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THE MAIN HEALTHCARE PROBLEMS OF THE REPUBLIC OF KAZAKHSTAN

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Abstract

This article examines key issues facing the healthcare system in the Republic of Kazakhstan, including access to medical care, staffing, digitalization, the development of high-tech medicine, and maternal and child health. Particular attention is paid to the impact of noncommunicable diseases and lifestyle factors on population health. Based on statistical data analysis, systemic limitations are identified and areas for improving public healthcare policy are proposed.

Keywords: *healthcare in the Republic of Kazakhstan, primary health care, digitalization, medical workforce, reproductive health, noncommunicable diseases, telemedicine*

Introduction

The healthcare system of the Republic of Kazakhstan is undergoing active modernization, aimed at improving the accessibility and quality of medical services. State policy in this area is aimed at ensuring sustainable development, improving public health indicators, and increasing life expectancy.

Relevance of the Study

The relevance of the study stems from the need for a comprehensive analysis of healthcare issues in the context of demographic growth, increasing burden on the healthcare system, and the spread of noncommunicable diseases. The COVID-19 pandemic has exposed the system's vulnerabilities, including insufficient digitalization, staff shortages, and infrastructural limitations, particularly in rural areas.

Purpose of the Study

The purpose of the study is to identify key issues in the healthcare system of the Republic of Kazakhstan and analyze areas for improvement at the current stage.

Research Materials and Methods

The study utilized methods of analyzing regulatory documents, statistical data from the Ministry of Health of the Republic of Kazakhstan and the World Health Organization, as well as comparative and systemic analysis. The empirical base was formed by

official reports, government programs, and scientific publications.

Kazakhstan is a WHO member country, associated with the development of primary health care worldwide. In 2018, the WHO Global Conference on Primary Health Care was held in Astana, marking the 40th anniversary of the 1978 WHO Declaration of Alma-Ata, which adopted the Astana Declaration on Primary Health Care, which will serve as the basis for the development of primary health care worldwide in the 21st century.

Overall, the fight against the coronavirus pandemic has required the diversion of significant human and material resources from routine medical services and has emphasized **the need to transition to remote medical services, especially in remote areas.** Thus, in order to provide timely medical care to patients with COVID-19 at the primary health care level, 3,054 mobile teams (providing 2.9 million services) were organized in all primary health care organizations in 2021 to monitor patients with COVID-19, including patients with risk factors (hypertension, diabetes, coronary heart disease, COPD, asthma, and others) and pneumonia.

In this regard, **remote medical services** are being actively implemented in the country to improve access to medical care. Legislative regulation of the use of remote medical services has been completed. However, the lack of medical facilities and underdeveloped infrastructure at the district healthcare center level, as well as the use of outdated computer equipment in remote rural healthcare facilities, limit internet access and the possibility of using remote medical services.

Thus, the main problems in providing primary health care are:

- Insufficient access to and quality of medical care and service, especially in remote communities, due to understaffing, an insufficient number of primary health care facilities, including deteriorating buildings, and insufficient medical equipment;
- Low internet access in remote rural areas and a lack of modern computer equipment;
- Heavy workload on the GP (General Practitioner) site;
- Demand for healthcare workers (GPs, nurses, and healthcare psychologists);
- Poor digitalization of primary health care and limited internet access in rural facilities; and an insufficient range of remote medical services.

Kazakhstan is among the top 30 countries in terms of cardiac surgery development. Our country ensures access to 80 types of high-tech medical care (HTMC). In 2021, more than 18,000 HTMC services were provided.

Regional offices are functioning for patients with chronic heart failure, 453 beds have been created, and a registry for patients with chronic heart failure (CHF) is being implemented. Despite significant progress in medical and surgical treatment, the prognosis for patients with CHF remains unfavorable. The primary treatment for patients with terminal heart failure is heart transplantation.

However, the number of necessary donor organs is critically short, even in countries with high transplant activity. The main alternative to transplantation may be the use of ventricular assist devices (LVADs). Since the launch of the LVAD clinical program, approximately 500 mechanical cardiac support devices have been implanted in the country. The high survival rate of patients after LVAD implantation and heart transplantation in Kazakhstan is comparable to data in the United States and Europe (Healthy Nation: 2026).

An achievement of domestic cardiac surgery is the transplantation of a donor heart to a patient with CHF (chronic heart failure), first performed in 2012 at the National Scientific Cardiac Surgery Center. Since then, 86 heart transplants have been performed.

In 2016, the first unique lung transplant was successfully performed. Lung transplantation is currently the only curative treatment for certain chronic lung diseases. As of 2021, 16 lung transplants have been performed.

The global burden of chronic kidney disease (CKD) is rapidly increasing. By 2040, CKD is projected to be the fifth most common cause of reduced life

expectancy worldwide. Furthermore, CKD causes catastrophic healthcare costs; dialysis **and transplantation costs account for 2–3% of the annual healthcare budget.**

Renal replacement therapy, as an outcome of CKD, is a complex, lifelong medical and social service that helps reduce mortality and maintain a socially adapted life expectancy.

In the Republic of Kazakhstan, there are over 8,000 patients on hemodialysis, including 2,500 kidney transplant recipients. This necessitates the creation of a registry for the timely detection of CKD, the development of programs to monitor the rate of progression of renal failure, the planning of medication management, the implementation of quality indicators for assessing dialysis procedures, the adequacy and appropriateness of treatment for CKD complications, the planned preparation and selection of hemodialysis/peritoneal dialysis modalities, and the monitoring of kidney graft survival.

Due to the stagnation of transplant services in 2018–2019 and the COVID-19 pandemic in 2020–2021, a significant decline in transplants has been observed. The main reason for this decline is the shortage of donor organs, which is associated with a decline in the number of identified deceased donors. As demonstrated by the experience of countries leading organ donation, the driving force behind deceased donation is a well-developed network of professionally trained transplant coordinators (in Spain, there are 13 transplant coordinators and 48 effective deceased donors per million people). In 2021, there were 3,374 patients (including 97 children) on the organ transplant registry (waiting list), including 3,045 kidney transplant recipients (including 80 children), 161 liver transplant recipients (including 9 children), 150 heart transplant recipients (including 6 children), and 18 lung and cardiopulmonary complex transplant recipients (including 2 children).

