Improvement of Chemical Safety in Estonia

K.Reinhold, P. Tint
Tallinn Technical University
Kopli 101, 11712 Tallinn, Estonia

Introduction

People are exposed to different chemical hazards (solvents, dusts) in everyday work-life and during their leisure time. According to the data gathered by the National Board for Health Protection of Estonia in 1996 /1/ at least 25 000 workers were exposed to different types of chemicals (petroleum products, nitric and lead compounds, benzene and its derivates, manganese, nickel, phenols etc.) and 22 000 workers were exposed to different types of aerosols (organic dust, welding aerosols, oil-shale dust, mineral fibers, dust of abrasive materials, etc.). The propotion of female workers in the jobs where chemicals and aerosols are used or formed, was 35.6%.

Environmental pollution by chemicals has diminished in the last 5 to 10 years, as the big chemical factories producing for the former Soviet Union have disintegrated and some of them finished their work entirely. The present high exposure to different chemicals is connected with the increasing number of petrol stations and loading work at ports and railway-stations as large amounts of dangerous chemicals are transported through Estonia /2/. A Worrying factor is also the emission of dangerous aerosols during the welding of various materials (non-ferrous or painted metals) or finished objects, ships. These substances may be carcinogenic. Occupational poisonings are mainly caused by organic solvents (house painters, car painters).

Chemical safety legislation considering EU directives, has been worked out in Estonia. The Chemical Act is in force from 1998. Nevertheless the accidents (like methanol poisoning killing 70 persons in Pärnu in 2001) happen. So, the Chemical Act and the regulations based on this act are not sufficient for safe handling of chemicals. At the moment Estonia has to introduce “The risk assessment programme of existing substances in the European Union” that demands the large-scale risk assessment of at least 113 commonly used chemicals.

Aim and method

To assess the workers level of knowledge about health and safety risks connected with chemicals a questionnaire was worked out and the questioning of 129 (Russian- and Estonian-speaking, 66% of them women) workers was carried out by the students of Chemical Faculty of Tallinn Technical University in 2001-2002.

The safety in handling of chemicals by painters of buildings and cars, chemical laboratory staff, veterinarians, medical workers, drivers, workers of petrol-stations, hair-dressers, cleaners was investigated. These workers are mainly exposed to organic solvents, but also to petrol, lead, acids and alkalis in every-day work-life.

The questionnaire examined the existence and level of the following risk factors in the working environment:

*exposition to chemicals and other occupational risks

*level of workers' knowledge about the influence of chemicals on their health

*state of being provided with PPE (personal protection equipment) and its use

*the opinion of workers about safety instructions

*the proposals of workers on improvement of working conditions

*the character of health disorders (headache, sleeping disturbances etc.) connected with occupation

*knowledge on Chemical Act

The average age of examined workers was 36.0 years.

Results

The investigation gave the following results:

1.The workers were mainly exposed to organic solvents (toluene, xylene, halogenated hydrocarbons, acetone, petrol products), concentrated acids and alkalis, dusts.

2. Of the respondents 77.0% knew how the chemicals influence on their health. Sometimes they did not exactly know the effect of all the used chemical substances, or on what organ the influence was the strongest.

Of the examined persons 15.3% had no idea how the chemicals influence on the body.

Most often the persons pointed on allergic effects, influence on respiratory organs and danger of chemical burning.

Only some of the workers know that the dangerousness may be identified by labels. Nobody of respondents pointed at chemical data sheets as an information source for chemical hazards.

3. The question about personal protection equipment.

The supply with PPE is good in older firms; however, the questionnaire did not show whether the workers also use the PPE. Probably the answer was formal: if we must use it, then we write that we do.

Some of the respondents (36.0%) pointed that the PPE disturbs the work; others mentioned that the quality of PPE is not very good.

4. Do you know your specialist of working environment? - In 62.8% of the cases answered “yes”.

5. Where you instructed about chemical risks during your first and periodical instruction? - 84.4% answered “yes”.

6. Different opinions were given on safety instructions. The assessment was made in a 6-point scale (from 0 to 5). The average 2.3 was above satisfactory (2), but we must consider that 25.0% of respondents had not had any instructions. Sometimes the instructions are good, but it is not possible to follow them.

7. The knowledge on Estonian Chemical Act. Only in 32.5% of cases answer was “yes”.

The above-mentioned questionnaire showed that 77.0% of workers knew or thought that they knew the health risks connected with chemicals, so we might hope that there are no special occupational health problems.

However, the reality is different:

Of examined workers 21.7% had health damages connected with work.

