**ECOLOGICAL­MICROBIOLOGICAL ASSESSMENT OF POLYCHLORINATED   
BIPHENYL­CONTAMINATED GROUNDS**

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Polychlorinated biphenyls (PCB) are ones of most widespread toxic xenobiotics being resistant to environmental degradation. Recovery of natural ecosystems from PCB contamination is primarily related to activity of microorganisms capable of degrading these compounds. In order to study the bacterial communities of degraders from the PCB­contaminated grounds from the area of the JSC «Middle­Volga Chemical Plant» (the City of Chapaevsk, Samara Region), there was evaluated a number of bacteria­degraders in the grounds; the taxonomic composition of these communities was determined and most efficient bacterial associations degrading the PCB were selected. The ground samples taken from this enterprise territory have shown that the PCB concentration varied within 0.21­1.07 mg/kg. The amount of bacteria­degraders of biphenyl/PCB in the grounds under study was estimated as 4.0×106 – 1.5×107. Meanwhile, with the increase of the PCB concentration in the grounds, there was detected elevated number of bacteria­degraders. It was determined that bacterial degraders were represented by genera Achromobacter, Pseudomonas, Arthrobacter, Microbacterium, Acinetobacter, Bacillus, and Rhodococcus. Bacterial associations of degraders were selected that effectively degraded the PCB commercial mixtures «Delor 103» and «Sovol». These bacterial associations may be used for development of new biotechnologies, for remediation of PCB­contaminated soils and grounds.

**Keywords:** polychlorinated biphenyls, PCB contamination, bioremediation, bacteria, destructors, bacterial communities

**MODEL­BASED DECISION SUPPORT SYSTEM FOR ASSESSMENT OF ENVIRONMENTAL FACTORS IMPACT ON POPULATION HEALTH**

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Based on the statistical data of the sanitation and hygiene monitoring for the period from 1992 to 2014, an information and analytical system is being developed as a means of model­based decision support at the level of regional services’ monitoring of population health and the environment. The system consists of several interacting subsystems and exchange data. The first subsystem is a database for collection, storage and organization of end­user access on the Internet. The second subsystem processes statistical data, ensures visualization of current statistical parameters of data sets and, on their basis, constructs statistical forecasting models of behavior of individual factors of the region’s social and economic system, including the environment. The third forecasting subsystem based on fuzzy logic is necessary to construct models in situations of incomplete or distorted information about the status of various parameters of the region’s dynamics. These three subsystems will be part of a unified service system for collection and management of data via the Internet. The developed framework of the information and analytical system will ensure a more effective assessment of interactions of environmental and population health factors in order to manage this system of relationships.

**Keywords:** environmental factors, population health, impact assessment, information and analytical system, databases, modeling, forecasting.

**HYGIENIC ASSESSMENT OF WORKING CONDITIONS IMPACT ON MORBIDITY   
WITH TEMPORAL DISABILITY OF WORKERS IN VESSEL METAL HULLS ASSEMBLY SHOP OF MACHINE BUILDING PLANT**

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In the article, there have been presented the results of assessment of working conditions’ impact on workers of a vessel metal hulls assembly shop of a machine building plant on levels of morbidity with temporal disability (MTD). The assessment of the working conditions has been made according to the results of the assessment of workplaces, the levels of MTD ­ on the ground of the long­term average annual indices for 2005­2014. The cause­and­effect relations between the working conditions and the MTD levels have been established by means of a comparison of the working conditions’ classes according to the results of the workplaces’ assessment and the MTD levels characterizing the impact of harmful factors on the most vulnerable human body organs and systems. According to the study results, it has been established that the MTD levels of the respiratory viral infections, diseases of the respiratory organs, diseases of the locomotor system and connective tissue, diseases of the genitourinary system were statistically significantly connected with the effect of low air temperatures, high concentrations of harmful chemical substances in the working zone air, high levels of local vibration and high labor burden.

