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Human Health in the Arctic: Socio-Spatial Discourse (Case Study of the Yamalo-Nenets Autonomous Okrug)*

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Abstract. The purpose of the research presented in the article is to study the attitude of various social groups of residents of the Far North – the Arctic zone of the Russian Federation to health, taking into account extreme natural and climatic conditions. Geospatial conditions are imposed by the socio-spatial vector of development of the Russian Arctic, which should coordinate neo-industrial development of certain parts of this territory, the formation of a new transport and logistics system, and the reproduction of the agro-industrial complex. There are groups of actors in each of the identified areas, who carry out their activities in the Arctic territories on a permanent or temporary basis, which makes the northerners' health issues highly specific and requiring a comprehensive analysis, including the sociological one. The scientific novelty of the research and its results presented in the article consists in a combination of geo- and socio-spatial approaches to studying the attitude to health among various social groups of northerners, and analysis of their specifics in Arctic conditions. The Yamalo-Nenets Autonomous Okrug is the base region of the study. Its health care system has both positive results and unresolved issues in the field of population health. The authors reveal the possibilities of its further improvement based on sociological and interdisciplinary research from a systemic perspective, taking into account the fact that the main resources of health saving are lifestyle, nutrition, quality medical care, and the environment. The authors note that the situation significantly differs in large and small cities of the Arctic, villages and shift settlements, and among nomads in the tundra. The materials of statistics, mass representative surveys, and comparative expert assessments are analyzed. The research findings illustrate the identified opportunities for improving the health of different groups of the Arctic population and indicate the need to significantly strengthen the comprehensive scientific support of Arctic projects, including sociological monitoring. The materials and results of the work are particularly relevant due to the upcoming Russia's presidency in the international Arctic Council.

Key words: Arctic, health, social space, health-saving factors, sociological research.

Introduction

The successful implementation of the ongoing and planned investment mega-projects on neo-industrial exploitation of the Arctic zone of the Russian Federation (the Russian Arctic) largely depends on the effective use of the accumulated and continuing to increase high quality human potential, relevant education, and training of direct participants of the projects and other groups, including representatives of indigenous minorities of the North (imn), as we previously mentioned in articles on Arctic subjects [1–3]. No less important are the problems related to health of people who live and come there to work, the reduction of mortality, and the increase of healthy life duration. The permanent population of the Russian Arctic was 2397.5 thousand people as of January 1, 2019. At the same time, there has been a steady decrease of this indicator in recent years, which was mainly caused by migration outflow, but, in some areas, it resulted from natural population loss[1].

[1] *Socio-Economic Situation of the Yamalo-Nenets Autonomous Okrug in January 2019: A Brief Stat. Report*. Department of the Federal State Statistics Service for the Tyumen Oblast, Khanty-Mansi Autonomous Okrug – Yugra and Yamalo-Nenets Autonomous Okrug. pp. 33–34. Available at: https://www.gks.ru/free_doc/new_site/rosstat/togs/1172/2019-01.pdf (accessed: October 13, 2019); *Socio-Economic Situation of the Yamalo-Nenets Autonomous Okrug in January 2018: A Brief Stat. Report*. Department of the Federal State Statistics Service for the Tyumen Oblast, Khanty-Mansi Autonomous Okrug – Yugra and Yamalo-Nenets Autonomous Okrug. pp. 33–34. Available at: https://www.gks.ru/free_doc/new_site/rosstat/togs/1172/2018-01.pdf (accessed: October 13, 2019).

In the Arctic regions, people (especially strangers living there for quite a long time) permanently feel a specific polar tension caused by the weakening of the body's resistance in harsh natural and climatic conditions. Studies, conducted in the 1990s, recorded the following fact: in high latitudes, the body's adaptive reserves are depleted, chronic diseases occur at a young age, and people experience premature ageing. The polar tension syndrome is a recognized sociobiopsychological phenomenon typical for the North. Its main characteristics are disorders of the metabolism, endocrine system, immune insufficiency, psychoemotional stress, and other health disorders. In practice, there are people who were caught in extreme weather conditions and then suffering from long-term mental disorders[2]. It is no accident that the legislative, legal, and normative control provides special regimes and certain preferences for people working and living in the Arctic territories.

On the other hand, the increase of average annual temperatures observed in the Arctic and subarctic regions will lead, according to prognostic studies, to the increase in the epidemiological consequences of the degradation of permafrost spaces, to the expansion of traditional areas of activity of vectors and pathogens of parasitic and infectious diseases. Considering current experience in dealing with pandemic situations, special attention should be paid to these factors.

It can be reasonably argued that, in the context of large-scale new development challenges, health care of the Arctic regions' socio-territorial communities, including development of measures for its protection and strengthening, has become a fundamental spatial-societal problem. The importance of its solution is indicated in the "Spatial Development Strategy of the Russian Federation until 2025"[3], the Decree of the President of the Russian Federation no. 204 "On National Goals and Strategic Objectives of the Russian Federation through to 2024"[4] dated May 7, 2018, the corresponding national priority project "Health", the Executive Order of the President of the Russian Federation "Basic Principles of Russian Federation State Policy in the Arctic to 2035"[5] dated March 15, 2020, the Executive Order of the President of the Russian Federation "On the National Development Goals of the Russian Federation through 2030"[6] dated July 21, 2020.

Since Soviet times, a new scientific direction has been formed in Russian medical science – polar medicine[7]. Research projects, recognized as the largest in the world, have been implemented in the field of Russian polar medicine. This work was conducted by researchers of the Institute of Clinical and Experimental Medicine, the Institute of Physiology (Novosibirsk), the Institute of Medical Problems of the North, the Institute of the Far North (Krasnoyarsk, Nadym) and other research organizations of the Siberian

[2] Khasnulin V.I. *Introduction to Polar Medicine*. Novosibirsk: SO RAMS, 1998. 337 p.; Kaznacheev V.P. *Clinical Aspects of Polar Medicine*. Moscow: Medicine, 1986. 208 p.

