PREVENTIVE HEALTHCARE: TOPICAL ISSUES OF HEALTH RISK ANALYSIS

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Research article

THE MEDICAL AND DEMOGRAPHIC SITUATION IN RUSSIA: LONG-TERM TRENDS, PROSPECTS AND IMPROVEMENT POTENTIAL

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Relevant trends for shaping state social policy, including public health protection, can only be formed relying on accurate assessment and forecast of changes in key medical and demographic indicators. Following the COVID-19 pandemic, which had both direct and indirect adverse effects on population mortality across the globe, interest in evaluating possible future changes in the medical and demographic situation has increased. According to the median projections by the United Nations Population Division and the Federal State Statistics Service, the population of the Russian Federation may decrease by 7.3–10 million people by the beginning of 2046. To reverse this negative trend, substantial efforts should be taken beyond migratory growth, including finding innovative mechanisms to stimulate birth rates and reduce mortality (increase life expectancy at birth) as the primary components influencing natural population growth and, consequently, population dynamics.

The aim of this study is to identify long-term medical and demographic trends in the Russian Federation and explore the potential for increasing birth rates, life expectancy at birth, and reducing mortality. The research is based on data from Rosstat on population size and age-sex structure, birth rates, mortality, and life expectancy at birth both in Russia as a whole and by regions, as well as data on deaths from Federal Register for Medical Death Documentation for the period 1970–2023 (with a forecast up to 2046).

Observed current demographic trends in the Russian Federation align with global trends and are described by the demographic transition theory. However, significant regional heterogeneity is noted. Therefore it is challenging to develop a unified universal approach to transforming the healthcare system. Nonetheless, it is possible to identify relevant directions for all regions of the Russian Federation to strengthen demographic potential.

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The study identifies two priority areas for improving the medical and demographic situation in the country in terms of reducing mortality, each requiring different sets of measures: 1) increasing the average age of death from chronic non-communicable diseases that account for over 70 % of deaths both in Russia and other developed countries; 2) minimizing deaths from external causes (injuries, traffic accidents, suicide, poisoning, etc.) and infectious diseases.

Keywords: *demography, mortality, birth rate, life expectancy at birth, risks of losses, Russian Federation, forecast, medical and demographical trends.*

Assessing the trends in key medical and demographic indicators is a core challenge for global health surveillance [1]. Conclusions made following the surveillance results play an important role in shaping state social policies including health protection [2].

Following the COVID-19 pandemic, which had adverse effects on population mortality across the globe [3], interest in evaluating possible future changes in the medical and demographic situation has increased. According to the Population Division of the United Nations Organization (hereinafter UN), as of January 01, 2021 Russia held the ninth rank place as per the population number among all countries in the world[1]. The latest UN forecast expects that Russia can go down to the 14th place by 2046 since the country population will decline by 10 million people (-7.2 %). This is the closest to the medium-case scenario of the Federal State Statistic Service (hereinafter Rosstat) predicting that the country population would go down by 7.6 million people[2].

When making long-term forecasts, it is especially relevant to investigate dynamics of birth rates, mortality rates and life expectancy at birth (hereinafter LEB) as basic components influencing changes in population. To provide sustainable growth of the RF population, substantial efforts should be taken in future beyond migratory growth, including and implementing relevant reserves to stimulate birth rates, reduce mortality and increase LEB.

The aim of this study was to identify long-term medical and demographic trends in the Russian Federation and explore the potential for increasing birth rates and life expectancy at birth and for reducing mortality.

Materials and methods. We analyzed data on deaths from Federal Register for Medical Death Documentation (hereinafter FRMDD) and Rosstat databases for the period 1970–2023 (with a forecast up to 2046) on population size and age-sex structure, birth rates, mortality, LEB both in Russia as a whole and by regions. RF regions were grouped together per Federal Districts (for the total birth rate, hereinafter TBR) and per population density (for the total mortality rate and LEB) to achieve better visualization of the results.

Since the total mortality rate to a great extent depends on the population age structure, in particular, on changes in proportions of children or elderly people in a given population, we applied standardized mortality rates to estimate resulting demographic indicators in accordance with conventional world practice. The European Standard Population 2013 (ESP 2013) was applied in this study for standardization.

Data on the age group 0–14 years were not used when calculating mortality rates due to relatively few deaths in it against other age groups. An approach to combining ages into specific groups was shaped by the authors and substantiated by significant differences in the structure of case-specific mortality based on analysis of the actual data.

