**Differences in accidents at work statistics between the Nordic countries**

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**Abstract**

*In 1990 work began at European level to harmonize the criteria and the methodologies used to record data on accidents at work (see ESAW 2001). When it comes to accidents at work statistics, the European countries can be divided in two: Countries with statutory accident insurance system (by law) and countries without such a system. In addition to Finland, in Germany, Portugal, Spain, France, Switzerland, Austria, Italy, Luxemburg and Belgium there is a statutory accident insurance system (by law), and the reporting of accidents is financially profitable to the employer – only claimed accident at work cases are compensated.*

*Accidents at work statistics are not fully comparable between European countries, because the definitions, concepts and principles for statistics compilation differ. The term “accident at work” differs from country to country. Comparing the Finnish accidents at work statistics to other countries is only valid to countries with similar statutory accident insurance and compensation system.*

*In practice, also the structures of economies, availability of production factors, standard of living, location or weather conditions differ from country to country.*

*Comparison with the Nordic countries to each other could, however, be meaningful if there would be a fundamental co-operation between the national insurance systems, regarding for example the data collection.*

*In this paper we discuss ways to improve the comparability of accidents at work statistics in Finland, Norway and Sweden*.

# 1.The Finnish System

*1.1 Data collection from the statutory workers’ compensation insurance*

Under the Workers’ Compensation Act, the employee is always entitled to compensation for losses caused by an occupational accident or disease.

The employer is obliged to take out insurance cover against occupational accidents and diseases from the insurance company of its choosing. The employer is also obliged to notify the insurance institution of an accident at work.

Wage earners’ and entrepreneurs’ statistics on accidents at work are collected by the 12 insurance institutions. Data is then sent to the Finnish Workers' Compensation Center (TVK). Farmers’ accident data is collected by The Farmers’ Social Insurance Institution (Mela). The statistics of accidents at work are then delivered from TVK and Mela to the Statistics Finland for official publication and for the further processing, and the Statistics Finland, in turn, delivers data to the Eurostat and the ILO.

In the claims handling process all the data along with all the other information required to make the claims decision and for compensating the given medical treatment and paying of other benefits mentioned in the Workers’ Compensation Act is collected.

The coding of the variables is made in the first possible step in the notifying process. In most cases it is for example team leader, supervisor, secretary, HR, accountant, manager or the owner of a company who fills in a notification to the insurance company. Employer representative also fills in the required ESAW codes.[[1]](#footnote-1) If the codes are missing the insurance company has to fill in the missing codes with the information supplied by the employer. TVK does not contact the employer directly if the data is incorrect or missing. Corrections to the codes are possibly made by the insurance company. TVK has minimal control over the content of accident description text and validity of variable coding.

In practice the distributed worker’s compensation insurance system means also distributed coding of accident data. Many of the people involved in the coding of variables are unexperienced in the terminology and the coding but have more accurate information of the accident itself. Some of the insurance companies, work safety expert companies and software providers have also support services, guides and software/internet tools to assist in finding and choosing the correct codes. Majority of the notifications are nowadays made electronically, but still it is possible to make the notification manually using an old-fashioned paper document. There are many steps in the process of the data collection and a lot of interesting information that could be helpful for accident prevention is “lost”. Prevention work could use more and better data but the economic burden of the data collection process has to be taken into account every time when discussing changes to the system. In the distributed data collection system even a minor change in data collection results in many changes in ICT-systems of all the stakeholders (and is experienced to be hard and slow to implement and expensive).

For accidents at work all the costs of the medical care (including first aid) given by the medical institutions are invoiced usually (in most cases) directly from the insurance company. In case of an accident at work the medical institution has to ask or check the insurance company of the employer to send the invoices. When the insurance company receives the information from the medical care institution they can check whether the employer has supplied all the required information for that accident. This results in relatively good coverage. However the insurance institution prioritizes the success of the compensation process, not in the quality of the coded variables. In some cases the missing codes must be accepted because information is unavailable for some reason. Quality of the coding can also be evaluated afterwards with the written description of the accident.

The insurance company checks the information in the compensation process and in the following step TVK also checks the data for errors and for missing values.

Labour Inspectors can access accident statistics but they have no major role in the data collection process.

Also accidents at work for the employees of uninsured employers are covered in statistics. When the employer does not have an insurance policy, the TVK operates the compensation process. For entrepreneurs themselves taking an insurance cover is voluntary. Accidents at work of those entrepreneurs that do not have an insurance policy are not covered in the statistics.

