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ORGANIZATION OF THE PULMONOLOGICAL SERVICE IN KAZAKHSTAN: PROBLEMS AND PROSPECTS

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Abstract

Introduction. Chronic bronchopulmonary diseases are one of the leading causes of morbidity and mortality worldwide. The development of a modern pulmonological service in the Republic of Kazakhstan is due to a number of significant organizational measures aimed at intensifying scientific and practical work in the field of pulmonology. At the present stage of healthcare development, it is the organizational and methodological technologies and the modernization of the industry management system that are used systematically and introduced into everyday practice based on comprehensive professional activity programs that are designed to improve the efficiency and quality of medical care in pulmonological practice.

Objective: The aim of our study is to analyze the organization of the pulmonological service in the Republic of Kazakhstan and identify problems and prospects for further improvement.

Materials and methods: There were analyzed the statistical data of the Ministry of Health of the Republic of Kazakhstan. The organization of the pulmonological service in the Republic of Kazakhstan was studied on the basis of legal regulatory documents. Bibliographic, information-analytical and statistical methods of research are applied.

Results and conclusions. The morbidity and mortality rates from respiratory diseases are increasing, and this was especially noted during the pandemic. An important condition in the system of organizing medical care for the population is to provide healthcare authorities and organizations with organizational, methodological and regulatory documents. In this regard, it is extremely relevant to analyze the degree of use of information technologies and recommendations of professional communities in the activities of primary health care physicians, their awareness of the main organizational, administrative and regulatory legal acts regulating the procedure for providing medical care to patients with bronchopulmonary diseases. At present, good prerequisites have been created for the development of pulmonological care for patients.

Key words: *pulmonological service, bronchopulmonary diseases, COPD, asthma, global health.*

Резюме

ОРГАНИЗАЦИЯ ПУЛЬМОНОЛОГИЧЕСКОЙ СЛУЖБЫ В КАЗАХСТАНЕ: ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ

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Хронические заболевания легких являются одной из ведущих причин заболеваемости и смертности во всем мире. Развитие современной пульмонологической службы в Республике Казахстан обусловлено проведением ряда существенных организационных мероприятий, имеющих целью интенсифицировать научную и практическую работу в области пульмонологии. Организационно-методические технологии и модернизация системы управления отраслью, используемые системно и внедряемые в повседневную практику на основе комплексных программ профессиональной деятельности, призваны обеспечить повышение эффективности и качества медицинской помощи в пульмонологической практике.

Цель данного исследования – проанализировать организацию пульмонологической службы в Республике Казахстан и выявить проблемы и перспективы для дальнейшего совершенствования.

Материалы и методы: Проанализированы статистические данные Министерства здравоохранения Республики Казахстан. Изучена организация пульмонологической службы в Республике Казахстан на основе нормативно-правовых документов. Применены библиографический, информационно-аналитический и статистический методы исследования.

Результаты и выводы: В период пандемии было отмечено повышение показателей заболеваемости и смертности, связанных с болезнями органов дыхания. В связи с этим крайне актуальным является обеспечение организаций здравоохранения организационно-методическими и нормативными документами, не менее важен

анализ степени использования информационных технологий и рекомендаций профессиональных сообществ в деятельности врачей первичного звена. В настоящее время созданы хорошие предпосылки для развития пульмонологической помощи больным.

Ключевые слова: *пульмонологическая служба, болезни органов дыхания, ХОБЛ, бронхиальная астма, глобальное здравоохранение.*

Түйіндеме

ҚАЗАҚСТАНДА ПУЛЬМОНОЛОГИЯЛЫҚ ҚЫЗМЕТТІ ҰЙЫМДАСТЫРУ: ПРОБЛЕМАЛАРЫ МЕН БОЛАШАҒЫ

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Өкпенің созылмалы аурулары дүние жүзінде ауру мен өлімнің негізгі себептерінің бірі болып табылады. Қазақстан Республикасында қазіргі заманғы пульмонологиялық қызметтің дамуы пульмонология саласындағы ғылыми-тәжірибелік жұмыстарды жандандыруға бағытталған бірқатар маңызды ұйымдастырушылық шараларға байланысты. Кәсіптік қызметтің кешенді бағдарламалары негізінде жүйелі түрде қолданылатын және күнделікті тәжірибеге енгізілген ұйымдастыру-әдістемелік технологиялар мен саланы басқару жүйесін жаңғырту пульмонологиялық тәжірибеде медициналық көмектің тиімділігі мен сапасын арттыруға арналған.