[3] Order of the Government of the Russian Federation no. 207-p, dated February 13, 2019. Available at: http://static.government.ru/media/files/UVAlqUtT08o60RktoOXl22JjAe7irNxc.pdf (accessed: July 20, 2020).

[4] On National Goals and Strategic Objectives of the Russian Federation through to 2024: Decree of the President of the Russian Federation no. 204, dated May 7, 2018. Available at: http://www.kremlin.ru/acts/bank/43027 (accessed: July 20, 2020).

[5] Basic Principles of Russian Federation State Policy in the Arctic to 2035: Executive Order of the President of the Russian Federation no. 164, dated March 5, 2020. Available at: https://www.garant.ru/products/ipo/prime/doc/73606526/ (accessed: July 20, 2020).

[6] On the National Development Goals of the Russian Federation through 2030: Executive Order of the President of the Russian Federation, dated July 21, 2020 no. 474. *Rossiyskaya Gazeta*, 2020, July 22, fed. issue no. 159 (8213).

[7] Khasnulin V.I. *Introduction to Polar Medicine*. Novosibirsk: SO RAMS, 1998. 337 p.; Kaznacheev V.P. *Clinical Aspects of Polar Medicine*. Moscow: Medicine, 1986. 208 p.

branch of the Russian Academy of Sciences, medical institutions and universities, and now it is continued in the studies in the new socio-economic and organizational conditions. Representatives of many other scientific fields are engaged in the studies of the northerners' health problems together with medical workers. It is difficult to name any field of knowledge that would not somehow address the health problems of the people of the North. These issues have also become popular in foreign studies [4–8].

In research, for which a consistent methodology and conceptual framework, especially the key fundamental category of health, are essential, an interdisciplinary approach is increasingly being adopted[8]. WHO Constitution states: "Health is a state of complete physical, mental, and social well-being, not just the absence of disease or infirmity"[9]. This definition, in addition to an extended and idealized interpretation of this most important human and social phenomenon, practically does not take into account the geosociospatial content, which is highly necessary for significantly different natural and climatic conditions, especially such extreme ones for humans as the Arctic. In this regard, we are faced with the task of assessing the impact of various factors on the health of people carrying out their life activities in high-latitude territories, and the possibility of neutralizing the most toxic of them. Taking into account the limited availability of sources of state and medical statistics that reflect subject-object relations, the study conducted mass surveys of various population groups and in-depth interviews with health experts, emphasizing subject-subject relations, including the subjective attitude of various groups of people to their health, self-assessment of their condition, satisfaction with health care organization, medicine, sports, and health-promoting work, etc.

The current health situation is very ambiguous and differentiated across the territories of the Russian Arctic. It is significantly influenced by socio-economic factors. The new stage of socio-economic development of the Arctic space is primarily caused by development of open hydrocarbon and other natural resources in a number of regions, the prospects for facilitating the availability of land and sea communication routes in the polar latitudes, which contributes to a significant reduction of the cost of their operation compared to earlier periods of time. The regular commercial operation of the restored Northern sea route, which almost halves the route of ships and goods from Europe to the far East and the Asia-Pacific region and back, on the one hand, opens up enormous opportunities for optimizing and intensifying trade relations between these parts of the world, and, on the other hand, makes it necessary to recreate and develop the appropriate infrastructure along the route, attracting a large number of qualified specialists to work at sea and on land.

The purpose of the research presented in the article is to study the attitude to health of various social groups of residents of the Far North – the Arctic zone of the Russian Federation – taking into account extreme natural and climatic conditions. The main research area is the territory of the Yamalo-Nenets Autonomous Okrug (YNAO), which is in fact the main oil and gas production base of the country, both at present and in the future, where new investment megaprojects are being

[8] Lebedeva-Nesevrya N.A., Gordeev S.S. *Sociology of Health: Course Book for University Students.* Perm State National Research Institute. Perm, 2011. 238 p.; Lisitsyn Yu.P. *Public Health and Healthcare*. Moscow: Geotar-media 2009. 512 p.; Annandale E. *The Sociology of Healthand Medicine: A Critical Introduction*. Cambridge: PolityPress, 1998. P. 212.

[9] WHO Constitution. Available at: https://www.who.int/ru/about/who-we-are/constitution (accessed: July 20, 2020).

developed for the extraction of hydrocarbons, liquefaction, and transportation of natural gas, etc.; grand projects are being implemented: development of oil and gas fields in the Kara Shelf, the Gulf of Ob, the commissioning of the full capacity of the largest plant for the liquefaction of natural gas in Bovanenkovo settlement, transportation routes, airport and sea port in Sabetta settlement ("Gate of the Arctic"), etc. New plants are being built in other parts of the Yamal Peninsula. In this regard, not only special technical and technological difficulties arise and being overcome, but also social problems that are characteristic of the polar region, in particular, the alignment of the neo-industrial mainstream with the traditional life of the indigenous minorities of the North – the Nenets, Khanty, Selkups, etc.

