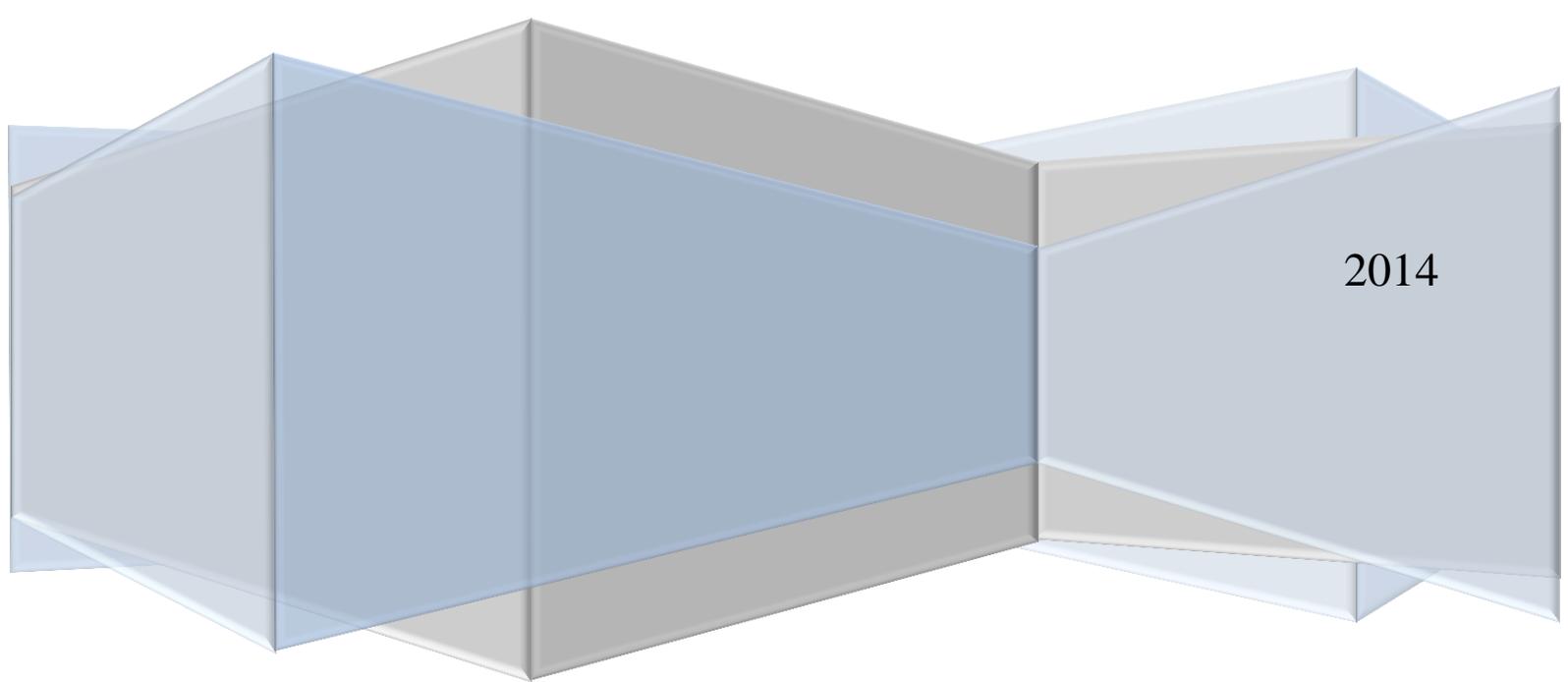


# Cost of lost labour input

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# Introduction

Lost labour input generates costs both to society and employers. Studies and calculations of these costs have been made from the point of view of the national economy. However, these calculations are difficult to apply to the workplace level, and there is no broad understanding of the basis for the calculations. In spite of this, only workplaces themselves can make work more productive and improve the well-being of their personnel. Therefore, it is important to calculate which costs of the lost labour input especially focus on workplaces.

