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RISK ASSESSMENT AND MANAGEMENT OF RURAL HEALTH IN KAZAKHSTAN

The issue of protection and promotion of the rural health remains as a priority in the socio-economic policy of the Republic of Kazakhstan. There are not only relatively higher disease incidence or prevalence in rural health but also the low staffing of medical personnel in rural regions. Studies showed that in conditions of a low level of health of the rural population, the existing rural health care turned out to be ineffective and requires radical structural and functional restructuring.
The aim of this work is to present a model of assessment and management of risk to the health of the rural population of Kazakhstan proposed as one of recommendations resulted from the three-year study of rural health in South Kazakhstan Region.
Keywords: *rural health, medical and preventive care, environmental diseases, risk assessment and management*

Introduction

Despite the current positive changes in the level of health of the rural population of the Republic of Kazakhstan, the issue of protecting and improving the rural health remains as a priority in the socio-economic policy of the state. In this connection, medical and demographic indicators of the health of the rural population, the organization of medical care, and various preventive measures are of particular importance.

When developing plans for the socio-economic development of rural areas, as a rule, the regional features of the formation of medical and demographic processes and the urbanization level of the settlements, are not fully considered. Therefore, in 2018, the Strategic Plan for the Development of the Regions of the Republic of Kazakhstan for 2020-2025 was adopted [1]. In this document, the health protection of the rural population of the Republic of Kazakhstan is emphasized as one of the prior focuses of the state's internal policy.

The problems associated with the health state of the rural population are evidenced by the annual medical and statistical reports of the Agency for Statistics of the Republic of Kazakhstan and the Ministry of Health and Social Protection. According to them, it follows that the medical and demographic situation in the countryside remains alarming: there are relatively high mortality rates for children under 5 years of age, 10.69 cases per 1000 live births, infant mortality - 8.37 cases per 1000 live births. Maternal mortality in rural areas also remains relatively high at 16.4 cases, with 12.1 cases in urban areas per 100,000 live births [2].

For the regions that are part of the South Kazakhstan region, the rural health issues are exacerbated by a number of medical and geographical features: a vast territory, low population density, a variety of natural conditions (dry steppes and semi-deserts), which requires disproportionately higher costs for development and maintenance of all components of social infrastructure, including the health care system. The unsatisfactory indicators characterizing the morbidity of women working in the agro-industrial complex are especially noted, which is associated with the great influence of health risk factors: irregular nutrition - 49.1%, neuropsychic stress - 44.5%, increased physical activity - 23.8%. It should be considered that the main part of peasant farms is represented by a female contingent. There is a number of additional factors affecting their health status: physical overload, cooling microclimate, high bacterial contamination of the air in the working area and others. It leads to disruption of many body functions [3-5].

Studies showed that in conditions of a low level of health of the rural population, the existing rural health care turned out to be ineffective and requires radical structural and functional restructuring [6, 7].

One of the most serious problems facing rural health care is not only the higher incidence or prevalence of sickness among rural residents, but also the low staffing of medical personnel. Health care workers are a special category of the rural population. Their social status, health, household and industrial facilities directly affect the quality of medical care.

The main principles outlined in the message of the President N. Nazarbayev to the people of Kazakhstan dated October 05, 2018 are as follows: The health of the nation is the main priority of the state. Creating a comfortable living environment. One of the directions of state policy at the new stage of development of our country should be the improvement of the quality of medical services, which is the most important component of the social well-being of the population, and the development of a high-tech healthcare system [8].

The International Bank for Reconstruction and Development reported very successful results of the implementation of one of its six main directions of the State Program of the Health Care Development "Salamatty Kazakhstan" (2016-2020) - strengthening preventive measures, screening studies, improving diagnostics, treatment and rehabilitation of the main socially significant diseases and injuries. At the same time, they noted the existing shortcomings in the health care system - a weak level of primary health care (PMC) and the inadequacy of the current principles of financing the system to its growing needs [9].