The National Neurosurgery Center is a leader in Central Asia for the treatment of neurosurgical diseases. More than 70 new technologies, previously unused in Central Asia, have been pioneered in Kazakhstan, as well as fundamentally new areas of neurosurgery, including microneurosurgery, endovascular, endoscopic, and functional neurosurgery.

Neurosurgeons in Kazakhstan were among the first in the CIS to introduce and perform unique surgeries for pregnant women with pathologies of the brain and spinal cord. We perform spinal cord neurostimulation, stereotactic brain biopsy, surgery for Parkinson's disease, endovascular treatment of aneurysms and arteriovenous malformations, endoscopic treatments for neurosurgical pathologies, microsurgery using a neuronavigation system and fluorescence navigation, brain surgery with preserved consciousness, and modern surgical methods for the treatment of epilepsy, among other things.

In 2021, we launched a state-of-the-art stereotactic radiosurgery system – the Gamma Knife, the only one in Central Asia. The Gamma Knife radiosurgical system is used for the safe, non-invasive treatment of tumors, vascular, and functional diseases of the brain and is the "gold standard" of radiosurgical treatment. More than 400 Gamma Knife surgeries have been performed.

By the end of 2021, the number of people with drug dependence undergoing dynamic monitoring was 18,692, of which 7,062 were opioid dependent, representing 37.7%. Opioid agonist maintenance therapy (OAT) is being implemented in the Republic of Kazakhstan. Its main goals are to reduce or stop non-medical opioid use and the associated risks. This program is supported by the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and more than one-third of participants have successfully completed it.

Consistent efforts are being made to prevent the spread of the HIV epidemic, which is at a concentrated stage (0.2%). An average of 3.5 million tests are conducted annually within the framework of the guaranteed volume of free medical care, or approximately 16% of the population is screened. The service has an approved three-component comprehensive tariff, which includes recommendations for clinical protocols. Further work is required to allocate budgetary funds to implement all recommendations for the management of patients from the group of

people living with HIV infection, key populations, and population testing for HIV.

The main problems in providing specialized medical care are:

- weak transfer of innovative technologies and high-tech medical services in the regions;
- high incidence of tuberculosis compared to OECD countries;
- poor development of the network of transplant coordinators and the necessary equipment for determining brain death, as well as donor organizations;
- shortage of donor organs;
- poor development of regional mental health centers and medical and social rehabilitation units;
- unsatisfactory material and technical infrastructure, including insufficient equipment at national and regional mental health centers and pathology services;
- poor development of intensive pulmonology and pulmonary rehabilitation, fragmentation of various types of treatment and diagnostic care for patients with respiratory diseases;
- poor quality of laboratory services, shortage of laboratory equipment;
- insufficient coverage and provision of medical rehabilitation care for adults who have recovered from COVID-19;
- a shortage of qualified personnel for multidisciplinary medical rehabilitation teams;
- a lack of a methodological framework for providing rehabilitation care.

The main problems in maternal and child health are:

- insufficient integration of primary health care, maternity hospitals, and specialized hospitals;
- the influence of behavioral and external factors on the reproductive health of the population;
- the poor material and technical condition of maternity facilities, their failure to meet modern requirements, insufficient medical equipment, and understaffing, including with specialized specialists (obstetricians-gynecologists, anesthesiologists-resuscitators, neonatologists) in maternity care organizations;
- lack of a standard for school medicine;
- an increase in disability among the child population;
- insufficient coverage of restorative treatment and medical rehabilitation for children in the regions.

The main problems in ensuring the sanitary and epidemiological well-being of the population are:

- lack of a system for forecasting and preventing biological threats;
- insufficient effectiveness of control and surveillance functions with an underdeveloped system for epidemiological assessment and forecasting potential threats and risks;
- insufficient biosafety of the SES laboratory for conducting modern, high-precision, and rapid research;
- poor material and technical equipment and maintenance of the SES infrastructure;
- lack of a sustainable human resources policy and a high-quality system for training professional personnel (sanitary doctors, epidemiologists, and laboratory workers);
- a weak system for implementing the results of scientific research on the impact of environmental factors on public health in practical healthcare;
- inadequate supervision and control over compliance with state regulatory requirements for industrial hygiene;
- weak digitalization and automation of SES activities.

The main problems in providing healthcare personnel are:

- imbalance of personnel in the healthcare system;
- professional vulnerability of healthcare workers;
- Low motivation of medical personnel, insufficient social support coverage at the local level;
- Insufficient quality of medical personnel training;
- Overburdened primary care physicians due to insufficient involvement of mid-level medical workers in the

provision of preventive, therapeutic, and diagnostic care;
- Migration of human resources.

The main problems of medical science and research are:
- Insufficient development of the biomedical research market;
- The country's unattractiveness for international clinical trials with the participation of foreign sponsors;
- Low level of use of a personalized approach in the diagnosis and treatment of diseases;
- Low commercialization of scientific research results;
- Insufficient funding for medical science.

The main problems of infrastructure development and digitalization of the healthcare system are:
- Deterioration of medical facility buildings;
- Insufficient availability of digital services in medical facilities in remote rural areas;
- Lack of a single industry operator in the field of e-health;
- More than 47 disparate information systems (monolithic, outdated information system architecture).

National Project "High-Quality and Affordable Healthcare for Every Citizen: Healthy Nation" 10/12/2021

The national project consists of four areas and includes nine objectives, 21 indicators, and 72 activities. The funding for the national project is approximately 3.6 trillion tenge.

The national project consists of four areas:
- The first area is focused on improving the accessibility and quality of medical care;
- The second area is designed to create a modern system of epidemiological forecasting and response;
- The third area will facilitate the development of the domestic pharmaceutical industry;
- The fourth area is aimed at increasing the proportion of the population leading a healthy lifestyle and developing mass sports.

National Project "High-Quality and Affordable Healthcare for Every Citizen: Healthy Nation"

Objectives, performance indicators, and implementation activities are outlined for each area.

