

## Developing Official Statistics on Accidents at Work in Norway

Jensen, Arne

*Statistics Norway, Division for Health Statistics*

*Kongens gate 6*

*NO-0033 Oslo, Norway*

*E-mail: arne.jensen@ssb.no*

Bråthen, Remy

*Statistics Norway, Division for Health Statistics*

*Kongens gate 6*

*NO-0033 Oslo, Norway*

*E-mail: remy.brathen@ssb.no*

### Introduction

The production of official statistics on accidents at work is a priority both at the international level in The EU and at the national level in Norway. The EU has passed the Regulations that constitute the legal basis for mandatory annual reports on accidents at work from EU member states and EFTA-countries like Norway to the EU in accordance with the European Statistics on Accidents at Work (ESAW) methodology developed in Eurostat (EU 2011, EU 2008). At the national level the Norwegian Government underlines the need for knowledge-based policymaking while supervisory authorities are preoccupied with information that helps them exercise their regulatory authority on different areas of the working life.

Pursuant to the Statistical Act Statistics Norway is the central body of production and dissemination of official statistics in Norway. This implies that Statistics Norway shall identify and place in order of priority the needs for official statistics, coordinate comprehensive statistics which are produced by administrative agencies, develop statistical methods and apply statistics to analysis and research, provide information for statistical use for research purposes and for public planning, and bear the main responsibility for international statistical cooperation. However, the area of accidents at work involves several governmental bodies and agencies at different jurisdictional levels in Norway. Moreover, there are some major challenges to be faced at the national level to provide methodological sound official statistics and to meet the requirements of international reports. Hence the development of official statistics requires collaboration with and contributions from different national stakeholders.

The paper tries to describe the current situation in Norway regarding the data collection, different sources of basic data, and the systemic and statistical challenges Norway is facing when developing official statistics on accidents at work. Furthermore, the paper tries to introduce the different actions that are carried out at the national level to fulfil international obligations as well as national needs for official statistics.

### The current situation in Norway

The purpose of producing official statistics on accidents at work in Norway is to fulfil international statistical obligations and to meet at least the most fundamental national needs for information on this area. Currently Norway is reporting accidents at work to the EU (Eurostat) but these reports are not sufficient to cope with the valid EU Regulations. Furthermore, there are produced some statistics on accidents at work at the national level but the statistics is too fragmented to give a comprehensive and coordinated picture of the situation.

Despite the insufficient and fragmented nature of current reports and statistics, and the methodological and conceptual differences between them, it is important to gain some insight into the data sources they are founded on to understand the actions that are carried out in Norway. And while some of the data sources provide information about non-fatal accidents, others contain data on fatal accidents at work.

### *Data sources and data collection*

Reports on accidents at work to Eurostat are principally based on data from the National Insurance System (NIS). The Norwegian Labour and Welfare Administration (NLW) administer the NIS including the paper based forms that are used for reporting accidents at work and occupational diseases in Norway. These forms are first of all the basis for the NLW's administration of occupational injury compensation but provide the basic data for the Eurostat reports as well. In practice it is the Norwegian Labour Inspection Authority (NLIA) that is carrying out the annual reports to Eurostat based on copies of the paper based forms received from the NLW. It should be noted that the NLW data primarily covers the non-fatal accidents at work and that the NLW is neither producing any regular statistics based on the basic data nor on the administrative decisions that are reached about the compensation.

The supervisory authorities of the Norwegian working life have administrative registers which include data on non-fatal and fatal accidents and are to some extent producing statistics within their jurisdiction. The NLIA produces some information about accidents in land based parts of the Norwegian working life, the Petroleum Safety Authority (PSA) focuses on accidents that take place offshore, the Norwegian Maritime Directorate (NMD) is preoccupied with accidents at sea, and finally the Civil Aviation Authority (CAA) is concerned with accidents at work that occur in civil aviation. The data collection systems used by the supervisory authorities differ from each other and are established for supervisory purposes. The information provided by these authorities is not coordinated at the national level.

