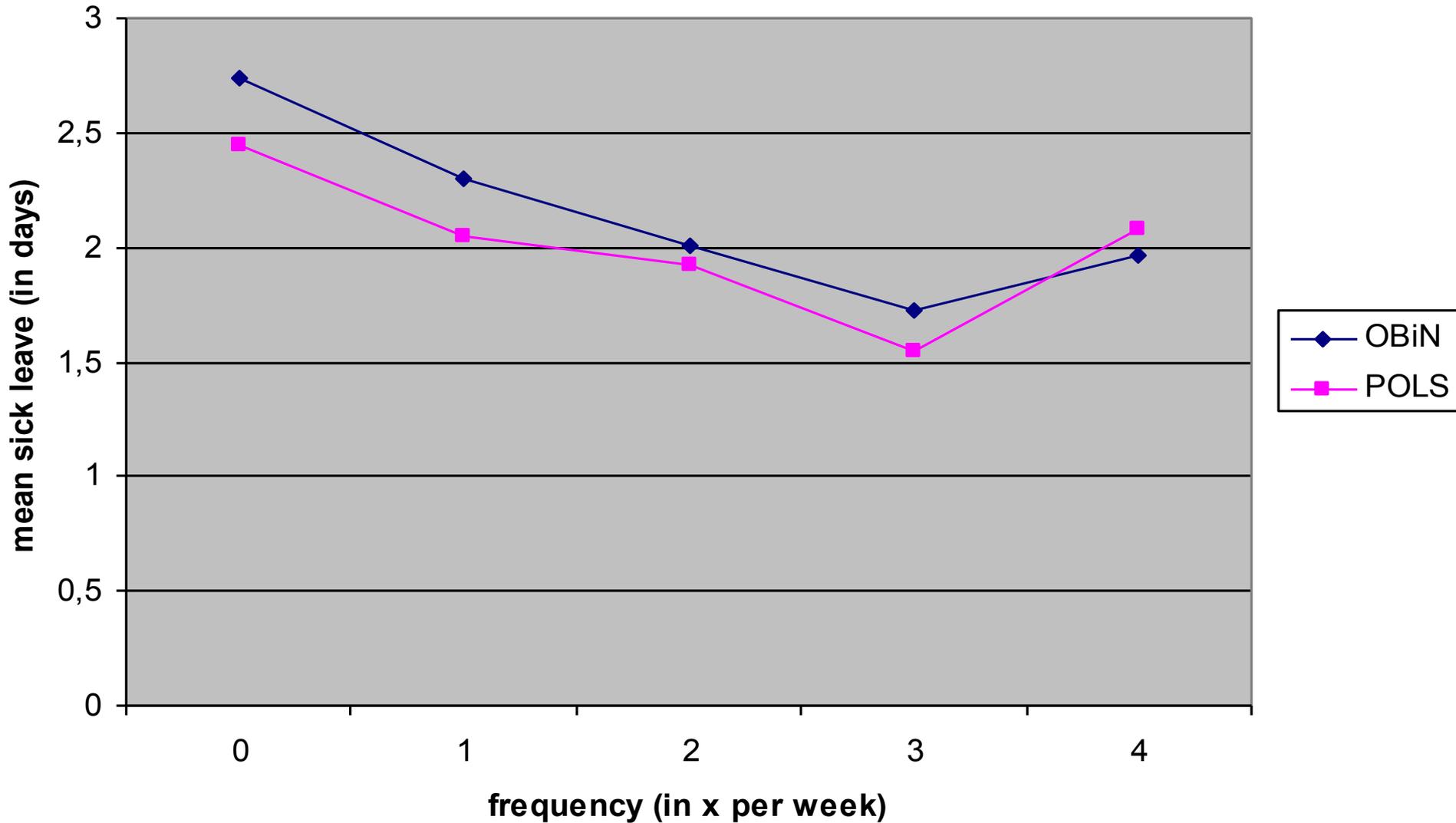
5 studies obesity short-term sick leave: inconclusive results

Dose–response relation between physical activity and sick leave

K I Proper, S G van den Heuvel, E M De Vroome, V H Hildebrandt, A J Van der Beek

- 3 large Dutch databases:
 - 2 continuous + 1 cross-sectional
 - surveys
 - representative samples Dutch population
- Physical activity: duration, frequency and intensity
- Outcome measure: number of days of sick leave
- Results
 - No relation between moderate PA & sick leave
 - Workers meeting recommendation of vigorous PA ($3 \geq$ times/week): significantly less sick leave
- Conclusion: vigorous PA for at least 3x/week has an inverse relationship with sick leave

mean sick leave by frequency of vigorous PA



Major health problems

Lifestyle (health behaviour)

