

NOTES

Physical Agents in the Occupational Environment in Estonia

Paul Krooni
Vernold Kallasmaa
Tamara Makarova

Health Protection Inspectorate, Estonia

Physical agents cause several physical and mental health disorders and reduce human capability for work, in most severe cases they cause disability. Usually the influence of these physical factors takes place in the work environment and depends on the factor's intensity, exposure time, and individual characteristics. Influence is cumulative and may manifest itself after a long period of time, in several years. It is recommended to follow internationally recognized limit values of factors and introduce medical control of people before they start working as well as periodical medical control. From the most widespread risk factors, this article deals with noise with the data obtained from objective studies on Estonia.

physical agent health protection

1. INTRODUCTION

At present mean life expectancy in Estonia is 65 years for men and 75 years for women. As according to the literature data working conditions in Estonia are considerably worse than in industrially more developed European countries, we have set a task to get data on physical health risks in Estonian industry. Until 1998 the task was assigned to the Health Protection Inspectorate.

Under control were, in all, 3,789 industrial enterprises with the total number of employees of over 633,690 people.

2. PARTICIPANTS AND METHODS

Selection was made from employees of enterprises of agriculture, transport, mining, power industry, and wood-working industry, in all, approximately 365 thousand people.

Health Protection Inspectorate carried out assessments and measurements of physical agents according to European Union (EU) directives and International Organization for Standardization (ISO) standards:

- Acoustics—altogether 46 established standards were used in the period between 1975 and 1995.
- Vibration—altogether 20 established standards were used in the period between 1974 and 1994.

For measurements acknowledged measuring instruments of controlled degree of precision were used. Measurements were carried out at the request of inspectors or on the basis of employees' complaints in selected locations at conditions corresponding to controlled activity and on the ground of ISO standards and International Labour Office (ILO) requirements.

3. RESULTS

As assessment of agents according to the character of work is rather complicated, inspectors considered it necessary to carry out specific measurements at workplaces. The results are presented in Table 1.

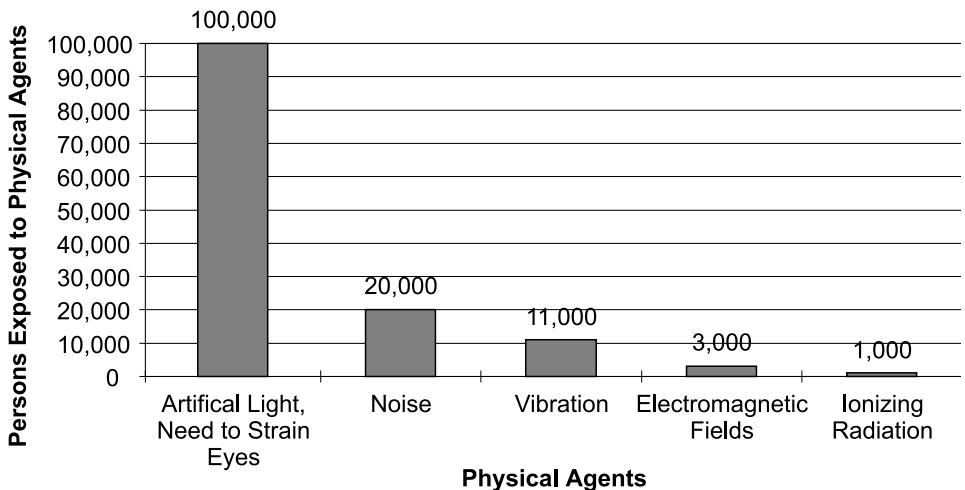


Figure 1. Number of persons exposed to physical agents at work according to expert estimates. Notes. Numbers are rounded up to the nearest 100.

TABLE 1. Measurements of Workplace Risk Factors in 1997

Factor	Workplaces Studied	Workplaces Not Meeting Requirements (%)	Workers Exposed to Conditions Not Meeting Requirements
Intensity of light	4669	24.90	1819
Noise	1791	45.50	1278
Vibration	107	44.80	66
Electromagnetic field	126	16.60	21
Radiation	916	0.15	none

The measurements showed that according to the reports of inspecting offices over 15% of Estonian industrial workers were exposed to some hazardous factor. However, the occupational morbidity indicator per 10 thousand workers is 2.0 (1996 data). This is lower than could be expected considering the number of workers whose working conditions fail to meet the requirements. Besides it may be claimed that medical control of workers is not sufficiently efficient. Moreover, one patient may have several illnesses. For instance truck and tractor drivers may have in addition to *Hypacusis ex sonare* also vibration or overload sicknesses, or both, which are mainly caused by forced posture, physical load at lifting, or unfavourable microclimate.

As to radiation in Estonia, one fatal accident occurred when a radiation source from a storage-place got into the hands of a person stealing scrap metal. Two cases of occupational disease were registered with skin damage (an X-ray technician and a worker in a measuring instruments plant). The World Health Organization recommends ensuring constant medical surveillance of all substantially irradiated persons up to the end of their life.

In Estonia this is thinkable only in the case of people who participated in removing the consequences of the Tchernobyl accident.

Occupational diseases are presented in Table 2.

TABLE 2. Occupational Diseases Caused by Physical Agents in 1997

Disease	Number of Cases	% of the Total Number of Cases of Occupational Diseases
<i>Hypacusis ex sonare</i>	25	13
Vibration sickness	60	30
Others (physical overload; radiculitis; toxications; lung, skin, and communicable diseases)	113	57
Total	198	100

4. CONCLUSIONS

1. Surveillance of physical agents should be continued and the data received through national inspection and employer's self-control should be kept for up to 10 years after the end of exposure, instead of the current 3 years. This is so because illness can manifest itself considerably later after exposure.
2. It is advisable to integrate EU Directives into Estonian legal acts taking into account experience of leading countries in Europe in the relevant field.
3. It is necessary to raise the efficiency of workers' medical control.
4. It is necessary to arrange co-operation with scientific institutions to find emerging risks as soon as possible to plan complex prevention.