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Features of the Sakha Republic (Yakutia) Population mortality dynamics in Different groups of Districts

Abstract

Basing on the retrospective analysis, the article presents the dynamics of the main causes of mortality of the population inhabiting different regions of the Sakha Republic (Yakutia) in the period 1991-2010. It reveals the periods of the mortality rate variations, as well as the trend changes in the main classes of mortality causes in the rural, industrial and Arctic groups of the republic's regions. It also emphasizes the importance of keeping record of the population loss peculiarities.

Keywords: population mortality, causes of mortality, regional peculiarities.

Introduction.

With its varied natural, climatic, social, economic and ecological conditions, wide-ranging demographic breakdown, Russia has pronounced regional peculiarities of the population mortality rates, which can be used to assess the population sanitary well-being and pathological peculiarities of certain groups [3,4,7]. This makes it especially important to carry out regional surveys of the population health indicators, and the mortality rate, in particular. The Sakha Republic (Yakutia), covering a huge area of 3.1 million square kilometers and characterized by considerable differentiation in the social and economic situation in different regions, also keeps track of the inter-regional peculiarities of the population mortality figures.

Aim of the Research: to study changing trends in the rate and breakdown of mortality in different groups of regions in the Sakha Republic (Yakutia).

Material and Methods of the Research.

We have conducted a retrospective analysis of the mortality rate in Arctic, rural and industrial groups of the regions in the Sakha Republic (Yakutia) for the period 1991-2010. We used the statistical data on mortality collected by the Federal State Statistical Service, the Regional

Office in the Sakha Republic (Yakutia), for these years, as well as state records of death from the Civil Registry Office under Government of the Sakha Republic (Yakutia) for the period 2007-2010[1,2].

Out of the zoning methods offered in professional literature, the method of medical and economic zoning was applied for the Sakha Republic (Yakutia) [6]. The method uses 32 parameters characterizing social and economic, medical and demographic features of areas, also considering basic indicators of the population health and public medical care. Thus, 35 administrative units of the republic were divided into three groups: Arctic, including 12 regions; rural (13); and industrial (10 regions and townships).

To study main causes of the population mortality we used the 10th revision of the International Classification of Diseases and Related Health Problems (1997).

Results and Discussion.

The mentioned groups of the regions significantly differ in the covered area and population density (Tab. 1).

The groups of regions also differ considerably by a share in the total population of the republic. The industrial group of regions is the most populated one, with 62.0% of the total population (589,359 people), as of the beginning of 2010; the rural group (13 regions) - 30.8% (291,977 people); Arctic group (12 regions) - 7.2% (68,011).

The study of the republic's population loss from 1,121.3 thousand people in 1991 to 958.7 in 2010 (by 162.6 thousand people, or 14.4%) showed different decline rates in the number of inhabitants in different groups of regions (Tab. 2). In the industrial group of regions, the population decreased by 92.1 thousand by the year 2005; then it saw a growing trend, thus the population loss over the studied period made over 80.0 thousand people (12%). Up to the mid-1990s, the rural group of regions demonstrated a growing trend, but in the subsequent period of 1995-2010 the population decreased by 19.0 thousand (6.1%). The Arctic group experienced the fastest rate of the population loss, which halved over 20 years (from 140.4 to 68.0 thousand people).

We should note that in the 1990s the republic witnessed all-time high migration of the population. In 1990, for the first time in many years, migration inflow was replaced by migration outflow at 6.7 thousand people. The following year of 1991 saw migration outflow increasing by 4.6 times and totaling to 30.8 people. The migration outflow reached its peak at 33.5 thousand people in 1994. The intensive migration outflow was caused by a number of factors: the general social and economic downturn, transition to the market economy, significant rise in cost of living in the North, liquidation of numerous enterprises and even settlements. The social and economic

transformations of the 1990s resulted in the loss of main advantages of living in the North: high salary and wages, sound provision with food and consumer goods, which attracted people from other regions of the country and helped to cope with sever climatic conditions[1]. By the year 2010, the migration outflow of the population almost halved (reducing by 1.9 times) and made 17.7 thousand people.

