THE CONCEPT OF THE DEVELOPMENT OF THE STATE OF CHEMICAL ANALYTICAL ENVIRONMENTAL MONITORING

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Chemical and analytical monitoring of the quality of environment is based on the accounting of the trace amount of substances. Considering the multicomponent composition of the environment and running processes of transformation of substances in it, in determination of the danger of the exposure to the chemical pollution of environment on population health there is necessary evaluation based on the simultaneous account of complex of substances really contained in the environment and supplying from different sources. Therefore, in the analytical monitoring of the quality and safety of the environment there is a necessary conversion from the orientation, based on the investigation of specific target substances, to estimation of real complex of compounds.

Key words: monitoring of chemical pollution of the environment; evaluation of the efficacy and safety of new technologies; processes of transformation; methods of control of substances; identification of the component composition of the environmental objects; real spectra of substances supplied by sources of pollution

THE MAIN CONCLUSIONS ABOUT THE MEDICAL ASPECTS OF AIR POLLUTION: THE PROJECTS REVHAAP AND HRAPIE WHO/EC

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For the time present the World Health Organization (WHO) is coordinating two major international projects aimed to provide the European Union (EU) with science-based information on health aspects of air pollution for a comprehensive analysis of EU policy in the field of air quality, scheduled for 2013. The information provided is structured in the form of answers to 26 policy-forming key questions, defined by the European Commission (EC). The questions cover the both general aspects that are important for air quality management, and also specific topics related to the health effects of certain air pollutants. Texts of the answers to the questions were provided on requests of large group of invited experts from leading specialized institutions around the world. First stages of the overview of existing data have shown that in recent years there has been published a significant amount of information proving adverse health effects of suspended particulate matter (PM), ozone (O3) and nitrogen dioxide (NO2) in an amount, which typically occurs in the air in Europe. These new data confirm the findings reported in renewed in 2005 WHO Guidelines for Air Quality (GAQ), and show that the negative health effects in some cases may take place at concentrations of aeropollutants in the air below mentioned in the GAQ in 2005. In the review there are presented the scientific arguments in favor of adoption of strong measures to improvement air quality and reduction of the burden of diseases associated with air pollution in Europe. The conclusions formulated within a framework of these projects, are equally referred to all Member States and can become a basis for the development and implementation of effective strategies to reduce air pollution and reduction of its negative impact on the health of the population.

Key words: air pollutants, air pollution – adverse effects; environment and health; evidence-based practice; guidance; health policy
DEVELOPMENT OF NATIONAL AND INTERNATIONAL STANDARDS OF POPULATION AGE DISTRIBUTION FOR MEDICAL STATISTICS, HEALTH-DEMOGRAPHIC ANALYSIS AND RISK ASSESSMENT

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The current European standard (CES) and the World population age distribution standard is widely used in medicaland demographic studies, performed by international (WHO, etc.) and national organizations. The Russian FederalService of States Statistics (RosStat) uses CES in demographic yearbooks and other publications. The standard is applied in calculation of the standardized mortality rate (SMR) of the population in different countries and territories. Risk assessment is also used CES. In the basis of the standards there has been laid the idea to assess mortality accordingto uniform standard, so to get possibility to compare the mortality rate of the population in different countries and regions, different genders and different calendar years. Analysis of the results of test calculations of the values of the SMR for the population of Russia and other countries with the use of current standards has revealed serious shortcomings of the latters and set up the task of improving them. A new concept of the development of standards based on the use of the concept of stable equilibrium of the age distribution of the population and survivorship function is proposed.

Key words: standard; age distribution; demography; medical statistics; the mortality rate; risk comparison.

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PROBLEM OF UNPREDICTABLE ANTHROPOGENIC EXPOSURE TO THE STATE OF NATURAL ENVIRONMENT IN COUNTRIES OF SOUTHWEST ASIA

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There is considered problem of the negative human impact on the environment in Russia and the countries of southwest Asia. The adverse impact of high-fluoride and high-arsenic drinking water in artificial endemic provinces and increased radiation background on the health of the population of Syria, Iraq, Bangladesh has been investigated. With the aim of prevention there has been recommended the improvement of the system for treatment of drinking water and the disposal of radioactive waste, performance of sanitary outreach activities and promotion of healthy lifestyles, the organization of periodic examinations of the population.

