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## The health of the region's population in the new life realities during the Coronavirus Disease 2019 pandemic

#### **Abstract**

*Main problem*: Among the numerous threats to international security and personal security, one of the central problems remains ensuring a stable and effective system of global governance in the field of healthcare. The article is devoted to the problem of public health as an indicator of regional development during the coronavirus pandemic. This article actualizes socio-economic problems in the context of threats to the external environment that affected the EAEU countries, as well state of health of the population of the Pavlodar region and the measures taken by the state in connection with the COVID-19 pandemic that has engulfed the world.

Problems of a socio-economic nature can be solved by joint efforts of state structures, private, medium and small businesses. At the same time, joint programs are an important priority area of partnership during the development of the pandemic, in the cancers of which the transition to the organization of public order with enhanced quarantine restrictions will be carried out. Financing of such activities can be carried out from various sources, including grant funds aimed at finding new medicines. Regional specifics are important, since the level of spread of dangerous diseases depends on many factors. In connection with the existing prerequisites, based on an in-depth analysis of the medical and demographic situation, morbidity and disability of the population of the Pavlodar region, it is advisable to give a comprehensive assessment of the health status of residents of the region during the coronavirus pandemic.

*Purpose:* based on an in-depth analysis of the medical and demographic situation, morbidity and disability of the population of the Pavlodar region, to give a comprehensive assessment of the health status of residents of the region during the coronavirus pandemic.

*Methods*: In accordance with the tasks set, the following methods were used: analytical, statistical, comparative, theoretical and system analysis, psychological analysis methods, sociological methods (questionnaire, survey).

*Results and their significance*: The results obtained can be used in the course of further study of the laws of functioning of the social sphere of the regional economy and the principles of functioning of the health management system of the Pavlodar region.

*Key words:* regional healthcare system, factors, management, performance indicators, pandemic, new coronavirus disease COVID-19, legislative acts, regulatory documents, analysis and recommendations.

#### Introduction

The health of the population is the most important public good in which every individual and society as a whole are interested. Now, when the whole world is gripped by the coronavirus pandemic, and a difficult situation has developed in Kazakhstan, the country's economy and the health of the country's population are in serious danger.

The pandemic caused by COVID-19 and the restrictive measures imposed on it, as well as the alarmist information background with the obsessive repetition of negative events in the aggregate, had a serious impact on all spheres of society's life and led to social changes that are predominantly negative in nature.

Based on an in-depth analysis of the medical and demographic situation, morbidity and disability of the population of the Pavlodar region, to give a comprehensive assessment of the health status of residents of the region during the coronavirus pandemic.

#### Materials and methods

The present study was carried out using such general scientific methods of cognition as: monographic, economic-statistical, analytical, methods of comparative and structural analysis, economic-mathematical modeling, classification method. Each of these methods was applied adequately to its epistemological potential, which made it possible to ensure the reasonableness and reliability of generalizations, conclusions and provisions of the dissertation work.

#### Results

To assess the health status of the population of the Pavlodar region, the indicators of general and primary morbidity in terms of access to city and district outpatient clinics were analyzed. All indicators have been analyzed in dynamics over the past three years with the calculation of relative values and growth rate.

#### **Discussion**

The pandemic has had an impact on almost all spheres of economic and social life. As practice shows, currently there is a transformation of socio-economic processes, including changes in consumer behavior of society in the conditions of COVID-19 [1, 2]. Industry and such spheres as education, public administration and healthcare are no exception [3].

It is important to emphasize that the infection that caused the pandemic has changed the usual way of life of people. It showed that health is the greatest value that requires constant attention, care and strengthening. Governments of all countries have united in the fight against COVID-19. Extensive work to support and restore the healthcare sector was also carried out in Kazakhstan [4].

Despite the situation with the coronavirus pandemic, in 2020, the positive dynamics of most indicators of economic development remained in the Pavlodar region. For example, indicators in industry, agriculture and housing construction were positive. There is an increase in the production of mechanical engineering products by 29,2 %, the construction industry - by 32,7 %, metal structures - by 11,6 %, light industry - by 9,5 %. In general, the region finished the year with results at the level of national averages [5].

According to the indicators of the State Program for the Development of Healthcare in the Pavlodar region, one target indicator for maternal mortality of 25.7 (3 sl.) – (plan – 18.6) and two indicators for the neonatal mortality rate – 3.9 (plan – 3.41), for the birth rate among adolescents aged 10 to 14 years – 0.07 (plan – 0.015) has not been achieved.

