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Underreporting of occupational accidents - estimating realistic statistics

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Indicators of work injuries provide the most commonly used outcome measures of performance of OH&S management.

- Fatal work injuries
- Non-fatal work injuries

Experts know that under-reporting of work injuries is widespread, decision makers don't always know that.

The actual size of under-reporting has remained unquantified in most countries.

Proportion of registered fatal work injuries: Examples from high-income countries 15-25 years ago

In the U.S., in 1987, the National Academy of Sciences proposed for a better system of registration of work injuries. The number of registered fatal work injuries doubled in the first year of the new system. (see Rosenman 2008).

In Australia, between 1989 and 1992, only 35% of fatal work injuries were found in the statistics of the Ministry of Labour. (Driscoll et al. 2003; see Brière et al. 2012).

In Norway, during 2000-2003 the real number of fatal work injuries was 44% higher than the number registered by the Labour Inspection Authority (Wergeland et al. 2009).

Proportion of reported non-fatal work injuries:

USA: The national database may contain 20-40% of all work injuries (Leigh et al. 2004; Lowery et al. 1998; Probst et al. 2008; Probst and Estrada 2010; Rosenman et al. 2006).

Canada: Some 50%–60% of work-related injuries in Canada are reported (Thompson 2007).

Norway: In the Norwegian maritime industry, 50% of all work injuries were reported (Hassle et al. 2011).

Brazil: Reported injuries represent < 20 % of the total number of work injuries (Mendeloff 2015)

Latvia: Estimations have indicated that 5-7 % of work injuries are registered (Vanadzins and Martinsone 2012).

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

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

Austria, Belgium, Finland, France, Germany, Italy, Portugal, Spain, Switzerland

Non-insurance based system, reporting level:

Denmark (46%), Ireland (30%),

Norway (25-100%), Sweden (52%), U.K. (43%)

European Statistics on Accidents at Work (ESAW) (year 2005)

The most reliable outcome indicator is death.

EU-15: the 15 Member States of the EU in 2005

The data included:

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

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

1 fatal injury --- 1,000 non-fatal injuries with >3 d absence

EU-15 coefficient: nonfatal-to-fatal injury ratio

Fatal work injuries as indicators of the total burden of work injuries

The ILO has used the rates of recorded fatal work injuries as a starting point for the estimation of the total burden of work injuries in a number of reports (see Takala et al. 2014; Hämäläinen et al. 2006).

[This is also a starting point for one of the two methods employed in the rough estimation of the total number of work injuries in the BSN countries.]



Global estimates of occupational accidents

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Abstract

Information of occupational accidents is not standardized worldwide. Especially, developing countries do not have reliable information on their occupational accidents due to lack of proper recording and notification systems. The number of accidents is under-reported but figures are still used as a baseline for occupational safety work. In this paper global estimates of occupational accidents are presented for 175 countries. These estimates are based on figures from selected countries in eight different regions. Global estimates help to compare different countries and regions to each other to detect improvements in safety and safety work. In 1998 the average estimated number of fatal occupational accidents was 350000 and there were 264 million non-fatal accidents. Global estimates are needed to guide national policies and decision-making.

v. 2008

14,665,130 / 14,090 = 1,041

347

4042

?

34%

Vapaanvotus

TABLE II. Work-related Injuries and Diseases in the World

Region	Economically Active Population	Fatal (Reported)	Four or more days absence	Fatal Injuries ILO estimates	Four or more days absence: ILO mid-point estimate	Fatal work-related diseases	Total work-related mortality
High-Income Areas	494,365,003	11,850	4,959,039	14,090	14,665,130	306,988	321,077
African Region	251,588,449	759	46,616	44,699	46,561,176	336,144	380,843
American Region	315,509,490	1,944	657,580	25,534	8,866,101	113,023	138,557
Eastern Mediterranean	152,610,995	0	0	17,912	18,657,924	117,164	135,076
European Region	213,740,690	6,777	325,004	16,190	18,093,167	198,366	214,557
Southeast Asia	642,390,831	81	1,676	83,096	86,558,781	523,355	606,451
Western Pacific	921,078,060	193	43,756	119,058	124,019,195	427,530	546,588
Total	2,991,283,518	21,604	6,033,671	320,580	317,421,473	2,022,570	2,343,149

1,041
347
1,042

990

v. WHO Regions in the Region column are listed at: http://www.who.int/healthinfo/global_burden_disease/definition_regions/en/; High-income Areas: see Table III.

