Occupational Medicine & Health Affairs
ISSN: 2329-6879

Okenwa-Emegwa, Occup Med Health Aff 2014, 2:4
DOI: 10.4172/2329-6879.1000176

Research Article Open Access

Determinants of Sick Leave Duration Following Occupational Injuries among Workers in the County of Gävleborg, Sweden

Leah Okenwa-Emegwa*

Department of Occupational and Public Health Sciences, University of Gävle, Sweden

***Corresponding author:** Leah Okenwa Emegwa, Department of Occupational and Public Health Sciences, Faculty of Health and occupational studies, University of Gävle, Kungsbäcksvägen 47, room 55:410, 801 76 Gävle, Sweden, Tel: +46 26 645082; E-mail: lehema@hig.se

Received date: May 06, 2014, **Accepted date:** September 05, 2014, **Published date:** September 09, 2014

Abstract

Background: Occupational injuries continue to add to the global burden of injuries. Recent global estimates show that up 317 million workers were injured in accidents at work that resulted in absence from work of four days or more. Whereas sick leave is important for rehabilitation and recovery, the duration of sick leave and consequent return to work is of concern in order to prevent negative outcomes. There is therefore a need to examine factors associated with sick leave duration among injured workers for effective rehabilitation. This study aimed to investigate the determinants of leave sick duration following occupational injuries.

Method: The Swedish National Working Environment Agency keeps a record of all cases of occupational injuries requiring at least one day sick leave day and reported to Swedish Social Welfare Security Agency. The present study is register based using data from a total of 5291 cases of occupational injuries that occurred in the county of Gävleborg, Sweden between 2007 and 2012.

Result: Sick leave longer than two weeks was highest for the self-employed and temporary workers although injury frequency was low for both groups. Fall injuries and injuries involving slip, trip and snapping or breaking of an object were more likely to lead to sick leave longer than two weeks. Shorter sick duration was observed among injured workers in the health and manufacturing sectors.

Conclusions: Possible reasons for the observed results and the need for individual based rehabilitation process for effective and more meaningful return to work are discussed.

Keywords: Sick leave; Occupational injury; Return to work; Rehabilitation; Inequality, occupational sector; Employment

Background

Due to a growing economically active population, work related injuries have increased considerably and continue to contribute to the global burden of disease and injuries [1-4]. According to recent global estimates, over 96,00,00 workers are injured and 1020 die per day due to work related injuries [3]. Recent studies from the European Union show that the one year incidence of occupational injuries within the region's approximately twenty countries is about 3.2% [5]. Globally, it is estimated that about 317 million workers were injured in accidents at work that resulted in absence from work of four days or more. This equates to an average of 850,000 injuries per day [6].

While sick leave is of great importance for the workers in terms of recovery, it is also a matter of concern due to its potential negative consequences to all stakeholders i.e. the individual, employer and society. At the individual level, research has shown that there is a significant risk of permanent disability and potential job loss [7,8]. Sick leave duration has been linked to disability pension and labour market exclusion [9]. Wang et al. in a 2013 study [10] found that sick leave was associated with suicide attempt and completed suicide. This association remained even after adjusting for previous mental healthcare, suicide attempt and present use of antidepressants among other factors. This risk for suicide attempt and suicide was also found to increase with longer sick leave duration [10]. At the company and societal level, loss of productivity for the time period and worker's compensation are some of the known consequences of sick leaves. Up to 2.5% of the total gross national product (GNP) and between 3-6% working hours are lost due to sick leaves [11].

The acknowledgement of the importance of sick leave duration and an individual's ability to return to work following sick leave has led to the development of screening methods for for this purpose. An example is the use of Readiness for return to work (RTW) scale results of which may be useful for tailoring occupational rehabilitation [12]. Some known determinants of length of sick leave duration following occupational injuries include age [13,14], gender [15,16], workplace bullying and violence [17]; education, occupational class and income [18] among others. In a study by Slany et al. [19], additional factors such as job problems or problems with colleagues were identified as possible determinants of return to work following sick leave. Identifying predictors of the potential length of sick leave may prove useful to not just the individual such as in enhancing job retention [8] and preventing disability, [7] but also economically relevant for employers and society.