There is a decrease in indicators:

- infant mortality per 1000 children born alive by 10,3 %;
- infant mortality rate per 1,000 live births by 16,6 %;
- the incidence of oncological diseases per 100 thousand population by 16,8 %;
- the incidence of tuberculosis per 100 thousand population by 14 %.

Within the framework of the Employment Roadmap 2020 program, capital and current repairs of buildings were carried out at 19 healthcare facilities in the region. Repair work has been completed on all projects. The total number of temporary jobs created at healthcare facilities amounted to 285 people.

5 new mobile medical complexes have been received for rural areas.

A 64-slice computed tomograph based on an oncological dispensary for cancer patients has been launched as part of a guaranteed volume of free medical care.

The ambulance fleet has been updated with new 109 reanimobiles through DBK leasing.

The Pavlodar Regional Ambulance Station has been using the unique information program "Komek 103" since September 2020, which automated the entire data transmission system, starting from the first second of receiving a call. The system monitors the movement of sanitary vehicles with an accuracy of up to a second, integrates call reception into a single whole, transmitting it to the on-board navigator, while ensuring the interaction of all hospitals and polyclinics of the city [6].

A telecommunications network based on personal computers and modem communication, with software, has been created in the information and operational dispatch department.

During the pandemic, it became possible to call an ambulance via a Telegram bot.

PACS systems are being actively implemented in medical organizations of the region. At the beginning of 2020, the PACS system was implemented in 4 organizations of the region. To date, out of 31 medical organizations, the PACS cloud system has been implemented in 16 medical organizations of the region, which is 51,6%.

The construction of an extension to the reception department of the main building of the KGP at the Pavlodar City Hospital No. 1 with the reconstruction and redevelopment of the existing reception department of the main building (1st, 2nd floors) continues.

Repair work is underway to open a stroke center on the basis of the KGP at the Pavlodar Regional Cardiological Dispensary.

It is planned to introduce hybrid operating rooms on the basis of the city Hospital No. 1.

Department of Health of Pavlodar region in the fight against coronavirus infection COVID-19:

- 1) a plan of measures for health facilities to work with viral infections in the autumn-winter period 2020-2021 has been developed and approved;
- 2) the reconstruction of the old oncological dispensary building has been completed for an infectious diseases hospital with 300 beds, which serves as a "triage center", where medical sorting of patients is carried out depending on the severity of the condition;
  - 3) a modular infectious diseases hospital with 200 beds has been launched;
- 4) repair work is underway on the infectious diseases department (annex) on the basis of the G. Sultanov Regional Hospital for 60 beds, completion is planned in 2021;
  - 5) in 2021, the repair work of the new infectious diseases department of Ekibastuz will begin;
- 6) The number of virological laboratories conducting PCR diagnostics has been increased from 1 to 6. The total capacity is 3350 studies per day with an indicator of 445 per 100 thousand population. All laboratories are integrated with the Laboratory Information System (LIS) of the Republican National Center of Expertise.
  - $7)\ medical\ organizations$  are equipped with all the necessary resources:
  - − the number of ventilators has been tripled − 352;

- the number of beds equipped with oxygen has been increased by 6 times;
- there are 9 oxygen stations, 7 new ones have been installed;
- there are 11 CT and 82 X-ray machines at the disposal of healthcare;
- 8) the primary link has been strengthened, the number of mobile teams has been increased 3 times (from 55 to 169), which are equipped with everything necessary (transport, PPE, drugs, pulse oximeters);
- 9) early vaccination of the population was carried out: 72,944 people from the risk group were vaccinated. 72,944 doses (91,1%) of 80,050 purchased doses were received;
- 10) 157 young doctors and 129 average medical workers arrived in the region. A reserve of medical workers of the region has been formed in the amount of 580 people (doctors 157, average medical workers 238 and junior medical personnel 185) who will be involved in the event of a new wave of COVID-19 infection [7].

In connection with the current epidemiological situation of coronavirus infection, the work of medical organizations of the Pavlodar region is proceeding normally with compliance with all anti-epidemic safety measures. Zoning into "dirty" and "clean" zones is provided.

Training seminars and briefings are held for medical personnel to combat COVID-19.

Receptions are conducted by appointment in compliance with the sanitary and disinfection regime and distancing.

At the inpatient level, the flows of planned, emergency and infectious patients with signs of CVI are divided. An obstetric-surgical hospital is functioning for pregnant women with CVI.

Advisory groups consisting of narrow specialized specialists and district doctors have been created in each polyclinic.

