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REVIEW OF THE PUBLIC POLICY IN FOOD STUFFS FORTIFICATION IN REPUBLIC OF KAZAKHSTAN

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Population's food consumption and condition of micronutrient insufficiencies.

The first National Research of nutritional status of adult population of Republic of Kazakhstan was carried out by Kazakh academy of nutrition in 1996 year. Average daily entrance of energy was 1983 kcal and nutrition of population was unbalanced on the basic food substance and diet's food value. Thus, the carbohydrates had a dominant part in diets; a protein deficiency was the most expressed at women and boys-teenagers. The results of research were specified that the median of consumption of food substances was less than an estimated average requirement (EAR) established by WHO, hence there were all bases to assert, that the deficiencies of folic acid, riboflavin, thiamine, zinc, iron and niacin takes place in nutrition of significant part of adult population of Kazakhstan. Insufficient consumptions of vitamins of B group, iron and zinc took place in diets of sizeable part of population in comparison with WHO recommended norms. Average daily adequate at men and women on thiamine made 61,0% and 53,3%, on riboflavin - 55,5% and 56,7%, on niacin - 90,8% and 71,8%, on folic acid - 37,5% and 31,3%, on iron - 82,1% and 24,0%, on zinc - 66,7% and 59,8% from WHO recommended levels, accordingly. Daily consumption of vitamin A was extremely low (0,29 mg and 0,22 mg for men and women), that is accordingly made 32,2 % and 24,4 % from WHO recommended level(0,9 mg); vitamin C - 38,0 mg and 31,0 mg at norm level in 150,0 mg; and consumption of calcium was in 2,0-2,3 times less than recommended. It was necessary to specify a sufficient consumption of vitamin B_6 and superfluous of vitamin E by population.

A. Prevalence of Iodine Deficiency Disorders (IDD). According to data of 1970-80 years the centers of endemic goiter were found out in 11 of 14 oblasts of Kazakhstan. Frequency of neonatal hypothyroidism in South of Kazakhstan and Almaty city was made 6-7% and 7,2% and this figures in 150-300 times are higher than in the countries where National programs on preventive maintenance of iodine deficiency are realized. Prevalence of visible endemic goiter among children and teenagers of East-Kazakhstan oblast in 1990th years was made 52-59% (4590 persons in 10 settlements were examined); general frequency of endemic goiter among schoolboys in South-Kazakhstan oblast was 26 % (1025 persons were examined) and among adult population run up to 50-60%. Concentration of iodine in urine (<100 mc/l) was registered in 53,0% of cases at women of reproductive age in 1999 year. And only 29,0% of surveyed 5844

householders of republic were consumed iodized salt. After realization of Programs on iodination of salt a share of householders consuming iodized salt in 2004 year had been growing in 3 times in comparison with 1999 year and has made 86,0%.

B. Prevalence of Iron Deficiency Anemia (IDA). According to official statistics of Ministry of Health of Republic of Kazakhstan the IDA makes 74,7% of cases of diseases of mothers of newborns died in early neonatal period and 43,5% - in late neonatal period. Frequency of different kinds IDA in risk groups of female and children's population was 36,0% on data of National Demographic Health Survey (DHS, 1999); the highest level of severe anemia was registered in rural areas of western oblasts of Kazakhstan, especially in Aral Sea and Caspian Sea regions. Among pregnant women a share of anemic persons was made more than 60,0% and in the western oblasts was run up to 90,0%. Results of 2003 year (Kzylorda oblast) testified that frequency of IDA among fertile age women has made in city locality 44,9%, in rural - 65,9%; at children prevalence of IDA in countryside has reached 53,7%, in city locality - 63,2%. Presence of latent iron deficiency has established at urban reproductive age women (88,8%) and at rural (90,5 %) on parameter of organism's iron reserve (serum ferritin). Among urban children a frequency of serum ferritin deficiency has reached 92,9% and not one case with normal parameters of ferritin has revealed among surveyed rural children.

C. Prevalence of folic acid deficiency. Frequency of folic acid deficiency in blood has made 91,4% and 81,9% among children in age till 5 years in East-Kazakhstan and Kzylorda oblasts (2003 year). Frequency of congenital defects of development of nervous tube (CDDNT) according to retrospective analysis of medical documentations of obstetrical establishments of three oblasts for the period of 1997-2001 years has made 0,33-0,48 cases on 1000 newborns. According to data of Republican Research Centre of Mother and Child Health Protection (Almaty city) 556 cases of births of children with congenital defects of development of nervous tube were revealed for the period 1998-2002 years and frequency of CDDNT in Kazakhstan is stable and makes 0,6 cases on 1000 births and has no tendencies to reduction.

According to WHO classification the Kazakhstan is one of "Moderately affection countries» category (WHO/UNICEF/UNU, 1996) with critical IDA level (15-40%) demanding the realization of urgent Programs under the prevention of an anemia at a national level.

Official declaring of public problems. A lot of normative legal acts on urgency for Kazakhstan problems of IDA and IDD and 5 Decrees of the President of Republic of Kazakhstan for the period with 1998 for 2004 years were passed. There are a lot of decisions of Government of RK in which the concrete ways, methods and activities are determined directed on prophylaxis of IDD and IDA at a national level. Universal iodination of food salt is regulated by the Law of Republic of Kazakhstan «About preventive maintenance of IDD» from 14.10.2003, N489. A

vitaminization of wheat flour of extra and first-class is stipulated in the Law of Republic of Kazakhstan «About quality and safety of foodstuff» from 08.04.2004 N 543.

