



Survey on working conditions in the Republic of Croatia

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Abstract

Background and Purpose: Survey and assessment of occupational hazards in work processes and economic activities are crucial for successful health protection of working population. The survey of working conditions in Croatia aims to provide an overview of occupational hazards and to identify major factors affecting the workers' health.

Materials and Methods: A survey of occupational hazards was carried out on a representative sample of working population of the Republic of Croatia consisting of 12% of all employed workers, evenly allocated in all economic activities. The survey was based on the questionnaire containing detailed classification of occupational hazards. The questionnaire was sent to 3,930 companies, i.e. 1,500 companies employing more than 50 employees (LC) and 2,430 companies employing less than 50 employees (SE). The response rate for LC was 42% and for SE 7%.

Results: Each Croatian worker is averagely exposed to 4.5 occupational hazards. The most heavily exposed to hazardous working conditions are workers in fishing (7.0 hazards per worker), mining and quarrying (6.9 hazards), construction (5.7 hazards) and manufacturing (5.0 hazards). Croatian working population is mostly exposed to psychosocial and organizational factors (82.8% of workers), statodynamic strains (80.4%), mechanical hazards (69.5%) and falling and crashing (58.5%). A considerable number of workers is also exposed to adverse climate conditions (33.4%), chemicals (25.0%), electric hazards (22.9%) and noise (21.7%). Exposure to occupational hazards are significantly less frequent in SE than in LC, presumably due to the lack of interest of small employers in health and safety issues. The most numerous occupational hazards are present in manufacturing, mining and construction.

Conclusion: The survey results show high frequency of risks resulting from »new« technologies and at the same time the presence of hazards produced by »old« technologies. The survey findings can be the basis for the future policy planning of work-related matters and implementation of the occupational health and safety measures for protection of worker's health at the national level.

INTRODUCTION

Work is an integral element of human life and provides a number of economic, financial, social and mental benefits. Despite these favorable effects of work and employment, many workers are during work exposed to various potentially hazardous working conditions

TABLE 1

Classification of occupational hazards used in survey.

Mechanical hazards
Tools: manual, mechanized
Machines and equipment
Transport devices
<ul style="list-style-type: none"> • motor vehicles: cars, trucks, lorries, tractors etc. • transport devices: forklift • engineering vehicles: excavators, bulldozers, road rollers, loaders etc.
Lifting devices: cranes, derricks
Object manipulation
Guns
Other mechanical hazards
Risk of falling and crashing
Falling of persons: on the same level, in depth, from heights, from heights over 3m
Falling of objects
Electric hazards
Open electric circuit
Other electric hazards
Fire and explosion
Explosive substances
Inflammable substances
Termic hazards
Hot materials
Cold materials
Chemicals
Toxins: metals, nonmetals, organic compound
Corrosives: acids, alkalis, other corrosives
Irritants: highly water soluble, low water soluble, degreasers, other irritants
Asphyxiant gases: simple, chemical
Senzitizers: organic dust, allergogenic chemicals, thermophilic actinomycetes, others senzitizers
Fibrogenic dusts: asbestos, crystalline silica, other fibrogenic dusts
Mutagens, cancerogens, teratogens
Biological hazards
Infectious material, persons, animals
Dangerous animals and plants
Physical agents
Noise: continuous, discontinuous, distracting
Vibrations: hand-arm vibration, whole-body vibration
Atmospheric pressure: increased, decreased, changing of
Climate and microclimate conditions: work outside, hot environment, high humidity, windy, cold environment, often temperature changing, adverse effects of air-condition

