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ARCTIC MEDICINE

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MAJOR DEMOGRAPHIC TENDENCIES OF THE ARCTIC AND SUB-ARCTIC ZONE OF RUSSIA

ABSTRACT

The **aim** of the research: was the description of the general evolution of basic demographic indicators of the territories of the Arctic zone of the Russian Federation for the period 1993-2017.

Methods. A description of the main demographic indicators for the period of 1993 2017 in the Krasnoyarsk Area, the Arkhangelsk, Murmansk regions, the Komi Republics, the Sakha (Yakutia), the Nenets, the Yamalo-Nenets and the Chukotka Autonomous Districts in comparison with the national indicators.

The data of the Central Statistical Database of the Federal State Statistics Service, the Russian database on fertility and mortality were used.

The analysis used indicators: standardized total mortality rates, life expectancy at birth, infant mortality, total fertility rate, demographic burnout.

Conclusions. Despite the general positive demographic trends, the territories of the Arctic zone of Russia remain areas of a tense demographic situation, manifested in supermortality, insufficient fertility for the reproduction of the population, migration outflow of the population, which leads to continued depopulation of these regions.

Keywords: Arctic, fertility, mortality, migration.

Introduction. The modern territorial concept of the Arctic zone was formed by a Presidential Decree of May 2, 2014, which determined the boundaries of the land areas of the zone [4]. Moreover, only a part of large territorial entities is included in this zone. In this regard, we have analyzed the enlarged territories, namely the regions, districts, territories, taking as a basis the assumption about the similarity of the trends in them in general and in their individual territories in particular.

Table 1

Chain growth rates (losses) of the average population of the Arctic zone (1993 - 2017)

	Krasno-yarsk Area	Arkhan-gelsk Region	NAO	Mur-mansk Region	YaNAO	ChAO	Komi Republic	Sakha (Yakutia)
1993	-0.4	-1.2	-3.8	-3.0	-1.0	-13.4	-1.2	-1.6
1994	-0.7	-1.3	-3.9	-3.0	1.5	-12.1	-2.1	-2.0
1995	-0.6	-1.4	-3.4	-2.9	2.1	-13.0	-2.5	-2.1
1996	-0.5	-1.5	-2.3	-2.6	1.4	-9.9	-1.8	-1.3
1997	-0.5	-1.4	-1.8	-2.4	1.1	-7.5	-1.6	-1.2
1998	-0.6	-1.4	-1.2	-2.4	0.7	-7.3	-1.7	-1.6
1999	-0.7	-1.5	-0.7	-2.4	-0.2	-7.6	-1.7	-1.6
2000	-0.8	-1.6	-0.7	-2.2	-0.1	-7.4	-1.6	-1.0
2001	-0.7	-1.4	-0.3	-1.9	0.7	-5.3	-1.3	-0.6
2002	-0.7	-1.3	0.9	-1.8	1.0	-3.9	-1.3	-0.5
2003	-0.8	-1.3	1.2	-1.8	0.8	-3.1	-1.5	-0.1
2004	-1.0	-1.3	0.2	-1.9	0.6	-1.3	-1.6	0.2
2005	-1.1	-1.3	0.0	-1.9	0.6	0.4	-1.9	0.2
2006	-1.0	-1.3	-0.1	-1.9	0.7	1.1	-2.0	0.2
2007	-0.6	-1.0	0.0	-1.5	0.6	0.4	-1.5	0.2
2008	-0.2	-0.8	0.0	-1.1	0.1	-0.7	-1.2	0.1
2009	-0.1	-0.8	0.3	-0.9	0.0	-1.6	-1.2	0.0
2010	-0.1	-0.9	0.3	-0.7	0.2	-1.7	-1.3	0.0
2011	0.1	-1.0	0.4	-0.7	1.2	-0.2	-1.2	-0.1
2012	0.3	-0.9	0.8	-0.9	1.6	0.4	-1.0	-0.1
2013	0.3	-0.9	0.7	-1.1	0.3	-0.4	-1.0	-0.1
2014	0.2	-0.8	0.7	-0.9	-0.2	-0.2	-0.9	0.1
2015	0.2	-0.7	0.9	-0.6	-0.5	-0.4	-0.9	0.3
2016	0.3	-0.7	0.6	-0.6	-0.4	-0.7	-0.8	0.3
2017	0.2	-0.8	0.2	-0.6	0.4	-0.8	-0.9	0.2

Source of data: authors' calculations based on Rosstat data.