"Implementation of the first area of the National Project will increase public satisfaction with the quality of medical services to 80%, including in rural areas". "The support and satellite villages will be 100% provided with primary health care, primary healthcare, and consultative and diagnostic services," said A. Tsoi.

Furthermore, there are plans to build and modernize at least 40 healthcare facilities and two research centers, expand outpatient medical care, and provide pregnant women with individual and multidisciplinary prenatal care and children under one year with proactive monitoring and screening. Eight additional children's rehabilitation centers and two early intervention centers will also be opened, tripling the coverage of medical rehabilitation for children with disabilities. To address the physician shortage, the number of educational grants for residency programs in critically needed specialties will be increased to 3,800.

As part of the second area, the Ministry plans to implement scientifically based systems for forecasting and responding to national and global risks, and increase the share of sanitary and epidemiological testing laboratories that meet international biosafety and conformity assessment standards from 61% to 90% (On approval of the Concept for the Development. 2026).

The measures taken in the third area will increase the share of accredited laboratories/centers for compliance with international standards; launch at least 30 new pharmaceutical and medical device manufacturing facilities; and bring the national regulator to WHO benchmarking maturity level 3. Increase the share of domestically produced medicines and medical devices in the local pharmaceutical market to 50%; and increase the share of locally sourced medicines and medical devices purchased through the unified distribution system within the framework of the guaranteed volume of medical care and the compulsory health insurance system to

50%. "Implementation of the fourth area will reduce the prevalence of tobacco smoking among the population to 19%, increase the proportion of citizens leading a healthy lifestyle to 45%, increase the number of citizens involved in physical education and sports to 50%, increase the provision of sports infrastructure per 1,000 people to 53%, and increase the proportion of the population with special needs regularly involved in physical education and sports to 14%," the Minister stated.

As a result of the national project, life expectancy in Kazakhstan is expected to increase to 75 years, and public satisfaction with the quality of medical services is planned to increase to 80%. In terms of economic development, private investment in healthcare is planned to increase to 783 billion tenge, creating approximately 13,000 new jobs, and increasing the share of domestic pharmaceuticals to 50%.

Kazakhstan is among the top 10 countries in the world with the most unhealthy diets

The government of Kazakhstan is currently considering changes to taxes on unhealthy foods, including possible taxes on sugar-sweetened beverages.

Kazakhstan is among the top 10 countries in the world with the most unhealthy diets. According to the latest data from the Ministry of Health of the Republic of Kazakhstan, more than 9 million Kazakhstanis regularly consume energy drinks. And 16.3% of boys and 17% of girls aged 6–9 consume sugar-sweetened beverages daily.

Half of children-52%—drink sugar-sweetened beverages from 1 to 5–6 times a week (On approval of the Concept for the Development. 2026).

Also, according to the Ministry of Health, 14% of Kazakhstani teenagers drink Coca-Cola daily. These beverages are known to be one of the main sources of sugar consumption, yet they provide no additional nutritional value. Excessive consumption of sugar-sweetened beverages, salt, and foods high in trans fats is associated with an increased risk of hypertension, coronary heart disease, obesity, and type 2 diabetes.

Sugar Content in the Most Popular Foods

The World Health Organization provides data on the sugar content of the most popular foods we consume every day. For example, a ready-to-eat cereal contains approximately 4 tablespoons of sugar, while a milk drink contains 7. Furthermore, one sugar-sweetened beverage contains more than 20 teaspoons of sugar.

The Ministry of Health reports that the incidence of type 2 diabetes in Kazakhstan has quadrupled in recent years, and the number of children under 15 with diabetes increased by 66% from 2015 to 2022. Approximately 16,000 limb amputations are performed annually due to complications from this disease. Furthermore, the number of patients on dialysis reached 16,000 in 2023. In total, 400,000 people with diabetes are registered in our country.

Some more figures: 21% of children aged 6–9 are overweight, and 6% are obese. As for adults, according to WHO research, the average prevalence of obesity in Kazakhstan in 2016 was 18.9% for men and 22.7% for women. In both cases, the incidence of obesity is steadily increasing.

A healthy plate consists of 1/4 protein, 1/4 healthy fats (high-quality oils in dark glass bottles), and the remaining 1/2 plate of complex carbohydrates (vegetables, grains). Maintaining this balance will prevent a healthy person from craving sweets. By distributing the micronutrient load in this way, the need for constant refills is reduced. Sweet cravings can have many causes, for example, a deficiency in micronutrients such as magnesium, zinc, chromium, and iron. As a rule, closing the deficiencies of these vitamins leads to a decrease in strong cravings for sweets (How Kazakhstan is moving toward sugar freedom).

According to the WHO, taxes on sugar-sweetened beverages should be at least 20%.

The Ministry of Health, as a government executive body, expects an increased burden on public health, as the country's population is projected to grow by 13% by 2030. This means that the increased incidence of diseases will lead to significant costs for the healthcare system.

Non-communicable diseases account for approximately 84% of all deaths in our country.

Diabetes is among the top ten most costly diseases according to the Ministry of Health for 2023.

Losses to the economy associated with decreased labor productivity exceed government healthcare expenditures by 6.5 times, amounting to 2 trillion tenge per year. Overall, the current damage caused by non-communicable diseases to the Kazakh economy amounts to 2.3 trillion tenge per year, equivalent to 4.5% of the country's annual GDP.

Taxes on sugar-sweetened beverages (SSBs) are considered a cost-effective policy measure to limit excessive calorie consumption. For governments, this can yield a triple benefit: improved public health, increased government revenue, and reduced long-term healthcare costs.

In 2016, the WHO specifically identified SSN taxation as a priority policy measure to combat noncommunicable diseases and eliminate childhood obesity. Fiscal policy measures are recommended as important components of a comprehensive approach to improving public health. Currently, 115 countries already implement SSN taxes (import duties, excise duties, and ad valorem taxes), including the world's wealthiest countries – the UAE, Saudi Arabia, Qatar, Oman – and European countries. At least 148 countries have also introduced excise taxes on alcoholic beverages at the national level.