Ionizing radiation: X-ray, radioactive elements
Non-ionizing radiation: UV, infra-red, microwave, laser, low-level electromagnetic fields
Lighting: insufficient, flare
Other physical hazards
Statodynamic strain
Static: long-term sitting or standing, awkward posture, hands overheads squatting, kneeling, work in confined space
Dynamic: repetitive movements with or without forceful component, lifting and carrying of heavy loads, pushing and pulling of loads, heavy manual work
Psychosocial and organizational factors
Unfavourable pace of work: high work intensity, normative work, no control over pace/speed of work, irregular time patterns
Disturbed biorhythm: shiftwork, night work, over-time work
Interfering with social needs: working out of place of residence
Responsibility for people and materials: management, driving
Possible uncommon events
Hard receiving of information: audio and visual signals and signs, noise, insufficient lighting
Unsuitable job demands: demanding job, low job decision control, oscillating work, monotonous tasks, contact with clients
Harassment, mobbing, bullying
Burnout
Other psychosocial or organizational factors

such as chemicals, biological agents, physical factors, statodynamic strains, psychosocial factors or mechanical hazards. Exposure to these occupational hazards can affect and damage health, or even threaten life, and result in injuries at work and occupational and work-related diseases. Identification of occupational hazards and analysis of risks to health are substantial in prevention of diseases and injuries at work. In order to achieve this aim, it is necessary to assess working conditions and identify health hazards, either at enterprise or global national level.

The Republic of Croatia aims to become a member of the European Union (EU) in the near future. Although the main concern for Croatian employees, state and social partners has been employment in general, the importance of the the EU occupational health and safety (OHS) standards is increasing. The mobility of workers and capital within the the EU and Croatia will only be possible if workers can everywhere find the same level of protection and the same quality of working life as they have in their own country. To achieve the EU level of health protection at work, importance of working conditions in the process of increasing the quality of work in Croatia should be highlighted. The assessment and monitoring of working conditions and hazards, as a presumption for taking safety measures and promotion of healthy workplace, are the way of harmonization with the EU standards and contribution to the accession process.

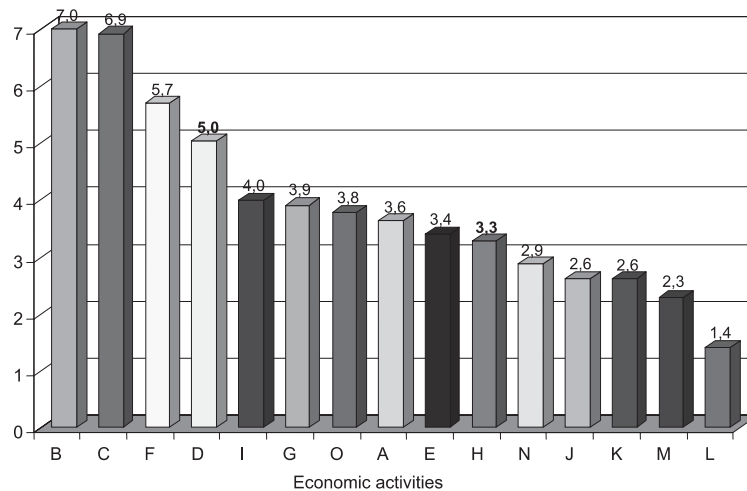


Figure 1. Average number of occupational hazards per worker in particular economic activity. *A=Agriculture, hunting and forestry; B=Fishing; C=Mining and quarrying; D=Manufacturing; E= Electricity, gas and water supply; F=Construction; G= Wholesale/retail trades, repairs; H=Hotels and restaurants; I=Transportation and communication; J=Financial intermediation; K=Real estate and business activities; L=Public administration and defense; M=Education; N=Health and social work; O=Other community and social activities;*

The survey of working conditions at national level aims to provide an overview of the state of working conditions in Croatia, to identify major issues and factors affecting the workers’ health and to contribute to a better monitoring of the quality of work and workers’ health.