Бұл зерттеудің **мақсаты** – Қазақстан Республикасындағы пульмонологиялық қызметтің ұйымдастырылуын талдау және проблемалары мен одан әрі жетілдіру перспективаларын анықтау.

Материалдары мен әдістері: Қазақстан Республикасы Денсаулық сақтау министрлігінің статистикалық мәліметтері талданды. Қазақстан Республикасындағы пульмонологиялық қызметтің ұйымдастырылуы құқықтық құжаттар негізінде зерттелді. Зерттеудің библиографиялық, ақпараттық-аналитикалық және статистикалық әдістері қолданылды.

Нәтижелер мен қорытындылар: Тыныс алу жолдарының ауруларынан болатын аурушаңдық пен өлім-жітім, әсіресе пандемия кезінде өсуде. Осыған байланысты МСАК дәрігерлерінің қызметінде ақпараттық технологияларды және кәсіби қоғамдастықтардың ұсыныстарын қолдану дәрежесін, бронх-өкпе аурулары бар науқастар үшін медициналық көмек көрсету тәртібін реттейтін негізгі ұйымдастырушылық, әкімшілік және нормативтік құқықтық актілерден хабардар болуын талдау өте өзекті болып табылады. Қазіргі уақытта науқастарға пульмонологиялық көмекті дамыту үшін жақсы алғышарттар жасалған.

Түйінді сөздер: *пульмонологиялық қызмет, респираторлық аурулар, ӨСОА, бронх демікпесі, жаһандық денсаулық.*

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Introduction

The global burden of lung disease is significant, accounting for about 7.5 million deaths per year, which is approximately 14% of annual deaths worldwide [1]. Major diseases include, in descending order, chronic obstructive pulmonary disease, lung cancer, tuberculosis, acute respiratory infections, asthma, and interstitial pulmonary fibrosis [2]. The main risk factors include smoking, indoor and outdoor air pollution, and occupational exposures [3].

Although the distribution of both diseases and risk factors varies greatly by age, geography and setting, the greatest burden is on populations living in low- and middle-income countries [4]. To improve these rates, serious public health measures to limit smoking are required; improving air quality in both the community and the household; combating the ongoing burden of infections such as tuberculosis, influenza and many other agents that cause acute respiratory infections. It is also important to identify and protect workers from the danger of exposure to toxic substances [5].

The pulmonological service in the Republic of Kazakhstan in recent years has received significant development, despite social and economic difficulties [6]. In the last twenty years, a number of organizational measures have been taken to intensify scientific and practical work in the field of pulmonology. In many regions, active work is being carried out to organize pulmonological care, create a network of specialized pulmonological institutions, develop targeted comprehensive programs for the development of pulmonological care [7]. New methods of diagnostics, treatment and prevention of chronic respiratory diseases are being introduced into healthcare practice, the quality of

diagnostics, treatment and prevention of such diseases as bronchial asthma, chronic obstructive pulmonary disease, and pneumonia has significantly improved. The Respiratory Society of the Republic of Kazakhstan conducts significant organizational, methodological and educational activities [7,8].

The coronavirus disease (COVID-19) pandemic has raised many questions about the management of patients with chronic obstructive pulmonary disease (COPD) and the need to modify their therapy. Problems have been noted in recognizing and differentiating coronavirus disease (COVID-19) from COPD given the similarity of symptoms. The Scientific Committee of the Global Initiative on Chronic Obstructive Pulmonary Disease (GOLD) used established literature review methods to provide an overview of the management of patients with COPD during the COVID-19 pandemic [9].