The main complaints were: heavy breathing, headache, and complaints of eyes, vertigo, sleeping disturbances, and fatigue. The main illnesses were: damages of respiratory system, allergic diseases of skin and rhinitis, damages of skin of hands, chemical burnings, poisonings with organic solvents.

We have to point out that in this group (workers that have health damages) nobody had heard about Estonian Chemical Act. The mean mark for safety instructions was 0.85 and 57.2% of sick persons had no instructions for safe handling of chemicals.

Average age of the examined workers, their length of service and health complaints (as headache, fatigue, sleeping and blood pressure disturbances, smoking habits) are presented in Figure 1-4.

For illustration some of the answers are given in the Table 1.

Table 1. Health damages connected with chemical exposure of workers

OCCUPATION	CHEMICAL	HEALTH DAMAGES
Chemists (engineers, laboratory assistants, technologists)	1. Concentrated acids, alkalis, organic solvents 2. Printer's ink, solvents 3. Chemicals used in galvanics, acids, alkalis 4. Petrol products, toluene 5. Ozone, phenol, benzene, tetrachloromethan	Damages of eyes, toxic-allergic bronchitis Sensibilisation with solvents Contact and allergic dermatitis Eczema or dermatitis Irritation on skin Contact dermatitis
Finishers of furniture	Formaldehyde, aromatic compounds	Allergic dermatitis, allergic bronchitis
Painters of buildings	1. Dust, solvents, liquefiers 2. Organic solvents, liquefiers	Allergic dermatitis, allergic bronchitis, Chronic intoxication
Painters of cars	Dusts, paints, solvents, acryl-latex paints	Allergic dermatitis, chronic intoxication
Veterinarians	Formalin, antibiotics, chloroamine	Allergic reactions of skin and eyes

Discussion

The knowledge about occupational health risks at enterprises, particularly in small, just founded ones, is not always sufficient and there is a great need for information on different topics, such as toxicity of chemical substances and its connection to illnesses. The knowledge of enterprises' leadership and therefore, also of the workers about protective measures is inadequate.

References

1. Tint P. Risk Assessment in the Working Environment in Estonia. International Journal of Occupational Safety and Ergonomics 1998; 2: 237-248.
2. Tint, P. Chemical Risk Assessment at Estonian Enterprises. CD-Rom. Proceedings of ECCE-3, 3rd European Congress of Chemical Engineering, 26-28 June 2001, Nuremberg, Germany.

