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BREAST CANCER: MORBIDITY AND MORTALITY STATISTICS

An analysis was made of the primary incidence of breast cancer (BC) among women in the Irkutsk region for 2011–2021. and mortality from it in comparison with data for the Russian Federation in order to assess the situation. According to the results of the analysis, an increase in the relative indicators of the primary incidence of breast cancer in the region by 25%, in the Russian Federation – by 17%. At the same time, the upward trend in indicators is more pronounced in the region: the average growth rate is +2.2% against +1.8% in Russia. In 2021, the region recorded an excess of the all-Russian primary incidence of breast cancer by 9% and in all age groups by 1.1–1.3 times, except for women 75–79 and over 85 years old. During the study period, mortality from breast cancer in the Irkutsk region changed little, while in the Russian Federation there is a downward trend with an average annual rate of 1.5%. Standardized indicators characterizing the true situation with breast cancer indicate that the Irkutsk region is not well: the mortality rate for 2011–2021 exceeded the national average by 9%, and in 2021 the region ranked 6th among the subjects of the Russian Federation in terms of primary morbidity and 8th in terms of mortality.

Keywords: breast cancer, primary morbidity, mortality, relative and standardized rates.

Introduction. Breast cancer (BC) is the most common localization of malignant neoplasms among women. In terms of new cases, 2.2 million were detected worldwide in 2020 [5]. In Russia, breast cancer is diagnosed annually in ~70 thousand women and more than 20 thousand die. Malignant neoplasms of the breast continue to be a huge medical and social problem, causing enormous damage at the state, regional [1, 6] and individual levels. The fight against an increase in the incidence of breast cancer depends on the state of women's health, including reproductive, genetic predisposition, awareness of the female population about risk factors, prevention measures, and the quality of medical care [4, 7, 8, 10, 11]. As is known, certain factors increase the risk of developing breast cancer: age after 40 years, obesity, low physical activity, heredity, the harmful effects of radiation, alcohol, smoking, etc. [4, 7, 8, 10, 12].

The purpose of the study: to assess the situation in the Irkutsk region in terms of the level of primary incidence of breast cancer in women in 2021 and mortality from it in comparison with 2011 and data for Russia.

Materials and research methods. The data of the statistical collections "Malignant neoplasms in Russia (morbidity and mortality)" of the Ministry of Health

of the Russian Federation for 2011–2021 were used; mortality tables 5TC "Main cumulative characteristics by causes of death" of Rosstat for 2011 and 2021. The methods of comparative analysis of relative, standardized (world standard), long-term averages and average growth/decrease rates were used in the work, the statistical significance of differences in indicators was determined using a 95% confidence interval (95% CI); ranking of indicators of 85 constituent entities of the Russian Federation in descending order. The calculations were carried out using standard Windows programs (version 10.0).

Results and discussion. In women of the Irkutsk region in 2011, 1018 primary cases of breast cancer (BC) were registered, in 2021 - 1237 cases, a total of 12598 cases were detected for the first time during this period. The incidence rate for newly diagnosed breast cancer increased by 24.7% from 78.1 in 2011 (95% CI 73.3; 82.9) to 97.4 per 100,000 in 2021 (95% CI 91.9; 102.8). The average long-term level of primary incidence of breast cancer in the region for 2011–2021 amounted to 88.6 per 100 thousand, the average annual growth rate is +2.2%. During the study period, the standardized rate of primary cancer incidence of breast cancer in the region increased from 50.6 to 59.2 per 100 thousand (+17.0%), the long-term average was 55.6 per 100 thousand - fig. 1. The decline in 2020 is certainly related to the COVID-19 pandemic, after which the upward trend resumed, but the indicators did not return to pre-Covid levels.

In the Russian Federation, the primary incidence rate of women with breast cancer in 2011 was recorded at the level of 74.9 (95% CI 74.3; 75.5); in 2021 - 89.3 per 100 thousand (95% CI 88.6; 89.9),

i.e. increased by 19.2%. The long-term average for the Russian Federation for the study period was 84.6 per 100 thousand, the annual growth rate is +1.8%. In the US, the primary incidence of breast cancer continues to rise, but more recently over the course of 2010–2019, the indicator increased annually by 0.5% [9]. The standardized primary incidence rate of breast cancer among women in the Russian Federation increased by 11.5% from 45.2 in 2011 to 50.4 per 100 thousand in 2021 with a long-term average of 49.3 per 100 thousand (Fig. 1). The authors of the studies draw attention to the continuing growth of cancer incidence among the population, including breast cancer [1, 2, 6, 9].

In 2021, the primary incidence rate of breast cancer among women in the Irkutsk region at 97.4 per 100 thousand (95% CI 91.9; 102.8) was 9.1% higher than in the Russian Federation - 89.3 per 100 thousand (95% CI 88.6; 89.9). In 2011, although this indicator exceeded that in the Russian Federation by 4.3%, the difference was statistically insignificant. The average long-term rate of primary incidence of breast cancer in women in the Irkutsk region statistically significantly exceeds the figure for the Russian Federation by 4.7%. The upward trend in the primary incidence of breast cancer in the region is characterized by large fluctuations and faster rates: +2.2% per year against +1.8% in the Russian Federation. During the study period, the percentage of women living in the Irkutsk region who were diagnosed with stage IV breast cancer for the first time decreased from 12.5 (95% CI 10.5; 14.5) to 10.4 (95% CI 8.7; 12.1), but was statistically significantly higher than in the Russian Federation: 2011 - 9.1% (95% CI 8.9; 9.3); 2021 - 8.1% (95% CI 7.9; 8.3).

