EDITORIAL

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MALIGNANT NEOPLASMS AS THE MOST IMPORTANT ECONOMIC AND SOCIAL PROBLEM IN THE NORTH

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The analysis of the data of 18.117 cases of death of the official statistics of the Republican Statistical Office of the Republic Sakha (Yakutia) for 2001 - 2015 was carried out. We presented the results of the analysis of socio-economic damage related to mortality from malignant neoplasms (MN). Analysis of mortality showed that tumors of gastroenterological localization in the male population of Yakutia account for 41.3% of all deaths from malignant neoplasms, and in the female - 40.7%. Similar indicators for Russia were respectively 35.6% - in men and 36.7% - in women. The second highest frequency in men in the RS (Ya) is occupied by malignant tumors of respiratory organs (32.6; Russian Federation - 30.2%), and women - genital organs (16.4 and 15.3%, respectively). Men have the third highest ranking of urinary neoplasms (4.7%) and women have breast cancer (12.1%).

In both populations MN of digestive organs remain the dominant localizations, their total share was at the beginning and end of the analyzed period (2001, 2015), respectively, 52.8 and 45.2% in men and 41.3 and 40.0% in women.

Between 2001 and 2015, mortality trends in both populations are estimated to be upward (with average annual growth rates for men and women 0.55 and 0.35%, respectively). By 2020, the projected level of total mortality rates from malignant tumors in men will be $145.0^0/_{0000}$. (with an average annual growth rate of 0.70%). Mortality rates from rectal cancer are likely to be high - $5.3^0/_{0000}$ (3.60%), pancreas - 7.0 (1.15), liver - 14.4 (0.75) and respiratory disease - $44.3^0/_{0000}$ (0.85%).

Keywords: malignant neoplasms, mortality, socio-economic damage.

Introduction. As estimated, 40 million deaths from non-communicable diseases occurred globally in 2015, accounting for 70% of the world 's 56 million deaths. Most of these deaths were caused by four major non-communicable diseases, namely, cardiovascular disease - 17.7 million deaths (accounting for 45% of all non-communicable diseases deaths); cancer - 8.8 million deaths (22%); chronic respiratory diseases - 3.9 million deaths (10%); And diabetes - 1.6 million deaths (4%) [3].

In 2017 in Russia it is for the first time revealed nearly 541 thousand cancer patients (more than 617 thousand new tumors), died of malignant new growths of 290.7 thousand patients (15.9% in the general structure of mortality) - the second reason after cardiovascular diseases. About 40% of the first detected malignant neoplasms have the III-IV stage of the disease, which causes a rather high one-year fatality (22.5%) [5].

In the Russian Federation, about 1/3 (29.5%) of men 's deaths are caused by MN, and stomach tumors caused 12.6% of men 's death. Further, the wound sites were distributed as follows: malignant tumors (MT) of the urinary system (7.0%), prostate (6.6), colon (5.8) and rectum (5.2%), pancreas (5.0%), head and neck (4.7%) and hemoblastosis (4.6%) [1, 2].

In Yakutia, one in six women and one in nine men among those who died in the Republic during the year of the MN are the main cause of their death. Their share is 14.8% (in the Russian Federation - 13.8%) from all deaths in the republic and in importance they take the second place after cardiovascular pathology [4].

The aim of the study is to analyze the data of population mortality from the MN of the population of Yakutia. The results obtained will be of interest to specialists in the development of a targeted, reasoned anti-cancer program.

Materials and methods of research. The analysis of the official statistics of the Republican Statistical Office of the Republic Sakha (Yakutia) for 2001 - 2015 has been carried out. During this period, 18.1 thousand deaths from the MN have been registered in the Republic.

Considering that the results of socio-economic analysis at the regional level are important for determining the priorities of health care on the ground, we estimate the socio-economic damage associated with mortality from health care. In order to rank certain forms of MN according to the degree of their socio-economic importance, we have used a method of counting based on a derivative of the average life expectancy, expressed in the loss of man-years of life.

The population, territorial and temporary patterns of mortality of the population of Yakutia have been established, the forecast and socio-economic damage have been calculated. In order to estimate social and economic losses in connection with death from the MN, a model based on the identification of the difference between actual and actual average life expectancy was used.

Results and discussion. In 2015 in RS (YA) the number of deaths from carcinoma reached 1227, which is 3.8% higher than in 2001 (1182) at an average annual growth rate of 0.25%. Men were

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54.2% and women were 45.8%, the ratio of men to women was 1.2: 1.0 (Figure 1).

Similar indicators for Russia were respectively 35.6% - in men and 36.7% - in women. The second highest frequency in men in RS (Ya) is occupied by malignant tumors (MT) of respiratory organs (32.6; RF - 30.2%), and women - genital organs (16.4 and 15.3%, respectively). In men, the third place is taken by neoplasms of urinary organs (4.7%), and in women - breast cancer (12.1%).

Characterizing the dynamics of mortality from malignant neoplasms of the population RS (Ya), it can be noted that in both populations malignant tumors of digestive organs remain the dominant localizations, their total share was 52.8 and 45.2% in men and 41.3 and 40.0% in women at the beginning and end of the analyzed period (2001, 2015), respectively.