Aim of this study is to analyze the organization of the pulmonological service in the Republic of Kazakhstan and identify problems and prospects for further improvement.

Materials and methods. Bibliographic, information-analytical and statistical methods of research are applied. As part of the literature review of the research work, an in-depth analysis of sources was carried out using the Cochrane, e-Library, PubMed, Scopus, Web of Science, Google Scholar, CyberLeninka databases, including the regulatory framework. The search depth was 10 years (2012-2022). *Inclusion criteria:* original articles, literature reviews, reports of randomized and cohort studies with a large population; meta-analyses, regulatory documents; publications in Kazakh, English and Russian. *Key words:* pulmonological service, bronchopulmonary diseases, COPD, asthma.

Also analyzed the statistical data of the Ministry of Health of the Republic of Kazakhstan. The organization of the pulmonological service in the Republic of Kazakhstan was studied on the basis of legal regulatory documents.

Results. At present, good prerequisites have been created for the development of pulmonological care for patients. The Ministry of Health of the Republic of Kazakhstan approved the Standard for organizing the provision of pulmonological care in the Republic of Kazakhstan, the Regulations on the activities of healthcare organizations providing pulmonological care. In order to improve pulmonological care in the Republic of Kazakhstan, a Road Map has been approved for improving pulmonological care in the Republic of Kazakhstan.

The re-equipment of health facilities and the training of primary health care physicians under the National Health Program has improved the quality of diagnosis and treatment of respiratory diseases (RD) at the primary health care level. Respiratory departments have been opened in hospitals of the Republic of Kazakhstan.

Despite the fact that respiratory diseases are a significant socio-economic threat, both for an individual and for the entire community [10], there are significant problems in organizing the diagnosis, treatment and prevention of these diseases. At the same time, in many regions of the Republic of Kazakhstan, there is a tendency to reduce the number of patients with chronic diseases of the respiratory system seeking medical care, which can lead to an increase in adverse outcomes in the treatment of patients with chronic pulmonary pathology [11]. One of the causes of disability and mortality of the population from respiratory diseases is the lack of effectiveness of the existing system of therapeutic and preventive measures. First of all, this is manifested by the low level of accessibility and quality of medical care, which affects the timeliness and adequacy of treatment, diagnostic and preventive measures [12].

In Kazakhstan, respiratory diseases (RD) occupy the first line in the structure of the overall morbidity and seeking medical care, which is generally consistent with global data. In terms of mortality rates in the Republic of Kazakhstan, respiratory diseases rank second after diseases of the circulatory system [13]. In 2019 this index was 81.19 per 100,000 people. The dynamics of the mortality rate for 2012-2019 can be seen in figure 1.

