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Somatic pathology in residents of Khanty-Mansi Autonomous Okrug – Yugra

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ABSTRACT

Aim. To study the 8-year dynamics of somatic pathology in residents of the Khanty-Mansi Autonomous Okrug – Yugra.

Materials and methods. The article analyzes the migration of the population of the Far North and the dynamics of the incidence of chronic non-infectious pathology among residents of territories equated to the Far North – the Khanty-Mansi Autonomous Okrug – Yugra, based on literature data and officially registered statistics for clinical and statistical groups for the period 2010–2017.

Results. The analysis revealed the leading groups of somatic pathology in the Khanty-Mansi Autonomous Okrug – Yugra. The indicators of population dynamics of the territories of the Far North of Russia were estimated.

Conclusions. The study identified patterns in different flows of the Russian population in and from the North, the incidence rate (defined by the leading group of diseases) and its dynamics, characteristic of the territories equated to the Far North. The obtained data make it possible to identify priority research areas aimed at analyzing the frequency of diseases of internal organs in the territories equated to the Far North, the features of their course and outcomes as well as to develop effective programs of primary and secondary prevention of these diseases.

Key words: Far North, morbidity, somatic pathology, metabolic syndrome, steatohepatitis, respiratory diseases, diseases of the digestive system, hypertension, coronary heart disease, opisthorchiasis.

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Соматическая патология у жителей Ханты-Мансийского автономного округа – Югры

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РЕЗЮМЕ

Цель. Изучение 8-летней динамики соматической патологии у жителей Ханты-Мансийского автономного округа – Югры (ХМАО – Югры).

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Материалы и методы. В статье проведен анализ миграции населения Крайнего Севера, изучена динамика заболеваемости хронической неинфекционной патологией у жителей территории, приравненной к Крайнему Северу, – ХМАО – Югры. Используются данные литературы и официально регистрируемой статистики по клинко-статистическим группам за период 2010–2017 гг.

Результаты. Выявлены лидирующие группы соматической патологии в Ханты-Мансийском автономном округе – Югре. Оценены показатели динамики населения территорий Крайнего Севера России.

Заключение. Полученные данные позволяют определить приоритеты для научных исследований, направленных на анализ частоты болезней внутренних органов на территориях, приравненных к Крайнему Северу, особенностей их течения и исходов, а также разработку эффективных программ первичной и вторичной профилактики этих заболеваний.

Ключевые слова: Крайний Север, заболеваемость, соматическая патология, метаболический синдром, стеатогепатит, болезни органов дыхания, болезни пищеварительной системы, артериальная гипертензия, ишемическая болезнь сердца, описторхоз.

Конфликт интересов. Авторы декларируют отсутствие явных и потенциальных конфликтов интересов, связанных с публикацией настоящей статьи.

Источник финансирования. Авторы заявляют об отсутствии финансирования при проведении исследования.

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INTRODUCTION

Health problems of the global population are caused by many factors, primarily genetic and environmental ones. If we are evaluating human health, it is important to understand the degree of influence of climatic and geographical factors (primarily, cold and increased geomagnetic activity); we also need to keep in mind the technogenic factors. Due to migration of the population to economically developed regions of the world and to the Far North and equivalent territories, it is necessary to control the state of health of the indigenous population and people coming from other geographical locations [1].

The northern territories occupy 20% of the globe, and in Russia, 7.4% of the population live in 11 northern regions (beyond the 60th parallel). [2] The growing interest in the Northern territories is primarily explained by abundance of mineral resources such as gas, diamonds, oil, etc., as well as by the rapidly developing mining industry.

