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REGIONAL FEATURES OF THE MORTALITY
STRUCTURE OF THE POPULATION⁴

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Formulation of the problem. A noticeable increase in the mortality rate of the population in the context of the COVID-19 pandemic updates research in the field of mortality and life expectancy. The article compares the dynamics and mortality rate from the main causes of death in Russia and the Komi Republic on the eve of a pandemic. *The aim of the study* is to identify regional opportunities for increasing life expectancy due to the characteristics of the structure of mortality by causes. *The subject of the research* is mortality of the population of Russia and the Komi Republic due to causes of death. *Methods used.* The study was carried out on the basis of official data from Rosstat for the period 1990-2019, characterized by multidirectional trends in life expectancy. Methods of systemic, statistical and dynamic analysis and comparison were used. *The main hypothesis of the study* is the assumption of the presence of significant regional reserves for the growth of life expectancy for all major classes of causes of death. *Presentation of the main material.* In Russia, the period under review is characterized by a decrease in mortality from respiratory diseases, external causes and diseases of the circulatory system, in Komi - only from a group of external causes. But its level and share in the structure of mortality remain higher than the national average - this is still the main reserve for increasing life expectancy. There has been a convergence with the all-Russian parameters of the level and proportion of mortality from cardiovascular diseases, which previously favorably distinguished the region. Komi is characterized by significantly more unfavorable dynamics and mortality rates from diseases of the digestive system and from neoplasms. The republic approached the beginning of the pandemic with a less favorable situation with mortality from respiratory diseases, but with a more favorable situation from infectious and parasitic diseases. The region has reserves for increasing life expectancy for almost all major causes of mortality. *Originality and practical significance of the research.* Revealing the specifics of the structure of mortality by causes makes it possible to determine regional priorities in demographic policy. *Conclusions and prospects for further research.* The COVID-19 pandemic has made significant changes in the structure of mortality by cause, which will be the subject of our further research.

Key words:

pandemic, life expectancy of the population, mortality, causes of death, epidemiological transition.

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РЕГІОНАЛЬНІ ОСОБЛИВОСТІ СТРУКТУРИ СМЕРТНОСТІ НАСЕЛЕННЯ

Постановка проблеми. Помітне зростання смертності населення в умовах пандемії COVID-19 актуалізує дослідження в області смертності і тривалості життя. У статті порівнюються динаміка і рівень смертності від основних причин смерті в Росії та Республіці Комі напередодні пандемії. *Мета дослідження* – виявлення регіональних можливостей підвищення тривалості життя за рахунок особливостей структури смертності з наступних підстав. *Предмет дослідження* – смертність населення Росії і Республіки Комі з причин смерті. Використані методи. Дослідження проведено на основі офіційних даних Росстату за період 1990-2019 рр., який характеризується різноспрямованими тенденціями тривалості життя. Використано методи системного, статистичного і динамічного аналізу, порівняння. *Основною гіпотезою дослідження* є припущення про наявність значних регіональних резервів зростання тривалості життя за всіма основними класами причин смерті. *Виклад основного матеріалу.* У Росії розглянутий період характеризується зниженням смертності від хвороб органів дихання, зовнішніх причин і хвороб системи кровообігу, в Комі – тільки від групи зовнішніх причин. Але її рівень і частка в структурі смертності залишаються значніше, ніж в середньому по країні – це як і раніше головний резерв збільшення тривалості життя. Відбулося наближення з загальноросійськими параметрами рівня і частки смертності від серцево-судинних захворювань, які раніше вигідно вирізняли регіон. Комі характеризується помітно більш несприятливою динамікою і рівнем смертності від хвороб органів травлення і від новоутворень. До початку пандемії республіка підійшла з менш благополучною ситуацією зі смертністю від хвороб органів дихання, але з більш благополучною від інфекційних та паразитарних захворювань. Регіон має резервами підвищення тривалості життя практично за всіма основними причинами смертності. *Оригінальність і практична значущість дослідження.* Виявлення специфіки структури смертності з причин дозволяє визначити регіональні пріоритети в демографічній політиці. *Висновки і перспективи подальших досліджень.* Пандемія COVID-19 внесла істотні зміни в структуру смертності з причин, що стане предметом нашого подальшого дослідження.