Key words: endemic provinces; fluoride; arsenic; radiation; disease

GS-1306-026

HEALTHCARE OF CHILDREN AND ADOLESCENTS IN NATIONAL STRATEGY FOR ACTION FOR CHILDREN FOR 2012–2017

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The National Strategy defines the main directions and objectives of public policy in the interests of children and the key mechanisms for its implementation. The strategy is based on the universally recognized principles and norms of international law. Implementation of the National Strategy will be realized in the following areas: Family Child Welfare Policy, availability to quality education and training, cultural development, and information security of children, child-friendly health care, and healthy lifestyle; equal opportunities for children in need of special care of the State, the creation of protection and safeguarding the rights and interests of children and child-friendly justice, and children - members of the realization of National Strategy. School health care is intended to be actively involved in two directions: availability to quality education and training, cultural development, and information security of children, health care, child-friendly and healthy lifestyle. The main tasks in the part of hygiene and children's health are: state support for the construction of new preschool educational institutions and the development of
all forms of safe preschool education, including non-state sector; providing for every upperclassman safe choice of training profile corresponding to his inclinations and life plans, as well as the functional possibilities and health state; providing quality psychological, correctional and pedagogical aid to children in educational institutions; renewal of forms and methods of control of child neglect, drug addiction, alcoholism, crime, prostitution; the development of effective mechanisms in prevention of deviant behavior in childhood; the creation and implementation of training programs for children and adolescents on rules of safety behavior in the World Wide Web, prevention of Internet addiction; the introduction of the system for monitoring of
the educational environment; the creation of portals and sites accumulating the information about best
resources for children and parents. Creation child-friendly health care is provided by: improvement of the
regulatory and legal framework in the area of the healthcare of children, the development of technologies
for complex diagnosis and early medical and social care for children with deviations in development and
health, development of adolescent medicine, creation of the Youth Counselling Centres, centers for
reproductive health care for adolescents and centers for medical and social care for adolescents;
implementation of educational work on the prevention of early pregnancies and abortions in minors;
support for successfully realized projects for creation friendly to children and young people clinics in the
regions; restoring medical offices in educational institutions, the encouragement of responsibility of health
staff in medical institutions in delivery of health care to children, available developed network of
institutions, including telephone emergency services, counseling online, providing help to children and
adolescents to will protect children in hardship. Availability of physical culture and sports, tourism
infrastructure for all children with bearing in mind their individual needs, increasing the proportion of
children and adolescents regularly engaged in physical culture and sport, will meet natural biological
move requirements of children.

Key words: strategy of actions in the interests of children; health care for children; medical care for
children in educational institutions; prevention; availability of safe education; psychological assistance;
child-friendly health care; healthy lifestyle

GS-1306-030
BIOPHYSICAL ASPECTS OF BIOLOGICAL ACTIVITY STRUCTURE – STRAIN CALCIUM
CARBONAT IN MICELLAR FORM

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Results of the study of electrochemical and structural state of phase of associated water in the solutions
of structurally stressed calcium carbonate in the micellar form are reported. On the base on the
comparison of structural - physical changes of activated water with the data on the activity of
bioluminiscent “Ecolyum” microorganisms in their noncontact activation the electronic mechanism of the
effect of activated water on cellular metabolism is substantiated. The use of “Micellate of calcium”
possessing non-contact electron-donor action on cellular structures was shown to permit to compensate
the deficit of electrons and thereby to restore the activities of reductases and iron-containing peptides
required for the production of regulatory ROS and alteration in redox state of the intracellular
environment.

Key words: micellate of calcium carbonate; activated water; “Ecolyum" microorganisms; cell metabolism

GS-1306-033
DRINKING WATER REGULATIONS IN UKRAINE AND INFECTIOUS MORBIDITY RATE WITH
WATER PATHWAY OF TRANSMISSION OF CAUSATIVE AGENTS

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These are presented drinking water regulations in Ukraine on microbiological indices in the new state
document “Hygienic Drinking water regulations intended for human consumption” (State sanitary
regulations and standards (GsanPiN) 2.2.4-171-10). There is reported an analysis of both the open
waterbodies water quality and water for centralized water supply in 2007-2011 and 1992-1996 also on
sanitary-bacteriological indices for performance of comparative retrospective analysis. There has been
shown water quality degradation for open waterbodies, the main sources of water supply for population.
Against this background, a marked improvement of drinking water quality has been noted, the number
of non-standard samples decreased to 3.6 % compared with 8.8% in the preceding 15 years. This index
correlates with a decrease in the number of outbreaks of infections transmitted by water. There was noted
unsatisfactory registration of viral infections with water pathway of transmission and the increase in
morbidity rate of gastroenterocolitides of unknown etiology that may include acute viral intestinal
infections. Expediency to keep “fermentation of glucose” test in bacteriological examination of water in the identification scheme of general coliforms has been substantiated.

