**DRINKING WATER SUPPLY TO THE POPULATION OF THE WATER SCARCE REGION THE ORENBURG REGION**

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In the article a problem of providing with qualitative drinking water of the population of the Orenburg region which is one of water scarce regions of Russia is considered. The current condition of water systems is caused by existence of a significant amount of sources of pollution and semi­arid climate of the region. And namely this aspect accents a problem of research of quality of drinking water in this region. Main reasons for unsatisfactory quality of drinking water are opened. Except the natural polluting factors, the anthropogenic activity on catchment areas of water objects associated with plowing of lands, use of herbicides and fertilizers, a construction of roads, bridges and gas and oil pipelines has a great influence on quality of water. The presence of these constructions produces an increase in concentration of pollutants, its accumulation along routes with the subsequent washout by drains of rain and thawed snow in water objects. Environmental stress is increased by cross­border transfer of harmful pollutants from Chelyabinsk region, the Republics of Bashkortostan and Kazakhstan. Surface water quality practically of all water objects doesn't meet standard requirements of economic and drinking and fishery appointment. This is due to fact that in most parts of the region there are no facilities for water purification and disinfection. In rural settlements technical condition of water distribution networks is unsatisfactory. There are no water disinfection systems and this fact often leads to the emergence of infectious diseases. The main actions in order to optimize the system of providing the Orenburg region population by standard quality drinking water and in sufficient quantity are offered.

**Keywords:** water scarce region, drinking water

**ASSOCIATIONS BETWEEN SOCIOHYGIENIC FACTORS ON HEALTH  
OF CHILDREN AND ADOLESCENTS IN PRIMORSKY KRAI**

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The paper presents the results of estimation of distribution ecology­dependent diseases in bioclimatic zones of the territory of Primorsky Krai among children and adolescents. Conducted to assess the prevalence of major classes ecology­dependent diseases through self­referral: diseases of the respiratory organs, diseases of the digestive system, diseases of the blood and blood­forming organs, diseases of the cardiovascular system, diseases of the skin and subcutaneous tissue, diseases of the genitourinary system, neoplasms, congenital anomalies, infectious diseases. Used formal statistical reports N 12 (ICD­10). By regression analysis of SPSS the connection between environmental factors and the level of distribution ecology­dependent diseases, the calculated values of factor loadings affecting the indexes of morbidity in children and adolescents. The study showed that environmental and hygienic factors are the specific features of the health effects of the population in varying degrees in children and adolescents depending on bioclimatic zones and ecological­hygienic situation. The level of ecology­dependent morbidity is determined by the complex influence of ecological­hygienic factors, with a predominance of the man­made component and related parameters of the environment, such as chemical pollution of urban areas (soil, air, water). Installed a different degree of response of children and adolescents through the incidence of the impact of environmental and hygienic environmental factors that must be considered when designing and conducting medical and prophylactic activities.

**Keywords:** social­hygienic factors, bioclimatic zones, ecology­dependent diseases, children, adolescents

**INCIDENCE OF THE MAIN CLASSES OF DISEASES AMONG HEALTHCARE WORKERS IN VOLOGDA, BASED ON CASE HISTORIES**

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The purpose of the cross­epidemiological research was to study the incidence of the main classes of diseases among health workers of the large general hospital in Vologda. On the outpatient medical records, we examined the prevalence figures in different classes of diseases on medical aid appeal ability among doctors, middle and junior medical staff of the surgical, therapeutic and paraclinical departments of the Vologda city hospital no 1. The prevalence of diseases among the hospital staff were compared with those in the unexposed group. It was found that the most common pathologies among the medical staff of surgical, therapeutic and paraclinical departments are cardiovascular diseases (34,9­41,5 %) and musculoskeletal diseases (30,2­39,0 %). Among the staff of the surgical and paraclinical departments, digestive system pathologies are frequent too (21,0 % and 19,0 % respectively), among the staff of the therapeutic and paraclinical profile – endocrine system diseases (12,1 % and 19,0 % respectively). The prevalence of the circulatory system diseases (χ2 = 4,05, p = 0,044) in the group of health workers in surgical departments (39,6 %) and the prevalence of skin diseases (p = 0,050) among paraclinical departments’ employees (7,9 %) is higher than among those who do not work in the health system (27,7 %).