Study **objective:** to describe the general evolution of basic demographic indicators of the territories of the Arctic zone of the Russian Federation.

Materials and methods. The analysis was carried out for the Krasnoyarsk Area, the Arkhangelsk, Murmansk regions, the Komi Republics, Sakha (Yakutia), Nenets (NAO), the Yamalo-Nenets (YNAO), and the Chukotka (ChAO) autonomous districts in comparison with the national indicators.

The period of analysis: 1993-2017.

The data of the Central Statistical Database of the Federal State Statistics Service [6], the Russian database on fertility and mortality [2] are used.

Results and discussion. In the territories under consideration, a decline in the population prevails in general, despite the positive growth trends in the whole country. Sustainable growth in the last decade is demonstrated only by the Krasnoyarsk Area and the Nenets Autonomous District. These trends have continued since the early 1990s (Table 1). The leaders in population decline over the past five years are the Komi Republic (-3.5%), the Murmansk and Arkhangelsk regions (-3.1%). Of those territories that demonstrate a positive population dynamics, significant steady growth is observed only in the Sakha Republic (Yakutia), while in the Krasnoyarsk Area the growth is compensatory, when the growth rates by 2016 only reached the level of 2012, and in 2017 dropped again. In the NAO in 2016 they returned to the level of 2014 in order to decline again in 2017. The decrease in population is ensured by both the natural movement of the population and the migration outflow. In all regions, with the exception of the Krasnoyarsk Area, over the past five years, there has been a negative migration inflow. Most regions show either a slowdown or a decrease in natural population growth. The exceptions are NAO and Chukotka, where natural population growth has a steady upward trend over the past five years.

The population of the Arctic regions is subject to aging, as well as in the whole country, which is associated with a recession of fertility and mortality in the working age. The process of demographic aging of the population leads to an increase

Table 2

Demographic burden per 1000 of the working age population (15-59 yrs), 2017

Age	RF	Krasno-yarsk Area	Arkhan-gelsk Region	NAO	Mur-mansk Region	YaNAO	ChAO	Komi Republic	Sakha (Yakutia)
0-14	287	301	299	377	274	328	319	306	372
60+	348	305	370	235	279	111	158	288	210
Общая	635	606	669	612	553	439	477	594	583

Source of data: authors' calculations based on Rosstat data.