Key words: drinking water; microbiological indices; infectious diseases morbidity rate; water pathway of transmission.

GS-1306-038

MEDICAL AND ENVIRONMENTAL ASPECTS OF THE DRINKING WATER SUPPLY CRISIS.

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Modern data determining drinking water supply crisis in Russia have been considered. The probability of influence of drinking water quality used by population on current negative demographic indices was shown. The necessity of taking into account interests of public health care in the process of formation of water management decisions was grounded. To achieve this goal the application of medical ecological interdisciplinary approach was proposed. Its use is mostly effective in construction of goal-directed medical ecological sections for territorial schemes of the rational use and protection of water resources. Stages of the elaboration of these sections, providing the basing of evaluation and prognostic medical and environmental constructions on similar engineering studies of related disciplinary areas (hydrological, hydrogeological, hydrobiological, hydrochemical, environmental, socio-economic, technical and technological) were determined.

Key words: drinking water supply crisis; water resources management; human healthcare

GS-1306-045

HYGIENIC PROBLEMS IN THE LOCATION OF MODERN WIND ELECTRIC POWER STATIONS IN THEIR DESIGN


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Hygienic aspects of the placement of wind power plants (WPP) in connection with the intensive development of wind power and the lack of systematic information on their effects of the environment and living conditions of the population are becoming more actual. In the article there are considered results of the sanitary-epidemiological expertise of the construction project of three modern large wind farm (the South - Ukrainian, Tiligulskaya and Pokrovskaya ) with a total capacity of from 180 to 500 MW of wind farms with 2.3 MW power generators of wind turbines. It is shown that in the process of wind farm construction a contamination of the environment (air, soil, ground water) may take place due to the working of construction equipment and vehicle, excavation, welding and other operations, in the exploitation of wind farm there can be created elevated levels of acoustic and electromagnetic pollution in the neighborhood and emergencies with the destruction of WPP in adverse weather conditions. Based on the calculations presented in the projects, and the analysis of data on the impact of foreign wind farm on the environment it was found that the limiting factor of the influence is the wind farm noise pollution in the audio frequency range that extends beyond the territory of wind fields, electromagnetic radiation is recorded within the hygienic standards and below only in the immediate vicinity of its sources (electrical equipment and power lines). For considered modern wind farms there was grounded sanitary protective zone with dimensions of 700 m from the outermost wind turbines by the noise and it was recommended compliance distance of 200 m from the wind turbine to limit any activity and people staying in times of possible emergency situations in adverse weather conditions.

Key words: wind power plants; the environment; noise pollution; electromagnetic pollution; sanitary protective zone; hygiene recommendations

GS-1306-049

HARMONIZATION WITH INTERNATIONAL APPROACHES TO GUIDANCE DOCUMENTS ON METHODS OF ASSESSMENT OF THE MUTAGENIC PROPERTIES OF CHEMICAL ENVIRONMENTAL FACTORS
Evaluation of mutagenic activity - an indispensable element of the toxicological characteristics of chemicals in their hygienic regulation. In the article there is performed an analysis of the adopted in the Organization for Economic Cooperation and Development (OECD) and in Russia guidance documents on methods of assessment of the mutagenic properties of chemicals. In the OECD there are 17 manuals, each of which describes a single method, in Russia there were approved five guidance documents for specific groups of chemicals (drugs, pesticides, nanomaterials, substances normalized in the water and the air), which represent the basic and auxiliary methods of testing mutagens. Basic methods aimed to the evaluation of gene, chromosomal and genomic mutations include: assessment of gene mutations in bacteria, methods for estimating mutations in cell cultures of human and mammals in vitro, methods for inspecting mutations in somatic and germ cells of mammals in vivo. Analysis of Russian documents shows that the protocols of basic tests of assessment of the mutagenic activity are close to the protocols of the OECD. It is necessary to publish guidance documents on tests of assessment of the mutagenic activity of chemicals harmonized with the OECD documents.

