

The costs incurred by poor working conditions

a burden to society, a prospect to companies

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Summary

Economic indicators are increasingly important for political strategies as well as for the policy of companies. After many years in which safety and health at work is promoted from a moral standpoint, now economic considerations have a place in the frontline. Recently an in 1997 developed model on societal costs of working conditions was extended and updated for the Netherlands' Ministry of Social Affairs and. Effects that are considered are absenteeism, occupational disability, occupational accidents, costs of prevention, occupational safety and health care as well as of enforcement. On the basis of this model, it is clear that most costs are the result of work-related absence and disability. These are mainly determined by work-related drop out because of psychological and musculoskeletal disorders. It is estimated that these costs add up to €6 billion.

In continuation, two studies were performed for the costs at sector level. Two sectors were analysed: building and construction, respectively education. There are major differences, both with regard to the role of cost categories as well as to the predominant diagnoses.

Furthermore, these studies helped to develop a view on how to assess the costs and benefits of occupational safety and health (OSH) interventions. It turns out that a generic model allowing analysing the cost effectiveness of any intervention cannot be developed. Nevertheless, much support can be derived from the tens of cases that are analysed until now. In general, many OSH interventions do benefit core business values and so are beneficial. In many cases, a positive cost benefit ration can be proven.

The model

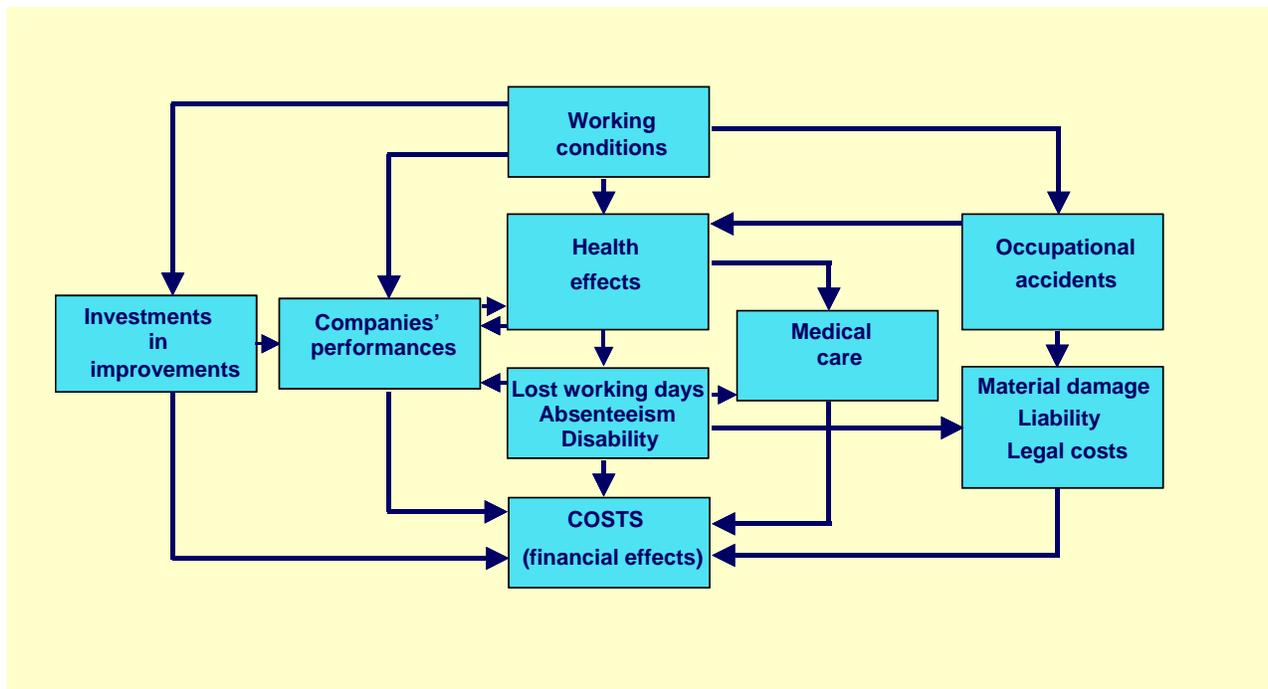
The model used is shown in figure 1. Working conditions may have an effect on health, partly resulting in absenteeism and occupational disability. The resulting costs concern paid wages while off work and worker compensation. Of course, only illnesses and injuries are taken into account, which are fully or mostly caused by work factors. Health effects may require medical treatment, resulting in cost.

Poor working conditions may also cause occupational accidents¹. As the resulting health effects are already accounted for in the categories above, in this box we only look at the cost of material damage, liability, legal cost and penalties.

Next to the direct effects on health and safety, the effects of poor working conditions, health effects as such and lost working days on companies' performances are taken into account.

Lastly, the investments in improvements are considered: legislation, labour inspectorate (enforcement), occupational health and safety services and companies' investments to improve working conditions.