Involving of Public sector in the market of food stuffs. Associations of manufacturers take part in realization of projects on improvement of health population: The Grain Union of Kazakhstan and Association of Salt producers of Republic of Kazakhstan have been promoted a strengthening of motivation of manufacturers to output expansion and increase of quality of fortified wheat flour and iodized salt; protection of internal consumer's market from poor-quality and falsification production.

Development of communication strategy, organization of basic advertising actions in Mass media, estimation of efficiency of consumption of iodized salt and fortified wheat flour on improvement of micronutrient status of population, and also strengthening of knowledge of the population on a problem of IDA and IDD were carried out by the Kazakh academy of nutrition by way of sentinel and special pilot researches where the target groups were women of reproductive age and children of 2-15 years.

The Confederation of NGOs of Kazakhstan was carried out the information supply, training of members of various public organizations and target groups of population on IDA/IDD problems.

SYSTEM OF FAMILY DOCTORS CONTINUING PROFESSIONAL DEVELOPMENT IN KYRGYZ REPUBLIC.

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New system of continuing professional development (CPD) of family doctors is implemented in Kyrgyz Republic since 2001. The system consists of three components: organization of regional workshops, providing of visiting training courses and self-learning. First two components are realized on constant basis since 2001; modules for self-learning are currently developed by teachers of family medicine from Kyrgyz State Medical Institute of retraining and professional development (KSMIRPD), including the modules of computerized courses and distance learning courses. From the moment system started to work each regional workshop and visiting course were given definite number of «credit-hours». After completing each course of CPD the «credit-hours», collected by each medical worker, are registered and kept in databases of KSMIRPD. Number of collected «credit-hours» will be used as one of the criteria series for attestation and giving of qualification category on family medicine [6].

While providing the regional workshops and visiting training courses in a frame of program of continuous qualification improvement, training process is controlled through carrying out of test and structured clinical exam (OSCE) on family medicine. The whole teaching process at courses is organized on principles of evidence-based medicine, and firstly, relies on clinical protocols, approved by Ministry of Health of Kyrgyz Republic.

Objectives of CPD system:

1. To actively detect educational needs of workers of primary care.
2. To improve access to newest information in area of practical healthcare based on EBM principles.
3. To encourage learning and further implementation of clinical protocols approved by Ministry of Health of KR.
4. To participate in process of coordination and integration of WHO vertical educational programs with out-patient practice («Integrated management of childhood diseases», «PAL strategy», «Family planning and reproductive health», «DOTS", etc.).
5. To encourage more effective and rational financing of educational programs on family medicine, which are directed mostly to reduce travel expenses of doctors.

For period of providing the CPD since 2001 2697 doctors were trained at regional seminars and 2453 doctors – at visiting training courses.

CPD system uses pre- and post-training tests to evaluate training results. There are 30-62 test questions, which allow checking the origin knowledge level of family doctors, to clarify their competence in topics offered to learn. On results of post-training test we defined degrees of training material's mastering and accessibility of its exposition form. Efficiency of both forms of training was same, and knowledge improvement has amounted 20-24%.

Conducting of short-term courses of qualification improvement in terms of regional workshops and visiting training courses gives to family doctors an opportunity to constantly update their knowledge on base of EBM principles, to have access to newest information, and encourages learning new clinical protocols at level of primary health care. CPD system encourages reduction of financial costs for training of medical workers through decreasing the travel expenses.

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CONTEMPORARY HYGIENIC PROBLEMS IN TOBACCO MANUFACTURING (LITERATURE REVIEW)

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Tobacco has been under cultivation last 30-40 years only in Almaty oblast (Enbekshikazakh, Ily and Talgar rayons). in Kazakhsatan. Currently, tobacco is under cultivation in Almaty, Zhambyl and South-Kazakhstan oblasts.

Contemporary tobacco-fermentative factories are characterized by high-degree mechanization of main and some auxiliary processes, related with treatment of tobacco raw materials, fermentation of one and post-fermentation processing.

In 1980s, a change-over of post-yield tobacco processing technology into manufacturing base had lead to building of mechanized tobacco-growing complexes. Because of lack of typical projects the mechanized drying plants were build on base of experimental constructions' development.

The main disadvantages of such plants are: lack of effective struggle with gas-polluted air and suspended materials concentration, irrational arrangement of separate types of equipment, insufficient set of sanitary-personnel facilities.

At the same time it is necessary to note that mechanization of heavy works on these complexes positively impacts on functional state of workers' organism. Insalubrity of tobacco-fermentative manufacture is conditioned by technology of raw materials processing. Of them are dust, gas and vapors, free water, and also heat, negatively effecting on workers

organisms. Most of insalubrities (dust, gas, and vapor) have specific character, appropriate to tobacco-fermentative manufacture.

The main professional insalubrity of tobacco-fermentative production is dust, forming and escaping at all stages of mechanized tobacco processing.

Air-borne dust independently or in complex with other factors (harmful gas, noise and others) exerts adverse effect on human body. It is necessary to mention, that at casing and fermentation of tobacco there is series of harmful substances in gaseous and vaporized states in the air of manufacturing facilities: nicotine, methyl alcohol, ammonia, carbon monoxide and others. Intensity of its ingress is increased with rise of temperature.

