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COMPARATIVE ANALYSIS OF THE MORTALITY MAIN CAUSES AMONG THE WORKING AGE IN THE REPUBLIC OF SAKHA (YAKUTIA): ETHNICITY DIFFERENCES

ABSTRACT

The comparative analysis of the mortality leading causes among the working age population in Republic Sakha (Yakutia) depending on ethnicity is presented in article. In the structure of mortality for period of 2005-2011 external causes were at the first place, the second – cardiovascular diseases and at the third one – malignant tumors. Ethnic differences were characterized by the fact that the non-natives died from the cardiovascular diseases, including the acute myocardial infarction, and malignant tumors, more often than the natives. In the non-natives the mortality from alcoholic cardiomyopathy and casual poisoning and exposure to alcohol was higher. Mortality from the external causes was higher among indigenous small in number people of the North than among the Yakuts and the non-natives. In the Yakuts in comparison with indigenous small in number peoples of the North the mortality from cardiovascular diseases and cerebrovascular accidents was higher.

Keywords: Yakutia, mortality, working age, population ethnic differences.

INTRODUCTION

In the Republic of Sakha (Yakutia), as well as in the whole of Russia, depopulation is one of the most actual problems. In Russia has one of the lowest life expectancy in comparison with developed countries of the world and countries, the level of economic development which is close to the Russian. Low life expectancy is formed mainly due to high mortality in the working age [1]. In recent years, both in Russia and in Yakutia marked positive shifts in the demographic development, characterized by stable fertility rates, overall mortality, and natural population growth. Life expectancy of the republic population in 2005 has increased by 5.13 years and in 2014 was 69.81 years (for men – 64.34 yr, an increase of 5.68 yr; for women – 75.50 yr, an increase of 3.96 yr) [2]. According to the Federal State Statistics Service of the Russian Federation the life expectancy in 2014 was 70.93 years (since 2005, an increase of 4.56 yr) (for men – 65.29 yr, an increase of 6.37 yr; for women – 76.47 yr, 4 years length) [3].

According to the National Population Census in 2010 in the structure of the working age population of the Republic of Sakha (Yakutia) non-native population was 48.7%, Yakuts – 47.3%, indigenous small in number peoples of the North – 3.9%. Compared with census in 2002, the total number of the Yakutian working age population increased by 1.7% (10,384 people). At the same time, the number of the working-age non-native population decreased by 8.6% (28,223 people), Yakuts increased by 12.8% (33033 people) and indigenous small in number peoples (ISNP) of the North – by 30% (5574 people) (Fig. 1).

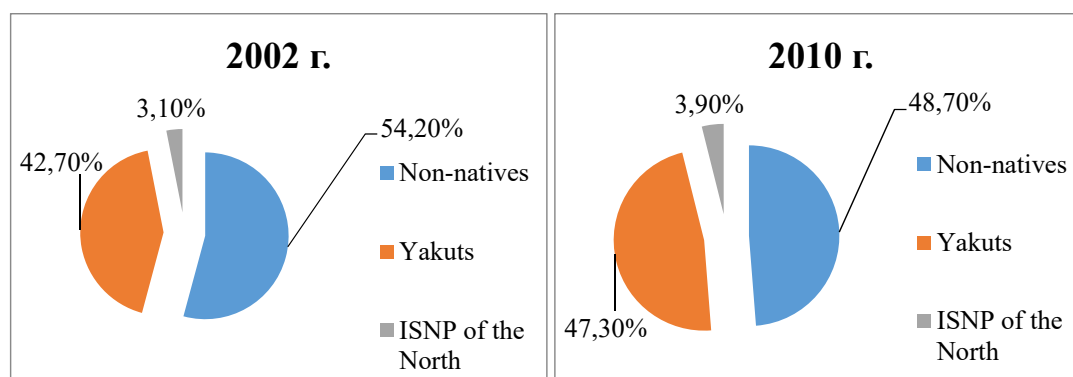


Fig. 1. The proportion of the Yakutian working age population in national groups according to the National Population Census in 2002 and 2010

Despite some improvement in health and demographic indicators in the country, of the working age population mortality rate of remain high, which may cause in the future labor shortages, especially among men.

Objective: The comparative analysis of the mortality leading causes among the working age population in Republic of Sakha (Yakutia) for the period of 2005-2011.