Thus, the relevance, versatility and fragmentary study of the above problem have led to the need, high scientific and practical significance of a large-scale study with the aim of an objective comprehensive scientific assessment of the state of the environment and health of the rural population for sustainable development of regions.

It should be noted that environmental pollution is fraught with a threat to public health. Accordingly, medicine is increasingly forced to turn to the ecological accents of one pathology or another. Today, researchers are increasingly concluding that further increases in investment in medicine will not lead to a decrease in morbidity. Only an environment favorable for humans and a healthy lifestyle will ensure the desired level of public health.

Carrying out research including the study of the entire complex of all these factors, would make it possible not only to find out the cause-and-effect relationships "factors - health", i.e. the basics of health and well-being of the population, but also to identify ways and tools for further strengthening health and ensuring the sanitary and epidemiological well-being of the population, which is set in the tasks of the State Program for the Development of Healthcare of the Republic of Kazakhstan for 2016-2020 "Densaulyk" [10].

In current socio-economic conditions, the development of an effective long-term state policy in relation to the sustainable development of the rural territory of the state is of particular importance. At the same time, the central place in solving this problem is assigned to the formation of an effective model of management and integration of rural health care in the context of the implementation of the Unified National Health System (UNHS) in Kazakhstan until 2020 [11]. Within the framework of this program, it was planned to strengthen screening socially significant therapeutic diseases, such as ischemic heart disease, diabetes mellitus, chronic hepatitis, bronchial asthma and rheumatic diseases. The health of the rural population deserves special attention. In this connection, it is necessary to develop and test a model for organizing the provision of medical services within transport accessibility in the form of "Densaulyk" road trains and trains, as well as scientifically substantiate the positive experience and negative aspects, make proposals to improve the UNHS, considering the peculiarities of rural health care.

A model of management of the health of the rural population

Considering the needs noted in the state strategic documents, a model for managing the health of the rural population has been developed as the basis for improving the quality of life (Figure 1).

The management of the rural health is based on continuous preventive screening of the health, comprehensive monitoring of all aspects of assessment of the level of environmental pollution that affect the health and quality of life with the development and implementation of sanitary and hygienic, medical and health promotion, and organizational measures for further effective sustainable development of rural areas. The Model includes three main directions of measures: Preventive screening of health of the rural population, Provision of medical care, and Sanitary and hygienic protection of rural health.

1. Preventive screening health of the rural population

1. Comprehensive medical examinations of the rural population should be carried out at least once a year with the obligatory involvement of narrow specialists and with the involvement of mobile medical care, as a method that makes it possible to timely diagnose premorbid and clinical forms of various pathological conditions and carry out preventive measures among the rural population.

2. In order to reduce cardiovascular pathology, regularly conduct screening examinations with the obligatory inclusion of an electrocardiographic study with the active involvement of the population to identify risk groups.