169 mobile teams have been created at the primary level (at the rate of 1 mobile team per 5,000 population) for the medical supervision of patients with asymptomatic, mild, moderate form of COVID-19 disease. On average, 39 to 87 mobile teams are involved per day, depending on the daily number of calls to the house. The work of mobile teams of PHC organizations is monitored daily.

In PHC organizations:

- purchased 50 disinfection tunnels, 180 pyrometers;
- -48 filters have been created to receive patients with fever, with signs of acute respiratory viral infections, influenza, pneumonia and COVID-19.
- floor markings, fences and barrier tapes have been installed to ensure social distancing and the direction of movement of visitors.

In addition, 3162 pulse oximeters were purchased to measure saturation and pulse in patients.

Persons over 65 years of age are serviced at home, delivery of medicines with a 3-month supply at home.

There is a sufficient supply of medicines and personal protective equipment.

Information and explanatory work on the prevention of acute respiratory viral infections, influenza, pneumonia and COVID-19 is carried out on an ongoing basis (speeches in the media, on the radio, in social networks, in Damomed mobile applications, distribution of booklets, brochures, etc.), briefings with the participation of the head of the regional health department.

A call center has been created for information and explanatory work with the population on the first signs of COVID-19 and the algorithm of actions when they appear, a hotline in Service 109 has been organized 24/7.

Information about the work of Call centers at the PHC of the region with the indication of numbers is posted on websites, in social networks, in the media and by Push notifications through medical information systems, as well as mobile SMS mailing [8; P. 5].

The round-the-clock operation of Call centers at PHC has been organized with the involvement of medical personnel and paramedical personnel in order to provide online consultations.

To improve work with the population, the WhatsApp line of the head of the department is functioning, as well as WhatsApp lines of the first heads of medical organizations are functioning for rapid response

Systematic work is being carried out in the region to provide the population with the necessary medicines and medical products at the inpatient and outpatient levels.

In 2020, within the framework of inpatient care, supplies of medicines and MI were carried out for a total amount of 5,9 billion tenge, taking into account additional applications (100%). The stock of drugs in medical organizations in the amount of monthly needs and more. Deliveries to medical organizations at the inpatient level will begin in January-February 2021, according to the established schedules.

In 2020, as part of outpatient care, drugs and MI were delivered in the amount of 6,27 billion tenge. The fact of providing the attached population is 99,1%. The balance of medicines in medical organizations in the amount of 54 million tenge. Additionally, in 2020, COVID-19 nosology was introduced, including 5 names of drugs: (antipyretics and anticoagulants: Paracetamol, Ibuprofen, Rivaroxaban, Apixaban and Dabigatran).

In order to replenish the stabilization fund with medicines, JSC "SEC "Pavlodar" concluded an agreement for the issuance of short-term loans in the amount of 500 million tenge with Incar LLP. Deliveries of 14 batches of medicines were organized. In total, 3010508 packages (36 items including analogues) were

delivered to the region. 212 pharmacies of the region are supplied with medicines from the stable fund according to applications.

All medicines comply with the COVID-19 and ARVI treatment protocol of the Ministry of Health of the Republic of Kazakhstan. A single distributor has formed a two-month supply of COVID-19 medicines (non-reduced supply) for 44 items at the Nur-Sultan hub.

In the region, 5,569 secondary medical workers are trained to work in information systems and are equipped with computer equipment. All medical organizations (37) of the region up to the district level have access to the Internet. A 98 % transition to electronic digital health passports has been ensured. 85,6 % of services are provided in electronic format. More than 198,000 people use the mobile application "Damumed", which is 50,7 % of the Internet active population [9].

The introduction of PACS continues. This system allows you to digitize the results of diagnostic studies and store them in the EPZ. A pilot project of remote monitoring of diseases has been launched in 16 medical organizations.

The development of the epidemiological situation in the world and in the Republic of Kazakhstan with the wave-like development of the epidemic process with relative stabilization with the introduction of restrictive measures and complications after their relaxation indicates that the COVID-19 virus will not disappear from the human population. At the level of state bodies, it was decided to ensure the transition to the functioning of the state in conditions of constant circulation of the virus among the population without causing significant damage to the country's economy (by analogy with the seasonal rise in the incidence of SARS and influenza).