**Keywords:** machine building plant, vessel metal hull assemblers, morbidity with temporal disability

**COMPARATIVE CHARACTREISTICS OF METHODS OF CONNECTIVE TISSUE DYSPLASIA DIAGNOSIS IN CHILDREN**

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Тhe article compares different authors’ methods of diagnosis of connective tissue dysplasia in children on the basis of phenotypic and visceral markers. The benign joint hypermobility syndrome in children of different ages in Tver was diagnosed using the Beighton method: it was detected in 71% of children under 7 years old and in 31.1% of older children. The benign joint hypermobility syndrome is typical of practically all children from 3 to 4 years old and of the majority of children from 5 to 7 years old, which indicates that increased flexibility is a physiologic standard for this age and that the Beighton method does not detect accurately the abnormality of connective tissue in children under 7 years old. 120 children have been examined for presence and severity of connective tissue dysplasia using three different ways at the same time and also using different authors’ methods and diagnostic tables. The method of T.I. Cadurina detects presence of connective tissue dysplasia 1.5 times more often than the methods of T. Milkowska­Dimitrova and A. Karkashov. The results when using the method of L.N. Abbakumova are in between. The conclusion of the article shows that diagnosis of connective tissue dysplasia in children cannot be based only on identification of the benign joint hypermobility syndrome, and the methods of diagnosis of connective tissue pathology taking into account not only external but also internal markers are more accurate. Common methods of calculating frequency of connective tissue pathology in children must be applied in all regions of our country.

**Key words:** connective tissue dysplasia, benign joint hypermobility syndrome, diagnostics, сhildren

**MANIFESTATION OF PATHOGENIC PROPERTIES IN MARINE BACTERIA UNDER IMPACT OF ANTHROPOGENIC POLLUTION**

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The article is devoted to the study of biological activity, including pathogenicity factors, of marine bacteria isolated from water in areas with different anthropogenic load, both coastal zones with high levels of different pollutants and pure zones with no human impact. To maintain the experimental integrity, we excluded *Enterobacteriaceae* from the obtained collection of marine microorganisms. Then we worked with the rest of the isolates for detection of their hydrolytic activity toward organic substrates, antibiotic resistance and such pathogenicity factors as: cytotoxicity, hemolytic activity, plasma coagulase and hyaluronidase activities. Comparative studies of hydrolytic activity in microorganisms isolated from sea water with different anthropogenic load have not revealed any differences in these indicators. However, the strains isolated from water areas with great impact of industrial, domestic and river drains, were highly antibiotic­resistant, highly adhesive and cytotoxic compared to the strains isolated from pure sea water. It is assumed that pollution of marine environment results in manifestation of aggressive properties of microorganisms, as a response to impact of stress factors that is both of general biological, ecological and epidemiological significance.

**Keywords:** marine microorganisms, enzymatic activity, anthropogenic pollution, pathogenicity factors

**PSYCHOLOGICAL CHARACTERISTICS OF FIRST­YEAR STUDENTS LIVING   
IN CONDITIONS OF CLIMATIC AND GEOGRAPHIC SOCIAL TENSIONS   
OF THE REPUBLIC OF TUVA**

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Тhe article presents results of a study of psychological characteristics of Tuvan first­year students living in conditions of climatic and geographic social tensions of the Republic of Tuva.

The peculiarity of the Republic of Tuva is not only harsh climate, national way of life and lifestyle, but also low socio­economic standards of living. The study was conducted in the framework of the monitoring in the University Health Centre with the computer program «Methodology for integrated assessment of physical and mental health of students in higher and secondary professional educational institutions» by R. I. Aisman. The Tuvan students were characterized by optimal parameters of anxiety, stress resistance, aggression and hostility, neurotization and psychopathology corresponding to the middle­age norms. They had quite a high level of motivation to succeed. Among the parameters of social and psychological adaptation, orientation to dysaptation prevailed. The nervous system’s neurodynamic indicators indicated the medium­weak type of the nervous systems of Tuvinians. There have been identified gender characteristics of the girls, they had higher anxiety, hostility and motivation to succeed. The young men were more emotionally stable, calm, optimistic, because there were no persons with the high neurotization level among them. The girls were characterized by lower psychological adaptation, however, they had a higher level of physiological adaptation in comparison with the young men.