In addition to that, the concept of conditionally avoidable deaths is used in this study. The avoidable mortality concept was first introduced in a study by D.D. Rutstein et al. (1976)[3]. Deaths were considered ‘excessive’ or ‘needless’ in case they could be avoided or

[1] World Population Prospects 2022. *United Nations*. United Nations, Department of Economic and Social Affairs, Population Division, 2022. Available at: https://population.un.org/wpp/ (March 01, 2024).

[2] Demografiya [Demography]. *Rosstat: Federal State Statistic Service*. Available at: https://rosstat.gov.ru/folder/12781 (March 01, 2024) (in Russian).

[3] Rutstein D.D., Berenberg W., Chalmers T.C., Child C.G. 3rd, Fishman A.P., Perrin E.B. Measuring the quality of medical care. A clinical method. *N. Engl. J. Med.*, 1976, vol. 294, no. 11, pp. 582–588. DOI: 10.1056/NEJM197603112941104

prevented under ideal conditions [4]. In this study, conditionally avoidable mortality included deaths of people younger than 70 years due to all causes.

Results. ***Total population size.*** The Rosstat forecast on changes in the RF population size, which was valid as of the end of 2023, covers the period up to January 01, 2046 and is shaped according to three scenarios[4]:

– according to the worst-case scenario, the population size will go down by 15.8 million people in 2024–2045 and will equal 130.6 million people by the beginning of 2046;

– the middle-case scenario expects that the population size will decline by 7.6 million people;

– the best-case (the most optimistic) scenario assumes a growth in the population size by 4.5 million people after the mid 2030ties (Figure 1).

Birth rates and natural growth. Starting from 2017, a negative trend appeared in Russia as the absolute number of births started to decline. According to all three Rosstat scenarios, deaths will be higher than births up to the end of 2030ties; only the best-case scenario predicts more births than deaths by the end of the forecast period (Figure 2).

It should be noted that this situation results from both fewer children born by one woman and the declining number of women in specific reproductive age groups, both phenomena occurring due to changes in the sex-age population structure in Russia. Thus, in 2008, there were 6.2 million women aged 20–24 years in the country whereas the number declined practically by two times by 2021 and went down to 3.5 million people. The number of women aged 25–29 years also went down; however, we may expect this negative trend to persist for approximately 3–5 years and after that there might be a growth in the number of women in this age group. Women older than 30 years reached the peak in their number by the end of 2021 but the figure is expected to go down in the nearest future. Figure 3 clearly shows wave-like changes in the number of women as per 5-year age groups.

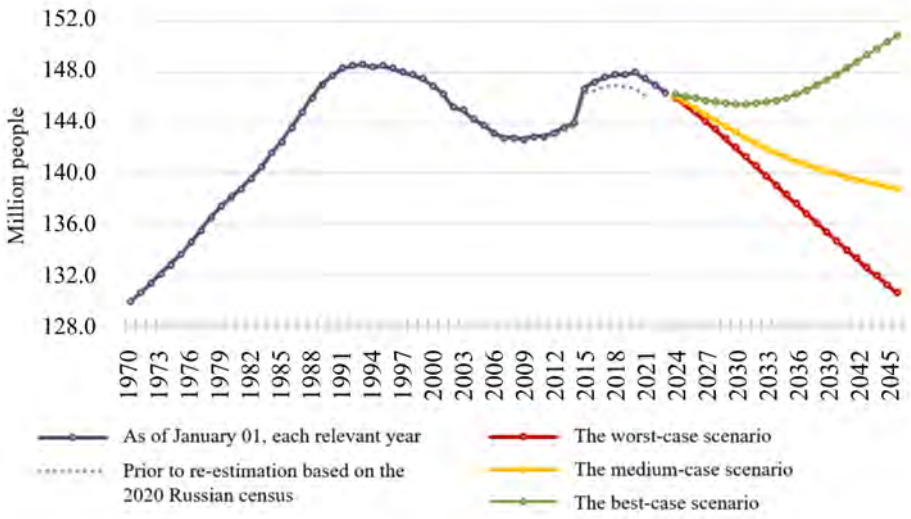

Figure 1. Changes of the resident population size in Russia in 1970–2023 and according to three Rosstat scenarios in 2024–2046, as of January 01, each relevant year; million people[5]

[4] Demografiya [Demography]. *Rosstat: Federal State Statistic Service*. Available at: https://rosstat.gov.ru/folder/12781 (March 01, 2024) (in Russian).