MATERIAL AND METHODS

The survey of occupational hazards in Croatian economy was carried out by the Croatian Institute of Occupational Health during two years. The investigation was based on the questionnaire containing detailed classification of occupational hazards, elaborated according to the hazards listed in the Croatian regulation on risk assessment at work (Table 1). Besides the hazard classification, the questionnaire comprised questions on employer’s economic activity, number of employed workers, presence of hazards in a company and the number of workers exposed to particular hazard. The questionnaire was sent to 3,930 companies, i.e. to 1,500 companies employing 50

employees and more, and to 2,430 companies employing less than 50 employees. Companies were chosen at random, taking into consideration appropriate representation of each economic activity (1). Employers and their safety experts or services were asked to fulfill the questionnaire using data from their risk assessment document which, according to the Croatian legislation, each employer is obliged to have (2). The collected data were analyzed in data base of the Croatian Institute of Occupational Health.

RESULTS AND DISCUSSION

In Croatia there are 104,956 active companies employing 1.407,072 people (3). Only 4% of the companies (3,164) have 50 and more employees, being categorized as large companies (LC). Ninety-six percent (101.792) of all active companies are small enterprises (SE), and they employ less than 50 employees. Although there is a small number of LC they employ 68% (958,117 workers) of all working population, and SE employ only 32% (448,955 workers) of employees.

The fulfilled questionnaire was returned by 800 (20%) of 3,930 addressed companies. The response rate for LC was 42% and for SE only 7%. This survey covered 172,987 employees altogether, which is 12% of all the workers employed in Croatia. A total of 167,503 employees were from LC, which is 17% of workers employed with LC, and 5,484 employees in SE, which is only 1.2% of workers employed with SE. Relatively low response to the survey questionnaire in SE is not surprising, because neither in our country nor in the EU countries small employers are informed and interested enough in OHS issues. This result stresses out the need for stronger involvement of small employers in the OHS activities.

TABLE 2

Percentage of workers exposed to hazards causing injuries in the Croatian working population, LC and SE

	Croatian economy	LC	SE
Mechanical hazards	69.5	70.2	48.8
Falling and crashing	58.5	59.3	37.7
Electric hazards	22.9	23.2	16.2
Fire and explosion	14.3	14.4	12.0
Thermic hazards	7.7	7.8	5.6

LC = large companies (>50 employees); SE = small enterprises (<50 employees)

Figure 1 presents average number of occupational hazards per one worker in particular economic activity. Each worker in the Croatian economy is averagely exposed to 4.5 hazards to his/her health or life. Each worker is exposed during the work life to even 7 health hazards in fishing, 6.9 hazards in mining, 5.7 hazards in construction and 5 in manufacturing. Work conditions in these economic activities are known as dangerous and our results confirm that information.

Health hazards causing injuries

Mechanical hazards, falling and crashing, fire and explosion, electric and termic hazards always result in injuries, or even in death, and therefore they require special attention in OHS. Table 2 shows the relative number of workers exposed to hazards causing injuries. Seven of ten workers are at risk of injury caused by tools, machines, equipment, devices or vehicles. Similar, high risk of injury is caused by falling of persons or by falling of objects on persons. So frequently present hazards are reflected in a high number of injuries at work (4). In LC, hazards causing injuries have slightly higher incidence than in the whole examined group, but in SE these hazards are not present so often. This could be accounted for by as better implementation of the OHS measures or better work conditions in small enterprises. Unfortunately, the real reason is insufficient knowledge of risk assessment and lack of understanding of the OHS measures in small enterprises.

Health hazards causing occupational and work-related diseases

Chemicals, physical agents, biological hazards, static dynamic strains, psychosocial and organizational factors mainly result in occupational and work-related diseases. Table 3 shows the percentage of workers exposed to hazards causing diseases. Again, it is evident that all hazards are significantly less frequent in SE than in LC.

Although chemicals are usually considered as a significant danger for health, they are not the most frequent

TABLE 3

Percentage of workers exposed to hazards causing occupational and work-related diseases in the Croatian working population, LC and SE.