As the WHO notes, introducing high taxes on alcohol and sugar-sweetened products also encourages companies to shift to producing healthier products. A recent Gallup poll, conducted in collaboration with the WHO and Bloomberg Philanthropies, found that a majority of respondents in all countries support raising taxes on unhealthy products such as alcohol and sugary drinks.

Global Energy Drink Consumption

Experts attribute the growing popularity of energy drinks to the modern pace of life and the intense competition in some countries. This requires people to be active 24/7. This is obviously physically impossible. Even during the day, a person's body is physiologically unable to work at the same pace nonstop. Energy drink manufacturers and marketers exploit this, successfully selling a "25th" hour of the day to people who strive to "get it all done."

While energy drinks were previously consumed primarily by athletes, night shift workers, gym-goers, and truck drivers to prolong their activity at the right time, now, according to a study in the International Journal of Health Sciences, young people have become the main consumers of energy drinks (5). Moreover, according to expert observations, teenagers most often try them out of curiosity or to become part of a certain group of teenagers who already consume energy drinks. Teenagers often consume adult beverages out of a desire to appear "grown-up." Many of them neglect sleep, relying on a can of "liquid batteries" that promises to energize and even improve their health, as many cans list added vitamins among the ingredients. People describe the effect of the "energy drink" as suppressing sleep, increasing concentration, and reaction time – in other words, enhancing mental and physical activity. Gradually, a person becomes dependent on this quick recharge. Over-the-counter distribution in various countries also contributes to sales growth.

The composition of modern energy drinks has changed significantly compared to their early versions. Today, energy drinks are classified as non-alcoholic (or low-alcohol) beverages. Most of them have identical compositions: caffeine, taurine, ginseng, guaranine, L-carnitine, and some contain B vitamins, ascorbic acid, melatonin, glucose, fructose, and sucrose. Caffeine, taurine, ginseng, and guaranine are plant-based psychoactive stimulants.

The harmful effects of energy drinks have been confirmed by research from the World Health Organization (WHO)

Experts are paying particular attention to energy drink consumption among minors. For adolescents aged 12 to 18, the maximum daily caffeine intake is 100 mg.

Incidentally, caffeine is also found in other products that some families consume daily, such as tea, chocolate, and cocoa. Therefore, the actual daily caffeine intake from energy drinks can be even higher.

In addition to its effects on the nervous system, caffeine depletes iron, zinc, potassium, B vitamins, and calcium from the body. This can lead to growth retardation and skeletal deterioration in adolescents. Scientists have also concluded that energy drink consumption causes serious damage to tooth enamel after just five days of daily consumption. The main purpose of energy drinks is to stimulate the nervous system, and since children's nervous systems are still developing, this can cause irreparable harm to a growing body.

Experts claim that energy drinks are addictive, both physiologically (caffeine tolerance) and psychologically (from the almost instantaneous boost of energy (the gases contained in the drink accelerate peristalsis and absorption of substances).

In Kazakhstan, a ban on the sale of energy drinks has been in effect since 2013 in educational and training facilities, preschools, orphanages, and children's health and sanatorium facilities. According to the decision of the Customs Union Commission dated December 9, 2011, "On the adoption of the technical regulations of the Customs Union 'On food safety,'" the maximum permissible caffeine level in beverages is no more than 150 mg/liter. Accordingly, each can of soft drink containing caffeine in excess of 150 mg/liter must be labeled with the warning: "Not recommended for children under 18 years of age, pregnant or breastfeeding women, or individuals with increased nervous excitability, insomnia, or hypertension."

Nevertheless, energy drink consumption is growing among Kazakhstani teenagers. According to an analysis by the Ministry of Health, published in the "Open Regulatory Acts" section of the e-government website Egov, approximately 45% of teenagers in our country aged 11 to 15 have tried energy drinks. Many of them subsequently developed an addiction. Currently, almost 12% of schoolchildren drink energy drinks daily or several times a week, and the proportion of such drinkers is increasing every year.

Reproductive health refers to both the health of the reproductive system and the complete physical and social well-being of expectant parents. Reproductive rights are human rights related to the reproduction of one's own kind (reproduction). According to the Beijing Platform for Action (1995) and the UN Convention on the Elimination of All Forms of Discrimination against Women (Article 16), reproductive rights are based on "the recognition of the fundamental right of all married couples (World Health Organization. Reproductive health. 2026).

Within the framework of the UN Sustainable Development Goals global agenda, Goal 3 aims to ensure universal access to sexual and reproductive health services by 2030, including family planning services, information, education, and the integration of reproductive health issues into national strategies and programs.

The reproductive rights of citizens of the Republic of Kazakhstan are regulated by the following regulatory documents:

1. The Constitution of the Republic of Kazakhstan;
2. The Code of the Republic of Kazakhstan "On Public Health and the Healthcare System" dated July 7, 2020, No. 360-VI ZRK.

In Kazakhstan, the incidence of genitourinary diseases affecting reproductive health in individuals aged 18 and older in 2021 was higher among women (878,524 cases) than among men (274,044 cases). The difference amounts to 604,480 cases. Furthermore, genitourinary diseases such as kidney and ureteral stones are almost equally common in both women (12,495 cases) and men (10,819 cases). The number of cases of renal tubulointerstitial disease recorded in both women (226,484 cases) and men (97,284 cases) is alarming. Also noteworthy is the high number of cases of cervical erosion and ectropion in women (60,640 cases).

Male infertility cases were registered in 1,372 patients in 2020, and in 1,515 men in 2021. Female infertility cases were registered in 16,187 patients in 2020, and in 19,880 women in 2021. We are seeing an increase in the registration of both female and male infertility cases in the republic.

Registration of both female and male infertility cases

Table 1. *Incidence of diseases of the genitourinary system affecting reproductive health in individuals at risk grow up to 18 years and older in 2021*

Name of classes and individual diseases	Number of registered diseases in the reporting year		of which with a diagnosis established for the first time in life	
	men	women	men	women
Diseases of the genitourinary system, total	274 044	878 524	121 126	402 228
of these:				
glomerular diseases	2 027	2 215	350	429
renal failure	8 366	8 088	1 758	1 570
renal tubulointerstitial diseases	97 284	226 484	34 292	74 367
of these				
kidney and ureter stones	10 819	12 495	4 761	5 220
prostate disease	53 062	–	20 008	–
male infertility	1 515	–	814	–
salpingitis, oophoritis	–	46 124	–	25 028
erosion and ectrodion of the cervix	–	60 640	–	24 766
menstrual-ovarian cycle disorder	–	18 402	–	12 422
menopausal and postmenopausal disorders	–	14 709	–	6 829
female infertility	–	19 880	–	7 162

Anemia incidence data in the republic demonstrate positive trends, with the number of patients with anemia decreasing each year. In 2016, 1,888.8 cases of anemia were recorded, while in 2021, the rate was 1,016 per 100,000 population.