MATERIAL AND METHODS

The analysis of the all working-age population mortality in the Republic of Sakha (Yakutia) for 2005-2011 according to the Yakut republican medical information-analytical center was held. Total 31001 the case of working-age persons death we analyzed. For comparative analysis were used age-standardized mortality rates for the age group 15-64 years. To calculate of the mortality rates by ethnicity were used census data of the working age population in 2002 and 2010. Were calculated the mortality rates in accordance with the International Classification of Diseases 10th revision (ICD-10) by primary of the death main causes: cardiovascular diseases (I00-I99), external causes of morbidity and mortality (V01-Y98) and malignant tumors (C00- C97). The statistical processing of data been conducted with the program «Statistica 6».

RESULTS AND DISCUSSION

In the Russian Federation and the Far Eastern Federal District (FEFD) in the structure of the working age population mortality causes, since 2008, the first place was occupied by cardiovascular diseases, the second place – external causes (accidents, injury, poisoning, suicide), who led in the previous years and the third – malignant tumors. At the same time in the period under review in the Republic of Sakha (Yakutia) in the first place was mortality from external causes, except for 2010, the second place was occupied by death from cardiovascular diseases, and the third – by malignant tumors (Table 1).

Table 1

**The mortality rate of the working population by mortality main causes in the Republic of Sakha (Yakutia)
(RS(Y)), Far Eastern Federal District (FEFD) and Russian Federation (RF)
(on 1000 working-age population)**

Cause of mortality		Years						
		2005	2006	2007	2008	2009	2010	2011
Cardiovascular diseases (I00-I99)	RS (Y)	2,64	2,34	2,20	2,35	2,40	2,60	2,31
	FEFD	3,27	2,92	2,63	2,71	2,52	2,72	2,50
	RF	2,63	2,36	2,16	2,17	2,01	2,01	1,89
Of them ischemic heart disease (I20-I25)	RS (Y)	0,78	0,67	0,60	0,69	0,66	0,56	0,61
	FEFD	1,58	1,42	1,29	1,34	1,29	1,29	1,18
	RF	1,27	1,13	1,05	1,06	0,98	0,97	0,88
Including acute myocardial infarction (I21)	RS (Y)	0,21	0,17	0,19	0,16	0,17	0,16	0,24
	FEFD	0,35	0,35	0,34	0,32	0,32	0,31	0,30
	RF	0,16	0,16	0,16	0,16	0,16	0,15	0,15
Cerebrovascular diseases (I60-I69)	RS (Y)	0,58	0,53	0,45	0,46	0,44	0,43	0,42
	FEFD	0,67	0,60	0,52	0,51	0,48	0,50	0,45
	RF	0,56	0,52	0,50	0,51	0,49	0,50	0,34
External causes of morbidity and mortality (V01-Y98)	RS (Y)	2,92	2,77	2,61	2,71	2,53	2,53	2,40
	FEFD	3,39	2,97	2,71	2,69	2,39	2,49	2,43
	RF	2,69	2,40	2,21	2,07	1,89	1,82	1,67
Of them deliberate self-harm (suicide) (X60-X84)	RS (Y)	0,67	0,66	0,65	0,67	0,65	0,56	0,56
	FEFD	0,53	0,51	0,50	0,49	0,46	0,43	0,40
	RF	0,40	0,37	0,36	0,33	0,33	0,30	0,26
Accidental poisoning by and exposure to alcohol (X45)	RS (Y)	0,14	0,10	0,05	0,07	0,09	0,10	0,08
	FEFD	0,35	0,25	0,17	0,17	0,15	0,16	0,14
	RF	0,37	0,29	0,23	0,22	0,19	0,17	0,15
Traffic accidents (V01-V99)	RS (Y)	0,28	0,31	0,19	0,20	0,21	0,20	0,27
	FEFD	0,36	0,29	0,35	0,32	0,23	0,28	0,32
	RF	0,34	0,22	0,34	0,31	0,27	0,25	0,27
Malignant tumors (C00-C97)	RS (Y)	0,76	0,70	0,75	0,69	0,75	0,64	0,66
	FEFD	0,96	0,94	0,94	0,91	0,89	0,91	0,90
	RF	0,88	0,87	0,87	0,87	0,86	0,85	0,85

