patient gender division: 106 women (70.7%, mean age 42 years) and 44 men (29.3%, mean age 48 years). The reasons why so often both genders are attending MRI associated by CNS disease (32.7%), spinal disease (32%)and bone-joint system diseases (16.7%). 46% of patients didn't feel any discomfort during MRI procedure, but 54% of patients felt some discomfort using MRI, while women associate the discomfort with noise more often (p=0.036). The machine noise and lying still were mentioned by patients as more frequent reasons of discomfort, as well as claustrophobia was noted. Women are afraid of MRI more often (p=0.05) but men are sedated before MRI screening more frequent (p=0.009). Also, men tend to sleep during MRI (p=0.062). There is statistically significant correlation by age groups (Spearman's rho) between the expressions of discomfort and age: the older women mentioned the general discomfort (p=0.01), headaches / dizziness (p=0.013) and unpleasant vibration feeling (p=0.023). Women have panic attacks more often (p=0.001), they also tend to take sedatives more frequent than men (p=0.08). 94% of patients never had unterminated MRI because of the subjective discomfort. It is proved correlation between magnetic field strength, medical staff working day and acute transient symptoms as dizzinessor metallic taste in the mouth: the stronger magnetic field or a longer shift, the more intensive symptoms will be developing. **Conclusions.** The most part of patients notes discomfort during MRI, which can be reduced by different ways. The most popular way to avoid it is to sedate patient or give him earplugs. These methods are quite effective but it is necessary to improve the cooperation of doctor-patient that is proven as one of the most effective methods.

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THE USE OF EYE TRACKING METHOD FOR WELL-BEING OF COMPUTER USERS

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ИСПОЛЬЗОВАНИЕ ОКУЛОГРАФИИ ДЛЯ СОХРАНЕНИЯ ЗДОРОВЬЯ ПОЛЬЗОВАТЕЛЕЙ КОМПЬЮТЕРОВ. **Гринберга С.** Рижский университет им. Страдыня, ул. Дзирциема, 16, Рига, Латвия, LV-1007

Key words: *eye tracking; software ergonomics; well-being*
Ключевые слова: *окулография; эргономика программного обеспечения; благополучие*

The increased use of information technology at work can affect computer users' wellbeing in different ways. The most common health disturbances of computer users are musculoskeletal problems, visual discomfort, as well as stress-related disorders. Undoubtedly, a great role is played by physical ergonomics, in how correctly or incorrectly the monitor, keyboard, the table, the chair or document holderis positioned. Computer mice and keyboard design are also important, i.e. how easy it is to work with it. However, no less important is the role of software ergonomics, where the software usability is central. Poorly designed software can be extremely annoying to users; it can cause stress that contributes to both muscle tension and dissatisfaction with the work that can contribute to various psycho-physiological changes in the employee's body. To improve the well-being of the employee, to increase job satisfaction, as well as positive emotions and mindfulness, software ergonomics must be improved. Various subjective and objective usability studies are carried out for this purpose. Eye tracking is one of the usability testing methods which helps understand the user experience while using information and communication technologies. Eye tracking shows the **instantaneous** reactions of computer users, as well as the dispersion of their attention in an interface. Eye tracking can be used with a variety of other research methods, such as observations, interviews, and retrospective think aloud. However, eye-tracking, as an objective study method provides much more information about the user than other subjective methods, such as the retrospective think aloud method. The reason for this is that the test participant may not remember his activities during the test, because behavior is unconscious, or they are quickly forgotten, or they cannot verbalize the reasons for their behavior.Whereas through examination of eye tracking data, visualisations and replays the causes for behavior can be found more precise and specific.In eye tracking of special interest are points of "**fixation**" — areas in which a user's gaze stops moving and "**saccade**" — the movement of a user's eyes between fixation points. The data of eye tracking can be visualised and interpreted to **reveal** behaviour that is otherwise invisible, including: an ordered list of fixations which shows what the user sees; an unordered list of unnoticed elements, which shows what the user does not see; time to reach any fixation This may be related to how easy or difficult it is to find the element; fixation time which may be related to how appealing or comprehensible an element might have been; the number of fixations per element which can be related to how confusing, useful or inconsistent an element might have been. It is important that the eye tracking method can provide data that would be considerably more difficult to obtain with other testing methods.

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ASSESSING EXPOSURE TO OCCUPATIONAL CHEMICALS IN LARGE-SCALE EPIDEMIOLOGICAL STUDIES ON OCCUPATIONAL CANCERS

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ОЦЕНКА ВЛИЯНИЯ ХИМИЧЕСКИХ ВЕЩЕСТВ НА ПРОИЗВОДСТВЕ В ШИРОКОМАСШТАБНОМ ЭПИДЕМИОЛОГИЧЕСКОМ ИССЛЕДОВАНИИ РАКОВЫХ ПРОЦЕССОВ, ОБУСЛОВЛЕННЫХ ПРОФЕССИОНАЛЬНЫМИ ВРЕДНОСТЯМИ. **Ханс Кромхут.** Институт исследований по оценке риска, Университет Утрехта, ул. Ялелаан, 2, Утрехт, Нидерланды