Ключові слова:

пандемія, очікувана тривалість життя населення, смертність, причини смерті, епідеміологічний перехід.

РЕГИОНАЛЬНЫЕ ОСОБЕННОСТИ СТРУКТУРЫ СМЕРТНОСТИ НАСЕЛЕНИЯ

Постановка проблемы. Заметный рост смертности населения в условиях пандемии COVID-19 актуализирует исследования в области смертности и продолжительности жизни. В статье сравниваются динамика и уровень смертности от основных причин смерти в России и Республике Коми в преддверии пандемии. *Цель исследования* – выявление региональных возможностей повышения продолжительности жизни за счет особенностей структуры смертности по причинам. *Предмет исследования* – смертность населения России и Республики Коми по причинам смерти. *Использованные методы.* Исследование проведено на основе официальных данных Росстата за период 1990-2019 гг., характеризующийся разнонаправленными тенденциями продолжительности жизни. Используются методы системного, статистического и динамического анализа, сравнения. *Основной гипотезой исследования* является предположение о наличии значительных региональных резервов роста продолжительности жизни по всем основным классам причин смерти. *Изложение основного материала.* В России рассматриваемый период характеризуется снижением смертности от болезней органов дыхания, внешних причин и болезней системы кровообращения, в Коми – только от группы внешних причин. Но ее уровень и доля в структуре смертности остаются значительней, чем в среднем по стране – это по-прежнему главный резерв увеличения продолжительности жизни. Произошло сближение с общероссийскими параметрами уровня и доли смертности от сердечно-сосудистых заболеваний, которые прежде выгодно отличали регион. Коми характеризуется заметно более неблагоприятной динамикой и уровнем смертности от болезней органов пищеварения и от новообразований. К началу пандемии республика подошла с менее благополучной ситуацией со смертностью от болезней органов дыхания, но с более благополучной от инфекционных и паразитарных заболеваний. Регион располагает резервами повышения продолжительности жизни практически по всем основным причинам смертности. *Оригинальность и практическая значимость исследования.* Выявление специфики структуры смертности по причинам позволяет определить региональные приоритеты в демографической политике. *Выводы и перспективы дальнейших исследований.* Пандемия COVID-19 внесла существенные изменения в структуру смертности по причинам, что станет предметом нашего дальнейшего исследования.

Ключевые слова:

пандемия, ожидаемая продолжительность жизни населения, смертность, причины смерти, эпидемиологический переход.





Formulation of the problem. In 2020, for the first time after the completion of the first stage of the epidemiological transition in developed countries, the world faced an epidemic of the scale of a pandemic. The epidemic of a new type of coronavirus infection that began in China at the very end of 2019, despite the unprecedentedly strict quarantine measures of the Chinese authorities, quickly covered all continents. As early as January 2020, WHO declared the outbreak of the SARS-CoV-2 coronavirus a health emergency of international importance. And on March 11, 2020, the WHO Director General said that the spread of the new coronavirus in the world has acquired the character of a pandemic. In March-April 2020, all countries took unprecedented measures aimed at curbing the spread of the pandemic, dubbed COVID-19, by limiting human contact with each other as much as possible. However, the spread of the new infection was very rapid and very significant. By January 26, 2021, the number of cases of SARS-CoV-2 coronavirus infection detected in the world exceeded 100 million people.

Despite the fact that mortality from a new infection, in contrast to virulence, was not as significant as was feared at the beginning of the pandemic, the mortality rate of the population in 2020 compared to previous years increased markedly, especially during the second wave. In Russia, according to the operational monthly records of Rosstat, in January-December, 2124.5 thousand deaths were registered, which is 323.8 thousand, or 18%, more than in January-December 2019. - increased in the country in 2020 to 14.5 per 1000 population compared to 12.3 % in 2019 [7]. More detailed information, including on mortality due to causes in the context of the COVID-19 pandemic, is not yet available. The presented article is devoted to identifying the situation with the mortality of the population from the main causes of death on the eve of the unfolding of a pandemic.