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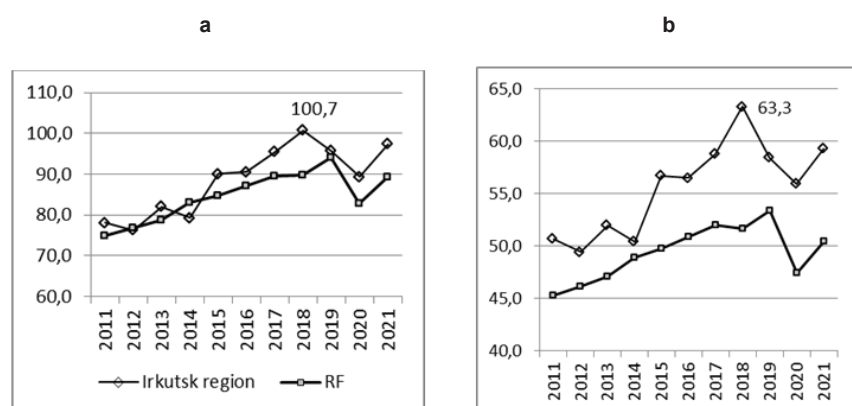


Fig. 1. Dynamics of breast cancer incidence rates in women in the Irkutsk region and the Russian Federation for 2011–2021: a) relative; b) standardized (per 100 thousand)

According to the data for 2021, the Irkutsk region in terms of relative and standardized indicators of the primary incidence of breast cancer among 85 subjects occupied the 26th and 6th rating positions, respectively.

The highest levels of primary morbidity among women in the Irkutsk region in 2011 were recorded at the age of 60 to 74 years. But in 2021, a group of women aged 80–84 years was added to these risk groups by age (Table 1), in which a high growth rate of +60% was registered. During the study period, high growth rates were noted in women aged 30–49 (from +21.3 to +122.5%), in connection with which the multiplicity of exceeding the all-Russian indicators increased (Table 1). Thus, higher rates of primary incidence of breast cancer in women of the region, compared with similar levels in the country, have developed in almost all age groups. The region is no exception in this situation [6].

In the Irkutsk region for 2011–2021 3964 women died from breast cancer. The mortality rate from breast cancer remained practically at the same level: 28.3 per 100 thousand in 2011 (95% CI 25.4; 31.2); 2021 - 27.9 (95% CI: 25.0; 30.8). The absence of a pronounced dynamics of women's mortality from breast cancer in the region confirms the value of the average annual rate - minus 0.1%. The decrease in the standardized mortality rate from breast cancer during the study period was not statistically significant: from 17.0 (95% CI: 15.2; 18.9) to 14.9 per 100 thousand (95% CI: 13.3; 16.6). Unstable dynamics of relative and standardized mortality rates from breast cancer in the region is shown in fig. 2.

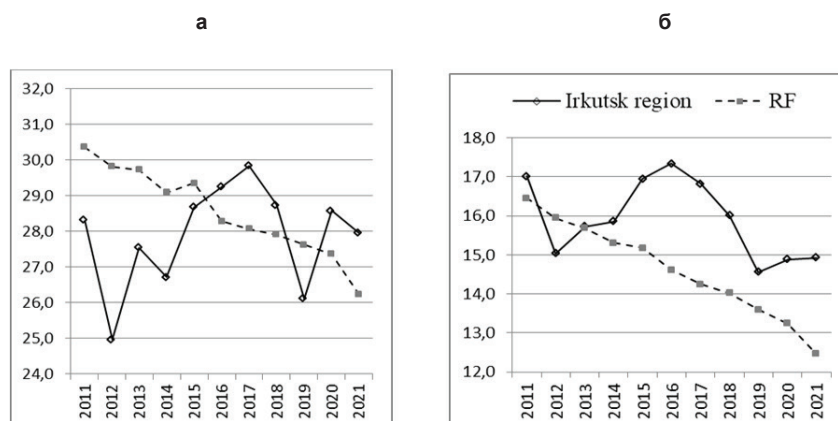
In general, in Russia there is a clear trend towards a decrease in the mortality of women from breast cancer [3], with an average annual rate of decline of 1.5%.

In the United States, the rate of decline in mortality from breast cancer slowed down - 1.3% per year from 2011 to 2020, and in the previous decade 1.9% [9]. For 2011–2021 in the Russian Federation, the relative mortality rate of women from breast cancer decreased by 13.6% from 30.4 (95% CI 30.0; 30.7) to 26.2 per 100 thousand (95% CI 25.9; 26.6). The decrease in the standardized mortality rate of women in the Russian Federation from breast cancer is also statistically significant: from 16.5 (95% CI 16.2; 16.7) to 12.5 per 100 thousand (95% CI 12.3; 12.7). The line of dynamics of standardized indicators for the Russian Federation is smoother compared to the line of relative indicators, and almost straight (Fig. 2).