The comparative analysis of the total population mortality in the period 1991-2010 revealed the following facts (Tab. 3):

The rural group demonstrated higher mortality rates (7.8-8.9 per 1,000 people) than the mean republic's figures at 6.9-7.9 in 1991-1992; and in 1997-1999 (9.7 - 10.0 against 9.0-9.5). Then, up to the year 2010, the total population mortality rate remained rather high, being second after the Arctic regions, and ranged from 9.2 to 10.4. In comparison with the year 1991, by the end of 2010, this group of regions showed increase in this indicator by 29.5% (from 7.8 to 10.1 per 1,000 people).

The industrial group ranked first in 1994-1996 (from 9.4 to 9.9 per 1,000 people); otherwise, the total mortality rate in these regions was below mean regional figures, and from the year 2000 it has been the lowest among all the regions of the republic.

In 1991-1999 the Arctic group (except for the year 1997) showed the lowest mortality rates, with a growing trend, though (from 6.1 to 8.7 per 1,000 people). However, the year 2010 changed the pattern and gave start to annual growth of mortality; as a result, the past eleven years (2000-2010) the Arctic regions demonstrated the highest mortality rate ranging from 10.0 to 13.1 per 1,000 people; and there is a clear growing trend for future (Fig. 1).

Whereas excess male mortality is nowadays seen as a natural phenomenon, the Arctic regions display high female mortality, as well (Fig. 2, 3). It is not an overstatement to say that these regions are primarily responsible for the negative statistics on mortality in the republic. The Arctic regions also have the worst mortality in the working-age population, which accounts for over 50% of the dead, the mortality rate in this category being the highest in the republic (Table 4).

In the year 1991, there were six main classes of death causes in the republic, by frequency: circulatory system diseases (CSD); injuries, poisoning and other consequences of external factors impact (external causes); neoplasms; respiratory system diseases (RSD); digestive system diseases (DSD); and symptoms, signs and anomalies, revealed under clinical and laboratory examination and unclassified in other categories (vague symptoms). This breakdown was observed in the industrial and rural groups of regions; in the Arctic group it was slightly different with the external causes ranking first (Table 5).

[1] Analytical newsletter № 58, Regional Office in the SR(Y), FSSS, 2008

The rural regions demonstrated higher mortality of the first five classes of causes than mean republic's figures. This group also showed an unfavorable situation with infectious and parasitic diseases (20.6‰ against 14.2% in the republic in whole); nervous system diseases (10.6 against 7.3); congenital anomalies (19.3 against 10.5); urogenital system diseases (16.4 against 9.9, respectively).

The mortality rate of external causes in the Arctic regions exceeded the mean republic's indicator by 1.2 times (211.5 against 173.7); whereas the rates for neoplasms, CSD and DSD were relatively low. The industrial group of regions demonstrated moderate figures for all the classes of death causes, except for psychological disorders and endocrine system diseases (4.3 and 8.1 per 1,000 people, against 3.6 and 6.5 in the republic in whole). They also showed the lowest mortality rate of vague symptoms (13.1 against 19.7).

According to 2010 data, ranking of the first three positions remained the same in the republic, whereas DSD went up to the 4th position, vague symptoms occupied the 5th position, ousting RSD (Table 5). In general, respiratory system diseases left the 4th position among the main causes of death in all groups of regions. Vague symptoms were becoming more and more common, ranking fourth in the industrial regions and third in the Arctic regions, leaving neoplasm mortality behind (for example, this figure is 233.4‰ in Verkhoyansky region, in Eveno-Bytantaisky – 174.9, Allaikhovsky – 163.4, Srednekolymsky – 151.9) (Tab. 3).

Besides, the rural group of regions maintained an alarming situation with mortality of nervous (37.0‰) and urogenital (8.2) systems diseases; prenatal conditions (8.6) and congenital anomalies (4.5); external causes (213.0), with the figures being considerable higher than the republic's average.

The Arctic regions experienced a critical situation with mortality of all classes of diseases (except for neoplasms, respiratory diseases and complications during pregnancy, delivery and after-delivery periods); moreover, the mortality rate of psychological disorders and behavioral disorders exceeded the mean republic's figure by 6 times (17.6 against 2.8‰).