In general, mortality statistics record more than 300 causes of death, combined into 20 classes. But the main reasons are given by Rosstat for the following six groups: diseases of the circulatory system; new formations; external causes (accidents, poisoning, injury, murder, suicide and other unnatural reasons); diseases of the digestive system - rhenium; respiratory diseases; infectious and parasitic diseases (groups are listed in descending order of mortality in recent years). Until 2012, these six classes of causes accounted for over 90% of deaths in Russia, and more than 80% recently. That is, despite the decrease in their share due to other reasons, they still determine the mortality rate and life expectancy of the population. The situation with mortality due to causes will be considered on the

example of the Republic of Komi - a region traditionally characterized by a lag in life expectancy from the all-Russian level, respectively, having significant regional reserves for its increase. The specificity of mortality in the Komi Republic from six main groups of causes of death is considered for 1990-2019, for which annual statistical information is available, in order to identify regional opportunities for increasing the life expectancy of the population due to the peculiarities of the structure of mortality by causes.

Analysis of recent research and publications. Changes in the structure of mortality due to causes that occurred in the developed countries in the 20th century are explained in the theory of epidemiological transition. Its foundations were laid by J. Bourgeois-Pishat, who introduced the differentiation of mortality into exogenous (from infectious and parasitic diseases, respiratory diseases, accidents, poisoning and murders) and endogenous (from malignant neoplasms, diseases of the circulatory system) [12]. In 1971, A. Omran formulated the concept of an epidemiological transition consisting of three stages [18]. It was supported by M. Terris [13], who brought the issue of the second epidemiological revolution to the agenda, expanding the tasks of epidemiology beyond infectious diseases - to all causes of disease [20]. Later the concept was developed by a number of researchers [14-17; 19] and supplemented with new stages. The completion of the first stage of the epidemiological transition (according to Omran), the first epidemiological revolution or the first stage of the epidemiological revolution (according to Terris), the first phase of the sanitary transition (according to Melle-Wallen) means, in fact, the same thing: a dramatic decrease in mortality from infectious diseases and other diseases of exogenous etiology and the transition to the dominance of endogenous diseases in the structure of mortality.

In Russia, the first stage of the epidemiological revolution, as in economically developed countries, ended by the mid-1960s – with the achievement of life expectancy up to 64.6 years among men (in 1964-1965) and 73.5 years among women (in 1967-1968) [11, p. 42]. After that, due to a number of reasons [1; 3; 8; 10]. At the same time, a combined structure of causes of death, combining the worst features of traditional and modern pathologies, was formed in Russia, in which high mortality from diseases of the circulatory system and neoplasms coexisted with no less high mortality from accidents, poisoning and injuries, as well as from diseases. respiratory organs and other similar reasons. Moreover, the mortality from accidents has become the second largest in

Russia after mortality from cardiovascular diseases [1, p. 102].

Only after the 1979 census, which recorded a decrease in the life expectancy of Russian men to 61.5 years, women - to 73.1 years, this issue became acute on the agenda. In 1985, an anti-alcohol campaign was launched in the country, which briefly interrupted the downward trend in the indicator - with the achievement in 1986-1987. until recently, the maximum levels of life expectancy of the Russian population, which amounted to 70.1 years for both sexes, 64.9 years for men and 74.6 years for women [11, p. 42].

Purpose of the article. The aim of the study is to identify regional opportunities for increasing life expectancy due to the characteristics of the structure of mortality by causes.

Presentation of the main research material. The period 1990-2019, for which there are annual data on mortality by causes of death for both Russia and the Komi Republic, is characterized by multidirectional trends in the life expectancy of the population: a sharp decline in the indicator in the

early 1990s, an increase in tensions of 1995-1998, a decrease during 1999-2003, an increase since 2004. Changes in the structure of mortality due to causes and peculiarities of the situation in the Komi Republic will be considered in accordance with these periods of multidirectional dynamics of life expectancy.

First of all, it should be noted that by the beginning of the 1990s in the Komi Republic there was a structure of mortality by causes that was different from the average Russian one. If in the country as a whole, the external causes of death as a result of the anti-alcohol campaign in 1985 dropped to the natural third place for them, skipping ahead of mortality from neoplasms, then in the Komi Republic external causes stably remained in second position after diseases of the circulatory system (table 1). However, a very significant increase in mortality from a group of accidents and other unnatural causes, which was characteristic of Russia in the 1990s, had already by 1993 returned external causes to the second place in the structure of causes of death of the Russian population.