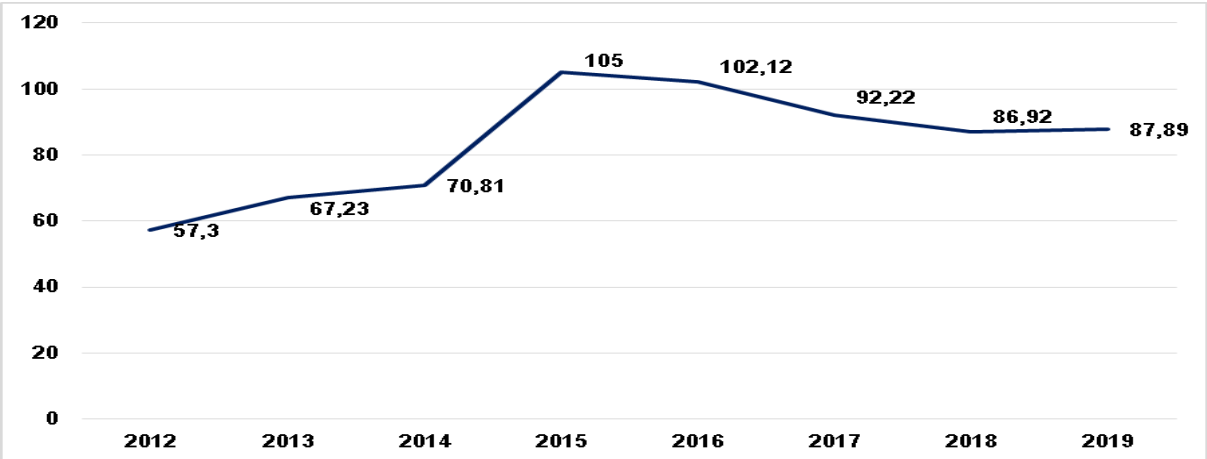

Figure 1. Dynamics of the mortality rate from respiratory diseases in the Republic of Kazakhstan per 100,000 people. (Statistical collections "Health of the population of the Republic of Kazakhstan and the activities of healthcare organizations" for 2012-2020).

Since 2015, COPD and pneumonia have taken 2nd-3rd place in the structure of total mortality of the population. Over the past 5 years, there has been a steady increase in the incidence of RD, especially during the coronavirus pandemic [14].

According to the official medical statistics of the Ministry of Health of the Republic of Kazakhstan in 2019, 5,197,975 people applied for respiratory diseases (28,076.4 per 100,000 population), which accounted for about 40% of the total incidence of the population.

In 2019, according to the official statistics of the Ministry of Health of the Republic of Kazakhstan, the incidence rate of pneumonia was 724.3 per 100,000 population. Unfortunately, there are no official data on reported cases of pneumonia during the pandemic period. Errors in the diagnosis of pneumonia are about 30%, and the number of hospital-acquired pneumonia not taken into account is 2.5 times higher. The lack of timely diagnosis of a pathology such as pneumonia contributes to an increase in complications and, accordingly, an increase in the cost of treatment, as well as an increase in overall morbidity and mortality. Figure 2 shows the incidence of pneumonia in the Republic of Kazakhstan for 2012-2019 (per 100 thousand inhabitants).

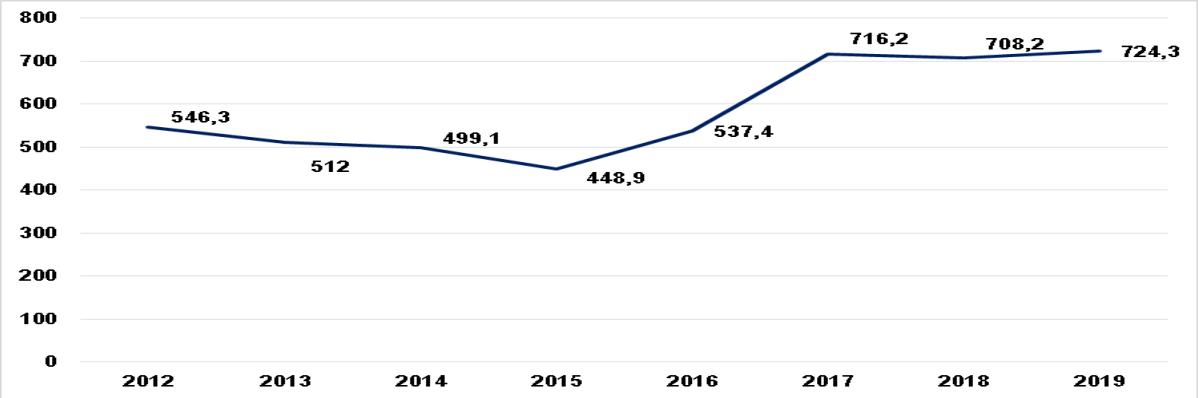

Figure 2. Pneumonia incidence rates in the Republic of Kazakhstan for 2012-2019 per 100,000 people.
(Statistical collections "Health of the population of the Republic of Kazakhstan and the activities of healthcare organizations" for 2012-2020).