Disability for work

**95% at
work**

**5% off
work**

**primary and secondary
prevention**

**secondary and tertiary
prevention**

Paradigm shift

Lifestyle (health behaviour)

Disability for work

**Workers
health**

**Occupational
health**

presenteeism

absenteeism

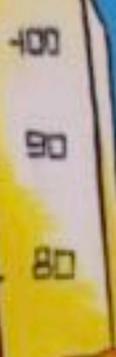
**primary and secondary
prevention**

**secondary and tertiary
prevention**



BERND

VERONIA



ECONOMIC EVALUATION OF INTERVENTIONS FOR OCCUPATIONAL HEALTH



EXPLORING METHODS & APPLIED STUDIES



KIMI UEGAKI

Why do economic evaluations?

To fund or
not to
fund?

Is it worth
doing?



The Decision Maker

Economical evaluation *research question*

Is this intervention worth the investment, compared to other things one could do with similar means?

It is not: is this intervention cheaper than other interventions for the same disease, complaint?

Types of economic evaluations (1)

1) Cost-Effectiveness Analysis (CEA)

Incremental costs vs. incremental (health) effects of a program
(i.e. effects are measured in 'physical units')

ICER = Incremental Cost-Effectiveness Ratio

$$\text{ICER} = \frac{\text{Costs}_{\text{Intervention}} - \text{Costs}_{\text{control}}}{\text{Effect}_{\text{Intervention}} - \text{Effect}_{\text{control}}} = \frac{\Delta \text{Costs}}{\Delta \text{Effect}}$$

Decision rule: **ICER** < Maximum willingness-to-pay (λ)

Types of economic evaluations (2)

2) Cost-Benefit Analysis (CBA)

Incremental costs vs. incremental benefits of a program

Costs: Program costs

Benefits: Program outcomes converted to monetary values

Examples: Reduced costs due to medical care, absenteeism, presenteeism, turnover, and/or work disability management resulting from the intervention

Metrics

Net Benefits (NB) = Δ Benefits - Δ Costs

Benefit Cost Ratio (BCR): = Δ Benefits / Δ Costs

Return On Investment (ROI) = $((\Delta$ Benefits - Δ Costs) / Δ Costs)*100

Viewpoint of the economic evaluation

The viewpoint (perspective) of an economic evaluation determines which costs are included in the analyses

Examples: societal perspective, employers' perspective, workers' perspective, health care insurers' perspective, et cetera

What perspective should be taken ???

- *“When in doubt the analyst should always adopt the societal perspective, which is the broadest one and is always relevant”*
- *“A more restricted perspective can be used if, for example, the economic evaluation is commissioned by a given body”*
(Dummond et al, 2005)

Worksite health promotion (WHP) programs



Am J Prev Med 2003;24(3)

Effect of Individual Counseling on Physical Activity, Fitness and Health

A Randomized Controlled Trial in a Workplace Setting

Karin I. Proper, MSc, Vincent H. Hildebrandt, PhD, MD, Allard J. Van der Beek, PhD, Jos W.R. Twisk, PhD, Willem Van Mechelen, PhD, MD

Costs, benefits and effectiveness of worksite physical activity counseling from the employer's perspective

by Karin I Proper, PhD,^{1,2,3} Martine C de Bruyne, PhD,⁴ Vincent H Hildebrandt, MD,^{1,3} Allard J van der Beek, PhD,^{2,3} Willem Jan Meering, MSc,⁵ Willem van Mechelen, MD^{2,3}

Scand J Work Environ Health 2004;30(1):36-46

Effectiveness of worksite physical activity counseling



RCT individual counselling

To investigate the cost-effectiveness and cost-benefit of a worksite individual counselling program from the employer's perspective (*Proper et al, 2004*)

Intervention group (n=131)

- During 9 months a maximum of 7 consultations for individual counselling (20 min in working time)
- Written information about several lifestyle factors (e.g. physical activity, nutrition, smoking, musculoskeletal disorders, and stress).