There are both positive and negative trends in the region's healthcare system. Thus, as of 2018, life expectancy of those born in the YNAO was the highest among population of the Russian Arctic and reached 74.4 years. The overall mortality rate is the lowest here in comparison with other territories of the Russian Arctic making up 4.7 cases per 1 thousand people[10]. In the YNAO, the largest natural population growth is observed (8.6 per 1 thousand people), while there is a natural decline (-12.8 per 1 thousand people in 2018) in the European regions of the Russian Arctic. At the same time, the YNAO is the territory of the highest risk for primary morbidity of the adult population (over 18 years of age) for all classes of diseases. The Arctic regions of the Arkhangelsk Oblast are at the top only in terms of malignant neoplasms (559.9 cases per 100 thousand people); the Chukotka Autonomous Okrug (CHAO) and the Republic of Sakha (Yakutia) rank the first according to chronic alcoholism criterion[11].

In the Russian Arctic, the incidence of infectious and parasitic diseases is significantly higher than in Russia as a whole. Thus, the highest level of acute intestinal infections in 2018 was observed in the YNAO (234.7 cases per 100 thousand people, which is almost three times higher than the Russian indicator). The Okrug is also poor in the incidence of opisthorchiasis, where the incidence rate was 155.6 cases per 100 thousand (13.0 in the Russian Federation). Meanwhile, according to expert surveys, the actual incidence is significantly higher than the official registration indicators[12].

The combination of geo- and socio-spatial approaches in the study of attitudes to the health of various social groups of northerners and the analysis of their specifics related to extreme natural and climatic conditions ensure the scientific novelty of the proposed findings. Studying people's health in the Arctic in an interdisciplinary geosociospatial discourse, we used the conceptual approaches of regional sociology, in particular, the sociological diagnostics of the problems considered in individual regions. At the same time, sociological diagnostics of human health, which is one of the most significant elements of human capital (along with the level of education and professional training) and which is being implemented for the Arctic region of Russia, required studying the factors determining the northerners' health (including climatic and

[10] *Socio-Economic Situation of the Yamalo-Nenets Autonomous Okrug in January 2019: A Brief Stat. Report.* Department of the Federal State Statistics Service for the Tyumen Oblast, Khanty-Mansi Autonomous Okrug – Yugra and Yamalo-Nenets Autonomous Okrug. Pp. 33–34. Available at: https://www.gks.ru/free_doc/new_site/rosstat/togs/1172/2019-01.pdf (accessed: October 13, 2019*); Socio-Economic Situation of the Yamalo-Nenets Autonomous Okrug in January 2018: A brief Stat. Report*. Department of the Federal State Statistics Service for the Tyumen Oblast, Khanty-Mansi Autonomous Okrug – Yugra and Yamalo-Nenets Autonomous Okrug. Pp. 33–34. Available at: https://www.gks.ru/free_doc/new_site/rosstat/togs/1172/2018-01.pdf (accessed: October 13, 2019).

[11] *Ibidem*.

[12] *Ibidem*.

environmental factors caused by anthropogenic activities, conditions, nutrition, medical care, etc.), the dynamics of changes of the situation in different social groups of the Arctic population (old-timers and newcomers, indigenous ethnic minorities of the North, shift personnel), and the possibilities of implementing innovative health-saving technologies.

Approaches and methodology

In modern social science, there are two general methodological foundations for regional structures and certain societal phenomena in them, in this case, health. One of them is the geospatial approach, the subject of which is the physical space as the basis of the territorial way of existence of geo objects associated with various spheres of human life. The geospatial approach proper has a huge heuristic potential, which makes it possible to study health in the regional aspect as a geospatial segment of social reality, considering it from certain angles. A special scientific direction of medical geography even appeared [9].

Another approach is based on the sociological theory of space, the foundations of which were laid at the beginning of the last century by Georg Simmel. The theory emphases the social differentiation of space and the subject-subject relations in its segments (cities and regions) [10]. The modern classic of the sociological theory of space is most pronounced in the concept of social space by P. Bourdieu (actions of actors (agents) on various social fields, positions, dispositions, habitus, etc.), although the actual regional (socio-territorial) content is not deployed in it [11].

Russian science has also developed a wide variety of ideas that have geo-and socio-spatial contexts that are closely related to regional issues, in which geographers, economists, sociologists, political scientists, lawyers, psychologists, historians, and cultural scientists have empirically interacted, cooperating with representatives of specialized technical and natural science branches of knowledge. Regarding the interdisciplinary study of health problems, almost every industry has developed links with medical science, forming a special direction, for example, the sociology of medicine.

Integration of these approaches was the focus of two fundamental research programs of RAS Presidium: "Fundamental issues of spatial development of the Russian Federation: interdisciplinary synthesis" (2009–2011) [12] and "Role of space in modernization of Russia: natural and socio-economic potential" (2012–2014) [13]. There are prospects for an interdisciplinary synthesis of geo- and socio-spatial approaches to territorial entities, including macroregions, regions, cities, and other settlements [14]. Such an umbrella approach covers the growing field of spatial studies, localizes them empirically in the synthesis of individual substantive aspects (economic, political, cultural, etc.), temporary taking into account the globalization and virtualization trends in the external circuit, and focusing on the social subjectivity of human individuals and their groups in the internal boundary.

The geosociospatial approach is directly related to the study of modern transformations, including those in the field of health, both at the national-societal and regional levels[13] [15–18]. At the same time, certain issues of public health in the Northern (Arctic and subarctic) territories were covered in special publications, mainly of a medical and environmental nature [19–26]. Psychological [27] and legal aspects [28] are also investigated.

[13] Lisitsyn Yu.P. *Public Health and Healthcare*. Moscow: Geotar-media 2009. 512 p.; Medik V.A., Yuriev V.K. *Public Health and Healthcare*. Moscow: Professional, 2009. 432 p.