The industrial group of regions demonstrated rates of mortality comparable with the mean republic's average in all classes, except for a slight excess for certain causes (neoplasms, endocrine system diseases, respiratory diseases and digestive system diseases).

Conclusion.

Therefore, the mortality rate has significant variations in different medical and economic groups of regions in the republic. Comparison of population sizes in the given groups with the total mortality rate revealed an inverse proportion relationship: in 2010, the highest mortality rate was

registered in the least populated Arctic group – 13.1‰, while the most populated industrial regions showed a relatively low mortality rate – 9.4. It should be noted that these groups of regions differ a lot by economic zoning parameters. Relatively prosperous industrial regions are characterized by higher economic and social development, advanced transport infrastructure, as well as by satisfactory medical and health-improving facilities with sufficient resources, both material, like up-to-date equipment and devices, and human, like medical specialists of all profiles. Also, there are a number of major companies, capable of making great contribution into the local medical care in the area.

Peculiarities of the medical care functioning in the Arctic regions are largely determined by extreme natural and climatic conditions of living. Medical institutions fail to provide effective services due to vastness of the area, remoteness and difficult access to settlements, poor, and often nonexistent, transport infrastructure. But this is not the only problem. As daunting is the situation with understaffing, especially with doctors. Enough medical and diagnostics equipment was purchased under the national project on healthcare development and modernization; yet, there is still lack of qualified personnel to use the advanced equipment in full. In addition, all these problems are aggregated by low general social and economic development of the Arctic regions. The main external cases of death in this area lie, in fact, beyond the healthcare system liabilities, being rather a sphere for social and law-enforcement authorities (murders, suicides, accidental alcohol poisoning, etc.).

In this respect, it makes sense mentioning a high mortality rate of alcohol-related causes, which in ten Arctic regions in 2010 exceeded the mean republic's figure (65.9 per 100 thousand people) by 1.7-2.6 times (Fig. 4). There is potential for decreasing the population mortality, since a large share falls on the working-age population, making over 50% of the dead, and mortality in this category can be prevented. Higher mortality rates of endocrine, nervous, urogenital diseases, conditions arising in the prenatal period and from congenital anomalies, as well as 3-fold higher rate of deaths of vague symptoms (120.6‰ against 44.7) emphasize importance of proper diagnostics and treatment.

In the surveyed period the rural group of regions demonstrates significant positive changes in comparison with the 1990s. The figures on most classes of death causes correspond to the republic's average. The Regional Vascular Center and a number of vascular wards opened in first-referral hospitals are expected to decrease the mortality rate of myocardial infarction and strokes. Also, the recent years have witnessed large-scale equipping of rural medical institutions, as well as some positive changes in staffing.

According to WHO data, the current state of medical care can prevent fatal termination of most infectious and parasitic diseases, respiratory and digestive system diseases, especially in working-age population [5]. In this respect, all the groups of regions have potential of decreasing mortality rates of these causes.

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Table 1

Area and population density in different groups of regions in the Sakha Republic (Yakutia)

Groups of regions	Area (ths sq. km.)	Population density (people per 1 sq.km)
Arctic	1541.0	0.05
Rural	541.4	0.97
Industrial	1001.1	8.49

Table 2

Changes in population sizes in different groups of regions in the Sakha Republic (Yakutia) in 1991-2010 (ths people)

Groups of regions	1991	1995	2000	2005	2010	Loss in absolute numbers and %
Industrial	670.0	628.4	590.2	577.9	589.4	80.6 (12.0%)
Rural	310.9	314.1	308.9	299.7	291.9	19.0 (6.1%)
Arctic	140.4	106.0	89.5	73.0	68.0	72.4 (51.6%)
Sakha Republic (Yakutia)	1121.3	1048.5	988.6	950.7	949.3	172.0 (15.3%)

