

INFLUENCE OF WORK INJURIES AND ILLNESSES ON ECONOMICAL AND TIME ASPECT OF THE WORK

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Abstract

The aim of the submitted article is to analyze how the work injuries occurrence, occupational diseases and others illnesses influence the economical and time aspect of the work. The exact analysis has been done for area of the University Forest Enterprise TU in Zvolen (VšLP) for the time period from 1977 to 2004. The main analyzed factors are: work injuries, occupational diseases, illnesses, share of nonusage time for injuries and illnesses, hazardous workplace, costs to personal protective work equipment. The highest amount of compensations was recorded in 1997 and reached 16,492 Slovak Crones per cause. The largest share of working time nonusage caused by work injury and illness was recorded in 1995 which was 9.3 % of total working time. The highest costs for personal protective equipment purchase were evaluated in 1999 with the amount of 4,990 Slovak Crones per worker.

Key words: work injury, occupational disease, illness, compensations

Classification JEL: M 140 Corporate Culture, Social Responsibility

1. Introduction and problems

The forests of Slovak Republic cover ca. 41 % of the total land area. This fact, together with the importance of wood especially as a strategic source in the energy field, increases the significance of forestry in national economy.

Workplaces in forestry are characteristic by the permanent risk of accidents and occupational diseases occurrence. Workers in the wood harvesting process are exposed to the biggest hazard and the work accidents occurring in this process have often fatal consequences. Based on this accident frequency, forest management is ranked among the most hazardous economic sectors in Slovakia (Suchomel, J. et al, 2009, p. 67).

Most of the work injuries (more than 50 %) are caused by risk of the work (cause number 12) and (ca. 30 % of the work injuries) by workers themselves (work without authorisation, against the order, breaking the rules and staying in hazardous area – cause number 8). However, the analysis of fatal and serious injuries showed different results. The majority of these injuries (ca. 67 %) happened as a consequence of hazardous processing or operating principles used by workers (cause number 8). 17 percent of the fatal and serious accidents were caused by the risk of the work – lack of background for ordinary job performance (cause number 12). The causes of the two fatal accidents were the defective or adverse conditions of the accident source (cause number 1) (Suchomel et al, 2008, p. 83).

Salminen (2001, p. 42) presents that the main causes of accidents are lost of one's balance, a small flying object, and the chain saw. The lower limbs and back are affected the most. These are the results of a study which was aimed to analyse the occupational accidents of Finnish forestry workers. Subjects of this analysis were 228 loggers.

The risks associated with logging are well documented, however little work has been done on estimating the economic impact of injuries among loggers. Mujuru et al. (2006, p. 1042) used a West Virginia Workers' Compensation claims data for the period of 1996 – 2001 to assess the economic burden of logging injuries in the state. There were 1,371 claimants during this period with the highest number of claims (39 %) in the 25 – 34 years age category. The total cost of injuries was over \$14 million. The most severe injuries, like traumatic brain injuries (TBI), thoracic, cervical, and lumbar, resulted in the highest medical costs, indemnity costs and permanent disability. The average medical cost for logging-related to traumatic brain injuries

was \$198,048 compared to \$15,321 for other major industries. The magnitude of the economic costs underscores the need for active research of injury prevention among loggers and for greater attention to occupational safety and health programs.

Musculoskeletal disorders are the most expensive form of work disability for companies. In Germany, they are responsible for almost 27 % of all production downtimes caused by sick leave from work. The direct and indirect annual expenses of these disorders amount to approximately 24.5 billion Euro for the labour force and approximately 38 billion Euro for the total population. For analytical and practical reasons, measures for prevention of this socioeconomic damage should be implemented in companies (Thiehoff, 2002, p. 953).

In countries where accident insurance plans are in place, premiums go up as compensation volumes rise. In some industrialized countries, workers' compensation fees have become one of the largest cost factors of all, seriously affecting the economic viability of logging businesses. In the United States, for example, insurance costs often amount to as much as 40 percent of payroll expenses, i.e. US\$ 40 of insurance have to be paid on top of every US\$ 100 of wage (Garland, 1989, in Poschen [online]).