Sweden

Different rules apply in different countries regarding worker compensation and support following sickness or occupational injuries. In Sweden a sick or injured worker backed by a medical certificate is entitled to eighty percent (80%) of their income for the period of their sick leave up to 364 days. Thereafter they become entitled to seventy five percent (75%) up to maximum 550 days. The employer is however responsible for the sick leave pay for the first two weeks after which the Swedish Social Insurance Agency takes over. The Swedish National Working Environment Agency keeps a record of all cases of work place injury reported to the Swedish Social Welfare Security Agency [20,21]. Although there are some studies exploring trends and patterns of occupational sick leaves in Sweden, most of them are either injury specific eg [22] or industry specific [17]. There is therefore a need to investigate how other types of injuries contribute to the overall burden and what role the injured worker's occupational sector may play in determining sick leave duration. There are also very few studies exploring occupational injury patterns and distribution at county level, for example in Gävleborg county. Gävleborg is one of the twenty one counties in Sweden. It has a population of about 276,323 with a population density of about 15 per kilometer square [17]. Information about the duration of sick leave following occupational injuries may be useful for planning and prevention effort at the regional and local level.

The aim of this study is therefore to investigate the likely predictors of leave sick duration following occupational injuries.

Methods

Design and participants

The study is based on the register kept by the Swedish National Working Environment Agency. The register covers all cases of occupational injuries requiring at least one day of sick leave reported to the Swedish social security board. The classification system used is the Swedish standard classification system (In Swedish, SNI). The SNI system follows European standards for classification of occupations industrial sectors. The coding system is regularly reviewed and updated which means that codes change periodically. The latest update gave rise SNI 2007 which as the name implies has been in use since 2007 [23]. For the sake of homogeneity only cases classified using the most recent classification system were selected for this study i.e. cases that occurred between 2007 up to 2012. All cases of non fatal occupational accident among all categories of workplace as well as the self-employed were included giving rise to a total of 5291 participants.

Measures

Variables

Dependent variable

Sick leave following occupational injury

There were four broad categories for this in the original data file namely: 1-3 days; 4-14 days; longer than 14 days and death. For the purpose of this study, these classifications were recoded into two broad categories i.e. 1-14 days and longer than fourteen days, all fatalities were excluded.

Independent variables

The independent variables in the study include age, gender, industrial sector, employment status and cause of injury.

Data analysis

Data analysis was conducted using the statistical software SPSS. Descriptive analysis was used to show the length of sick leave due to occupational injury across the independent variables. Logistics regressions was used to assess the interactions between the variables with significance level set at $p<0.005$ and 95% confidence interval.

Ethical consideration

Ethical approval for the study was granted by the regional institutional review board.

Results

The study found duration of sick leave following occupational injuries in Gävleborg County to be related to age, gender, cause of injury, industrial sector age and gender. The frequency distribution of occupational injuries by varying factors is shown in table 1. The proportion of injured workers increased with age with workers in the 40-49 years and 50-59years age group accounting for a majority of the injuries (26.2% and 26.8% respectively). The proportion of injured men is almost twice that of women (61%), other factors with higher proportion of injuries include injuries due to loss of control (27.5%); manufacturing sector 34.0%); permanent staff (82%).