[5] The present data consider the retrospective re-estimation of the population size in 2012–2021 according to the data obtained by the 2021 Russian census conducted in 2020–2021. The broken line in the graph shows the population size before re-estimation. Failure to correctly account for migration over the period between 2010 and 2021 is the basic reason for substantial correction of the population size.

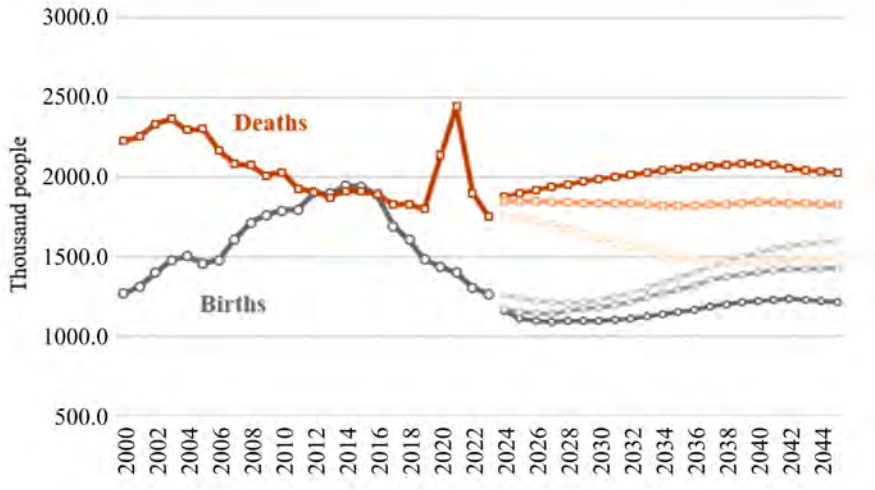

Figure 2. Changes in the absolute number of births and deaths in Russia in 2000–2023 and according to three Rosstat scenarios in 2024–2045, thousand people

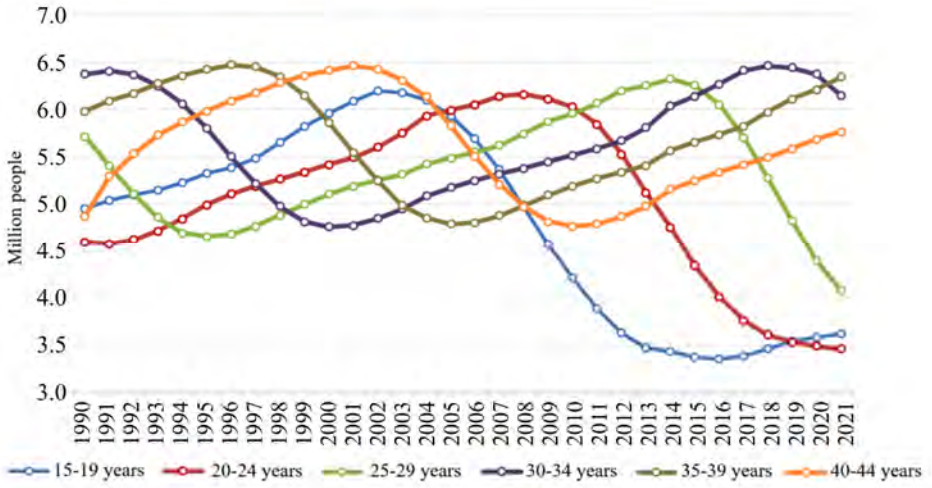

Figure 3. Changes in the number of women in specific reproductive age groups in 1990–2022

The absolute number of births is of great importance not only as a component of natural population growth. It is this number that determines a cohort (generation) size and, consequently, a future population size. As mentioned above, the absolute number of births depends on two factors, the number of women in reproductive age groups and reproduction intensity.

Reproduction intensity describes the TBR or, in other words, an expected number of births per one woman by the end of her reproductive age provided that age-specific birth rates observed in a calendar year remain unchanged during this whole period. In 2000–2016, the number of births grew due to both growing female population of the most fertile age (20–39 years) and growing reproduction intensity: there was a growth in the TBR from 1.19 to 1.79 childbirths per one woman in 2000 and 2016 accordingly. A drastic decrease in the number of births after 2016 from almost two million live births in 2015 down to 1.26 million in 2023[6] resulted from both a declining number of women in reproductive age groups and (to a greater extend) decreasing reproduction intensity. Though the TBR values in 2020ties are higher than those in early 2000ties, the absolute number of births is close

[6] Otchetnaya forma Estestvennoe dvizhenie naseleniya (EDN) [The Report on Natural Changes in Population]. *Rosstat*, 12 months of 2023 (in Russian).

to that observed in 2000 when the value of this rate was among the lowest ones in the whole history of contemporary Russia. This comes from a less favorable age structure of the population characterized by a decline in the number of women in reproductive age groups.