Control group (n=168)

- Written information about lifestyle factors

RCT individual counselling

Costs and benefits from the employer's perspective

- Intervention costs
- Sick leave costs

Primary outcome measures

- Physical activity
 - Meeting public health recommendation (*yes/no; questionnaire*)
 - Energy expenditure (*kcal.day⁻¹; interview*)
- Cardiorespiratory fitness (*beats·min⁻¹; Åstrand bicycle test*)
- Musculoskeletal symptoms (*yes/no; questionnaire*)

Analyses: CBA / CEA

RCT individual counselling

Intervention costs: € 430 / participant

Cost-benefit:

2000/2001 NB: € -305 / participant (*Net loss*)

2001/2002 NB: € 330 / participant (*Net benefit*)

Cost-effectiveness:

€ 5.2 per extra kcal/day energy expenditure ↑

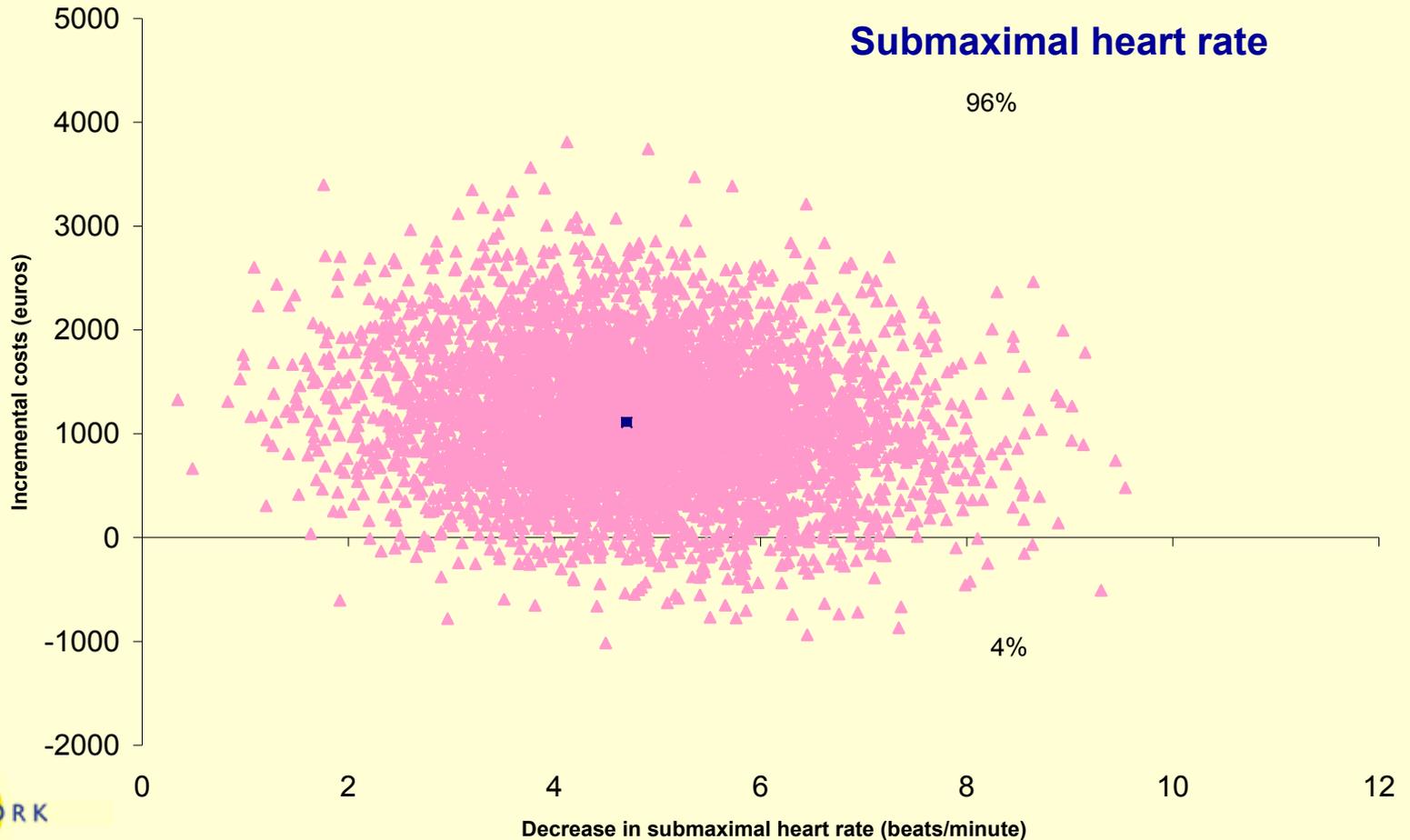
€ 235 per extra heart beat/minute in the submaximal heart rate ↓

