

# Estimating the costs of work-related accidents and ill-health: An analysis of European data sources

European Risk Observatory

Executive summary

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This report was commissioned by the European Agency for Safety and Health at Work (EU-OSHA). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect the views of EU-OSHA.

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Luxembourg: Publications Office of the European Union, 2017

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## Abstract

EU-OSHA aims to produce an estimation of the costs of accidents at work, work-related health problems and deaths in Europe. A first step to achieve this objective entails the production of an overview of the availability and quality of national and international data sources that could be needed for the development of such a European level cost calculation. The current report presents the results of this first step.

The availability of relevant data was searched at the international level as well as at the national level in the EU28, Iceland and Norway. Data were collected with help of country experts who were asked to fill out templates relating to sources of cases and costs of accidents at work and work-related health problems.

The resulting data were assessed against predefined quality criteria. For the costs assessment was limited to an overview of availability.

After assessing the coverage and quality of data sources, it turns out we do not have enough data to determine cases of the work-related burden of disease at the European level. Data from accidents at work as well as data from work-related health problems are lacking, not reliable or insufficient.

With regard to costs we found that direct healthcare costs can be deduced from international data sources. Calculating indirect costs will be challenging since several additional costs and costs on the friction period are missing. Based on the available data sources on gross salary we recommend adopting the human capital approach. Essential precondition for such an approach however, is that the number of missed workdays can be estimated.

Despite the lack of data, some of the gaps may be filled through estimation. Suggestions for an approach to do so can be based on the following observations:

- In some countries the availability of data sources seems reasonably sound and may be sufficient to carry out a cautious estimation. Subsequently, these results may be used to estimate the costs in other countries with comparable structures.
- Through a combination of figures on the work-related fraction of diseases, figures on incidence and prevalence of these diseases, and figures on costs, a cost estimation may be feasible for some specific diseases.
- Since much research has been done on the impact of certain risk factors on specific health problems, and figures on the occurrence of certain risk factors are also available, a cost estimation by risk factor seems to be feasible.

An approach like this may allow for a partial cost estimation. However, an estimate of the *total* burden of work-related disease is only possible when based on a considerable amount of assumptions.

## 1 Executive summary

Although many countries realize the importance of Occupational Safety and Health (OSH), many workers still face unhealthy and unsafe working conditions (International Labour Office, 2011<sup>1</sup>). In the EU-28 in 2013, there were approximately 3.1 million non-fatal accidents with at least four days of absence and 3,674 fatal accidents in the EU-28 (Eurostat, 2016a)<sup>2</sup>. In the same year, the percentage of the EU-28 population suffering from one or more work-related health problems, caused or made worse by work, was on average 7.4 % (Agilis, 2015<sup>3</sup>).

A healthy and safe work environment is not only desirable from the workers' perspective, but also contributes considerably to labour productivity and promotes economic growth. OSH increases the competitiveness and productivity of enterprises by reducing costs resulting from accidents at work and work-related health problems and by enhancing worker motivation. Moreover, a decrease in accidents and work-related health problems relieves pressure on public and private social protection, insurance and pension systems.

EU-OSHA aims to produce an estimation of the costs of accidents at work, work-related health problems and deaths in Europe. In order to achieve this objective, EU-OSHA will take a two-stage approach. The first stage entails the production of an overview of the availability and quality of national and international data sources that could be needed for the development of a European level cost calculation. In this report the results of the first stage are presented.

To estimate the costs of the work-related burden of disease, it will be necessary to estimate the number of cases, and subsequently apply monetary values to the identified cases. The availability of relevant data sources on costs and cases was searched at the international level as well as at the national level in the EU28, Iceland and Norway. We engaged country experts in the project to collect information on the availability of data sources at the national level. To harmonise the data collection of the country experts we made use of templates. In order to ensure these templates captured all relevant information, we did a literature search before the final structure of the template was defined. In this literature search, existing studies on costs of accidents and work-related health problems were consulted. Moreover, we composed country profiles to identify the national structures that determine the reporting of accidents and work-related or occupational diseases and to identify relevant characteristics for cost estimations. These profiles enable a better understanding of the availability and quality of the data identified throughout the project.

