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Итоги профилактических медицинских осмотров детского населения Донецкой Народной Республики, Луганской Народной Республики, Запорожской и Херсонской областей

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АННОТАЦИЯ

Обоснование. В последние годы профилактическое направление медицины стало набирать популярность. Правительством Российской Федерации уделяется большое внимание здоровью населения и проведению профилактических осмотров, поскольку среди многих основных приоритетов государства было и остаётся здоровье детского населения как залог здоровой нации.

Цель исследования — оценка состояния здоровья детского населения новых территорий Российской Федерации и разработка мероприятий по дальнейшему совершенствованию медицинской помощи на региональном уровне.

Материал и методы. Объектом исследования стало детское население в возрасте 0–17 лет, проживающее на новых территориях Российской Федерации: в Донецкой Народной Республике, Луганской Народной Республике, Запорожской и Херсонской областях. Для проведения углублённых профилактических медицинских осмотров детского населения указанных регионов сформированы 32 бригады из специалистов 30 субъектов Российской Федерации.

Результаты. Среди осмотренных преобладали дети в возрасте 0–14 лет. В структуре общей заболеваемости во всех регионах преобладали болезни одних и тех же классов по МКБ-10: костно-мышечной, эндокринной и нервной систем, расстройства питания и нарушения обмена веществ, болезни глаза и его придаточного аппарата, органов пищеварения, органов дыхания, а также психические расстройства и расстройства поведения. У половины детей диагноз был установлен впервые в жизни.

Более высокая доля здоровых детей (с I группой здоровья) по сравнению с российским показателем обусловлена контингентом детского населения, а количество детей с III группой здоровья — в связи с углубленным характером профилактических медицинских осмотров. Распределение по группам для занятий физической культурой соответствовало группам здоровья. По результатам углублённого профилактического осмотра под диспансерное наблюдение передано более трети от общего числа осмотренных детей. Особого внимания заслуживали экстренные и неотложные случаи, требующие лечебных мероприятий, или оказания медицинской помощи в стационарных условиях, а также случаи психических расстройств.

Заключение. Результаты углублённых профилактических медицинских осмотров могут быть основой для последующей лечебно-диагностической и реабилитационной работы, проводимой медицинскими организациями, а также для профилактической и оздоровительной деятельности, реализуемой в образовательных учреждениях.

Ключевые слова: здоровье; детское население; профилактические медицинские осмотры; заболеваемость; инвалидность; медицинская помощь; профилактика.

Как цитировать

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Results of preventive medical examinations of children in Donetsk People's Republic, Luhansk People's Republic, and Zaporizhzhya and Kherson regions

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ABSTRACT

BACKGROUND: The preventive direction of medicine has become increasingly popular in recent years. The government has paid much attention to the health of the population and preventive examinations. Among the main priorities of the state, the health of the pediatric population remains a guarantee of a healthy nation.

AIM: To assess the health status of the pediatric population of the new territories of the Russian Federation and develop measures to further improve medical care at the regional level.

MATERIAL AND METHODS: The study enrolled children aged 0–17 years living in the new territories of the Russian Federation, namely, the Donetsk People's Republic, Luhansk People's Republic, Zaporozhye oblast, and Kherson oblast. A total of 32 teams of specialists from 30 territories of the Federation have been formed to conduct in-depth preventive medical examinations of the pediatric population of these new territories.

RESULTS: The study participants were predominantly children aged 0–14 years. The overall morbidity in all regions was dominated by diseases from the five classes according to ICD-10, namely, diseases of the musculoskeletal system and connective tissue; endocrine, nutritional, and metabolic diseases; of the eye and adnexa; and disorders of the nervous system, respiratory system, and psychological development. Half of the study participants were diagnosed with a disease for the first time in their lives.

In the Russian Federation, the high proportion of healthy children is due to the contingent of the child population, and the third group of health with better detection of diseases due to the in-depth nature of preventive medical examinations. The distribution into groups for physical education corresponded to health groups. According to the preventive medical examinations results, more than a third of the total number of examined children was transferred to dispensary supervision. Emergent and urgent cases and mental disorders require measures under stable conditions.

CONCLUSION: The results of the preventive medical examinations can be the basis for subsequent therapeutic, diagnostic, and rehabilitation work by medical organizations and preventive and health-improving activities by educational institutions.

Keywords: health; children's population; preventive medical examinations; preventive medicine; morbidity; disability; medical care; prevention.

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BACKGROUND

Protecting children's health is the most important task of the state. The degree of implementation of measures in this direction is considered an indicator of the social health of the society [1, 2].

Outstanding figures of medicine, such as S.Ya. Mudrov, G.A. Zakharyin, A.A. Ostroumov, I.I. Pirogov, I.M. Sechenov, S.P. Botkin, I.P. Pavlov, at one time, realized that the future belonged to preventive medicine. In 1928, N.A. Semashko considered medical examination as the best method of prevention. Russian healthcare has accumulated significant experience in conducting medical examinations of the population and its groups. Each time, in accordance with the general political and economic situation, different problems were solved [3].