In production of fermented tobacco the processes proceed with escaping of significant quantity of heat into environmental area. Sources of heat development in manufacture facilities are surfaces of manufacture lines' heated walls, plants for conditioning tobacco and its components on humidity.

At that, issues of working conditions improvement in such complexes are still no satisfactorily solutions. This is evidenced by presence of fugitive chemical substances of tobacco and tobacco dust in the air of manufacture facilities, creating unfavorable working conditions for workers.

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THE NECESSITY OF PROVIDING CLINICAL-ECONOMIC RESEARCH IN KAZAKHSTAN

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It is necessary to set priorities for providing Parma-economical research in Kazakhstan. According to experts' opinion, efficiency of resource use needs to be increased, by drawing attention to diseases while inflicting maximum benefit to country's economic situation. These diseases in the most developed countries are cardio-vascular, bronchopulmonary, endocrine and oncological ailments. Treatment expenses for patients with coronary heart disease in Germany amounted to 2,6 %, in US - 7,9%, in UK - 1% of all healthcare costs (5,6,7).

Same numbers are not known neither in Russian Federation, nor in Kazakhstan. However, it is evident that the study of cardio-vascular diseases is essential due to its high prevalence, mortality and tangible socio-economical effect on society. It seems rational to activate pharma-economical research of medication for treatment of circulatory system diseases.

The Republic of Kazakhstan foresees adoption of conception and methodology development of formulary system, realization of actions on formulary system implementation (including development of appropriate legal base), organization of conducting pharma-economical and pharma-epidemiological research. In this context, it is useful to examine an experience of Russian colleagues. Economical realizations require a new thinking from healthcare organizers, first of all in area of economical justification of diagnostic and treatment technologies. Implementation of what is known as formulary system, taken in many countries as a basis of preventive-medical activities for the facilities, hence it is one of the possible ways to optimize their work. In a Decree of President of the Republic of Kazakhstan dated 13th September, 2004, #1438 «About National program of healthcare reforming and development for 2005-2010» it is noted that «up to present day the mechanisms of providing pharma-economical research are not developed».

What kind of measures may therapeutically and economically encourage rational selection and prescription of medication? Working meeting of European regional bureau (Denmark, 1996), devoted to policy in sphere of information about pharmaceuticals in countries of Central and Eastern Europe and new independent states (7,8,). They came to conclusions about next measures which requires providing of a state policy targeted to production of safe and effective preparations acceptable for population (prices should be acceptable both to government and the customer).

This policy must be reflected in national law of medication as follows:

§ Creation of national lists of vitally important medicaments and Formularies of

medicaments at various levels: separate medical facilities, regional, state;

§ Creation of standard instructions on treatment of general diseases;

§ Publication of independent pharmaceutical informational bulletins about medications and establishment of Pharmaceutical Information Centers;

§ Adoption of rules on medication advertisement, limiting nonobjective information about drugs;

§ Development and implementation of programs on rational selection and prescription of drugs for doctors and pharmacists at all levels;

§ Education of patients on issues of rational using of drugs;

§ Allocation of resources at state level.

In recent years, possibly owing to market economy, the necessity of using the economical assessment methods in healthcare became a routine. We see the need of implementing next stage of the program, pharmaeconomy to be strongly integrated into Kazakhstan health care as follows (2):

§ To develop and set a system of getting the operational and strategic information in area of pharmaceutical and informational provision of population and medical workers;

§ To provide pharmaeconomical and sociological studies;

§ To conduct full research of qualitative and quantitative features of pharmaceutical market of Kazakhstan;

§ To work through drugs policy at stages of production or purchasing, sales and practical use;

§ To implement actions, methodic, and standards on increasing the rationality of pharmacotherapy, including informational provision of medical workers by true information about efficiency and safety of registered drugs in Kazakhstan, to organize data collection and analysis about appeared cases of side effects;

§ To provide constant monitoring of pharmaeconomical rates of each medication, included into special lists;

§ To collaborate with international organizations and facilities, working in sphere of informational provision of medical workers and population about drugs;

§ To give research-methodical and other assistance to healthcare system facilities in familiarizing the medical workers with newest achievements in science and training of national pharmacotherapy.

Any practicing physician must know and be able to use basic fundamentals of medical economy – knowledge of expenses for different kinds of medical care, knowledge of ways of increasing the healthcare effectiveness, and economical substantiation of healthcare

plans. Today, economical assessment is used in healthcare only to define cost of money committed to medical intervention. For healthcare organizations, the main costs should decrease and treatment efficiency must improve, while reductions in resource consumption must be achieved, with decrease in morbidity and mortality rates. For patients, if they pay for drugs themselves, low cost of drugs, disability reduction, pain reduction, fewer side effects and mortality, increasing of treatment comfort, and life quality are important (4,5).

MATHEMATICAL MODELING AND EVALUATION OF PROCESSES IN CARE AND PROMOTION OF COMMUNITY HEALTH

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Our purpose is to create an algorithm to evaluate the examined factors for community health. These factors are divided to positive (P) and negative (N) that is reflected in proportion P/N. The initial ones are processes of birth rate, natural growth of population, life expectancy at birth. The secondary ones are infant mortality, children's mortality (1-4 years old), general mortality, primary prevalence, disability. For each studied factor we developed structure-level coefficients with adequate scales and tables.

We have provided situation analysis of quantity and quality of community health in comparative aspect over the Republic of Kazakhstan using average, over Almaty city and Almaty oblast that allows extrapolate presented results to other regions of the country.