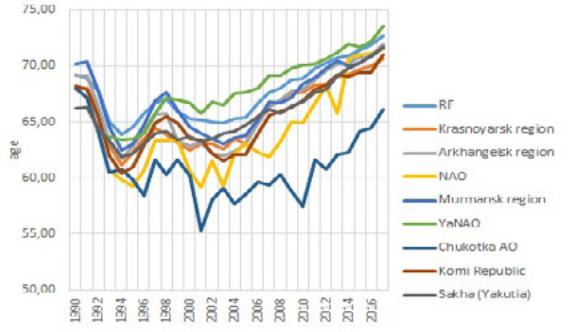

Fig.1. Life expectancy at birth, total population, both sexes, years, 1990-2017

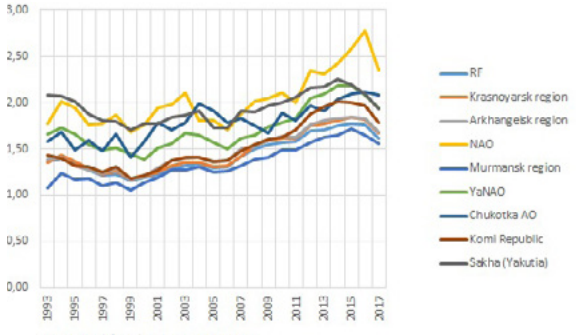

Fig.2. Total fertility rate, 1993-2017

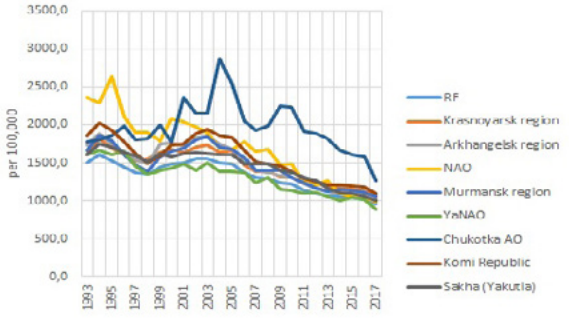

Fig.3. Dynamics of standardized mortality rates, per 100,000, ESP

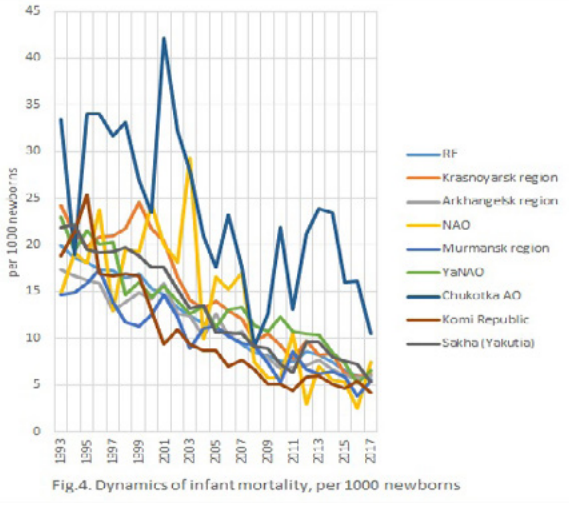

Fig.4. Dynamics of infant mortality, per 1000 newborns

in the demographic burden on the working population (Table 2). By the end of the second decade of the 21st century, various trends in demographic burden indicators are observed in the studied regions. So, in the Arkhangelsk region, as well as in the whole country, there is a negative picture, when the burden of the older age groups prevails over the burden of children. In the NAO, the demographic burden of older ages is much lower comparing with Arkhangelsk region. In the Murmansk region rendered by younger and older age groups are practically in parity.

The dynamics of life expectancy at birth (LE) in the studied regions was congruent to the all-Russian, differing in level (Fig. 1). In general, most regions show lower indicators of LE in comparison with all-Russian ones. The lowest rates of life expectancy for the entire population, in comparison with the all-Russian, were observed in the NAO and ChAO, where throughout the analyzed period, the gap with the national indicators reached 9 - 12 years. Moreover, if the difference in the life expectancy of the population of the NAO and the country tends to reduce, the gap with the indicators of ChAO has increased, reaching a historical maximum in 2010 (16.5 years for men and 15.1 years for women), after which some positive trend began and by 2017, the difference reached 9.1 years. Separately, the YNAO stands out, where LEs exceeded all-Russian indicators since the late 1990s for the entire population, and in the male population since the mid-1990s, reaching a maximum by the middle of the first decade of the new century. This trend was absent in the female population, where there was a gradual reduction in the gap until the early 2000s, then a decline and then a new reduction. As a result, the life expectancy of the female population of the YNAO by 2016 is almost equal to the life expectancy of women in the whole country. In all regions, as well as in the whole country, there is a reduction in the life span of men and women.