The Causes of Death Register (CDR) is a national health register that contains information about all deaths among Norwegian residents. The Norwegian Institute of Public Health (NIPH) is the governmental body responsible of the data processing in the CDR while Statistics Norway administers the registrations in the register. The data is registered on the basis of paper based forms for medical declaration of death (declaration of death form) filled out by the designated doctor. The declaration of death form consists of some parts which are reserved for deaths caused by accidents and the information is coded and registered by Statistics Norway. This includes the geographical location (where the fatal accident occurred) and the activity (the activity that was carried out when the fatal accident occurred).

In addition to the registers introduced above Statistics Norway is on a relatively regular basis carrying out two surveys that are relevant in this context. The Labour Force Survey (LFS) is carried out four times a year and in 2007 a Eurostat-designed module that provided information about accidents at work was included. According to plans the module is to be repeated in 2013. On the other hand the Level of Living Survey (LLS) is carried out approximately every third year and in 2009 the survey included information about accidents in particular.

### *Systemic and statistical challenges*

In order to produce official statistics on accidents at work that is consistent with current international guidelines for official statistics, e.g. Code of Practice, and with international obligations and national needs for statistics, some systemic and statistical challenges have to be faced.

Firstly, with regard to information about non-fatal accidents at work the current fragmented data collection systems in Norway represent a challenge in the sense that there is need for more coordinated basic data for statistical purposes. Different governmental authorities operating within different jurisdictions collect data and produce statistics for different purposes. There is an understanding among the stakeholders at the national level that the data collection related to the NIS and administered by the NLW has the best prospects in respect of coordination. However, to make the best possible use of the NIS data the data collection system has to be changed. More specifically there is reason to believe that the data collection, the coverage of information and the quality of data would be enhanced if an electronic solution for electronic forms replaces the present paper based forms used to report occupational injuries at the national level.

Secondly, the preliminary analysis of NIS data displays some biases and underreporting of accidents at work between different industries. The Norwegian system for reporting accidents at work could be said to lack some of the financial incentives to report accidents other states have embedded in their insurance systems. Additionally, comparisons between insurance data from the NIS and data from the LFS and the LLS displays that the frequency of reports on accidents registered in the NIS differ extensively from one industry to another. Therefore, despite the potential to coordinate and improve the data collection by introducing an electronic solution for reporting occupational injuries in Norway, there is need for developing refined weights based on other data sources to control for biases and underreporting in the basic data.

Thirdly, the challenge of fragmented and unsound data collection systems is also present with regard to information about fatal accidents at work. The supervisory authorities have information about fatal accidents within their limited jurisdictions but this information is not compiled or coordinated across the jurisdictions at the national level. The CDR contains information about all deaths among Norwegian residents but the data which helps extract and define deaths caused by accidents at work is either lacking or invalid for statistical purposes. Finally the NIS could provide some useful data on compensations related to fatal accidents at work, e.g. dependent's pensions, but there is reason to believe that this only include some of the cases. Therefore, in the short term data from the supervisory authorities should be put together and utilised to assess the quality of the information for statistical purposes. In the long term the administration of the CDR should be altered to rely on electronic declaration of death forms which contain explicit and valid information about deaths caused by accidents.

