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MODERN APPROACHES TO SOCIAL AND HYGIENIC MONITORING OF THE HEALTH STATUS OF DRIVERS OF PUBLIC TRANSPORT

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Summary. Babienko V. V., Gwantzeladze C. R., Mykhaylenko V. L., Gerasimenko E. A. **MODERN APPROACHES TO SOCIAL AND HYGIENIC MONITORING OF THE HEALTH STATUS OF DRIVERS OF PUBLIC TRANSPORT.** The aim of the study was to develop a system of social and hygienic monitoring of the health status of drivers of shuttle buses. The research was performed during 2009 - 2014. Working conditions of drivers of shuttle buses were evaluated. The assessment of the health status of shuttle buses drivers using objective methods of clinical and physiological, psycho-physiological and laboratory research was conducted. There was shown that existing system of pretrip and after-inspection is imperfect, runs formally and requires improvement. There was developed database which includes records about health conditions and risk factors of occupational environment. The developed integrated system of social-hygienic monitoring is discussed as able to reduce car accidents and improve drivers' health.

Key words: social-hygienic monitoring, occupational health, drivers, public transport

Реферат. Бабиенко В. В., Гванцеладзе К. Р., Михайленко В. Л., Герасименко Е. А. **СОВРЕМЕННЫЕ ПОДХОДЫ К СОЦИАЛЬНО-ГИГИЕНИЧЕСКОМУ МОНИТОРИНГУ СОСТОЯНИЯ ЗДОРОВЬЯ ВОДИТЕЛЕЙ ОБЩЕСТВЕННОГО ТРАНСПОРТА.** Цель исследования: разработать систему социально-гигиенического мониторинга состояния здоровья водителей маршрутных такси (МТ). Исследование проведено в 2009-2014 г. г. Изучались условия труда водителей МТ. Произведена оценка состояния здоровья водителей МТ с использованием клинико-физиологических, психофизиологических и лабораторных методов. Показано, что существующая система предрейсовых и послерейсовых медицинских осмотров несовершенна, проводится формально и требует усовершенствования. Созданная база данных включает записи о состоянии здоровья и факторах риска производственной среды. Обсуждается возможность снижения числа дорожно-транспортных происшествий и улучшения состояния здоровья водителей с помощью разработанной системы социально-гигиенического мониторинга.

Ключевые слова: социально-гигиенический мониторинг, медицина труда, водители, общественный транспорт

Реферат. Бабієнко В. В., Гванцеладзе К. Р., Михайленко В. Л., Герасименко О. А. **СУЧАСНІ ПІДХОДИ ДО СОЦІАЛЬНО-ГІГІЄНІЧНОГО МОНІТОРИНГУ СТАНУ ЗДОРОВ'Я ВОДІЇВ ГРОМАДСЬКОГО ТРАНСПОРТУ.** Метою дослідження було розробити систему соціально-гігієнічного моніторингу стану здоров'я водіїв маршрутних таксі. Дослідження проведено в 2009-2014 р. р. Вивчалися умови праці водіїв маршрутних таксі. Зроблена оцінка стану здоров'я водіїв маршрутних таксі з користуванням методів клініко-фізіологічного, психофізіологічного і лабораторного дослідження. Показано, що існуюча система передрейсових та післярейсових медичних оглядів недосконала, проводиться формально і вимагає удосконалення. Створена база даних включає записи про

стан здоров'я та фактори ризику виробничого середовища. Обговорюється можливість зниження числа дорожньо-транспортних пригод та поліпшення стану здоров'я водіїв за допомогою розробленої системи соціально-гігієнічного моніторингу.

Ключові слова: соціально-гігієнічний моніторинг, медицина праці, водії, громадський транспорт.

Transport is an important part of the industrial and social infrastructure of settlements. According to Eurostat data the transport sector in the EU employed 4.5% of all human capital corresponding to 4.6% of GDP. Today different capacity bus runs about 70% of all passenger transport in Ukraine. Today buses are widely in urban, suburban routes, long-distance and even international routes.

In the EU Strategy on health and safety of employees in 2014-2020 (EU Occupational Safety and Health (OSH) Strategic Framework 2014-2020) states that the vehicles, despite all measures taken, continues to be among the most disadvantaged by conditions sectors, along with construction, agriculture, fishing and area of medical - social services.

The constant increase of the number of vehicles, including those intended for the carriage of passengers, makes the increase in the number of employees in the industry. Employees of transport infrastructure now make a significant portion of the working population of any modern city. In in the Odessa region according to social - hygienic monitoring (2010-2013) the number of employees in transport amounted to 10.0% of the working population and tended to increase by 1.0-2.0% per year. Even with the economic and socio-political crisis of the past two years have not reduced the intensity of transport, including volunteer aid for refugees and replaced population.

The relevance of the chosen direction caused by the paucity and inconsistency of data on working conditions of drivers, especially drivers of buses with the large and small capacity for intercity and commuter passenger transportation, taking into account road - transport situation prevailing on the highways in big cities. Insufficient studies of the impact of working conditions on health of drivers determine the high pertinence of developing effective prevention measures aimed to reduce the risk of health disorders amongst bus drivers working in taxi mode in the new socio-economic conditions.

