

12th World Conference on Injury Prevention and Safety Promotion

Thematic conference on occupational safety:
Conference from OSH strategies to practice

Tampere, 18-21 September 2016.

Reliability of work injury statistics in the BSN countries - decision making based on partial facts?

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BALTIC SEA NETWORK ON OCCUPATIONAL HEALTH AND SAFETY, SINCE 1995



Focal points from:

- Denmark
- Estonia
- Finland
- Germany
- Latvia
- Lithuania
- Norway
- Poland
- Sweden
- Russian Federation

Estonia – rates of non-fatal work injuries (>3 days lost)

In Estonia occupational accidents and occupational diseases are reported by employers. The number of accidents is clearly under-reported. Next graph (Figure 3) illustrates the statistics problem of Estonian reporting system of occupational accidents.

Estonia – rates of fatal work injuries

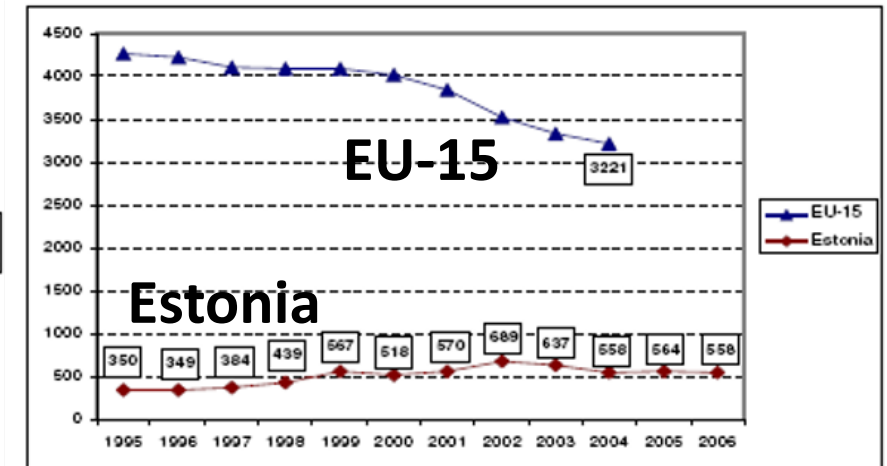
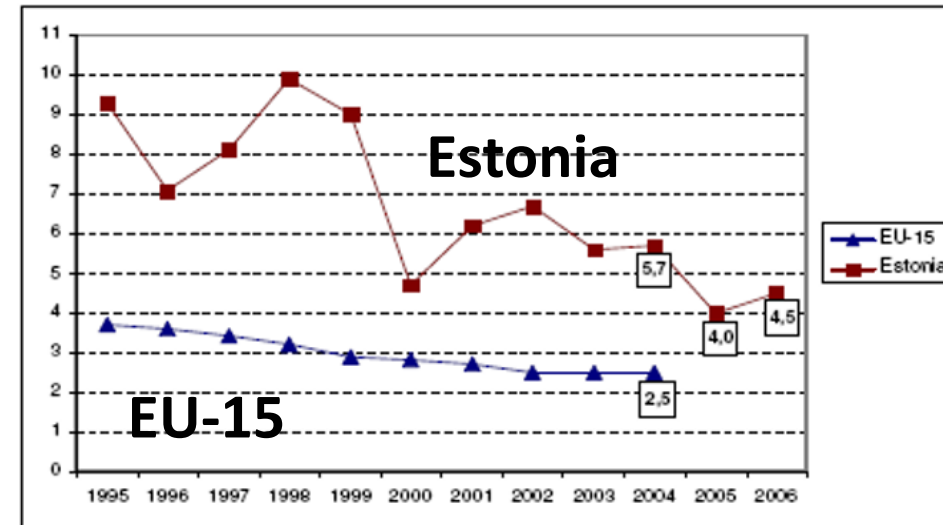


Figure 3. Occupational accidents per 100 000 workers in Estonia and EU-15

Source: Labour Inspectorate and Eurostat

Figure 4. Fatal accidents per 100 000 workers in Estonia and EU-15

Source: Labour Inspectorate and Eurostat

In the countries of the Formerly Socialist Economies the indicators of work injuries have shown an improbable pattern. The rates of fatal work injuries in Estonia, Latvia, Lithuania, Poland and the Russian Federation have been much higher than in the EU-15. Yet, the incidence rates of non-fatal work injuries in these countries have been very low at the same time.

A high rate of registered fatal work injuries in combination with a low rate of registered non-fatal work injuries suggests that much of the non-fatal work injuries may have remained unregistered.

Materials

The analysis relied on the national monitoring statistics that have been submitted by national authorities to the International Labor Organization (ILO Yearbook of Labor Statistics 2008).

The study covered a 5-year period between 2003 and 2007.

The source populations included employees who were insured for occurrence of work injuries.

Comparability constraints

- data submitted to the ILO Yearbook by national authorities are not fully comparable
- differences between countries exist in many aspects

Such differences explain why quantitative comparisons between countries are problematic.