Migration in most regions of the Far North and their equivalent territories is ambiguous. On the one hand, it happens due to complete or partial urbanization of the small indigenous minorities of the North, and on the other hand, due to relocation of the working-age population of the country from favorable climatic conditions of life to unfavorable and difficult ones to work in national and international corporations [2–4]. Migration processes are complex for both the first and the second categories of the population. In this regard, the processes of maladaptation of the human body are developing, and these processes

are characterized by tension and restructuring of homeostasis [4, 5]. The problem of human life in the northern latitudes is determined by survivability in extreme situations and the necessity to maintain good health in complex interactions with new technogenic, environmental, social, and psychological factors [3, 6, 7]. Change in the nature of nutrition plays a significant role, especially for the indigenous minorities of the North, who are accustomed to their culture and stereotypes that have developed over the centuries [1, 4, 7].

Taking into account the fact that the risk of developing internal organ diseases increases significantly in the North [7–10], it is extremely important to develop measures aimed at improving the quality of life and increasing the life expectancy of a person living in atypical and extreme conditions within the P5 paradigm of medicine [11, 12].

Clinical epidemiology, as a tool of evidence-based medicine, allows to objectively assess the situation with non-infectious pathology that dominates the structure of mortality and justify the measures for targeted correction of negative effects in high-risk groups [6, 12, 13].

The aim of this research was to carry out a comparative study of the parameters and structure of the most common somatic pathology in the residents of the Khanty-Mansi Autonomous Okrug – Yugra (KhMAO – Yugra).

MATERIALS AND METHODS

Demographic parameters and incidence rates of the residents of KhMAO – Yugra have been analyzed

using a continuous sampling method during an 8-year period, from 2010 to 2017. We took the data on the size and migration of the Russian population [14] from official statistics and collections prepared by the Department of Monitoring, Analysis, and Strategic Development in Healthcare of the Ministry of Health of the Russian Federation. The data were also provided by the Federal Research Institute for Health Organization and Informatics of the Ministry of Health of the Russian Federation. The clinical and statistical groups were formed on the basis of official reporting statistics forms No. 12 “Information about the number of diseases registered in patients living in the area of examination of the medical institution” and No. 14 “Information about the hospital activities”.

The dynamics of the most important morbidity parameters was analyzed, including long-term annual average values for somatic systems of organs. The study was conducted as part of the research topic of

the Department of Internal Medicine of Surgut State University, approved on 24.06.2019. The initiative theme of the R&D No. AAAA-A19-119062490051-6 “Predictors of the genesis, course and outcome of chronic and comorbid diseases” was registered in the Unified State Information System for Recording the Results of Research, Developments and Technological Works.

RESULTS AND DISCUSSION

Analysis of the dynamics of migration flows from central Russia to the northern regions and migration flows from them allows to assess the demographic situation in the country (Table 1). As of 01.01.2018, 146, 880, 432 residents lived in the Russian Federation.

9, 920, 891 people lived in 26 regions of the Far North and the territories equated to them, which is 6.75% of the whole population of the country or every 14th-15th resident (Table 1).

Table 1

The number of inhabitants and migration trends in the territories of the Far North and areas equated to them in 2018*					
№	Region	Population as of 01.01.2018	Total growth	Natural growth	Migration growth
Regions of the Far North and areas equated to them, in total		9, 920, 891	-37, 895	12, 975	-50, 870
1	Altai Republic	30, 762	213	446	-233
2	Republic of Buryatia	94, 897	-1, 283	120	-1, 403
3	Republic of Karelia	622, 484	-4, 428	-3, 108	-1, 320
4	Komi Republic	840, 873	-10, 638	-1, 362	-9, 276
5	Sakha Republic	964, 330	2, 679	5, 619	-2, 940
6	Tyva Republic	321, 722	2, 701	3, 681	-980
7	Zabaikalsky Krai	21, 041	-440	-13	-427
8	Kamchatka Krai	315, 557	-834	-132	-702
9	Krasnoyarsk Krai	439, 276	-133	1, 201	-1, 334
10	Perm Krai	28, 387	-393	-77	-316
11	Primorsky Krai	99, 173	-1, 676	-687	-989
12	Khabarovsk Krai	515, 285	-5, 610	-2, 064	-3, 546
13	Amur Oblast	94, 690	-1, 380	-297	-1, 083
14	Arkhangelsk Oblast including the Nenets Autonomous Okrug	1, 155, 028	-10, 909	-3, 816	-7, 093
15	Nenets Autonomous Okrug	43, 997	-168	224	-392
16	Arkhangelsk Oblast without the Autonomous Okrug	1, 111, 031	-10, 741	-4, 040	-6, 701
17	Irkutsk Oblast	534, 792	-6, 712	-1, 772	-4, 940
18	Magadan Oblast	144, 091	-2, 857	-194	-2, 663
19	Murmansk Oblast	753, 557	-5, 501	-1, 099	-4, 402
20	Sakhalin Oblast	490, 181	-543	-219	-324
21	Tomsk Oblast	192, 620	-2, 120	-190	-1, 930
22	Tyumen Oblast including the Autonomous Okrug	2, 212, 797	11, 654	16, 860	-5, 206
23	Khanty-Mansi Autonomous Okrug – Yugra	1, 655, 074	8, 721	12, 145	-3, 424