Key words: mutagenic activity; chemicals; environment; international requirements
THE ORGANIC CARBON – ISSUES OF HYGIENIC REGULATION AND HARMONIZATION

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This study is devoted to the investigation of possibility to use the total organic carbon as regulated index in drinking water as well as to the issues of hygienic regulation and harmonizing this index with the standards of other countries. Basing on the results of 3 years lasting investigation carried out by Municipal Unitary Enterprise “Vodokanal” of Yekaterinburg city permits to propose as the most informative and reliable index of the presence of organic substances in drinking water the content of total organic carbon in comparison with currently regulated permanganate oxidability, chemical and biochemical oxygen consumption.

Key words: total organic carbon; drinking water; permanganate oxidability; chemical and biochemical oxygen consumption.

RISK FACTORS FOR CHILDREN’S POPULATION HEALTH IN STRESSED ENVIRONMENTAL CONDITIONS OF LEAD POLLUTION

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Adverse environmental conditions in Shymkent significantly increase the risk of accumulation of lead in the bodies of the children of the third generation of the population residing in the contaminated areas, cause deteriorations of antioxidant defense in the respiratory system, greatly decline barrier-protective properties of cellular systems of the local immunity, disturb the process of hematopoiesis. Performed statistical analysis of the data permitted to identify a correlation relationship between the accumulation of lead in the soil and the change in the functional activity of the cells of buccal cheek epithelium, catalase activity in expired breath condensate. Haematological signs of lead poisoning include not only the number of reticulocytes, but also the correction (RPI) for the alteration with allowances made for the maturation of reticulocytes in peripheral blood circulation as early criterion for toxic anemia.

Key words: child health; prenosological diagnosis; lead in soil; Shymkent lead plant

ON THE PROBLEM OF ASSESSMENT OF OCCUPATIONAL HEALTH RISK IN PERSONNEL PERFORMING INTENSE VISUAL WORK

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In the work an there is given an assessment of the working conditions during intense visual activity without the use of displays medium and optical devices. It is proved that the indices of evaluation of the light environment in accordance with “Guidelines for hygienic assessment of factors working environment and labor process” P 2.2.200605 R 2.2.2006-05 were substantiated to be been supplemented by indices of uneven brightness and color temperature of the light source. It is confirmed that the intense visual work is a meaningful evaluation of the constraint, especially in terms of sensory loads. In the dynamics of the working day there was revealed the deterioration of the visual analyzer and psychoemotional state. In periodic medical examinations there was noted a marked gain in revealed pathology of diseases of the
eye and adnexa with increasing work experience. A method for estimation of the risk in people doing intense visual work, taking into account the evaluation of the light environment, intensity of work, dynamics of the functional state during the shift has been proposed.

Key words: professional risk; intense visual work; working conditions; occupational lighting; sensor loads; the visual analyzer

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THE ACTUAL INCIDENCE OF THE POPULATION IN THE RF SUBJECT: ASSESSMENT OF ECONOMIC EFFECT (LOSSES)

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In the paper there is presented an analysis and evaluation of the economic losses associated with the actual incidence of the population of the Altai Region on disease classes "Poisoning by drugs, medicaments and biological substances» (T36-T50) and "Toxic effect of substances, mainly non-medical purpose » (T51-T65), including the assessment of the underproduced product in economy of the region in monetary terms, assessment changes in cash flows on the budgets of the Russian Federation (tax receipts ). The time period of analysis on disease classes is 5 years (2007–2011) .

Key words: the actual incidence of the population on disease classes; the economic evaluation of losses; the losses on taxes; losses on Gross Regional Product

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RESULTS OF ANALYSIS OF RATIOS OF INDICES OF TOXIC AND SENSORY EFFECT OF CHEMICALS

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Key words: toxic effect; sensory effect; regression relationships

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ENERGY SAVING AND LED LAMP LIGHTING AND HUMAN HEALTH

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The appearance of new sources of high-intensity with large proportion of blue light in the spectrum revealed new risks of their influence on the function of the eye and human health, especially for children and teenagers. There is an urgent need to reconsider the research methods of vision hygiene in conditions of energy-saving and LED bulbs lighting. On the basis of a systematic approach and knowledge of the newly discovered photosensitive receptors there was built hierarchical model of the interaction of “light environment - the eye - the system of formation of visual images - the hormonal system of the person - his psycho-physiological state.” This approach allowed us to develop a range of risk for the negative impact of spectrum on the functions of the eye and human health, as well as to formulate the hygiene requirements for energy-efficient high-intensity light sources.