	Croatian economy	LC	SE
Chemicals	25.0	25.2	17.0
Physical agents	79.7	80.6	59.0
Biological hazards	8.4	8.6	5.0
Statodynamic strains	80.4	81.1	62.5
Psychosocial and organizational factors	82.8	83.8	61.1

LC = large companies (>50 employees); SE = small enterprises (<50 employees)

TABLE 4

Percentage of workers exposed to different types of chemicals with the Croatian working population, LC and SE.

	Croatian economy	LC	SE
Toxins	2.7	2.6	5.0
Corrosives	3.8	3.8	3.5
Irritants	4.5	4.6	1.9
Asphyxiants	4.0	4.1	0.6
Sensitizers	4.2	4.2	4.1
Fibrogens	1.8	1.8	0.3
Mutagens, carcinogens, teratogens	0.4	0.2	0.8

LC = large companies (>50 employees); SE = small enterprises (<50 employees)

TABLE 5

Percentage of workers exposed to physical agents in the Croatian working population, LC and SE.

	Croatian economy	LC	SE
Noise	27.7	21.9	14.3
Vibration	6.8	6.9	3.6
Altered atmospheric pressure	0.3	0.3	0.0
Adverse climatic conditions	33.4	33.7	27.4
Ionizing radiation	1.7	1.7	0.9
Non-ionizing radiation	6.4	6.5	4.7
Insufficient lighting	2.0	9.3	0.8

LC = large companies (>50 employees); SE = small enterprises (<50 employees)

occupational hazard. One quarter of Croatian workers is exposed to chemicals, while only 15% of the EU workers handle chemical products or substances (5). Depending on biological effects, chemicals comprise toxins, corrosives, irritants, asphyxiants, sensitizers, fibrogens, mutagens, carcinogens and teratogens. Incidence of particular type of chemicals in working environment is presented in Table 4. Such a rare presence of mutagens, teratogens and specially carcinogens was unexpected. It is surprising, in particular because awareness of carcinogenic risk is present not only among experts but even in general public. Recently Croatia has adopted a regulation on mutagens and carcinogens harmonized with the EU directive (6), and it has to be incentive to raise awareness and knowledge about those hazardous chemicals at workplace.

Physical agents are very frequent hazards in Croatian economy. Table 5 shows percentage of workers exposed

TABLE 6

Percentage of workers exposed to psychosocial and organizational factors in the Croatian working population, LC and SE.

	Croatian economy	LC	SE
Unfavourable pace of work	14.8	14.9	13.4
Disturbed biorhythm	33.0	33.5	19.7
Responsibility for people and materials	7.5	7.5	10.1
Unsuitable job demands	13.1	13.1	15.9
Others	14.4	14.8	2.0

LC = large companies (>50 employees); SE = small enterprises (<50 employees)

to physical agents. Every third worker in Croatia is exposed to adverse influence of climate conditions, such as heat, cold, humidity or windy conditions. As effects of these hazards can be diminished by technical or organizational measures, it is inappropriate to expose such a large number of workers to such risks. This is confirmed by the data that in the EU countries only 20% of workers are exposed to unfavorable climate conditions (5). In Croatian economy 27.7% of workers are exposed to noise, almost the same as in the EU with 30% of workers (5). Although economic development and machine modernization reduce the occurrence and intensity of industrial noise, the noise-induced hearing impairment is still a frequent occupational disease (7). On the other hand, new technologies bring in new sources of noise, which are not damaging to hearing, but reduce concentration and work ability or affect and worsen many diseases.