The topic of this article is to analyze the influence of occurred work injuries, occupational diseases and others illnesses on economical and time aspect of the work.

2. Material and methods

The exact analysis has been done for the area of the University Forest Enterprise Technical university in Zvolen (VšLP) for the time period from 1977 to 2004.

The university forest enterprise Technical university in Zvolen (VšLP) is an important special purpose facility for practical training of students as well as scientific and research activities of workers of Technical University. The VšLP manages forests in the area of 10,089 ha spreading in three separate orographic units divided by the flows of the rivers Hron and Slatina in the close vicinity of Zvolen. The Kremnica Mountains and the Štiavnica Mountains are managed by the forest district of Budča, the Javorie is managed by the forest district of Sekier. The mountains have the stratovolcanic structure formed by andesite minerals and pyroclastic rocks with predominating brown forest soil. The climatic, soil and site conditions in the vicinity of Zvolen have enabled the occurrence of heterogeneous ecosystems in five forest altitudinal vegetation zones in the concentrated area. Broadleaved tree species prevail over the coniferous ones, with dominating tree species beech and spruce.

The averages annual ranges of the tasks within the main activities of the VšLP are as follows:

- Forest reproduction 55 ha,
- Cleanings 205 ha,
- Thinnings 350 ha,
- Logging 45,000 m³ (Macko, Š. et al., 2008, p. 36).

The primary data needed to set the target landing were selected from annual reports on activities and management of the University Forest Enterprise. The particular data related to:

- a) work injuries (WI) (total number of work injuries, number of work injuries per 100 workers, number of compensated work injuries, amount of compensation, number of lost days due to a work injury),
- b) occupational diseases (OD) (total number of occupational diseases, number of occupational diseases per 100 workers),
- c) illnesses (number of lost days due to an illness),
- d) share of time nonusage due to injuries and illnesses,

- e) hazardous workplace (number of workers on hazardous workplace, amount of hazardous work premium, particular injurious agents),
- f) costs to personal protective work equipment (PPWE).

Data were processed with the use of Microsoft EXCEL software. The analysis of influence of occurred work injuries, occupational diseases and others illnesses on economical and time aspect of the work are evaluated based on the graphs, which are interpreted at the same time.

3. Results

The total number of workers has a decreasing trend (Figure 1). From the number of 328 in the year 1977 a decline in the number of 129 workers (y. 2004) was recorded.



Figure 1: Number of workers, number of workers on hazardous workplaces

Source: own

The number of persons working on hazardous workplaces is also visible at this figure (Figure 1). The average share of these workers is reaching the value of 21 % in the monitored period. A hazardous work premium was paid until the year 1993. The amount of hazardous work premium as well as costs on work injuries and occupational diseases compensations and the costs associated with work safety and protection of health at work are pictured in following figure (Figure 2).

As we can see in the figure, the highest costs of enterprise are the resources expended on personal protective work equipment, resp. work safety and protection of health at work. The highest costs to personal protective equipment purchase were evaluated in 1999 with the amount of 4,990 Slovak Crones per worker. However, marked increase is evident back in 1995. The trend of resources used for the work injuries and occupational diseases compensations payments has a similar course. The highest amount of paid compensations was recorded in 1997 and reached 16,492 Slovak Crones per cause. But, it is necessary to point out that the compensations since 1995 include only occupational diseases amends and therefore the actual sum of compensations could be higher (several injuries occurred every year since 1995 to 2004.). An analogical analysis was done by following authors: Suchomel, Belanová, Vlčková (2008, p. 180). They evaluated regresses and compensations for work injuries and occupational disease occurred at the branches Čadca and Levice in the time period of 2000 – 2006. Costs to amends and regresses were the highest in 2006 at the branch Čadca. The total amount of 144,541 Slovak Crones to four workers (36,135.25 Slovak Crones/worker). Equally, at the branch Levice the

most of resources were expended on compensations in 2006. The sum of 23,000 Slovak Crones was paid to one worker.