Table 1 (continued)

24	Yamalo-Nenets Autonomous Okrug	538, 547	2, 932	4, 667	–1, 735
25	Tyumen Oblast without the Autonomous Okrug	19, 176	1	48	–47
26	Chukotka Autonomous Okrug	49, 348	315	78	237

*http://www.rosstat.gov.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1140096034906

Official data from Rosstat show that in 25 out of 26 regions mainly negative migration statistics was revealed, and only 12 regions had positive dynamics with natural population growth. Having analyzed the migration processes in 11 regions of the Far North, it can

be noted that 10 of them have outflow of the population. In 2018 alone, 271, 384 people arrived in the Far North of Russia and 305, 382 people left it, so the migration loss of the population in this year was 33, 998 people in 10 out of 11 regions (table 2).

Table 2

Dynamics of migration of the population in the Far North regions in 2018*				
№	Region	Number of immigrants (n =)	Number of emigrants (n =)	Dynamics %
1	Republic of Karelia	22, 161	23, 331	–1.05
2	Komi Republic	31, 695	40, 484	–1.28
3	Nenets Autonomous Okrug	2, 309	2, 566	–1.11
4	Murmansk Oblast	35, 460	39, 866	–1.12
5	Khanty-Mansi Autonomous Okrug -Yugra	66, 390	72, 549	–1.09
6	Yamalo-Nenets Autonomous Okrug	30, 549	34, 211	–1.12
7	Tyva Republic	12, 307	13, 406	–1.09
8	Sakha Republic	39, 226	44, 404	–1.13
9	Magadan Oblast	6, 629	8, 707	–1.31
10	Sakhalin Oblast	19, 383	20, 769	–1.07
11	Chukotka Autonomous Okrug	5, 275	5, 089	+1.04
Total		271, 384 people	305, 382 people	–33, 998 people

*http://www.rosstat.gov.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1140096034906

In 2018, the Sakhalin Oblast, KhMAO – Yugra and the Republic of Tyva were the most attractive of the 11 Northern territories of Russia, with 1.07% – 1.09% of the population leaving them (Table 2). The largest number of migrant's returns was registered in the Republic of Komi – 8, 789 people, or 1.28% , and the lowest – in the Chukotka Autonomous Okrug, from which only 186 people left (+1.04%).

As of 01.01.2018 and 01.01.2019, KhMAO – Yugra had 1, 655, 074 and 1, 663, 795 residents, respectively, so the total population growth was 1.5%. As of 01.01.2019, 1.14% of the total population of Russia lived in KhMAO – Yugra. The population of this region is primarily young, aged 34–39 years.

Due to the common climate, geographical and environmental characteristics of all northern territories, the results of the study on epidemiological indicators in one of them can be extrapolated to all northern territories

of the Russian Federation and the globe. At the same time, human life expectancy in the North is very important, since people migrating to other climatic territories are initially burdened with chronic somatic diseases [3].