The template on cases should cover every category of work-related ill-health. Cases refer to accidents at work and to health problems which are (partly) caused or aggravated by work. Health problems in which the occupational factor is the only or the most important cause are also identified as 'occupational diseases'. We identified four main categories:

- accidents at work;
- occupational diseases;
- work-related diseases and
- presenteeism.

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<sup>1</sup> International Labour Office. (2011). *XIX world congress on safety and health at work: ILO introductory report: Global trends and challenges on occupational safety and health: Istanbul, turkey, 11-15 September 2011*. Geneva: ILO.

<sup>2</sup> Eurostat. (2016a). Accidents at work statistics. Retrieved from [http://ec.europa.eu/eurostat/statistics-explained/index.php/Accidents\\_at\\_work\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Accidents_at_work_statistics)

<sup>3</sup> Agilis, S. A. (2015). Statistics and informatics. Final statistical report on the quality assessment and statistical analysis of the 2013 ad hoc module. 2015. Retrieved from: [http://ec.europa.eu/eurostat/documents/1978984/6037334/Evaluation\\_report\\_LFS\\_AHM\\_2013.7z](http://ec.europa.eu/eurostat/documents/1978984/6037334/Evaluation_report_LFS_AHM_2013.7z)

For each category, the template contained questions about source information, geographic scope, time reference (e.g. single study, continuous registration), accessibility, disaggregation potential (by age, gender, economic sector, occupation, type of employment or diagnosis) and coverage (e.g. sectors excluded, self-employed excluded). If applicable, information relating to the type of health problem and severity was collected as well as general reporting criteria, such as voluntary or obligatory, incentives, and estimates on underreporting. Furthermore, the template contained specific information relating to the categories. For example, “what is the definition of ‘accident’?”

To get an overview of the available sources needed to estimate the costs of accidents at work, illnesses, deaths and presenteeism, we collected information with regard to the following cost categories:

- Productivity costs;
- Healthcare costs;
- Quality of life losses;
- Administration costs; and
- Insurance costs.

To enable the completion and interpretation of the costs, the cost categories were subdivided into subcategories, dependent on the cost bearer. Cost bearers may be:

- Workers and family;
- Employers;
- Government; and
- Society.

The assignment of quality scores was not possible for cost data sources as cost categories were often based on a variety of data sources, and information concerning quality was often lacking. Therefore, this overview of data sources on costs will be limited to the availability of the data. To assess the coverage of data sources on costs, we first identified the cost types that were considered the most essential for our aim, which resulted in the following direct and indirect cost types:

- healthcare costs within the healthcare system: overall health spending and overall medical costs for workers in disability schemes;
- productivity costs: gross salary, number of working days lost, friction period<sup>4</sup>, overall costs of sick pay/sickness benefits, overall costs of incapacity/disability benefits;
- additional costs not covered by the two previous categories: the costs of temporary worker replacement, recruitment costs and rehabilitation costs.

In addition to these costs we also estimated the costs of the impact of work-related health losses on life. These costs refer to the value of loss in quality of life or to the loss of life itself. It is not possible to assign a monetary value to this loss directly. However, by assigning a value to the loss of quality of life, it ensures that the impact of work-related illness on quality-of-life loss is considered when making decisions on OSH. When included in cost estimates, quality of life is often the largest component.

After the assessment of coverage and quality of the data sources needed, we came to the following conclusions:

- With regard to accidents at work, in the international data sources [European Statistics on Accidents at Work (ESAW) and Labour Force Survey ad hoc modules (LFS-AHM)] many countries have missing or unreliable data for non-fatal accidents. In some countries, national sources are available that may complete or replace the international data sources; however, we cannot be sure of their quality.