¹ <http://www.eurofound.eu.int/ewco/2004/07/NL0407NU05.htm>



Categories and their cost

A cost calculation was done based on information collected from different sources with data concerning 2001. The health effects are analysed for each of the ICD-diagnostic categories (International Codes of Diagnoses). The distribution of injuries over diagnoses is used as a basis. The distribution turns out to be different for absenteeism at one hand and for disability at the other. Accidents, blood diseases and respiratory disorders represent a larger fraction of absenteeism than of disability and the opposite is the case for diseases of the heart and vascular system, the nervous system and for cancers. As we are only interested in injuries and diseases that have an origin in work, work related factors have to be used for each of the diagnoses. These factors are expert guesses based on the most recent literature. Their values differ from 45% for musculoskeletal disorders to 3% for blood diseases. Some diagnoses show relatively high work related factors, for instance skin diseases.

For the medical care, a similar approach is used, but first the cost for the work force has to be filtered out of the total of medical cost for the country. So elderly and youth are excluded. A 'healthy worker' correction is also applied as workers generally have a higher level of health than non-working people do.

Since compensation in the Netherlands does not discriminate between occupational accidents and other accidents, there are no reliable data on the number of occupational accidents. Neither are there reliable data or estimates of the mean cost of an occupational accident. Therefore, this category could not be calculated.

The same problem arises with regard to the calculation of the effects on companies' performances. In individual companies, these effects can very well be defined and cost can be calculated or at least estimated. For the total work force however, one needs to have mean values for effects on for instance productivity and for the resulting cost.

The cost for preventive measures could very well be found, as there are reliable data, like statistical data of the occupational health and safety services, and the governmental budget.

The total cost

The estimated total of the cost per worker are given in table 1 (data from 2001).

	All industries and services	
	Euro/worker	% of total
Costs as a result of work:	1.368	77,3%
Work related costs of absenteeism	527	29,8%
Work related costs of occupational disability	609	34,4%
Cost of reintegration grants	103	5,8%
Work related costs of curative health care	129	7,3%
Costs related to occupational accidents (other than medical)	p.m.	p.m.
Costs of prevention:	400	22,7%
Costs of preventive occupational H&S measures	120	6,8%
Companies' investments and expenses for prevention	157	8,9%
Costs of occupational health & safety research and development	10	0,6%
Juridical cost	2	0,1%
Administration by companies	102	5,8%
Costs of legislation and inspection	6	0,3%
Subventions and grants for improvement	3	0,2%
Total expenses per worker per annum	1.768	100,0%

Table1. Estimated total costs per worker (The Netherlands, 2001)

The total cost for the Netherlands is equivalent to 2,96% of the gross national product.

Two diagnoses are responsible for 83% of the cost of work related health effects: musculoskeletal disorders (43%) and psychosocial diseases (40%). Other diagnoses that result in relatively high cost are: diseases of the heart and the vascular system (5%), nervous system (4% incl. eyes, ears) and occupational accidents (4%).

The calculation is made in an Excel file, which allows scenario's to be analysed. For instance: the effects of changes in the absenteeism rate can be calculated.

Due to the differences in social legislation and systems between countries, the program is not automatically applicable in other countries. The model as such, however, can be of value for studies elsewhere.

Cost differences in sectors

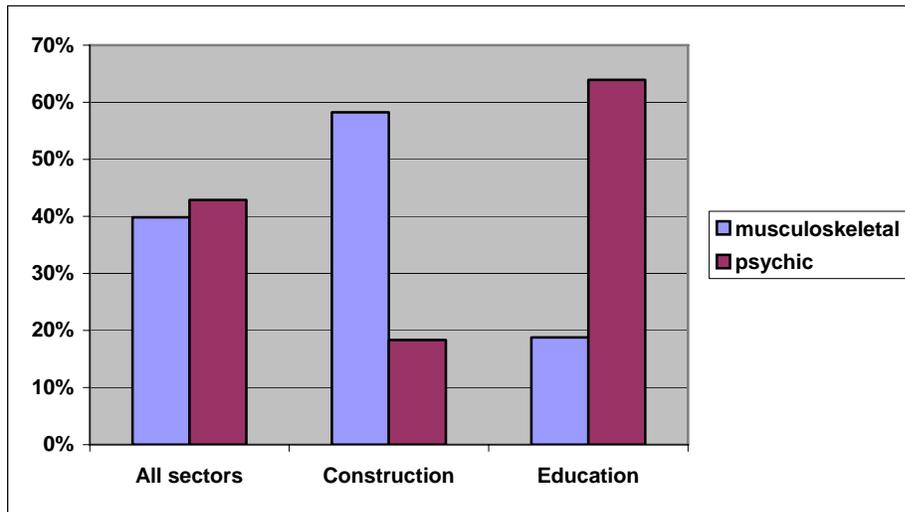
Similar analyses were made for two sectors: building and construction respectively education. These two large sectors count 280,000 construction workers and 355,000 people in education; 78% of the latter are teachers.

In construction, the costs for occupational disability are extremely high compared to other sectors or the national mean. These high costs are predominantly caused by large influx in the eighties and early nineties of the twentieth century. Since then, the construction sector's level of absenteeism as well as the number of people becoming disabled is almost equal to the average of all sectors.