The aim of the study was to develop a system of social and hygienic monitoring of the health status of drivers of shuttle buses.

Material and methods

The research was performed during the 2009-2014. There were evaluated the working conditions of drivers of shuttle buses. Than the assessment of the health status of shuttle busesdrivers using objective methods of clinicalandphysiological, psycho-physiological and laboratoryresearch was conducted. Simultaneously the authors conducted hygienic research of the characteristics of occupational environment (microclimate, noise, vibration, particulate matter pollution) and duration of working time. There were examined 200 persons, including 150 - on busy city routes and 50 - on suburban routes. The control group consisted of 100 healthy amateur drivers who are not related to commercial passenger transport. The third phase conducted a statistical analysis of the definition mentioned various risk factors and developed a comprehensive scheme of preventive measures including social-hygienic monitoring issues. Statistical processing of obtained results was conducted with the use of STATISTICA 12.5 (StatSoft Inc., USA) software.

Research results. The study allowed us to estimate the prevalence of the main featuresofchronicnoncommunicablediseasesandmorbidity structure amongst shuttle bus drivers, and to compare these data with the results of hygienic assessment of working conditions.

There was determined that shuttle bus drivers can be roughly classified into three main groups by their age and medical-social characteristics. There were persons with professional experience up to 10 yearswho have usually secondary or incomplete higher education. This professional drivers with experience more than 10 years with experience as both passenger and freight traffic. Finally it retirement age with experience more than 20 years, suffering from various chronic diseases.

The average age of drivers equaled 45.8 ± 1.0 years, and the average length - 24,5 ± 1,1 years. The results of initial medical examinations 92.3% of those found fit to drive the vehicle without restrictions. This fact does not coincide with the presence of a large number of people of

pre-retirement age and suffering from chronic diseases.

Analysis of medical records showed that outpatient monitoring of the health of drivers is imperfect. In the survey there was found that their health as "good" was estimates only by 20.0% of drivers (in control - 32.0%) as "satisfactory" - 29.0% of drivers (in control - 69.0 %). Among the reasons that influence individual health of shuttle bus drivers was related to the poor socio-economic situation in the country (12.0%), the presence of industrial hazards (87.0%), excessive labor intensity (63.0%), the insufficient weekends (39.0%). In formal pretrip and after-inspection there were 66.0% of respondents and 26.0 % respondents did notanswer this question. The structure of answers of city shuttle bus drivers of city and suburban routes did not differ ($p > 0,05$).

The majority of drivers were working on vehicles made in Ukraine. However average lifetime of vans and standard city buses was $6,9 \pm 0,5$ years. Thus every tenth vehicle was older than 20 years.

The microclimate of the working environment in the cab was cooling or intermittent inwinterand heating or intermittent in spring and summer. Average level of dust pollution in the breathing zone does not exceed 2.1 ± 0.2 ppm. The average noise level in the workplace was 60.1 ± 0.2 dB. Illumination level on the dashboard was 15.7 ± 0.2 lx.

The levels of vibration in the workplace were following: 86.5 ± 0.4 dB per axis and Z0 dB 84.5 ± 0.3 per axis X0 and Y0.

Professiografic study showed that ratio between activities of driving and rest pause was 18.3. Every third driverhad elevated blood pressure in after-inspection. We considered the following key risk factors and their modifiers for (Fig. 1).

Risk factors	Risk modifiers	Outcomes
Physical environment (cab ergonomics, violence danger, traffic intensity) Labour arrangement (time deficiency, shifting, breaks, social isolation) Decision making issues	Demographic/gender issues Personality (psychotype, extraversion/introversion, affectivity, emotional lability/rigidity) Others (social support, civic control, legislation)	Physical (cardiovascular diseases, GIT pathology, diseases of joint & muscles, CFS) Psychological (anxiety, depression, PTSD) Behavioral (addictions and alcohol abuse)

Fig. 1. Risk factors for drivers' health

Among modifying risk factors are the main source of experience and state of health. As for drivers with experience of 5 years, their professional skills could be improved with the use of training simulators, but today this practice is restricted in Ukraine.In any case, measures to control production risks must be integrated with the department of social and hygienic monitoring of sanitary-epidemiological service. We developed database containing information about contingent of drivers having risk for health. This database is accessible both to specialists in preventive medicine, public health managers and health providers.

With the implementation of the monitoring system can be expected to reduce car accidents and to improve drivers' health. In the future, this database will be supplemented by periodic medical examinations in identifying additional risk by physiological, clinical and laboratory tests. If risk of disease exceeds 1.0 than rehabilitation programs could be applied.This approach could be useful not only for shuttle bus drivers but for any employees of commercial transport sector.

Conclusions:

1. Existing system on pre- and after-trip medical examinations are imperfect and requires improvement;

2. Developed database includes records about health conditions and risk factors of occupational environment.

3. The integrated system of social-hygienic monitoring could allow to reduce traffic accidents and to improve drivers' health

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