The most important priority of Russian healthcare is prevention based on the use of the dispensary method. Over the last decade, the government and the Ministry of Health of the Russian Federation have exerted unprecedented efforts to develop prevention activities for infectious and noninfectious diseases [4].

Preventive examinations are the main link in medical monitoring and assessment of the health status of the population, particularly children; therefore, government agencies and scientific communities traditionally pay increased attention to them [5]. Preventive medical examinations include a system of measures aimed at identifying early disease stages and functional deviations in the development of children and adolescents. The results of preventive examinations are used as the basis for subsequent therapeutic, diagnostic, and correctional work conducted at clinics and preventive and health-improving activities implemented in educational institutions [6–9].

Children are subject to mandatory preventive monitoring in accordance with the order of the Ministry of Health of the Russian Federation of December 30, 2003, No. 621 "On a comprehensive assessment of the health status of children." According to the order of the Ministry of Health of the Russian Federation dated August 10, 2017, No. 514n "On the procedure of preventive medical examinations of minors" (as amended by the orders of the Ministry of Health of the Russian Federation dated July 03, 2018, No. 410n, dated June 13, 2019, No. 396n, dated November 19, 2020, No. 1235n), preventive medical examinations of minors are performed at established age periods for the early (timely) detection of pathological conditions, diseases, and risk factors for their development, as well as for forming health groups and developing recommendations for minors.

The preventive focus as the main doctrine of Russian medicine is emphasized in the annual state of the President of the Russian Federation Vladimir Putin. Special attention is paid to the issues of the in-depth development of programs for preventive examinations of the population. Thus, the addition of instrumental and laboratory studies in the list of preventive examination items was proposed to ensure in-depth and prompt identification of the most common pathologies in various populations. Additional laboratory and instrumental resources used during preventive medical examinations of minors will provide the health basis of the nation and prospects for its development. The President instructed the government to begin implementing an expanded program of medical examination and preventive examinations of the population since July 1, 2021, strengthening the regional aspect of the healthcare system with mobile medical diagnostic complexes. Moreover, one of the main activities of the healthcare system, one of its priority tasks, remains the preservation of the health of the country's young generation as a future strategic reserve for the security of its existence and national heritage [5].

This study aimed to assess the health status of the pediatric population in new territories of the Russian Federation and develop measures to improve further medical care at the regional level.

METHODS

The study enrolled pediatric patients aged 0–17 years living in new territories of the Russian Federation, namely, Donetsk People's Republic (DPR), Lugansk People's Republic (LPR), Zaporozhye Region (ZR), and Kherson Region (KR).

In accordance with the Order of the Government of the Russian Federation dated October 22, 2022, No. 3116-r[1] and dated February 22, 2023, No. 447-r[2], as well as based on the order of the Ministry of Health of the Russian Federation dated October 28, 2022, No. 707[3], 32 teams were formed from specialists from 30 constituent territories of the Russian Federation to conduct in-depth preventive medical examinations of the pediatric population of these regions. To coordinate the work of the medical teams, curators from the National Medical Research Center for Children's Health of the Russian Ministry of Health were assigned to each entity.

The teams included pediatricians, pediatric surgeons, neurologists, ophthalmologists, orthopedic traumatologists, otorhinolaryngologists, psychiatrists, gynecologists, pediatric endocrinologists, pediatric cardiologists, pediatric urologists–andrologists, ultrasound diagnostic specialists, functional diagnostic doctors, and psychologists.

[1] Order of the Government of the Russian Federation dated October 22, 2022, No. 3116-r. Access mode: http://publication.pravo.gov.ru/Document/View/0001202210240020.

[2] Order of the Government of the Russian Federation dated February 22, 2023, No. 447-r. Access mode: http://publication.pravo.gov.ru/Document/View/0001202302220041?index=1&rangeSize=1.

[3] Order of the Ministry of Health of the Russian Federation dated October 28, 2022, No. 707 "On approval of qualification requirements for medical and pharmaceutical workers with higher education in the field of training "Healthcare and Medical Sciences" (Registered with the Ministry of Justice of Russia on October 23, 2015, N 39438) Access mode: https://miacugra.ru/meditsinskim-rabotnikam/pr707n08102015.pdf.

Table 1. Age distribution of the examined children by region

Age groups	Total	DPR	LPR	ZR	KR
0–17 years, thousand people	337.8	145.7	135.8	36.8	19.4
0–17 years, %	100.0	41.1	42.9	10.9	5.1
0–4 years, %	9.6	13.5	13.0	8.6	7.5
0–14 years, %	80.9	84.8	82.1	86.2	83.4
10–14 years, %	42.3	41.9	41.0	43.3	44.8
15–17 years, %	19.1	15.2	17.9	13.8	16.6

Examinations were performed directly in organized groups in schools, kindergartens, secondary vocational educational institutions (colleges, technical schools, and training schools), and outpatient medical organizations.