In KhMAO – Yugra, the mortality rate is generally lower than in other regions of the country, but among working age population it reaches 73.5% of the total number of deaths, which necessitates a detailed study of the causes of this situation and development of measures for practical healthcare [3, 9, 13].

Studying the officially registered morbidity rates in Russia and in the territories of the Tyumen Oblast and KhMAO – Yugra, we obtained the following data. According to the long-term annual average indicators of the general morbidity of the population, KhMAO – Yugra parameters did not differ from the all-Russian ones (Fig.1). However, in the North, there was a progressive increase in the morbidity of the population despite their

young age (Fig. 2). The total morbidity of the population in KhMAO – Yugra is 10.7% – 10.5% higher than the morbidity rate of the population in the Ural Federal District (UrFD) and the Tyumen Oblast, excluding KhMAO – Yugra (Fig. 1).

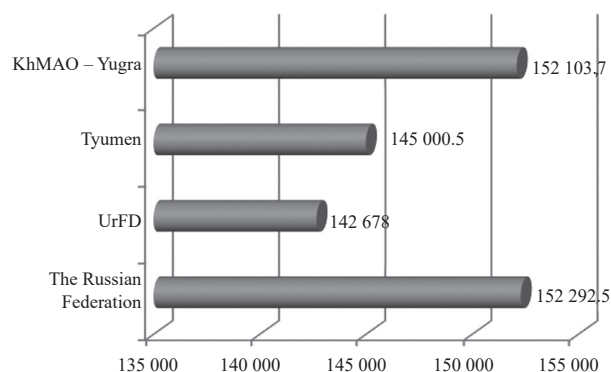


Fig. 1. Weighted average indicators of general morbidity of the population for the period 2010–2018 (per 100,000 population)

Regional indicators of morbidity were compared with indicators throughout Russia, in the UrFD and the Tyumen Oblast, without taking into account the population of KhMAO – Yugra. During the analysis of the health status of the population of KhMAO – Yugra, we identified the following facts (Fig. 1 – 2).

Over the course of eight years, the long-time annual average rates of morbidity per 100,000 population in the compared territories varied from 142,678 to 152,292.5 [5]. The overall morbidity of the young population in KhMAO – Yugra did not differ much from the national average value. The morbidity was 9,425.7 higher than in the UrFD and 7,103.2 higher than in the Tyumen Oblast (Fig. 1). In addition to the highest morbidity rates in KhMAO – Yugra, it had progressive growth rates, compared with the general morbidity in the Russian Federation (Fig. 1).

Amongst somatic pathologies, the leading ones are diseases of the respiratory, cardiovascular, digestive and endocrine systems, which is confirmed by the literature [2].

Despite the young age of KhMAO – Yugra population, respiratory diseases in the region have prevailed over similar indicators throughout Russia since 2010, apart from indicators in the Tyumen Oblast and the Ural Federal District with an annual progressive increase starting in 2013 (Fig. 2).

In KhMAO – Yugra, the incidence of cardiovascular diseases is the lowest in comparison with other regions and Russia on the whole. The fluctuations in new cases of cardiovascular diseases in different years was registered (Fig. 3).

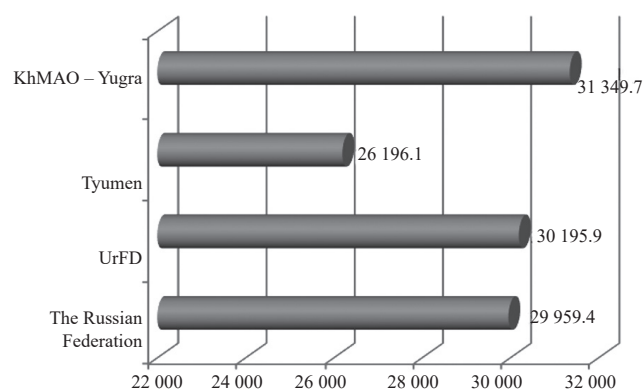


Fig. 2. Weighted average morbidity rates for the period 2010–2018 (pathology of the respiratory system per 100,000 population)