The aim of this memorandum is to find a generally acceptable method to calculate the minimum costs of lost labour input. When the minimum costs are known, workplaces can, better than today, concentrate on both identifying the causes of costs and reducing the costs.

The starting point for the calculations was that some labour input is lost. The cost of lost labour input is at least as high as the pay of the employee, including non-wage labour costs. When employees are more productive than their pay, their work is value-adding. This added value cannot be defined reliably. For the calculations presented in this memorandum, an employee's pay, including non-wage labour costs, was used as a basis when calculating the lost labour input. The costs of sickness absence, presenteeism and incapacity for work were calculated using this method. The results concerning the costs of sickness absence and presenteeism can be used for comparisons on the workplace level.

With regard to disability pensions, the calculations focus on identifying the potential of lost labour input and defining its value. Costs due to accidents are based on insurance compensation payments and on generally accepted amounts of indirect costs. Health care costs of the working-age population are, in turn, a societal cost that can be indirectly affected by improving well-being at work.

These calculations use data from 2012, which was the latest year including all background information necessary for this purpose. However, the health care costs of the population are from the year 2011, which was the last year fully included in the statistics. The calculations cover mainly wage-earners — and are restricted by the availability of data. The appendix shows the accurate calculations and their sources.

The calculations presented in this publication are the result of co-operation with the following experts: Mr Guy Ahonen, Regional Director at the Finnish Institute of Occupational Health, Mr Niko Määttä, Research Supervisor at the Research Institute of the Finnish Economy (ETLA), Mr Pauli Forma, Director of Working Life Services at KEVA (the institution for public-sector earnings-related pensions), and Mr Risto Kaartinen, working life expert at KEVA. We offer our sincerest thanks to these experts for their contributions in developing and discussing the calculations.

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## Sickness absence

Sickness absence<sup>1</sup> is one of the most important factors leading to loss of labour input at workplaces. The lost labour input is a cost for the employer. Sickness absence periods are not divided evenly between the different wage-earner groups. Socio-economic differences are emphasised especially relating to long-term sickness leaves. The impact of these differences can be taken into account by calculating the cost of lost labour input separately for short-term and long-term sickness leaves (up to 10-day sickness leaves).

The number of long-term sickness leaves and the sums of pay as a basis for compensation are collected from sickness allowance statistics of the Social Insurance Institution KELA. The cost of lost labour input in the case of short-term sickness absence was calculated on the basis of the Labour Force Survey and the Structure of Earnings Survey from Statistics Finland. Those statistics show the sickness absence data and average pay of employees by employer sector.

*Cost of lost labour input = price of a sickness day \* number of sickness days*

**Cost of lost labour input due to long-term sickness absence,  
based on payment data from the Social Insurance Institution KELA**

*= EUR 150.39/day \* 11 414 403 days = EUR 1 716 612 067.17  
= EUR 1.7 billion*

**Cost of lost labour input due to short-term sickness absence**

*≈ EUR 1.7 billion*

According to Statistics Finland, in 2012 wage-earners had 20 193 000 sickness days in total. KELA's data show that long-term absences covered 11 414 403 days. The total number of sickness days due to short-term absence was then 8 778 597.

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<sup>1</sup> The statistics on sickness absence in the Labour Force Survey of Statistics Finland cover absences due to own illness or accident (e.g. occupational accident). Source: Statistics Finland, contacted on 10 April 2014.

Table 1. Cost of lost labour input due to short-term sickness absence, by employer sector

Employer sector	percentage among all sick days <sup>2</sup>	Number of sick days	Average annual earnings by employer sector <sup>3</sup> , EUR	Pay per day <sup>4</sup> , EUR / day	Cost of lost labour input
Private	63.69	5 591 088	50 226	198	1 107 035 424
State	5.93	520 571	55 863	221	115 046 191
Municipal	29.78	2 614 266	44 911	177	462 725 082
Unknown	0.6	52 672	49 108	194	10 218 368
<b>Total</b>	<b>100</b>	<b>8 778 597</b>			<b>1 695 025 065</b>