The lowest values of the total fertility rate in the studied regions, as well as in the whole country, were noted in 1999 (Fig. 2). Then there was a period of its increase, followed by local declines, which lasted, in general, until 2015, when the indicator was equal to approximately the values of the early 1990s, reaching in some regions the level necessary for simple reproduction of the population (2.1). However, by 2017, the regions showed a decrease in the indicator. It should be noted that in general, in the studied regions in 2015, a slowdown in the growth rate of the total birth rate was noted, and from 2016 its full stop and turn to decrease. As a result, in 2017 all regions showed the largest decline. In particular, the NAO stands out, where the decline in the total fertility rate for the year was 15.3%.

Similar to the dynamics of life expectancy, the dynamics of overall mortality was identical to the fluctuations in mortality in the country (Fig. 3). It should be noted that in all the studied regions, in addition to the YNAO, the mortality rate, with a similar dynamics, was distinguished by a high level throughout the study period. The maximum gap with the all-Russian indicators was demonstrated by the NAO, ChAO and Komi Republic. On average, over the past quarter century, the mortality rate in the ChAO was higher than the national one by 26.5%. Moreover, the gap between the death rates in this region and those for the whole country tends to increase until 2015. The reduction in mortality in its duration is unprecedented. As a result, by the middle of the second decade of the new century, the mortality rate in the studied regions reached the levels of the early 1990s and less. However, the rate of this decrease gradually decreases and by 2014-2015 it almost stopped, slowing to a minimum, and in some territories, for example, in the YNAO and NAO, the death rate even increased compared with previous years.

The infant mortality rate, as well as LEs, is an integral indicator reflecting, among other things, the quality of life of the population (Fig. 4). The infant mortality rate in the regions, as well as in the whole country, had a steady downward trend with the exception of short-term upturns of the early 1990s and 2000s. Most of the regions, with identical dynamics, showed higher rates of infant mortality than in the

whole country. As in the case of the general mortality rate, the leader in excess was ChAO, where the infant mortality rate in 2015 exceeded the national one by 2.9 times, and the average over the past 25 years was 95.8% higher than the country level.

In all regions, the distribution of the leading classes of causes of death was traditional for the country. Cardiovascular diseases remain the leading class of causes of death, followed by neoplasms, and then external causes, injuries and poisonings, the level of which exceeds the national level.

The analysis of basic demographic processes taking place in the Arctic and subarctic belt of the Russian Federation shows that against the background of general positive changes in the demographic situation, negative trends remain. A significant migration outflow of the population, noted in most of the studied regions, is one of the main reasons for the depopulation of the Russian Arctic [5]. Nevertheless, in a number of regions, rooting of the visiting population can be observed, since the in them is higher than that of the migrants. These regions include the NAO rate of natural increase, the Yamal-Nenets Autonomous Okrug, the Republic of Sakha (Yakutia). In contrast, the Arkhangelsk and Murmansk regions, the Republic of Komi, ChAO, demonstrate a fairly steady downward trend in population. In these regions, even in conditions of a positive balance of natural movement of the population, the migration outflow is so great that it completely eliminates the existing successes associated with an increase in the birth rate and a decrease in mortality. This circumstance indicates the continuing, noted earlier socio-economic inequality of regions completely or partially related to the Arctic [1, 3]. In general, the main factors hindering natural population growth and stimulating migration outflows are the low standard of living of the population, severe climatic conditions, poor quality of public goods, alcoholism [3, 7, 9, 10]. It should also be noted that in regions with harsh climatic conditions, rotational work methods are widespread, not involving a change of permanent residence. In addition, since 2011, the methodology for calculating internal migration has been changed, making it difficult to compare data before and after this year. The rise in infant mortality in the early 1990s and 2000s is associated with improving the quality of accounting and the transition to new standards for determining live birth [8].

Conclusions. Despite the general positive demographic trends, the territories of the Arctic zone of Russia remain areas of a tense demographic situation, manifested in supermortality, insufficient fertility for the reproduction of the population, migration outflow of the population, which leads to continued depopulation of these regions. It is impossible to fully ensure geopolitical interests, sovereignty, security of economic activities in the Arctic without the due attention to the negative demographic processes occurring in the Arctic and subarctic belt of Russia.

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