In 2015, men ranked first in mortality rates: lung cancer (42.1 $^{0}/_{0000}$), liver cancer (16.8), stomach cancer (15.3), pancreas cancer (8.8) and esophagus cancer (7.7), and women's cancer in

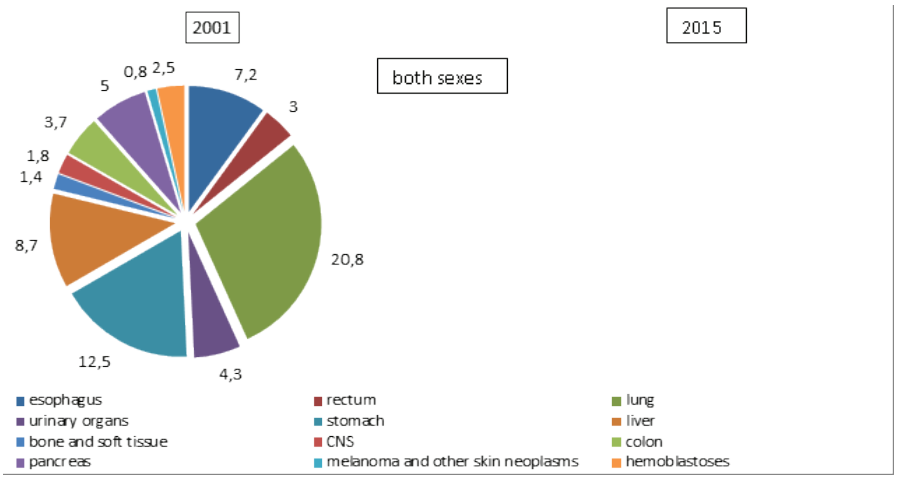


Fig. 1. Structure of mortality in the Republic Sakha (Yakutia) from malignant neoplasms in 2001 and 2015 (%)

mortality rates: breast cancer (13.8), lung cancer (12.8), stomach cancer (10.9), liver cancer (9.9) and cervical cancer (8.5 $^{0}/_{0000}$), respectively. Between 2001 and 2015, mortality trends in both populations are estimated to be upward (with average annual growth rates for men and women 0.55 and 0.35%, respectively) (Table 1).

The highest annual mortality rate of the population of Yakutia from MN is in

Table 1

Dynamics of mortality from malignant neoplasms of RS (Ya) population for 2001-2015 and probable characteristic for 2020

Localization	Years															Forecast 2020
	2001	2002	2003	2004	2005	2006	2007	2008	2009	1010	2011	2012	2013	2014	2015	
Both sex																
Malignant neoplasms - total	120.1	124.6	130.5	127.0	125.1	126.9	129.6	125.2	131.6	120.3	125.3	127.7	125.5	126.9	128.0	126.8
MN of head and neck	3.9	3.3	3.4	4.4	3.1	3.9	4.3	3.4	4.2	2.9	2.7	3.1	3.9	4.4	3.9	3.7
Digestive organs	56.4	59.0	59.4	58.3	56.1	54.3	52.6	53.1	53.3	48.5	49.0	50.5	53.4	48.4	52.6	54.2
Respiratory organs	30.4	30.6	30.1	30.4	33.3	31.9	29.8	28.4	35.2	26.6	31.5	28.6	29.1	28.6	29.6	30.3
Bones and soft tissues	1.7	3.5	2.8	3.7	2.3	2.1	3.2	2.9	2.9	2.0	3.5	3.0	2.2	1.8	3.0	2.8
Skin cancer and melanoma	1.1	0.7	1.3	0.9	1.5	0.9	1.1	1.8	1.3	1.6	0.9	1.0	1.3	1.6	1.7	1.4
Uric bodies	6.0	6.4	6.5	5.1	4.2	6.8	7.0	5.5	4.6	5.1	5.5	6.7	4.6	5.1	4.6	5.5
CNS	2.2	2.0	3.2	2.1	3.3	2.5	4.1	2.4	3.2	2.6	2.7	3.1	3.2	3.2	2.6	2.8
Hemoblastoses	3.1	3.7	5.1	4.5	4.4	4.5	3.2	5.6	3.5	5.2	3.4	5.7	4.3	5.8	4.8	4.5
Men																