Variable	n	N	%
Age			
<20	166	5291	3.1
20-29	820		15.5
30-39	914		17.3
40-49	1385		26.2
50-59	1420		26.8
60 and above	586		11.1
Sex			

Male	3251	5291	61.4
Female	2040		38.6
Cause of Injury			
Loss of control	1454	5091	27.5
Fall	1385		26.2
Movement involving load	416		7.9
Slip/snapping/splitting/breaking of an object	283		5.3
Violence	642		12.1
Movement not involving load	791		14.9
Electricity/fire/Explosion	42		8.0
Leakage/Radiation	78		1.5
Industry	106	5291	2.0
Agriculture/fishing/logging	9		0-2
Mining	1801		34.0
Manufacturing	19		0.4
ELectricity/gas/stea/airconditioning	49		0.9
Watersupply/sewage/waste management/remedial	490		9.3
Construction	255		4.8
Whosale/retail trade/repair of vehicles&motorcycle	363		6.9
Transport & storage	74		1.4
Accomodation & Food service activities	15		0.3
Information and communication	12		0.2
Financial insurance activities	75		1.4
Real estate	64		1.2
Professional/scientic/technical activities	254		4.8
Administrative & support services	218		4.1
Public administration/compulsory social security	392		7.4
Education	966		18.3
Human health and social work	90		1.7
Arts/entertainment/recreation & other services			
Employment Type			
Self-employed and family members	51		1.0
Permanent employment	4339		82.0
Student	86		1.6
Temporary	777		14.7
Sickness Absence			
1 – 3 days	1344	5291	25.4
4 – 14 days	1928		36.4
>14days	2006		37.9
Death	13		0.2

Table 1: Frequency distribution of occupational injuries requiring at least one day of sick leave, by demographic factors, occupational sector and cause of injury

Table 2 shows that the proportion of sickness leave was significantly related to specific factors. Like injury frequency, the proportion of workers who had sick leave longer than fourteen (14) days appears to increase with age. More proportions of men had sick leave duration longer than 14 days. Nearly half of all injuries due to fall (45.2%) and Slip/snapping/splitting/breaking of an object (46.5%) resulted in sick leave longer than 14 days. More than half of the injuries occurring in the agricultural (56.7%), mining (55.6%), real estate (57.4%) significantly led to sick leave longer than 14 days. From table 2, it can be seen that sick leave longer than fourteen days is higher among the

self-employed and their family members (72%). All of the figures reached statistical significance.

Variable	Sick leave longer than 14 days			
	N	n	%	P-
	value			
Age				
<20	166	22	13.3	0.000
20-29	818	228	27.9	
30-39	913	324	35.5	
40-49	1383	545	39.4	
50-59	1413	591	41.8	
60 and above	585	296	50.6	
Sex				
Male	3242	1304	40.2	0.000
Female	2036	702	34.5	
Cause of Injury				
Loss of control	1447	510	35.2	0.000
Fall	1385	626	45.2	
Movement involving load	416	149	35.8	
Slip/snapping/splitting/breaking of an object	282	131	46.5	
Violence				
Movement not involving load	641	222	34.6	
Electricity/fire/Explosion	791	267	33.8	
Leakage/Radiation	42	14	33.3	
	76	20	26.3	
Industry				
Agriculture/fishing/logging	104	59	56.7	0.000
Mining	9	5	55.6	
Manufacturing	1794	599	33.4	
ELectricity/gas/stea/airconditioning	19	7	36.8	
Watersupply/sewage/waste management/remedial	48	21	43.8	
Construction				
Whosale/retail trade/repair of vehicles&motorcycle	490	228	46.5	

Transport & storage	255	104	40.5	
Accomodation & Food service activities				
Information and communication	362	181	50	
Financial insurance activities	74	31	41.9	
Real estate				
Professional/scientic/technical activities	15	5	33.3	
Administrative & support services	12	0	0	
Public administration/compulsory social security	75	41	54.7	
Education	64	23	35.9	
Human health and social work				
Arts/entertainment/recreation & other services	254	104	40.9	
	218 84 38.5			
	392 133 33.9			
	964 327 33.9			
	90 42 46.7			
Employment status		36	72	0.000
		1667	38.5	
		9	19.5	
		286	37.8	
Self-employed and family members	50			
Permanent employment	4331			
Student	86			
Temporary	773			