From November 2022 to May 2023, mobile teams of the National Medical Research Center for Children's Health (hereinafter referred to as mobile teams) and local regional teams (specialists from new territories) examined 337,802 children aged 0–17 years, including 159,438 boys (52.8%) and 142,527 girls (47.2%). Moreover, most of the children lived in the DPR (41.1%) and LPR (42.9%). Pediatric patients from ZR (10.9%) and KR (5.1%) accounted for a smaller proportion (Table 1). Among those examined, children aged 0–14 years predominated (80.9%), and adolescents aged 15–17 years accounted for 19.1%. The age structure of pediatric patients who underwent preventive medical examinations was comparable across the territories (p >0.05).

The diseases of pediatric patients were diagnosed using the International Statistical Classification of Diseases and Related Health Problems, 10th revision[4]. The routing algorithm for pediatric patients with somatic and surgical pathologies is presented in Fig. 1.

To automate the collection of data from the results of preventive examinations, which work offline, programs have been developed and implemented (application "Preventive examinations"[5]). With the use of such software, primary data are entered, and a network client–server application allows data entry in the presence of a local computer network. It is also a server for consolidating data received from stand-alone applications. This greatly contributes to the formation of consolidated reporting in the coordination center of the National Medical Research Center for Children's Health of the Russian Ministry of Health.

Study design

A prospective, cross-sectional, observational study.

Compliance criteria

Children aged 0–17 years.

Conditions

This study was conducted by specialists from the National Medical Research Center for Children's Health of the Russian Ministry of Health under the auspices of the Ministry of Health of the Russian Federation. Preventive examinations of pediatric patients were performed only for residents of the newly annexed territories LPR, DPR, ZR, and KR.

Study duration

From November 1, 2022, to May 31, 2023.

Description of medical interventions

Depending on the age and indications, the pediatric patients were examined by a pediatrician, a neurologist, a dentist, an otorhinolaryngologist, an ophthalmologist, a pediatric urologist–andrologist (for boys), an obstetrician–gynecologist (for girls), a pediatric cardiologist, an endocrinologist, an orthopedic traumatologist, and a psychiatrist/psychologist. In addition to the examination, specialists performed a general blood test (blood is sampled from a finger), general urinalysis, ultrasonography of the abdominal organs and heart, and electrocardiography.

Research main outcome

The target for achieving the goal was to cover at least 321 thousand pediatric patients with preventive examinations.

Ethical considerations

Protocol of ethical committee No. 7 of July 14, 2023 (favorable opinion).

Statistical analysis

Principles for sample size calculation. The sample size was not precalculated.

Methods of statistical data analysis. Mathematical processing of the obtained data was performed using variation statistics methods. To assess the statistical significance of the differences, the parametric Student's test was used. The results were processed using Statistica v. 6.1 and Microsoft Office Excel 2010.

[4] International Statistical Classification of Diseases and Related Health Problems, 10th Revision (short version). 1999. Access mode: https://normativ.kontur.ru/document?moduleId=1&documentId=71591.

[5] A.A. Mitrokhin, V.I. Smirnov, D.N. Kapilyushny et al. Certificate of state registration of a computer program No. 2023614720, Russian Federation. Preventive Examinations, No. 2023610880, appl. 01/20/2023, publ. 03/03/2023; applicant National Medical Center for Children's Health of the Ministry of Health of the Russian Federation. Access mode https://elibrary.ru/item.asp?id=50427150.