€ 53.6 per extra % in prevalence of upper-extremity symptoms ↓

RCT individual counselling

Example CE-plane

Submaximal heart rate



RCT individual counselling

Summary results

CEA

- Intervention resulted in an increased energy expenditure, improved fitness and decreased prevalence of upper-extremity symptoms at the price of higher costs
 - Whether the intervention is cost-effective depends on the “Willingness To Pay”

CBA

- Relatively large reduction in sick leave costs (mainly 2nd year) in relation to intervention costs

Alife@Work

To investigate the cost-effectiveness and cost-utility of two modes of a distant worksite counselling program for overweight employees from the societal perspective

(van Wier et al, submitted)

Intervention group (*phone*) (n=462)

- Phone-based distant counselling program, ring binder containing 10 health education modules, pedometer, health education materials

Intervention group (*Internet*) (n=464)

- Internet-based distant counselling program, website containing 10 health education modules, pedometer, health education material

Control group (n=460)

- Health education materials



Alife@Work

Costs and benefits from the societal perspective

- Intervention costs
- Sick leave costs
- Medical costs

Primary outcome measures

- Body weight (*Digital scale, light clothes, no shoes*)
- Quality Adjusted Life Years (QALYs) (*EuroQol*)

Analyses: CEA / CUA



Alife@Work

Intervention costs (2004 Euros)

Phone: € 201 / participant

Internet: € 177 / participant

Cost-effectiveness (2004 Euros)

Phone: € 1,009 per kg weight loss

Internet: € 16 per kg weight loss

Cost-utility (2004 Euros)