For suspected and proven occupational diseases the process of data collection is different. Finnish Institute for Occupational Health (FIOH, [www.ttl.fi](http://www.ttl.fi)) has a major role in publishing statistics for occupational diseases.

Workers’ Compensation Act (459/2015) can be read in Finnish and Swedish from [www.finlex.fi](http://www.finlex.fi) and an unofficial English translation can be found from [www.tvk.fi](http://www.tvk.fi).

# 2. The Norwegian System

Enabled by the implementation of a new data collection system in 2015, Statistics Norway has produced methodologically sound official statistics on accidents at work since. The process of developing statistics on accidents at work in Norway has been presented at the 58th and 60th World Statistics Congress ISI in 2011 and 2015. This section will highlight data processing and dataflow of the current system and discuss experiences using the system to produce official statistics.

## 2.1 Current System

In figure 1, the dataflow between the Norwegian Labour and Welfare Administration (NLW) and Statistics Norway is outlined. After an accident at work has taken place, the NLW receives and scans the received form and transmit image files of the forms and extracted register data to Statistics Norway. This system was realised in January 2015.

*Figure 1 – Dataflow and data collection system between NLW and Statistics Norway.*

(1) The employer, the employee or other authorized person sends the form to the NLW

(2) The NLW receives and scans the form and extracts some data from their systems

(3) The NLW sends scanned forms (tiff-files) and other data (csv-files) to Statistics Norway

(4) Statistics Norway receives, interprets and registers information in designated registers

(6) Statistics Norway administers registers, produce official statistics and produce reports to Eurostat

(5) Statistics Norway joins this information with administrative registers on employment and demography

Official statistics on accidents at work has been published by Statistics Norway on a yearly basis since 2015 using the system outlined above. Issues that affect data processing remains, such as; 1) incentives to report an accident is skewed and barriers to reporting might not be insignificant; 2) not all NLW forms are equal, some cannot be interpreted; 3) quality issues in some variables due to item non-response within the NLW form; and 4) the system have contingencies and dependencies on NLW IT-systems beyond Statistics Norway’s control. Statistics Norway has employed methods for correcting these issues.

## 2.2 Underreporting and Incentives

It has become evident that the incentive(s) to report an accident are skewed and clustered by industry. The main incentive to report an accident to the NLW is to trigger national insurance for occupational injuries, and which is statutory for the employer to sign on behalf of the employee. However, those who are self-employed are not affected by the mandated insurance scheme. Thus, Statistics Norway are experiencing underreporting within industries such as agriculture, forestry, and fishing. This is corroborated by findings during data processing, especially when joining data on occupational injuries with administrative registers on work status, employer, and industry. Statistics Norway has also integrated data from surveys such as work environment survey and labour force survey to examine the issue further.

## 2.3 Interpreting NLW-forms and Information Loss

Using Eyes and Hands FORMS 5 (Optical Character Recognition (OCR), Intelligent Character Recognition (ICR), and Optical Mark Recognition (OMR)) to capture data from the received NLW forms is challenging due to information loss. Sometimes the information loss of an accident at work is complete, and sometimes it pertains to systematic low levels of information and quality for variables which could produce official statistics. The latter is often the issue for variables that describe the accident such as type of accident or date of accident, and is due to the employer, which is usually the party filing the forms, not completing the entire form. Statistics Norway encounter the former issue that the .tiff-file cannot be interpreted at all due to old NLW-forms being used by the employer, rendering the information within the form unusable. However, the associated .csv-file for the accident is still usable.

Statistics Norway has employed methods to address both issues. To combat low level quality in variables such as we join the interpreted information with information from administrative registers such as work status, associated industry, employer, as well with demographic information such as nationality where applicable and available. We also use these registers to calculate relative incidence rates within aggregated industry classifications. Weighting is applied to interpreted forms to address forms that could not be interpreted. The process is based on the available .csv-file for the form that couldn’t be interpreted and is predominantly used to correct for length of absence from work due to injury, within industry. Checks have shown that this method, albeit simple, does not further skew length of absence.

## 2.4 System Dependencies and Contingencies

The NLW has a major role in facilitating dataflow, and the current system rests on NLW scanning and transmitting the received forms to Statistics Norway, but also on NLWs IT-infrastructure. Initially, files were delivered by CD/DVD, but the implementation of a Secure Shell File Transfer Protocol (SFTP) improved dataflow greatly. The process of scanning forms is not regarded as a potential source of error as much as the filters used by the NLW when they extract the reported accidents. Thus, potential upgrades to the NLW IT-systems could have major effects on the cases which are reported to Statistics Norway if the upgrades can affect the number of cases transmitted to Statistics Norway.