Key words: *occupational chemicals; exposure; cancer epidemiology*
Ключевые слова: *химические вещества на производстве; воздействие; эпидемиология рака*

Retrospective exposure assessment for both community-based (case-control) and industry-based (cohort or nested case-control) epidemiological studies can be quite challenging especially when more than one centre/country is involved. When pooling data across community based case-control studies (like for instance in the case-control studies of the SYNERGY project) the exposure assessment has to be redone in order to overcome the issue of the lowest common denominator. Also when exposure assessment is based on expert judgement in individual studies, no straightforward approaches exist for calibration and pooling of these exposure estimates. Often though, complete and detailed occupational histories of the study participants will be available which can be used as the basis for a standardized approach across centres/studies. For instance in the SYNERGY project we successfully managed to collect actual exposure measurements across Europa and Canada covering almost 4 decades (1970-2010). Based on this wealth of exposure data a job-exposure matrix (JEM) was elaborated with quantitative estimates of the level of exposure by job, year, and region. Combining the JEM with occupational histories of cases and controls resulted in quantitative exposure histories which allowed for derivation of quantitative exposure response relationship for amongst others silica and asbestos. A feature not previously seen within community-based studies. In industry-based cohort studies exposure assessment can often be performed at a much more detailed level by ascertaining detailed occupational histories and collecting production characteristics in multiple companies enrolled in a cohort study. For instance by collecting (a considerable amount of) industry specific measurements with detailed auxiliary information very specific exposure models can be derived. Consequently these models will allow for quantitative exposure estimates at the detailed level of exposure scenario (rather than just at the level of a job). For instance by doing so in the European Asphalt Workers study we were able to estimate quantitatively workers exposure to bitumen fume, organic vapour, and benzo(a)pyrene. Standardization of exposure assessment tools, approaches and empirical modelling are clearly needed in this day and age where big data will be the norm and will be needed to discern the so far undetected (smaller) cancer risks. However, availability of actual measurements of workers' exposure will stay a prerequisite in order to calibrate and validate our exposure assessment methods employed in large-scale epidemiological studies on occupational cancers.

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SICKNESS ABSENCE AND PRESENTEEISM RATE IN SOCIO-DEMOGRAPHIFC GROUPS IN LATVIAN WORK POPULATION

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ЧАСТОТА ПРЕЗЕНТЕИЗМА И ОТСУТСТВИЯ ЗАБОЛЕВАНИЯ В СОЦИАЛЬНО-ДЕМОГРАФИЧЕСКИХ ГРУППАХ ЛАТВИЙСКОГО РАБОТАЮЩЕГО НАСЕЛЕНИЯ**. Лакиса С., Гобина И., Ванадзинс И.** Рижский университет им. Страдыня, Институт охраны труда, ул. Дзирциема, 16, Рига, Латвия, LV-1007

Key words: *presenteeism; sickness; Latvian work population*
Ключевые слова: *презентеизм; заболевание; латвийское работающее население*

Introduction. Presenteeism it's a complex phenomenon which is investigated by health care and occupational health specialists, economists and work psychologists. There have been significant economic changes in Latvia during the last decade, including economic crisisand changes in legislation, which may affect the sickness absence and presenteeism rates among employees. Since 2014 increases public expenditure on benefits, sick – benefit receiver count and the number of cases per beneficiary. Official lost working days in 2016 accounted 7.5 million and this is only long term absence days (more than 10 days).**The aim** of this study was to investigate sickness absence and presenteeism rate differences in socio – demographic groups during period 2006–2016.**Methods.** Self-reported data on sickness during the last year among representative sample of employees were analysed. The total number of respondents was 2357 in 2006, 2103 in 2010 and 2260 in 2013. Three groupswere analysed: formal sickness absence group (took sick leave while was sick), informal sickness absence group (was absent from work while was sick, without sick leave) and presenteeism group (was at work while was sick). **Results.** Every year in average 40% report that they were sick during last year. Statisticaly significant structural differences in 2010, were observed less formal sickness absenceand more informal sickness absence and presenteeismthan in 2006 and 2013. Sickness absence rate was similar in both gender — 25.3% men and 28.3% women (p=0.006).For both gender formal absence rate is significant lower and presenteeism rate increase in 2010. Formal sickness absence rate was highest in age group 35 – 44 age, 31.3% comparing to 23.6% — 27.9% in other age groups (p<0.001). Informal absence rate was higher in group 18–24 age and 25–34 age, 8.0% and 7.0% respectively comparing to 4.4% — 6.3% in other age groups. The lowest presenteeism rate was in 18–24 age group (5.9%) compared to 24 – 34 age and 35–44 age presenteeism rate 10.7% (p<0.001). No significant differences in formal sickness absence and presenteeism rate were found among educational groups during the studied time period. Informal sickness absence rate was significantly higher for higher education group 8.4% comparing to 3.4% — 5.9% in other educational groups (p<0.001). In 2010 formal absence rate was in average 7% lower than other years in elementary, secondary and vocational education group. In elementary education groups presenteeism is significantly increasing from 5.1% to 14.2% (p=0.009) in 2006–2016 period.Highest formal absence rate is for senior specialists 29.5%, skilled workers 28.6%, specialist/practitioner 28.3%, lower rate