Phone: € 245,243 per QALY gained

Internet: € 1,337 per QALY gained

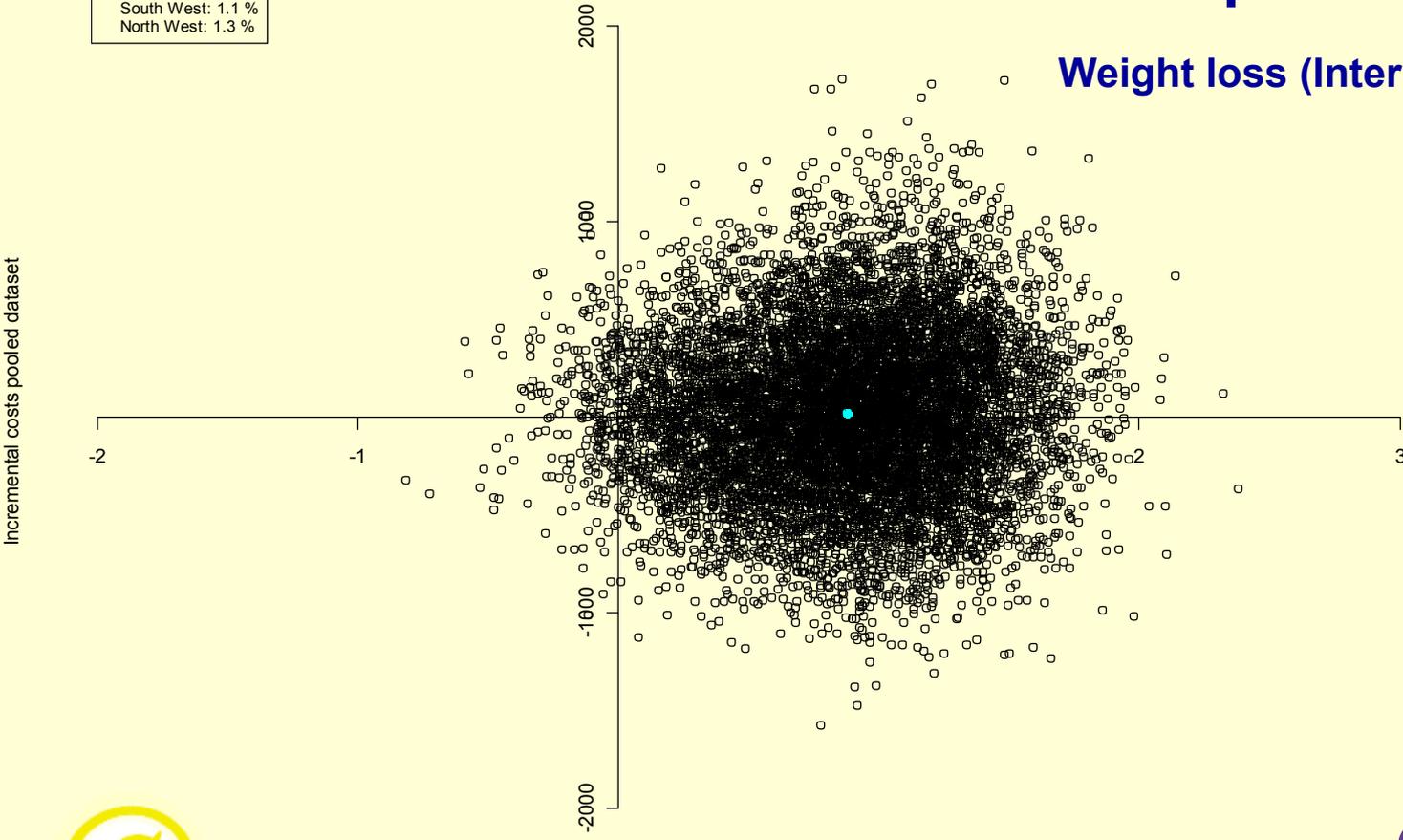


Alife@Work

North East: 49.6 %
South East: 48 %
South West: 1.1 %
North West: 1.3 %

Example CE-plane

Weight loss (Internet)



Incremental effects pooled datasets



Alife@Work

Summary results

CEA

- Interventions (phone & internet) were more costly and more effective
 - Cost per kg weight loss were lowest for the internet intervention
 - Whether the intervention is cost-effective depends on the “Willingness To Pay”

CUA

- Internet intervention
 - Costs per QALY gained (€ 1,337)
 - < Dutch willingness to pay per QALY for preventive interventions (€ 20,000)
- Phone intervention
 - Costs per QALY gained (€ 245,243)
 - > Dutch willingness to pay per QALY for preventive interventions (€ 20,000)



Health under Construction

*A lifestyle intervention for construction workers
at risk for cardiovascular disease*

Sustained body weight reduction by an individual-based lifestyle intervention for workers in the construction industry at risk for cardiovascular disease: Results of a randomized controlled trial

Iris F. Groeneveld, Karin I. Proper*, Allard J. van der Beek, Willem van Mechelen

(2010)

Preventive Medicine

Cost-Effectiveness and Cost-Benefit of a Lifestyle Intervention for Workers in the Construction Industry at Risk for Cardiovascular Disease

Iris F. Groeneveld, PhD, Marieke F. van Wier, MSc, Karin I. Proper, PhD, Judith E. Bosmans, PhD, Willem van Mechelen, PhD, MD, and Allard J. van der Beek, PhD

JOEM, 2011

Iris Groeneveld

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Health Under Construction

To investigate the cost-effectiveness (**societal perspective**) and the cost-benefit (**company perspective**) of an individual lifestyle intervention for workers in the construction industry with an elevated CVA risk

(Groeneveld et al, 2011)

Intervention group (n=280)

- Periodical health screening, health education materials, and 6-month counselling program (3 face-to-face sessions / 4 telephone contacts)

Control group (n=293)

- Periodical health screening, health education materials



Health Under Construction

Costs and benefits from the societal perspective (CEA)

