A simple method for cost-justifying ergonomics interventions

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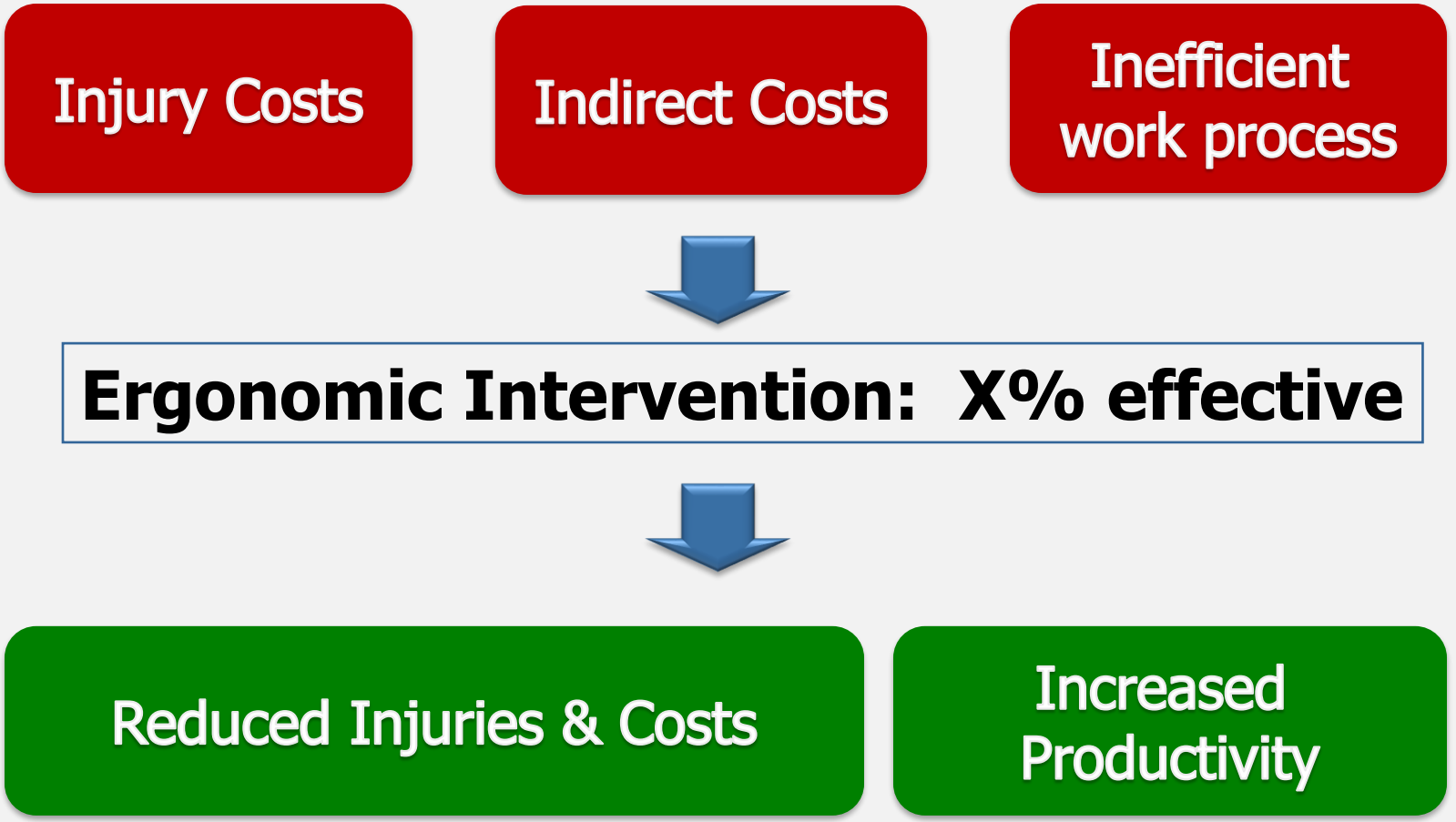
Overview