Establishing a prognostic base on key components of the community health, we also have a series of quantitative and qualitative measures. All of that in sum allows formulating the process of analysis and evaluation of all examined factors. In particular, to generate a mathematical model of forecasting the life expectancy people, we use method of multiple linear regression. An equation of this model is expressed as:

$$y = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 \qquad (1),$$

where y - life expectancy (dependent variable), $x_i, i = \overline{1, n}$ - predictors, viz: x_1 - birth rate per 1000 of population, x_2 - infant mortality per 1000 of born, x_3 - children's mortality per 1000 of children of 1 – 4 years old, x_4 - general mortality per 1000 of population, x_5 - general morbidity per 100 000 of population, x_6 - disability per 100 000 of population; a, $b_1, b_2, \mathbf{K}, b_6$ - unknown absolute term an appropriate coefficients in the regression equation. These coefficients are defined on method of least-squares by equations (2) and (3):

$$a = \frac{\sum y - \sum_i b_i \sum_i x_i}{n} \qquad (2),$$

$$b_i = \frac{n\sum x_i y - \sum x_i \sum y}{n\sum x_i^2 - \left(\sum x_i\right)^2},\ i = \overline{1, 6} \qquad (3)$$

Calculated values of the coefficients allow to study simultaneous action of mentioned above predictors. Values b_i > 0 mean that appropriate predictors x_i make a «positive» contribution into change of resultant variable (life expectancy), and values b_i < 0 mean that appropriate predictors x_i make «negative» contribution into change of resultant variable (life expectancy). Absolute values of mentioned above coefficients show what kind of change of resultant variable (life expectancy) will occur, if any predictor is increased to one unit.

There are also assessment methods to calculate errors of coefficients [1]. As it is shown [2]: «Applying the method of multiple regression the number of cases should exceed the number of studied factors to 10 fold». If there are not enough data, observations, then it is not sufficient to study all predictors' contribution into the regression equation. Then it is necessary to provide a definition procedure, which of mentioned above predictors significantly effect on dependent variable, and which – not, since even for essential predictors, the examined coefficients will differ when we change the number of variables in the regression equation. Various statistical modes of inclusion and elimination of variables are used to accomplish that procedure. These modes are realized in packages of statistical software, e.g. SPSS.

After using one of such procedures we may analyze edited equation of multiple linear regression.

By substituting real and expected rates of study variables into the formulas, we can model one or another situation in various perspectives. Particularly, concerning children's age-specific

mortality this index should not exceed 1,06‰ among children of 1-4 years old, and among children of 1-14 years old – no more than 8‰. On primary sickness rate of all population the index amounts to 54 000 per 100 000 at level of general disability - 137,4 per 10 000 of population.

Therefore, using the averages for 2005, in the Republic of Kazakhstan, the most acceptable parameters are as follows: general coefficient of birth rate must correspond to 18‰ and more, general coefficient of mortality – no more than 10‰, natural growth must not be less than 8‰. Cumulative rate of birth must correspond to 2,6 per 1 woman or per 1000 women of fertile age - 2600 children. Life expectancy at birth in that case will amount to 68 years for both genders, for men - 63 years and women - 72 years that is more real at current stage of society development.

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IMPLEMENTATION OF WHO STRATEGY ON SAFE MOTHERHOOD

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One of the main priorities in the Development Strategy-2030 is improvement of medical-demographic situation, which first is related with maternal and children's care. That's why, National program of healthcare reforming and development for 2005-2010 foresees an implementation of new technologies of pregnancy management in accordance to international standards.

Since March of 2006 in Astana has been started implementation of project «Partnership: Healthy motherhood is future of Astana». Actions on realization of safe motherhood principles

have been conducted by joint efforts of City health department, Kazakhstan Association of family doctors and Zdrav+/USAID.

Goal of the project**:** Quality improvement of services on reproductive health.

Project's tasks:

- Training of medical personnel on WHO principles of safe motherhood;
- Organization of schools for training of pregnant women on partner delivery;
- Training of medical personnel how to consult on issues of family planning;
- Information provision of pregnant women in conditions of Astana city;

In a frame of joint project, more than 120 obstetricians-gynecologists, midwives and family doctors were trained on principles of safe motherhood at 6 courses. Trainings were conducted by consultants of international level and trainers from Kazakhstan.

The training module includes training of consulting skills on family planning. That skill will allow to decrease abortions number as method of birth rate regulation.

The implementation of project «Healthy motherhood is future of Astana» was regularly covered in mass media. The pamphlets and brochures were developed and copied to inform women and their partners.

In contemporary conditions the main directions of improvement of maternal and children's health care service are creation of efficiently acting system integrated with primary health care and other stakeholders, along with development of highly qualified medical care system for mother and child health promotion, reducing of level of maternal, infant and children's mortality.

Conclusions:

1. As a result of joint project in Astana were improved the schools of training on partner delivery at delivery clinics.
2. Material base was created for school on pregnant women training in model family medicine center «Demeu».
3. Population awareness on reproductive health issues was improved.
4. Number of trained couples was increased.

KYRGYZ REPUBLIC HEALTHCARE REFORM AND POPULATION HEALTH

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National program of healthcare system reform «Manas» (1996-2006) approved by Government of Kyrgyz Republic was developed in 1996. The main attention was concentrated on reorganization and improvement of medical services, administration methods, human resources policy and financing.