A change in 2018 within the NLW IT-system had severe negative effects on data transmission to Statistics Norway. A peripheral change thought to have no effects on the filter and the selection of cases transmitted to Statistics Norway were implemented in NLW IT-systems early 2018. Consequently, the change affected the filters which in turn decreased the number of accidents at work which were reported to Statistics Norway and hampered dataflow. With somewhat severe ramifications to Statistics Norway’s data processing, the change was identified and rectified within NLW IT-systems. However, after identifying the issue, it took more than six months to assume normal dataflow between NLW and Statistics Norway and claimed more resources for both parties. Thorough examination of the new data, dataflow, and concurrent data processing shows no lingering effects on data.

# 3. The Swedish System

## 3.1 ISA - information system on occupational injuries in Sweden

The first generation ISA (information system on occupational injuries) was commissioned in 1979. It took place in connection with the introduction of new health and safety law and Swedish Work Environment Authority took over responsibility for the work injury statistics from Swedish Social Insurance Agency.

Since its inception in 1979, there has been close cooperation between the Swedish Work Environment Authority and the Swedish Social Insurance Agency. By law, employers are required to notify occupational injury to the Swedish Social Insurance Authority and serious accident and serious incident at work to the Swedish Work Environment Authority. For this, a work injury form stating that the Swedish Social Insurance Authority provides the Swedish Working Environment Authority with a copy of the notification for statistical purposes and monitoring of events. Now there is a digital channel www.anmalarbetsskada.se for these two types of notifications.

There is an agreement between the Swedish Work Environment Authority and the Swedish Social Insurance Agency which regulates the responsibilities between the interface and the authorities. Practically, it is solved by storing every digital notifications of occupational injury in the Swedish Work Environment Authority system. At the same time, data is transferred automatically to the Swedish Social Insurance Agency for their processing. However, all information is stored in the Swedish Work Environment Authority's system, due to the statistic mission. Paper notifications, however, goes to the Swedish Social insurance Agency and their partner Iron Mountain (formerly Recall) that scans and ensures that digital transmission is made to the Swedish Work Environment Authority respective Swedish Social Insurance Agency. Also in this case all notifications are stored in the Swedish work environment authority's system.

The Swedish Work Environment Authority was formed in 2001 through the merger of the National Board of Occupational Safety and Health and the Labour Inspectorate. Today, ISA structure consists of several generations who all still are used more or less.

*3.1.1 1979-1991 ISA*

The first generation of ISA is today called ISA79-91. Work injury reports were made on paper and reported, at the time, to the 20 different local Swedish Social Insurance Agency’s in Sweden. Swedish Social Insurance Agency sent a copy of the work accident report with annexes to the National Board of Occupational Safety and Health which since microfilmed documents. The original notifications was retained by the Swedish Social Insurance Agency.

*3.1.2 1992-2001 NYISA*

The second generation is called NYISA. t Occupational injury notifications were still sent in paper to the Swedish Social Insurance Agency, which then provided the occupational safety and health with copy that were microfilmed.

*3.1.3 2002- ISA3*

The third generation is based on NYISA but called ISA3. This was the introduction of a new input programme – Isak - to implement the coding, and that instead of microfilming so introduced scanning. ISA3 of today (2018) handles only work injury reports received by the Swedish Social Insurance Agency on the paper and transferred to the Swedish Work Environment Authority as scanned images and text files. The intention is to phase out paper management in line with the increasing use of digital services.

*3.1.4 2012- E-ISA, ESKADA*

The fourth generation of the ISA was introduced in December 2011 when the Web form www.anmalarbetsskada.se was in use and are referred to as ESKADA or E-ISA. In connection with the Web form introduced a new system whereby notifications of serious accidents and serious incidents relating to the Working Environment Act and occupational injury notifications concerning the Social Insurance Code were coordinated. The aim was to make reporting easier for the employers that could make the two different reports in one Web form.

*3.1.5 2017- B2B*

From 2017 ESKADA also treats notifications arriving via a web-service (B2B). Web-service offers employers the opportunity to incorporate notification functionality in their own intranet or deviation system. Notifications via digital channels is increasing constantly.