Malignant neoplasms – total	132.1	143.1	153.4	145.5	145.5	142.8	147.4	137.4	147.8	133.9	146.4	147.3	139.9	150.0	143.0	145.0
MN of head and neck	5.5	4.3	5.8	8.0	5.4	6.9	6.7	5.0	7.6	4.4	3.9	5.0	4.7	4.5	5.8	5.7
Digestive organs	69.9	72.4	76.8	74.5	74.0	60.5	63.1	60.4	59.6	53.6	59.3	60.1	59.5	75.9	59.1	65.9
Respiratory organs	39.1	43.4	42.9	44.7	46.1	48.1	40.3	42.6	50.7	39.4	48.2	43.1	44.2	45.5	46.7	44.3
Bones and soft tissues	2.4	4.3	2.8	5.0	2.8	2.4	4.4	4.0	4.3	2.9	3.0	3.9	2.8	4.5	3.6	3.7
Skin cancer and melanoma	1.0	0.6	1.5	0.8	2.1	1.1	2.2	1.5	1.8	1.7	0.8	1.1	1.5	0.6	2.0	1.4
Urinary organs	2.7	2.7	3.2	3.2	1.9	2.2	4.6	2.8	3.7	3.7	4.9	5.4	2.4	2.8	5.8	3.4
CNS	6.3	4.1	4.7	5.8	5.4	8.6	8.7	5.6	5.7	5.2	7.9	8.6	5.9	8.8	6.2	6.4
Hemoblastoses	1.8	2.5	4.3	2.6	3.5	3.3	4.3	3.7	3.3	3.5	2.6	3.2	4.1	2.6	2.6	3.2
MN of head and neck	4.1	5.1	5.0	5.2	4.3	4.8	3.7	5.9	4.4	5.9	4.3	6.9	5.0	6.0	4.9	5.0
Women																
Malignant neoplasms - total	108.2	106.5	108.6	109.3	105.8	112.0	112.8	113.7	116.5	107.5	105.3	109.1	111.9	105.1	114.0	111.3
Lips. oral cavity	2.2	2.2	1.0	1.0	0.8	1.0	2.0	1.8	1.0	1.6	1.6	1.4	3.1	4.3	2.0	1.8
Digestive organs	43.1	45.8	42.9	42.9	39.1	48.5	42.7	46.3	47.3	43.7	39.2	41.5	47.6	22.6	46.4	43.1
Respiratory organs	21.8	18.2	17.9	16.8	21.1	16.6	19.8	15.1	20.6	14.7	15.7	14.9	14.9	12.6	13.6	17.0
Bones and soft tissues	1.0	2.8	2.7	2.4	1.8	1.8	2.0	1.8	1.4	1.2	3.8	2.0	1.6	0.6	2.2	1.9
Skin cancer and melanoma	1.2	0.8	1.2	1.0	1.2	0.8	2.0	2.0	1.0	1.4	0.9	1.0	1.2	2.6	1.6	1.4
Mammary gland	14.1	12.9	12.8	14.0	11.7	14.5	12.9	12.7	14.1	8.0	13.0	14.5	12.4	13.4	13.8	12.9
Genital organs	14.5	15.7	17.1	17.9	16.8	14.5	16.5	18.4	16.5	12.6	14.2	15.3	15.9	18.9	18.7	16.1
Urinary organs	5.0	4.4	3.7	4.3	2.9	4.5	4.1	5.3	3.5	4.9	2.8	4.1	3.3	1.6	2.6	3.7
CNS	2.6	1.6	2.1	1.6	3.1	1.8	3.9	1.2	3.1	1.8	2.8	3.1	2.4	3.9	2.6	2.5
Hemoblastoses	2.2	2.2	5.2	3.9	4.5	4.3	2.7	5.3	2.7	4.5	2.6	4.5	3.7	5.5	4.7	3.9