In accordance with current program, the groups of family doctors (GFD) started to be created everywhere. The creation process of groups of family doctors was accompanied by restructuring of existing out-patient facilities, including children's and adults' out-patient clinics, antenatal clinics, rural out-patient clinics. At the beginning of 2005, 84 centers of family medicine (CFM) were opened on base of former out-patient clinics and urban hospitals by way of its reorganization, and they included 672 GFDs. Also oblast CFMs were organized to coordinate activity of primary healthcare segment of the oblast. In 2001, a new structure was appeared, the ambulatory-diagnostic units (ADU) in every territorial hospital in order to render multi-profile consultation-diagnostic assistance to population and accomplishment of relation between primary health care (PMC) and in-patient care. Also new oblast united hospitals were created.

Thus, the reform directed to rational use of sector resources resulted to drastic reduction of funds for beds and facilities of in-patient care. Number of hospital beds was decreased twice more (from 53305 beds in 1991 to 26040 in 2004). This reduction at that general hospital facilities was 2 to 3 times more (from 323 in 1991 to 143 in 2004).

Considering the market forces and reorientation vital interests of population have been reflected on visits to out-patient facilities towards its reduction from 32568 thousands of visits per year (or 7,3 per one person) in 1991 to 20754 thousands (or 4,1) in 2004 (Table 1).

Low salary of medical workers and lack of proper manpower policy in the country had lead to drain of professionals into Kazakhstan and Russia. Comparing 1991 to 2004,, there were 34,2 doctors and 94,7 of middle medical personnel per 10000 of population versus 25,3 and 60,4, respectively.

Analysis of general morbidity of population in the course of healthcare reform years has shown tendency to decrea. Ther rate of general morbidity of adults and adolescents decreased in 2005 comparered to 1991; 10,8% less and in a greater degree children under 14 years old –24% less, and primary sickness rate of adults and adolescents decreased 22,6% less and children under 14 - 31,9%.

Rate reduction must not be considered as reflection of true picture of population incidence and it is related to reduction of network and capacity of hospital facilities, decreasing

number of physicians and middle medical personnel number, financing problems of healthcare system, low paying ability of population, decreasing of medical workers activity in diseases detection among population and many others, and this decreasing tendency of general and primary morbidity is correlated with reorganization processes of healthcare network.

Respiratory diseases, ranks the number one morbidity condition in Krgyzystan. This caused by unfavorable background in conditions of high epidemiologic situation with tuberculosis.

Morbidity rate of iodine-deficit disorders and diabetes were roughly increased. According the data from medical-information center [1], general prevalence of hypotherosis among children and adolescents of age from 7 to 16 years old ranges from 29,7% to 53,1%. High level of sexually transmitted infections and increasing of HIV-infections still remain. Growth of STDs prevalence raises extreme alarm in connection with hazard of HIV-infection prevalence. Incidence of syphilis per 100000 of population in 2004 amounted to 33,4, and gonorrhea - 29,9. There is also tendency of increasing the number HIV cases among women and since 1996. Since then women gave birth to nine children with HIV.

Logical continuation of general healthcare system reorganization is new National program “Manas taalimi” (2006-2010) approved in 2006 by Ministry of Health of Kyrgyz Republic. It is directed to strengthening of achieved results and stabilization of healthcare system. Program selected main priorities of healthcare sector development. According to that, integration of medical services presented in a frame of priority programs on maternal and childrens’ care, tuberculosis prevention, reproductive health, and also public health services to be started.

Thus, the transformations performed in healthcare system lead to some positive and sometimes to negative consequences. In recent years we achieved definite successes in the area of rationalization of beds funding, restructuring medical-preventive facilities and change of financing system. However, many problems remain unsolved. Analysis shows that it is impossible to achieve significant results during that short period. Number of factors such as poverty, internal migration, low level of population awareness, low salary of medical workers and low prestige of profession, as well as and misbalance of human resources interfere with progress..

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THE PROBLEM OF OCCUPATIONAL TRAUMA IN KARAGANDA OBLAST

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Karaganda oblast leads on index of occupational trauma among all regions of Kazakhstan. The trauma related to industry amounted to 2593 and 2357 cases in Karaganda during 2004 and 2005, respectively. In particular, number of suffered at enterprises of coal department in 2004 were 288 people, and 257 in 2005, that means approximately 11% of the workers had work related trauma in both years.

During these years dynamic of trauma coefficient (number of traumas per 1 million tons of mining and per 1000 of workers) shows persisting tendency to slow reduction of trauma In 1996, there were 138,2 traumatism cases per 1 million tons of coal mining, then in 2005 - 22,9 cases, and for 6 months of 2006 – 19,3 cases. Unfortunately, number of fatal accidents per 1000 workers is not decreased.

Unfavorable situation with occupational trauma has been formed in coal pits of JSC “Mittal Steel Temirtau”. For 10 years, from 1996 till 2006, occupational trauma in those enterprises has amounted to 5860 cases, including 157 fatal cases, and 422 severe injuries.

In 2004, according to data of Emergency Situations Ministry, in mines of "Mittal Steel Temirtau" coal department, the growth of accidents are three times more than before and the fatal trauma is more than five times. Only a single tragedy in "Shakhtinskaya" mine took away 23 lives in December of 2004.

The prevalence of occupational trauma among enterprises of JSC “Mittal Steel Temirtau” is observed in Kazakhstanskaya, Tentekskaya, Lenin and Shakhtinskaya mines. Table 2 shows insignificant decrease of trauma rate in 2005 turned out to be not relevant , $p>0,05$. So for the last two years, the level of occupational trauma remains at the same level. Most of the suffered workers are in age groups of 40-55 years old (49,6% and 50,4%) and 25-40 years old (38,8% and 35,0%), during 2004-2005.