Currently, the active development of new drugs for the treatment of coronavirus infection is underway. Many countries have made decisions on the use of experimental drugs for the treatment of CVI. Thus, in Russia, as well as the regulators of the United States of America (FDA) and the countries of the European Union (Eigoreapmedicines Adepsu), permits for emergency use in outpatient settings have been issued for experimental medicines for the treatment of coronavirus infection.

As of November 2021, there are certain shifts in the health and social services sector of the population, which give grounds for the fact that gradually the economy will come to a stable state, and demographic problems will be solved (Figures 1, 2).

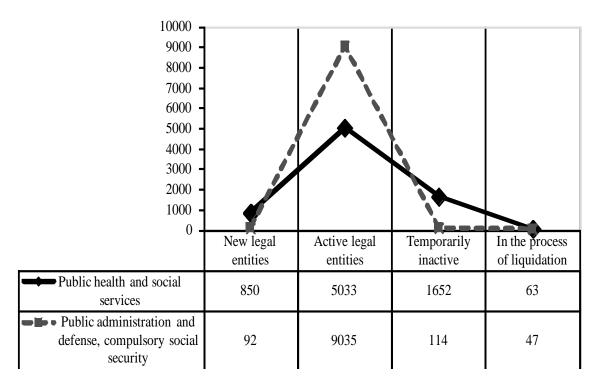


Figure 1 – Statistics of enterprises of certain sectors of the economy of the Republic of Kazakhstan as of November 1, 2021, units [10; P. 16]

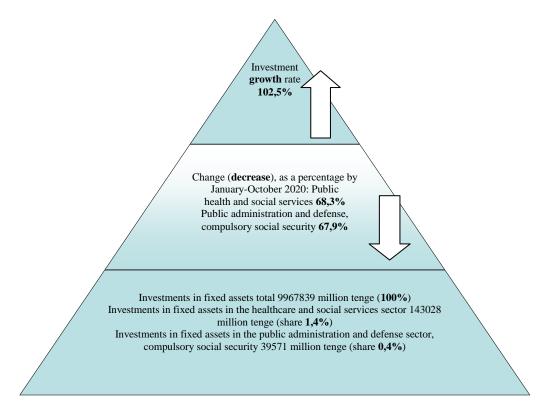


Figure 2 – Investments in fixed assets by areas of use in the Republic of Kazakhstan as of January – October 2021, units [10; P.15]

#### Conclusion

In the implementation of a socially oriented strategy of regional development, the improvement of regional health care management, which is a territorial combination of health care entities interconnected with each other and with public administration bodies on the basis of organizational, economic, financial, social, legal relations in order to ensure the greatest socio-economic effect in the development of health care, is of particular relevance.

The development of the regional healthcare system is one of the most important mechanisms for achieving the effectiveness of socio-economic development of the regions of the Republic of Kazakhstan and providing high-quality medical services to the population. On this basis, the functioning of the healthcare system in the region acts as a necessary prerequisite for ensuring the continuity of the multilevel process of reproduction of medical services for the needs of the population.

Promising areas for optimizing the system of intersectoral interaction on public health protection are informatization and automation, the creation of a single information space by integrating local information networks (hardware and software complexes) of its key subsystems (interested sectors), determining the structure and interrelation of individual components and processes.

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# С.Г. Симонов<sup>1\*</sup>, С.К. Жанузакова<sup>2</sup>, Г.Г. Кенжебаева<sup>2</sup>, Л.М. Давиденко<sup>2</sup> <sup>1</sup>Тюмень индустриалды университеті, Ресей <sup>2</sup>Инновациялық Еуразия университеті, Казахстан

## Coronavirus Disease 2019 пандемиясы кезеңіндегі жаңа реалды өмірде аймақ халқының денсаулығы

Халықаралық қауіпсіздік пен жеке адамның қауіпсіздігіне төнетін көптеген қауіптердің ішінде денсаулық сақтау саласындағы жаһандық басқарудың тұрақты және тиімді жүйесін қамтамасыз ету негізгі мәселелердің бірі болып қала береді. Мақала коронавирустық пандемия кезіндегі аймақтық дамудың көрсеткіші ретінде халықтың денсаулығы мәселесіне арналған. Бұл мақалада ЕАЭО елдерін қозғаған сыртқы орта қатерлері жағдайындағы әлеуметтік-экономикалық мәселелер өзекті, сондай-ақ Павлодар облысы халқының қазіргі денсаулық жағдайы және әлемді дүр сілкіндірген Coronavirus Disease 2019 (COVID-19) пандемиясына байланысты мемлекет қабылдап жатқан шаралар көрсетілген.