the age group over 70 years (910.8$^{0}/_{0000}$). Within this age group, both male (1,452.7$^{0}/_{0000}$) and female (802.0 $^{0}/_{0000}$) age mortality rates are the highest (Table 2).

It should be noted that malignant tumors of hepatobiliary zone organs, which make up 1/3 of all deaths from malignant tumors of digestive organs, allow classifying them as leading forms of oncological pathology in conditions of the North as causing significant social and economic damage to the population of the Republic.

Table 2

Dynamics of mortality from malignant neoplasms of RS (Ya) population for 2001-2015 and probable characteristic for 2020

Localization	Years a	Abs. number	ИП	Per 100,000 population of appropriate age														
				0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70 +.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
both gender																		
Malignant neoplasms - total	2001-2005	6039	127.3	3.0	4.2	5.4	4.6	5.7	10.8	19.6	37.4	66.9	136.0	252.0	386.7	628.9	873.2	1139.2
	2006-2010	6077	127.9	3.1	2.8	2.6	4.3	5.1	8.1	15.1	23.7	65.5	102.0	203.8	373.1	570.1	801.0	1083.5
	2011-2015	5640	126.4	2.0	0.6	3.1	3.1	5.8	4.5	18.1	29.8	42.2	99.0	180.8	306.3	491.4	741.5	910.8
Lip, Oral cavity, throat	2001-2005	173	3.6	0.3	0.0	0.0	0.0	0.0	0.8	0.0	0.9	2.1	6.1	8.9	15.6	17.2	22.8	21.9
	2006-2010	131	2.8	0.3	0.0	0.0	0.0	0.0	0.8	0.0	1.2	2.4	4.2	6.4	9.3	16.7	7.9	11.3
	2011-2015	165	3.5	0.2	0.0	0.0	0.0	0.3	0.5	0.0	0.6	0.6	3.2	6.8	8.8	8.3	32.6	23.1
Digestive organs	2001-2005	2785	58.7	0.3	0.3	0.2	0.4	1.3	3.5	8.1	12.0	25.6	56.6	105.9	164.5	288.7	443.2	608.3
	2006-2010	24.9	52.8	0.3	0.3	0.0	0.7	0.0	1.3	4.2	7.2	20.4	37.6	74.8	129.8	235.2	349.8	528.2
	2011-2015	2224	50.6	0.0	0.0	0.0	0.0	0.8	1.6	5.2	9.4	15.9	34.4	67.2	115.3	182.7	318.5	409.3
Respiratory organs	2001-2005	1491	31.4	0.0	0.6	0.0	0.2	0.5	0.5	0.9	3.7	11.9	33.2	64.1	110.7	180.7	232.6	278.1
	2006-2010	1443	30.4	0.3	0.0	0.0	0.5	0.4	0.8	0.6	0.6	12.0	20.4	48.0	102.7	166.7	209.9	241.5
	2011-2015	1348	30.1	0.0	0.0	0.6	0.0	0.5	0.0	0.8	1.5	7.0	21.4	46.2	81.9	139.5	167.9	210.1
Bones and soft tissues	2001-2005	135	2.8	0.3	0.3	1.1	1.2	0.8	0.3	0.3	1.5	2.1	3.3	9.3	8.2	10.0	11.0	14.0
	2006-2010	123	2.6	0.0	0.0	0.3	1.2	0.7	1.0	0.6	1.5	1.8	3.4	5.0	6.3	7.6	16.0	12.0
	2011-2015	118	2.8	0.0	0.2	0.0	0.3	0.3	0.0	0.3	1.5	2.3	1.2	5.2	6.5	7.9	12.0	19.0
Melanoma, skin cancer	2001-2005	55	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.2	1.4	1.3	2.3	2.5	6.3	7.9	6.9
	2006-2010	74	1.5	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	1.2	0.9	2.8	4.8	5.4	5.0	16.0
	2011-2015	58	1.3	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.9	0.6	0.9	1.9	4.9	2.8	3.9	8.9
Urinary organs	2001-2005	272	5.7	0.0	0.0	0.2	0.0	0.0	0.0	0.3	1.4	1.6	4.8	11.5	16.3	37.5	42.1	54.7
	2006-2010	276	5.8	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	2.4	3.7	7.8	21.6	28.9	44.3	45.7
	2011-2015	241	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	1.9	4.1	6.3	12.4	21.3	27.8	44.5
CNS	2001-2005	123	2.6	1.5	1.1	1.6	0.8	0.8	0.3	1.7	2.6	2.1	3.3	6.1	6.3	7.0	10.5	7.5
	2006-2010	141	3.0	1.4	0.3	1.1	0.2	0.9	0.3	1.1	2.7	3.6	3.2	5.6	8.6	6.9	14.8	11.3
	2011-2015	132	2.9	0.0	0.2	0.6	0.9	1.0	0.0	2.1	4.1	0.3	2.8	4.4	3.9	12.1	17.3	11.0
Hemoblastoses	2001-2005	212	4.5	0.9	1.7	2.2	1.5	2.1	1.6	2.3	1.7	3.0	4.3	8.0	6.9	15.6	18.4	32.8
	2006-2010	208	4.3	0.6	2.1	1.1	0.9	1.7	1.9	1.4	2.4	2.1	4.4	7.0	14.1	16.7	17.7	19.8
	2011-2015	215	9.8	0.0	0.6	3.0	2.1	4.3	1.5	3.2	5.6	5.1	11.0	17.5	23.1	30.0	63.5	24.7