- How the calculator was developed
- Examples of its use
- A quick demo
- Q&A

Influences

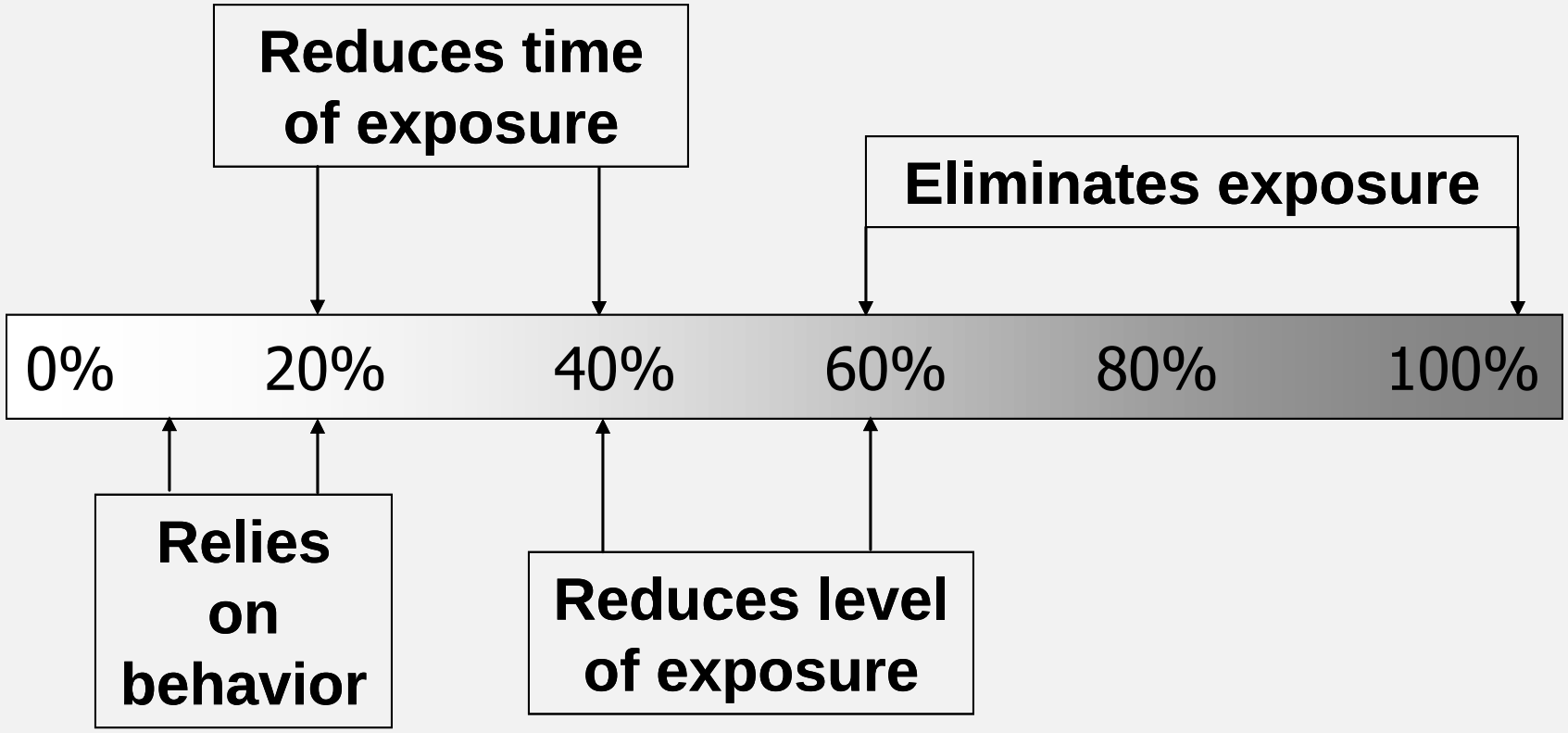
- Hal Hendrick (1996) – “Good Ergonomics is Good Economics”
- Maurice Oxenburgh (1991) – “Increasing Productivity and Profit through Health & Safety”
- Deborah Read, President, ErgoFit Consulting
- The 100’s of researchers and practitioners who published case studies of successful ergonomics interventions


Injury Costs
Indirect Costs
Inefficient work process
Ergonomic Intervention: X% effective
Reduced Injuries & Costs
Increased Productivity

Results from 250 case studies

Metric	Number of examples	Mean	Median	Range
WMSDs	90	59% ↓	56% ↓	8%-100%
Lost workdays	78	75% ↓	80% ↓	3%-100%
Workers' comp costs	52	68% ↓	70% ↓	15%-100%
Productivity	61	25% ↑	20% ↑	-0.2%-80%

How effective are ergonomic interventions?