Key words: vision hygiene; energy saving lamps; LEDs; melanopsin; melatonin; cryptochrome.
HEATWAVES AND POPULATION DIE OFF IN THE VORONEZH CITY

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Climatic factor is most important condition for the formation of public health. Attention to it has increased recently against the background of global and regional climate change. The aim of the study was to investigate the effect of air temperature on population die off in the Voronezh city in the period of fire-related emergencies. Assessment of cause-and-effect relationships between the air temperature and daily death cases was performed with the help of the method of time series. Correlation analysis showed a statistically significant positive relationship between air temperature and population die off from all causes and from diseases of the circulatory system with a lag of 0, 1, 2, 3 days; respiratory diseases - with a lag of 3 days. With the gain in air temperature by one degree the number of deaths increases by 3%. The results were used in adopt management decisions on minimization risks and potential negative effects on human health.

Key words: air temperature; the risk to health; mortality; management decisions.

ASSESSMENT OF THE IMPACT OF SOCIO-ECONOMIC FACTORS ON THE HEALTH STATE OF THE POPULATION OF THE SVERDLOVSK REGION IN THE SYSTEM OF SOCIAL-HYGIENIC MONITORING


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There was investigated the impact of socioeconomic factors on medical and demographic processes in working age population. For the assessment of the impact of living conditions and environmental factors on mortality rate in a population of the Sverdlovsk region factor-typological, correlation and regression analyzes were applied. There was shown an availability of statistically significant correlation relationships between mortality of the population of working age and socio-economic characteristics (degree of home improvement, quality of medical care, the level of social tension, the level of the demographic load ), as well as between their increments with taking into account the time shifts. The effect of the value of the purchasing power on the mortality rate of the working population has been established. The purchasing power was shown to be connected with a mortality rate of working population from external causes more stronger than death from all causes.

Key words : socio-economic factors; purchasing power; mortality rate of working population.

RATIONALE FOR DIFFERENTIATED SANITARY PROTECTION ZONES FOR BATTERY RECYCLING ENTERPRISES IN MODERN CONDITIONS

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In the paper there is presented the rationale for differentiated sanitary protective zones in the present conditions both of the increase of volumes of production and introduction of various technological solutions on the example of battery recycling enterprise. It is established that the in acting regulations the classification of enterprises recycling of nonferrous metals, fails to take into account such the hazard risks criteria of the enterprise, as volume of emissions of priority substances, the height of their arrival in the
atmosphere, etc., and also does not take into account increased significantly in the current time processing volumes. The results of the performed research allowed to offer new positions in the classification of production of secondary lead from used batteries (I to IV class), depending on the volume of production (from 20 000 to 160 000 tons per year), the amount of emissions of lead (0.2 to 1, 6 tons per year) and release height (15 to 60 m).

Key words: health protective zones; classification of plants; lead; battery recycling.

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MODERN PROBLEMS OF THE APPLICATION OF SANITARY REGULATIONS CONCERNING SANITARY PROTECTION ZONES AND SANITARY CLASSIFICATION OF ENTERPRISES, BUILDINGS AND OTHER FACILITIES


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In this paper, there was performed an analysis of the application of sanitary norms and rules concerning sanitary protective zones and sanitary classification of enterprises, buildings and other facilities, including requirements for the sufficiency and accuracy of information in the performance of projects in sanitary protection zone (SPZ). There is presented an analysis of regulations that set requirements for implementation of mapping works in drafting the SPZ. The design of the SPZ was shown to be, on the one hand, the element of territorial planning subjects of the Russian Federation, on the other hand, the object of capital construction. The substantiations of requirements for graphic and text content, structure, and composition of data, sources of their obtaining, methods of data convergence are reported. There are revealed inconsistencies in Sanitary Regulations and Norms (SanPins) and in their relationship with the Town Planning and Land Code and other laws, and regulations adopted in their development

Key words: urban planning documentation; operating plants; access to types of work; sufficiency of information; capital construction; hazard class of the enterprise; the volume; which allows to give an estimation; design decision; sanitary protection zone; a self-regulatory organization; design work; land use planning, functional zoning.