A group of experts has evaluated the monitoring systems of work injuries of five Nordic countries: “because of problems with overall comparability, scientific studies could not be undertaken by combining the Nordic data.”

[On the other hand, comparability is a relative concept. There cannot be absolute comparability, only degrees of comparability. Everything can be compared at least in qualitative terms.]

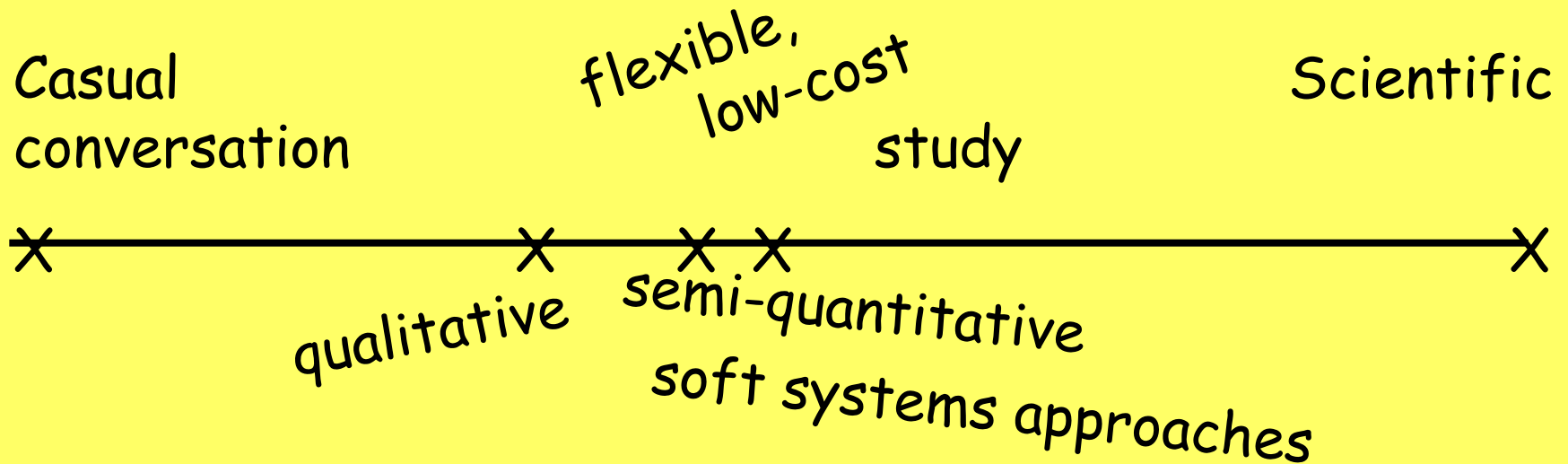
Despite of comparability constraints

- Countries can be compared, within reason, even when the quality of data is not optimal and precise quantitative analyses not feasible.
- One cannot exclude from the scope of evaluation an important indicator for the reason that it is difficult to measure.
- Some amount of error is inevitable, but the result can still be an improvement on prior knowledge.
- Appropriate imprecision can be tolerated in such comparisons.

The aim of the study

- to estimate the order of magnitude of the occurrence of non-fatal work injuries (>3 days absence) in the BSN countries and the levels of reporting and underreporting of such incidents.

Rapid assessment procedures (RAP)



- available imprecise information can be used
- often used by UN organisations (vaccination programs, terrorist catastrophies, ...)

Semi-quantitative approach

- semi-quantitative data analyses.
- useful when reliable quantitative data are missing or are of poor quality
- not precision driven

A semi-quantitative analysis provides approximations about issues under study. (*No sophisticated mathematical model is required.*)

The results are given in the form of a point approximation or as a range of approximations.

Two separate strategies to estimate the reporting level

Benchmark strategy:

Applying external incidence rates of work injuries of benchmark countries to the workforce of the country that is to be estimated, and comparing the results to those in the official statistics.

Empirical coefficient strategy:

Multiplying the annual number of fatal work injuries (5-year average) in a country by external coefficients (nonfatal-to-fatal ratio of work injuries) calculated from data of benchmark countries.

EUROSTAT - registration rates of work injuries in EU15 countries (2001)

Insurance-based system, nearly 100% reporting level is assumed:

Finland, Germany: incentives to report

Non-insurance based system, reporting level:

Denmark (46%), Norway (25-100%), Sweden (52%):

- no/little incentives to report

Benchmarks:

Finland, Germany, EU-15

Finland and Germany are the two BSN countries with work accident insurance system.

The total rate of non-fatal work injuries in Finland and Germany was about 2,800 per 100,000 workers employed for both countries, close to the average EU-15 rate of 3,098 per 100,000.

Thought experiment: Latvian workforce working in Finland or EU-15

Table 8. Numbers of cases and incidence rates of non-fatal work injuries with lost work days in Latvia, by economic activity, per 100,000 employees. In addition, numbers of expected work injuries when using the incidence rates of Finland or the EU-15 average, and the estimated levels of reporting of work injuries in Latvia.