- Intervention costs
- Sick leave costs
- Medical costs

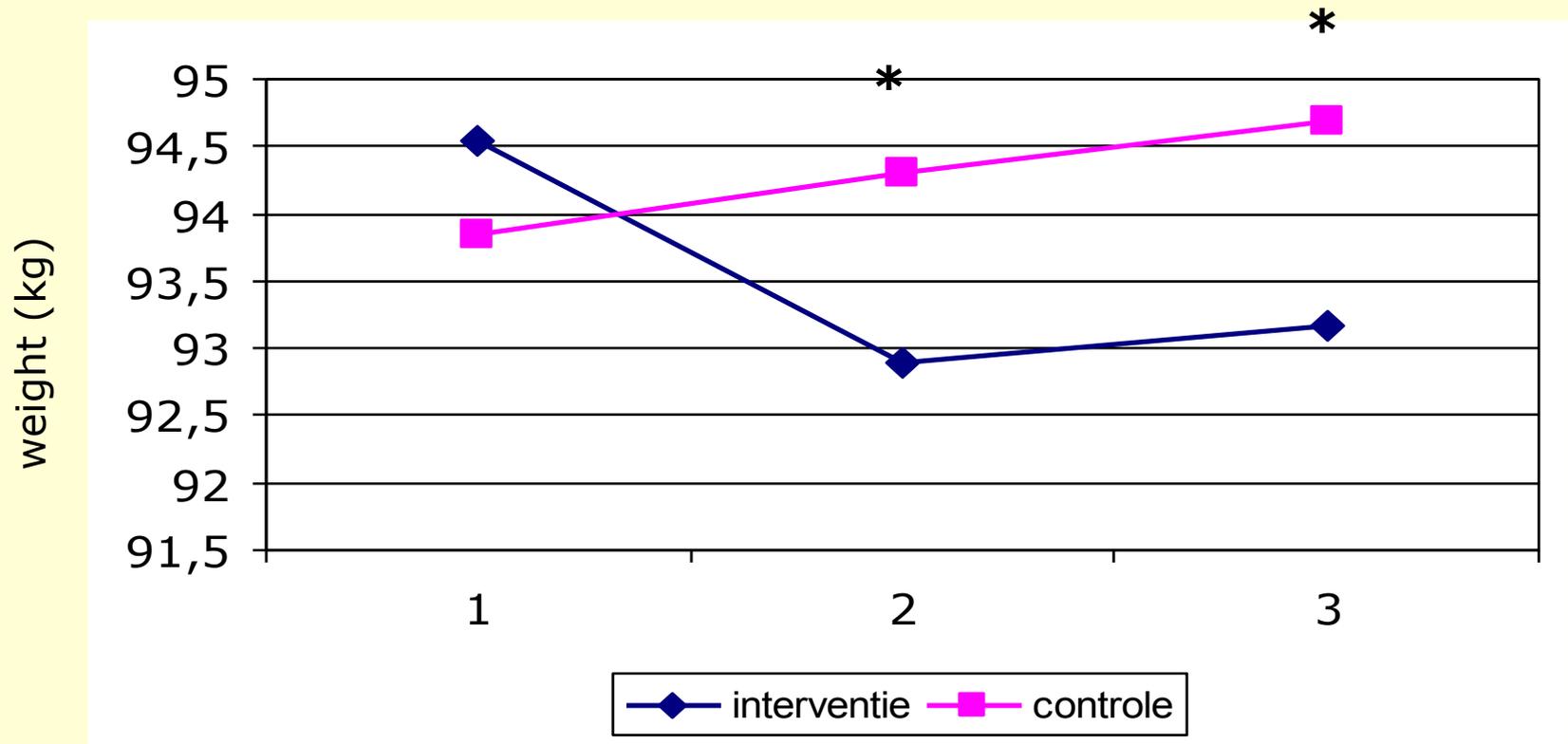
Costs and benefits from the company perspective (CBA)

- Intervention costs
- Sick leave costs

Primary outcome measures

- Body weight (*Digital scale, light clothes, no shoes*)

Effects on Body Weight: 6 & 12 months



Health Under Construction

Intervention costs (2008 Euros)

€ 605 / participant

Cost-effectiveness (2008 Euros)

€ 145 per kg weight loss

Cost-benefit (2008 Euros)

NB: € -254 per participant (Net loss)