**Keywords:** healthcare workers, prevalence of diseases, blood circulatory system diseases

**OPTIMIZATION OF HEAT­INSULATION OF SPECIAL CLOTHING:  
AN ANALYSIS USING REGRESSION MODELS**

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The article deals with the problems of designing special clothing for the workers of the oil producing industry, solving the problem of maintaining thermal homeostasis person using multi­layer heat­shielding stackup materials. We processed array of experimental data on the properties of advanced materials designed to protect against high and low temperatures (with the defined climatic conditions and the dynamics of movement works), as the example of special clothing for the workers of the oil producing industry of the southern region of Russia. The article tells about posed and solved problem of optimal choice of package materials for comfortable working conditions in the test clothing. The criterion for the quality of insulation is special clothing. Equations connection optimization problem obtained by regression analysis of the relationship between the structural and thermal parameters set heatproof materials multilayered clothes: such as insulation, surface density, permeability, thickness of the coating material that is acceptable for the package materials and ambient temperature. We got the equation for quadratic regression insulation. On the basis of an offer regressive model, the optimal are certain the methods of the quadratic programming: thickness of package, thickness of the coating color and air permeability of the package of materials the heat­insulation of clothing has maximal comfort. It allows to set the maximum acceptable for the given conditions of the construction of special clothing, as well as to adapt the process of picking a package of materials for special clothing with the necessary insulation for comfortable working conditions.

**Keywords:** heat­protective multi­layered clothing, regressive model, optimization of the thermal resistance

**CONTENTS OF SOME TRACE ELEMENTS IN BIOSUBSTRATES**

**OF PRESCHOOL CHILDREN OF NORTHERN EUROPEAN IN RUSSIA**

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The paper presents results of research of the content of zinc, copper, lead, cadmium and selenium in hair of 236 native persons aged 1­6 years of some regions of northern European in Russia: in the city Inta and town Troitsko­Petschorsk of the Komi Republik and in the town Plesetsk of Arkhangelsk region. Research showed that the content of trace elements in hair of examined children differ from each other and the norm for the midland of Russia. Almost 50% of children of the city Inta the content of zinc in hair is lowered. All the studied places are characterized by high copper content: in Inta ­ for 71 % of preschool children, in Troitsko­Petschorsk ­ for 53 %, in Plesetsk ­ for 74 %. The content of lead at children in Inta and Troitsko­Petschorsk exceeds the norm. More than half of the examined children of Inta have an excess of lead. It can be connected with an environmental situation and the characteristics of geochemical provinces of Northern European. Connections between content of some trace elements in organism and development of diseases have been analyzed.

**Key words:** children, trace elements, biosubstrate, disease

**RELATIONSHIP BETWEEN THE STRUCTURE OF INTELLIGENCE AND PHYSIOLOGICAL PARAMETERS OF DECISION­MAKING IN SECONDARY­ AND HIGH SCHOOL STUDENTS**

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The purpose of the study ­ the study of the relationship of verbal and nonverbal intelligence with the physiological parameters of decision­making at the school in the age range 11­18 years. To study the structure of intelligence intelligent use group test (HIT) and the test structure of intelligence R. Amthauera. Assessment of individual results in these methods is carried out using an empirically selected age norm in points. An objective assessment of decision­making in a variety of environmental conditions carried out using a computer complex for psychophysiological research KPFK ­ 99 "Psihomat." The study was conducted in the modes of "Free Choice", "Probabilistic choice", "Controlled Choice". The modality of stimulus in all three modes ­ light. The results were subjected to statistical analysis by means of statistical analysis software package SPSS. To study the structure of the relationship of verbal and nonverbal intelligence and decision­making strategies in the age aspect in each age group was conducted correlation analysis with a preliminary estimate of the distribution features of normality, calculated the Pearson linear correlation coefficient (Pearson Correlation). Correlation models are based on matrices, analyzed the number of relationships, taking into consideration only the average (0,3 < r < 0,7) and strong (r ≥ 0,7) bond. The results of correlation analysis revealed the existence of statistically significant relationships physiological parameters and decision­making structure of the intellect. These relationships are found in a free, probabilistic and deterministic environments. The study of the number and structure of the relationships among pupils aged 11­18 revealed that the correlation models are age and gender characteristics. Identify the structure of intelligence relationships with psychophysiological indicators allows further study of psychophysiological mechanisms of decision­making in different age categories.

Keywords: students 11­18 years, the structure of intelligence, environmental conditions, decision­making, the correlation mode

**REFERENCE VALUES FOR CHEMICAL ELEMENTS CONCENTRATION IN HAIR  
OF ADULTS IN THE REPUBLIC OF TATARSTAN**

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Elemental hair profile of the population is adequate hygienic indicator reflecting the impact of climatic and geographical, biogeochemical and ecological characteristics of the area on human. This indicator is also a tool for monitoring the population's health through detection and elimination the elementosis which is typical for the territory. The purpose of this study was to carry out a study of element status of adult population of the Republic of Tatarstan not employed in the manufacturing sector in the framework of the Federal Target Program "National System of chemical and biological security of the Russian Federation. It was analised elemental composition of hair 2,127 adult residents (1,667 women and 460 men aged 25­50 years) of the Republic of Tatarstan in the period 2004 and 2010 to perform the tasks. ICP­AES and ICP­MS methods was used. Mathematical processing of data was carried out using methods of nonparametric statistics. In general, the evaluation of the element status of population of the Republic of Tatarstan showed that the situation with the adult residents is sufficient, although the male part of the population deficits are relatively frequent. Attracts attention common for both men and women accumulation of aluminum, silicon and calcium in hair. The positive facts necessary to carry a small risk hipoelementosis frequency in women.