Table 1

Incidence rates of breast cancer in women in the Irkutsk region and the Russian Federation in 2011 and 2021 by individual age groups (per 100.000; frequency of excess. number of times)

age groups	Irkutsk region		RF		$P_{\text{Irkutsk region}}/P_{\text{RF}}$	
	2011	2021	2011	2021	2011	2021
25-29	6.6	5.8	4.6	5.5	1.4	1.1
30-34	12.3	27.4	15.4	20.3	0.8	1.3
35-39	30.7	52.9	33.5	48.1	0.9	1.1
40-44	54.6	111.7	65.4	83.7	0.8	1.3
45-49	121.0	146.8	97.9	119.4	1.2	1.2
50-54	140.8	136.5	124.3	129.6	1.1	1.1
55-59	167.0	194.7	151.8	152.7	1.1	1.3
60-64	223.7	214.3	187.5	181.5	1.2	1.2
65-69	216.5	240.3	193.1	205.3	1.1	1.2
70-74	222.0	241.7	181.1	217.3	1.2	1.1
75-79	187.9	160.7	162.0	191.8	1.2	0.8
80-84	139.6	223.4	132.2	161.3	1.1	1.4
85+	158.6	100.3	119.1	105.1	1.3	1.0



Fig/ 2. Dynamics of mortality rates of women in the Irkutsk region and the Russian Federation from breast cancer for 2011–2021 a) relative; b) standardized (per 100 thousand)

The average long-term mortality rate from breast cancer in the Irkutsk region for 2011–2021 does not exceed the level in the Russian Federation - 27.9 versus 28.5 per 100 thousand. However, the standardized mortality rate from breast cancer in the region for the study period statistically significantly exceeds the national indicator by 8.9%: 15.9 (95% CI 15.0; 16.8) versus 14.6 per 100 thousand (95% CI 14.4; 14.7). The Irkutsk region, as before [3], belongs to the disadvantaged subjects of the Russian Federation in terms of standardized indicators of female mortality from breast cancer, ranking 8th among the subjects of the Russian Federation in 2021.

In a more detailed analysis of the standardized mortality rates of women in the Irkutsk region from breast cancer for 2011–2021, among women from 15 to 59 years old, a decrease is recorded from 14.7 to 10.4 per 100 thousand, among women over 60 years old, on the contrary, an increase in the indicator from 77.6 to 80.5 per 100 thousand.

In 2011, the average age of women who died from breast cancer at the age of 15–59 years was 51.45 years; in 2021 – 49.90 years; over the age of 60 years – 73.29 and 72.48 years, respectively, i.e. over the past 10 years, women of working age and the elderly began to die from breast cancer earlier - with a difference of 1.55 and 0.81 years, respectively.

Conclusion. According to the results of the analysis, an increase in the relative indicators of the primary incidence of breast cancer in the Irkutsk region by 24.7% was revealed, in the Russian Federation – by 17.0%. At the same time, the upward trend in indicators is more pronounced in the region: the average growth rate is +2.2% against +1.8% in Russia. According to official data for 2021, an excess of the primary incidence of breast cancer in the Russian Federation by 9.1% was registered in the region, as well as in all age groups by 1.1–1.3 times, excluding women 75–79 and over 85 years old.

Breast cancer is a preventable cause of death, so the mortality rate largely depends on the timeliness of its detection [6]. In the Irkutsk region, although the proportion of women with diagnosed breast cancer in advanced stage IV has decreased from 12.5% in 2011 to 10.4% in 2021, this indicator still differs from that of the Russian Federation – 9.1 and 8.1% respectively. According to WHO, in recent years, high-income countries have made progress in the treatment of breast cancer and mortality rates have begun to decline [4, 9]. But other middle- and low-income countries have yet to achieve similar results [5].

During the study period, mortality from breast cancer in the Irkutsk region changed little, while in the Russian Federation there is a downward trend with an average annual rate of 1.5%. Standardized indicators characterizing the true situation with breast cancer indicate that the Irkutsk region is not well: the mortality rate for 2011–2021 exceeded the national average by 9%, and in 2021 the region ranked 6th among the constituent entities of the Russian Federation in terms of morbidity and 8th in terms of mortality. Thus, if for the Russian Federation the results in reducing mortality from breast cancer over the past 10 years can be called positive, then for the Irkutsk region, such success, unfortunately, has not been achieved.

The increase in the primary incidence of breast cancer indicates the aging of the female population and the improvement in the quality of medical care for the diagnosis of this disease. Taking into account the absence of noticeable shifts in mortality in the region from breast cancer, the level of care for patients is still insufficient and requires additional research. No one can dispute the importance of early detection and subsequent treatment of breast cancer. But due to the fact that not all risk factors for breast cancer are subject to adjustment [4, 7], the role of primary cancer prevention is increasing [4].

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