Table 2: Proportions of sick leave duration longer than two weeks by demographic factors, occupational sector and cause of injury

Adjusted odds ratios for determinants of length of sickness absence are presented in Table 3. The results show that the odds of sickness absence longer than fourteen (14) days increased with age (<20yrs=0.214; 20-29=0.397; 30-39=0.575; 40-49=0.709; 50-59=0.778; 60 and above=1.000). Compared to females, Injured male workers were less likely to be away from work for periods longer than four days (OR=0.783). There was a twofold odds for longer sickness absence for injuries due to fall (OR=2.020) and Slip/snapping/splitting/breaking of an object (2.078).

With regards to occupational sector, being a worker in the manufacturing or healthcare sector was a significant predictor of sick leave duration with workers in this sectors having lower odds for sick leave longer than two weeks (0.558; p=0.011 and 0.592; p=0.025) respectively. The sectors with the highest odd of longer sick leave were mining (1.833), agriculture (1.246), transport (1.153) and real estate (1.136) however, these did not reach statistical significance. It can also be seen from Table 3 that the self-employed, their family members and temporary workers were more likely to have been on sick leave longer than 14 days.

	Sick leave longer than 14 days		
Variable	**Adjusted OR**	**CI for OR**	**P-value**
Age			
<20	0.214	0.122 - 0.377	0.000
20-29	0.397	0.312 – 0.504	0.000
30-39	0.575	0.460 – 0.719	0.000
40-49	0.709	0.578 – 0.871	0.001
50-59	0.778	0.636 – 0.952	0.015
60 and above	1.000		0.000
Sex			
Male	0.783	0.668 – 0.919	0.003
Female	1.000		

Cause of Injury			
Loss of control	1.467	0.861 – 2.497	0.158
Fall	2.020	1.185 – 3.444	0.010
Movement involving load	1.642	0.934 – 2.889	0.085
Slip/snapping/splitting/breaking of an object	2.078	1.169 – 3.695	0.013
Violence	1.649	0.955 – 2.848	0.073
Movement not involving load	1.348	0.784 – 2.320	0.280
Electricity/fire/Explosion	1.172	0.501 – 2.742	0.714
Leakage/Radiation	1.000		0.000
Industry			
Agriculture/fishing/logging	1.246	0.685– 2.268	0.471
Mining	1.833	0.447 – 7.510	0.400
Manufacturing	0.558	0.356 – 0.873	0.011
ELectricity/gas/stea/airconditioning	0.613	0.213 – 1.769	0.366
Watersupply/sewage/waste management/remedial	0.838	0.405 - 1.731	0.632
Construction	0.911	0.566 - 1.467	0.701
Whosale/retail trade/repair of vehicles&motorcycle	0.829	0.501 – 1.371	0.464
Transport & storage	1.153	0.708 – 1.878	0.567
Accomodation & Food service activities	0.989	0.518 – 1.886	0.973
Information and communication	0.468	0.145 – 1.505	0.202
Financial insurance activities	0.000	0.00	0.999
Real estate	1.136	0.599 – 2.154	0.695
Professional/scientic/technical activities	0.657	0.330 – 1.309	0.232
Administrative & support services	0.784	0.474 – 1.297	0.344
Public administration/compulsory social security	0.741	0.438 – 1.254	0.265
Education	0.683	0.419 – 1.116	0.128
Human health and social work	0.592	0.374 – 0.938	0.025
Arts/entertainment/recreation & other services	1.00		0.000
Employment Type	2.172	1.112 – 4.240	0.023
Self-employed and family members	0.875	0.733 – 1.045	0.140
Permanent employment	0.420	0.178 – 0.987	0.045
Student	1.000		0.005
Temporary			

Table 3: Adjusted odds ratio for sick leave duration: adjusted for age, sex, cause of injury, employment status and industrial sector

Discussion

Findings from the present study show that both injury frequency and sick leave duration are to a significant extent related to factors such as age, gender, cause of injury and occupational sector. Although the role of factors such as gender and age in relation to occupational injury occurrence has long been known [6,24], focus continues on these factors due to their role even in consequent injury outcomes. In line with similar research [25,19] but contrary to some other studies [26-28], the present study found that injury frequency increased with age. With regards to length of sick leave, the odds for longer sick leaves increased with age. Known reasons for this are due to age related complications and possible difficulty in redeploying older workers to other kinds of job tasks [29].