Continuation of table 2

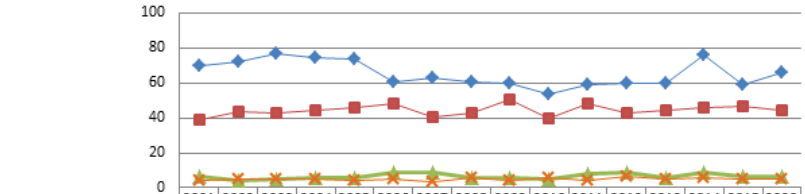
Men																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Malignant neoplasms - total	2001-2005	3399	146.7	4.1	5.5	4.8	6.6	4.7	6.4	17.7	38.3	70.0	169.6	341.3	529.5	889.6	1248.6	1667.0
	2006-2010	3294	143.0	4.4	3.6	3.9	6.5	6.1	7.4	11.7	20.0	72.0	122.2	268.1	528.1	802.8	1116.8	1427.4
	2011-2015	3364	146.4	1.1	1.8	4.3	5.9	6.6	15.1	26.1	37.5	113.8	239.6	239.6	435.7	701.5	1034.6	1452.7
Lip, throat	2001-2005	137	5.9	0.6	0.0	0.0	0.0	0.0	1.1	0.0	1.1	3.3	10.1	14.9	32.6	30.8	43.4	48.1
	2006-2010	141	6.1	0.0	0.0	0.0	0.0	0.0	0.5	0.6	1.8	3.1	5.2	15.6	28.2	19.5	45.1	54.4
	2011-2015	121	5.2	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.6	5.9	12.1	12.1	18.2	21.8	48.7	7.2
Digestive organs	2001-2005	1736	74.9	0.6	0.6	0.0	0.4	0.5	3.7	9.1	16.6	35.5	82.4	160.8	244.4	436.6	712.3	968.4
	2006-2010	1368	59.4	0.6	0.0	0.0	0.9	0.0	1.1	5.0	7.3	26.4	49.4	113.0	187.4	336.7	460.7	705.2
	2011-2015	1369	59.0	0.0	0.0	0.6	1.0	2.6	7.3	12.5	19.4	49.1	95.9	95.9	166.6	263.6	426.0	657.7
Respiratory organs	2001-2005	1021	44.1	0.0	1.1	0.0	0.4	0.5	1.1	1.1	7.4	20.3	55.8	116.7	190.1	293.5	347.4	443.4
	2006-2010	1018	44.2	0.0	0.0	0.0	0.9	0.9	0.5	0.6	1.2	21.5	36.9	85.4	189.9	303.1	358.1	370.4
	2011-2015	1035	44.6	0.0	0.6	0.0	0.5	0.0	1.0	2.4	8.4	33.4	78.5	78.5	159.3	252.7	326.2	391.0
Bones and soft tissues	2001-2005	82	3.6	0.6	0.0	1.3	1.6	1.0	0.0	0.6	2.2	2.8	5.3	11.5	15	12.6	8.6	23.0
	2006-2010	82	3.6	0.0	0.0	0.0	2.3	1.3	1.1	1.2	2.4	3.7	5.8	5.4	8.3	12.4	27.5	20.4
	2011-2015	71	3.1	0.0	0.0	0.0	1.0	0.0	0.5	3.0	0.6	2.7	6.9	6.9	5.8	14.1	12.2	30.7
Melanoma, skin cancer	2001-2005	29	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.7	1.8	1.0	2.1	1.4	9	10.8	10.5
	2006-2010	38	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.5	3	8.3	8.9	7.5	20.4
	2011-2015	48	2.1	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.6	2.0	4.0	4.0	5.1	9.8	7.3	24.3
Prostate	2001-2005	65	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	4.1	12.2	10.9	30.4	56.5
	2006-2010	78	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	5.0	19.5	50.1	64.6
	2011-2015	112	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	2.9	5.1	28.3	48.7	33.9
Urinary organs	2001-2005	172	7.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	1.4	6.4	12.9	24.4	68.8	73.8	87.8
	2006-2010	167	7.3	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.6	3.1	6.2	10.2	32.3	37.2	75.1	68.0
	2011-2015	172	7.4	0.0	0.0	0.0	0.0	0.0	1.0	0.0	1.3	6.5	13.3	13.3	23.3	34.9	51.1	80.8
CNS	2001-2005	69	3.0	0.0	1.7	0.9	1.2	0.0	0.0-	1.7	2.9	1.9	3.2	10.2	9.5	12.7	15.2	4.2
	2006-2010	83	3.6	2.2	0.6	2.2	0.5	1.7	0.5	1.1	1.2	4.3	3.6	7.2	13.3	8.9	20.0	15.3
	2011-2015	74	3.2	0.6	0.0	0.6	1.0	0.0	1.6	5.3	0.0	3.9	6.4	6.4	6.5	14.2	12.2	19.4
Hemoblastoses	2001-2005	118	5.1	0.6	2.2	2.6	2.1	2.1	0.0	3.4	1.1	3.8	6.9	10.9	10.9	23.6	21.7	39.7
	2006-2010	113	4.9	0.0	0.6	3.0	1.7	0.9	0.8	2.6	1.1	3.0	2.4	4.7	9.0	23.8	16.0	25.0
	2011-2015	126	5.4	0.0	0.6	2.4	1.5	2.2	1.5	1.2	3.8	3.9	9.8	9.8	15.3	16.3	41.3	40.4