Study of character and localization of injuries show that limb fractures are leading with 31,9% and 37,6%, 2004 and 2005, respectively, The second common trauma type is superficial

injuries (hurts, sprains) with 24,4% and 25,5% in respective years, and the third is wounds at 20% and 22,8%, for 2004 and 2005, respectively.

Most of workers' injuries at the coal plants of Shakhtinsk city are injuries of head, neck and eyes (31,5% and 24,2%), upper extremities (hand – 20% and 26,8%) and lower extremities (15,1% and 21,4%). Analyzing trauma on specialities, we observed that miners' faces are more amenable to traumas (22,3% and 26,5%), while drifters are only (17,3% and 15,4%), and underground electrical fitters are 12,4% and 15,4%, in 2004 and 2005, respectively.

Number of died workers in Karaganda mines exceeds world-wide rates more than 3 times.

BLOCK-RECURSIVE MODEL OF HEALTH CARE SYSTEM BASED ON STRUCTURAL AND REDUCED EQUATIONS

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The analysis of healthcare system organization in Odessa Region was made on basis of experience of Odessa Regional Clinician Hospital, taking into consideration the social and demographic characteristics of population as well as those indices, which were characteristic for the existing healthcare system. The inclusion into such a model of the backward directed influences as well as postponed indices on efficacy of healthcare system permitted to investigate dynamic character of social system on the basis of structural equations. The usage of equations' reduced forms, which are able to characterize each endogenous variable as a function of exogenous variable, permits to undertake urgent forecast for effective governing of regional system of health care. One of the important ways of applying the developed model is policy planning and evaluation (managerial decisions) regarding the healthcare system organization. Analysis' results suppose detection of unobvious consequences of making the corresponding decisions, changing the system of medical services.

It should to underline significant fact that designed mathematical model allows to effectively estimate internal (endogenous) trends and interrelations of healthcare structure, which приобретают actualization due to formation of medical services market.

The model might be used in evaluation of such managerial decisions as implementation of limits for building of new clinics or expanding of services range in medical-preventive facilities.

HISTORICAL ASPECTS AND ANALYSIS OF ORGANIZATION OF ORTHODONTIC CARE.

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In recent years, interest of doctors-dentists in orthodontics is increased. That is, undoubtedly, related to technical revolution in construction of orthodontic devices. There is a new concept in treatment technology of patients of different age, and with such complicated dentoalveolar anomalies, in the past positive results for these conditions were unthinkable. Bracket-system allowed us to render orthodontic care whatever age, anomaly's complexity and deformity.

In comparing research data in area of epidemiology of dentoalveolar anomalies at the end of XX and beginning of XXI centuries, using statistical analysis of patients which are examined in our clinics in Kostanay oblast, we concluded, that needs in orthodontic care remains high.

According to A.V. Alimsky, K.Z. Shalabaeva, A.Ya. Dolgoarshinnyh (2002), prevalence of dentoalveolar anomalies in Kazakhstan among children of 7-19 years old amounted to 50%. WHO reccomends assessment of dental health in index age groups, anomalies among 6-years old children is 12%, while 12 years old is 34%, and among 15 years old is 42%.

As far as growth of population culture, increasing of incomes, demand for treatment by doctor-orthodontist is rapidly increased among adult population of age from 18 till 50 years old. Prevalence of dentoalveolar anomalies is about 75%. The main causes of office visits include: 1) disturbance of face esthetics as a result of anomalies of separate teeth' position, 2) existence of trema and diastema as a result of untimely orthopedic treatment either diseases of parodontium tissues, and 4) bite disturbance.

We found that along with primary visits (patients did not get orthodontic care before) in 35% of cases are repeated visits (orthodontic treatment in anamnesis), and they are both among children of 12 years old, and among adults. In our opinion, the result of orthodontic treatment depends on methodic level of research; professional skills of doctors-orthodontists; complex rehabilitation jointly with maxillofacial surgeons, parodontists, orthopedists; and material-

technical base. Insufficient information about achievements in orthodontics leads to incomplete volume of research, applying of outdated and inefficient treatments methods in practice, to incorrect technical production of new constructions of orthodontic devices, and as consequence, to clinical mistakes.

Before emerging and development of private dental care, orthodontic care was given in children's dental clinics. Unfortunately, as usual in a sense of many health managers of different levels and practicing doctors, orthodontics is appendage or orthopedic dentistry, or children's dentistry, but now it is as independent part of medicine. It should be considered that qualitative orthodontic treatment consists not only in creation of smile esthetics, but also creation of normal occlusion, recovery of dentoalveolar complex's functions, and harmonic face. Stability of treatment result depends on complex approach to diagnosis and treatment in each specific case.

Thus, professional development of doctors, popularization of new methods of diagnosis and treatment of dentoalveolar-facial anomalies, implementation of ones into clinical practice encourages improvement of treatment results.

Study and implementation of contemporary technologies allow solving problems of complex rehabilitation with disturbances of facial esthetics, gnathic forms of anomalies, and congenital malformations of maxillofacial area, traumatic and inflammatory affects.

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DIFFERENT FACTORIES SMELLS' IMPACT ON POPULATION HEALTH (REVIEW)

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In recent years, organizations of sanitary-epidemiologic service in the NIS countries and Kazakhstan have new problems on estimation of smell level to control air pollution and to take effective actions in region of large-scale tobacco factories location, which effluents contain substances with smell [8].