Compared to females, males in this study accounted for a larger proportion of the overall burden of injury, however, likelihood of sick leave longer sick longer than two weeks was higher for females than for men. Differences in the common or dominant type of occupations for males and females may explain the trend [30]. According to Mathews [31], gender differences in length of sick leave duration may be related to the unwittingly segregated labour market i.e. more men are found in physically more demanding job and more women in physically more strenuous job characteristics [31]. The overall effect is reflected in the differences in length of sick leave between men and women following work place injury even after controlling for other factors [30]. There is therefore a need for stakeholders to put the gender aspects of work conditions and the risk of longer sick leave into perspective.

Fall injuries and injuries involving slip and snapping, snipping or breaking of an object presented with the most significant and highest (i.e. two fold) odd for longer period of sick leave. There seems to be a general consensus in literature regarding the severity of fall injuries [32]. The finding is in line with previous studies [7] and also to a similar one conducted in Denmark by Jorgensen & Layrsen [33], in which falls were identified as one of the injury causes associated with the long sick leave. Although falls and injuries involving slipping are often categorized separately, studies have shown the interconnectedness of both i.e. that a slip may indeed precede a fall [34-35]. In developed countries, the burden of disability arising from this combination of occupational event is estimated to be between 20-40% of the total disability due to work related injuries and is associated with higher economic costs. One previous study from Sweden showed that 22% of injuries leading to disability were due to falls to a lower level [34]. This may in part explain the tendency for longer sick duration observed in this group, i.e. that the severity of fall injuries warrants longer recuperation time.

Two sectors i.e. manufacturing and healthcare standout due to the lower odds of injured workers in these sectors to be on sick leave longer than two weeks. Further studies may be needed to investigate the lower propensity for sick leave longer than two weeks observed among injured workers in the manufacturing and healthcare sectors, as reasons may differ for both groups. For example, previous studies in other context (non Scandinavian) have shown that the manufacturing sector is regarded as one sector with weaker job security [36]. Other studies point to evidences that injured workers in the manufacturing sector may be facing increased challenges in terms of job retention [8]. This may be due to reasons such as reluctance of managers to redeploy them, accept them when redeployed to other departments after having been away sick leave and shortcomings in the routines for maintaining contact with an injured worker on sick leave [8]. It may be of interest to find out what the true situation is in Sweden for manufacturing industries.

According to the sickness flexibility model [34], Individual worker's attendance at work depends on their understanding of how they think

they are expected to act, which in turn is related to their perceived environmental conditions and the consequences of being absent [37]. Although lower propensity for sick longer than two weeks seen in this study may be regarded as positive, studies have shown that returning to work in spite of being sick (also known as presenteeism), can lead to negative consequences such as high risk of coronary disorders [38]. Similar observation i.e. lower propensity to be on sick leave has been made within the healthcare profession [38]. Common reasons for this were commitment to duty, not wanting to burden colleagues, own ability for self-medication and rehabilitation and incentives [38-39]. A need to address this trend is necessary due to the known risk for negative outcomes already discussed above.