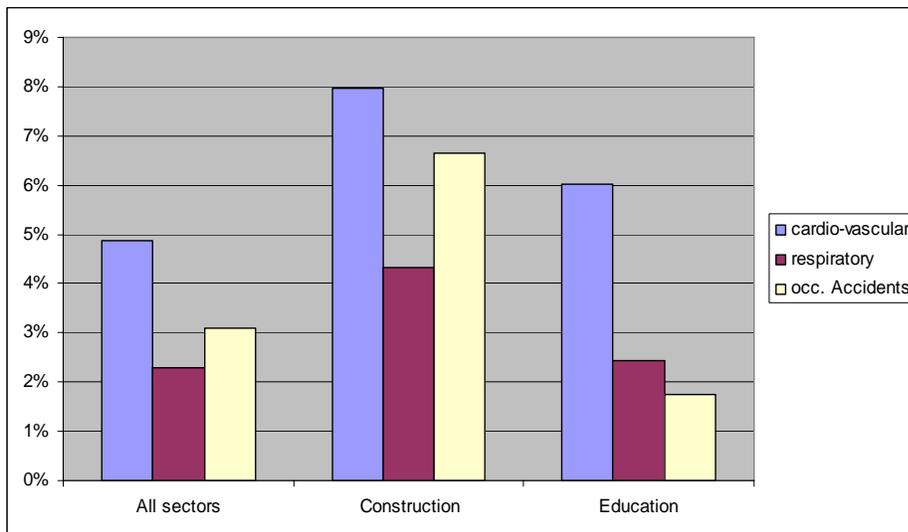
The costs for medical care are relatively low compared to the average. The major reason is that diagnoses that lead to expensive treatment (hospitalization) are less common amongst these workers. Besides, construction workers do not go easily to doctors, as many of them have collective arrangements to commute. Therefore, for a well-based collective occupational health service, these costs are relatively high.

The education sector shows high costs for absenteeism, as are the costs for occupational disability. The absenteeism rate is relatively high, while the costs for occupational health care are relatively limited.

The contribution of diagnoses to the costs differs over these two sectors, which can be seen in graphs 1 and 2. Musculoskeletal disorders are the predominant cause for health related costs in construction, while psychic complaints are responsible for a great part of the costs in education. Cardio-vascular diseases are important in both sectors. In addition, as one can imagine, occupational accidents are important in construction and only of minor importance in education.



Graph 1: Contribution of two diagnoses to the costs of health impairment.



Graph 2: Contribution of three diagnoses to the costs of health impairment.

Costs and benefits of interventions

Over the past decades, many models were developed to evaluate cost effectiveness of health and safety measures. Many of these are complex: data must meet the specifications defined by the model, where working with available data would not only be more clients oriented, and more efficient. As a result, in many cases data need to be collected or developed by different departments in a company.

This made us think of the needs of companies. For what goals do they want cost benefit evaluations?

Who will be the one to make such? What data will be available, or can easily be produced. And: what level of details is necessary, and which level of reliability will be required?

For consultancy, we developed a participatory approach, which is efficient, quick and gives the insight that is needed to make decisions.

Cost effectiveness evaluations can be made for several goals:

1. To convince people that investments in H&S are useful.
2. To evaluate a proposed investment, or to evaluate the decision afterwards.
3. To benchmark to other companies.
4. To follow a trend in time.
5. To sell products, systems.

As the goal is important to decide what kind of tool or evaluation method one should use, we first will explain what the impact is of each of the five goals.

Ad 1: Examples of cost benefit analyses can be convincing that the outcomes will also be valid for other solutions or measures to be implemented in other situations. Especially if several examples are given, indicating the broadness of the applications. The calculation must be plausible, and easy to understand. Data do not need to have a high level of reliability; it will be sufficient if each of the input data is considered to be in the expected range. An example is a small computer program to calculate the cost of absenteeism, which we developed and is now available on the Internet for several sectors in the Netherlands (e.g. www.keeperpunt.nl, in Dutch).

Ad 2: Management will take a decision based on several considerations. Financial considerations (e.g. the expected return on investment) are amongst these, but certainly not the only consideration. Next to quantitative parameters qualitative pro's and con's count, sometimes even more. Most of the company's decisions are only partly based on financial terms; 'abdominal feelings' are important, though people don't always admit it to be so. Cost benefit analyses need to be accurate in proportion to the extent and consequences of the investment. For smaller investments, a quick analysis, partly based on estimations, may be good enough.

Ad 3: Benchmarking is a hobby of managers. Many a time the size of the differences gets more attention than the background of the differences. Of course this is not correct. In order to make benchmarks useful, it is highly recommended to use the same evaluation method, as well as the same assessment tools. This implicates that a well-balanced method shall be developed, which is not easy. The method needs to be described as detailed as possible, in order to guarantee a use according to the specifications. Such methods will often be difficult to apply, resulting in little use. Many of the cost effectiveness methods in the field of health and safety suffer from this. The before mentioned studies into the national cost of poor working conditions were performed for 1995 and for 2001. However, the same method was used, already after these six years many categories could not be compared, due to changes in legislation and losses of data files.