The Rosstat forecast assumes a growth in reproduction intensity, which will be especially rapid after 2027 within the best-case and medium-case (the most likely) scenario; still, the 2016 level will not be reached. The worst-case scenario predicts middle-term stagnation in the TBR at the present level of 1.4–1.45 childbirths per one woman. Synchronously with the reproduction intensity growth, Rosstat expects a growth in the absolute number of births starting from 2030ties even within the worst-case scenario, which does not include any growth in the total birth rate. This means that we can expect a growth in the number of women in reproductive age groups in 2030ties and especially in 2040ties, which, other conditions being equal, should have a favorable effect on the absolute number of births.

The TBR can be calculated both for all rates and for an order of birth; it is noteworthy that total birth rates calculated as per an order of birth are additive. A growth in births of second children made the greatest contribution to the overall TBR increase in 2006–2016; it occurred, among other things, due to the Maternity (Family) Capital policy implemented in the country. Approximately at the same time a rapid growth appeared in births of third and next children; births of both first and second children started to decline after 2016 but births of third and next children went on growing. The TBR of first births grew slightly in 2022 for the first time after its long-term decline; on the contrary, the TBR of second births dropped significantly thereby causing a decrease in the overall TBR of all births.

Our analysis of birth rates per regions of the Russian Federation established that in 2023 they varied within rather a narrow range between 1.2 and 1.6 births per one woman, the national average being 1.41. This is true for most RF regions except those where the demographic transition from high birth rates and mortality rates to low ones started considerably later than in the country in general (Chechnya, Tyva and Altai Republic). In some regions, the TBR dropped down to its extremely low value, one child per one woman (Figure 4). This is true for Sevastopol, Mordovia and specifically the Leningrad region where the TBR equals 0.88 since most births are registered in Saint Petersburg creating an artificially low birth rate in the region.

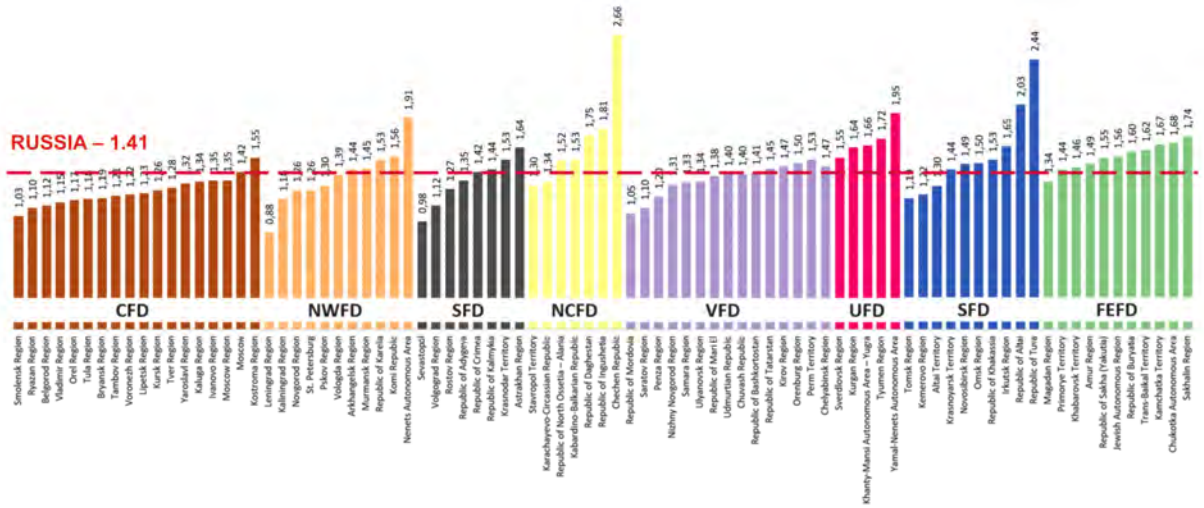

Figure 4. The TBR as per regions of the Russian Federation (within its boundaries as of 2021) in 2023[7]

[7] Summarnyi koeffitsient rozhdaemosti [Total birth rate]. *EMISS: Unified Interdepartmental Information-Statistical System*. Available at: https://www.fedstat.ru/indicator/31517 (April 17, 2024) (in Russian).