Despite injury frequency being lowest among the self-employed, sick leave longer than two weeks was significantly higher in this category compared to the others (OR=2.172; CI=1.112-4.240; There may be two possible explanations for this observation, first is that the low levels of injury occurrence in this group may be due to underreporting already shown in previous research [40,41]. Second, research has shown that due to complex bureaucracy, the self-employed in Sweden usually consider it a cheaper alternative to wait a few days after injury before applying for sickness benefits [42]. Sick leave longer than two weeks seen in the self-employed participants of this study is partly in contrast to what is previously about the self-employed in Sweden not having the luxury to be sick [41-42]. There may however be contextual contentions in this case as most of the previous research come from the agricultural sector. Still a need for review of policy can never be overemphasized in order to avoid creating inequalities in access to sick leave among different worker categories.

Another group of workers observed to have sick leave longer than two weeks in the present study is the temporary worker group. One plausible explanation may be that although injury occurrence among temporary workers is low, the severity of the injury may warrant longer stays at home. On the other hand it may also be possible that the effective and functional compensation program following work place injury in Sweden [20] may be attractive enough to make temporary workers not return to work. Foley et al. [43] found that temporary workers have higher compensation claims rate and more lost workdays compared to other groups. Indeed previous research from Sweden has shown that after controlling for other factors, being less than fifty percent part time employed is a likely predictor of being a candidate for disability pension claims [44]. These findings along with those of the present study may be pointing to possible indication that precarious job situations may in some ways be associated with longer or even permanent absence from work. The reason why this is so may require further investigation as longer sick leave may be pointing to an interplay between injury severity, economical coping strategies, job situation, sick leave and compensation claims.

Conclusion

Hill & Trist [45] in their explanation of the social approach to accidents describe accidents as both social as well as personal events, meaning that the relationship between employees and their place of work may in some way play a role in accident proneness and occurrence, the same may be true even for sick leave duration. According to Virtanen [46], the need for sick leave may sometimes be subjective and may be dependent on interplay between the worker's true physical state and trends in the labour market. Longer sick leave in certain groups may therefore not simply be an indication of injury severity but rather an indication of inequalities in sick leave taking accross different employment status, industrial sector and job descriptions,. The explanation is that certain occupational branches may have better resources to take longer sick leaves than do others [36]. Although sick leave is necessary for full recovery and rehabilitation, physicians and occupational therapists agree that work ability following sickness or injury is an obscure and complex concept [47]. The reason behind this general consensus among is due largely to the interplay between the person, the context of life, the work, and the society [4]. Whereas efforts should be taken to ensure quick and smooth return to work, returning to work to soon may be a risk factor for recurrent or repeated sick leave. Repeated short spell sick leave has been found to be related to occupational structure, physical job demand, employment status and compensation [43,48]. There is therefore a need for continued and increased collaboration between different stakeholders in assessing individual cases. This will go a long way in ensuring individual based rehabilitation process for eventual effective and more meaningful return to work.

Acknowledgement

The author is grateful to the Swedish National Working Environment Agency for the provision of data and useful tips.

Funding

This study is funded by University of Gävle, Sweden.

Ethical Approval

Ethical approval for the study was granted by the institutional review board (IRB) for the region whose duty it is to ensure that studies are done in accordance to international ethical standards such as the Helsinki Declaration.

References

1. Krug EG, Sharma GK, Lozano R (2000) The global burden of injuries. Am J Public Health 90: 523-526.
2. Fingerhut M, Driscoll T, Imel Nelson D, Concha-Barrientos M, Punnett L, et al.. (2005) Contribution of occupational risk factors to the global burden of disease. SJWEH Suppl 1: 58–61.
3. Hämäläinen P, Leena Saarela K, Takala J (2009) Global trend according to estimated number of occupational accidents and fatal work-related diseases at region and country level. J Safety Res 40: 125-139.
4. Leigh JP (2011) Economic burden of occupational injury and illness in the United States. Milbank Q 89: 728-772.
5. European Commission
6. (2011) ILO introductory report: global trends and challenges on occupational safety and health: XIX World Congress on Safety andHealth at Work: Istanbul Turkey, 11-15 September 2011 / International Labour Office.- Geneva: ILO.
7. Mazina D, Donneau AF, Mairiaux P (2012) Determinants of sickness absence duration after an occupational back injury in the Belgian population. Am J Ind Med 55: 270-280.
8. James P, Cunningham I, Dibben P (2002) Absence management and the issues of job retention and return to work. Human Resource Management Journal 12: 82-94.
9. Alexanderson K, Kivimäki M, Ferrie JE, Westerlund H, Vahtera J, et al.. (2012) Diagnosis-specific sick leave as a long-term predictor of disability pension: a 13-year follow-up of the GAZEL cohort study. J Epidemiol Community Health 66: 155-159.