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<sup>4</sup> The friction period is the time needed until another worker from the pool of unemployed has fully replaced the individual who is absent due to illness (W. Kirch, 2008, Encyclopedia of Public Health, Springer)

- In addition to accidents at work, the occurrence of occupational diseases, defined as illnesses caused by work, is an important indicator for the work-related burden of disease. However, the debate on what diseases are caused by work and what diseases have another origin is not yet over. European countries apply different lists of occupational diseases and diagnostic criteria.
- Data are available on work-related health problems for all European countries in the present study. Although the data originate from sound international sources (surveys of high quality), the value of self-reported work-related health problems for estimating the work-related burden of disease is limited. Apart from the general limitations of international surveys, such as recall bias, wording problems and cultural differences, the main limitation is the inability to assess fatal diseases and diseases with a long latency using a survey. Further only one disease per year is taken into account, even if further incidents of ill-health occurred, which can lead to underestimation of the real problem.
- Data on presenteeism, derived from a high-quality survey, were obtained for all countries. However, this information is not sufficient to estimate the productivity and output losses or any other costs due to presenteeism as no information is available on work-relatedness or the extent of productivity loss.
- We have data on the prevalence and incidence of diseases for all countries. However, to assess the work-related burden of disease, we still need to know the work-related fraction of these diseases.

In summary, there were insufficient data to identify cases of the work-related disease at the European level. There is a paucity of robust, reliable data relating to accidents at work and work-related health problems.

Although data on cases are missing, we identified sources on costs:

- The majority of countries provided data sources on overall health spending and overall medical costs for workers in disability schemes. To place the actual magnitude of healthcare costs in perspective, data on productivity costs and loss of quality of life are of great importance.
- With regard to productivity costs, international data sources provided data only on gross salary. National data on the number of working days lost, friction period, overall costs of sick pay/sickness benefits and overall costs of incapacity/disability benefits are fragmented, making the calculation of productivity costs challenging. The human capital approach seems the most appropriate means of calculating the cost of poor OSH practices, but this approach still requires the estimation of the number of work days.
- Data on additional costs — mainly used for the friction cost approach — are rare. Therefore, extra costs of replacing a sick worker and reaching the initial productivity level cannot be calculated.
- With regard to the quality-of-life losses, almost no data are available on quality-adjusted life-years or willingness to pay. An alternative may be found in the disability-adjusted life-year (DALY), provided by the Global Burden of Disease study. The work-related fraction is required to calculate the number of DALYs associated with accidents at work and work-related illness.

In summary, direct healthcare costs can be deduced from international data sources. However, calculating indirect costs is challenging, as several additional costs and costs on the friction period are missing. Based on the available data sources on gross salary, we recommend adopting the human capital approach. However, to use this approach, estimation of the number of work days missed is essential.

Despite the lack of data, some of the gaps may be filled through estimation. Below we list some possibilities.

- In some countries the availability of data sources appears to be reasonably sound and complete and may be sufficient to carry out a cautious estimation. Subsequently, these results may be used to estimate the costs in other countries with comparable structures.
- Through a combination of figures on the work-related fraction of diseases, incidence and prevalence of these diseases and costs associated with such diseases, a cost estimation may be feasible for some specific work-related diseases.
- Since much research has been done on the impact of certain risk factors on specific health problems, and figures on the occurrence of certain risk factors are also available, a cost estimation by risk factor seems feasible.

These methods may allow a partial cost estimation. However, an estimate of the **total** burden of work-related disease would require a considerable number of assumptions to be made.

#### **Development of an approximate economic costing model**

Given the limitations of national data sources discussed in this report, EU-OSHA will collaborate with the ILO, Finland and Singapore in the development of an approximate cost estimate, based on available data at international level, to calculate a rough cost estimation for each EU member state including Norway and Iceland. The calculation will be based on DALYs (disability adjusted life years) lost due to occupational injuries and work-related diseases. It is planned to present this estimate together with the ILO at the XXI World Congress on Safety and Health at Work in Singapore in September 2017.

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