During the analyzed period in the Republic of Sakha (Yakutia), the coefficient of the working-age population total mortality declined steadily up to 2009. Thus, in 2008 the figure was 7.07 per 1000 population, which is lower than the figure in 2005 by 8.8%. Then, starting in 2009, the mortality rate from all causes had a tendency to grow, and in 2011 increased by 5.9% as compared with 2008 (Table 2). A comparative analysis of the mortality dynamics by ethnicity the following differences are revealed. Dynamics of the total mortality among non-natives was similar to the Republican: in 2008 compared to 2005, the coefficient of the total mortality decreased by 12.9%, then in the following years, this figure has increased significantly and peaked in 2011 (an increase by 25.4% compared to 2008). Among the indigenous small in number peoples of the North the opposite is true: until 2009, the mortality rate increased (in 2008 increased by 22.9% compared to 2005) and then decreased by 34.1% in the following years. Yakuts noted steady decline in overall mortality and for the analyzed period has decreased by 23.9%. Ethnicity differences in dynamics of mortality can be

explained by the working age population changes: a reverse exodus non-native population and an increase in the number of indigenous people. In analyzed period the dynamics of the mortality from cardiovascular diseases, external causes and malignant tumors among native people of Yakutia tended to a steady decline, among the non-natives the mortality rate from external causes and malignant tumors was increased.

Table 2

The main causes of the working age population mortality in the Republic of Sakha (Yakutia) by ethnic groups for the period 2005-2011

(1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Coefficient of the total mortality							
Yakuts	7,17	6,42	6,92	6,75	6,04	5,38	5,46
ISNP of the North	8,97	9,18	9,56	11,02	8,26	6,89	7,26
Non-natives	8,14	7,61	7,18	7,09	8,12	9,24	9,51
RS (Y)	7,75	7,15	7,14	7,07	7,24	7,32	7,51
including mortality from cardiovascular diseases (I00-I99)							
Yakuts	2,14	1,79	1,90	2,04	1,86	1,81	1,81
ISNP of the North	2,43	2,54	2,32	2,38	1,78	1,99	1,37
Non-natives	3,02	2,72	2,52	2,94	2,83	3,53	2,95
RS (Y)	2,63	2,32	2,25	2,54	2,39	2,65	2,23
malignant tumors (C00-C97)							
Yakuts	0,63	0,57	0,67	0,61	0,70	0,44	0,47
ISNP of the North	0,49	0,54	0,65	0,86	0,81	0,42	0,58
Non-natives	0,89	0,86	0,99	0,81	0,90	1,03	1,11
RS (Y)	0,77	0,72	0,84	0,73	0,81	0,73	0,78
external causes (V01-Y98)							
Yakuts	3,28	2,84	3,20	3,07	2,07	2,18	2,07
ISNP of the North	5,02	4,48	4,91	6,00	2,97	3,45	3,74
Non-natives	2,66	2,53	2,24	2,29	3,00	2,88	2,97
RS (Y)	3,00	2,72	2,73	2,74	2,60	2,57	2,57

Currently it is causing great economic damage from external causes of mortality among the population of working age. Working age indigenous small in number peoples of the North in 2 times more likely than the non-natives and 1.3 times than the Yakuts, die from external causes, including prevailing traffic accidents, suicides, and accidental drowning attacks (Table 3). In the structure of mortality from external causes among the non-natives prevailed accidental poisoning and alcohol impacts compared with the indigenous people.

Table 3

The structure of the working-age population mortality from external causes by ethnic groups for the period 2005-2011 (1000 individual respective ethnic group)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Transportation accidents (V01-V99)							
Yakuts	0,32	0,23	0,16	0,21	0,19	0,17	0,23
ISNP of the North	0,43	0,22	0,16	0,11	0,43	0,08	0,08
Non-natives	0,30	0,34	0,16	0,20	0,22	0,22	0,35
RS (Y)	0,32	0,29	0,16	0,20	0,21	0,19	0,29
Intentional self-harm (X60-X84)							
Yakuts	0,87	0,76	0,93	0,84	0,50	0,53	0,58
ISNP of the North	1,73	1,30	2,00	1,89	0,92	1,16	1,45
Non-natives	0,49	0,46	0,36	0,43	0,75	0,54	0,58
RS (Y)	0,69	0,61	0,66	0,65	0,65	0,56	0,61
Attack (X85-Y09)							
Yakuts	0,80	0,69	0,72	0,23	0,38	0,41	0,37
ISNP of the North	3,29	0,70	1,19	0,65	0,16	0,58	0,58
Non-natives	0,48	0,47	0,50	0,20	0,53	0,55	0,51
RS (Y)	0,70	0,57	0,61	0,23	0,46	0,49	0,45
Accidental poisoning by and exposure to noxious substances (X40-X49)							
Yakuts	0,26	0,18	0,15	0,26	0,21	0,23	0,10
ISNP of the North	1,67	0,16	0,16	0,22	0,27	0,21	0,00
Non-natives	0,30	0,32	0,34	0,25	0,34	0,52	0,37
RS (Y)	0,32	0,26	0,25	0,26	0,29	0,37	0,23
Of them, accidental poisoning and exposure to alcohol (X45)							
Yakuts	0,15	0,05	0,07	0,13	0,11	0,14	0,04
ISNP of the North	0,22	0,05	0,11	0,05	0,05	0,17	0,00
Non-natives	0,18	0,18	0,09	0,11	0,15	0,23	0,16
RS (Y)	0,17	0,12	0,08	0,11	0,13	0,18	0,10
Accidental drowning and submersion (W65-W74)							
Yakuts	0,31	0,33	0,37	0,29	0,17	0,22	0,23
ISNP of the North	1,03	0,86	0,49	0,32	0,38	0,37	0,42
Non-natives	0,14	0,18	0,20	0,33	0,28	0,24	0,19
RS (Y)	0,24	0,26	0,28	0,32	0,24	0,23	0,22