Along with the above-mentioned fundamental works[14] [15; 16; 17, etc.], we should highlight the works containing a deep analysis of empirical research [29; 30; 31, etc.] in the sociological literature. In interdisciplinary terms, a monograph on health protection of the participants of the new stage of Arctic development has been prepared on a sociological basis [32]. On the one hand, there is complicating of the entire complex of relations regarding saving and improving health of people in the North, the possibilities of developing regional health structures, which is significantly affected by the uncertainty of social situations developing in and around them, their multi-factor and multi-vector nature. On the other hand, it is argued that, in the social fields of the Arctic space, people's health is influenced by various stakeholders, actors and agents from government institutions, business and civil society, who have their own specific interests in the use of space (territory, subsurface resources, air, water and land, accumulated socio – economic and socio-cultural potential) along with the general ones, which, in one way or another, imply the issues of health and health care of various social groups.

The socio-spatial discourse of studying the situation concerning people's health in the Arctic region involves identifying and sociologically measuring the positions of various social groups of the northerners (old-timers, including representatives of aboriginal ethnic groups, newcomers who have lived in the Arctic for less than three years, shift workers who come to work from other regions) operating in different spatial positions (European – Asian sectors of the Russian Arctic, regions, city – village, city – town, center – periphery of the Okrug, etc.).

Achievement of the main purpose of the study, required to identify a set of problems related to the need to preserve the health of people living in the Arctic and newly arrived, assess their significance from a systemic perspective, establish relationships, alternative solutions, and risks. The empirical research, which has become monitoring since 2005, used traditional sociological tools: mass surveys of representatives of different social groups of the northerners, in-depth experts' interviews, focus groups, content analysis of the media, including social networks, etc. Materials from health care institutions and individual data from state and medical statistics were used.

Sampling for mass surveys was based on spatial and social criteria for selecting observation units and consisted of two stages. Initially, the localities were selected based on their status and type of settlement. Then the respondents were selected according to the social structure of a settlement. We used both selection criteria, traditional ones (gender and age) and those which were significant for our study (ethnicity and Northern experience). At the same time, specific conditions of the Arctic (uncertainty due to climatic conditions, production mobility, etc.) greatly complicated the preliminary planning and selection of respondents, therefore the sampling representativeness required its mandatory adjustments.

In February – September 2019, in order to study public health, the factors affecting it and its preservation possibilities in the conditions of neo-industrial development of oil and gas resources of the Russian Arctic, we organized and implemented a new public and expert opinion poll, the results of which are analyzed in this article.

[14] Lisitsyn Yu.P. *Public Health and Healthcare*. M.: Geotar-media 2009. 512 p.; Annandale E. *The Sociology of Health and Medicine*: *A Critical Introduction*. Cambridge: PolityPress, 1998. P. 212.

The sample of the mass survey on the questionnaire is multi-staged, representing the Yamal population taking into account gender and age factors, Northern experience, ethnicity, and field of activity with an error on one attribute not exceeding 3.5%. In total, 1.554 respondents were interviewed in the Priuralsky and Shuryshkarsky districts, the towns of Salekhard, Nadym, N. Urengoy, and Noyabrsk of the Yamal-Nenets Autonomous Okrug in 2019. 16.1% of the respondents are employed in the oil and gas industry, 61.7% – in other sectors of the economy and social sphere, 6.7% are engaged in traditional activities of aboriginal ethnic groups, and 15.5% do not work.

In addition to the mass questionnaire survey of the YNAO population in 2019, we conducted an in-depth survey of 146 experts. Most of them (58.8%) represented the health care sector (chief doctors and their deputies in medical institutions), 28.1% – oil and gas companies, and the remaining 13.1% – state and municipal authorities. The majority of experts have an extensive Northern background: 61.5% have been working in the Russian Arctic from 16 to 30 years, 23% – from 6 to 15 years, 5.1% for more than 30 years, and only 10.3% for less than 5 years. They estimated their own health as follows: satisfactory – 57.9%, good – 21.1%, poor – 21%.

Research results

The northerners' attitude to health was clarified in the structure of other vital issues. In the questionnaire, the respondents were asked to rate their importance on a 10-point scale in ascending order. In the hierarchy, financial problems came first, followed immediately by the issues related to their own health and the health of their relatives, the quality of medical care, and only then the problems of housing, education, ecology, leisure, etc. (*Tab. 1*). This correlation and connection of personal (family) finances and health is quite natural in modern conditions, since even with insurance medicine, people have to pay for a number of services supporting the therapeutic effect, medicines and auxiliary means. At the same time, the majority of respondents ranked the importance of health within the first five positions. Although, it should be noted that almost a third of men and more than a quarter of women ranked these problems 6^{th}–8^{th}, and 15.4% of men and 12.8% of women – 9^{th}–10^{th}. Of course, this distribution is directly related to the respondents' age: the older they are, the more significant health is. However, these data indicate that there are reserves of preventive work among the population, especially among young people.

In general, 12.5% of the respondents consider themselves perfectly healthy; 58.2% assess their health as satisfactory; 11.1% of the respondents are often sick, but do not have chronic diseases; 15.5% have poor health and chronic diseases; 2.7% of the respondents are disabled.

As far as the Northern experience increases, the respondents' self-reported health deteriorates (*Tab. 2*).

It is known that satisfaction (or, on the contrary, dissatisfaction) with one's work significantly affects physical and mental health. It turned out that most of the northerners surveyed liked their work to some degree (14.5% like their work very much, 56.3% like their work), almost a quarter (23.7%) rated it as "so – so", and only 5.5% "do not like it at all". Most of the latter have less than 3 years of experience in the North, and they are unlikely to stay there. The highest level of satisfaction is among older members of indigenous minorities of the North and young shift workers.