One of these plants is tobacco factory of JSC "Fillip Morris Kazakhstan" located in Almaty oblast.

Sanitary-protection zone of size no less than 300 meters is in accordance with sanitary norms of designing the manufacturing objects №1. 01.001-94.

However, as complains of "Utegen batyr" village inhabitants complain about specific smell of tobacco factory's effluents of different intensity is felt outside of sanitary-protection zone, in spite of, that at border of the zone concentrations of tobacco dust (on nicotine) do not exceed maximum one-time concentrations according to estimated data of SES. In view of that, organoleptic assessment of atmospheric pollutions has great hygienic value.

Unaccounted odorous organic substances, emissioned to the open air, can significantly change pollution characteristic around tobacco factory in comparison with that one, which is given by tobacco dust, and thus to condition necessity of organization the adequate control and evaluation [8].

It is important to mention, that in real conditions of sanitary service facilities' activity the determining volatile substances, which are in gaseous (free) state and sorbed on tobacco dust, is extremely hard task.

To control atmospheric pollution by mentioned substances it is appropriate to use organoleptic method, which allows sensing smell of factory's emissions entirely [9].
Organoleptic control allows to evaluate probability of unfavorable smell effect on population via an odorimetric analysis (i.e. to define probability distribution of smell sensing by population on perception strength).

Therefore, various volatile organic substances, which fall into different classes of danger, evolved into the production process of different factories, represent serious hygienic problem.

All of that persistently dictate advisability of providing hygienic studies in mentioned above manufactures with next development of purposeful program of prevention and rehabilitation the health state disturbances of both workers and population living nearby theses factories.

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ROLE AND OBJECTIVES OF THE HEALTHY LIFESTYLE SYSTEM IN REALIZATION OF HEALTHCARE DEVELOPMENT AND REFORM PROGRAM FOR 2005-2007: THE EXAMPLE OF ALMATY OBLAST.

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To accomplish the objectives of propaganda on healthy lifestyle, health promotion of population, in the Almaty Oblast there is service of adapting healthy lifestyle, coordinator of which is the Oblast center of adapting healthy lifestyle issues.

Sixteen rural and three urban Centers of health promotion, established on base of primary health care (PMC) organization working in the oblast.

For several months, information and education was provided on tuberculosis, brucellosis, ARVI and influenza, tobacco smoking, drugs abuse prevention; decades actions on prophylactics of oncology diseases, trauma, accidents and poisonings, cardio-vascular diseases, bronchial asthma, acute enteric infections and viral hepatitis. In addition, through the World days – of health and Health Festival the following are regularly provided: struggle with tobacco smoking, drugs abuse, tuberculosis prevention.

These actions are to emphasize on increasing of school children and their parents awareness for questions of TB prevention and healthy lifestyle propaganda including: mass actions, theatrics, games-trainings, lectures, contest for best poster, pictures, dictations, expositions, debates, parents' meetings and class hours with coverage of 70% school children.

Anti-tobacco information-educational campaign covered more than 29 thousand of people. The medical-preventive PMC facilities were open during the days on assisting to people want to drop smoking.

In period of conducting the decade on prevention and early detection of oncology-diseases by means of prophylactic examinations more than 11 thousands of people of age 35-49 years old were performed.

From May 15 to May 25 May, the Oblast provided the program for the decade on prevention of trauma, accidents, and poisonings among children of age 12-15 years old with coverage of 1284 people. During the decade on prevention of bronchial asthma among children of age 6-7 years old, 29 thousand children were examined, of those 478 children were with risk factors, and 25 with symptoms of bronchial asthma.

Among the population, more than 45 thousands of copies of information-educational literature on issues of health promotion and disease prevention were disseminated in Kazakh and Russian languages.

Month with slogan «Drugs are not toys for children» devoted to International day of struggle with drugs abuse and narcotic trafficking was carried out. The month was composed of mass actions with attraction of different groups of population, especially 8-10 years old children and adolescents. Main specialists, doctors–narcologists using video-materials about deleteriolis impact of narcotics on health covered about 10 thousands of children. Oblast center of adapting healthy lifestyle provided round table «Young generation and narcotics» with participation of students of high educational institutions and specialized secondary educational facilities in TaldyKorgan city.

To provide an activate information-educational work, oblast narcologic facilities and rayon narco-offices conducted organization-methodic and consultative assistance to teaching staff of educational institutions on prevention of alcoholism, drugs abuse and toxicomania.

Conclusions:

1. In Almaty Oblast the whole complex on healthy lifestyle improvement was created.
2. Number of actions, mentioned in article, directly effect on realization of healthcare reform and development program for 2005-2010 in Almaty Oblast.
3. Healthy lifestyle system and educational work immediately impact on level of life quality, on preventive activity and promotion of population health.
4. Healthy lifestyle system also effects on improvement of quantitative and qualitative indices as shown by the example of Almaty Oblast.
5. Above mentioned conclusions directly point to necessity of increasing the financing of preventive actions and healthy lifestyle systems.

THE TREATMENT OF FETOPLACENTAL DEFICIENCY OF POLYUNSATURATED FATTY ACIDS IN HIGH RISK PREGNANT WOMEN.