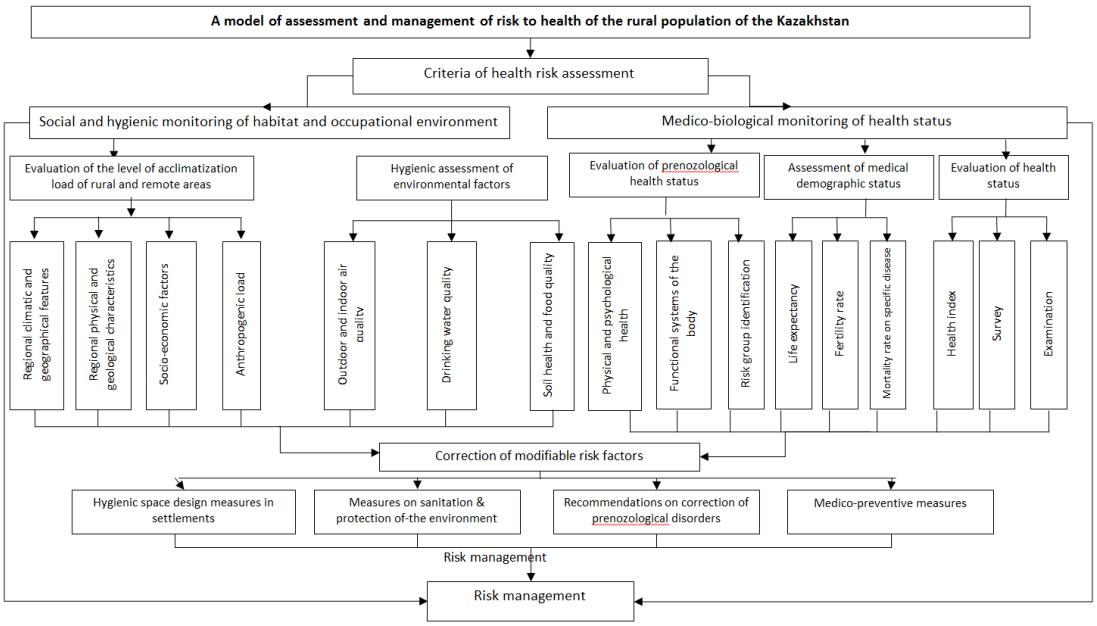

Figure 1 - A model of assessment and management of risk to the health of the rural population of Kazakhstan

3. Considering the urgency of the issue of iron deficiency anemia (IDA), due to the widespread prevalence and aggravating, negative impact on the growing child's body, priority is given to timely prevention and treatment of this pathology. A modern strategy of integrated prevention and treatment of IDA should include the following components: supplementation with iron, iron fortification of food; prevention and treatment of chronic non-communicable diseases, infectious and parasitic diseases, programs for safe motherhood, breastfeeding and integrated management of childhood diseases.

4. High rates of infection with zoonotic infection (listeriosis) dictate the need to introduce effective sanitary and hygienic, anti-epidemic and to improve preventive measures among children.

5. To reduce the level of maternal and infant mortality, the development and implementation of a set of measures for the reproductive health protection of is of priority importance:

- strengthening the preventive work of PHC institutions in rural settlements of the region to protect the health of mothers and children;
- strengthening awareness, health education of the population about reproductive health;
- ensuring the access and improving the quality of medical care for women at the PHC level, improving the screening system for pregnant women using ultrasound diagnostics, identifying chronic fetal hypoxia and other disorders associated with exposure to environmental factors.

6. The development of the main directions of comprehensive rehabilitation, the introduction of preventive and medical measures for the sanitation of children and the organization of medical and environmental assistance to the rural child population.

The main direction of improving the organization of medical care should be to increase the role of a general practitioner who has mastered the principles of diagnostics and treatment of environmentally dependent diseases.
In connection with the strengthening of the role and functions of PHC, it is necessary to systematically develop the regulatory and legal framework of its activities, including protocols and standards for prevention and treatment, issues of clinical examination, sanitary and epidemiological regulation, drug provision of the population at the outpatient level.
It is necessary to introduce training of personnel in methods of diagnosis, treatment and rehabilitation of children with environmentally related pathology.

2. The provision of medical and preventive care of the rural population

The first level of health care delivery including feldsher-obstetric and feldsher posts provides the simplest types of medical care for the population of rural areas with a low population density:
- Collection of anamnesis data and examination of the child with an assessment of the ecological environment;
- Assessment of the incidence of infectious diseases;
- Assessment of physical, sexual and neuropsychic development;
- Assessment of the condition of the skin and subcutaneous tissue, bone and muscle, respiratory, cardiovascular, digestive, urinary systems;
- Evaluation of the child's feeding and nutrition and living conditions.