Leisure is no less important for maintaining health than work. The relationship between physical activity and health is obvious (*Tab. 3*). The survey of northerners showed that only

Table 1. The northerners' most urgent problems (gender aspect), % of a number of respondents

Rank of significance	Lack of financial resources, family income	Growth of expenses	Unemployment, possibility of losing a job	Lack of housing, opportunities to improve housing conditions	Increasing housing and utility rates	Own and relatives' health, poor quality of medical care	Education and upbringing of children	Security, criminal situation, corruption	Deterioration of the environment	Inability of interesting and healthy leisure activities	Other	Total
Men												
1	12.5	15.5	12.3	10.6	14.1	10.8	6.5	3.8	6.8	6.3	0.7	100
2	7.8	11.2	9.0	11.6	6.7	8.2	12.3	10.4	12.7	10.1	0.0	100
3	15.5	7.2	10.5	8.8	9.4	10.5	9.4	6.6	13.8	8.3	0.0	100
4	10.4	9.6	11.9	10.4	7.4	8.1	11.9	13.3	8.1	8.9	0.0	100
5	12.6	2.2	9.6	10.4	11.9	11.1	12.6	11.1	9.6	8.9	0.0	100
6	4.0	4.0	9.3	10.7	4.0	13.3	16.0	13.3	17.3	8.0	0.0	100
7	4.3	5.8	8.7	8.7	8.7	10.1	15.9	11.6	17.4	8.7	0.0	100
8	5.4	6.5	4.3	16.3	5.4	9.8	8.7	22.8	8.7	12.0	0.0	100
9	0.0	0.0	14.8	6.6	9.8	8.2	11.5	16.4	11.5	21.3	0.0	100
10	8.8	9.6	4.8	6.4	9.6	7.2	8.0	16.8	7.2	21.6	0.0	100
Women												
1	13.2	15.3	10.1	8.4	13.7	11.9	7.7	4.7	7.4	6.9	0.8	100
2	9.7	7.2	10.2	10.9	9.0	7.7	13.2	10.2	12.7	9.2	0.0	100
3	10.5	7.0	11.2	12.6	9.4	8.7	10.1	11.2	10.1	9.1	0.0	100
4	8.7	5.2	8.7	11.4	10.0	11.8	9.6	10.0	14.0	10.5	0.0	100
5	4.9	8.0	12.0	12.9	6.7	7.6	8.9	15.6	12.0	11.6	0.0	100
6	4.3	6.1	11.3	16.5	5.2	13.0	11.3	11.3	12.2	8.7	0.0	100
7	5.6	6.5	6.5	12.1	1.9	6.5	20.6	15.0	13.1	12.1	0.0	100
8	3.8	4.8	6.7	8.6	3.8	8.6	16.2	19.0	17.1	11.4	0.0	100
9	7.5	1.1	5.4	7.5	1.1	4.3	6.5	23.7	19.4	23.7	0.0	100
10	8.5	8.5	8.9	8.1	9.8	8.5	9.4	15.7	5.5	17.0	0.0	100

Source: data of the 2019 survey.

Table 2. Self-reported health depending on the Northern experience, % of a number of respondents

Health status	Living in the North		Shift worker from another region
	Less than 5 years	More than 5 years	
Perfectly healthy	14.8	11.7	34.0
Satisfactory health	70.4	57.3	32.3
Often sick, but have no chronic diseases	3.7	12.0	12.5
Poor health, have chronic diseases	11.1	15.9	21.2
Disabled people	0.0	3.1	0.0
Total	100.0	100.0	100.0

Source: data of the 2019 survey.

Table 3. Self-reported health status depending on leisure activities, % of a number of respondents

Health status	Spending leisure time			
	Physically active	Passively	In different ways	Alsmost no leisure
Perfectly healthy	33.3	8.8	9.4	6.5
Satisfactory health	46.7	55.9	62.1	54.8
Often sick, but have no chronic diseases	10.7	9.8	11.5	12.9
Poor health, have chronic diseases	8.0	20.6	14.4	25.8
Disabled people	1.3	4.9	2.6	0.0
Total	100.0	100.0	100.0	100.0

Source: data of the 2019 survey.

13.6% of them are physically active in their free time, play sports, run, regularly perform gymnastic exercises, etc. 86.6% of the respondents consider their rest to be quite complete, but 18.5% mostly rest passively: lie, read, watch TV, sit at the computer. However, 61.1% still answered that they spent their leisure time "in different ways". 5.8% of the respondents say that they have "no leisure time" at all. While 13.4% of the respondents have circumstances preventing them from relaxing at home, which, of course, affects their health.

Attention is drawn to the significant proportion of those respondents who consider their health to be satisfactory during passive leisure activities. This group requires to be studied additionally, as it has the potential to get problems in the future. The group of "workaholics" who have "almost no leisure" also deserves a deeper analysis.

In terms of gender, men traditionally rate their health higher than women (*Tab. 4*).

However, this self-assessment requires critical analysis. Of course, it is affected by the mental characteristics of the "stronger" or "weaker" sex, the disparity in the gender and age structure of the population of the Okrug, and so on. However, it is important to take into account the difference in self-assessment in demographic policy, especially in relation to the most fertile ages.

Naturally, the differences in self-assessment of health in different age cohorts are the most noticeable (*Tab. 5*).

High self-assessment in the youth and middle-aged groups is understandable with some nuances. But at least three indicators in the older groups are of interest. The first is a sharp rise in self-assessment ("perfectly healthy") among the respondents over 60 (up to 12.5%), compared with the group from 51 to 60 years old (5.4%). Does it really gain a "second breath", or is it a desire to maintain achieved positions? The second and third points relate to the ratio of "chronics" in the same groups: a sharp increase in the proportion (from 7.1 to 16.7%) of people who are often sick but having no chronic diseases, and, at the same time, a

Table 4. Self-assessment of health, gender differences, % of a number of respondents

Health assessment	Gender	
	Men	Women
Practically healthy	18.8	9.2
Health is satisfactory, but sometimes get sick	59.9	57.5
Often sick, but have no chronic diseases	10.7	11.3
Poor health, have chronic diseases	7.6	19.7
Disabled people	3.0	2.3
Total	100.0	100.0
Source: data of the 2019 survey.		