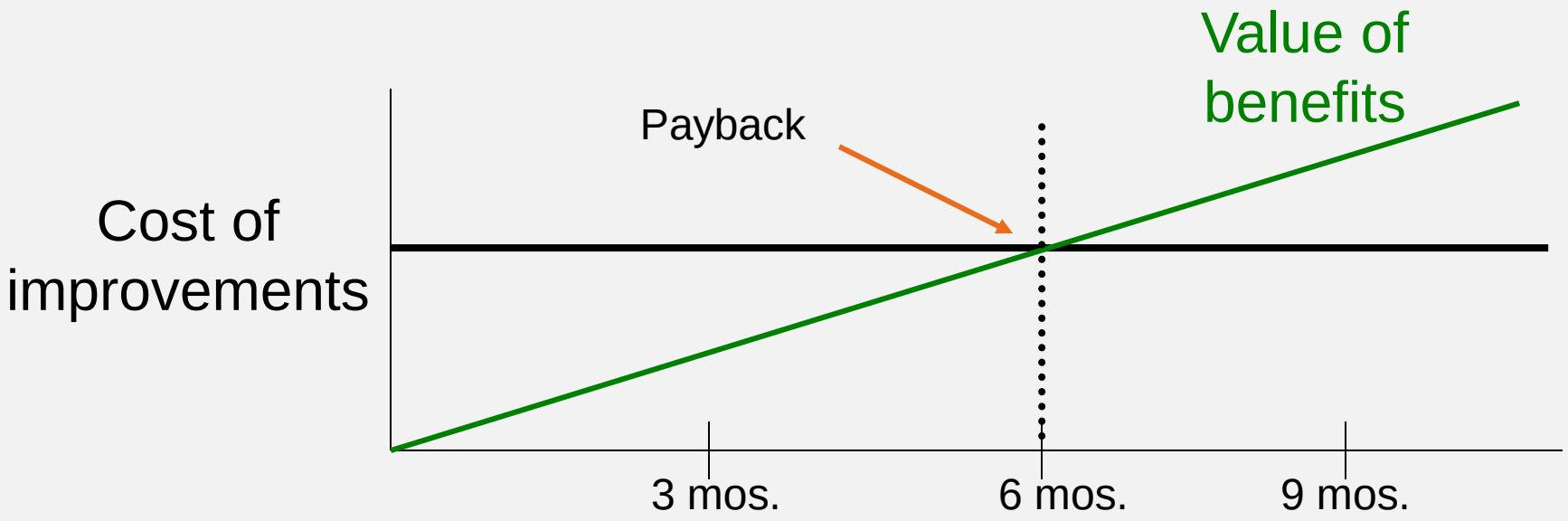
Benefit values chosen for calculator

Solution Effectiveness Estimates	
Type of Solution	Reduction in Claims
Eliminates exposure	70%
Reduces level of exposure	40%
Reduces time of exposure	15%
Relies on behavior	10%

Productivity Improvement Estimates	
Level of Increase	Percent Increase
High – speeds up process	10%
Medium – reduces wasted motion	5%
Low – improves comfort/fatigue	2.5%

Calculator Output: Payback Period

Time required for accrued benefits to equal cost of initial investment



Limitations of the model

- Doesn’t take workers’ compensation into account
- Injury costs are specific to Washington state
- Indirect costs are simple ratios of direct costs
- Solution effectiveness estimates based on relatively small number of case studies
- Solution effectiveness estimates assume you truly fix the problem

Examples of use

Examples of use - Spain

"Virtual ergonomics?: ergonomic improvement at industrial laundry workplace by using digital human modeling (DHM) "

