A study on the economic costs of work-related MSDs in Switzerland

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Content

• The study
• Defining work-related musculoskeletal disorders wrMSDs?
• Results
• Modelling:
  • Working conditions and wrMSDs
• Discussion:
  • Economic costs for Switzerland
• Conclusions
The Database

- **Source:** Fourth European Working Conditions Survey
- **Interview data of a random selection of 847 employees in Switzerland**
  - Mastering the languages German, French or Italian
- **Cases:** n=176
  - Indicating backache and/or muscular pains judged to be work related by the interviewed subjects
- **Controls:** n=671
  - Indicating neither backache nor muscular pains judged to be work related
- **Potential occupational risk factors for wrMSDs included in the data source**
Search for risk factors


• Step 1:
  • Determination of risk factors for wrMSDS included by the „Dublin-survey“ . . . . . . . . Result n = 67

• Step 2
  • Univariate testing for significant relationships between variables describing the working situation and wrMSDs . . . . . . . . . . . . . . . . . . . . Result n = 29

• Step 3
  • Logistic regression with backwards elimination
    • . . . . . . . . . . . . . . . . . . . . Result n = 8
The question on wrMSDs

• Does your work affect your health, or not?
  • if Yes .......... > CONTINUE WITH . . .

• „How does it affect your health?“
  • . . .
  • „backache“
  • . . .
  • „muscular pains in shoulders, neck and/or upper/lower limbs“
  • . . .

Source: Fourth European Working Conditions Survey
Luxembourg: Office for Official Publications of the European Communities, 2007
wrMSDs in Switzerland

Prevalences in the Swiss working population 2005

• „Does your work affect your health, or not?“
  • . . .
  • „backache“
  • . . .
  • „muscular pains in shoulders, neck and/or upper/lower limbs“
  • . . .

18%
Yes: 31%

13%
The eight identified risk factors for wrMSDs by the logistic regression model:

(I) Physical loads and time pressure

<table>
<thead>
<tr>
<th>Carrying or moving heavy loads or persons</th>
<th>Percentage with wrMSDs</th>
</tr>
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<tbody>
<tr>
<td>half of the time or more (n=164)</td>
<td>0%</td>
</tr>
<tr>
<td>¼ of the time or less (n=683)</td>
<td>20%</td>
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<th>Vibrations from hand tools, machinery, etc</th>
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<td>half of the time or more (n=93)</td>
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<td>¼ of the time or less (n=754)</td>
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<th>numerical production targets or performance targets?</th>
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<td>Yes (n=471)</td>
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<td>No (n=373)</td>
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The eight identified risk factors for wrMSDs by the logistic regression model:

(I) Physical loads and time pressure

- Carrying or moving heavy loads or persons
  - Half of the time or more: (n=164)
  - ¼ of the time or less: (n=683)

- Vibrations from hand tools, machinery, etc
  - Half of the time or more: (n=93)
  - ¼ of the time or less: (n=754)

- Numerical production targets or performance targets?
  - Yes: (n=471)
  - No: (n=373)

Percentage with wrMSDs

- 0%
- 20%
- 40%

High risk

Many cases
The eight identified risk factors for wrMSDs by the logistic regression model:

(II) working time

In general, do your working hours fit in with your family or social commitments outside work?

- not very well / not at all well (n=101)
- very well / well (n=744)

How often do you have to interrupt a task you are doing in order to take on an unforeseen task? (and this is disruptive)

- sometimes … almost always (n=252)
- rarely / almost never (n=592)

You are free to decide when to take holidays or days off.

- rarely / almost never (n=309)
- sometimes … almost always (n=460)
The eight identified risk factors for wrMSDs by the logistic regression model:
(III) work satisfaction and collaboration

On the whole are you satisfied with working conditions in your main paid job?
- not at all / not very satisfied (n=86)
- very satisfied / satisfied (n=759)

You can get assistance from your superiors / boss if you ask for it?
- rarely / almost never (n=188)
- sometimes … almost always (n=650)
The used, simplified model for estimating the economic costs caused by wrMSDs

\[ y = 0.12x - 0.13 \]
\[ R^2 = 0.93 \]

Percentage with wrMSDs

Number of risk factors for wrMSDs present at the work place

Economic costs of work-related MSDs in Switzerland
EVD/SECO/ABGG and ETH Zurich – Thomas Läubli
## Estimations for Switzerland (3.2 Million employed persons)

<table>
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<tr>
<th>Cases with wrMSDs</th>
<th>Employed Swiss (3.2 Millionen)</th>
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<tbody>
<tr>
<td>thereof due to occupational risks</td>
<td>670‘000 cases</td>
</tr>
<tr>
<td>thereof due to occupational risks</td>
<td>560‘000 cases</td>
</tr>
</tbody>
</table>

| Absence from work due to health problems caused by your work | 1.6 million days |
| thereof due to occupational risks | 1.6 million days |

| Work situations with increased risks for wrMSDS | 1.8 million employees |

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Economic costs of work-related MSDs in Switzerland  
EVD/SECO/ABGG and ETH Zurich – Thomas Läubli
Costs due to absence from work: 970 million Swiss Franks (= US$)

Assumption*: one day of absence costs 600 CHF

The model shows:

- Absences from work due to wrMSDs cost Swiss companies huge amounts of money.
- Most subjectively work-related MSDs can be explained by risk factors at work.

Conclusion: A big deal of these losses can be avoided!

Costs due to reduced production by cases with wrMSDs: 3‘300 million Swiss Franks (= US$)

Assumption*: three percents reduction of efficiency in cases with wrMSDs.

- Reduced capacity in cases with wrMSDs leads to a loss of production equal to 3‘300 million per year.
- > 80% of these losses due to unfavorable working conditions.

**Conclusion: A big deal of these losses can be avoided!**


Costs due to lower efficiency in working conditions characterized by the presence of risks for wrMSDs: 5‘500 million Swiss Franks (= US$)

Assumption*: In work places characterized by increased risks for wrMSDs, five percentage increase in productivity can be reached improving organization and ergonomics.

- Conclusion: Optimizing the design of work improves productivity of companies and protects workers‘ health.