Swiss
7.1%
reducing
variability

2.1%

88

317 421 473 = 100

6033671 - x

19.0%

Secondary calculations from previously published data on global estimates (Takala et al. 2014):

Estimated proportion of registered fatal work injuries:

On the global scale, 7 % of the fatal work injuries are registered

In the European Region (WHO category) 42 % of fatal work injuries are registered.



Secondary calculations from previously published data on global estimates (Takala et al. 2014):

Estimated proportion of registered fatal work injuries:

In the High income areas (WHO category) 84% of the fatal work injuries are registered,

8 % in the American Region,

< 2 % in the African Region,

< 1 % in Southeast Asia, < 1 % in Western Pacific, 0 % in Eastern Mediterranean.

Examples of High income countries :

[Australia 97%, Austria 97%, Canada 97%, France 100%, Germany 100%, Japan 97%, Luxembourg 100%, New Zealand 95%, Norway 96%, Republic of Korea 71%, Singapore 97%, Spain 96%, Sweden 97%, Switzerland 98%, USA 97%]

Secondary calculations from previously published data on global estimates (Takala et al. 2014):

Estimated proportion of registered non-fatal work injuries (> 3 day absence):

On the global scale, 2 % of the non-fatal work injuries are in the national registers.

In the High income areas (WHO category) 34% of non-fatal work injuries are registered, 7 % in the American Region, 2 % in the European Region, < 1 % in the African Region, < 1 % in Southeast Asia, < 1 % in Western Pacific, 0 % in Eastern Mediterranean.

2 % in the European Region



Australia 45%, Austria 60%, Bahrain 3%, Canada 52%, Cyprus 19%, Italy 73%, Japan 9%, Luxembourg 104%, New Zealand 27%, Norway 30%, Singapore 15%, Sweden 39%, USA 19%.

Estimated proportion of reported non-fatal work injuries: examples

USA: The national database may cover 20–40% of all work injuries (Leigh et al. 2004; Lowery et al. 1998; Probst et al. 2008; Probst and Estrada 2010; Rosenman et al. 2006). **[using the nonfatal-to-fatal coefficient: 19%]**

Canada: Some 50%–60% of work-related injuries in Canada are reported (Thompson 2007). **[using the nonfatal-to-fatal coefficient: 52 %]**

Latvia: Estimations have indicated that 5-7 % of work injuries are registered (Vanadzins and Martinsone 2012).

[using the nonfatal-to-fatal coefficient: 2-3 %]

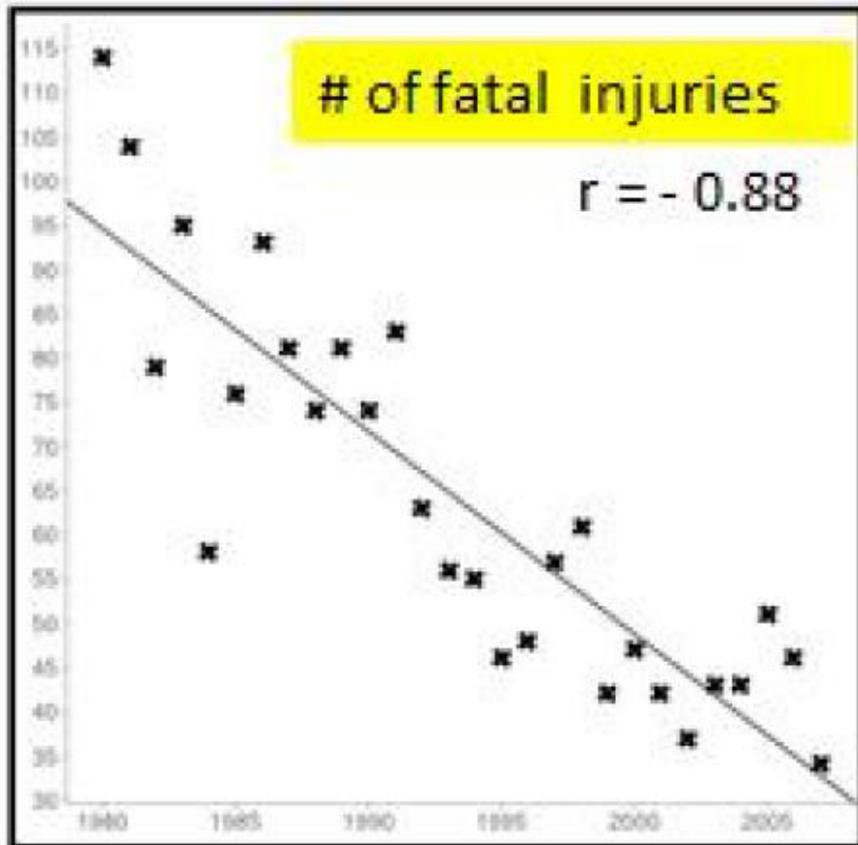
Stability of the nonfatal-to-fatal injury ratio?