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The literature [9] shows that the basis of FPD pathogenesis is lipid metabolism abnormalities in the form of formation of surplice quantity of active forms of oxygen, leading to oxidative modification of lipoproteins of low density (LLD), and owing to that there is predominance of saturated fatty acids in the blood, that is attended by increasing levels of biomembrane rigidity. Increasing levels of saturated fatty acids level in blood also leads to reduction of fermentative-synthetic activity of cells and metabolic processes in system mother-placenta-fetus. Thus, correction of misbalance of fatty acid composition of blood during medical-preventive actions is needed for women of high risk group to prevent the reproductive losses.

Using experimental technological studies we had biologically active addition «Omega–3», consisted of complex of polyunsaturated fatty acids (**eicosapentanoic** and decosagexanoic acids). Complex of polyunsaturated fatty acids encourage normalization of prostanoids pathway – basis of placental deficiency genesis. Based on data from previous studies, peroral use of polyunsaturated fatty acids complex «Omega–3» in therapy of placental deficiency during pregnancy favorably impacts on nosotropic components of FPD progression by: joining

metabolism processes; participates in energy supply regulation, correcting impaired compensation abilities of maternal and fetus organism.

We examined 50 pregnant women, in risk groups on FPD progression. «Omega–3» efficiency was estimated by comparative analysis of pregnancy, delivery, perinatal pathology frequency, and also studies blood's fatty acids spectrum. All women were divided to two comparison groups. First group consisted of 28 women who started use of "Omega-3" by 1 capsule 2 times a day at mealtimes and the second group (n=22) who did not received the indicated addition mentioned above. Prevention of FPD was provided during critical periods of pregnancy, on progression of FPD (5-6, 24-26, 30-32 weeks).

In the main group of pregnant women who used «Omega-3» was at risk for **miscarriage** in 10 cases (36%), whereas in control group – it was 12 cases (54%). Late gestosis in first group was 1,8 times ($p<0,01$) less, than in control one and amounted to 4 cases, FPD progressed 2 times ($p<0,001$) more in control group of study and amounted to 32%.

APGAR scale test of newborns in main group at 1 minute amounted to 7,5±0,2 scores, at 5 minute 8,3±0,4 scores. In alternative group, at 1 minute - 6,3±0,3 scores, at 5 minute - 7,4±0,2 scores ($p<0,05$).

Use of preventive course in first group also promoted a change of fatty acid content of blood toward increasing of unsaturated fatty acids (USFA) over saturated ones (SFA) from first 22,0% ($p<0,01$) till third 28,0% ($p<0,01$) trimester of pregnancy. In second group of comparison pathological spectrum of fatty acids was stable during whole pregnancy and was marked by preponderance of SFA over USFA.

Therefore, use of PSFA «Omega-3» in therapy of fetoplacental deficiency leads to increase the rates of vascular resistance in various components of circulation in system mother-placenta-fetus, improve fetus tolerance of delivery, and also improve newborns adaptation to postnatal life by reducing number of children with pathological body weight loss, jaundice, with arousal syndrome and central neural system depression.

THE ANTIOXIDANT THERAPY OF FETOPLACENTAL DEFICIENCY IN OBSTETRIC PRACTICE.

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Literature indicates that having fetoplacental deficiency (FPD) leades to more often circulation disturbance in vessels of feto–placental complex as a result of hypovolemia, thrombosis and high vessels resistance. So, one can make a conclusion about insufficient oxygen supply of fetus, and presence of trophic deficiency. This situation requires to prescribe the therapy on improvement of microcirculation and oxygen supply.

Materials and methods. We examined 50 pregnant women, risk groups. All examined women were divided into three groups. The first group consists of 18 women started "Coenzyme Q-10" in first trimester of pregnancy, in the second group – 18 women started Coenzyme Q-10 in second trimester – 2 main groups. Average age of women: in first group – 25,2± 4 years, in second - 25,5± 3,7 years, and in third – 24± 3,9 years, differences are not reliable ($p > 0.05$). More frequently 78% of pregnant has anemia, 37% - obesity, 27% - chronic pyelonephritis, and 5% - varices.

We conducted dopplerometric test of system mother-placenta-fetus of all women after 32 weeks of pregnancy.

Results and discussion. Average value of hemoglobin in pregnant women of compared groups during 1^{st} and 2^{nd} trimesters amounted – 113,5± 6,7g/l and 118,8± 7,8g/l, differences are not significant. Hemoglobin level in third trimester in both groups was different. During hormone-producing function of placenta of first group's women we detected normal level of plasma theelol; the level of placental lactogen of 30,5% women was increased and of 9,0% was reduced. In second group theelol level of 6,25% of women was decreased, placental lactogen level of 33% of women was raised and of 20% - was reduced. 55% of third group women had normal theelol level, and 45% - increased, 27% had increased level of placental lactogen, and 42% - reduced, that evidences tension of fetoplacental function with tendency to decompensation.

By Doppler test we defined systole-diastolic ratio (S/D) and index of resistance (IR): in funicle artery, medial cerebral artery of fetus and uterine artery.

Evidence from data show that among pregnant women of third group was progressed moderately apparent hypercoagulation syndrome, hormone-producing function of 50% women's placenta is impaired, disturbance of uterine-placental blood flow – at 44 % of women.

Conclusions. Use of "Coenzyme Q-10" supplement in complex of preventive and medical actions in group of high risk women with high risk of perinatal losses during pregnancy and intranatal period allowed reducing the frequency of FPD, and increasing frequency of favourable outcome of pregnancy and deliveries.