Regionally, anemia incidence is most common in Kyzylorda Region (2,663.1), Almaty Region (1,884.2), West Kazakhstan Region (1,714.9), Shymkent City (1,662.1), and Aktobe Region (1,335.9). It is worth noting that these regions also have high birth rates. This requires additional funding for anemia prevention and treatment. The lowest incidence of anemia is in the Karaganda region (273.1), Astana (470.3), and Pavlodar region (481.2).

Data on the incidence of anemia in the republic

Table 2. *Anemia incidence by region, number of cases per 100,000 population*

	2016	2017	2018	2019	2020	2021
Republic of Kazakhstan	1 888.8	1 875.8	1 680.4	1 555.2	1 272.7	1 016.0
Akmola region	921.3	8777	835.5	736.7	574.9	623.8
Aktobe region	2 518.9	2 166.0	1 630.4	1 506.2	1 418.9	1 335.9
Almaty region	2 221.9	2 241.1	2 045.8	2 077.5	2 054.5	1 884.2
Atyrau region	2 266.4	2 245.0	2 231.7	1 595.1	1 548.4	1 603.1
3KO	1 692.2	1 704.0	1 844.1	1 775.6	1 719.4	1 714.9
Zhambyl region	2 085.3	2 363.7	1 975.1	1 988.2	1 988.6	927.3
Karaganda region	669.8	637.1	595.0	477.2	390.9	273.1
Kostanay region	569.3	509.2	417.4	385.4	377.6	388.2

	2016	2017	2018	2019	2020	2021
Kyzylorda region	3 756.1	2 485.0	3 700.3	3 493.3	2 846.3	2 663.1
Mangystau region	2 676.7	2 688.5	2 644.1	2 443.4	1 737.5	1 115.8
South Kazakhstan region	3 551.3	3 475.5	–	–	–	–
Pavlodar region	730.0	749.6	722.2	607.3	473.3	481.2
CKO	709.2	661.9	700.9	694.8	689.4	622.3
Turkestan region	–	–	2 855.3	2 518.0	1 431.8	648.4
BKO	1 078.1	1 073.6	969.2	903.9	780.1	726.7
Astana	753.3	802.4	846.2	818.9	600.5	470.3
Almaty	1 363.6	1 357.1	1 158.0	1 004.2	731.4	660.1
Shymkent	–	–	2 970.7	2 793.2	2 191.9	1 662.1

An analysis of gender data on the incidence of iodine deficiency diseases in the republic reveals a decrease in the number of these diseases year after year (in 2018, there were 215 cases among women and 73.9 cases among men; in 2019, there were 197.7 cases among women and 67.4 cases among men; in 2020, there were 154.9 cases among women and 55.4 cases among men; and in 2021, there were 149.2 cases among women and 55.3 cases among men). However, the number of women diagnosed with iodine deficiency is three times higher than that of men. Data on patients diagnosed with iodine deficiency by urban/rural breakdown show that urban women are also 2.7 times more likely to be diagnosed with iodine deficiency than urban men, while rural women are diagnosed with iodine deficiency three times more often than rural men. We see a clear gender disproportion in the number of people suffering from iodine deficiency and the level of diagnosis of the disease.

The incidence of diseases associated with iodine deficiency in the republic

Table 3. *Incidence of diseases associated with iodine deficiency, nuber of newly diagnosed cases per 100,000 population, people*

	Total		Including			
			in urban settlements		in rural areas	
	women	men	women	men	women	men
2016	126.9	29.4	165.7	39.6	71.9	16.7
2017*	239.3	76.9	284.4	98.8	175.0	49.1
2018	215.0	73.9	257.7	92.3	152.4	50.0
2019	197.7	67.4	263.4	88.2	127.5	41.7
2020	154.9	55.4	196.7	75.2	91.2	28.9
2021	149.2	55.3	181.6	76.4	99.1	26.6

** Until 2017, data only on hypothyroidism was included, but since 2017, all diseases associated with iodine deficience have been added as a separate line to Form No. 12*

Analyzing the data on the incidence of diseases associated with iodine deficiency by region, we see that the “anti-leaders” in 2021 are Shymkent (271.7), Almaty (202.5), Zhambyl region (195.9), Kyzylorda region (113.9), and Astana (110.6). Patients are least likely to be diagnosed with iodine deficiency in such regions as West Kazakhstan region (7.4), Karaganda region (22.9), North Kazakhstan region (27.0), and Kostanay region (40.6) (Table 4).

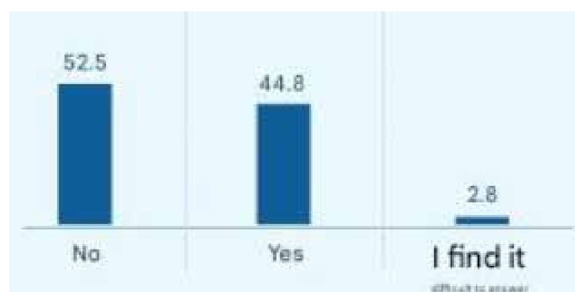
Incidence of diseases associated with iodine deficiency by region

Table 4. *Incidence of diseases associated with iodine deficiency, nuber of cases per 100,000 population, people*