10. Wang M, Alexanderson K, Runeson B, Head J, Melchior A, et al.. (2014) Are all-cause and diagnosis-specific sickness absence, and sick-leave duration risk indicators for suicidal behaviour? A nationwide register-based cohort study of 4.9 million inhabitants of Sweden. Occup Environ Med 71:12-20.
11. (2010) European Foundation for the Improvement of Living and Working Conditions. Absence from work.
12. Braathen TN, Brage S, Tellnes G, Irene O, Chris J, et al.. (2014) A Prospective Study of the Association Between the Readiness for Return to Work Scale and Future Work Participation in Norway. J Occup Rehabil .
13. Laflamme L, Menckel E (1995) Aging and occupational accidents: a review of the literature of the last three decades. Safety Science 21: 145–61.
14. Salminen S (2004) Have young workers more injuries than older ones? An international literature review. J Safety Res 35: 513-521.
15. d'Errico A, Costa G (2012) Socio-demographic and work-related risk factors for medium- and long-term sickness absence among Italian workers. Eur J Public Health 22: 683-688.
16. Hensing G, Andersson L, Brage S (2006) Increase in sickness absence with psychiatric diagnosis in Norway: a general population-based epidemiologic study of age, gender and regional distribution. BMC Med 4: 19.
17. Svedberg P, Alexanderson K (2012) Associations between sickness absence and harassment, threats, violence, or discrimination: a cross-sectional study of the Swedish Police. Work 42: 83-92.
18. Piha K, Laaksonen M, Martikainen P, Rahkonen O, Lahelma E (2010) Interrelationships between education, occupational class, income and sickness absence. Eur J Public Health 20: 276-280.
19. Slany C, Schütte S, Chastang JF, Parent-Thirion A, Vermeylen G, et al.. (2014) Psychosocial work factors and long sickness absence in Europe. Int J Occup Environ Health 20: 16-25.
20. Swedish Social Insurance Agency.
21. (2007) The Swedish Information System on Occupational Accidents and Work-related diseases. 2007 Report.
22. Rosberg HE, Carlsson KS, Cederlund RI, Ramel E, Dahlin LB (2013) Costs and outcome for serious hand and arm injuries during the first year after trauma - a prospective study. BMC Public Health 13: 501.
23. Statistics Sweden. SNI codes.
24. International Labour Organization Facts.
25. Villanueva V, Garcia AM (2011) Individual and occupational factors related to fatal occupational injuries: a case-control study. Accid Anal Prev 43: 123-127.
26. Chau N, Gauchard GC, Siegfried C, Benamghar L, Dangelzer JL, et al.. (2004) Relationships of job, age, and life conditions with the causes and severity of occupational injuries in construction workers. Int Arch Occup Environ Health 77: 60-66.
27. Siow S, Ngan K, Yu S, Guzman J (2011) Targeting prevention programs for young and new healthcare workers: what is the association of age and job tenure with occupational injury in healthcare? Am J Ind Med 54: 32-39.
28. Guest M, Boggess MM, Viljoen DA, Duke JM, Culvern CN (2014) Age-related injury and compensation claim rates in heavy industry. Occup Med (Lond) 64: 95-103.
29. Brook L, Healy P, Jian J, Taylor P (2009) The place of age in organizational policy making: Evidence from an Australian Qualitative Survey. In: Promotion of work ability towards productive aging. Kumashiro M, editor. Taylor Francis Group, London.