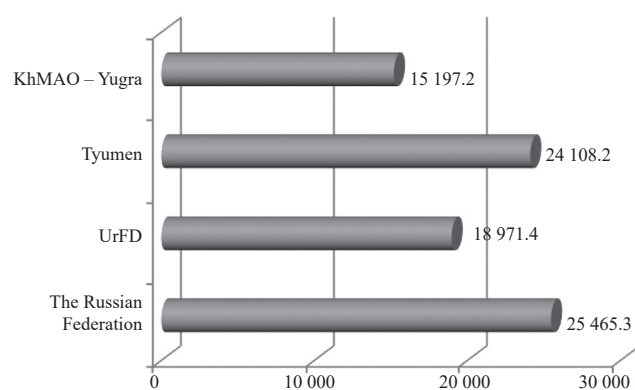


Fig. 3. Weighted average morbidity rates for the period 2010–2018 (pathology of the cardiovascular system per 100,000 population)

The pathology of the cardiovascular system is predominantly represented by arterial hypertension and coronary heart disease. Non-coronarogenic myocardial diseases, pericarditis and acute rheumatic fever are less common, but there is high prevalence of atherosclerosis of various localizations and infectious endocarditis officially registered in other groups of pathologies.

The pathology of the digestive system is much more common in KhMAO – Yugra than in the Ural Federal District and the Tyumen Oblast (Fig. 4) and also has progressive growth rates (Fig. 4). This may be explained by the widespread prevalence of opisthorchiasis in the Ob – Irtysh basin [14]. Moreover, the increase in the incidence of steatohepatitis, cardiovascular pathology in view of the cardiovascular disease continuum and hypertension, which form the paradigm of the metabolic syndrome [15], is confirmed by the dynamics of the incidence of type 2 diabetes and obesity in KhMAO – Yugra (Fig. 5)

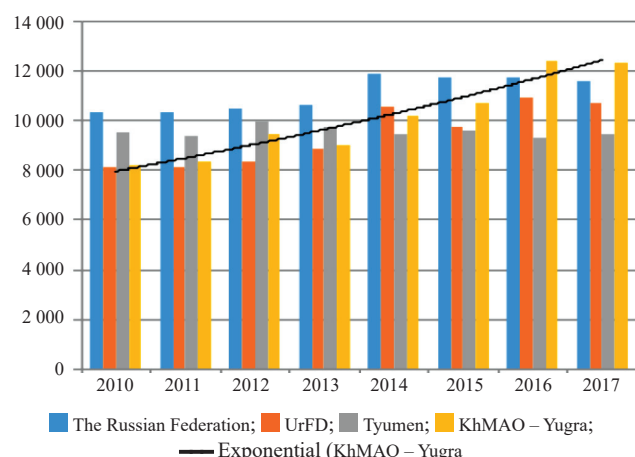


Fig. 4. 8-year dynamics of morbidity rates in KhMAO – Yugra and other regions of Russia (pathology of the digestive system per 100, 000 population)

The incidence of type 2 diabetes in the Ural Federal District and the Tyumen Oblast is higher than in Russia on the whole, which may serve as a marker of the metabolic syndrome of residents of the Cisurals, the North and territories equated to it.

Obesity is equally common in the Ural Federal District, in the Far North and in the Tyumen Oblast, but the number of obese people in these territories is still higher than in the rest of Russia (Fig. 6). This indicator characterizes