Ad 4: To follow a trend in time is useful for management to evaluate the progress of the business. The only important qualification is a well-described method that at different moments in time will be applied exactly in the same way. Estimations do not fit in such methods.

Ad 5: Producers and retailers do like to convince their potential clients by the benefits of their products. Of course, there may be honest companies and people, but it is likely that these groups be tempted to use invalid methods. Their published data and methods may look reliable, the opposite may be true. Always do ask for the details of the model used, and ask by whom the data were collected. If you want to use cost benefits to sell your products, let the evaluation and calculation be made by an independent and reliable party.

Method development

The Dutch method was developed based on expertise built up in a period of about ten years. Most of the work consisted of research. Early 2003 a project changed the view on cost effectiveness models radically. The Ministry of Social Affairs and Employment in the Netherlands promotes "Design for All" as an

approach that helps to reduce lost working days and disability. Design for All (D4A), also known as Universal Design, aims to design and produce products that allow as many as possible people to use these products effectively, and without a health or safety hazard. The same principles can be used to design workplaces and work organization.

In the project, 10 cases had to be evaluated with an emphasis on cost effectiveness. Given the budget and the access to data, we choose for a conference like way to collect all relevant data. The owner of the improvements (e.g. an employer or a producer) was invited, and a team of health and safety experts interviewed him or her. Items in the interviews were:

- What belongs to the specific case?
- What made you choose for a D4A-solution?
- Which investments in money and time did you spend, and what further efforts had been brought in?
- Which effects can be seen as a result of the investments and efforts? Can these be specified in terms of money? If not in quantitative data? If not in qualitative statements?

Five, partly different groups of experts did the interviews. The experts had no insight or knowledge about the cases at forehand.

A list of potential categories for costs, efforts, benefits and effects was drafted as a reference for the interviews. After the ten cases, the list was slightly adapted. In the 1½ year since the project, the list has been used about 30 times for different goals: health improvements, safety measures, environmental projects. Hardly any adaptations have been necessary, so now we consider the list as a general means.

Some generic calculation rules could be defined, but the general rule is that each case has to be done tailor made. Some cases deal largely with productivity aspects, others with absenteeism, accidents. A general model turned out to be impossible.

The method

The method was developed mainly for goals 1 and 2, and under restrictions for goal 5. This choice implicates that it is more a consultation method than a research method. The level of accuracy and reliability is not higher than what is expected by the owner of the question.

Basically, the model is a participative model. The cost benefit experts interview the one who wants to have a cost effectiveness evaluation. In many cases, some other people take part in the interview as well: users, workers, maintenance department, purchase department, health and safety experts.

The list of potential items is used as a reference manual, not as a strict program. The consulting skills of the experts, in particular their skills to analyze deeply, is essential to bring all relevant aspects up. An example illustrates this (see inserted text block).

The expert can also help how to find and process data that are required for a cost effectiveness analysis. Next, the expert makes the analysis as a draft. In a participative session, the draft is discussed. Potential missing data can be added, either by collection these from company records, or by estimations. Critical factors can be discriminated. The outcome is discussed. So an analysis arises that has a broad basis.

Depending on the goal of a costs and benefits evaluation, the method can be chosen. A quick scan is adequate for a relatively small investment to improve the work of one person or a small group. For long lasting improvements with a wide scope a more thorough assessment of factors and parameters is more appropriate. In general, if estimations have to be made, it is advisable to make the estimations in close collaboration with the responsible management. They have easy access to data and are familiar with indices. It prevents the consultant from having to prove the data and as management has taken part in validating the data, the outcomes are traceable and acceptable.

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An example to illustrate the advantage of participation

In a steel plant liquid iron is transported by rail wagons to the steel factory. The wagons have an inside ceramic covering to prevent hot iron to melt the wagon. The covering needs to be replaced regularly. The masons' work is physically straining, resulting in a high percentage of absenteeism and cases of disability off and on. Besides the population gets older, so there is a need of urgency to improve.

Many different solutions were evaluated, and the use of smaller blocks (less thick) was considered a good option. Blocks of a 30% reduced thickness met ergonomic standards. The logical expectation was that this measure would result in 30% more repairs. The calculation of management showed that the solution would result in extra costs of \$ 300.000/year.

In the cost effectiveness interview the expert heard about the thinner covering. He asked: "A thinner covering will result in a higher volume of melted iron on the wagon; will the axes and the track be strong enough to bear the extra load? Management answered enthusiastic: "Yes, that's no problem. But: more iron in each wagon means less transports, so reduced costs!"

The next question was: "Are you sure that a 30% thinner covering will have a 30% shorter life cycle?" The discussion turned into the question if a thinner ceramic block would have the same qualities as a thicker one. The blocks were tested and it showed that the hardness of the thinner block was evidently higher! In the cost benefit calculation the factor for the extra repairs (30%) turned out to be essential for the outcome: a break even was reached as this factor was 27%! So management decided to start a test in practice with one wagon, in order to examine the endurance of the thinner covering.