Therefore, the geographical picture that describes differentiation of birth rates across Russia is quite stable and has undergone very few changes over the last decades. Birth rates were higher than the national average in most regions located in the Asian part of the country (especially the Tyumen region and Autonomous Areas), including all regions in the Far East Federal District and in most regions in the North Caucasus Federal District. They were stably lower than the national average in the Central Russia, European Russia and southern regions near the Volga River. Birth rates tend to be higher in northern regions in the European part of Russia than in southern ones. Overall, a prominent geographical correlation is observed in birth rates, which may primarily indicate they have strong sociocultural determination.

Mortality. Mortality is one of three components that determine changes in a population size; it is also an indirect indicator of population health and the level of welfare in a society in general. Individual risk of death biologically depends on a person's age. A peak in it usually occurs in infancy; levels of this risk are minimal for children and adolescents but then they grow exponentially with ageing. The total mortality rate is influenced considerably by the population age structure; therefore, when a demographic situation is described, not only the fact of death itself is extremely important but also an age of a person who dies. The latter allows determining whether public healthcare organizations function effectively.

Both worldwide and in Russia, 103–105 boys are born per each 100 girls. But starting from the age of 20, the absolute number of deceased men is already higher than that of deceased women. A similar trend persists until 80 years of age when deaths among women again start to prevail; this is primarily due to a much smaller number of men who have managed to live this long. Similar sex-specific differentiation of mortality is typical for all countries across the globe (mortality among men is higher than that among women); however, a peculiarity detected in Russia is a significant level of this difference.

Over 1999–2023, the total mortality rate decreased in general from 14.6 down to 12.0 cases per 1 thousand people (by 12.7 %), from 16.2 down to 13.3 among men (by 21.8 %) and from 13.2 down to 10.9 among women (21.1 %). That is, decline rates in mortality did not differ between men and women.

According to the current Rosstat forecasts, the total mortality rate may grow slightly over the next 22 years and reach 13.2 cases per 1 thousand people within the medium-case scenario; 15.5 cases (22.6 % growth) within the worst-case scenario; or even decline down to 9.9 cases (by 21.1 %) within the best case scenario. Therefore, a favorable scenario implies that the descending trend in mortality that first occurred in the beginning of the 21st century is going to persist (more than 20 % over 22 years, Figure 5).

We calculated the standardized mortality rate using the ESP 2013 as a standard. As a result, it was established to go down by 55.2 % in the total population, by 59.1 % among men and by 56.5 % among women over 1999–2023. Therefore, consideration of the impact exerted by such factor as changes in the population age structure reflects a more intensive decline in mortality in Russia but does not lead to any significant changes in the differences between men and women as regards the intensity of the decline in the analyzed rate.

Just as birth rates, mortality rates are extremely heterogeneous in different regions and vary between 346.2 deaths per 100 thousand people in Ingushetia and 1671.7 deaths in the Pskov region. 2023 data allow concluding that population density has some effects on mortality but cannot be considered a key factor. Thus, a difference in mortality rate can reach 3.2 times in a group of RF regions similar as per population density (Figure 6).

Moreover, positive dynamics associated with the existing descending trend in mortality and detected in the country as a whole has apparent regional specificity in 2019–2023. Mortality went down against its 2019 levels in 61 regions whereas it grew in 24 regions. The average decline rate equaled -3.8 % in Russia as a whole.