Table 1: Dynamics of mortality rates of the population of the Komi Republic, per 100 thousand people of the population

Year	All Causes	Diseases of the respiratory system	Diseases of the digestive system	Diseases of the circulatory system	External causes	Infectious and parasitic diseases	Neoplasms
1990	749,0	33,4	21,9	364,0	149,3	7,0	127,9
1991	785,1	31,6	23,4	393,0	162,6	8,4	119,3
1992	941,1	39,0	26,3	452,3	229,3	9,1	132,0
1993	1221,1	59,5	34,4	570,2	321,9	10,4	147,2
1994	1368,7	72,9	43,8	649,5	351,9	15,2	140,7
1995	1315,4	59,5	44,6	622,5	330,0	15,9	138,7
1996	1216,3	51,0	40,3	593,5	288,7	15,2	140,7
1997	1107,3	42,7	31,0	553,4	227,0	15,4	148,5
1998	1062,2	36,6	34,7	500,2	232,2	10,9	146,4
1999	1147,4	39,0	36,4	562,1	224,9	13,7	155,4
2000	1294,2	56,0	42,8	619,7	285,9	16,9	155,0
2001	1347,9	60,0	51,0	647,8	303,9	16,3	156,2
2002	1492,4	63,5	64,7	723,9	322,9	21,9	159,0
2003	1568,5	70,7	72,0	755,1	327,2	20,7	165,1
2004	1534,2	73,5	80,2	726,5	315,3	22,6	157,4
2005	1549,4	72,5	89,0	716,7	314,1	25,6	159,0
2006	1417,3	60,6	78,4	669,5	264,3	24,2	157,0
2007	1309,2	54,3	69,5	620,3	231,6	18,6	168,4
2008	1321,4	54,1	81,0	615,1	213,7	23,4	174,5
2009	1328,2	59,7	85,8	618,5	213,5	25,0	179,1
2010	1305,1	52,7	91,5	603,6	205,3	24,0	178,2
2011	1237,0	51,3	81,9	561,1	186,6	20,3	189,4
2012	1223,4	46,9	86,4	559,5	182,3	18,5	192,9
2013	1196,3	47,6	89,3	538,5	166,9	15,3	198,0
2014	1223,3	46,2	91,9	536,8	180,7	15,0	213,3
2015	1236,8	50,0	91,3	575,4	161,3	16,0	205,9
2016	1237,6	49,2	100,9	551,0	159,9	13,7	204,8
2017	1176,2	47,1	85,3	535,5	131,5	12,7	212,0
2018	1187,6	44,9	84,6	544,9	133,4	15,2	206,6
2019	1198,4	42,3	96,6	558,1	133,8	10,9	208,0

Source: developed by the authors





For the period 1990-1994, including the most difficult years of the first years of socio-economic reforms of the 1990s with an unprecedented decrease in the incomes of the majority of the population, which led to a deterioration in the structure of nutrition, a reduction in opportunities for good rest, and the marginalization of part of the population, which was accompanied by inadequate state policy in the field of health care, a significant deterioration of medical care for the population, a decrease in its availability both due to the reduction in the network of hospital institutions and due to the rapid commercialization of the public health sector [1; 2], and the restoration of the traditional pathology of mortality, which made it possible to put forward the thesis of the "reverse epidemiological transition" in Russia [9], a very significant decrease in the level of life expectancy occurred in the country. In 1994, literally a few years after the maximum in 1986-1987, the minimum level after the completion of the first stage of the epidemiological revolution was recorded: 64.0 years for the entire population of Russia, 57.6 years for men and 71.2 years in women. In the Komi Republic, the decrease in the life expectancy of the population in the early 1990s was even more significant - over four years, the lag of the indicator from the average Russian level increased from 1.0 to 3.6 years. The minimum level of life expectancy in 1994 was 60.4 years for the entire population of the republic, 54.3 years among men, 68.0 years among women.

The mortality rate from all causes increased in Russia over 1990-1994. by 40%, in the Komi Republic - twice as strong: by 82.7%. This may be partly due to the acceleration in the region's aging rate of the age structure of the population associated with a large-scale migration outflow, but a noticeable increase in the gap with the average Russian level of life expectancy convincingly testifies to the extreme unfavorable situation in the region with mortality in the period under review.