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A specific example: glaziers

Glazier is a good but physically straining job. The work results in discomfort and in an unacceptable level of health hazard. In particular, double panes, that nowadays have become common, are heavy, and often too heavy for manual handling.

Over the past years, several new tools and means for transport have been introduced. The tools and means were developed in a participatory ergonomics project (Urlings 1998). Despite many promotional activities, the implementation on the work floor goes slowly. Employers are reluctant, as they doubt if the investments pay back. In a costs and benefits evaluation, a set of tools was considered: a simple crane mounted on the van helps to hoist the glass on and off. Next, there are two carts, each of which has a specific application depending on the transport circumstances. For the vertical transport to the window frame aluminium made hoisting unit of 10 m tall was developed. For cutting out the old panes a new electric hand tool was developed that prevents the straining manual cutting of glass paste. All means together are always available in the van. Therefore, the workers themselves can choose which means they use in a certain situation.

The investment leads to annual depreciation costs of Euro 640 (see Table 23.1). The time to learn to work with the means is short and can be depreciated over many years; so the annual costs will be very small and are not taken into account (these are stated as pro memoria).

The annual exploitation costs consist of an inspection of the crane and some maintenance: Euro 200. Therefore, the total annual expenses amount Euro 840 (see Table 2).

Equipment	Costs	Depreciation time	Annual costs
Crane mounted on the van	€ 1.250	5 years	€ 250
Cart 1	€ 150	5 years	€ 30
Cart 2	€ 250	5 years	€ 50
Electric glass paste cutter	€ 300	5 years	€ 60
Aluminium hoisting unit	€ 1.250	5 years	€ 250
Annual inspection, maintenance	€ 200	-	€ 200
Total annual costs			€ 840

Table 2: The total investment in tools and equipment per team of 2 glaziers and 1 van.

For the benefits, we look at the performances of the workforce. According to law, the maximum lifting weight is 25 kg per person. To handle and lift glass panes of more than 50 kg the regular team of two glaziers will need a third operator, which indeed is practice when needed. Together with management, it was estimated that in total a third man spends 15% of his working time to travel and to help a team of two glaziers. That represents 15% of his wages (Euro 26,000/year). With the new tools and lifting means, no third man is needed. The reduction of costs is 15% x Euro 26,000 = Euro 3,900. The travel costs for that third man are included.

Analysis of work has shown that the net productivity hardly differs when the glaziers use the means. However, the time spent for rests was reduced by about 10%; presumably, this is the result of the reduction of the musculoskeletal workload. It may be expected that part of that time will be used to perform more work. As a working day consists of many different tasks, including travels, management and consultant estimate that an increase of productivity with 3% is likely. This 3% has a value of 3% of the margin between the turn over of two men minus their wages. The team's annual turnover is 1,670 person-hours x 2 men x Euro 35/hour = Euro 116,900. Their wages are: 2x Euro 26,000 = Euro 52,000. So the margin of their work is Euro 64,900. The new working methods lead to a gain in productivity of: 3% of Euro 64,900 = Euro 1,947/year. The increased productivity does not mean that the workload and the discomfort will not decrease. Especially peak loads on the back, arms and shoulders are reduced. As a result, the related health complaints are expected to decrease; so will the number of lost working days. The absenteeism rate in this branch of industry is 7%. From previous projects (Koningsveld and Thé 1999) we know that the absenteeism is caused for 45% by musculoskeletal disorders; 50% of these cases find their origin mostly or completely in the work. So 7% x 45% x 50% = 1.58% of the work force is lost by absenteeism as a result of manual handling. When the workers do use the tools and means frequently, the most physically straining work is eliminated, though not all of it. Therefore, it is likely that only part of the work related absenteeism by musculoskeletal disorders would decrease. The ergonomists have estimated a decrease by 40%. So the decrease in absenteeism is 40% of 1.58% = 0.63%, with a value of 0.63% x 2 men x wages of Euro 26,000 = Euro 328/year. In table 3 the usual presentation in a cash flow table is given. The benefits are given as negative amounts, the costs as positive.

Cash flow	Per year
Investments	
• Depreciation costs	€ 640
• Training in new working methods	p.m.
Operating costs	€ 200
• Inspection, maintenance	
• Reduction of lost working days	- € 328
Performance:	
• No third worker needed	- € 3.900
• Increased productivity	- € 1.947
Total cash flow	- € 5.335

Table 3. The financial costs and benefits of new glaziers' equipment

The benefits by productivity gains and reduced absenteeism are Euro 6,175. These benefits can be compared with the costs of Euro 840 per year. So, we can conclude that the financial ratio is very positive.

Besides several non-financial benefits can be seen. The work related discomfort is decreased. The health of glaziers will be saved better; on the long term, it is more likely that they can stay active in their job. These points are important for employers, as the recruitment of new young workers is a big problem. As the workload is lower, more people can perform the work. So the recruitment can be directed at a larger target group. The risk of damage to the panes, to the frames and to parts of the building is reduced, as the carts and hoists allow a better control over the handling process. The risk of cutting and falling accidents is also reduced.