	2016	2017*	2018	2019	2020	2021
Republic of Kazakhstan	79.7	160.7	145.7	130.6	106.6	103.6
Akmola region	49.6	44.1	44.5	55.0	47.1	80.3
Aktobe region	17.5	109.0	93.0	69.3	65.0	58.0
Almaty region	42.0	119.7	105.6	108.9	69.0	82.2
Atyrau region	70.4	96.6	101.9	72.4	66.2	61.0
3KO	73.1	13.8	11.0	9.9	7.6	7.4
Zhambyl region	50.2	323.7	303.5	244.5	177.5	195.9
Karaganda region	101.2	16.1	19.2	23.5	22.9	46.6
Kostanay region	48.7	35.1	32.2	30.4	42.6	40.6
Kyzylorda region	60.5	152.4	185.7	218.3	155.7	113.9
Mangystau region	103.8	23.0	129.0	104.7	63.5	64.2
South Kazakhstan region	71.8	298.2	–	–	–	–
Pavlodar region	61.6	147.8	137.7	123.5	95.5	74.8
CKO	158.9	26.2	20.4	16.9	23.8	27.0
Turkestan region	–	–	130.6	97.6	63.0	65.5
BKO	74.5	161.8	202.5	143.7	121.2	98.9
Astana	225.0	100.7	113.8	129.8	169.5	110.6
Almaty	110.8	337.7	249.7	219.5	177.1	202.5
Shymkent	–	–	405.6	397.0	337.2	271.7

** Until 2017, data only on hypothyroidism was included, but since 2017, all diseases associated with iodine deficiency have been added as a separate line to Form No. 12.*

Figure 1. *Have you used any reproductive health services, (examination by doctors, screenings, etc.) in the last 5 years?(%)*



Source: Sociological research by KIOR

Kazakhstanis rate reproductive health services at 3.7 on a 5-point scale. On this scale, 1 indicates low satisfaction, 5 indicates high satisfaction (Code of the Republic of Kazakhstan. 2011).

Figure 2. *Have you used any reproductive health services, (examination by doctors, screenings, etc.) in the last 5 years?(%) (distribution by gender, %)*

Source: Sociological research by KIOR

Statistics on the incidence of sexually transmitted diseases (STDs) show a downward trend in both men and women, in both

urban and rural areas. In 2016, 115.2 cases of STDs were recorded among women, while in 2021, the figure was 63.6 per 100,000. Among men, the rate was 88 cases per 100,000 in 2016, while in 2021, the figure was 53. In urban areas, there were 73 cases of STDs in 2016, while in rural areas, the figure was 43.4. In 2021, the data decreased, showing 37.5 cases in the city and 21.1 in the village (Table 5).

Figure 3. *Have you used any reproductive health services, (examination by doctors, screenings, etc.) in the last 5 years?(%) (distribution by type of settlement, %)*

Source: Sociological research by KIOR

Data on the incidence of diseases primarily transmitted sexually

Table 5. *Incidence of sexually transmitted diseases, nuber of cases per 100,000 population, people*

	Total		including			
			in urben settlements		in rural areas	
	women	men	women	men	women	men
2016	115.2	88.1	144.8	158.4	73.3	43.4
2017	99.9	96.4	119.4	136.8	72.1	45.4
2018	84.6	85.0	100.2	119.0	61.8	40.9
2019	67.4	73.4	81.9	106.0	50.7	36.8
2020	51.0	53.2	64.5	76.4	30.5	22.1
2021	63.6	53.0	80.5	76.5	37.5	21.1

Data on the number of people registered with HIV/AIDS in Kazakhstan show a rapid increase. In 2016, there were 16,429 cases, while in 2020, there were 23,760 (an increase of 7,331). This increase was observed among both men – from 9,540 in 2016 to 13,902 in 2020 (an increase of 4,362) – and women, although the increase in incidence was less intense: from 6,889 in 2016 to 9,858 in 2020 (an increase of 2,960). A survey of Kazakhstani respondents' opinions on the effectiveness of public policy in the area of men's health, conducted as part of the National Report "Kazakhstani Families 2022," revealed that 42.5% of respondents (the total number of positive responses) considered public policy in the area of men's health effective, while 25.2% (the total number of negative responses) considered it ineffective. Moreover, positive assessments were more often given by women (43.6%) than by men (41.2%). Those who believe that public policy in the area of reproduction is ineffective were 27.2% of men and 23.4% of women.

Data from the National System of Assistance to Women of the Republic of Kazakhstan on the number of pregnant women infected with HIV show an increase in the incidence: from 724 in 2016 to 834 in 2020. Pregnant women with HIV are most frequently registered in Almaty (126), Karaganda Region (102), Almaty Region (96), East Kazakhstan Region (96), and Kostanay Region (72). The least frequent cases of HIV infection are recorded in Atyrau Region (3), Mangistau Region (7), Kyzylorda Region (10), and Aktobe Region (13).

Low life expectancy among Kazakhstani men-68.8 years, and among women-78 years – creates a gender gap of 8 years.87 The rising number of male mortality rates and the incidence of HIV and AIDS necessitates the development of new values among men regarding their own health, emphasizing individual responsibility for their own health. It is especially important to change gender stereotypes regarding men's health (the norm of physical fitness, which prohibits men from complaining of pain, seeking medical attention promptly, and avoiding risky sports, etc.).

Family planning allows couples to decide when and how many children to have; to have the information and tools to make this choice consciously and using safe methods. What is the difference between birth control and family planning? Birth control is a wide range of methods aimed at preventing pregnancy, including termination. Family planning involves determining the number of children, the timing of their births, the use of methods to prevent unwanted pregnancies, and, conversely, creating conditions for the onset of a desired pregnancy. Unlike birth control techniques, family planning excludes the use of induced abortion.

Data from the BNS ASPR RK show that from 2016 to 2020, the number of women using contraception in Kazakhstan has increased – from 1,621.2 thousand to 1,789.0 thousand. In percentage terms, this increase was from 35.6% in 2016 to 39.4% in 2020. However, in 2021, the number of women using contraceptives decreased to 1,610.9 thousand. The most popular contraceptives are the intrauterine device (IUD) – 689.2 thousand people, and condoms – 490.6 thousand people. At the same time, the pill is the least popular method of contraception (241.1 thousand people in 2021), while injections are used the least (4.3 thousand people in 2021).