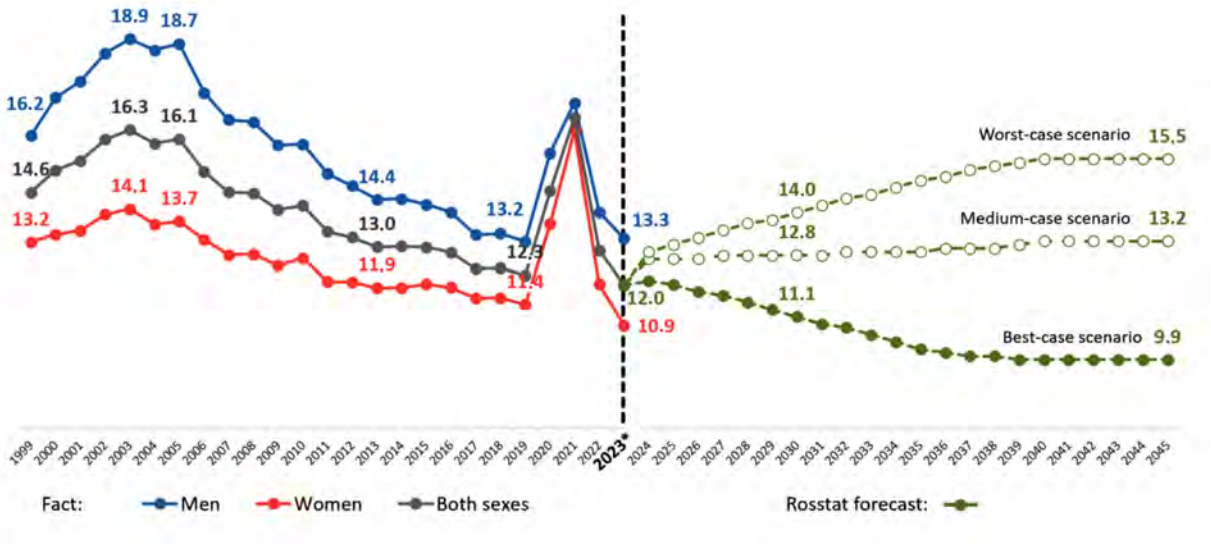

Figure 5. Dynamics and forecast of the total all-cause mortality rate per 1 thousand people (calculations are based FRMDD data over 12 months of 2023)

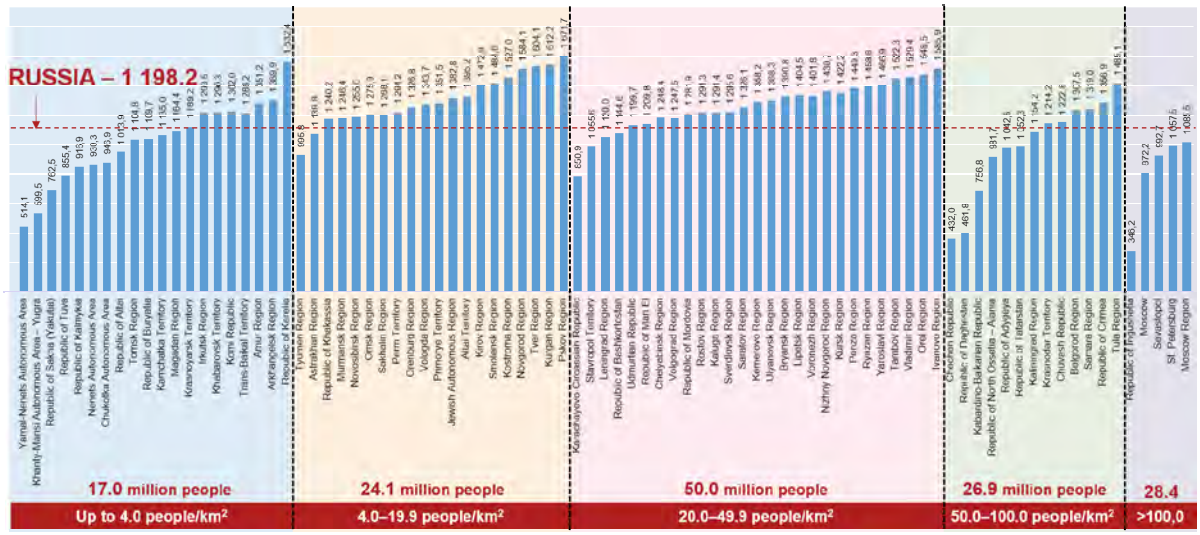

Figure 6. The total mortality rate as per RF regions depending on population density over 12 months of 2023 (calculations are based FRMDD data over 12 months of 2023)

Territorial differences are also significant in age-specific mortality. The proportion of deceased working age people is considerable in all RF regions. It should be noted though that people who died at the age younger than 70 years (conditionally avoidable deaths) account for 41.8 % among all deceased in Moscow but for 84.5 % in Chukotka Autonomous Area.

Standardized mortality rates create a totally different list of RF regions according to their ranks where regions with younger population tend to move onto higher places and vice versa: for example, Tyva moved from the 77th place to the 1st (Figure 7).

Mortality per causes. Long-term dynamics in the number of deceased due to most causes can also be described as positive. A decline has been established for all three major causes, namely, diseases of the circulatory system (hereinafter CSDs), tumors, and external causes. Hence, we can state that considerable success has been reached as regards reducing mortality due to key causes of death. Nevertheless, if we compare the results with global data, we can conclude that there are still unused reserves available in the sphere.