Table 5. Self-assessment of health, age differences, % of a number of respondents

Health assessment	Age, years			
	From 21 to 30	From 31 to 50	From 51 to 60	60 and older
Practically healthy	23.7	9.4	5.4	12.5
Health is satisfactory, but sometimes get sick	59.3	59.0	60.7	37.5
Often sick, but have no chronic diseases	5.9	13.4	7.1	16.7
Poor health, have chronic diseases	11.1	15.5	23.2	16.7
Disabled people	0.0	2.7	3.6	16.7
Total	100.0	100.0	100.0	100.0
Source: data of the 2019 survey.				

significant decrease in the proportion (from 23.2 to 16.7%) among those having chronic diseases. The authors plan to get responds to these questions in further research, taking into account the conditions of the ongoing pension reform.

In general, a comparison of the results of the Yamal residents' health self-assessment in 2019 with the results of surveys conducted in previous years [2] confirmed a clear trend toward a sharp decrease of positive ratings (*Tab. 6*).

Over nearly the last 5 years, there have been really serious changes in the country's health care system, which, of course, have also affected the state of medical care in the Okrug. Only 16.9% of the northerners surveyed are currently satisfied with the quality of medical care. 72.3% of the respondents rated it negatively, while 10.8% said they had never applied to a medical institution. The main drawback of the Northern health care is the lack of modern diagnostic and medical equipment, followed by the difficulty of getting an appointment with a doctor. Next in the rating is the lack or high cost of necessary medicines.

We also discussed the quality of medical care in the Arctic region with experts. It turned out that, according to most experts, the difficulty of getting an appointment with a doctor due to the optimization of medical institutions was the most significant drawback of the Northern health care. Further, as the relevance decreases, there is a lack of modern diagnostic and medical equipment in local medical institutions, the lack or high cost of necessary medicines, and the need to develop preventive and therapeutic technologies that take into account the specifics of the Arctic region. Experts working in the field of health care have highlighted the lack of modern equipment and high-tech assistance; the representatives of government agencies do not consider it problematic to get an appointment with a doctor.

Talking about the impact of environmental problems on health, respondents primarily named pollution of reservoirs and deterioration of the quality of water and fish consumed (48%), soil pollution and garbage dumps (31%), alienation of land for industrial facilities and communications (18%). City dwellers are particularly concerned about industrial and household garbage dumps. Northerly winds carry toxic substances that accumulate in them over a large area, causing serious harm to human health and the environment. The representatives of aboriginal ethnic groups pay attention to the fact that less and less land in the tundra remains for grazing deer and recreation of people.

Experts' opinion on this issue almost coincided with the population's estimates. Among the environmental problems typical for the Arctic region, the most significant impact on the northerners' health, experts say, is caused by water pollution, deterioration of the quality of water consumed, and the impact of

Table 6. Self-assessment of health in dynamics, % of a number of respondents

Health assessment	Year			
	2006	2010	2015	2019
Practically healthy	37	40	38	13
Health is satisfactory, but sometimes get sick	40	36	35	58
Often sick, but have no chronic diseases	8	10	12	11
Poor health, have chronic diseases	8	8	8	15
Disabled people	1	3	2	3
Found it hard to say	5	3	5	-
Total	100	100	100	100
Source: data of the 2019 survey compared to data of author surveys of 2006, 2010, and 2015.				

pollution on fish and the ecosystem as a whole. The second position is occupied by pollution of the soil cover and air basin, garbage dumps that are sources of various toxins. This is followed by an increasing alienation of land for industrial facilities and communications, and a reduction in the area for recreational purposes.

Medical and biological studies conducted by the Arctic Research Center (Salekhard, Nadym) have shown that the most effective method of people's health-saving in the Russian Arctic is regular consumption of local wild plants, raw fish stroganina, blood and internal organs of deer[15].

This is, to a certain degree, confirmed by the results of our survey (*Tab. 7*). Unfortunately, in recent years, such opportunities are becoming increasingly inaccessible for many northerners for a number of socio-economic and environmental reasons, and, at the time of the last survey in 2019, only 17.9% of respondents could constantly consume these products; 30.2% consumed them, but not often; 24.9% consumed them very rarely, and 27.1% of the Yamal residents surveyed had almost no opportunities to do this.

However, it is necessary to keep in mind the possible negative impact of the local food mass consumption. Currently, these products become the main source of persistent organic pollutants entering the northerners' body [33]. In addition, consuming traditional food without proper heat treatment (stroganina) is fraught with the risk of parasitic diseases (opisthorchiasis, trichinosis, etc.).

Of course, the indigenous peoples have much more opportunities to eat traditional Northern food than the rest of the residents of the Yamal-Nenets Autonomous Okrug; it is more typical for peoples nomadizing in the tundra and forest settlements than in cities (*Tab. 8*).

Table 7. Correlation of health self-assessment with the frequency of traditional food consumption, % of a number of respondents

Health assessment	Consuming traditional food			
	Constantly	Not often	Rarely	Never
Perfectly healthy	17.9	14.4	10.1	9.7
Satisfactory health	61.1	58.2	59.6	53.8
Often sick, but have no chronic diseases	10.5	14.0	8.1	11.7
Poor health, have chronic diseases	8.4	12.8	17.0	21.4
Disabled people	2.1	0.6	5.2	3.4
Total	100.0	100.0	100.0	100.0
Source: data of the 2019 survey.				