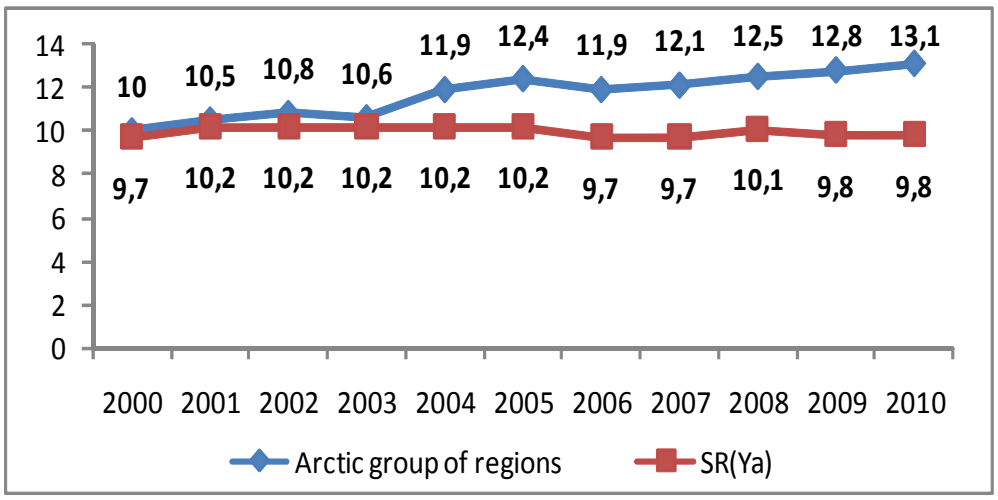

Fig. 1. Total population mortality rates in the Arctic group of regions and in the SR(Ya) (1991-2010)

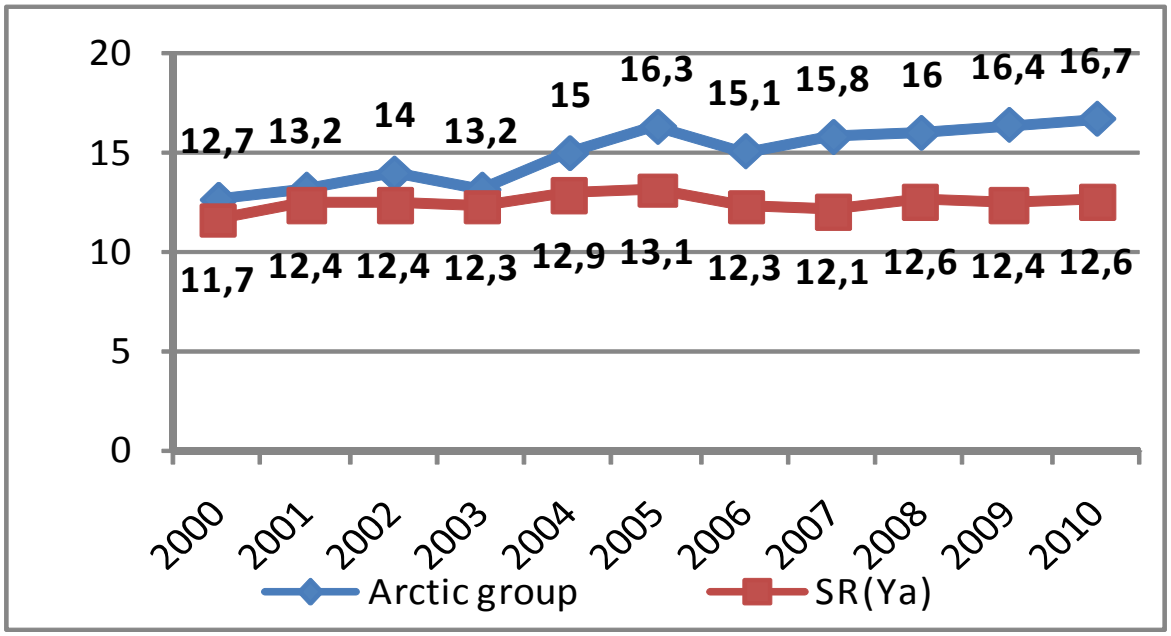

Fig. 2. Dynamics of male mortality rates in the Arctic regions of the Sakha Republic (Yakutia) in 2000-2010 (per 1,000 people)