The number of women using contraception

Table 6. *Use of contraceptives, thousands of people*

	2016	2017	2018	2019	2020	2021
The number of women using contraception	1 621.2	1 780.2	1 784.0	1 721.9	1 789.0	1 610.9
as a percentage of the number of women of reproductive age	35.6	39.2	39.3	37.9	39.4	35.4
Of these, by type of contraception						
condoms	339.9	403.2	451.7	420.9	4771	490.6
pills	298.3	329.7	321.7	291.5	276.5	241.1
injections	4.4	4.4	4.9	4.4	4.8	4.3
BMC	867.9	871.7	820.8	826.8	869.8	689.2

Regional statistics on contraceptive use show that 35.4% of women of reproductive age in Kazakhstan use contraceptives. Women in the Kyzylorda region (55.6%), Almaty region (52.9%), Astana city (48.3%), and Aktobe region (47.6%) are the most likely to do so.

Regional data on contraceptive use

Table 7. *Contraceptive use as of the end of 2021, people*

	The number of women using contraception		Including types of contraception			
	total	as a percentage of the number of women of reproductive age	condoms	pills	injections	BMC
Republic of Kazakhstan	16 108 56	35.4	490 616	241 067	4 338	689 150
Akmola region	53 724	31.7	21 838	6 384	22	17513
Aktobe region	103 656	47.6	19 100	13 156	100	57 440

	The number of women using contraception		Including types of contraception			
	total	as a percentage of the number of women of reproductive age	condoms	pills	injections	BMC
Almaty region	248 435	52.9	70 969	25 987	1 005	126 552
Atyrau region	18 842	12.3	3 302	2 480	32	10 784
ЗКО	45 378	29.5	11 574	7 673	28	19 777
Zhambyl region	74 757	29.4	10 223	4 651	152	55 002
Karaganda region	104 672	31.8	40 665	21 947	91	30 971
Kostanay region	65 399	31.3	24 476	20 815	4	13212
Kyzylorda region	103 576	55.6	20 843	3 317	452	70 144
Mangystau region	35 305	20.7	3 206	5 196	96	15 802
Pavlodar region	64 882	36.8	24 354	22 148	16	10 937
СКО	32 956	27.4	12 276	8 057	13	12 257
Turkestan region	101 678	22.9	13 612	5 570	915	73 284
ВКО	160 807	51.6	66 608	27 961	242	50 488
Astana	156 592	48.3	71 933	17 350	380	42 035
Almaty	154 001	26.3	57 829	40 543	577	31 874
Shymkent	86 196	31.2	17 808	7 832	213	51 078

Figure 3. *Do you think it is necessary to plan the birth of a child or is it optional ?(%)*

Source: Sociological research by KIOR

An unplanned pregnancy often results in induced termination of pregnancy. Induced termination of pregnancy is the termination of a pregnancy up to 22 weeks (essentially, up to the time the fetus must remain in the womb to survive). If pregnancy and childbirth pose a risk to the woman's life or fetal malformations incompatible with life are detected, doctors may recommend induced termination of pregnancy. In the Republic of Kazakhstan, induced termination of pregnancy is performed 1) at the woman's request up to 20 days into pregnancy and if her period is late, and up to 12 weeks into pregnancy; 2) for medical reasons for both the mother and the fetus, regardless of the gestational age, according to approved indications; 3) for social reasons between 13 and 22 weeks, according to approved indications.

Statistics on the number of induced terminations of pregnancy in Kazakhstan show that from 2016 to 2021, their number decreased from 78,900 to 71,800. The leading regions in terms of reducing the number of induced abortions include the cities of Astana (from 7.4 thousand in 2016 to 5.8 thousand in 2021), Almaty (from 8.3 thousand in 2016 to 6.9 thousand in 2021), and Kostanay region (from 5.3 thousand in 2016 to 3.3 thousand in 2021). The regions with the worst increases in abortion rates are Almaty Oblast (from 5,700 in 2016 to 6,700 in 2021), Aktobe Oblast (from 2,400 in 2016 to 2,800 in 2021), and Akmola Oblast (from 2,300 in 2016 to 2,800 in 2020).

In 2021, 428 cases of induced abortions among minors were registered, including 15 cases among adolescents under 14. The highest number of cases of induced abortions among minors were recorded in the Turkestan, Karaganda, Almaty, East Kazakhstan, and Mangystau regions.

Artificial termination of pregnancy among minors

Table 8. *Artificial termination of pregnancy by region, broken down by age grous*

Region	2021				6 months of 2022			
	of which by age				of which by age			
	up to 14 years incl.	15 17 years (ON)	18 years and older - we	Total	up to and including 14 years old	15-17	18 years and older we	Total
Akmola region	2	19	2763	2784	0	13	922	935
Aktobe region	1	10	2804	2815	0	5	1254	1259
Almaty region	2	38	6656	6696	0	15	3205	3220
Atyrau region	0	18	1951	1969	0	10	876	886
BKO	4	32	6400	6436	1	19	1981	2001
Zhambyl region	1	30	4482	4513	0	11	1097	1108
3KO	1	11	3441	3453	0	4	610	614
Karaganda region	1	45	6363	6409	0	19	1833	1852
Kostanay region	1	31	3321	3353	0	7	936	943
Kyzylorda region	0	7	2557	2564	0	0	1113	1113
Mangystau region	0	35	3316	3351	0	18	1056	1074
Pavlodar region	1	27	3255	3283	0	7	1229	1236
CKO	0	12	2542	2554	0	1	799	800
Turkestan region	0	47	6480	6527	0	26	3207	3233
Astana	0	25	5846	5871	1	6	1374	1381
Almaty	1	17	6961	6979	0	12	2848	2860
Shymkent	0	9	2281	2290	0	7	1237	1244
Totat	15	413	71419	71847	2	180	25577	25759

Maternal Mortality

The concept of safe motherhood was formulated in the 1980s by the World Health Organization as a set of socioeconomic, legal, and medical measures that promote the birth of desired children at optimal ages without negatively impacting women's health, preserving their lives, preventing disability, ensuring the upbringing of children, and balancing motherhood, household responsibilities, and work. Due to the high risk, pregnancy is contraindicated for women with a number of medical conditions, including active tuberculosis, malignant tumors, severe cardiovascular disease, liver and kidney disease, blood disorders, and other ailments. Some maternal illnesses adversely affect the fetus in utero, causing malformations, developmental delays, and death.