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	Option 1	Option 2	Option 3
Total first-year cost of control:	27.900,00 €	17.440,00 €	10.060,00 €
Annualy recurring costs:	5.000,00 €	2.880,00 €	1.620,00 €
Estimated annual benefits:	20.896,00 €	18.396,00 €	18.396,00 €
Estimated payback period:	1,34 years	0,95 years	0,55 years
Estimated net benefits after one year:	-7.004 €	956 €	8.336 €
Estimated net benefits after 3 years:	24.788 €	31.988 €	41.888 €
Estimated net benefits after 5 years:	56.580 €	63.020 €	75.440 €

Examples of use - Latvia

PROCESS MANAGEMENT IMPROVEMENT WITH ERGONOMICS SOLUTIONS

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Ergonomics interventions were implemented with process quality improvement and actions were as follows: purchase of automatic lifting machines in packaging process, new machinery tools for sorting and assembling the furniture parts. Participatory ergonomics interventions involved job rotation, staff training, involvement in decision making about necessary improvements in work process.

The cost-benefit calculator WSECBC results shows that ergonomics interventions in furniture production line pays off in one year, while the benefits will grow every year, and the whole first year it sums up to 63 206 EUR, but in 5 years it is expected to benefit 319 030 EUR.

Examples of use - Canada

Implementing powered stretcher and load systems was a cost effective intervention to reduce the incidence rates of stretcher related injuries in a paramedic service

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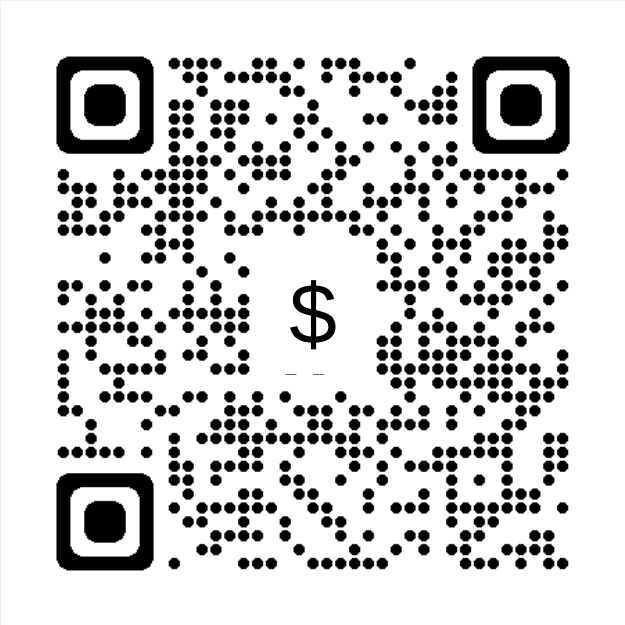
Our secondary purpose was to explore the economic feasibility of a powered stretcher and load system intervention. Using the Washington State Ergonomics Costs Benefit calculator, adapting the inputs to reflect actual and estimated costs to NEMS, a payback period of 5.8 years was calculated. The expected service life of the powered stretcher and load system implemented in this study is 7 years. Therefore, it is expected that the entire added cost (cost to purchase, maintain and train) can be recovered within the normal, expected service life of each powered stretcher and load system.

Puget Sound Human Factors and Ergonomics Society

Washington State Department of Labor & Industries

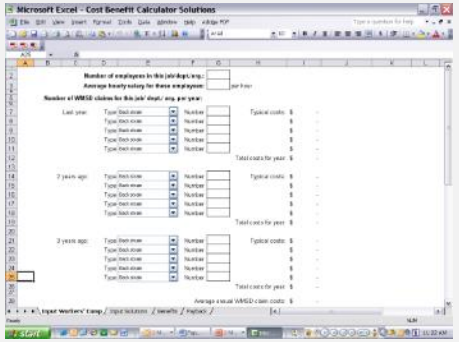
The Washington State CBA Model

https://www.pshfes.org/cost-calculator



CBA Calculator Demonstration

- Palletizing at the end of three conveyor lines
- 3 employees per shift, 3 shifts per day
- High rate of injury
- Bottleneck for facility



Q&A