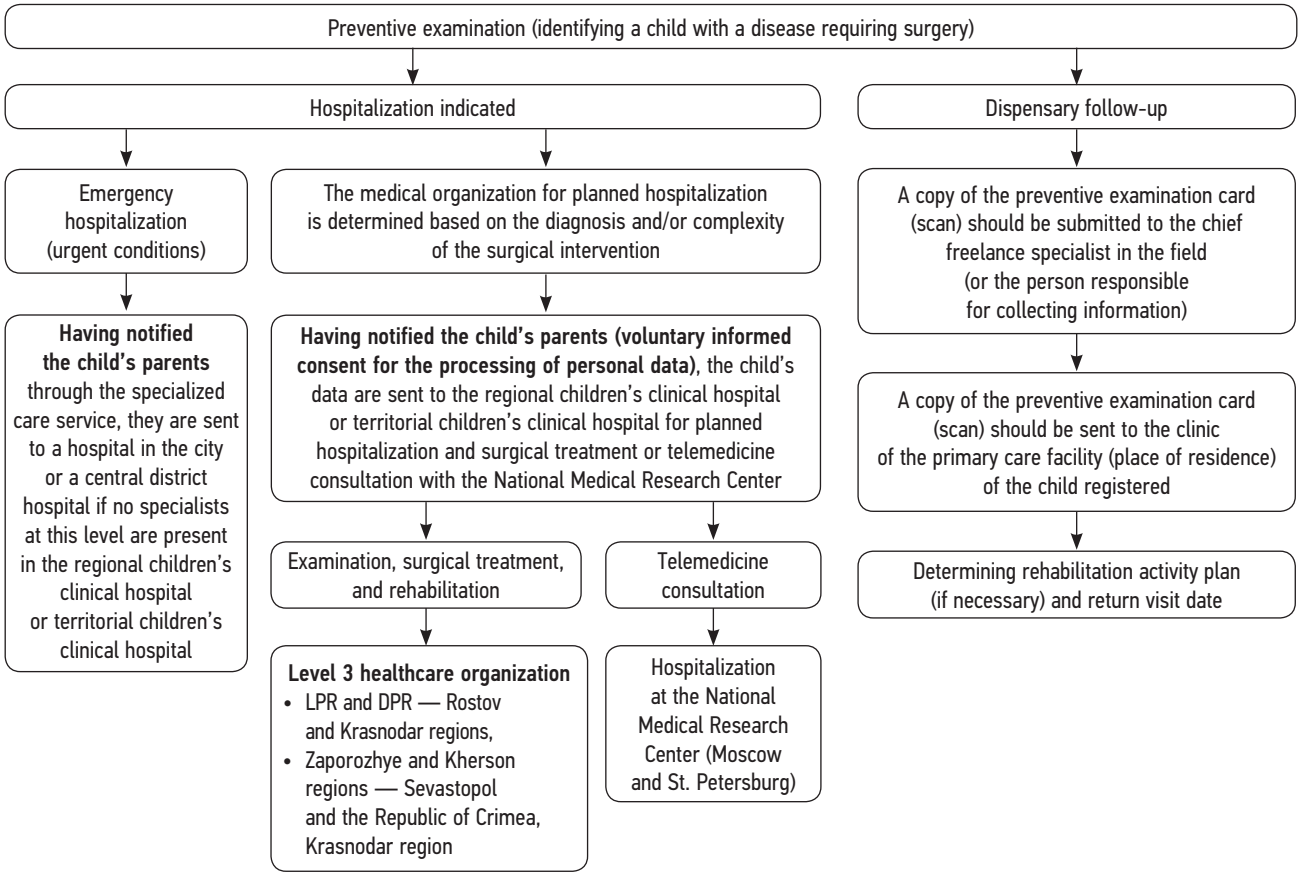


Fig. 1. Routing algorithm for children with somatic and surgical pathologies. LPR — Luhansk People's Republic, DPR — Donetsk People's Republic.

RESULTS

In these territories with preventive medical examinations, 95.9% of the pediatric populations were covered (DPR, 99.4%; LPR, 95.9%; ZR, 85.7%; and KR, 90.5%).

Because of preventive medical examinations, more than half of the pediatric patients (55%) were diagnosed with the disease for the first time. Regarding general morbidity, the first ranking places were occupied by musculoskeletal (18.4%) disorders; endocrine, nutritional, and metabolic disorders (17.3%); and diseases of the eye and its appendages (16.4%) (Fig. 2). Nervous, respiratory, mental, and behavioral disorders were quite common.

Musculoskeletal diseases were mainly represented by spinal deformities (kyphosis, lordosis, and scoliosis) in 26.2% of cases. Among endocrine, nutritional, and metabolic disorders, obesity (32.9%) and malnutrition (13.3%) accounted for a large proportion. Cases of diabetes mellitus (0.4%), delayed puberty (0.3%), and precocious puberty (0.4%) were also recorded.

Among nervous disorders, cerebral palsy and other paralytic syndromes accounted for only 0.6%, and regarding mental and behavioral disorders, mental retardation accounted for 4.8%. Asthma and status asthmaticus accounted for 2.5% of respiratory diseases.

Congenital anomalies (malformations), deformities, and chromosomal disorders were mainly represented by congenital, musculoskeletal (32.3%), and circulatory (32.0%) anomalies. Genital organs malformations were also common (10.9%).

Among less common pathologies, such as blood and hematopoietic organ diseases and certain disorders involving the immune mechanism, nutrition-related anemia accounted for a significant proportion (41.2%).

A comparative analysis showed that in all new territories of the Russian Federation, despite the existing differences, diseases of the same five classes according to ICD-10 prevailed, namely, musculoskeletal diseases; endocrine, nutritional, and metabolic diseases; diseases of the eye and its adnexa; digestive, nervous, respiratory diseases; and mental and behavioral disorders (Fig. 3).

Based on the results of preventive examinations, health group indicators and medical group indicators for physical education were determined for all pediatric patients (Fig. 4). The proportion of children in health group I was higher than that in Russia, which, from our point of view, is due to the cohort of the pediatric population that was included in in-depth preventive examinations; they were relatively healthy children attending preschool, school, and secondary vocational educational institutions. The high proportion of