## 3.2 Notifications to Swedish Work Environment Authority according to the Work Environment Act

Notifications of serious accidents and serious incidents at work to the Swedish Work Environment Authority according to the Work Environment Act corresponds what was previously known as notifications of serious accidents and serious incidents at work to the Swedish Work Environment Authority according to the Working Environment Regulation. The Working Environment Regulation stems from the Labour Inspectorate and inspection within the Swedish Work Environment Authority. Notifications according to the Work Environment Act were dealt with in the context of diary management and case management system Sara 1 and SARA 2. 2005 introduced a special module in SARA called P2 to handle the notifications to the Swedish Work Environment Authority according to the Work Environment Regulation. In 2012 (December 2011) coordinated the flow of notifications from the Social Insurance Code (to Swedish Social Insurance Agency) and notifications from the Work Environment Act (to Swedish Work Environment Authority) and while P2Eskada is created when there is a requirement to distinguish between the two types of notifications.

## 3.3 EU statistics

In connection with the introduction of the new input programme ISAK in 2002 to encode injury reports notified to Swedish Social Insurance Agency, Sweden went over to using the new classifications for encoding of reported accidents at work recommended by Eurostat. This meant that many old classifications were removed and replaced . Certain classifications such as Economic Activity of the employer (NACE) and occupation of the victim (ISCO) previously built on international classifications. But now, it also included classifications linked to the causes and circumstances of the accidents. During the first years, Eurostat common classifications of occupational accidents were based on "gentlemen's agreement", but from 2013, there is a legislation (349/2011) that accurately describes what the Member States are to deliver to Eurostat.

## 3.3.1 Delivery of occupational injury statistics to Eurostat

According to *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,* EU member states annually deliver accidents at work (annex IV) and occupational diseases and other work-related health problems and illness (annex V). Which describes the overall tasks to be delivered and even recommendations for more specific information that Eurostat would have.

For accidents at work is there since 2013 an implementation legislation, *Commission Regulation (EU) No 349/2011 of april 2011, implementing Regulation (EC) No 1338/2008 of the European Parliament and of the Council on Community statistics on public health and health and safety at work, regarding statistics on accident at work*.

The Swedish Work Environment Authority has since the entry into force of the regulation 1338/2008 delivered accidents at work as well as occupational recognised diseases to Eurostat, using the additional data from the Swedish Social Insurance Agency. The Swedish Work Environment Authority has also participated in the two working groups related to accidents at work (ESAW) or occupational diseases (EODS) at Eurostat.

In connection with the implementation of the legislation 349/2011 the delivery of accidents at work gave Sweden trouble with one of the tasks to be delivered. It's about the number of days lost for the accident in which Sweden has only information of the number of days lost over two weeks in connection with the introduction of the sick pay period for the employer in 1992. This means that only about half of the delivered work accidents has information of the number of days lost. Eurostat has questioned this, and the Swedish Work Environment authority is trying to find a solution to the problem.

## 3.3.2 EU classifications of occupational accidents

In addition to the obligatory classifications in phase 1 and phase 2 are choice of elective classifications linked to the causes and circumstances of accidents at work in phase 3. At least three of the eight classifications are required in phase 3. Of the eight classifications, Sweden chose the following ones:

Eight classifications in the phase 3:

Working Environment Not chosen

Working Process Not chosen

Specific Activity Not chosen

Material Agent to Specific Activity Not chosen

**Deviation Chosen**

**Material Agent to Deviation) Chosen**

**Contact - Mode of Injury Chosen**

Material Agent to Contact – Mode of Injury) Not chosen

# 4. Conclusion

There is a clear need for a fundamental co-operation between the national insurance systems, regarding for example the data collection, to improve the comparability of accidents at work statistics. Furthermore, one needs to compare the frequencies or accidents ratios or other key figures, not just the number of accidents, by pair countries, in order to balance out the economic structures and population size of different regions.

Statistics Finland and Statistics Norway have already started the co-operation; there has been two accident at work seminars, in February 2011 and in September 2014 in Helsinki, Finland. Also connecting Sweden (and Denmark) to this joint Nordic co-operation would be justified and endorsed.

Pan-Nordic accidents at work statistics seminar in Finland, Norway or Sweden in the near future could be the next step in order to provide better mutual understanding in the Nordic countries.

**Sources: European statistics on accidents at work (ESAW). Methodology. 2001 Edition.**[**https://ec.europa.eu/eurostat/ramon/statmanuals/files/ESAW\_2001\_EN.pdf**](https://ec.europa.eu/eurostat/ramon/statmanuals/files/ESAW_2001_EN.pdf)

1. In some cases the accident is notified to the insurance company by the medical institution, the injured worker or by a bookkeeping company or maybe even near-automatically by a company’s own ERP/HSE management system. [↑](#footnote-ref-1)