High mortality from external causes among indigenous small in number peoples of the North due to social and hygienic plague the residents of the Far North due to the lack of state support for agriculture and extremely low efficiency of the health system in the field. Increased mortality from external causes is most typical for maladjusted and poorly adapted to the market segments of the population. As the number of deaths the first place non-working population is occupied, the second – the working-age population, performing low-skilled jobs, and located on a low social level [5].

Indicators of the working age population mortality from external causes in the Far Eastern Federal District above the Russian average by 15-20 % in some years. Fluctuations in mortality coincide with the social-economic crisis and the growing of population alcoholism as a manifestation of social exclusion. The greatest economic damage causes mortality from external causes among men of working age the northern regions of the FEFD: Chukotka Autonomous Okrug and Sakhalin Region, followed by the Republic of Sakha (Yakutia) by a considerable margin. These figures are higher than the average for the Far Eastern Federal District, and including the Magadan region, are much higher than in Russia. In the southern regions, the mortality rate is close to the average level for the Far Eastern Federal District, and in some regions is slightly lower [6].

In the country's population of working age has been a steady decline in mortality from cardiovascular diseases for the period 2005-2011 (Table 4). Ethnicity differences were characterized by the fact that the non-natives in 2.5 times more likely to die from acute myocardial infarction and alcoholic cardiomyopathy, in contrast to the indigenous people, who in turn in 1.2 times more likely cause of death was cerebrovascular accident.

Table4

The structure of the working age population mortality from cardiovascular diseases by ethnic groups for the period 2005-2011 (1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Ischemic heart disease (I20-I25)							
Yakuts	0,44	0,38	0,34	0,44	0,50	0,31	0,31
ISNP of the North	0,76	0,65	0,43	0,32	0,38	0,12	0,12
Non-natives	1,05	0,97	0,85	1,12	0,78	1,06	0,97
RS (Y)	0,78	0,71	0,62	0,80	0,65	0,67	0,62
Of them: acute myocardial infarction (I21)							
Yakuts	0,11	0,09	0,10	0,05	0,16	0,06	0,03
ISNP of the North	0,11	0,11	0,00	0,05	0,00	0,08	0,04
Non-natives	0,40	0,28	0,31	0,31	0,18	0,34	0,35
RS (Y)	0,27	0,19	0,21	0,19	0,17	0,20	0,19
Other heart disease (I30-I52)							
Yakuts	0,84	0,71	0,80	0,83	0,85	0,87	0,65
ISNP of the North	1,03	1,08	1,40	1,67	1,03	1,41	0,79
Non-natives	1,23	1,06	1,02	1,14	1,18	1,65	1,25
RS (Y)	1,06	0,91	0,94	1,02	1,03	1,27	0,95
Of them: alcoholic cardiomyopathy (I42.6)							
Yakuts	0,21	0,16	0,14	0,14	0,34	0,34	0,25
ISNP of the North	0,16	0,43	0,16	0,43	0,22	0,75	0,37
Non-natives	0,69	0,68	0,40	0,52	0,45	0,71	0,64
RS (Y)	0,47	0,45	0,28	0,36	0,39	0,54	0,45
Acute cerebrovascular ischemic type (I67.8)							
Yakuts	0,66	0,57	0,61	0,59	0,40	0,50	0,46
ISNP of the North	0,54	0,54	0,38	0,32	0,38	0,33	0,39
Non-natives	0,56	0,54	0,49	0,52	0,62	0,68	0,55
RS (Y)	0,61	0,55	0,54	0,54	0,52	0,58	0,50

Mortality from malignant tumors predominated among the non-natives of Yakutia (Table 5). It is noteworthy that during the analyzed period among the non-natives in 2 times more likely to die from cancer of the respiratory and chest and breast than the indigenous people. Indigenous peoples of the North, compared with Yakuts more likely to die from cancer of the digestive system. In the developed countries of Europe in the population of working age in the proportion of tumors accounted for about 30% of deaths [4].