### Cost of lost labour input due to sickness absence

$$EUR\ 1\ 716\ 612\ 067 + EUR\ 1\ 695\ 025\ 065 = EUR\ 3\ 411\ 637\ 132 \approx EUR\ 3.4\ billion$$

### Per one wage-earner

$$EUR\ 3\ 411\ 637\ 132 / 2\ 146\ 000\ wage\text{-}earners \approx EUR\ 1\ 590 / wage\text{-}earner$$

Regarding the costs per wage-earner it is necessary to remember that the total includes part-time and fixed-term employees. The cost of lost labour input per wage-earner is therefore higher in the case of permanent full-time employees.

The cost of labour input lost due to sickness absence is about EUR 3.4 billion. The loss is about EUR 1 590 per wage-earner.

<sup>2</sup> Sickness absence of wage-earners by employer sector, Statistics Finland, 11 September 2014.

<sup>3</sup> Structure of Earnings 2012, publication, Statistics Finland.

<sup>4</sup> In theory 253 working days in 2012, according to the working hours survey by the Confederation of Finnish Industries EK.

<sup>5</sup> Presenteeism is a multidimensional concept. In this connection it is used to refer to attending work while sick. A wider interpretation of the concept also covers spending time ineffectively at the workplace.

## Presenteeism, i.e. attending work while sick

From the point of view of employers, besides sickness absence, also presenteeism leads to lost labour input<sup>5</sup>. Gary Johns states in his report *Presenteeism in the workplace: A review and research agenda* that presenteeism causes a greater loss than absenteeism, i.e. absence from work. Research has studied the costs of presenteeism on the basis of lost working hours. The minimum cost of labour input lost due to presenteeism can be calculated based on time spent on sickness absence and on the payroll.

Presenteeism has been studied by the Finnish Institute of Occupational Health. Research Professor Jari Hakanen says that the phenomenon of presenteeism relates to the different wage-earner groups more evenly than sickness absence or disability pensions. Therefore, it could be possible to use higher payroll levels for calculations of presenteeism than for calculations of sickness absence.

How great the loss due to presenteeism is varies between types of illness. Depression and strong pain cause the greatest losses. The aim in this report is to define a generally acceptable minimum cost for the loss of labour input. Therefore, a conservative estimate is that presenteeism is as major a problem as sickness absence.

### Estimation of the cost of presenteeism

*≈ EUR 3.4 billion*

### Per one wage-earner<sup>6</sup>

*EUR 3 411 637 132 / 2 146 000 wage-earners ≈ EUR 1 590 / wage-earner*

The cost of labour input lost due to presenteeism is about EUR 3.4 billion.  
Per one wage-earner, the cost amounts to about EUR 1 590.

<sup>5</sup> Presenteeism is a multidimensional concept. In this connection it is used to refer to attending work while sick. A wider interpretation of the concept also covers spending time ineffectively at the workplace.

<sup>6</sup> Number of wage-earners in 2012, Labour Force Survey, Statistics Finland

# Occupational accidents and diseases

Total costs<sup>7</sup> of occupational accidents are not known with certainty. They are divided into direct and indirect costs. The lost labour input and health care costs are direct costs. Those costs are covered by accident insurance. The indirect costs of occupational accidents include all other costs due to the accident: lost production, loss of sales, image losses, costs of accident investigation, and any potential legal expenses. According to research, the indirect costs are multiple compared to the direct costs.

The indirect costs of occupational accidents vary a lot. Different studies have tried to define the relation between direct and indirect costs. In Finland this problem has been lately dealt with by a project called *Turmitta*. On the basis of the literature and the *Turmitta* project, no generally valid ratio can be defined between direct and indirect costs. Researchers say that the only realistic way to determine the costs is to calculate them separately for each workplace and accident. Regarding the whole country, a conservative estimation is that the indirect costs are 3–4 times as high as the direct costs.