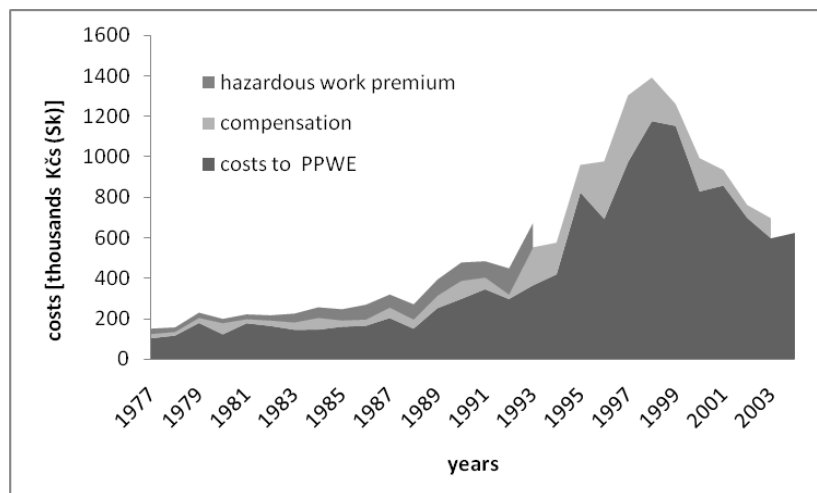


Figure 2: Development of costs to PPWE, hazardous work premiums and compensations

Source: own

The distribution of persons working at the hazardous workplaces is pictured in the Figure 3. It shows the numbers of workers exposed to poison (NW-HP-P), exposed to noise, vibrations and noxious gas (NW-HP-NaVaG), exposed to noise, vibrations, noxious gas and poison (NW-HP-NaVaGaP) and exposed to noise (NW-HP-N) illustrated. The hazardous work premiums were paid to the workers, who were exposed to an injurious agent.

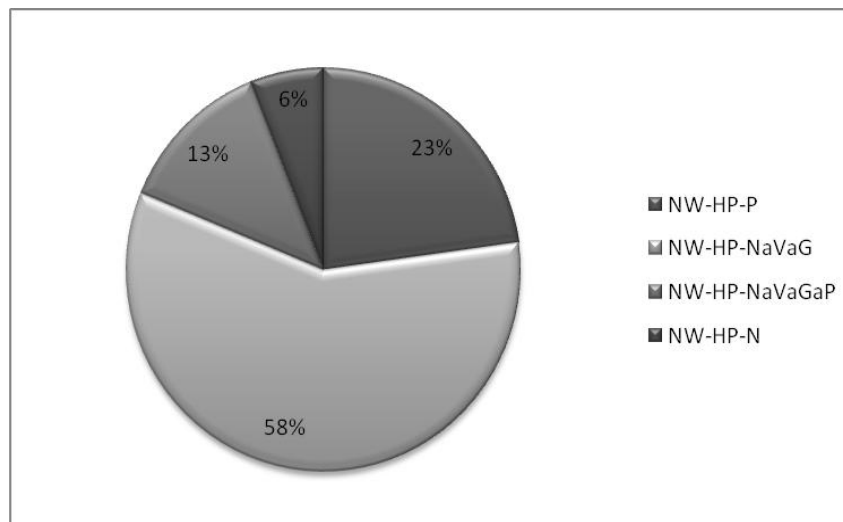


Figure 3: Distribution of workers at hazardous workplaces

Source: own

The most severe injurious agents noise and vibrations as well as other kinds of noxious agents as carbon monoxide (CO), carbon dioxide (CO₂), NO_x, or the dangerous substances used at the stand tending and silviculture. In many cases the workers are endangered by several

factors at the same time. The biggest group of forest workers represents the persons exposed to vibrations, exhaust pollutants and noise. All these injurious agents are occurring within the activities carried out with chainsaw. Pesticides, phytocides and insecticides belong to the especially dangerous in the stand tending and silviculture substances.