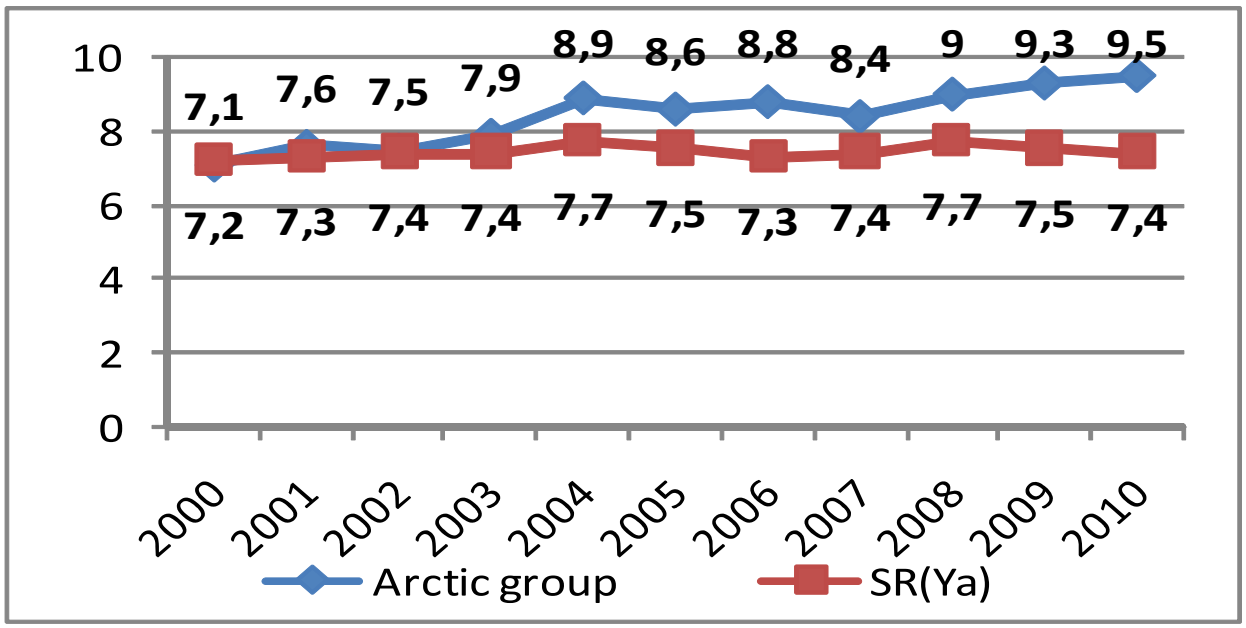

Fig. 3. Dynamics of female mortality rates in the Arctic regions of the Sakha republic (Yakutia) in 2000-2010 (per 1,000 people)

Table 3

Dynamics of the total population mortality in different groups of regions in the Sakha Republic (Yakutia) in 1991-2010

Groups of regions	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Rural	**7.8**	**8.9**	8.8	9.6	9.5	9.4	9.7	9.4	10.0	9.6	10.3	9.8	10.1	10.3
Industrial	6.4	7.6	8.8	9.9	9.8	9.4	8.4	8.5	9.3	9.3	9.6	9.8	9.6	9.9
Arctic	6.1	6.6	7.8	8.9	8.9	8.5	8.7	8.1	8.7	10.0	10.5	10.8	10.6	11.9
SR (Ya)	6.9	7.9	8.8	9.9	9.8	9.3	9.0	8.9	9.5	9.7	10.2	10.2	10.2	10.2

Table 4

Percentage of working-age population in the total number of dead and ratio per 1000 people in different groups of regions in the Sakha Republic (Yakutia)

Groups of regions	1991		1995		2000		2010	
	Percentage	Per 1,000 people	Percentage	Per 1,000 people	Percentage	Per 1,000 people	Percentage	Per 1,000 people
Rural	38.3	5.5	41.2	7.3	40.2	6.9	45.0	7.5
Industrial	48.2	4.9	54.0	8.3	48.7	6.8	46.7	6.6
Arctic	50.0	4.9	57.7	8.3	54.5	8.9	54.6	11.8