End of table 2

Women																		
Malignant neoplasms - total	2001-2005	2640	108.8	1.9	2.9	6.0	2.6	6.6	15.3	21.4	36.4	63.9	104.9	172.7	264.6	430.9	618.6	883.0
	2006-2010	2787	113.8	1.7	1.9	1.2	1.9	4.0	8.7	18.5	27.5	59.3	83.4	148.0	247.0	395.0	596.1	912.5
	2011-2015	2773	105.4	0.0	0.0	1.9	1.9	5.2	4.2	20.1	35.3	46.2	88.9	214.6	214.6	334.1	535.1	802.0
Lip, oral cavity, throat	2001-2005	36	1.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.6	0.9	2.5	3.6	1.2	6.9	8.8	9.1
	2006-2010	37	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.5	2.6	3.4	6.7	6.5	13.5
	2011-2015	51	2.08	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.6	0.0	2.98	3.0	3.23	17.41	18.6
Digestive organs	2001-2005	1049	43.2	0.0	0.0	0.5	0.4	2.0	3.3	6.9	7.4	16.1	32.9	57.2	96.3	176.2	260.7	433.4
	2006-2010	1119	45.7	0.0	0.6	0.0	0.5	0.0	1.5	3.4	7.2	14.7	26.7	41.7	83.0	158.8	277.8	440.2
	2011-2015	1060	43.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	81.0	81.1	109.7	251.7	358.3
Respiratory organs	2001-2005	470	19.4	0.0	0.0	0.0	0.0	0.5	0.0	0.6	0.0	3.7	12.3	17.5	42.9	95.0	154.6	197.9
	2006-2010	425	17.3	0.6	0.0	0.0	0.0	0.0	1.0	0.6	0.0	2.9	5.2	15.6	31.7	64.0	113.7	177.4
	2011-2015	374	15.2	0.0	0.0	0.0	0.0	0.0	0.5	0.0	1.2	0.0	0.0	18.4	18.5	60.5	47.4	144.3
Bones and soft tissues	2001-2005	53	2.1	0.0	0.6	1.0	0.0	0.5	0.5	0.0	0.6	1.4	1.5	7.2	2.3	8.3	13.2	10.2
	2006-2010	41	1.7	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.6	0.0	1.5	4.7	4.7	4.0	8.1	8.5
	2011-2015	57	2.3	0.0	0.0	0.0	0.0	0.5	0.0	8.0	8.8	10.6	14.0	5.4	5.4	3.2	12.7	17.8
Melanoma, skin cancer	2001-2005	26	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.6	1.0	1.5	2.4	3.5	4.2	5.9	5.1
	2006-2010	36	1.4	0.0	0.0	0.0	0.0	0.4	0.0	0.6	0.0	1.2	1.4	2.6	2.0	2.7	3.2	14.4
	2011-2015	33	1.3	0.0	0.0	0.0	0.0	0.0	0.5	1.6	5.3	7.4	14.6	3.0	3.0	1.6	6.3	10.8
Mammary gland	2001-2005	318	13.1	0.0	0.0	0.0	0.0	0.0	0.5	1.2	5.7	15.6	22.1	24.7	56.9	38.5	61.9	67.0
	2006-2010	298	12.2	0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.2	6.5	17.2	28.7	29.7	38.7	52.0	66.8
	2011-2015	326	13.2	0.0	0.0	0.0	0.0	0.5	0.5	1.1	1.2	0.6	3.0	32.1	32.2	52.4	58.5	69.8
Genital organs	2001-2005	402	16.6	0.0	0.0	0.0	0.0	0.0	6.0	8.1	15.4	17.9	22.1	44.5	39.5	71.6	54.5	70.0
	2006-2010	385	15.7	0.0	0.0	0.0	0.0	0.9	3.1	7.3	8.4	21.1	17.2	28.7	49.3	40.0	61.7	69.3
	2011-2015	408	16.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	2.4	38.7	38.7	46.0	55.4	62.8
Urinary organs	2001-2005	100	4.1	0.0	0.0	0.5	0.0	0.0	0.0	0.6	0.0	1.8	3.4	10.2	9.3	13.8	20.6	38.6
	2006-2010	109	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	1.4	5.7	12.8	22.7	24.4	34.6
	2011-2015	82	3.3	0.0	0.0	0.6	0.6	0.5	0.0	2.1	2.9	0.6	0.2	5.9	6.0	11.3	12.7	32.6
CNS	2001-2005	54	2.2	0.6	0.6	2.3	0.4	1.5	0.5	1.7	2.3	2.3	3.4	2.4	3.5	2.8	7.4	9.1
	2006-2010	58	2.4	0.6	0.0	0.0	0.0	0.0	0.0	1.1	4.2	2.9	2.9	4.2	4.7	5.3	11.4	9.3
	2011-2015	69	2.8	0.0	0.0	0.6	0.6	0.5	0.0	2.1	2.9	0.6	3.0	6.56	6.6	7.26	14.25	9.3
Hemoblastoses	2001-2005	29	3.9	1.2	1.2	1.8	0.9	2.0	3.3	1.2	2.3	2.3	2.0	5.4	3.5	9.6	16.2	29.4
	2006-2010	95	3.9	0.6	1.3	0.6	1.0	2.7	1.0	1.7	1.8	1.8	4.4	5.2	7.4	17.4	13	17.7
	2011-2015	108	4.4	0.0	0.0	0.6	0.6	2.1	0.0	2.0	1.8	1.2	1.2	7.75	7.8	13.7	22.1	24.0

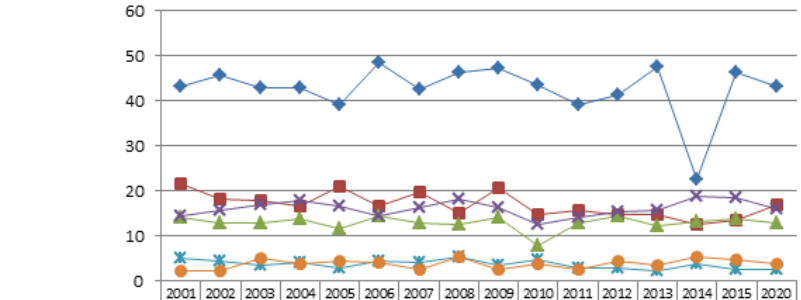
The results of the analysis allow noting that by 2020 the projected level of total mortality rates from containment in men will be 145.0 $^{0}/_{0000}$ (with an average annual growth rate of 0.70%). Mortality rates from rectal cancer are likely to be high - 5.30/0000 (3.60%), pancreas - 7.0 (1.15), liver - 14.4 (0.75) and respiratory disease - 44.3 $^{0}/_{0000}$ (0.85%) (Fig.2).

In the female population over the period from 2001 to 2015, the average annual growth rate of mortality from the MN of



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020
Digestive organs	69,9	72,4	76,8	74,5	74	60,5	63,1	60,4	59,6	53,6	59,3	60,1	59,5	75,9	59,1	65,9
Respiratory system	39,1	43,4	42,9	44,7	46,1	48,1	40,3	42,6	50,7	39,4	48,2	43,1	44,2	45,5	46,7	44,3
Urinary organs	6,3	4,1	4,7	5,8	5,4	8,6	8,7	5,6	5,7	5,2	7,9	8,6	5,9	8,8	6,2	6,4
Hemoblastoses	4,1	5,1	5	5,2	4,3	4,8	3,7	5,9	4,4	5,9	4,3	6,9	5	6	4,9	5

Fig. 2. Dynamics of mortality of the male population of the Republic Sakha (Yakutia) from malignant neoplasms by localization in 2001 - 2015 and probable characteristic in 2020 (per 100 thousand of the population)