Absences due to accidents are included in the sickness absence statistics. However, most of the sick days are caused by illnesses. In their working hours survey, the Confederation of Finnish Industries EK stated that the percentage of absence due to occupational accidents varies between 0.1% and 0.5% of the theoretical regular working hours. Absence due to sickness or accidents was 4.2% of the regular theoretical working hours in EK member companies.

Employers use the same insurance for their employees' accidents and illnesses. In 2012, a total of EUR 584.74 million was paid as compensation for occupational accidents and diseases (Federation of Accident Insurance Institutions TVL, statistics on statutory accident insurance compensation). It is estimated that five-sixths of the insurance premiums for occupational accidents and diseases are used to cover the direct costs of occupational accidents.<sup>8</sup>

## Direct costs of occupational accidents

$$5/6 * EUR 584.74 \text{ million} = EUR 487.283 \text{ million} \approx EUR 487 \text{ million}$$

## Indirect costs

The indirect costs of occupational accidents can be calculated by multiplying the direct costs by 3 and 4. This calculation shows that the indirect costs of occupational accidents vary between EUR 1.5 billion and EUR 2 billion.

*The indirect costs are approximately EUR 1.5–2 billion.*

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<sup>7</sup> The concept of occupational accidents covers both accidents at the workplace and accidents on the way to or from work.

<sup>8</sup> The compensation payments for occupational diseases are approximately one-sixth of all compensation payments, and therefore it is estimated that the corresponding share of costs is one-sixth (TVL, estimation).

### **Total costs of occupational accidents**

$$\begin{aligned} &= \text{direct costs} + \text{indirect costs} \\ &= \text{EUR 487 million} + [(\text{coefficient 3 or 4}) * \text{EUR 487 million}] = \text{EUR 2–2.5 billion} \end{aligned}$$

Absence periods caused by accidents are already included in the sickness absence rates, and the costs of medical treatment after accidents are included in the health expenditure for working-age people.

Occupational diseases are illnesses which usually are caused by a physical, chemical or biological factor at work. In Finland, an act and decree lay down provisions on occupational diseases. As a rule, occupational diseases are defined on the basis of these two statutes. Occupational diseases usually develop slowly, and therefore the indirect costs of the diseases are difficult to estimate.

According to the Federation of Accident Insurance Institutions TVL, the compensation payments for occupational diseases are about one-sixth of the compensation payments for all accidents.

### **The proportion of occupational diseases among compensation payments to wage-earners**

$$1/6 * \text{EUR 584.74 million} = \text{EUR 97.46 million}$$

Direct costs of occupational accidents  $\approx$  EUR 500 million. Indirect costs of occupational accidents  $\approx$  EUR 1.5–2 billion.

**Total costs of occupational accidents  $\approx$  EUR 2–2.5 billion**

**Costs due to occupational diseases  $\approx$  EUR 100 million**

## Disability pensions

For the calculation of the costs of lost labour input due to incapacity for work, only those persons were included who had received a pension from the Finnish employment pension system. Pensions from the Finnish national social insurance have been left out of these calculations.

People usually start to receive a disability pension when they retire after a long-term sickness leave, and their work capacity has deteriorated over a long period of time. It is likely that this has also led to a decline of pay level. The average annual earnings by educational group used for the calculations are therefore higher than the real level of earnings at the time of retirement, when a person has become incapable of work. However, it is justified to use the average annual earnings by educational group because it is a societal objective that all persons with the capacity to work are supported in working to their full ability, without any decline in work capacity or pay level.

The statistics on disability pensions include both wage-earners and entrepreneurs. The reason is that the work history of entrepreneurs included in pension statistics may also include periods when the same persons worked as wage-earners. In those cases the person may receive a pension from both the pension system for entrepreneurs and from the employment pension system. And vice versa, a person receiving a pension from the employment pension system may also have worked as an entrepreneur during his or her working career. In our review of pensions due to disability, the focus lies on the loss of potential labour input from the point of view of the national economy. Annually, one employee per one hundred employees retires and starts to receive a disability pension. This means on an annual level that, in practice, nobody working in small an medium-sized enterprises retires due to disability.