- How does the nonfatal-to-fatal injury ratio behave over periods of years?
- How much does the ratio indicator vary between branches of economic activity?
- How much is the ratio indicator influenced by the level of fatal work injury incidence?

It appears that research to address such questions is lacking.

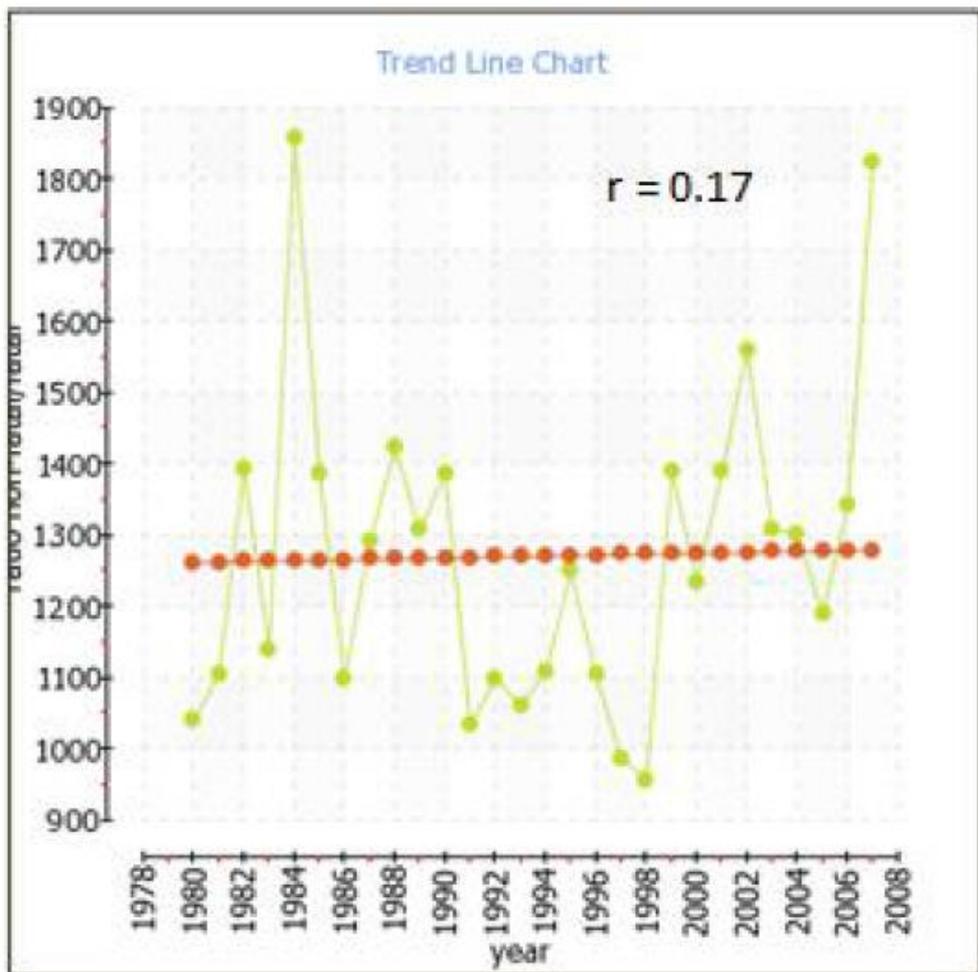
The Finnish statistical data was analysed in order to study the variability of the ratio indicator, and to see how it behaves over periods of years and by branch of economic activity. (The BSN report)

The two figures below show the total numbers of registered fatal and non-fatal work injuries in Finland in a 28-year period between 1980 and 2007.