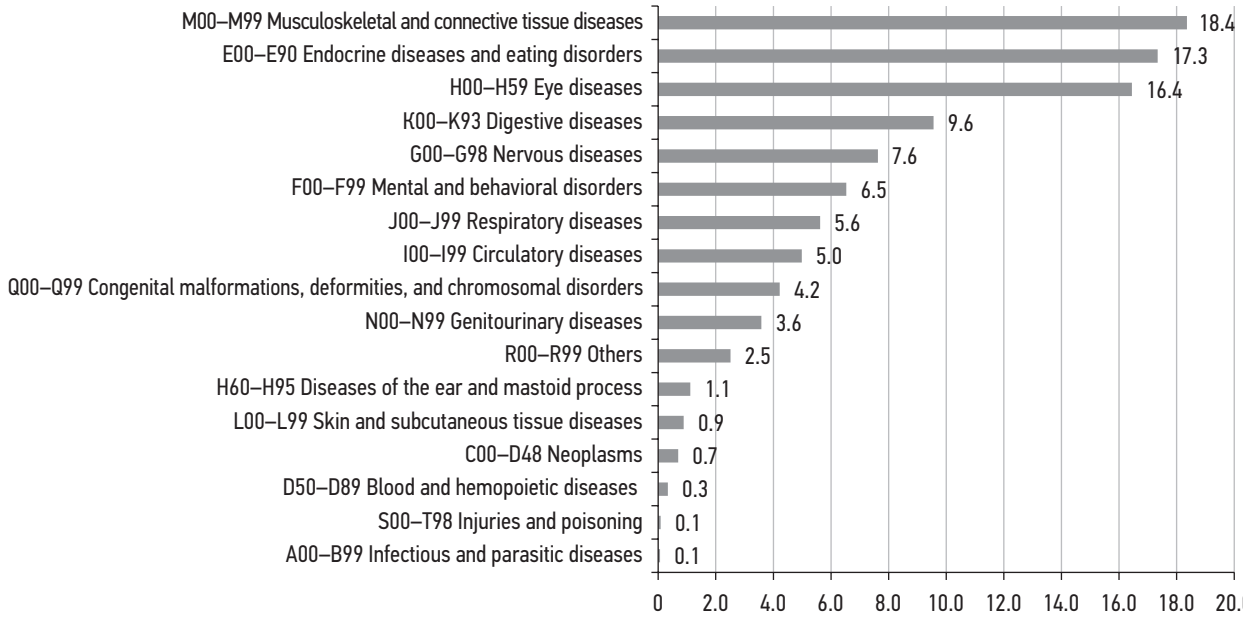


Fig. 2. Causes of the general morbidities detected during preventive medical examinations of the pediatric population of the new territories of the Russian Federation (%).

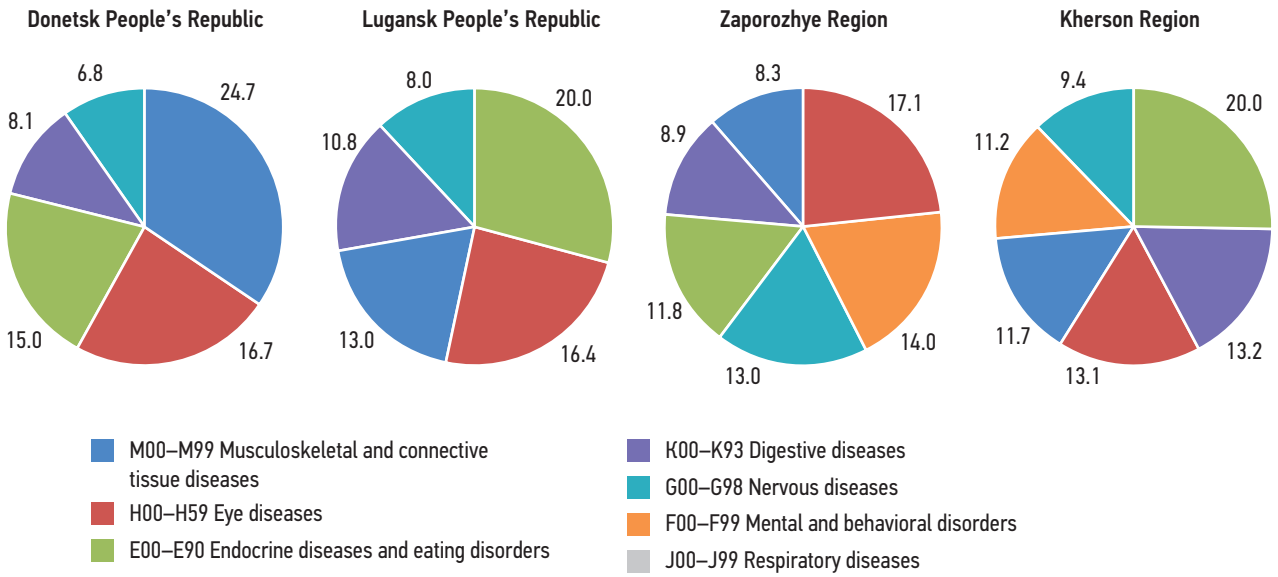
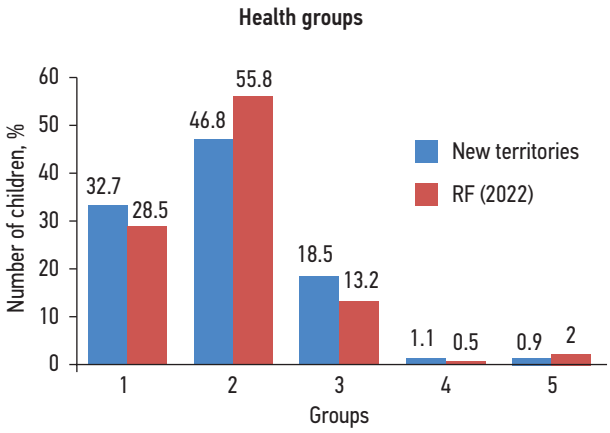