As in Russia as a whole, the most significant in the Komi Republic in 1990-1994, in the context of the abolition of the state wine monopoly in the country and a colossal increase in the consumption of low-quality and surrogate alcoholic beverages in the low-income strata of the population, increased mortality from external causes 2.4 times. Under the conditions of the "reverse epidemiological transition", mortality from diseases of the respiratory system and infectious and parasitic diseases has more than doubled, and mortality from diseases of the digestive system has doubled. Mortality from diseases of the circulatory system increased by almost 80%, but this is less than for all causes of death, from neoplasms - by 10%.

A regional feature of the situation during this period is not only the scale of the growth in the overall mortality rate, but also a very significant increase in the mortality rate of the population of the republic from respiratory diseases, which in the country as a whole increased less significantly than mortality from all causes. This may be based on the aggravation of the harsh natural and climatic conditions of the northern region of the negative social consequences of the reforms. As a result of this growth, the proportion of mortality from respiratory diseases increased in the overall structure of mortality in the Komi Republic from 4.5% in 1990 to 5.3% in 1994 (Table 2), exceeding the same share in the Russian Federation, which, on the contrary, slightly decreased over 1990-1994 (from 5.3% to 5.2%).

In the period from 1995 to 1998, the country experienced some improvement in mortality processes. In our opinion, the opinion is correct that it was of a compensatory nature after the first years of supermortality of the Russian population, which made a kind of "natural selection", "choosing" from the population of the weak and sick, as a result of which the population turned out to be "healthier" as a whole [1]. Life expectancy in Russia increased by 1998 to 67.0 years (by 3 years), in the Komi Republic - to 65.5 years (by 5.1 years). Those. during the period of mortality decline, the regional lag in life expectancy of the population decreased from 3.6 to 1.5 years.

The crude death rate decreased in Komi in 1994-1998. by 22.4% - more than in Russia (13.3%). The most significant decrease, as well as the national average, was characteristic of mortality from respiratory diseases (the share of which in the regional structure of mortality decreased during this period to a minimum level of 3.4%) and external causes of death, which also significantly reduced its specific gravity. Further, in terms of the scale of decline, there are infectious and parasitic diseases, diseases of the circulatory system and the digestive system. In the country as a whole, the sequence of reduction of the three reasons indicated during this period is reversed. And unlike Russia in the Komi Republic in 1994-1998. an increase in mortality from neoplasms was recorded with a corresponding increase in its share in the structure of mortality by causes. The next period in the dynamics of Russian mortality is an increase in its level until 2003, associated with a sharp deterioration in the standard of living of the population as a result of hyperinflation that followed the default of 1998. In the context of an increase in mortality, life expectancy of the Russian population decreased over 1998-2003 by 2.2 years (up to 64.8 years).

Table 2: Share of mortality in the Komi Republic from the main causes of death, %

Year	Diseases of the respiratory system	Diseases of the digestive system	Diseases of the circulatory system	External causes	Infectious and parasitic diseases	Neoplasms	Other causes
1990	4,5	2,9	48,6	19,9	0,9	17,1	6,1
1991	4,0	3,0	50,1	20,7	1,1	15,2	6,0
1992	4,1	2,8	48,1	24,4	1,0	14,0	5,6
1993	4,9	2,8	46,7	26,4	0,9	12,1	6,3
1994	5,3	3,2	47,5	25,7	1,1	10,3	6,9
1995	4,5	3,4	47,3	25,1	1,2	10,5	7,9
1996	4,2	3,3	48,8	23,7	1,2	11,6	7,1
1997	3,9	2,8	50,0	20,5	1,4	13,4	8,1
1998	3,4	3,3	47,1	21,9	1,0	13,8	9,5
1999	3,4	3,2	49,0	19,6	1,2	13,5	10,1
2000	4,3	3,3	47,9	22,1	1,3	12,0	9,1
2001	4,5	3,8	48,1	22,5	1,2	11,6	8,4
2002	4,3	4,3	48,5	21,6	1,5	10,7	9,1
2003	4,5	4,6	48,1	20,9	1,3	10,5	10,1
2004	4,8	5,2	47,4	20,6	1,5	10,3	10,3
2005	4,7	5,7	46,3	20,3	1,7	10,3	11,1
2006	4,3	5,5	47,2	18,6	1,7	11,1	11,5
2007	4,1	5,3	47,4	17,7	1,4	12,9	11,2
2008	4,1	6,1	46,5	16,2	1,8	13,2	12,1
2009	4,5	6,5	46,6	16,1	1,9	13,5	11,0
2010	4,0	7,0	46,2	15,7	1,8	13,7	11,5
2011	4,1	6,6	45,4	15,1	1,6	15,3	11,8
2012	3,8	7,1	45,7	14,9	1,5	15,8	11,2
2013	4,0	7,5	45,0	14,0	1,3	16,6	11,8
2014	3,8	7,5	43,9	14,8	1,2	17,4	11,4
2015	4,0	7,4	46,5	13,0	1,3	16,6	11,1
2016	4,0	8,2	44,5	12,9	1,1	16,5	12,8
2017	4,0	7,3	45,5	11,2	1,1	18,0	12,9
2018	3,8	7,1	45,9	11,2	1,3	17,4	13,3
2019	3,5	8,1	46,6	11,2	0,9	17,4	12,4