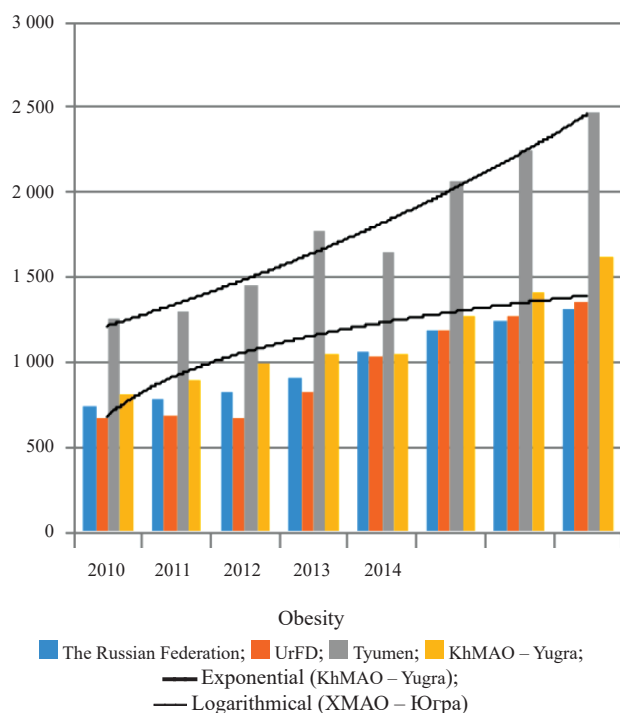


Fig. 6. 8-year dynamics of morbidity rate of obesity in the population of KhMAO – Yugra (per 100, 000 population)

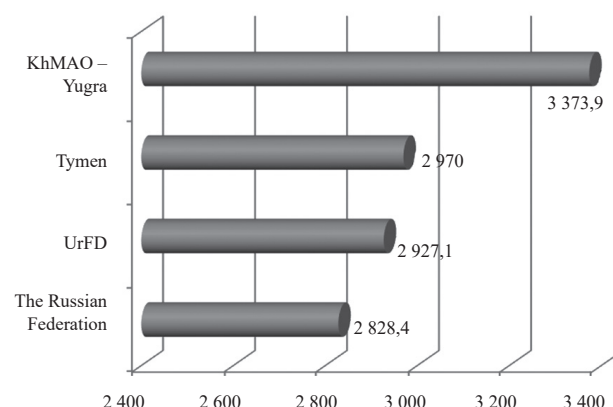


Fig. 5. Weighted average incidence of type 2 diabetes for the period 2010–2018 (per 100, 000 population)

the progressive growth of the disease among residents of the Tyumen Oblast and KhMAO – Yugra, despite young working age population and large migration flows, which can be seen from the data on trend lines.

Thus, in the Khanty-Mansi Autonomous Okrug – Ugra with minimal outflow of the population only in 2018, young age of residents and morbidity parameters comparable with the all-Russian ones, an increase in metabolic disorders is recorded, primarily of obesity and type 2 diabetes.

CONCLUSION

We have analyzed the morbidity of the main classes of internal organ pathologies in people living in the economically developed territories of Russia, which are equated to the Far North. KhMAO – Yugra attracts the largest number of migrants from all over the country, while the smallest number of people leaves the district. The region has the highest and progressing morbidity of respiratory diseases and pathologies forming the metabolic syndrome – diabetes and obesity. In KhMAO – Yugra, the largest number of patients suffer from type 2 diabetes, obesity and digestive diseases, in particular, steatohepatitis.

REFERENCES

1. Karpin V.A., Gudkov A.B., Usynin A.F., Stolyarov V.V., Shulenin K.S. The impact of territorial heterogeneity of the earth's crust on the morbidity of residents of the Northern urbanized territory. *Human Ecology*. 2018; 12: 10–16 (in Russ.).
2. Zaychenko I.M., Ishchenko E.A. Human resources analysis of The Far North Regions. *Russia in the Global World*. 2016; 9 (32): 232–241 (in Russ.).
3. Pisareva L.F., Lyakhova N.P., Odintsova I.N., Perinov D.A.,