## **Actions of development carried out in Norway**

### *Non-fatal accidents at work*

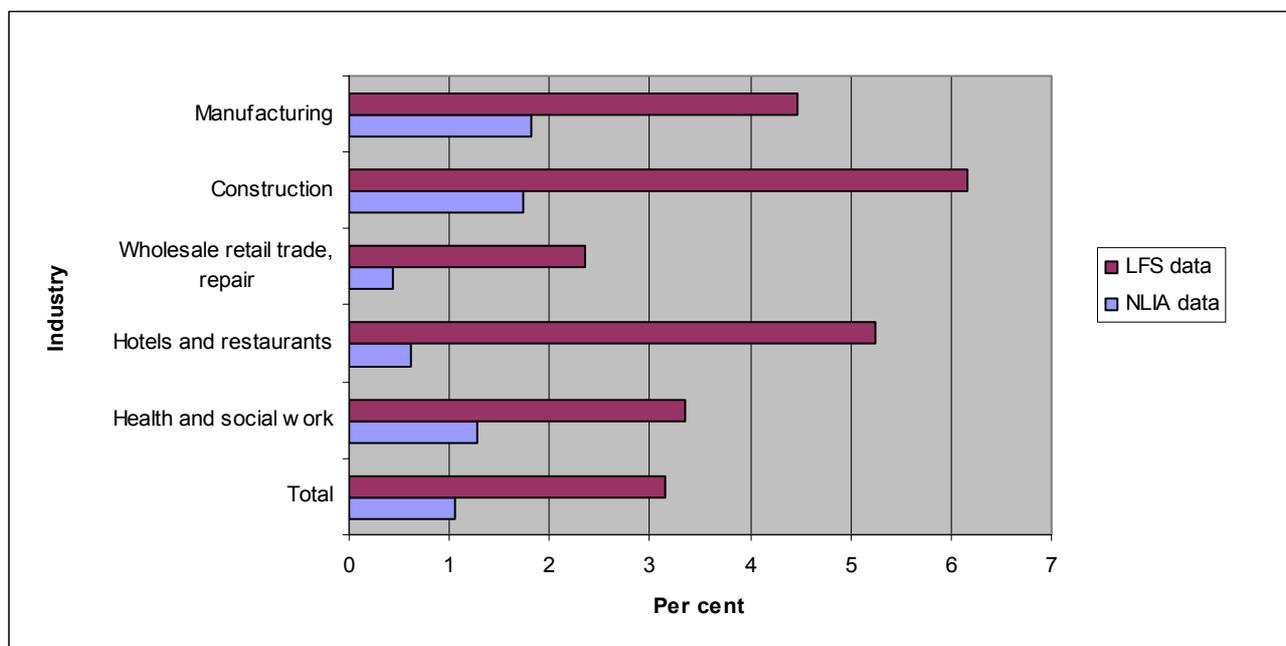
In order to develop official statistics on non-fatal accidents at work there is a need for a fundamental overhaul of existing data collection systems. More information about the accidents is needed and the quality of the data must be improved. To face these challenges different stakeholders in Norway have agreed to replace the current paper based regime for reporting occupational injuries to the NLW and introduce an electronic solution. The solution will be based on the Altinn portal, which was launched in 2003 and is the most widely used internet portal for public reporting in the Norway. Altinn contains several hundred forms and services from 29 Norwegian governmental agencies are currently available through Altinn.

An electronic solution provided by Altinn for reporting occupational injuries to the NLW has some important advantages. Among other things the users of Altinn can either fill in the forms directly in the internet portal or they can use their own IT systems to transfer data. Furthermore, Altinn automatically preregister all relevant data in the forms based on information extracted from administrative registers. Additionally Altinn provides the opportunity to implement one electronic solution which covers all the sectors of the Norwegian working life and replaces the current four paper based NLW forms.

At present, and since 2005, the NLIA reports non-fatal accidents at work from Norway to Eurostat based on data extracted from copies of the paper based NLW forms. Among other things the questionable access to the NLW forms and the limited coverage regarding accidents that occur outside the NLIA's jurisdiction, have made it necessary for the NLIA to adjust for biases and underreporting. Consequently the current reports on accidents at work to Eurostat include a weight of 2.5 that is constructed on the basis of survey data and used for all non-fatal accidents. However, findings from the LFS carried out in 2007 suggest that the NLIA has access to approximately a third of all accidents at work in Norway and that a weight of 3.0 would have been more proper. Furthermore, data from the LFS indicates biases in the data accessible for the NLIA with regard to age, sex and industry. In short, the flat weight of 2.5 has to be refined to present a better picture of accidents at work in Norway.

Figure 1 shows the percentage of employees reporting accidents at work in 2007 among some selected industries based on data reported through the LFS (LFS data) and data reported to Eurostat (NLIA data) respectively. The number of employees reporting accidents at work is presented as a percentage of the total number of employees within the different industries.