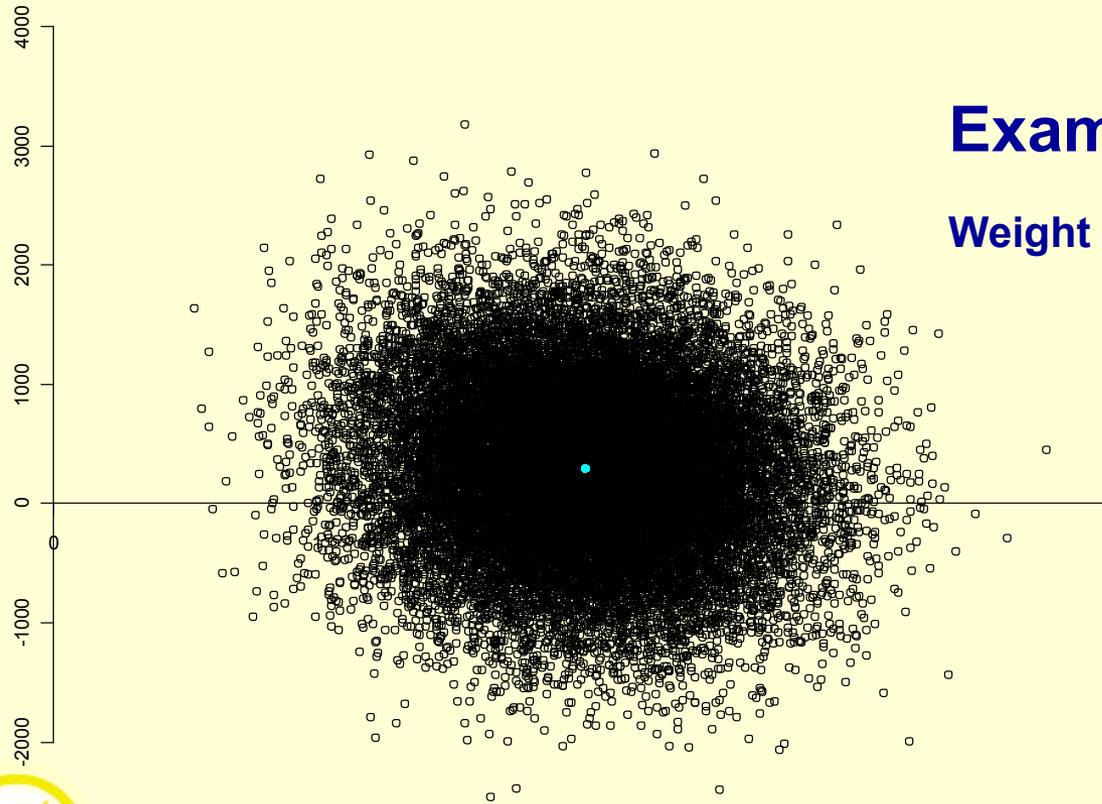


Health Under Construction

North East: 66.6 %
South East: 33.4 %
South West: 0 %
North West: 0 %

Example CE-plane

Weight loss



Incremental effects pooled datasets



Health Under Construction

Summary results

CEA

- The intervention was more costly and more effective in reducing weight
 - Whether the intervention is cost-effective depends on the “Willingness To Pay”

CBA

- As the intervention costs were higher than the benefits of absenteeism, the intervention was not cost-saving from an employer’s perspective

Obesity Comorbidity

Systematic review on the financial return of worksite health promotion programmes aimed at improving nutrition and/or increasing physical activity

J. M. van Dongen^{1,2,3}, K. I. Proper^{1,3}, M. F. van Wier^{1,2,4}, A. J. van der Beek^{1,3}, P. M. Bongers^{1,3,5}, W. van Mechelen^{1,3} and M. W. van Tulder^{1,2,4}

Systematic review

To critically appraise and summarize the current evidence on the financial return of WHP programs aimed at improving nutrition and/or increasing physical activity in employees, compared to usual care (including no intervention) or a cut-down version of the program

Systematic review

WHP programs are thought to generate financial savings:

- Financial return: \$ 1.40 to \$ 4.60 for every dollar spent (Soler et al., 2010)
- Medical costs decrease with \$ 3.30 and absenteeism costs with \$ 2.70 for every dollar spent (Baicker et al., 2010)

However:

- Previous reviews did not adjust for the different methodologies used in the included studies to estimate the financial return
- A risk of bias assessment was often missing
- Previous reviews focused on WHP programs in general, instead of programs aimed at improving nutrition and/or increasing physical activity

Systematic review

- **18 studies – 21 interventions**
 - Study design
 - 4 RCTs
 - 13 NRSs
 - 1 modelling study
 - Country and setting
 - 14 US
 - 3 The Netherlands
 - 1 UK
 - Interventions
 - 2 studies evaluated PA interventions
 - 16 studies evaluated PA/Nutrition interventions

Systematic review

Standardized costs and benefits (\$, 2010)

	Range
Program costs (n=21)	\$ 11 to \$ 1075
Absenteeism benefits (n=15)	\$ -113 to \$ 1384
Presenteeism benefits (n=3)	\$ 2 to \$ 1528
Medical care benefits (n=13)	\$ -82 to \$ 554

Systematic review

	ROI (mean)	BCR (mean)
absenteeism (n=15)	200%	3.00
medical care (n=13)	22%	1.22
absenteeism + medical (n=9)	174%	2.74