- Chemitdorzhieva T.N., Shukhova Y.A. Demographic characteristics of the Republic of Buryatia. *Bulletin of Siberian Medicine*. 2015; 14(3): 23–29 (in Russ.). DOI: 10.20538/1682-0363-2015-3-23-29.
4. Ananenko A.G., Stavkin G.P., Andreev O.P. Social aspects of technical regulation of rotational shift work in the Far North. Moscow: Nedra Publ., 2005: 256 (in Russ.).
 5. Aleksandrova G.A. Russian Statistical Year Book 2018. Moscow, 2018: 694 (in Russ.). <https://www.rosminzdrav.ru/ministry/61/22/stranitsa-979/statisticheskie-i-informatsionnye-materialy/statisticheskiy-sbornik-2017-god>.
 6. Ershov E.V., Babenko A.I., Ponich E.S., Khasnulin V.I. Health monitoring system of gas production enterprise workers in the Far North. *Bulletin of SB RAMS*. 2008; 2 (130): 57–62 (in Russ.).
 7. Foukal P., North G., Wigley T. Climate. A stellar view on solar variations and climate. *Science*. 2004; 306(5693): 68–69. DOI: 10.1126/science.1101694.
 8. Kladoy S.Y., Konobeyevskaya I.N., Karpov R.S. Alcohol and premature death rates of the population of Tomsk Region. *Bulletin of Siberian Medicine*. 2010; 9(1): 126–129 (in Russ.). DOI: 10.20538/1682-0363-2010-1-126-129.
 9. Lutsenko M.T., Pirogov A.B. Chronic lung diseases in the North of Russia. *Fundamental Research*. 2012; 4(1): 74–79 (in Russ.).
 10. Zenchenko T.A., Dimitrova S., Stoilova I., Breus T.K. Individual types of reactions of arterial pressure in practically healthy people to geomagnetic activity. *Clinical Medicine*. 2009; 4: 18–24 (in Russ.).
 11. Nikitin Yu.P., Khasnulin V.I., Gudkov A.B. Modern problems of northern medicine and efforts of scientists to solve them. *Bulletin of Arctic Federal University. Series: Biomedical Sciences*, 2014; 3: 63–72 (in Russ.).
 12. Khasnulin V.I., Artamonova M.V., Khasnulin P.V. Real state of health of inhabitants of high latitudes in unfavorable climatogeographic conditions of the Arctic and data of official health statistics. *International Journal of Applied and Fundamental Research*. 2015; 9: 68–73 (in Russ.).
 13. Darenskaya M.A., Kolesnikova L.I., Rychkova L.V., Grebenkina L.A., Khramova E.E., Kolesnikov S.I. Indicators of the metabolic status of tofalar teenagers, representatives of small indigenous ethnoses of Eastern Siberia. *Bulletin of Siberian Medicine*. 2018; 17(2): 31–40 (in Russ.). DOI: 10.20538/1682-0363-2018-2-31-40.
 14. Fedorova O.S., Kovshirina Y.V., Kovshirina A.E., Fedotova M.M., Deev I.A., Petrovskiy F.I., Filimonov A.V., Dmitrieva A.I., Kudryakov L.A., Saltykova I.V., Михалев Е.В., Odermatt P., Ogorodova L.M. Analysis of *Opisthorchis felinus* infection and liver and intrahepatic bile duct cancer incidence rate in the Russian Federation. *Bulletin of Siberian Medicine*. 2016; 15(5): 147–158 (in Russ.). DOI: 10.20538/1682-0363-2016-5-147-158.
 15. Golovach E.A., Fedorova O.S., Saprina T.V., Ivanov V.V., Perina E.A., Kovshirina Y.V., Ogorodova L.M. Metabolic syndromes, carbohydrate and lipid metabolism disorders in helminthic infections: review of the literature. *Bulletin of Siberian Medicine*. 2018; 17(4): 187–198 (in Russ.). DOI: 10.20538/1682-0363-2018-4-187-198.

Authors contribution

Verizhnikova L.N. – design and interpretation of data. Aryamkina O.L. – verification of intellectual content, final approval of the article for publication. Terentyeva N.N. – design and interpretation of data.

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