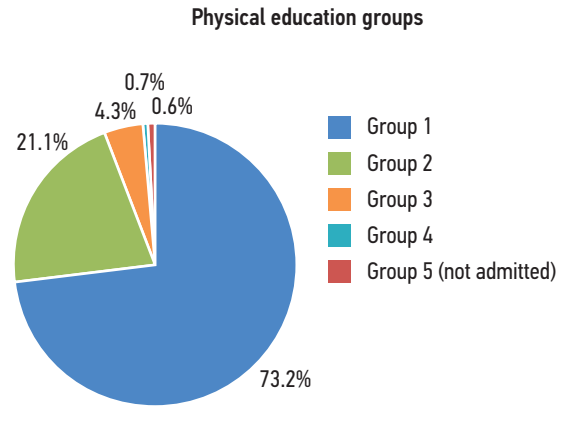
Fig. 3. Causes of the general morbidities detected during preventive medical examinations of the pediatric population in certain new territories of the Russian Federation (%).

pediatric patients in health group III is precisely determined by the higher detection rate of diseases because of the involvement of specialized experts in teams compared with the standard algorithm for conducting preventive medical examinations.

Based on the distribution by health groups and considering the level of physical development and health characteristics (established diagnoses), a physical education group was determined, followed by the formation of physical training programs (by coaching or teaching staff). With regard to medical groups for physical education, a similar pattern can be traced as with health groups, where physical education group I included pediatric patients with health groups I and II, which accounted for <70%. In general, across all territories and in each individual entity, the distribution of pediatric patients into health groups and medical groups for physical education was equal and showed a direct correlation.

To increase the efficiency of the work of teams of specialists, increase the availability of instrumental diagnostics (ECG and US diagnostics), and provide





Health groups	LPR	DPR	ZR	KR
Group 1	31.9	29.3	38	56.4
Group 2	47.5	48.2	47.3	29.9
Group 3	18.7	20.7	13.4	9.5
Group 4	1.1	0.9	0.6	2.9
Group 5	0.8	0.9	0.7	1.3

Physical education groups	LPR	DPR	ZR	KR
Group 1	73.4	71.4	78.6	82.6
Group 2	20.3	23.2	17	13.2
Group 3	4.9	4.0	3.2	3.5
Group 4	0.8	0.7	0.3	0.2
Group 5 (not admitted)	0.6	0.7	0.9	0.5

Fig. 4. Distribution of children by health groups and medical groups for physical education.

technical support for work processes, vehicles equipped with ultrasound units with all the necessary sensors, ECG machines, medical furniture, and auxiliary products were supplied in new territories of Russia on November 15, 2022.

Programs (applications) to automate the data collection process from the results of preventive examinations for use in the offline mode, where primary data were entered, were developed and implemented. A network client–server application was used, and it allows data entry in the presence of a local computer network, which is a data-consolidation server, received from autonomous applications, and the server for preparing and generating consolidated reporting in the coordination center of the National Medical Research Center for Children's Health of the Ministry of Health of Russia. The software can be used to collect primary data and control both by the curator of the territory and specialists of the National Medical Research Center for Children's Health of the Russian Ministry of Health.

According to the examinations performed, 2,504 pediatric patients were referred for telemedicine consultations with federal centers (Fig. 5). Telemedicine consultations were