Әлеуметтік-экономикалық сипаттағы мәселелер мемлекеттік құрылымдардың, жеке, орта және шағын кәсіпкерліктің бірлескен күш-жігерімен шешілуі мүмкін. Бұл ретте пандемияны дамыту кезеңіндегі серіктестік қатынастардың басым бағыты карантиндік шектеу шараларымен күшейтілген қоғамдық тәртіпті ұйымдастыруға көшу жүзеге асырылатын бірлескен бағдарламаларды ұйымдастыру болып табылады. Мұндай іс-шараларды қаржыландыру жаңа дәрілік препараттарды іздеуге бағытталған гранттық қорларды қоса алғанда, әртүрлі көздерден жүзеге асырылуы мүмкін. Аймақтық ерекшелік маңызды, өйткені қауіпті аурулардың таралу деңгейі көптеген факторларға байланысты. Қалыптасқан алғышарттарға байланысты Павлодар облысы халқының медициналық-демографиялық жағдайын, сырқаттанушылығы мен мүгедектігін терең талдау негізінде короновирус пандемиясы кезеңінде өңір тұрғындарының денсаулық жағдайына кешенді баға берген жөн.

Мақсаты — Павлодар облысы халқының медициналық-демографиялық жағдайын, сырқаттанушылығы мен мүгедектігін терең талдау негізінде коронавирус пандемиясы кезінде өңір тұрғындарының денсаулық жағдайына кешенді баға беру. Қойылған міндеттерге сәйкес келесі әдістер қолданылды: аналитикалық, статистикалық, салыстырмалы, теориялық және жүйелік талдау әдісі, психологиялық талдау әдістері, социологиялық әдістер (сауалнама, сауалнама). Алынған нәтижелер өңірлік экономиканың әлеуметтік саласының жұмыс істеу заңдылықтарын және Павлодар облысының Денсаулық сақтауды басқару жүйесінің жұмыс істеу принциптерін одан әрі зерделеу барысында пайдаланылуы мүмкін.

Түйін сөздер: аймақтық денсаулық сақтау жүйесі, факторлар, басқару, тиімділік көрсеткіштері, пандемия, жаңа COVID-19 коронавирус ауруы, заңнамалық актілер, нормативтік құжаттар, талдау және ұсыныстар.

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## Здоровье населения региона в новых жизненных реалиях в период пандемии Coronavirus Disease 2019

Одной из центральных проблем, связанных с международной безопасностью и безопасностью личности, остается обеспечение стабильной и эффективной системы глобального управления в сфере здравоохранения. Статья посвящена проблеме здоровья населения как индикатора регионального развития в период пандемии коронавируса. В данной статье актуализируются социально-экономические проблемы в условии угроз внешней среды, которые затронули страны ЕАЭС, а также отражено современное состояние здоровья населения Павлодарской области и меры, предпринимаемые государством в связи с охватившей мир пандемии Coronavirus Disease 2019 (COVID-19).

Проблемы социально-экономического характера могут быть решены совместными усилиями государственных структур, частного, среднего и малого предпринимательства. При этом приоритетным направлением партнерских отношений в период развития пандемии стоит организация совместных программ, в рамках которых будет осуществлен переход на организацию общественного порядка с усиленными мерами карантинных ограничений. Финансирование таких мероприятий может осуществляться из различных источников, включая грантовые фонды, нацеленные на поиск новых лекарственных препаратов. Важна региональная специфика, так как уровень распространения опасных болезней зависит от многих факторов. В связи со сложившимися предпосылками на основе углубленного анализа медико-демографической ситуации заболеваемости и инвалидности населения Павлодарской области целесообразно дать комплексную оценку состоянию здоровья жителей региона в период пандемии короновируса.

Цель статьи заключается в том, чтобы на основе углубленного анализа медико-демографической ситуации, заболеваемости и инвалидности населения Павлодарской области дать комплексную оценку состояния здоровья жителей региона во время пандемии коронавируса. В соответствии с этим были использованы следующие методы: аналитический, статистический, метод сравнительного, теоретического и системного анализа, методы психологического анализа, социологические методы (анкетирование, опрос).

Полученные результаты могут быть использованы в ходе дальнейшего изучения закономерностей функционирования социальной сферы региональной экономики и принципов функционирования системы управления здравоохранением Павлодарской области.

Ключевые слова: региональная система здравоохранения, факторы, управление, показатели эффективности, пандемия, новая коронавирусная болезнь COVID-19, законодательные акты, нормативные документы, анализ и рекомендации.

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