**Figure 1. Employees reporting accidents at work, by industry. Non-weighted data from the Norwegian Labour Inspection Authority (NLIA data) and the Labour Force Survey (LFS data) respectively. 2007 (per cent)**



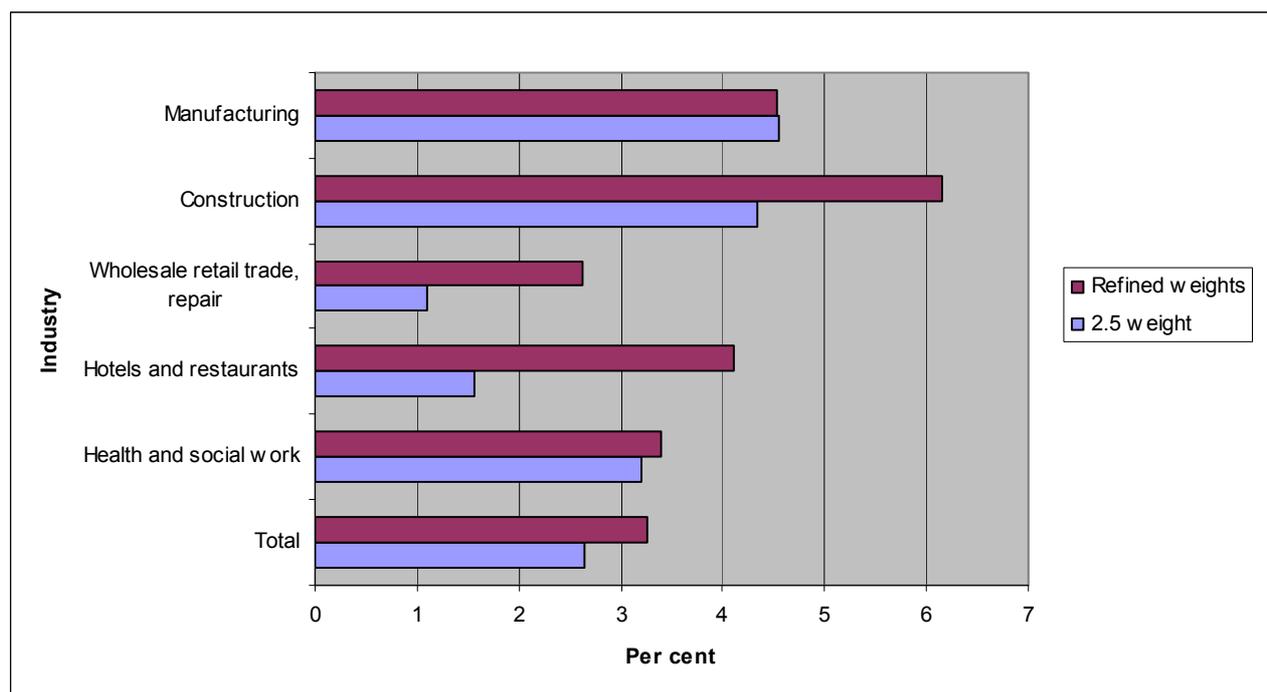
Data source: Labour Force Survey 2007. The NLIA reports on accidents at work to Eurostat 2007

Figure 1 shows that there is a substantial difference between the LFS data and the NLIA data with regard to the percentage of employees reporting accidents at work within the industries. Consequently a weight of 2.5 will adjust for some underreporting but will not adjust for the biases between industries. These and similar findings with regard to age and sex has prompted a need for more refined weights that take more than the general underreporting into account.

Refinement in weights is limited by the sample size used for weighting. If the sample contains few observations the representativeness of the findings will be questionable. Additionally, a weight that is based on a relatively small sample is more susceptible to volatility in future adjustment of the weight. In other words there is reason to develop and use weights that account for the sample size they are based on and could prove robust in the foreseeable future.

Preliminary efforts to construct more refined weights that account for more detailed biases and underreporting of accidents at work at the national level, has yielded 22 different weights based on age and industry. There is reason to underline that the efforts are not finalized. Nevertheless, Figure 2 shows the percentage of employees reporting accidents at work in 2007 among some selected industries based on data reported to NLIA, weighted according to weights based on age and industry (refined weights) and a flat weight of 2.5 (weight of 2.5) respectively. The percentage of employees reporting accidents at work is presented as a percentage of the total number of employees within the different industries.