In 2012, the total number of persons receiving a disability pension from the employment pension system was 192 768. It was calculated that part-time work carried out by persons receiving a disability pension was some 11 840 man-years. This means that the potential loss of labour input amounted to 180 928 man-years.<sup>9</sup>

### **Loss of potential labour input**

*EUR 8.0 billion*

The potential loss of labour input due to disability pensions in 2012 amounted to EUR 8.0 billion. The figure describes the loss of potential labour input during one year (2012).

<sup>9</sup> Statistics on persons receiving an employment pension and insured persons, Finnish Centre for Pensions ETK, KEVA, R. Gould, K. Kaliva, ETK Report 2010:5 on Disability pension and employment.

Table 2. Lost labour input of persons receiving a disability pension within the employment pension system in 2012, by educational level

Educational level	Percentage <sup>10</sup>	Number	Monthly earnings <sup>11</sup> , EUR	Annual earnings <sup>12</sup> , EUR	Lost labour input <sup>13</sup> , EUR
Primary education	29	52 469	2 725	41 740.19	2 190 066 029
Secondary education	51.2	92 635	2 750	42 123.13	3 902 076 147
Polytechnics degree	12.1	21 892	3 276	50 180.13	1 098 543 405
Bachelor's degree	3.7	6 694	3 352	51 344.26	343 698 476
Master's degree	3.7	6 694	4 407	67 504.22	451 873 248
Licentiate or doctoral degree	0.3	543	5 311	81 351.24	44 173 723
<b>Total</b>	<b>100</b>	<b>180 928</b>			<b>8 030 431 031</b>

<sup>10</sup>Percentage and number were calculated on the basis of N. Järnefelt, S. Nivalainen, A. Salokangas, H. Uusitalo, ETK Report No 01/2014 on socio-economic differences.

<sup>11</sup> Wage-earners' total monthly earnings in 2012, by educational level, Statistics Finland, Structure of Earnings Survey 2012.

<sup>12</sup> Annual earnings have been calculated using the formula: monthly earnings \* 12.5 \* 1.2254.

<sup>13</sup> Lost labour input was calculated using the formula: average annual earnings on an educational level \* number of persons incapable of working on that educational level.

## Health care expenditure in Finland

The cost of health care for the working-age population (aged 15–64) amounted to EUR 8.28 billion in 2011. The estimation of the health care expenditure for the working-age population is not updated annually.<sup>14</sup>

The expenditure for preventive measures and health promotion were about EUR 488 million in 2011. The figure does not include the second compensation class of the occupational health care, i.e. the expenditure for GP medical care and other medical care organised in addition to occupational health care. The figure (EUR 488 million) only includes the first compensation class of the occupational health care, i.e. expenditure for preventive measures and for activities maintaining the work ability of personnel.

### **Health care costs of the working-age population without preventive measures<sup>15</sup>**

$$EUR\ 8\ 280\ million - EUR\ 488\ million = EUR\ 7\ 792\ million$$

The primary national health problems are not work-related but work can affect them. The interventions carried out at workplaces can have impacts on work arrangements and even on health behaviour, which can reduce public health problems also on the individual level.

Work and working conditions cause some of the illnesses. However, the impact of work and working conditions varies depending on the types of illness and, for example, between cancer types this impact ranges from 2% to almost 90%. According to international research, work and working conditions cause 11% of asthma cases and 37% of back pain cases. At the moment, it is not possible to define how high of a percentage is caused by work and working conditions among all health expenditure. Some estimates can be found for certain diseases and disease groups.

In 2012, the working-age population totalled 3 517 089 persons (Statistics Finland, demographics). The percentage of wage-earners among the whole population is about 60, which means 2 146 000 persons.