Table 8. Frequency of traditional Northern food consumption, % of respondents

Frequency of consumption	Nationality		
	Indigenous minorities of the North	Russian	Other
Constantly	59.3	9.7	13.1
Not often	32.1	29.5	32.1
Very rare	7.4	28.4	27.4
Almost never	1.2	32.4	27.4
Total	100.0	100.0	100.0
Source: data of the 2019 survey.			

[15] *Sanitary and Epidemiological Welfare of the Population Living on the Territory of the Russian Arctic in 2018: Information Bulletin*. Saint-Petersburg: North-West Public Health Research Center, 2019. 39 p.

According to the studies of the Arctic Research Center, the protein-fat component in the diet of Yamal reindeer herders makes up about 70%. However, regular consumption of food with a high content of animal fats is not always suitable for people who came to the Arctic from other regions. For them, a different food structure is more optimal: protein – 16%, fat – 40%, carbohydrates – 44% (for aborigines, respectively, 20:50:30, in the Central regions of Russia – 10:26:64) [34].

This research is analytical and project-based in its nature. In the course of mass and expert surveys, we have clarified the attitude not only to the existing problems, but also to the ways to solve them strategically. Thus, the mass survey included a special section which was devoted to assessing factors for preserving people's health (health saving) in the North. Here, as well as in problem analysis, the ethnic and gender aspects were singled out as the most socially significant, especially for the Arctic. In *tables 9* and *10* the rank values (on a 10-point scale) of the respondents' preferences regarding certain factors, their significance in the overall structure (by line) and point proportions are reflected.

First of all, you can see a wide variation (even wider than when evaluating the problems) in the scores. Even if we take into account respondents' indecision when making quantitative estimates and avoiding extreme values, the priority of ecology, accessibility of health care, health resort treatment, etc. is obvious.

Table 9. Factors contributing to health saving (ethnic aspect), % of respondents

Rank of importance	Good ecology	Housing and clothing	Healthy food	Accessibility of health care	Health resort treatment	Doing sports	Breaking bad habits	Other	Total
Indigenous minorities of the North									
1	19.2	12.5	18.8	15.4	10.8	9.2	12.1	2.1	100.0
2	17.6	19.1	16.2	11.8	14.7	11.8	8.8	0.0	100.0
3	17.8	13.3	20.0	20,0	13.3	11.1	4.4	0.0	100.0
4	5.7	11.4	14.3	14.3	17.1	20.0	17.1	0.0	100.0
5	15.8	21.1	2.6	13.2	21.1	13.2	13.2	0.0	100.0
6	4.0	4.0	8.0	12.0	16.0	40.0	16.0	0.0	100.0
7	0.0	30.0	0.0	0.0	15.0	15.0	40.0	0.0	100.0
8	33.3	0.0	0.0	33.3	0.0	33.3	0.0	0.0	100.0
9	25.0	0.0	25.0	0.0	25.0	0.0	25.0	0.0	100.0
10	12.9	12.9	16.1	12.9	12.9	16.1	16.1	0.0	100.0
Russians									
1	18.2	11.1	15.6	19.1	13.0	8.7	12.0	2.3	100.0
2	10.0	17.1	12.5	8.4	15.2	19.8	17.1	0.0	100.0
3	13.4	15.3	17.1	13.4	13.0	16.2	11.6	0.0	100.0
4	8.7	18.0	16.0	9.3	16.7	20.0	11.3	0.0	100.0
5	9.6	19.8	12.4	6.2	18.1	20.9	13.0	0.0	100.0
6	8.9	16.8	9.9	5.0	17.8	20.8	20.8	0.0	100.0
7	5.5	21.9	4.1	2.7	9.6	26.0	30.1	0.0	100.0
8	12.5	17.5	12.5	15.0	12.5	17.5	12.5	0.0	100.0
9	13.3	23.3	3.3	13.3	20.0	16.7	10.0	0.0	100.0
10	14.2	11.1	15.4	16.7	14.2	13.0	15.4	0.0	100.0

End of Table 9

Rank of importance	Good ecology	Housing and clothing	Healthy food	Accessibility of health care	Health resort treatment	Doing sports	Breaking bad habits	Other	Total
Other ethnicity									
1	22.6	11.1	14.9	18.3	12.0	8.7	10.6	1.9	100.0
2	19.4	19.4	23.6	6.9	9.7	11.1	9.7	0.0	100.0
3	8.5	11.3	22.5	21.1	7.0	19.7	9.9	0.0	100.0
4	10.0	17.5	10.0	22.5	17.5	12.5	10.0	0.0	100.0
5	5.6	13.9	8.3	5.6	41.7	11.1	13.9	0.0	100.0
6	3.1	25.0	6.3	3.1	15.6	34.4	12.5	0.0	100.0
7	0.0	15.8	0.0	5.3	13.2	28.9	36.8	0.0	100.0
8	5.9	17.6	11.8	11.8	11.8	17.6	23.5	0.0	100.0
9	33.3	33.3	0.0	0.0	0.0	33.3	0.0	0.0	100.0
10	18.6	14.0	9.3	14.0	16.3	7.0	20.9	0.0	100.0
Source: data of the 2019 survey.									