Along with acute pathologies of the respiratory organs, there is an annual increase in such diseases as bronchial asthma (BA), chronic obstructive pulmonary disease (COPD). This fact is explained both by the influence of risk factors, and by improved diagnostics, and by an increase in life expectancy. In the Republic of Kazakhstan, the incidence of COPD in different regions ranges from 222.0 to 1613.5 per 100 thousand population. In total, about 75 thousand patients with COPD are registered, which is about 1% of the total adult population [15]. According to local epidemiological studies, the incidence of COPD is 10-17%. According to preliminary estimates, there are about 450-500 thousand patients with COPD in Kazakhstan, i.e. the diagnosis was established only in one of 6-8 patients. The incidence rate of asthma among the population of the Republic of Kazakhstan is 102.8 per 100 thousand population in 2019, which is a low indicator. Underdiagnosis of COPD and BA is associated with several reasons: mild variants of the disease, gradual development of symptoms, low availability of spirometry, insufficient number of pulmonologists, up to the absence in a number of regions of the Republic of Kazakhstan.

In addition to known infectious agents, the prevalence of smoking, certain occupational exposures, there are additional factors that cause an increase in the incidence of respiratory diseases. Efforts have been made to identify risk factors and mechanisms for the development of COPD in a number of countries. Smoking, air pollution, use of biomass fuels, and exposure to dust in the workplace explain the high prevalence of COPD [16]. Male sex and low socioeconomic status are also associated with COPD. Chinese scientists have also proposed a causal relationship between depression and exacerbation of COPD.

Over the past few decades, epidemiological evidence showing strong associations between air pollution and various outcomes (respiratory symptoms, decreased lung function, chronic bronchitis and mortality) has shown that outdoor air pollution is one of the causes of morbidity and mortality [17]. Outdoor air pollutants are also associated with COPD exacerbations and mortality. There is much less evidence of indoor air exposure to COPD, especially in developed countries in non-biomass residential settings. The limited existing evidence suggests that indoor particulate matter and nitrogen dioxide concentrations are associated with increased respiratory symptoms in patients with COPD.

In accordance with the Environmental Performance Index 2020 (EPI), Kazakhstan ranked 115th among 180 countries in terms of ambient air quality, and 138th in terms of the content of PM2.5* particles in the atmospheric air [18]. There is a risk of adverse chronic effects caused by particulate matter exposure in most of the cities studied. An extremely high risk of chronic effects from heavy metal exposure has been identified in cities such as Ust-Kamenogorsk, Shymkent, Almaty, Taraz and Balkhash.

The fight against COPD is a complex task that requires the joint efforts of the government and the medical community. Kazakhstani protocols for the diagnosis and treatment of diseases generally comply with international recommendations, but also take into account practical issues such as the cost and availability of specific interventions. Currently, COPD is included in the list of major diseases in the programs for the prevention and control of noncommunicable chronic diseases. Since 2019 this diagnosis is monitored by a disease management program. The specific goals of this project include early diagnosis and intervention in COPD, smoking cessation, improved patient self-management, and physician compliance. Respiratory disease education and management programs around the world have been shown to be effective in improving asthma control and quality of life [19].

For patients with chronic obstructive pulmonary disease (COPD), concerns about the development of coronavirus disease (COVID-19), as well as the impact of the pandemic on the basic functions of society and/or social services

related to their health, which additionally creates health stressors. The COVID-19 pandemic has made routine COPD management and diagnosis difficult due to reduced face-to-face consultations, difficulties with spirometry, and limitations in traditional pulmonary rehabilitation and home care programs. Patients also faced drug shortages.

At the present stage of healthcare development, it is the organizational and methodological technologies and the modernization of the industry management system that are used systematically and introduced into everyday practice on the basis of comprehensive professional activity programs that are designed to improve the efficiency and quality of medical care in pulmonological practice [20].

An important condition in the system of organizing medical care for the population is to provide healthcare authorities and organizations with organizational, methodological and regulatory documents relevant to the current level of development of the industry, the introduction of new medical standards and technologies in the field of practical medicine and healthcare. In this regard, it is extremely relevant to analyze the degree of use of information technologies and recommendations of professional communities in the activities of primary health care physicians, their awareness of the main organizational, administrative and regulatory legal acts regulating the procedure for providing medical care to patients with bronchopulmonary diseases.