Health care costs of the working-age population, preventive measures not included

$$EUR\ 8\ 280\ million - EUR\ 488\ million = EUR\ 7\ 792\ million.$$

<sup>14</sup>National Institute for Health and Welfare, Health expenditure for men and women by age group in 2011; A. Alila, Ministry of Social Affairs and Health.

<sup>15</sup> Figures provided by Antti Alila, Ministry of Social Affairs and Health, and detailed data on 2011 from Petri Matveinen, National Institute for Health and Welfare.

# Summary

## Lost labour input:

- sickness absence  $\approx$  EUR 3.4 billion
- presenteeism  $\approx$  EUR 3.4 billion
- incapacity for work  $\approx$  EUR 8 billion

## Occupational accidents and diseases:

- occupational accidents  $\approx$  EUR 2–2.5 billion
- occupational diseases  $\approx$  EUR 0.1 billion

## Health care costs:

- $\approx$  EUR 7.8 billion (preventive measures not included)

## In total:

- EUR 24.45–24.95 billion (any overlap has been subtracted)

## References:

Confederation of Finnish Industries EK. Työaikakatsaus. Työajat ja poissaolot EK:n jäsenyrityksissä vuonna 2012. (Working hours survey. Working hours and absences at EK member enterprises in 2012. Available in Finnish.)

Federation of Accident Insurance Institutions TVL, Finland. – Information on compensation amounts; informal communication, 9 December 2013.

Federation of Accident Insurance Institutions TVL, Lakisääteisen tapaturmavakuutuksen korvaukset 2013. (Compensation from statutory accident insurance in 2013. Available in Finnish.)

Financial Supervisory Authority. Lakisääteisen tapaturmavakuutuksen analyysi. (2012) (Analysis of statutory accident insurance in 2012. Available in Finnish.)

Finnish Centre for Pensions & Keva 2014. Pensioners and insured in Finland 2012.

Finnish Centre for Pensions. Statistical database. Eläkkeensaajat, eläkkeelle siirtyneet, työeläkkeellesiirtymisikä. (Pensioners and the age of retirement for the employment pension. Available in Finnish.) – Additional information received by email on 13 March 2014.

Gould R, Kaliva K, Työkyvyttömyyseläke ja ansiotyö, ETK Raportteja 2010:5 (Disability pension and employment. Report of the Finnish Centre for Pensions 2010:5. Available in Finnish.)

Järnefelt, N., Nivalainen, S., Salokangas, A. & Uusitalo, H.: Sosioekonomiset erot - työurat, eläkkeelle siirtyminen ja eläkejärjestelmä. Eläketurvakeskuksen raportteja 01/2014. (Socio-economic differences – working careers, retirement and the pension system. Report of the Finnish Centre for Pensions 01/2014. Available in Finnish.)

Johns, G. 2010. Presenteeism in the workplace: A review and research agenda. *Journal of Organizational Behavior* 31, p. 519–542.

Ministry of Labour 1996. Ikääntyvät työelämässä. Ikääntyvien työllistämisedellytysten parantamista selvittäneen komitean mietintö 1996:14, liiteosa. (Ageing persons in working life. Annex to committee report 1996:14. Available in Finnish.)

National Institute for Health and Welfare THL: Miesten ja naisten terveysmenot ikäryhmittäin 2011. (Health expenditure for men and women by age group in 2011. Available in Finnish.) – Additional information by email from Alila, A., Ministry of Social Affairs and Health, Administration and Planning Department.

Statistics Finland. Labour Force Survey. Database on stat.fi. – Additional information by email from Statistics Finland on 10 April 2014. Data on sickness absence days received on 11 September 2014.

Statistics Finland. National Accounts. – Additional information by email from Statistics Finland on 17 April 2014.

Statistics Finland. Structure of Earnings 2012.

Ministry of Social Affairs and Health, Department for Occupational Safety and Health, Finland

Tappura, Nenonen, Heikkilä, Reiman, Rasa, Ratilainen: Estimating overall costs of occupational accidents in the Finnish industrial sector. – Additional information by email and telephone from Tappura on 19 March 2014.