Source: developed by the authors

In the Komi Republic, there was a decrease in the indicator by 4 years (to 61.5 years) - with an increase in the gap from the average Russian level to 3.3 years. Those. both periods, extremely unfavorable in the dynamics of Russian mortality, were characterized by an increasing lag behind the regional indicator of life expectancy of the population. At the same time, the indicator in rural areas of the republic, which in 2003 was 58.1 years, dropped below the 1994 minimum (58.8 years).

The mortality rate from all causes increased in the Komi Republic in 1998-2003. almost one and a half times (by 47.7%) - much more significant than in the country as a whole (21.1%). The maximum growth, as in Russia, is typical for diseases of the digestive system, but the scale of growth in Komi is much more significant: more than twice. This is followed by diseases of the respiratory organs, which increased by more than 90%, and infectious and

parasitic diseases, with an increase of almost 90%. Mortality from the main cause, diseases of the circulatory system, increased over 1998-2003. 51%, slightly more than average for all reasons. The growth in mortality from external causes (by 41%) and from neoplasms (by 13%) in the republic was lower than the average for all reasons, although the scale of growth, as well as for other causes of death, significantly exceeded the national ones, especially for neoplasms.

Thus, like 1990-1994, the period 1998-2003. characterized in the Komi Republic outstripping the average Russian rate of growth in mortality from respiratory diseases and neoplasms, but differs in a relatively moderate increase in mortality from external causes - not the same increase in mortality for all causes. As a result, in Komi for 1998-2003. there was a slight decrease in the share of external causes in the structure of mortality by causes, although it re-



mained much more significant than the national average - more than 20% of all deaths.

Period 1990-2003 in general, despite the presence of a four-year period of decline in mortality, it is characterized by an increase in the overall mortality rate (in Russia by 46.8%, in the Komi Republic by more than two times) and an increase in mortality in all six main groups of causes of death. The most significant growth - 3.3 times - in the Komi Republic is typical for diseases of the digestive system. Already in 2002, this group of causes rose in the region to the fourth position in the structure of causes of death, displacing respiratory diseases. In the Russian Federation, such a re-grouping of causes of death occurred later - in 2006. It almost tripled in the Komi Republic in 1990-2003. mortality from infectious and parasitic diseases. Further, in terms of growth rates, there are external causes, diseases of the respiratory system, diseases of the circulatory system and neoplasms. For all causes of death, the scale of growth in Komi is much more significant than in the country as a whole. A particularly noticeable difference is in the increase in the mortality rate from neoplasms and respiratory diseases, the growth rates of which in the period under consideration exceed the average Russian rates by 6-7 times.