Many pulmonary rehabilitation programs have been suspended during the pandemic to reduce the risk of the spread of SARS-CoV-2. Patients during these periods should be encouraged to maintain an active lifestyle at home and may be supported by home rehabilitation programs which, although less effective than traditional supervised pulmonary rehabilitation. In such situations, technology solutions such as web or smartphone apps can be useful to support home-based rehabilitation during a pandemic. As programs resume, general infection control principles should be applied and local guidelines should be followed.

WHO periodically assesses national capacity for NCD prevention and control through a global survey conducted in all Member States, known as the Country Capacity for NCD Survey. This periodic evaluation allows countries and WHO to track progress and achievements in strengthening their capacity to respond to the noncommunicable disease epidemic.

Health organizations providing pulmonological care to the population are created in order to timely carry out activities aimed at identifying, treating and medically rehabilitating pulmonological patients.

The main tasks of healthcare organizations providing pulmonological care to the population are organization and implementation of activities aimed at the prevention of respiratory diseases; diagnosis of respiratory diseases and its treatment of respiratory diseases with continuity at all stages of treatment; medical rehabilitation of persons with non-specific congenital and/or acquired diseases of the respiratory system.

The organization of the provision of pulmonological care in the Republic of Kazakhstan is regulated by the №993 order of the Minister of Health and Social Development of the Republic of Kazakhstan dated December 23, 2015. The standard for organizing the provision of pulmonological care in the Republic of Kazakhstan establishes requirements for the organization of medical care for patients with respiratory diseases at the outpatient, inpatient and inpatient levels.

Pulmonary assistance to the population of the Republic of Kazakhstan is provided within the framework of the State Observatory of the Republic of Kazakhstan, approved by the Decree №2136 of the Government of the Republic of Kazakhstan dated December 15, 2009 «On Approval of the List of Guaranteed Free Medical Care».

Discussion

Taking into account the tasks performed, the diagnostic and treatment base of pulmonology rooms can only be institutions that include diagnostic and treatment departments that ensure its work. In this regard, they should be organized as part of regional and regional hospitals, large medical sanitary units, the Central District Hospital, and city polyclinics.

The organization of outpatient consultative and diagnostic units is of particular importance for improving pulmonological care for the population in modern conditions.

The main option that provides a real improvement in the epidemiological indicators of ORD while reducing the need for hospitalization is the organization of pulmonology rooms at city polyclinics and the Central District Hospital. The high clinical and epidemiological efficiency of the work of pulmonology rooms is explained by their profitability (the creation of rooms pays off within one year by reducing the actual level of expensive hospitalization of patients with AML and reducing losses from temporary disability). The organization of pulmonology rooms allows in a short time to achieve a reduction in the number of cases and days of temporary and permanent disability by 15-25%, and according to some estimates, by 1.5-2 times.

At the same time, in the system of organizing pulmonological care, a preventive orientation, including educational work with the population, is poorly developed. Moreover, a significant amount of work on the diagnosis and treatment of RD (and this should be taken into account when organizing pulmonological care) is carried out by local general practitioners, to whom these patients turn. Features of the clinical course of RD require the organization of treatment at the place of residence with the participation of the general medical network.

Conclusion

Respiratory diseases are among the most common in terms of morbidity and mortality. Taking into account the characteristics of risk factors, as well as new infectious agents, morbidity and mortality from bronchopulmonary pathology will tend to increase. The pulmonology service in the Republic of Kazakhstan needs further improvement, which requires the integration of outpatient and inpatient levels, as well as the development of continuity between all stages of the provision of specialized pulmonology care. The opening of respiratory centers will allow pulmonary rehabilitation for patients with respiratory diseases.

Authors contribution:

Kumar A.B. initiated the study.

Bazarbekova G.S. and Aman B.Zh. collected personal and clinical data.

Bazarbekova G.S. and Kumar A.B. designed the study and wrote the manuscript together.

Bazarbekova G.S. contributed to statistical analysis. All authors read and approved the final manuscript.

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