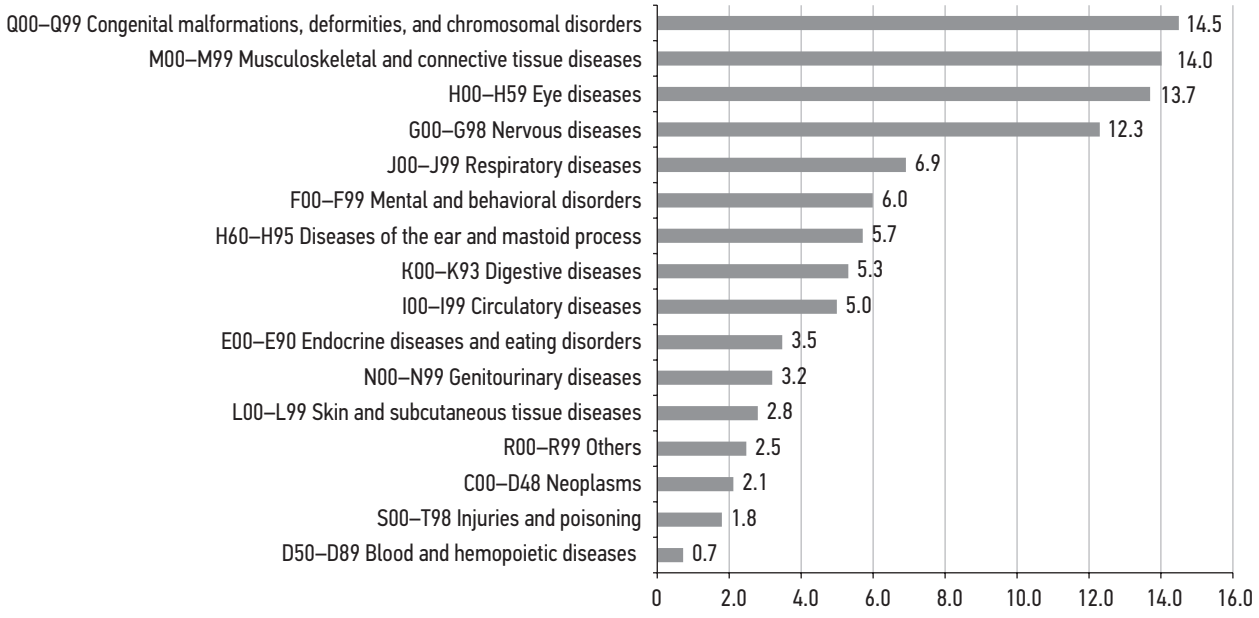


Fig. 5. Rank distribution of the morbidity causes when there is a need for telemedicine counseling (%).

conducted with the National Medical Research Center for Children's Health of the Ministry of Health of Russia, V.I. Shumakov National Medical Research Center for Transplantology and Artificial Organs of the Ministry of Health of Russia, A.I. Herzen Russian State Pedagogical University, V.I. Kulakov National Medical Research Center of Obstetrics, Gynecology and Perinatology of the Ministry of Health of Russia, Dmitry Rogachev National Medical Research Center for Pediatric Hematology, and Oncology and Immunology of the Ministry of Health of Russia. According to operational data, the following telemedicine consultations were performed after the completion of the examination of pediatric patients at the regional level. In addition, 117 children already at the time of completion of preventive examinations received specialized, including high-tech, care in federal medical centers.

Based on the results of an in-depth preventive examination, more than 114 thousand children were transferred under dispensary observation, which amounted to 38% of the total number of those examined. Examination and treatment in a hospital setting were recommended in approximately 12 thousand pediatric patients (10.8%), and elective surgical treatment was indicated for more than 7.5 thousand pediatric patients (61.4%). More than 2.5 thousand children were treated by regional medical organizations.

Specialists of the НМИЦ здоровья детей of the Ministry of Health of Russia have compiled lists of pediatric patients who were transferred to the territorial executive authorities to protect the health of citizens for further work (registration at a dispensary, referral for hospitalization, preparation of documents for telemedicine consultation, etc.).

Cases that require emergency and urgent measures in a hospital setting need attention. During the examinations, 10 pediatric patients were referred to the hospital with emergency indications, such as bleeding, ulcerative lesions of the upper gastrointestinal tract, decompensated diabetes mellitus, and grade III atrioventricular block. Fifteen pediatric patients were hospitalized for urgent indications, such as juvenile rheumatoid arthritis, severe anemia, congenital heart disorders, endocrine diseases, and neoplasms.

Regarding mental illness, groups were allocated to organize the subsequent routing of pediatric patients. Thus, with signs of mental maladjustment without clinical manifestations of mental and behavioral disorders, psychocorrective work was conducted by a medical psychologist from a medical organization. Children in a state of psychological crisis with a risk of poststress disorders and in need of assistance from medical psychologists and psychotherapists were referred to specialized medical organizations (psychiatric/psychotherapeutic), to receive medical care in an inpatient setting. In cases of acute or chronic mental disorders, if there was a need for case follow-up and medical care by a psychiatrist, as well as borderline mental and behavioral disorders requiring psychotherapeutic assistance, psychosocial rehabilitation, and secondary psychoprophylaxis, pediatric patients were referred to a medical organization providing medical care on psychiatry.

DISCUSSION

We have not found similar works in the literature. Thus, a comparison was made with the data of federal statistical monitoring for the Russian Federation in 2022, form No. 12 "Information on the number of diseases registered in patients living in the service area of a medical organization" and form No. 30 "Information about a medical organization."

According to the statistical age groups, the distribution of the pediatric population in all four territories was nearly identical to Russian data. Thus, the largest proportion (>80%) of pediatric patients belonged to the group aged 0–14 years. In addition, some differences such as a smaller proportion of pediatric patients aged 0–4 years and a large (nearly 1.5 times) proportion in the group aged 10–14 years compared with Russian Federation data were noted.