Statodynamic strains include static and dynamic components. Static component comprises elements such as long-term sitting or standing, awkward posture, squatting, kneeling, work in confined space or with hands overhead. In Croatia, 51.1% of workers are exposed to static strain, 51.6% in LC and 40.2% in SE. In the EU economies, 45% of workers work in painful and tiring positions (5). Dynamic component of statodynamic strains cover repetitive movements with or without forceful element, lifting and carrying of heavy loads, pushing and pulling of loads and heavy manual work. In Croatia 28.2% of workers are exposed to dynamic strain, 28.5% in LC and 20.9% in SE. In the EU countries, these working conditions are frequent because more than 60% of workers are exposed to repetitive hand and arm movements (5). Repetitive movements in our economy have significantly increased in work processes such as work with computer, but low frequency of this occupational hazard in our survey shows that we are not aware enough of its presence. It is important to point out that static and dynamic work are very often combined, and in the Croatian economy more than 80% of workers are exposed to statodynamic strain. These working conditions are im-

portant causal factor for the development of musculoskeletal diseases which are most frequent work-related diseases causing work disability (5, 8).

Psychosocial and organizational factors include many different working conditions which can result in stress-induced disorders. In Croatia, as many as 82.8% of workers are exposed to some of psychosocial factors. Table 6 shows percentage of workers exposed to particular psychosocial and organizational factors. Contrary to other hazards, responsibility for people and materials and unsuitable job demands are more often in SE than in LC. SE are especially sensitive to hard competition on the economic market, which produces high work requirements and stressful work conditions. In the EU countries, many workers (59 – 80%) are exposed to very high job demands, such as precise quality standards, unforeseen problems, complex tasks and learning of new things (5). In our economy, only 15% of workers are exposed to unsuitable job demands. This could be explained by better working conditions and organizational measures in our companies, but we are aware that higher and often unsuitable work requirements are considerably present, especially in private companies. The reason for low result in our survey is probably lack of awareness and knowledge of these occupational hazards. In Croatia, night – and shift work is still the most frequent stressful working condition (14.8% of workers). Shift – and especially night work, is in the EU countries significantly low, except in the eastern Europe where up to 25% of the

TABLE 7

The most frequent occupational hazards and their presence in Croatian economic activities.

Occupational hazard	Economic activities
Psychosocial and organizational factors	<ul style="list-style-type: none"> • manufacturing • mining and quarrying • transport and communication • education • construction
Statodynamic strain	<ul style="list-style-type: none"> • manufacturing • mining and quarrying • financial intermediation • construction • trade
Mechanical hazards Falling and crashing	<ul style="list-style-type: none"> • construction • mining and quarrying • manufacturing • agriculture and forestry
Hazards – climate, chemicals, noise	<ul style="list-style-type: none"> • manufacturing • mining and quarrying • agriculture and forestry • construction