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2020
Digestive organs	43,1	45,8	42,9	42,9	39,1	48,5	42,7	46,3	47,3	43,7	39,2	41,5	47,6	22,6	46,4	43,1
Respiratory system	21,8	18,2	17,9	16,8	21,1	16,6	19,8	15,1	20,6	14,7	15,7	14,9	14,9	12,6	13,6	17
Breast	14,1	12,9	12,8	14	11,7	14,5	12,9	12,7	14,1	8	13	14,5	12,4	13,4	13,8	12,9
Genitals	14,5	15,7	17,1	17,9	16,8	14,5	16,5	18,4	16,5	12,6	14,2	15,3	15,9	18,9	18,7	16,1
Urinary organs	5	4,4	3,7	4,3	2,9	4,5	4,1	5,3	3,5	4,9	2,8	3,1	2,4	3,9	2,6	2,5
Hemoblastoses	2,2	2,2	5,2	3,9	4,5	4,3	2,7	5,3	2,7	4	2,6	4,5	3,7	5,5	4,7	3,9

Fig. 3. Dynamics of mortality of the female population of the Republic Sakha (Yakutia) from MT for 2001-2015 on localizations and its probable characterization in 2020 (per 100 thousand population)

the lymphatic and hematopoietic systems (2.1 - a multiple increase in the initial indicators), from colon cancer (1.8 times), and ovary - (1.7), cervix (1.5), genitalia (1.3) and liver cancer (1.1 times).

According to the forecast, by 2020 the total mortality rate from malignant neoplasms will be 111.3$^0/_{0000}$, while maintaining the average annual growth rate of 1.05%. Including: from colon cancer - 6.4$^0/_{0000}$ (1.8%), hemoblastosis - 4.7 (2.1), liver cancer - 9.93 (1.1), from саTcer of genitalia organs - 18.7 (1.3), including ovarian and cervical cancer - 5.5 and 8.5$^0/_{0000}$ (1.5%) respectively (Fig.3).

Given that socio-economic analysis at the regional level is important for determining local health priorities, we estimate the socio-economic damage associated with cancer mortality. In order to rank certain forms of cancer according to the degree of their socio-economic importance, we have used a method of counting based on a derivative of life expectancy, expressed in the loss of man-years of life.

According to official statistics of the Ministry of Health of the Russian Federation, the losses of the population of Russia related to mortality from malignant neoplasms amounted to 4,288.8 thousand people-years. The most significant damage is caused to society by cancer of the lung (678.2), stomach (511.9), breast (401.7) and hemoblastose (268.5). The greatest losses of human-years of life of the working-age population of Russia are related to mortality: from lung cancer (101.2), stomach cancer (72.2), hemoblastosis (61.5), breast cancer (48.0), neck cancer (27.4), colon (21.1) and rectum (20.4) [1].

According to the results of the analysis in Yakutia, the average life expectancy of men due to death from malignant neoplasms is reduced by 1.53 and for women - by 1.74 years. Including men from colon cancer - 1.72 years, rectum - 1.71, primary gland - 1.70, esophagus - 1.69, stomach - 1.60, liver - 1.58, lung - 1.27. In women, life expectancy is shortened due to death from cancer of the lip, throat by 1.92 years, esophagus - 1.94, rectal - 1.92, uterine bodies - 1.92, ovarian - 1.91, colon - 1.88, stomach - 1.85, cervical cancer - 1.84, breast - 1.75, lung - 1.75, liver - 1.85 years.

A comparison of the average number of lost years of life by one deceased in RS (YA) and in Russia as a whole showed that during the analyzed period in the North men and women die from cancer at a relatively young age (under-life years in RS (I) - 13.1, and in women - 14.8 years, in the Russian Federation - 14.5 and 16.7 years respectively). In men, liver cancer (13.6 years), hemoblastosis (13.5), pancreas (12.5), lung cancer (11.8) and rectal cancer (11.7 years) follow in terms of the extent of "lost years of life." In women, in descending order of "lost years of life by one deceased," the first five places are: cervical cancer (19.2), lips (17.8), rectum (16.3), liver (14.6) and breast (14.5). The following are kidney cancer (12.8), stomach cancer (12.6), lung cancer (12.1), bladder cancer (11.9), etc.

In RS (YA) the general losses were about 17.3 thousand person-years of life, of them: from MN of digestive organs - 6.3 thousand (36.4%), respiratory organs - 3.4 (19.6), gemoblastoes - 0.7 (4.0), uric bodies - 0.2 (1.2), a female mammary gland - 1.0 thousand (5.8% - at women) and genitals at women - 0.05 thousand (0.3%).

The data of the analysis on the loss of human-years of life in working age show that the working-age population of the Republic loses 4.9 thousand people-years of life due to mortality from the MN, including 1.7 thousand people-years of life from the digestive organs, 0.8 hemoblastosis - 0.2, female genital organs - 0.05 thousand people-years.

In the North, the average number of lost years of life by one person of working age is 11.0 (in the Russian Federation-8.5), and in the female population - 18.5 (9.4). In men, mortality from larynx cancer (22.7), hemoblastosis (14.2), rectum (13.5), liver (13.5), pancreas (10.1), kidney (9.07), prostate (8.1), and in women - from hemoblastosis (34.6), uterine body (24.9), kidney (23.6), breast (21.5). Women have significant rates of damage in cervical cancer (17.2), lung cancer (15.8), ovarian cancer (13.2) and liver cancer (11.6 years).