Factors affecting safe motherhood:

- Age (the optimal age for a woman to conceive is between 20 and 35 years. After 35, women's reproductive function declines and the risk of having a child with a genetic disorder increases);
- Weight (low weight or, conversely, obesity can lead to hormonal changes in a woman's body and interfere with ovulation);
- Extragenital diseases (diabetes mellitus, diseases of other endocrine glands, kidney disease, liver disease, bronchial asthma, epilepsy) in men cause inflammation of the prostate, seminal vesicles, testicle and its epididymis, which leads to the inability to produce sperm and/or release them;

in women, inflammation of the ovaries, uterus and fallopian tubes, which prevents the maturation, movement and implantation of the fertilized egg; some STIs, for example, syphilis, can be transmitted through the placenta to the fetus, causing serious diseases in newborns;

- Harmful occupational factors (contact with pesticides, lead, mercury, various inorganic dust, radioactive isotopes);
- Use of certain medications;
- Smoking and alcohol consumption during pregnancy; The use of drugs such as cannabis (hemp), synthetic drugs, amphetamine (ecstasy), heroin, and others, causes the destruction of emotional and spiritual intimacy between a man and a woman;
- in men, this manifests itself, in particular, as loss of erection (impotence) and ejaculation (inability to ejaculate);
- in women, it is fraught with fetal developmental abnormalities and the development of drug addiction in the unborn child;
- stress (can be a factor in delayed or absent ovulation in a woman).

Early registration is very important. A doctor can prescribe therapy for underlying conditions; promptly diagnose the onset of preeclampsia (a complication that occurs in the second half of pregnancy) and prescribe treatment, and, if threatened, take action; determine the risks of hereditary diseases; identify developmental pathologies or intrauterine death of the fetus, and propose and take appropriate measures (Ventskovsky B. M., Ventskovskaya I. B., Gutman L. B., 2010).

Unfortunately, in Kazakhstan from 2016 to 2021 The number of deaths among pregnant women in labor and postpartum has increased from 51 women per 100,000 births in 2016 to 200 women per 100,000 births in 2021. The leading causes of maternal mortality are:

- extragenital diseases – 77%;
- gestosis (preeclampsia, eclampsia) – 6.1%;
- obstetric hemorrhage – 5.5%.

Maternal mortality

Table 9. *Maternal mortality*

	The number of deceased pregnant women, women in labor, and women in childbirth, people	Per 100,000 live births
2016	51	12.7
2017	66	17.4
2018	52	13.5
2019	55	13.7
2020	156	36.5
2021	200	44.71
10 months 2022	49	14.3

Table 10. *Stucture of maternal by causes of death, %*

	2016	2017	2018	2019	2020	2021
obstetric hemorrhage	11.5	6.1	12.5	20.0	5.5	5.5
gestosis (preeclampsia, eclampsia)	5.8	14.3	21.4	9.1	6.1	2.5
uterine rupture	5.8	0.0	1.8	5.5	3.5	1.5
sepsis	3.8	6.1	14.3	1.8	1.0	1.5
extragenital diseases	42.3	40.8	35.8	43.6	77.0	82.5
induced abortion	17.3	4.1	7.1	0.0	2.5	0.0
ectopic pregnancy	0.0	0.0	0.0	1.8	0.0	0.5
other reasons	13.5	28.6	7.1	18.2	4.4	3

According to the Ministry of Health of the Republic of Kazakhstan, the number of deaths among pregnant women, women in labor, and women in childbirth by cause of death by region of Kazakhstan is most often due to preeclampsia and eclampsia in women in the Atyrau region (3 cases in 2020) and in the East Kazakhstan region (2 cases in 2020). In 2020, 2 women died from obstetric hemorrhage in the Kyzylorda region. Three women died from uterine rupture in 2020: 1 case in the Almaty region, 1 case in the Zhambyl region, and 1 case in the Karaganda region. One woman died from sepsis in the Zhambyl region (1 case). A total of 119 women died from extragenital diseases in 2020. The most common regions where women died from extragenital diseases were Shymkent City (16 cases), Almaty Region (12 cases), Aktobe Region (10 cases), Turkestan Region (10 cases), and Kyzylorda Region (9 cases). Three women died from abortions in 2020: Aktobe Region (1 case), Kostanay Region (1 case), and Almaty City (1 case).

Most maternal deaths are preventable, as medical methods for preventing or managing complications are well known. All women need access to prenatal care during pregnancy, qualified care during childbirth, and care and support in the weeks after birth. Ensuring the presence of qualified healthcare professionals during childbirth is especially important, as timely care and treatment can make all the difference.

Study Results

The analysis revealed that Kazakhstan's healthcare system faces a number of systemic challenges.

First, the availability and quality of primary healthcare remains poor, particularly in rural areas. This is due to staff shortages, deteriorating infrastructure, and weak digitalization.

Second, there is a human resource imbalance and low motivation among healthcare workers, leading to their migration and overburdening existing staff.

Third, despite advances in high-tech medical care (cardiac surgery, transplantation, and neurosurgery), innovative technologies are poorly implemented in the regions and there is a shortage of donor organs.

Fourth, non-communicable diseases significantly impact public health, accounting for up to 84% of mortality. The prevalence of diabetes, obesity, and cardiovascular diseases is associated with poor diet and lifestyle. Fifth, challenges in maternal and child health remain, including the insufficient integration of healthcare services, staffing shortages, and the rise of certain negative indicators, such as maternal mortality.

Problems with sanitary and epidemiological safety have also been identified, including inadequate preparedness for biological threats and a weak laboratory infrastructure.

Conclusion

Thus, the healthcare system of the Republic of Kazakhstan is undergoing transformation, but remains plagued by a number of structural problems. Addressing these challenges requires a comprehensive approach, including infrastructure development, digitalization, strengthening human resources, expanding preventive programs, and improving the effectiveness of public policy.

The implementation of national projects such as "Healthy Nation" creates the preconditions for improvement, but requires further improvement of implementation and monitoring mechanisms.

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