Similar slopes for the occurrence over time of fatal and non-fatal work injuries in Finland.

Figure A. Finland 1980 – 2007: The trend line chart of the non-fatal-to-fatal ratio of work injuries



N = 28
Mean 1270
SD 222
 $r = 0.17$
 $r^2 = 0.03$
p (one-tailed) 0.20
p (two-tailed) 0.40

Table b. The ratio non-fatal-to-fatal work injuries by branch of economic activity in Finland, 5-year averages

Finland, economic activity	1980- 1984	1985- 1989	1990- 1994	1995- 1999	2000- 2004	2005- 2007	Total 1980- 2007
Total	1,307	1,302	1,138	1,138	1,359	1,452	1,271
Manufacturing	1,693	2,065	2,126	2,045	1,167	2,742	1,918
Construction	1,080	1,460	896	805	1,113	1,087	1,073
Transport	521	533	594	697	713	874	640

The table shows remarkably consistent patterns of the non-fatal-to-fatal ratio over a period of 28 years. The Manufacturing industry shows higher level of the ratio indicator than the average. The Construction industry and the Transport and communications industry show consistently lower ratios than the total average.

Table a. Non-fatal-to-fatal ratios of work injuries as calculated for the EU-15 and Finland. The ratio is not uniform across branches of economic activity.

Economic activity	EU-15 (2005) NACE ^{a)}		Finland (2003-2007) ISIC-Rev.3	
	Fatal work injury incidence per 100,000	Ratio non-fatal /fatal injuries ^{b)} (coefficient)	Fatal work injury incidence per 100,000	Ratio non-fatal /fatal injuries ^{c)} (coefficient)
Total	3.4	993	2.1	1,368
Agriculture, Hunting and Forestry	10.1	452	--	--
Manufacturing	2.6	1,340	1.9	2,083
Construction	8.8	691	8.8	905
Transport, Storage and Communications	7.6	485	7.1	612

a) All NACE branches; ^{b)} at least 4 days absence from work; ^{c)} at least 3 days absence from work;

Economic cost indicators of work injuries

(Dorman 2012)

A working paper from the ILO argues that economic cost indicators can facilitate policy integration by providing a common language for making linkages between OSH and other policies. Calculations of economic costs could play a large role in awareness-raising and strengthening incentives for meaningful OSH policies.

Task to estimate the costs of work injuries:

The first step is to provide plausible estimates for the numbers of work injuries. The second step is economic, determining their costs.

Critical points for monitoring work injuries

For any surveillance system to be accurate, employees must first inform their employers when they are injured at work. Second, organizations must accurately report documented injuries experienced by their workers to the appropriate regulatory authority.

a) organizations fail to record work injuries to the authorities (organizational-level under-reporting) or

b) employees fail to report work injuries to the company officials (individual-level under-reporting).

Individual-level under-reporting has been linked with variables such as fear of reprisals or loss of benefits, and with a general acceptance that injuries are a fact of life in certain lines of work (see Probst and Estrada 2010).

Reasons for under-reporting

USA (Probst and Estrada 2010):

- fear of reprisals or loss of benefits,
- breaking the company's "accident-free record" ‘
- being blamed for the incident,
- disciplinary action,
- Job insecurity
- re-assignment to less favorable tasks

USA (A Majority Staff Report ... 2008):

- Employers have strong incentives to underreport injuries
- Workers report widespread intimidation and harassment when reporting injuries
- Many employers have fired or disciplined workers who report injuries or complain about safety hazards.
- Others have added "demerits" to an employee's record for reportable injuries

Canada (Lebau & Duguay 2013):

- injured workers may be pressured by their supervisor, management, and/or co-workers not to report an occupational injury

Consequences of under-reporting

Statistical indicators are needed for creating, implementing, and evaluating policies.

The negative influence that under-reporting has on preventive safety measures is quite substantial. Employers are guided by injury statistics in implementing safety programmes. If employers are not aware of the true size of the work injury problem, preventive efforts may remain less of a priority.

At the national level, the decision makers study the official statistics provided by national authorities. It might be hard to accept that the national statistics lack a large portion, perhaps 80% or even more, of work injuries in many countries.

If decision makers are not aware about the true size of the burden of work injuries, preventive efforts may not be considered, calculations of economic loss are downplayed, etc.