Table 5

The structure of the working-age population mortality from malignant tumors by ethnic groups for the period 2005-2011 (1000 working age population by ethnic group of persons)

Ethnic groups	Years						
	2005	2006	2007	2008	2009	2010	2011
Malignant tumors of digestive organs (C15-C26)							
Yakuts	0,30	0,25	0,31	0,24	0,26	0,20	0,16
ISNP of the North	0,22	0,32	0,32	0,59	0,49	0,17	0,25
Non-natives	0,28	0,26	0,28	0,25	0,28	0,38	0,36
RS (Y)	0,29	0,26	0,30	0,26	0,28	0,28	0,26
Of them: malignant tumors of stomach (C16)							
Yakuts	0,11	0,10	0,09	0,08	0,09	0,07	0,06
ISNP of the North	0,11	0,22	0,16	0,22	0,11	0,08	0,08
Non-natives	0,10	0,07	0,11	0,07	0,10	0,12	0,13
RS (Y)	0,10	0,09	0,10	0,08	0,09	0,09	0,09
Malignant tumors of liver and intrahepatic bile ducts (C22)							
Yakuts	0,11	0,07	0,08	0,07	0,05	0,06	0,03
ISNP of the North	0,11	0,05	0,11	0,16	0,11	0,04	0,04
Non-natives	0,05	0,05	0,03	0,04	0,05	0,05	0,06
RS (Y)	0,08	0,06	0,06	0,05	0,05	0,05	0,05
Malignant tumors of respiratory and chest (C30-C39)							
Yakuts	0,12	0,13	0,10	0,14	0,19	0,09	0,11
ISNP of the North	0,05	0,11	0,16	0,00	0,11	0,12	0,08
Non-natives	0,26	0,25	0,25	0,21	0,26	0,26	0,25
RS (Y)	0,19	0,19	0,18	0,18	0,23	0,17	0,18
Malignant breast tumors (C50)							
Yakuts	0,01	0,03	0,03	0,02	0,03	0,01	0,01
ISNP of the North	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Non-natives	0,05	0,06	0,07	0,05	0,05	0,05	0,06
RS (Y)	0,03	0,05	0,05	0,03	0,04	0,03	0,03
Malignant tumors of female genital organs (C51-C58)							
Yakuts	0,07	0,05	0,05	0,07	0,04	0,04	0,04
ISNP of the North	0,11	0,11	0,05	0,05	0,00	0,00	0,04
Non-natives	0,15	0,06	0,06	0,07	0,09	0,07	0,08
RS (Y)	0,11	0,05	0,06	0,07	0,06	0,05	0,06

CONCLUSION

According to a comparative analysis of the main causes of mortality among working age population in the Republic of Sakha (Yakutia) for the period 2005-2011 it was shown that the non-natives are more likely than indigenous people died from cardiovascular diseases, including acute myocardial infarction and from malignant tumors. Non-natives are also the most vulnerable to alcohol abuse, among them was higher than deaths from alcoholic cardiomyopathy and accidental poisoning and alcohol impacts compared with the indigenous population of the republic. Mortality from external causes was higher among Indigenous Peoples of the North (69% of all causes of death) than the Yakuts and non-natives. Among the Yakuts, compared with the indigenous peoples of the North higher mortality from ischemic heart disease and cerebrovascular accidents.

In Yakutia harsh climatic conditions and medical and social maladjustment of the working age population ("polar stress syndrome", shift method of work, changing the traditional way of life and way of life of the indigenous population, "European" type of food, unemployment among the indigenous population, the increase in mass of stress factors, widespread prevalence of smoking and alcohol consumption and etc.) directly or indirectly affect the demographics including mortality, have an adverse effect on human health, deplete adaptive reserves of the organism, leading to the emergence of diseases, changing their course, contribute to premature aging and shortened life expectancy. The structure of causes of death in the Republic of Sakha (Yakutia) for the period under review for several years occupied the first place the external causes, the second – diseases of the circulatory system, the third – malignant tumors. Reduction of mortality in working age from preventable causes should be linked with the implementation of public prevention programs, increased availability and quality of medical care.

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