To conclude

It is possible to establish the economic parameters of working conditions at a national level, at sector level, and for interventions. By doing so several goals can be met. For cost benefit analyses however, no simple calculations are available, nor a generic calculation model. It is always necessary to state the effects of certain measures and then find indicators to quantify these. If quantification is impossible, qualitative indications of effects may as well serve as convincing arguments. By working participatory with relevant stakeholders, much insight can be attained; even more important maybe that participation leads to acceptable outcomes.

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A burden to society, a prospect for companies

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TNO | Knowledge for business



Agenda

1. Costs incurred by poor working conditions

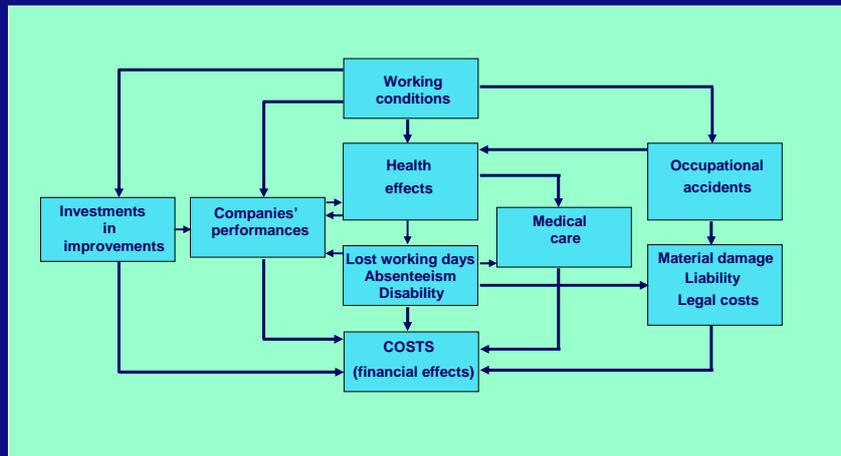
- Cost categories model
- Costs at a national level
- The Dutch costs of poor working conditions, 2001

2. Costs and benefits of interventions

- Working conditions and companies' performances (e.g. productivity, competitiveness)



Cost categories model



3

31 August, 2006



Costs at a national level

- Based on studies in 1997 and 2003
- Sources: publications, no new data collection
- Incidence costing vs annual costing

Incidence: all resulting costs of an event will be accounted in the year of the event (including costs in future)

Annual: all costs made in a specific year

4

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Costs at a national level

- Based on studies in 1997 and 2003
- Sources: publications, no new data collection
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5

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Costs at a national level

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- Sources: publications, no new data collection
- Incidence costing vs annual costing

Incidence: all resulting costs of an event will be accounted in the year of the event (including costs in future)

Annual: all costs made in a specific year

- Basic: in Netherlands no discrimination between social risk, and the occupational risk

6

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Lost working days: work related?

- Only part of absenteeism has its origin in work
→ we need a work related fraction (WRF)
- This WRF differs from diagnosis to diagnosis:
 - Occupational accidents are 100% work related
 - Skin diseases far less than 100%
- Literature based expert panels' guesses per diagnosis

7

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Work related fractions

Some examples:

- Musculoskeletal disorders: 45%
- Psychological diseases: 40%
- Skin diseases: 20%
- Cardio-vascular diseases: 20%
- Respiratory diseases: 15%
- Blood diseases: 3%

Sensitivity analyses learn: for most diagnoses a potential error has only minor effects on the total costs

8

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Costs of lost working days: how to assess?

- Absenteeism rate per diagnosis
- E.g.
 - musculoskeletal disorders: 33% of all lost working days;
 - respiratory diseases: 2%
- Costs of lost working days: costs of wages or added value, or the costs of temporary workers ?
 - At the national level: wages, as not all absenteeism does result in *extra* costs
 - For interventions: what are the effects of absenteeism ?

9

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Lost working days: the Dutch situation

- Employer pays sick person's wages for 2 years
- If longer: national disability compensation fund
- Regime has become increasingly tough:
 - compensation is only part of previous wages
 - other work must be accepted

10

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Costs of occupational disability

- Similar to costs of lost working days
- Diagnoses distribution is different
- Work related fractions are somewhat different
- Costs: paid compensation, as the premiums are also an instrument for politicians

11

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Costs of medical care

- At national level an interesting category
- For companies in NL not relevant, as all people are insured and premiums are fixed
- Calculation is very complex:
 - Total costs of medical care → costs per type of medical care
 - Exclude people <16 and >65 years
 - Split males / females
 - Use % employed per age cohort
 - Correct for medical consumption (working people < non-working)

12

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Occupational accidents

- In the Netherlands no discrimination between occupational and other accidents
- Result:
 - no reliable data of number of accidents
 - no data of the costs of accidents
- So the costs can only be calculated on the basis of new research, which was not part of the project
- So: health effects are included, material effects not

13

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Costs of prevention

- Legislation
- Labour Inspectorate
- Occupational health and safety services
- Companies' direct costs for H&S
- Research and consultancy

14

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Effect on companies' performances

At national level:

- National output (gross national product)
- Competitive strength

Very difficult to assess and to value!