**Figure 2. Employees reporting accidents at work, by industry. Norwegian Labour Inspection Authority data weighted by refined weights and the weight of 2.5 respectively. 2007 (per cent)**



Data source: Labour Force Survey 2007. The NLIA reports on accidents at work to Eurostat 2007

Figure 2 shows that the percentage of employees reporting accidents at work in some industries, e.g. manufacturing, is barely affected by the changes in weights while the situation in other industries, e.g. hotels and restaurants, shows substantial differences. The results indicate that the development of more refined weights is an important matter in the time to come.

In general the development of official statistics on non-fatal accidents at work must be carried out based on the main principles of official statistics as they are stated in the European Statistics Code of Practice (EU 2005). Non-excessive burden on respondents and cost effectiveness are two of these principles. The principle of cost effectiveness should be upheld by merging the existing paper based forms into one electronic form and disseminate the information between stakeholders in governmental agencies for administrative and statistical purposes. The principle of non-excessive burden is upheld by utilizing existing information registered in administrative registers, and by designing a user-friendly electronic form that is intuitive and easy to fill out. Both the amount of time reporters has to use on the form and the complexity of the form will have a major effect on the quality and the reporting levels.

#### *Fatal accidents at work*

The data collection systems in Norway which currently are used to document fatal accidents in the Norwegian working life have some limitations when used for statistical purposes. As a matter of fact it could be stated that the two most relevant systems represent somewhat opposite challenges. The supervisory authorities collect and register information about the fatal accidents within their jurisdiction but the cases are not compiled and coordinated across the different jurisdictional areas (lack of coordination). On the other hand the Causes of Death Register (CDR) contains information about all deaths among Norwegian residents but cannot provide sufficient data to extract the deaths caused by accidents at work (lack of identification).

Pursuant to the Statistical Act Statistics Norway has taken steps to collect data from the supervisory authorities to address the lack of coordination between their data collection systems regarding information about fatal accidents. Firstly, the purpose is to map out the total number of fatal accidents and the information registered for every accident in each of the registers. The timeliness could be inconsistent across

the registers but the intention is to collect data from the past 5 completed years. Secondly, the cases and the information related to each case have to be assessed in relation to international guidelines for official statistics (i.e. the Code of Practice) and coded according to current international methodology (i.e. the ESAW methodology).

The National Surveillance System for Work Environment and Occupational Health (NOA) estimates the amount of fatal accidents to be 60-70 per year based on data from supervisory authorities. This indicates that the work load of coding the accidents should become manageable. However, there is reason to believe that the registers have different methodologies embedded, e.g. in respect of population, which in turn makes the quality assessments of both registers and data more difficult. Therefore, the ultimate situation would be to produce official statistics on fatal accidents at work based on methodological sound data extracted from only one register, i.e. the CDR.

The CDR is currently inadequate in respect of identifying the deaths caused by accidents at work. The paper-based declaration of death form does contain questions regarding these deaths but in practice the information is either lacking or incomplete. Furthermore, and as a result of the present difficulties to collect additional information about the deaths that are suspected to have been caused by accidents, the register is not able to provide data to fulfil international obligations and national needs. The NIPH and Statistics Norway have started the work to establish a system based on electronic declarations of deaths forms which will replace the current paper-based forms. Although the purpose is to improve the quality of the CDR and the current data collection system in general, and not only to improve registrations regarding accidents, this could prove vital for statistics on fatal accidents at work.

Finally it should be noted that researchers have recommended that the information about fatal accidents collected by supervisory authorities should be compiled with information registered in the CDR to improve the quality and the completeness of the latter (Wergeland et al. 2009). Currently this is infeasible due to the practical difficulties and the workload such actions concerning the CDR imply. Therefore, in the short run the parties involved in the development of statistics on fatal accidents at work will rely on data from the supervisory authorities but is at the same time aiming at basing the statistics on the CDR in the longer run.

#### *Discussions at the national level*

The actions carried out at the national level to develop statistics on both non-fatal and fatal accidents involve several governmental agencies in Norway. Statistics Norway is administering the actions but the contributions from actors like the Ministry of Labour, the Norwegian Labour and Welfare Administration (NLW), the Norwegian Labour Inspection Authority (NLIA) and the National Surveillance System for Work Environment and Occupational Health (NOA) are important.