At the second level, which includes outpatient clinics, groups of general practitioners and family doctors, apart of the measures provided at the first level, they also study of the structure of morbidity, including infectious diseases; provide generally accepted compulsory laboratory examination and prescribe medication courses.
At the third level, which consists of polyclinics of a wide profile and rural district hospitals, to the activities carried out at the second level, laboratory-functional and instrumental studies are added, which are used in the general network of medical institutions.
The fourth level includes the central district (regional) hospitals, which provide inpatient and outpatient treatment of patients with the implementation of all measures of the third level.
The fifth level includes regional general hospitals, which provide general and some specialized methods of inpatient and outpatient treatment, diagnostics, surgical operations and other procedures, telemedicine communication facilities with the structures of 1-4 levels, training of medical workers. At this stage, in addition to the activities carried out at the fourth level, feldshers and doctors of the 1st and 2nd levels are consulted.
The sixth level includes large clinical centers, national institutions providing highly specialized care. In addition to the activities performed at the previous levels, these institutions provide:
- Immunological examination;
- In-depth laboratory-instrumental and functional examination of the bronchopulmonary system: Spirography, FVD, bronchoscopy, diffusion capacity of the lungs and ultrastructural microscopy); cardiological examination (electrocardiography, echocardiography, phonocardiography); additional studies according to indications (cytomorphological examination, intravenous urography, X-ray examination, etc.); examination of the state of the gastrointestinal tract using endoscopic examination - esophagogastroduodenoscopy, sigmoidoscopy, as well as X-ray, microbiological, cytomorphological, histological studies of ultrastructural microscopy; nephrological examination.
- Consultation of doctors of 1-5 levels.

3. Sanitary and hygienic protection of rural health

The complex of management decisions also includes the implementation of a number of planning, sanitary and hygienic, preventive and medical measures.
Planning measures include the organization and improvement of sanitary protection zones, recreation areas for the population, solving transport problems, the correct location of residential and industrial zones, landscaping, improvement of villages, etc.
The development of new, more advanced methods of purification of wastewater, soil and atmospheric emissions with high hygienic efficiency is at the heart of sanitary and hygienic measures. The following are the complex of sanitary and hygienic measures in the village:
- In order to prevent the emergence and spread of infectious and parasitic diseases transmitted through soil and water, the sanitary and epidemiological services should develop a long-term plan to strengthen the control of the soil health and of various types water supply sources.
- As the main epidemiological factors affecting the assessment of microbial risk in the studied territories, the sources of centralized and decentralized domestic drinking water supply, public amenities and a comprehensive assessment of sanitary and technical conditions of water use should be considered.
- The Tikhomirov and Popov algorithm for calculating the integral indicator should be used to assess the quantitative dependence of the acute enteric infections (AEI)' incidence among the population on the level of microbial water contamination.
- Of the entire set of standardized bacteriological indicators, it is necessary to single out the most significant ones that can cause AEI of aquatic etiology, with the determination of the weight (significance) of each indicator.

When carrying out comprehensive preventive and medical measures among the rural population, one should pay attention to the following:
1.Raising the level and quality of ecological and health education and the formation of a healthy lifestyle, to carry out active explanatory work in this direction about harmful environmental factors affecting their health.
2.Systematic comparative assessment of risks and damages from the impact of various environmental factors, mode and quality of life, and the presence of bad habits. Evaluation of health risk perception by various groups of the population is necessary.
3.Evaluation of the awareness of the population about the health promotion measures and their opinion on the effectiveness and significance of these measures.

4.The relatively high infectious morbidity in several regions of Kazakhstan dictates the need to develop and implement effective preventive and protective means as well as social prevention measures, active treatment and clinical examination of such patients.
5.Urgent measures to improve treatment outcomes are:
- full provision of medical facilities with diagnostic devices;
- sufficient spectrum of clinical and special laboratory research methods,
- provision of medicines and diagnostic products;
- increasing the requirements for the qualifications of personnel: infectious disease specialists, therapists, pediatricians, etc.
6.The majority of patients in rural areas poorly visits doctors even after a three-year follow-up period. Under these conditions, it is mandatory to conduct a systematic medical examination in each district of the region. Primary prevention of environmental diseases of the rural population should be implemented on the basis of the following basic principles:
- systematic functional and diagnostic monitoring of organs and body systems;
- systematic preventive examination of the rural population;
- the formation of a healthy lifestyle among the population.