For *interventions* many relevant indicators, like

- Productivity
- Quality
- Lead time (throughput time)
- Flexibility
- Personnel turnover

15

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Netherlands' costs of poor working conditions

2001	Euro per worker	%
Costs of lost working days		
work related absenteeism	527	29,8%
work related disability	609	34,4%
grants for return to work programs	103	5,8%
Costs of effects on companies' performances	p.m.	
Work related costs of health care		
of employees	116	6,6%
of disabled and other non participation work force	13	0,7%
Costs of prevention		
occupational health and safety services	120	6,8%
other companies' costs for prevention	157	8,9%
research and consultancy	10	0,6%
juridical costs	2	0,1%
administrative costs by companies	102	5,8%
legislation and inspection	6	0,3%
government grants for preventive investments	3	0,2%
Totaal	1.768	100%
Percentage van GNP	3,0 %	

16

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Conclusions national costs

- Costs for sub-optimal performances not included!
- Material effects of occupational accidents not included!
- 3% of gross national product is a significant sum
- Absenteeism and occ. disability: 70% of all costs
- Most important diagnoses:
 - Psychic diseases: 43 % of health related costs
 - Musculoskeletal: 40 %
 - Cardio-vascular: 5 %
 - Nervous system: 3,7%
 - Occupational accidents: 3,1% (only costs of health effects!)
 - Respiratory diseases: 2,3%
 - Skin diseases: 1,2%
- Legislation and inspection: 0,3% of all costs

17

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Costs and benefits of interventions

Cost and benefit categories:

Efforts:

- Investments
- Operational costs (annual costs)

Effects

- Health
- Safety
- Performances
- Liability
- Values and standards

18

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What are benefits ?

- Partly real benefits, like increased output, enhanced quality
- Partly reduced costs:



19

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Effects of OSH interventions

- Occupational safety and health interventions do effect company's performances
- OSH effects can be expressed in core business indicators, e.g.
 - Productivity products/day
 - Lead time minutes/product
 - Reliability of delivery % in due time; costs of too late
 - Quality % without faults; costs of repair
 - Flexibility workers; products; production rate
 - Workers' satisfaction change in score
 - Personnel turnover % better than/worse than target
 - Lost working days costs to replace absent workers + effects

20

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Increased productivity	Lower operational costs
Improved competitiveness	Company's values/standards

21 31 August, 2006 

<p>Increased productivity:</p> <ul style="list-style-type: none"> More efficient movements Fatigue ↓ Better motivation Personnel turnover ↓ Temporary workers ↓ Easier to assemble products 	Lower operational costs
Improved competitiveness	Company's values/standards

22 31 August, 2006 

<p>Increased productivity</p> <ul style="list-style-type: none"> More efficient movements Fatigue ↓ Better motivation ↑ Personnel turnover ↓ Temporary workers ↓ Easier to assemble products 	<p>Lower operational costs</p> <ul style="list-style-type: none"> Lost working days ↓ Cases of disability ↓ Easier and quicker return to work Temporary workers ↓ Costs to assist sick workers ↓ Rejected products ↓
<p>Improved competitiveness</p>	<p>Company's values/standards</p>

23 31 August, 2006 

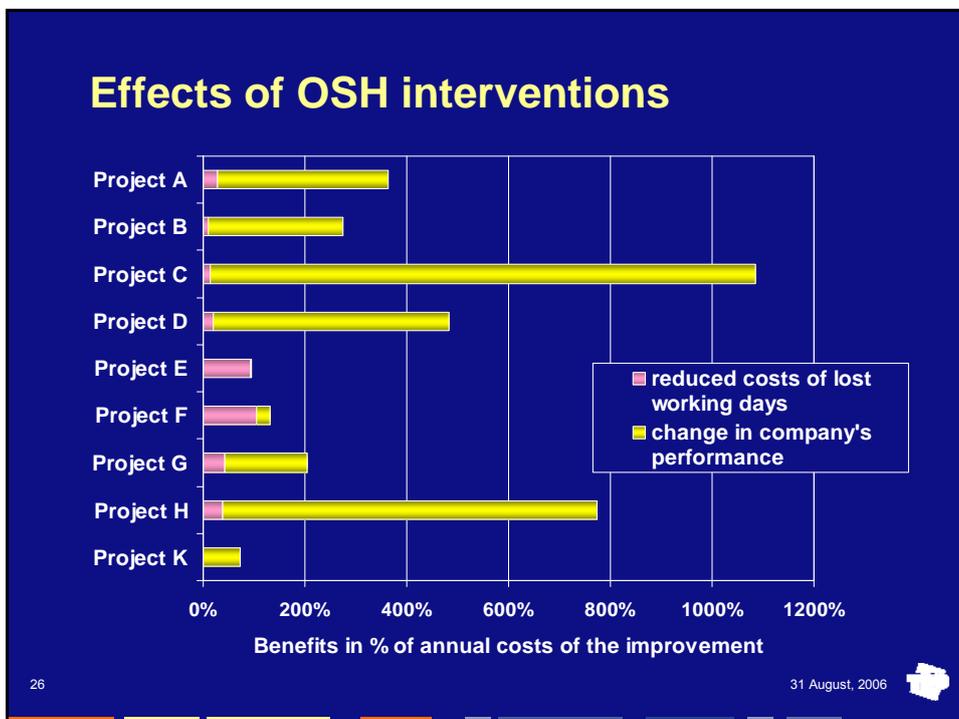
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<p>Improved competitiveness</p> <ul style="list-style-type: none"> Quality of production / products ↑ Flexibility of production ↑ Workers' satisfaction ↑ Clients' satisfaction ↑ Reliability of delivery ↑ Position on the labor market ↑ 	<p>Company's values/standards</p>