The male working-age population of the Republic loses 5.6 years of life annually, including from cancer of the digestive organs of the 2.4 (48.9%), breathing - 1.3 (20.1%) and urinary organs - 0.12 (3.1%). For the female population, the same figures reach 5.9 life years, with the highest losses caused by mortality from digestive cancer (1.25), hemoblastosis (0.24), respiratory organs (0.22), and female genital organs (0.09). In men from certain forms of malignant neoplasms, the first three places of the ranked row occupy p liver (1.21), lung (1.04) and stomach (0.38), and in women - cervical cancer (0.81), breast cancer (0.58 life years).

In conclusion, inflation, which continues for more than a quarter of a century, does not make it very likely to determine the amount of conditionally underexploited national income in monetary terms. However, the overall economic damage caused by deaths from malignant formations to the population of Yakutia was quite significant. Due to the death of the population of the Republic from malignant neoplasms every year loses 3.1 thousand person-years of life, including 0.72 thousand of working age, which is 23.3% of the total loss.

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ORIGINAL RESEARCHES

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THE ANALYSIS OF ASSOCIATIONS OF *HELICOBACTER PYLORI BABA* GENE IN PATIENTS WITH CLINICAL OUTCOMES OF GASTRODUODENAL DISEASES IN YAKUTIA

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УДК 616.34 (571.56)

Introduction: *Helicobacter pylori* has several of the most characteristic adhesins that have the property of a targeted effect on epithelial cells of human stomach, among which the *babA* gene is the most studied and exists in several variants – *babA1*, *babA2*. The BabA protein is high-affinity and binds to mono or difucosylated blood group antigens and each can be modified into blood group A, B, or 0 and expressed on epithelial cells of the stomach. The clinical outcomes of gastroduodenal diseases, depending on the *babA* variants of *Helicobacter pylori* circulated in Yakutia, has not been previously studied. The aim of this work is to analyze of associations of *Helicobacter pylori babA* gene in patients with clinical outcomes of gastroduodenal diseases in Yakutia.

Materials and methods: Gastric biopsy specimens were obtained from 322 patients. According to the results of histological analysis, 188 patients had the presence of *Helicobacter pylori* and divided into two groups: chronic gastritis and chronic gastritis with erosions and ulcers.

Results: Chronic gastritis was established in 96 samples (51,1%), and the diagnosis of chronic gastritis with erosions and ulcers was established in 92 samples (48,9%). *Helicobacter pylori babA2* gene variant were identified in 65 samples (34,5%), and *babA1* in 123 samples (65,4%). In the male patients the frequency of the *babA2* gene was almost two times higher (69,6%) than in the female patients (38,3%) (p<0,001). In contrast, in female patients more common was the *babA1* gene (61,6%) than in male patients (30,3%) (p<0,001). It was found that the *babA2* gene variant was significantly more common in samples of patients with chronic gastritis associated with erosions and ulcers of stomach and duodenum (43,4%) than in patients with chronic gastritis (26,0%) (p<0,05). Patients diagnosed with chronic gastritis had more often the *babA1* gene variant (73,9%), than patients with erosive gastritis (56,5%) (p<0,05). In comparing group of patients with different degrees of inflammation there were no statistically significant difference in the activity of inflammation with the presence of the *babA* gene, but there was a slight statistical difference with the second degree of dissemination which had the *babA1* gene variant.

Conclusion: We showed relationship between *babA2* gene of *Helicobacter pylori* and more severe clinical outcomes (erosions and ulcers) in patients with gastroduodenal diseases in Yakutia. Obtained result confirms previously known about data *babA2* which are more virulent and pathogenic than *babA1* gene of *Helicobacter pylori*. The data about *babA2* gene was more frequent in male patients and it may be an additional risk factor for more severe gastroduodenal diseases.

Keywords: *Helicobacter pylori*, gastroduodenal diseases, *babA* gene, Yakutia.

Introduction. In 1994, the US National Institute of Health published an expert opinion stating that the majority of recurrent gastric ulcers and gastritis with increased acidity are caused by infection with the bacterium *Helicobacter pylori* (*H. pylori*). Since then, evidence has gradually accumulated that duodenal ulcers and duodenitis are also associated with *H. pylori* infection. [17, 18]. In 2005 Robin Warren and Barry Marshall were awarded the Nobel Prize in Medicine about the medical significance of the bacteria. Recently, a lot of research has been done on the *H. pylori*. Most studies have found that *H. pylori* is a proven cause of gastroduodenal diseases (chronic gastritis, erosion, ulcers, and cancer of the human stomach). According to the latest data, the proportion of peptic ulcer associated with *H. pylori* infection accounts for 38% of gastric ulcers and 56% of duodenal ulcers worldwide [1].

These facts contributed to the emergence of a large number of works that devoted to the study of characteristics, prevalence and clinical significance of various on the genetic structure and on the virulence of *H. pylori* strains, including its molecular genetic characteristics. It has been shown that genetic factors of *H. pylori* – virulence and pathogenicity can have a great influence on the development and clinical outcomes of diseases of the upper gastrointestinal tract, as well as on the morphological changes in the gastric mucosa. Recently, the spectrum of genetic factors of pathogenicity of *H. pylori* is expanding and their role in