Table 10. Factors contributing to health saving (gender aspect), % of the respondents

Rank of importance	Good ecology	Housing and clothing	Healthy food	Accessibility of health care	Health resort treatment	Doing sports	Breaking bad habits	Other	Total
Men									
1	17.8	11.1	15.9	19.5	11.8	9.4	11.8	2.6	100.0
2	14.2	18.3	12.2	8.6	16.8	17.8	12.2	0.0	100.0
3	17.0	14.2	21.3	12.8	9.9	14.9	9.9	0.0	100.0
4	8.7	19.6	14.1	9.8	23.9	12.0	12.0	0.0	100.0
5	12.2	20.0	12.2	8.9	14.4	18.9	13.3	0.0	100.0
6	7.5	11.9	10.4	6.0	16.4	25.4	22.4	0.0	100.0
7	5.7	22.6	0.0	7.5	13.2	18.9	32.1	0.0	100.0
8	0.0	16.7	11.1	22.2	11.1	22.2	16.7	0.0	100.0
9	21.4	28.6	0.0	0.0	14.3	21.4	14.3	0.0	100.0
10	16.7	9.5	15.5	16.7	14.3	10.7	16.7	0.0	100.0
Women									
1	19.4	11.4	15.8	18.0	12.9	8.6	11.8	100.0	100.0
2	10.9	17.7	16.1	8.4	12.9	17.4	16.7	0.0	100.0
3	9.9	14.1	16.7	18.2	13.5	17.2	10.4	0.0	100.0
4	8.3	15.0	15.8	13.5	12.0	23.3	12.0	0.0	100.0
5	8.8	18.8	9.4	6.3	25.0	18.8	13.1	0.0	100.0
6	6.7	20.0	7.8	5.6	17.8	26.7	15.6	0.0	100.0
7	1.3	20.8	3.9	0.0	10.4	29.9	33.8	0.0	100.0
8	16.2	16.2	13.5	10.8	13.5	13.5	16.2	0.0	100.0
9	13.0	17.4	8.7	17.4	21.7	13.0	8.7	0.0	100.0
10	13.7	13.1	13.7	15.0	14.4	13.1	17.0	0.0	100.0
Source: data of the 2019 survey.									

The indigenous peoples who also ranked ecology first, put healthy food and a possibility to eat traditional northerners' food second, and the accessibility of health care, especially in nomadic life – third.

The survey revealed that, when choosing the most significant health saving factors, Yamal residents generally consider good ecology and affordable, high-quality health care to be the most important. At the same time, men consider health care to be more important, while women pay more attention to the causes of diseases – the environment.

The majority of the expert pool believes that people's health in the Arctic is most affected by the quality of medical care and lifestyle. While the experts engaged in the health sector, attach particular importance to neutralizing the negative impact of changes in temperature and atmospheric pressure; government officials and oil and gas producers, on the other hand, believe that the quality of drinking water and environmental situation are the most significant factors here.

Discussion and conclusion

Summarizing the results obtained in the course of sociological research, we can state that the situation in the sphere of preserving health of the Arctic population gets worse every year according to most parameters. At the same time, it is significantly different in spatial and social discourses. The Yamal-Nenets Autonomous Okrug differs from the average indicators for the regions of the Russian Arctic for the better, although it also has its own acute "pain points" of problems common to all Northern territories. In particular, the highest risk of primary morbidity of adult population is recorded here (especially in shift settlements, which was once again recently expressed in the indicators of coronavirus infection in the context of a pandemic), the highest level of opisthorchiasis in the Russian Arctic associated with violations of health standards while cooking fish, and so on. At the same time, in comparison with other Northern regions of the Russian Federation, the Okrug has recorded such important achievements over the past decade as the highest life expectancy, the highest natural population growth, and other positive health-saving trends.

This determined the authors' interest in the health situation and factors affecting it in the region. In 2019, we conducted basic research in the Yamal-Nenets Autonomous Okrug. In 2020 and thereafter, we are going to continue working in the Yamal-Nenets Autonomous Okrug, as well as to conduct field research in other regions (the Arkhangelsk Oblast and the Chukotka Autonomous Okrug), implementing an interdisciplinary geosociospatial approach to the study of social problems in the Arctic.

This very approach, which is the scientific novelty of the research, makes it possible to better understand the specifics of almost all the main aspects of life: especially health and people in extreme natural and climatic conditions of the Far North. The methodological and instrumental expression of this approach is the mixed methodology of combining quantitative and qualitative methods for analyzing and estimating the studied phenomenon, measuring it in theoretical and practical terms.

During the mass population surveys and in-depth interviews with experts in the Yamal-Nenets Autonomous Okrug, we identified people's assessment of their health and the degree of factors affecting it: length of service in the North, leisure structure, quality of food, medicine, environment, etc. The respondents paid attention to the most effective, from their point of view, health-saving strategies and technologies that require additional interdisciplinary study and justification.

Answering the open questions of the survey, the respondents suggest a number of specific measures to preserve and improve the northerners' health: making sanatorium treatment available, providing medical institutions with specialized professionals and necessary equipment, improving environmental situation, introducing modern technologies for recycling garbage and cleaning the soil cover, water purification, improving drug supply radically, expanding local production of high-quality food, etc. Some of the respondents, however, were pessimistic: "The North destroys health, nothing can be done. The main thing is to earn money and leave on time". Nevertheless, most people are convinced that the northerners' health can be regulated if you pay serious attention to it, study it, propose and implement regional health-saving programs within the framework of a priority national project, including not only medical but also socio-economic, socio-cultural, and educational activities.

The analysis of the research data has shown a significant similarity of mass and expert opinions not only in assessing the problems associated with life in the Far North but also in terms of common positions for developing strategic solutions. The findings are brought to the attention of legislative and executive authorities of the Okrug, and they are used in their activities. It is even more important, because Russia is to assume the chairmanship of the international Arctic Council in 2021, where the coordination of its member countries' efforts can get an additional impetus for cooperation and scientific justification in addressing common problems.

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