Statistics Norway has founded a National Board made of all the actors mentioned above. The fundamental topic of discussions is the implementation of EU Regulations on Health and Safety at Work, e.g. ESAW, in Norway. Accordingly the developments regarding an electronic solution in the NLW has been presented and debated in the forum. The most controversial issue addressed within the board is the question of financing the electronic solution in the NLW. Therefore, the meetings of the National Board have been important with regard to the formal hearings of the EU Regulations in Norway.

Statistics Norway has also founded a Collaboration Project made of all the same actors with the exception of the Ministry of Labour. At the project level there are a range of statistical questions being addressed. The enhancement of dataflow and the development of a new electronic solution for reporting occupational injuries to the NLW are the most fundamental problems. Additionally the project is occupied with coverage of variables, i.e. the type of information which is needed to fulfil international obligations and national needs, different actors' juridical access to data on occupational injuries, questions concerning statistical methodology, e.g. the use of weights to adjust for biases and underreporting, and coverage of all areas of the Norwegian working life.

The activities of the National Board and the Collaboration Project have to be maintained in the future to secure further developments and to carry out the actions necessary to fulfil international obligations and establish official statistics on accidents at work in Norway.

### **Conclusion and closing comments**

The EU Regulations as regards to statistics on accidents at work and the Norwegian governmental bodies' needs for information on this statistical area encourage and root the efforts of developing official statistics on accidents at work in Norway. At the same time there are some fundamental challenges to be faced and some extensive actions to be carried out at present and in the future. The paper has tried to describe some of the most important challenges and actions Statistics Norway and other governmental agencies have to deal with in the time to come.

## REFERENCES

EU (2011): Commission Regulation (EU) No 349/2011 of 11 April implementing Regulation (EC) No 1338/2008 of the European Parliament and the Council on Community statistics on public health and health and safety at work, as regards statistics on accidents at work, European Union

[http://eur-](http://eur-lex.europa.eu/Notice.do?val=570168:cs&lang=en&list=570168:cs,525958:cs,509633:cs,506143:cs,503214:cs,500537:cs,485786:cs,483364:cs,482438:cs,482095:cs,&pos=1&page=1&nbl=42&pgs=10&hwords=ESAW~&checktext e=checkbox&visu=#texte)

[lex.europa.eu/Notice.do?val=570168:cs&lang=en&list=570168:cs,525958:cs,509633:cs,506143:cs,503214:cs,500537:cs,485786:cs,483364:cs,482438:cs,482095:cs,&pos=1&page=1&nbl=42&pgs=10&hwords=ESAW~&checktext e=checkbox&visu=#texte](http://eur-lex.europa.eu/Notice.do?val=570168:cs&lang=en&list=570168:cs,525958:cs,509633:cs,506143:cs,503214:cs,500537:cs,485786:cs,483364:cs,482438:cs,482095:cs,&pos=1&page=1&nbl=42&pgs=10&hwords=ESAW~&checktext e=checkbox&visu=#texte)

EU (2008): Regulation (EC) No 1338/2008 of the European Parliament and of the Council of 16 December 2008 on Community statistics on public health and health and safety at work, European Union

<http://epp.eurostat.ec.europa.eu/portal/page/portal/health/documents/Regulation%20no%201338-2008%2016Dec2008%20JL354%20p.70.pdf>

EU (2005): European statistics code of practice for the national and community statistical authorities, European Union

[http://epp.eurostat.ec.europa.eu/portal/page/portal/product\\_details/publication?p\\_product\\_code=KS-77-07-026](http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/publication?p_product_code=KS-77-07-026)

Wergeland, E., Finn Gjertsen and Johan Lund (2009): Mortality due to occupational injury is underreported (summary), *The Journal of the Norwegian Medical Association*, **129**:981-6

[http://www.tidsskriftet.no/index.php?seks\\_id=1833447&a=summary&art\\_id=1833398](http://www.tidsskriftet.no/index.php?seks_id=1833447&a=summary&art_id=1833398)