Figure 1. Average age of workers

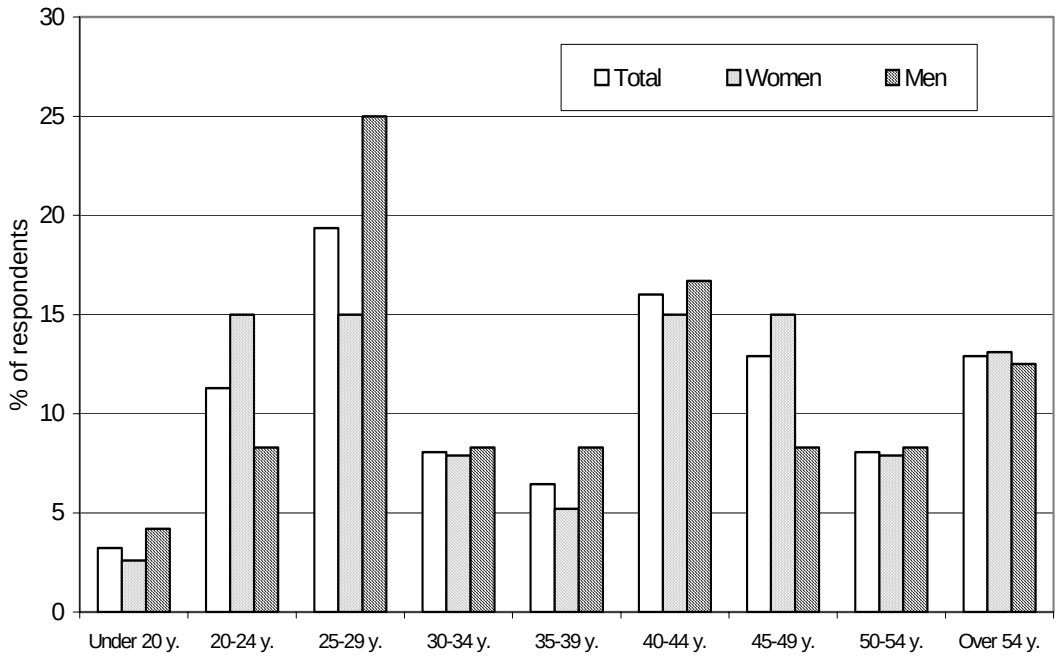

Figure 2. Average length of service of workers

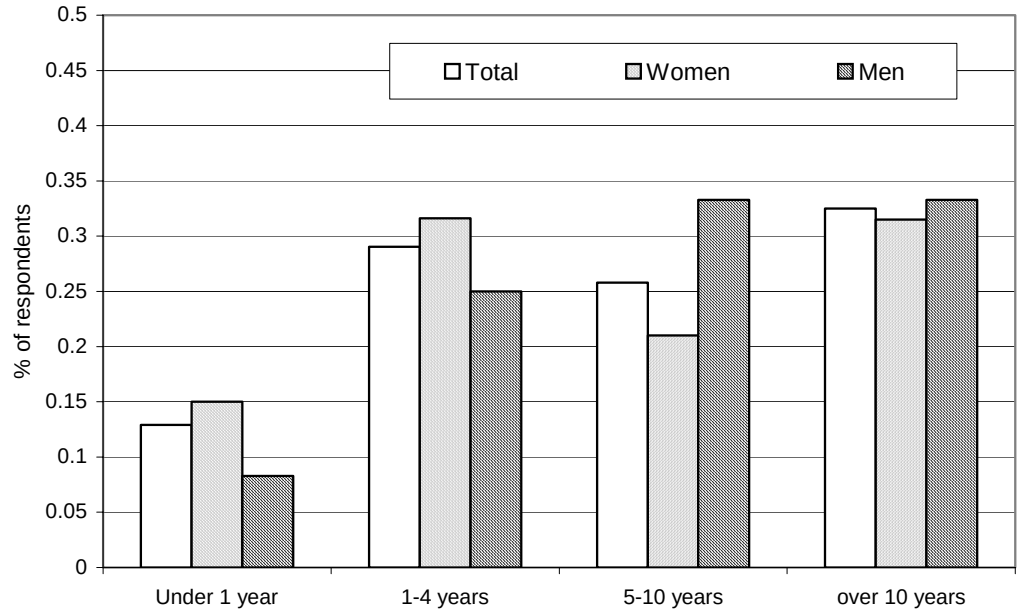

Figure 3. Characterization of health complaints of workers (headache and fatigue)

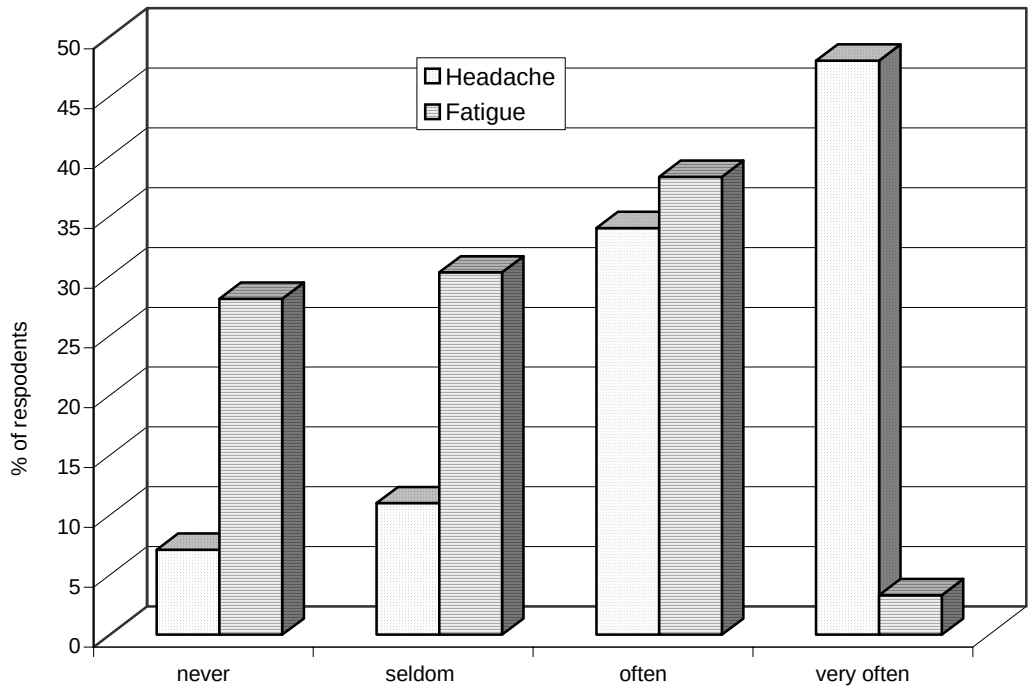

Figure 4. Characterization of health complaints of workers (smoking, blood pressure, sleep)