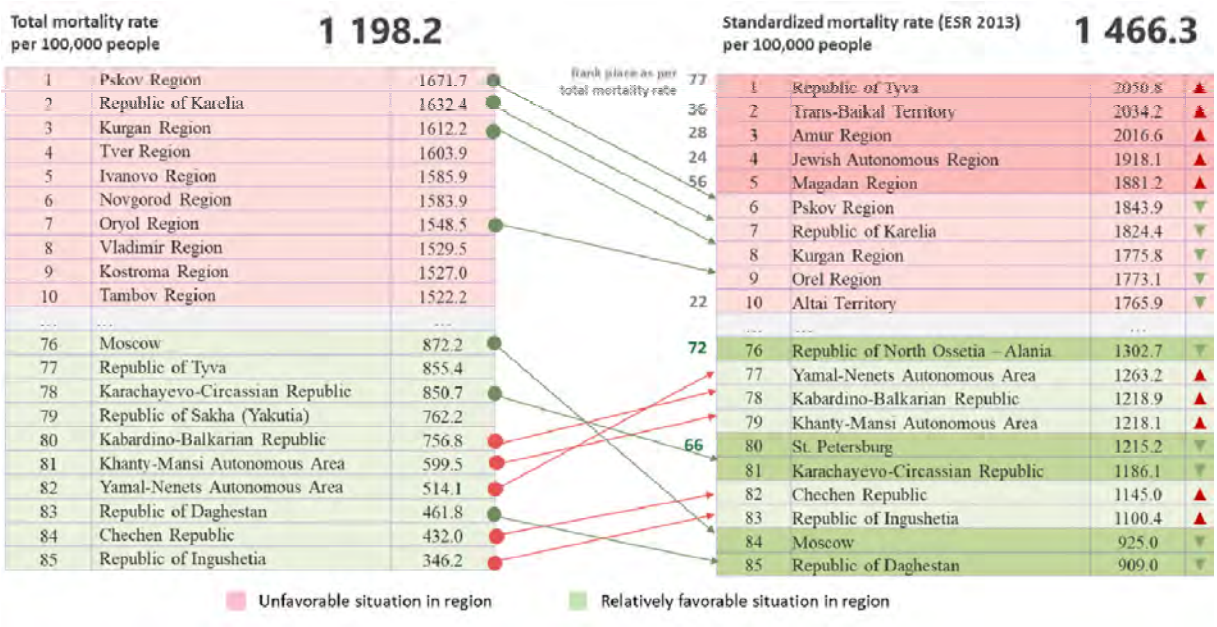

Figure 7. Total and standardized mortality rates (ESP 2013) in some RF regions, per 100 thousand people, over 12 months of 2023 (calculations are based FRMDD data over 12 months of 2023)

Differentiation between men and women is also observed as per causes of death. An age of death does not exceed 70 years for many classes of diseases or is close to this boundary, especially among men. Sex-related difference is also significant; it is slightly below 2 years for tumors but exceeds 8 years in women's favor for CSDs and diseases of the digestive system.

The structure of mortality as per causes changes with ageing (Figure 8).

On the one hand, such changes in the structure seem only natural: injuries and poisoning are the key cause of death in younger age while diseases associated with ageing (CSDs and tumors) hold the leading place in older age groups. On the other hand, any death at an age younger than 70 years is conditionally avoidable (according to WHO estimates) and depends not only on behavioral risk factors (primarily deaths due to risky behavior