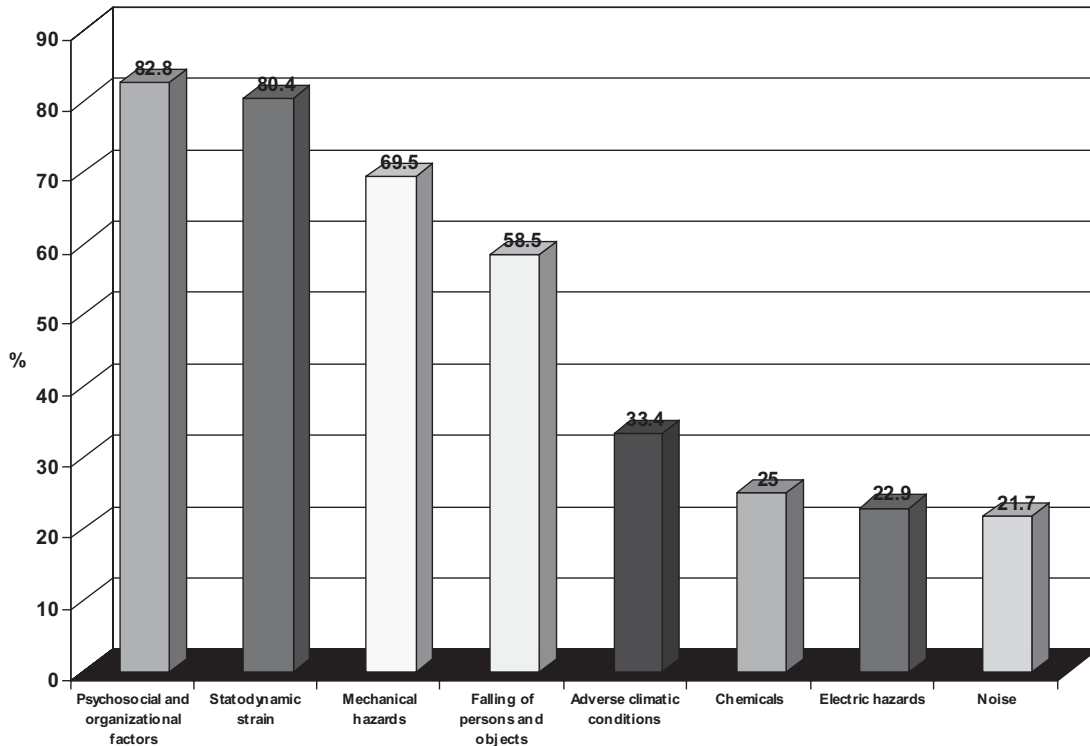


Figure 2. The most frequent occupational hazards in the Croatian economy.

working population is affected (5). Pace of work determined by the automatic speed of machine or work process is still considerably present (14.8%). An interesting result of this survey is the absence of harassment, mobbing or bullying at work, and very low presence of burn-out. It does not mean that aforementioned hazards do not exist. More likely, it means that workers are afraid to report those very unpleasant situations. At the same time, one of twenty workers in the EU reports temporary exposure to bullying or harassment at work (5).

Figure 2 shows the most frequent occupational hazards in the Croatian economy. Frequently occurring psychosocial factors and statodynamic, especially static strains are characteristic of developed and modern societies, and in that view we are close to the EU countries. But, at the same time our workers are exposed to the »old« hazards, such as mechanical hazards, climate or chemicals. It means that we have to deal with hazards of »new« technologies and simultaneously with problems of »old« technologies, generally solved in the EU.

Health hazards and economic activities

Psychosocial and organizational factors are mostly present in manufacturing, mining and quarrying, transport and communication, education and construction. Other frequently occurring hazards are mainly present in the same economic activities (Table 7), such as manufacturing, mining and construction. Similar findings are established in the EU, where construction, agriculture and manufacturing are the most hazardous economic activities (5).

CONCLUSION

Survey and assessment of occupational hazards in work processes and economic activities are crucial for successful health protection of working population. The survey of working conditions in Croatia aims to provide an overview of occupational hazards and to identify major factors affecting the workers' health.

Each Croatian worker is averagely exposed to 4.5 occupational hazards. The most heavily exposed to hazardous working conditions are workers in fishing (7.0 hazards per worker), mining and quarrying (6.9 hazards), construction (5.7 hazards) and manufacturing (5.0 hazards). Croatian working population is mostly exposed to psychosocial and organizational factors (82.8% of workers), statodynamic strains (80.4%), mechanical hazards (69.5%) and falling and crashing (58.5%). A considerable number of workers is also exposed to adverse climate conditions (33.4%), chemicals (25.0%), electric hazards (22.9%) and noise (21.7%). Exposure to occupational hazards is generally less frequent in SE than in LC. Psychosocial and organizational risk factors most often exist in manufacturing, mining, transport, education and construction, and statodynamic strain in manufacturing, mining, financial intermediation, construction and trade. Mechanical hazards and risk of falling jeopardize workers' health most frequently in construction, mining, manufacturing, agriculture and forestry, and adverse climate conditions, chemicals and noise in manufacturing, mining, agriculture and construction.

The survey results show high frequency of risks resulting from »new« technologies, and at the same time pres-

ence of hazards induced by »old« technologies. They highlight the importance of improving and developing working conditions as to enable workers to remain healthy and able to work as long as possible. The survey findings can be the basis for the future policy planning on work-related matters and implementing the OHS measures for protection of worker's health at the national level.

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