24 31 August, 2006 

<p>Increased productivity</p> <ul style="list-style-type: none"> More efficient movements Fatigue ↓ Better motivation Personnel turnover ↓ Temporary workers ↓ Easier to assemble products 	<p>Lower operational costs</p> <ul style="list-style-type: none"> Lost working days ↓ Cases of disability ↓ Easier and quicker return to work Temporary workers ↓ Costs to assist sick workers ↓ Rejected products ↓
<p>Improved competitiveness</p> <ul style="list-style-type: none"> Quality of production / products ↑ Flexibility of production ↑ Workers' satisfaction ↑ Clients' satisfaction ↑ Reliability of delivery ↑ Position on the labor market ↑ 	<p>Company's values/standards</p> <ul style="list-style-type: none"> Health and safety taken seriously "We are proud of our workers" Improved safety: accident rate ↓ Sustainable production, products

25

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26

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Conclusions

- Costs of poor working conditions are high: 3% of GNP
- Effects on companies' performances are not included!
- These may be another 2-3%
- Improving working conditions is profitable for companies.
- The Lisbon agreement (3% R&D) could benefit from better working conditions, and reverse!

27

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Thank you for your attention!

28

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Differences between sectors

- Two sectors compared:
- Building and construction / Education
Number of workers 280,000 / 355,000 (78% teachers)



Significant differences

- **Construction:**
 - High costs for occupational disability, predominantly caused in the past
 - Low costs for medical care
 - High costs for occupational health services
- **Education:**
 - High costs for absenteeism
 - Relatively high costs for occupational disability
 - Low costs for occupational health care

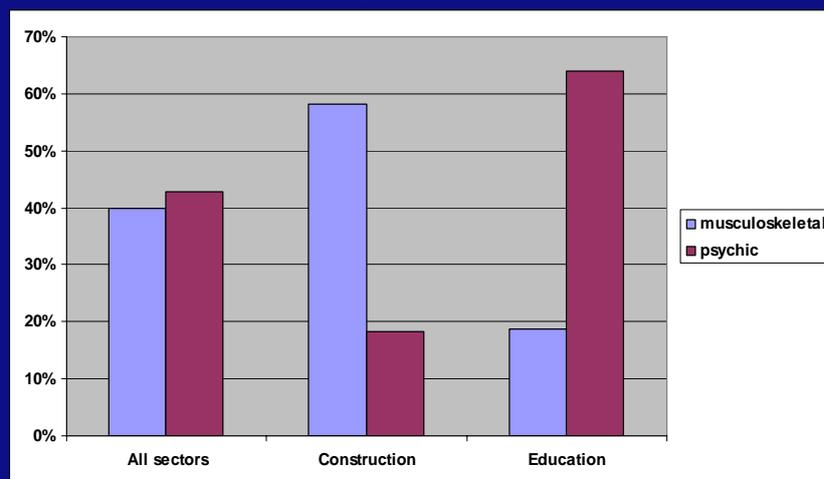
31

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Differences between sectors

Costs of health effects by diagnoses



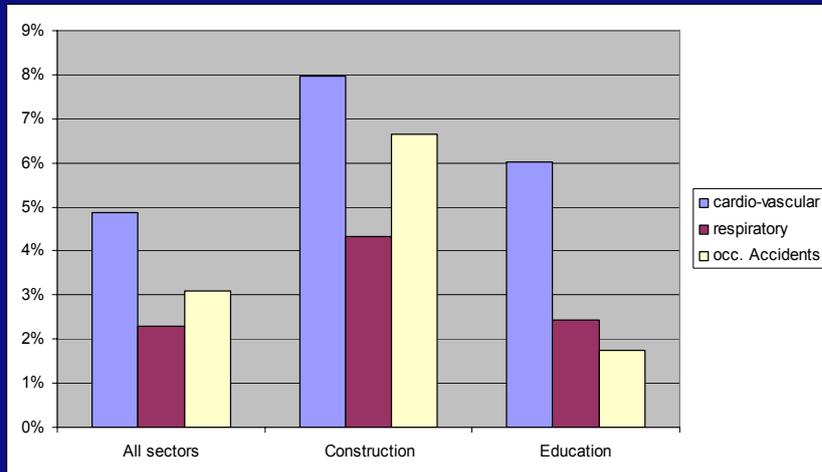
32

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Differences between sectors

Costs of health effects by diagnoses



33

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