Federal statistical monitoring data (2022) show that the structure of the general morbidity rate of the pediatric population (aged 0–17 years) of the new territories mainly corresponds to the Russian average. Note that the first ranking places were occupied by diseases of the same classes. The only difference was that in the new territories of the Russian Federation, instead of respiratory diseases, endocrine diseases were common, and in the arrangement of diseases by ranking. Thus, if in the Russian Federation, they were arranged in descending order of importance as follows: diseases of the digestive organs, the eye and its appendages, respiratory organs, musculoskeletal system, and nervous systems, then in the observed regions, these were diseases of the musculoskeletal system, endocrine system, eyes and its adnexa, digestive organs, and nervous system (Fig. 6).

In addition, during preventive medical examinations in the regions monitored, more children aged 0–17 years were registered at the dispensary, namely, 38% versus 24.1% on average for the Russian Federation (excluding new territories).

Thus, 95.9% of the pediatric population of these territories with preventive medical examinations was covered. Among those examined, pediatric patients aged 0–14 years predominated (80.9%). Half of the children (55%) were diagnosed with the disease for the first time. Among the general morbidity of the pediatric population of the new territories, diseases of the same five classes according to ICD-10 prevailed, namely, musculoskeletal diseases; endocrine, nutritional, and metabolic disorders; diseases of the eye and its appendages; digestive, nervous, respiratory organ disorders; and mental and behavioral disorders. The higher proportion of healthy children (with health group I) compared with the Russian average value is due to the inclusion of a cohort of the pediatric population who were relatively healthy children attending preschool, school, and secondary vocational educational institutions, and health group III was due to the higher detection of diseases

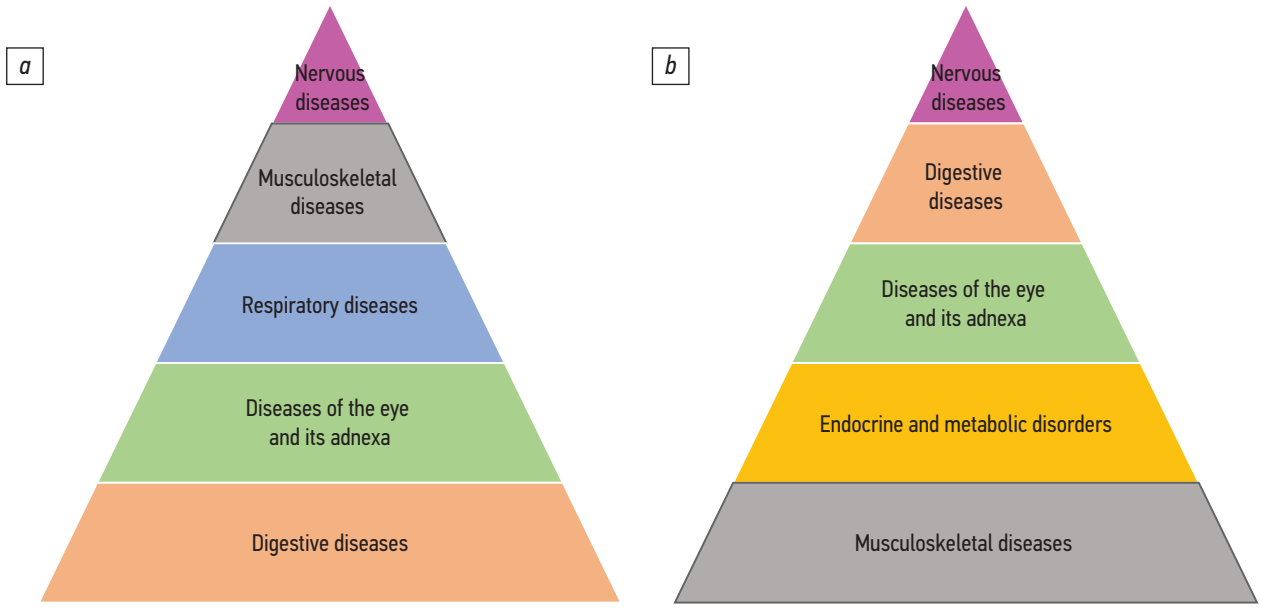


Fig. 6. Rank distribution of disease groups in new territories (*a*) and on average in Russia (*b*).

because of the advanced nature of the preventive medical examinations. As regards medical groups for physical education, a similar pattern can be noted for health groups.

CONCLUSION

Based on the results of an in-depth preventive examination, 38% of the total number of examined pediatric patients was transferred under dispensary follow-up. Examination and treatment in a hospital setting were recommended for 10.8% of the children examined, and planned surgical treatment was indicated for more than half of them (61.4%). Particular attention was paid to emergency and urgent cases requiring measures in a hospital setting and cases of mental disorders. The developed method for conducting preventive examinations in the format of in-depth medical examinations by mobile teams in organized children groups has proven to be effective. The results of in-depth preventive medical examinations can be used as the basis for subsequent diagnostic, treatment, and rehabilitation work performed by medical organizations, as well as preventive and health-improving activities implemented in educational institutions.

ADDITIONAL INFORMATION

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