After 2003, a decrease in mortality has been observed in Russia, due to the improvement in the level and way of life of the population characteristic of the 2000s and 10s, as well as the socio-demographic policy in the field of deaths modernization of the health care system [4], large-scale measures to overcome the alcoholic legacy of the 1990s and reduce mortality from injuries [6], strengthening the attractiveness of ideas of a healthy lifestyle in society, etc. already somewhat stagnant, however, 2019, after a slight increase in the overall coefficient in 2018, again demonstrated its decrease (from 12.5 to 12.3 ‰) and a continuing increase in the life expectancy. Life expectancy of Russians for 2003-2019 increased by 8.5 years, reaching 73.3 years (68.2 for men and 78.2 for women). These are the maximum values in the history of Russia. The previous maximums recorded in 1986-1987 for the female indicator were surpassed in 2009, for the indicator for the entire population - in 2012, for the male indicator - in 2013 [5].

In the Komi Republic, the life expectancy of the population increased in 2003-2019. by 9.8 years, reaching 71.3 years. The lag from the average Russian level decreased from 3.3 to 2.0 years. The male indicator increased to 65.8 years,

the female indicator - to 76.7 years. These are also all-time highs. For the entire population, the level of 1989 (the official maximum of the late 1980s in the region: before the 1989 census, the annual values of the population's life expectancy were not calculated) was exceeded in 2013. For the male indicator, the level of 1989 was reached in 2015, and exceeded in 2016. The maximum values of women's life expectancy, which were previously recorded in Komi in 1990-1991, were exceeded back in 2011.

2003-2019 the overall mortality rate for all causes decreased in the Komi Republic by 23.6% - slightly less than in the country as a whole (by 25.4%). As in Russia, the most significant decrease during this period is characteristic of external causes (about 59%). However, if in the Russian Federation they already in 2006 yielded to neoplasms the second position in the structure of causes of death, moving to third place, then in Komi such a regrouping of causes occurred with a noticeable delay - only in 2011. Accordingly, for 2003 -2019 the share of external causes in the structure of mortality has almost halved. On average in Russia it is already less than 8%, and in the Komi Republic it still exceeds 11%.

Further, in terms of the rate of decline in 2003-2019. In the Komi Republic there are infectious and parasitic diseases, diseases of the respiratory and circulatory systems. At the same time, in the context of a steady decrease in mortality for all causes, mortality rates from diseases of the digestive system and from neoplasms both in Russia and in the Komi Republic demonstrate an increase, in Komi it is quite significant.

Conclusions and perspectives of recent research. In general, over the thirty-year period 1990-2019, for which we have annual Rosstat data on the mortality rate of the Russian population from the main groups of causes, the total mortality rate of the Russian population increased by 9.5%. In the Komi Republic, the indicator increased by 60%. Unlike the country as a whole, where the period under review is characterized by a decrease in mortality from respiratory diseases, external causes and diseases of the circulatory system, in the Komi Republic there was a decrease in mortality only from a group of external causes, for all other reasons - an increase.

The most significant increase over the 30 years under consideration, both in the country as a whole and in the Komi Republic, is characteristic of mortality from diseases of the digestive system, which is largely due to the nature of the



population's diet and alcohol abuse and which tends to increase even in conditions of general decrease in mortality 2003-2019 (fig. 2 and 3). As already indicated, in 2002 in Komi, and in 2006 and on average across Russia, this group of causes rose from the fifth position in the structure of mortality by causes to the fourth. Among the population older than the working age, it occupies the third place in the structure. Until 2000, the mortality rate from diseases of the digestive system in Komi was lower than in the country as a whole; in the past two decades, it has been steadily higher. Moreover, the excess is significant: by 30-40%, in some years more - it reaches 50%. The share of mortality from diseases of the digestive system in the overall structure of mortality due to causes in Russia doubled, reaching 5.5%, in the Komi Republic it increased 2.8 times, exceeding 8% of all deaths. Thus, in the region, demographic policy measures related to the promotion of a healthy lifestyle in terms of improving the culture of food and the use of alcoholic beverages are extremely relevant.

The second place in the Komi Republic is the growth of mortality from neoplasms (by 63%), which, in contrast to Russia, is ahead of the increase in mortality from infectious and parasitic diseases in the region. Nevertheless, in the country as a whole, neoplasms took the second position in the structure of mortality due to causes already in 2006, in Komi - only in 2011. But already in 2011, the share of deaths from neoplasms in the region steadily exceeds the same share across the country as a whole. And since 2014, the mortality rate from neoplasms has also become higher than the all-Russian level. This puts on the agenda in the region the strengthening of demographic policy measures related to cancer prevention and early detection of oncological diseases.