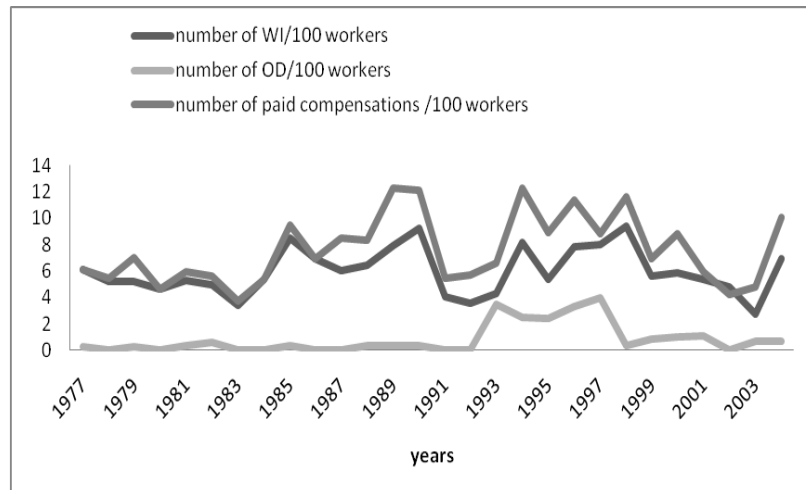


Figure 4: Development of work injuries, occupational diseases frequency and number of paid compensations

Source: own

In the figure 4 the following factors in an integrated form are evaluated:

- The number of work injuries per 100 workers - the highest share was recorded in 1998 – 9.4 work injuries/100 w, 1990 – 9.27, in 1985 – 8.52.
- The number of occupational diseases per 100 workers –based on the analysis for the period 1977 to 1992 a steady trend can be found. Significant increase was recorded in the period of 1993 – 1997. Since 1998 the tendency of occupational diseases frequency was similar to the beginning of the monitored period. The most frequent professional disease in forest industry is the vibrations disease (66 %), second most frequent is the Lyme borreliosis (26 %) and the third is the professional deafness with the share of 3 % (Suchomel et al., 2008, p. 960).
- Based on the evaluation of development of worker's compensation for work injuries or occupational diseases we can state that the curve describing this phenomenon significantly affects the number of injuries per 100 workers, because the occurrence of work injuries is higher than the occupational diseases frequency.

An influence of work injuries, occupational diseases, illness and others reasons and obstacles on the working time is expressed in relative value in the Figure 5. Amount of working time is also mentioned in this figure. The largest share of working time nonusage by reason of work injury and illness is recorded in 1995 in the share of 9.3 % of total working time. The occurred illness significantly influenced this fact.

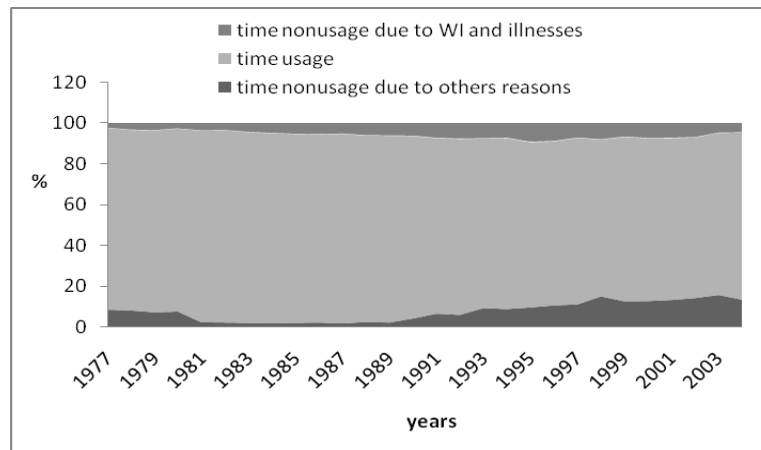


Figure 5: Use of working time

Source: own

The evaluation of the work injuries, occupational diseases and others illnesses influence on the number of lost days shows that remaining illnesses significant affect on the number of lost days at work (Figure. 6). The highest values were recorded in 1998, 1995 and 1996, whereby the absolute maximum was reached in 1998 – 8,670 lost days by reason of an illness. Seriousness of work injuries also markedly influences the trend of lost day's number. The curve describing the frequency of lost days due to a work injury has a balanced character, the highest values – over the number of 1000 lost days were recorded in 1995 and 1998.