**Keywords:** reference values, chemical elements, hair, multielement analysis, the adult population, Tatarstan

**THE HEALTH OF “THIRD AGE” PERSONS: OBJECTIVE AND SUBJECTIVE RATING  
OF HEALTH AMONG THE ELDERLY**

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The results of influence of “third age” education on subjective evaluation and objective indices of health are presented. Three groups of respondents took part in the research. Non­working pensioners (n = 23) constitute the first group. The second group includes 19 non­working pensioners who attended courses of computer literacy. The third group constitutes non­working pensioners (n = 21), students of special educational program “Applied psychology”. Average age of participants – 62,7 ± 4,4 years for women and 65,9 ± 5,2 years for men. Women­men ration was 70 % to 30 % respectively. Comparative analysis of health index in groups reveals statistically significant differences. Those who do not work and do not participate in educational programs consider that their health needs permanent control and care. Those who study mentioned some diseases that do not restrict their activity and mobility. Objective information about health was obtained by means of “Varicard 2.8” ­ the instrument for analysis of cardiac rate variability. The results reveal significant differences between groups in estimations of their state of health: non­working pensioners who do not participate in educational programs rate their health from bad to worse while objective examination does not confirm such evaluations; non­working pensioners who participate in different kinds of educational activity consider themselves more healthy than the results of medical objective examinations have revealed. Upon the whole, our research has revealed that educational activity results favourably on subjective representations of seniors about their health and on objective medical indices as well.

**Key words:** health and education of seniors, objective and subjective representations about health, third­age person

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**rs8193036 POLYMORPHISM OF IL­17A GENE IN A KAZAKH POPULATION  
AND ITS ASSOCIATION WITH PLASMA IL­17A AMONG ERYSIPELAS PATIENTS**

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We studied associations between rs8193036 polymorphism of IL­17A gene (C737T) and plasma levels of IL­17A in patients with erysipelas and healthy subjects in a Kazakh population. The rs8193036 polymorphism was assessed in 95 patients with erysipelas and 383 control subjects. The IL­17A (rs8193036) polymorphism was studied by a real time polymerase chain reaction. Plasma levels of IL­17A were assessed in 90 patients with erysipelas and 90 healthy subjects by enzyme immunoassay. Categorical data were analyzed using Pearson’s Chi tests and odds ratios (OR) with 95 % confidence intervals (CI). Continuous data were studied using Kruskal ­Wallis and Mann­Whitney tests with Bonferroni correction. We found that T allele occurred more frequently (OR = 1.41; 95 % CI: 0.21­0.92) while allele C (OR = 0.71; 95 % CI: 0.51­0.99) and genotype CC (OR = 0.44; 95% CI: 0.21­0.92) occurred less frequently in cases than in controls. In erysipelas patients with CC genotype the level of IL­17A was significantly higher (p = 0.010) compared to the carriers of CT genotype. Also, the levels of IL­17A in patients with erysipelas was higher than among controls in groups with both CC and CT genotypes (p = 0.023 and p = 0.020, respectively). These data suggest that the rs8193036 polymorphism of IL­17A gene may play a role in the etiology of erysipelas, but other factors are also involved.

**Keywords:** erysipelas, polymorphism, rs8193036, IL­17A, Kazakh population

**COHORT STUDIES IN MEDICINE AND PUBLIC HEALTH**

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The article presents the main methodological principles of planning, implementation and statistical analysis of data from cohort studies. Types of cohort studies, their main advantages and disadvantages, and practical examples of cohort studies in medicine and public health are also presented. We also present the main measures used in cohort studies, namely, the incidence, cumulative incidence, incidence density, absolute risk, relative risk, attributable risk and attributable risk fraction in a given cohort and in a population, incidence rate ratio and incidence rate difference. Examples of cohort studies in literature, including examples from Arkhangelsk region are presented and discussed. The methods of sample size calculation using “EpiInfoTM” software and calculation of the measures of association in cohort studies are also shown using examples from real studies. This is an introductory article about the main methodological principles of cohort study design in health sciences and it does not substitute specialized literature in clinical epidemiology. .

Key words: cohort study, research methodology, study design, evidence­based medicine