Mortality from infectious and parasitic diseases increased in the Komi Republic in 1990-2019. by 56%. This is less significant than in the region for all reasons and than the growth from this class of reasons for the country as a whole. It should be noted that during the period under review, the mortality rate from infectious and parasitic diseases in Komi is consistently lower than the national average - with the exception of 2009-2010, when a slight excess was recorded. In 2019, the level in the region (10.9 cases per 100 thousand population) and the share of infectious and parasitic diseases in the structure of causes of death (0.9%) were noticeably lower than in the Russian Federation (respectively,

22.4 per 100 thousand population and 1.8%). Those. by the beginning of the COVID-19 pandemic - the first pandemic after the completion in the developed countries of the first stage of the epidemiological revolution, which became a serious challenge to the world public health systems, having actualized the need to revive the preventive strategy for protecting public health - the situation in the Komi Republic with mortality from infectious and parasitic diseases was better than in Russia as a whole.

Further in terms of growth rates in the region are diseases of the circulatory system and diseases of the respiratory system, which in the Komi Republic, it should be emphasized once again, in general for the period 1990-2019. are also distinguished by an increase, while on average in Russia for the three decades under consideration, there was a decrease in the mortality rate from these causes.

Nevertheless, the mortality rate from diseases of the circulatory system in Komi is still below the all-Russian level. Along with infectious and parasitic diseases, this is the second group of causes of death, which in the Komi Republic is consistently characterized by a lower level than in the country as a whole. However, the differences have decreased significantly. If in the early 1990s the mortality rate from cardiovascular diseases in Komi was 30-40% less than in Russia, then in recent years it lags behind the average Russian level by no more than 10%, and in 2019 - only 2.3%.

The mortality rate from respiratory diseases, which is characterized by increased growth rates in the Komi Republic during periods of an increase in total mortality, until the beginning of the 2000s, was consistently below the national level. Since 2003, this pattern has been violated, and although in general the situation is not characterized by unambiguity, after that years prevail with an excess of the regional mortality rate from diseases of the respiratory organs of the average Russian level. In particular, the regional excess was recorded in 2003-2006, 2009-2010. and 2016-2019 Those. By the beginning of the COVID-19 pandemic, which caused a noticeable increase in mortality from community-acquired pneumonia, the Komi Republic came up with a less favorable situation with mortality from respiratory diseases than Russia as a whole.

For the period under review 1990-2019. in Komi, only mortality from external causes has decreased, but its level and share in the structure of mortality by causes remain more significant



than the national average. The mortality rate from accidents exceeds the national average by 30-40%, the share - by 40-45%. This is still the main reserve for increasing the life expectancy of the population in the Komi Republic.

In conclusion, it should be noted that in the context of the growth of life expectancy since 2008 in Russia, there has been a noticeable steady increase in the share of other causes of death, in which the spread of neurodegenerative diseases in an aging society, in particular, Parkinson's and Alzheimer's diseases, plays an important role. In 2019, it amounted to 18.5% against 7.1% in 2007. Since 2016, the share of other causes is inferior in Russia only to the share of the main cause of death - diseases of the circulatory system. In some countries with high life expectancy, the share of this group has already come out on top (for example, in France in 2018). In the Komi Republic, the 1990s were characterized by a rather noticeable, albeit not entirely consistent, increase in the share of other causes of death, which in 1998 exceeded the average Russian level, and this ratio remained until 2013. In recent years, the share of other causes has increased. death rate is not as significant as in the country as a whole, it has stabilized in the region at the level of about 12.5-13% - this is the third position after diseases of the circulatory system and neoplasms. But if it is possible to resume and stabilize the trend of growth in the life expectancy of the population, these causes of death will play an ever-increasing role, which will actualize the issues of the quality of life of older generations, the development of the system of social institutions and the restructuring of public health in the direction of strengthening gerontological and geriatric services.

Such a situation with the structure of mortality due to causes of death developed in Russia and the Komi Republic by the beginning of the COVID-19 pandemic, which made significant changes both in the mortality rate and life expectancy of the population, and the structure of mortality by causes, which will be the subject of our further research. It is also planned to study the regional specifics of gender and inter-settlement differences in the level and structure of mortality by causes.

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