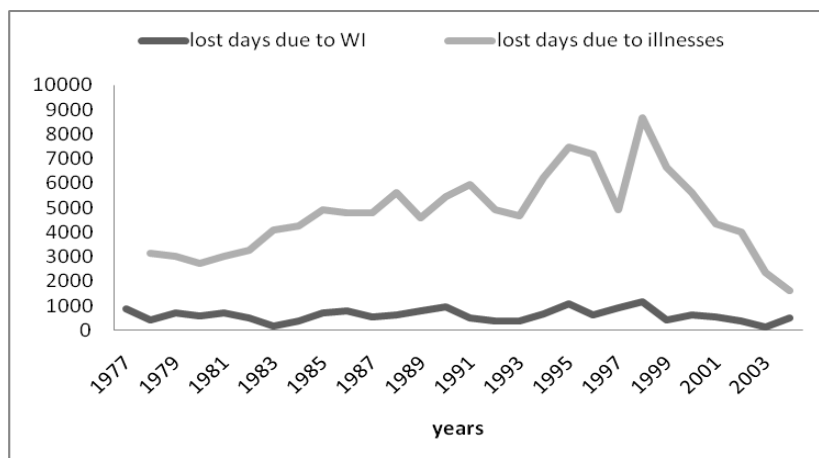


Figure 6: Development of lost days frequency

Source: own

Lilley et al. (2002, p 63) analyzed the prevalence, causes, and consequences of fatigue among forest workers in New Zealand, especially logging and silviculture workers. Specifically, the study sought to gather information about fatigue experience and about potential contributors to fatigue, particularly work-related contributors, in order to explore the relationship of these factors with self-reported adverse outcomes like near-misses, accidents, and lost-time injury. Lost-time injury over the previous 12 months was reported by 19 % of all (376) respondents. Of those reporting lost – time injury, 14.3 % reported 1 day off work, 34.9 % reported having 2 – 5 days, 23.8 % had 6 – 10 days off work, with the remaining 27 % having more than 2 weeks off work.

4. Conclusion

The aim of this article was to mention the enterprise economy burden consisting in compensations for forest workers for occurred work injuries and occupational diseases, but also the influence of work injuries, occupational diseases and others illness on working time. Based on the analysis of compensations amounts we can state an increasing trend during the years, although the occupational diseases amends are included only since 1995. The highest amount of compensations was recorded in 1997 and reached 16,492 Slovak Crones per cause.

The largest share of working time nonusage due to work injury and illness is recorded in 1995, which is 9.3 % of total working time. The occurred illness significantly influenced this fact. Equally, the remaining illnesses significant affect on the number of lost days at work. The highest value was recorded in 1998 – 8670 lost days by reason of an illness.

Costs to personal protective work equipment and hazardous work premium are also a part of the analysis in monitored time. The highest costs to personal protective equipment purchase were recorded in 1999 with the amount of 4,990 Slovak Crones per worker.

The compensations amount as well as the lost day's number depends on the kind of injury and the range of person's injury. Therefore, it is necessary to put more and more accent on prevention and by these means avoid the work injuries and occupational diseases occurrence risk. One of the prevention possibilities in forest management is also the selection of appropriate machinery and technology, primarily in the most hazardous part – timber harvesting (Slančík et al., 2009, p. 188).

In consequence of the change of the way the principal activity realization in Lesy SR, š.p. (dominant forest subject) by delivery works volume, we can rightfully await the increase of the professional diseases frequency. Therefore it is needed to take system arrangements for this situation improvement.

It is necessary focused these system arrangements on:

- hazards analysis,
- realization of preventive arrangements for elimination, resp. hazard removing,
- regular check of undertakings arrangements effectiveness, especially in field of health hazards elimination (Suchomel, Belanová, Vlčková, 2007, p. 57).

The basis for work safety is also executives' and workers' education (knowledge) and an appropriate qualification. Within the frame of longer-range labour for humanization at the work with chainsaw, the Educational program of development of humanization principle and occupational health and safety in forestry, was evolved (Suchomel et al., 2008, p. 193).

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