30. Laaksonen M, Mastekaasa A, Martikainen P, Rahkonen O, Piha K, et al.. (2010) Gender differences in sickness absence--the contribution of occupation and workplace. Scand J Work Environ Health 36: 394-403.
31. Matthews S, Hertzman C, Ostry A, Power C (1998) Gender, work roles and psychosocial work characteristics as determinants of health. Soc Sci Med 46: 1417-1424.
32. Larsson J, Esbjörnsson E, Björkdahl A, Morberg I, Nilsson M, et al.. (2010) Sick leave after traumatic brain injury. The person or the diagnosis--which has greater impact? Scand J Public Health 38: 541-547.
33. Jørgensen K, Laursen B (2013) Absence from work due to occupational and non-occupational accidents. Scand J Public Health 41: 18-24.
34. Courtney TK, Sorock GS, Manning DP, Collins JW, Holbein-Jenny MA (2001) Occupational slip, trip, and fall-related injuries--can the contribution of slipperiness be isolated? Ergonomics 44: 1118-1137.
35. LIN L, COHEN H (1997) Accidents in the trucking industry, International Journal ofIndustrial. Ergonomics 20:287-300.
36. Saloniemi A, Oksanen H (1998) Accidents and fatal accidentsÐsome paradoxes. Safety Science 29:59-66.
37. Johansson G (2007) The Illness Flexibility Model and Sickness Absence (Doctoral thesis). Karolinska Institutet, Stockholm.
38. Kivimäki M, Head J, Ferrie JE, Hemingway H, Shipley MJ, et al.. (2005) Working while ill as a risk factor for serious coronary events: the Whitehall II study. Am J Public Health 95: 98-102.
39. McKevitt C, Morgan M (1997) Illness doesn't belong to us. J R Soc Med 90: 491-495.
40. McKevitt C, Morgan M, Dundas R, Holland WW (1997) Sickness absence and 'working through' illness: a comparison of two professional groups. J Public Health Med 19: 295-300.
41. Jansson B (1998) A system for injury surveillance in Swedish emergency care as a basis of injury control. Studies on epidemiology in agriculture. Karolinska institute. Department of social medicine. Thesis Sundbyberg.
42. Hansson R, Broberg E, Johansson A, Jorner U, Selander R, et al.. (1989)Study of accidents in farming and forestry in 1987. The Swedish Farmers Safety and Preventive Health Association and the Swedish Board of Occupational Safety and Health, The Central Bureau of Statistics. Report 28/89. Stockholm; 1989 (in Swedish with English summary).
43. Lundqvist P, Svennefelt CA (2013) Swedish strategies for health and safety in agriculture: A coordinated multiagency approach. Work .
44. Foley F, Rappin C, Bauser E, Bonato D (2013) Occupational Health and Safety Surveillance of Temporary Help Supply Workers in Washington State. Annual conference (conference paper).
45. Ropponen A, Alexanderson K, Svedberg P (2014) Part-time work or social benefits as predictors for disability pension: a prospective study of Swedish twins. Int J Behav Med 21: 329-336.
46. Hill J, Trist A (1953) A consideration of industrial accidents as a means of withdrawal from the work situation. Human Relations 6: 357-380.
47. Virtanen P (1994) An epidemic of good health at the workplace. Sociology of Health and Illness 16: 394-401.
48. Sturesson M, Edlund C, Fjellman-Wiklund A, Falkdal AH, Bernspång B (2013) Work ability as obscure, complex and unique: views of Swedish occupational therapists and physicians. Work 45: 117-128.
49. Blank N, Diderichsen F (1995) Short-term and long-term sick-leave in Sweden: relationships with social circumstances, working conditions and gender. Scand J Soc Med 23: 265-272.