**Keywords:** first­year students, anxiety, social and psychological adaptation, stress resistance, aggression and hostility, motivation for success, tapping test

**MODERN APPROACH TO ARTERIAL HYPERTENSION IN THE CIRCUMPOLAR   
AND ARCTIC REGIONS. Literature review**

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A new approach to the problem of significant youthification of arterial hypertension and its fast progression in non­indigenous populations of the polar and arctic regions has been presented. The hypertension progression in high latitudes is combined with influence of climate change biological stressful pace in the Arctic area and influence of adverse space, geophysical, weather, chronobiological factors. Research scientists of the Russian polar and arctic regions have identified a number of leading elements of the northern climatic­geographic chronic stress which make the main contribution to formation and progression of hypertension in the North. The most characteristic manifestations of climatic­geographic stress in uncomfortable and extreme regions of the North and Siberia are reactions of the central nervous and endocrine systems, metabolic changes and development of “oxidative stress”. In addition to these manifestations the polisindromatic climatic stress may include: deficit of detoxification processes and barrier organs, northern metabolic type disorders, northern tissue hypoxia, immune deficiency, blood hypercoagulation, multiple endocrine disorders, regenerative and plastic failure, violation of electromagnetic homeostasis, functional dissymmetry of interhemispheric relations, desynchronosis, emotional stress, meteopathies. Obviously, creation of advanced innovative preventive and therapeutic technologies to reduce spread of hypertension among population in the polar and arctic regions require active study of the northern stress mechanisms’ role in progression of this severe cardiovascular pathology.

**Keywords:** arterial hypertension in polar regions, northern chronic stress, stress­dependent mechanisms of pathology

**RISK FACTORS OF 28­DAY STROKE CASE FATALITY IN KAZAKHSTAN:   
A COHORT STUDY**

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A considerable amount of international studies on risk factors of 28­days stroke case fatality have been published. However, the evidence from Kazakhstan is almost non­existent. In this historical cohort study (n = 937) we assessed 28­days case fatality from stroke and its associations with the most common risk factors identified in international literature. The study was performed in a city of Semey, East Kazakhstan. Independent associations between risk factors and the outcome were studied using multivariable Poisson regression with additional adjustment for the National Health Institutes Stroke Scale points. Crude and adjusted risk ratios (RR) with 95% confidence intervals (CI) were calculated. The overall 28­days stroke case fatality in the study sample was 22.4 %. Case fatality was positively associated with age, time between the onset of symptoms and hospitalization as well as NIHSS score (all P for linear trend <0.001). Ethnic Russians had greater risk of mortality (RR = 1.44; 95 % CI: 1.17­2.78) than ethnic Kazakhs. Hemorrhagic stroke (RR = 2.86; 95 % CI: 1.86­4.89) and subarachnoid hemorrhage (ОР = 3.77; 95 % ДИ: 2.22­6.42) posed greater risks of death than ischemic stroke. Atrial fibrillation was also a significant risk factor of 28­days stroke case fatality (RR = 1.38; 95 % CI: 1.12­1.69). The results of our study are generally in line with what has been observed in other settings. These risk factors should be taken into account in development of treatment strategies to address reduction of 28­days stroke case fatality in Kazakhstan.

**Key words:** stroke, 28­days case fatality, risk factors, Poisson regression, Kazakhstan

**HOSPITAL SURVEILLANCE OF HEALTHCARE­ASSOCIATED INFECTIONS:   
REPEATED PREVALENCE SURVEYS**

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This paper presents an approach to implementing institution­wide surveillance of healthcare­associated infections by means of regular point­prevalence surveys. We explain the methods of data collection and statistical analysis in details. Healthcare­associated infections are defined as localized or systemic conditions which was not present on admission or within the first 48 hour of hospital stay (or 30 days for surgical site infections). The prevalence of different categories of healthcare­associated infections varies in different hospitals that can be explained by variations in hospital stocks, types of medical units, treatment, age of patients and others. According to different published sources, the incidence of healthcare­associated infections in Russia exceeds the official data. An inconstancy in published results probably indicates under­registration of healthcare­associated infections and demonstrates a need for alternative surveillance measures to provide a basis to enhance the practice of infection control. Repeated prevalence surveys are known as simple surveillance options, which are efficiently used in the European countries. This method allows to obtain data on prevalence of different categories of healthcare­associated infections and factors associated with occurrence of infections in different hospital units. The results allows to identify areas requiring improvement in the hospital and develop specific prevention strategy for every hospital unit.

**Key words:** health­care associated infections, prevalence, point­prevalence surveys