Table 5

Mortality in the Sakha Republic (Yakutia) of different causes in 1991, 2010 (per 100 ths people)

Groups of regions	1991						2010			
	Class II	Class IX	Class X	Class XI	Class XVIII	Class XIX-XX	Class II	Class IX	Class X	Class XI
Industrial	108.3	228.3	32.4	26.9	13.1	167.7	126.4	463.6	36.1	36.1
Rural	145.7	261.2	47.0	37.0	32.8	157.9	120.2	476.1	36.6	50.3
Arctic	96.2	156.7	40.0	20.7	19.2	211.5	89.7	542.6	22.1	86.8
SR (Ya)	119.7	232.8	38.1	29.4	19.7	173.7	120.7	469.5	34.9	55.7

Notes. Class II – neoplasms, IX – circulation system diseases, X –respiratory system diseases, XI – digestive system diseases, XVIII – symptoms, signs and anomalies revealed under clinical and laboratory examinations and un classified in other categories, XIX-XX – injuries, poisoning and other consequences of external factors impact, external causes of death.

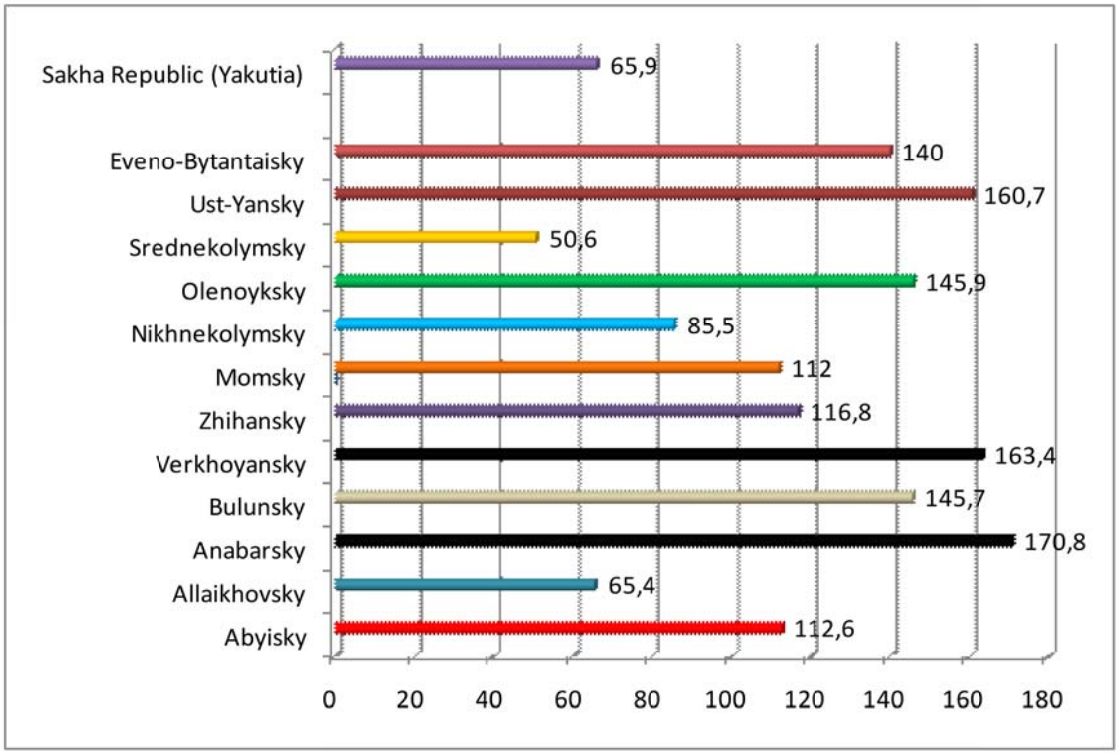

Fig. 4. Population mortality of alcohol-related causes of death in the Arctic group of regions in the Sakha Republic (Yakutia) (per 100 thousand people)