However,

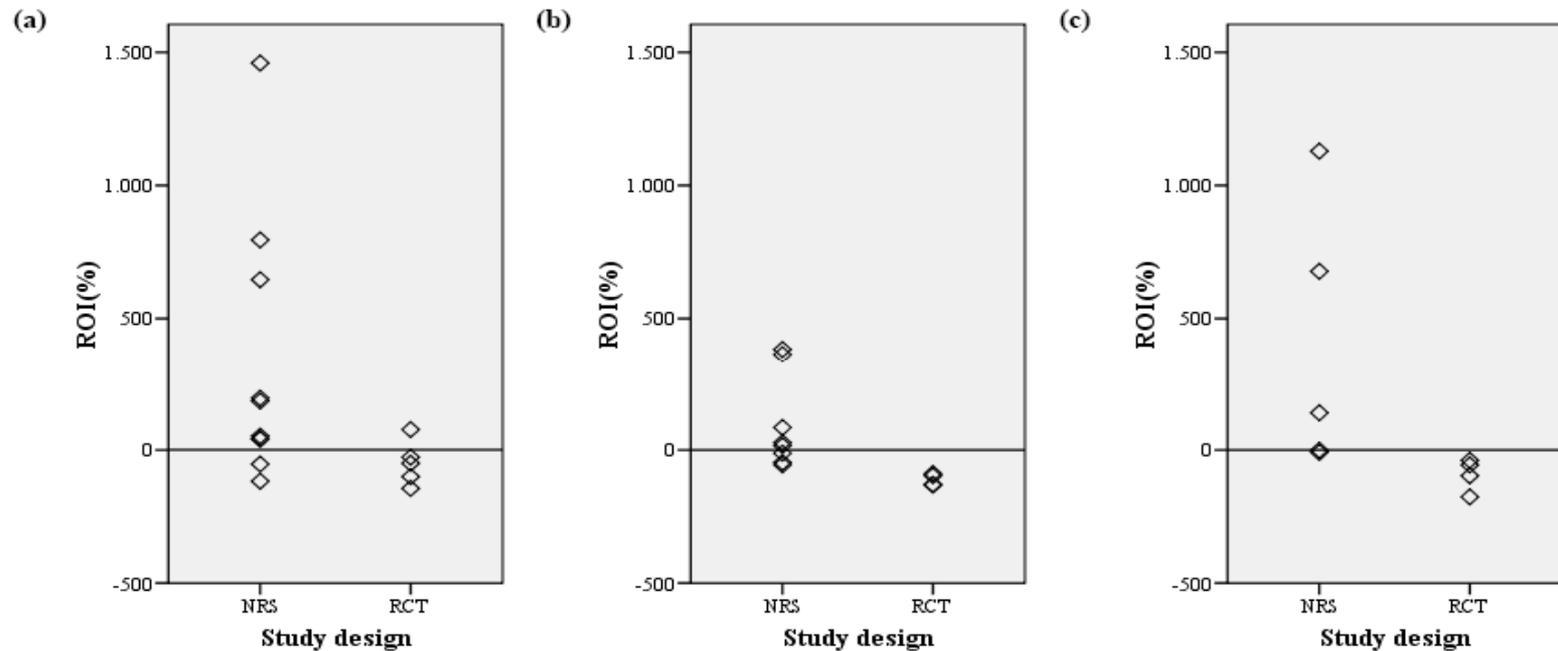
Systematic review

	NRSs		RCTs	
	ROI (mean)	BCR (mean)	ROI (mean)	BCR (mean)
absenteeism	325%	4.25	-49%	0.51
medical care	95%	1.95	-112%	0.12
absenteeism + medical	387%	4.87	-92%	0.08

- **Positive** ROI/BCR in NRSs
- **Negative** ROI/BCR in RCTs

Systematic review

Figure 2: Distribution of the Return On Investments (ROI) in terms of (a) absenteeism, (b) medical, and (c) both absenteeism and medical costs of Non-Randomized Studies (NRSs) and Randomized Controlled Trials (RCTs)



Systematic review

Discussion

- NRSs showing a positive financial return of WHP programs may be misleading due to selection bias
- RCTs with a low risk of bias indicate that WHP programs may not pay for themselves in terms of absenteeism benefits, medical care benefits or both
- Other, intangible benefits may also be important drivers for the business decision, but cannot be included in present financial return estimates (e.g. job satisfaction)



Take home messages

- Perspective of economic evaluations
- Worksite health promotion often more costly and also more effective
- Implementation is still another issue!