Economic activity ISIC-Rev.3	Latvian statistics in 2007		If Latvian workforce of 1,045,251 were working in Finland			If Latvian workforce of 1,045,251 were working in the EU15		
	Source popula- tion ¹	Reported work injuries rate # cases	Finnish rate	Projected # cases in Latvia	Estimated level of reporting work injuries in Latvia ^{a)}	Projected EU15 ²⁾ # cases in Latvia	Estimated level of reporting work injuries in Latvia ^{b)}	
Total	1,045,251	179 1,871	2,845	29,737	6%	3,098 32,382	6%	
A Agriculture, Hunt- ing and Forestry	21,296	324 69	4,187	4,515	2%	4,560 4,902	1%	
D Manufacturing	158,696	368 584	3,789	6,202	9%	3,505 5,776	10%	
F Construction	85,185	270 230	7,685	9,671	2%	6,069 7,623	3%	
I Transport, Storage and Communications	85,016	307 261	4,034	4,160	6%	3,696 3,844	7%	

^{a)} using as reference the rates from Finland (at least 3 lost work days), ^{b)} using as reference the rates from the EU15 (at least 4 lost work days)

¹⁾ The numbers of the source population by branch of economic activity have been back-calculated from the numbers of cases and accident rates printed in the ILO Yearbook of Labour Statistics 2008.

²⁾ Average EU15 incidence rates in 2005 (European Communities 2009)

An earlier estimation for Latvia (Vanadzins & Martinsone 2012):

Rate of total registered accidents 15-20 times lower than EU average – i.e. the reporting rate is 5 to 7 per cent.

Use of external coefficients from the EU-15 average and the benchmark countries (Finland, Germany)

European Statistics on Accidents at Work (ESAW) (year 2005),
covering the 15 Member States of the EU

The data included:

- 4 011 fatal injuries at work
- 4 048 491 non-fatal injuries at work with > 3 days lost

Hence,

$$4\,048\,491 / 4\,011 = 1\,009$$

1 fatal injury ---- 1 000 non-fatal injuries with >3 d lost

coefficient:	1,290 Finland (2003-2007)
	1,148 Germany (2003-2007)
	1,009 EU-15 (2005)

Table 3. Numbers of non-fatal work injuries (>3 days lost) calculated by using empirical benchmark coefficients (non-fatal-to-fatal ratio) from the EU-15, Finland, and Germany in 2003-2007.

BSN country	Average number of reported cases of fatal work injuries per year (2003-2007)	Reported cases of non-fatal work injuries per year ²⁾ (average 2003-2007)	Expected cases of non-fatal work injuries, coefficient from EU-15 1:1,009	Expected cases of non-fatal work injuries, coefficient from Finland 1:1,290	Expected cases of non-fatal work injuries, coefficient from Germany 1:1,148	Estimated reporting level: (%)
Denmark ¹⁾	62	43,644	62,558	79,980	71,176	55-70
Estonia	28	3,686	28,000	36,120	32,144	10-13
Latvia	54	1,812	54,000	69,660	61,992	2-3
Lithuania	108	3,577	108,000	139,320	123,984	3
Norway	41	19,081	41,000	52,890	47,068	36-47
Poland	489	92,824	489,000	630,810	561,372	15-19
Russian Federation	3,161	66,055	3,161,000	4,077,690	3,628,828	2
Sweden	65	29,675	65,000	83,850	74,620	35-46

¹⁾Denmark: year 2001; ²⁾workforce under monitoring

Estimated level of reporting non-fatal work injuries (>3 d absence)

	Empirical coefficients (ratio nonfatal-to-fatal) from Finland, Germany, the EU-15 ³⁾ (%)	External incidence rates from Finland, Germany, the EU-15 (%)	Previously estimated reporting levels ESAW 2001 ¹⁾ (%)	Estimated from Hämäläinen et al. 2006; Takala et al. 2014 (approx.) ²⁾ (%)
Denmark	55–70	55–60	46	63
Norway	36–47	-	25–100	30-35
Sweden	35–46	-	52	39-51
Estonia	10–13	18–20	-	8
Latvia	2–3	6	-	2
Lithuania	3	10	-	3
Poland	15–19	28–31	-	8
Russia	2	8–10	-	1

1) ESAW 1998 data (see:ESAW 2001)

2) source population: whole economically active workforce

3) source population: population covered by work injury insurance

Conclusion

In several BSN countries the level of reporting of non-fatal work injuries (>3 days absence) might be less than 10 or 20% of the estimated true level.

These big-picture approximations are in concordance with earlier estimates that have also addressed BSN countries.

Reasonable estimates of the true burden of work injuries can be used for calculations of economic loss incurred by work injuries.

Economic cost indicators can facilitate policy integration by providing a common language for making linkages between OHS and other policies (as suggested by Dorman 2012).

A challenge is to develop social marketing tools which help to convince the decision makers to accept that the underreporting problem is real and worthy of action.