Medical and ecological rehabilitation is one of the ways to protect the population living in ecologically unfavorable territories. Medical and ecological rehabilitation is understood as a complex of health-promoting measures aimed at stimulating the adaptive mechanisms of the human body, including increasing its immune resistance and the ability to accelerate the elimination of xenobiotics.

The most important stage in the rehabilitation of the health of the rural population is bioprophylaxis aimed at enhancing the elimination of toxic substances, reducing their harmful effects, and at increasing the body's defenses.

The correct organization of food all year round is of particular importance. Food with enhanced environmental protection properties has three functions:
- correction of defects in habitual nutrition (deficiency of protein and polyunsaturated fatty acids, excess of animal fats, simple and complex carbohydrates, as well as deficiencies of dietary fiber, vitamins and some minerals);
- protection from ecotoxicants;
- cleansing the body from xenobiotics.

Conclusion

Despite the accumulated experience of clinical examination and prophylaxis in rural medicine, there is still a need in further scientific studies of rural health management in regions with different geographical, social and economic conditions. The model of the management of the health of the rural population of Kazakhstan described in the article needs more attention and wider discussion and consideration by policy decision makers.

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ҚАЗАҚСТАН АУЫЛ ТҰРҒЫНДАРЫНЫҢ ДЕНСАУЛЫҒЫН БАСҚАРУ ЖӘНЕ ТӘУЕКЕЛДЕРДІ БАҒАЛАУ

Түйін: *Ауыл денсаулығын қорғау және нығайту мәселесі Қазақстан Республикасының әлеуметтік-экономикалық саясатында басым мәселе болып қала береді. Ауылдық жерлерде салыстырмалы түрде жоғары сырқаттанушылық немесе аурулардың таралуы ғана емес, сондай-ақ медициналық қызметкерлермен жасақталудың төмендігі де байқалады. Зерттеулер көрсеткендей, ауыл халқы денсаулығының төмен деңгейі жағдайында қолданыстағы ауылдық денсаулық сақтау тиімсіз болып шықты және түбегейлі құрылымдық пен функционалдық қайта құруды талап етеді.*

Осы жұмыстың мақсаты Оңтүстік Қазақстан облысындағы ауыл тұрғындарының денсаулығын үш жылдық зерттеу нәтижесінде алынған ұсынымдардың бірі ретінде ұсынылған Қазақстанның ауыл халқының денсаулығы үшін тәуекелдерді бағалау және басқару моделін ұсыну болып табылады.

Түйінді сөздер: *ауыл денсаулығы, медициналық-профилактикалық көмек, экологиялық аурулар, тәуекелдерді бағалау және басқару*

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ОЦЕНКА РИСКОВ И УПРАВЛЕНИЕ ЗДОРОВЬЕМ СЕЛЬСКОГО НАСЕЛЕНИЯ КАЗАХСТАНА

Түйін: *Вопрос защиты и укрепления здоровья села остается приоритетным в социально-экономической политике Республики Казахстан. В сельской местности наблюдается не только относительно высокая заболеваемость или распространенность заболеваний, но и низкая укомплектованность медицинским персоналом. Исследования показали, что в условиях низкого уровня здоровья сельского населения существующее сельское здравоохранение оказалось малоэффективным и требует радикальной структурной и функциональной перестройки.*

Целью данной работы является представление модели оценки и управления рисками для здоровья сельского населения Казахстана, предложенной в качестве одной из рекомендаций, полученных в результате трехлетнего исследования здоровья сельских жителей в Южно-Казахстанской области.

Ключевые слова*: здоровье сельского здоровья, медико-профилактическая помощь, экологические заболевания, оценка и управление рисками*