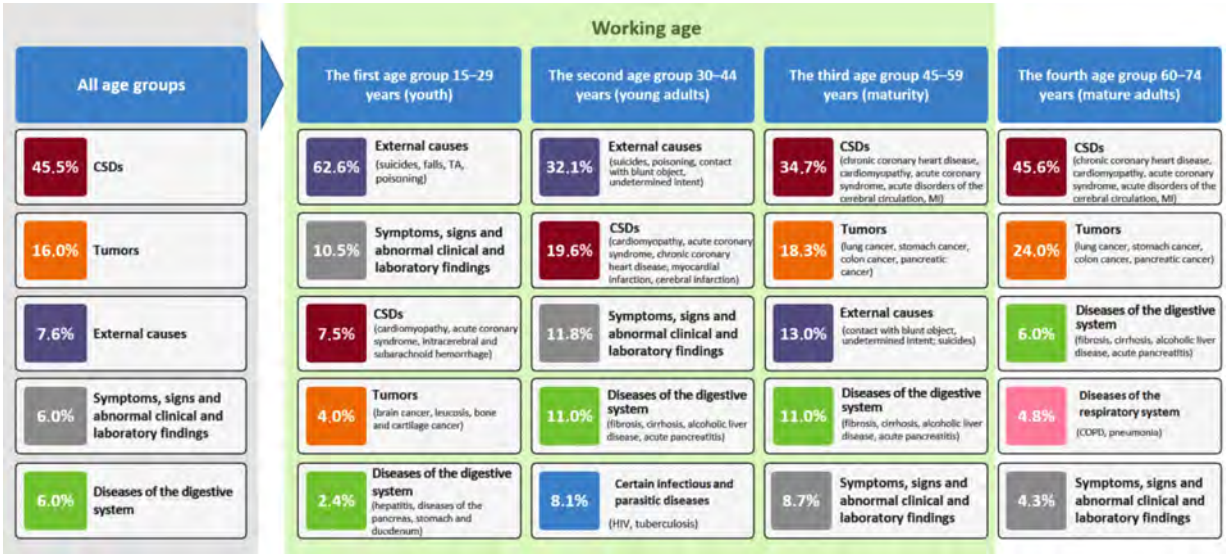

Figure 8. The proportion (in %) of key causes of death as per age groups over 12 months of 2023 in Russia as a whole (calculations are based FRMDD data over 12 months of 2023)

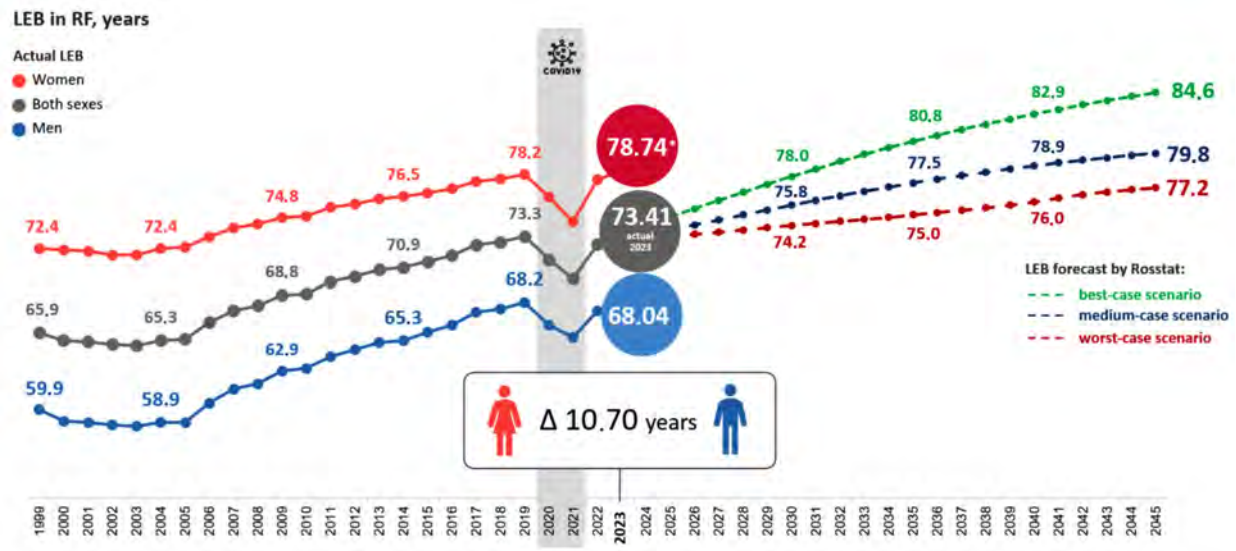

Figure 9. LEB dynamics in Russia, years

under the influence of alcohol) but also on prompt and qualitative healthcare provided for those who need it (especially in case of external causes such as injuries, transport accidents (hereinafter TA), or communicable diseases) as well as on preventive capacity and availability of primary healthcare (in case of deaths due to CSDs, diseases of the digestive system, tumors, etc.). Thus, the Sustainable Development Goals include such an indicator as mortality among people younger than 70 years due to major non-communicable diseases[8].

Life expectancy at birth. LEB, as a resulting demographic indicator, does not have methodological drawbacks intrinsic for the total mortality rate; therefore, it does not require any standardization. Figure 9 shows LEB in dynamics in Russia as a whole.

Between 1999 and 2023, LEB of the total population grew by 7.5 years, by 8.1 years for men and 6.4 years for women. Just as it was with the total and standardized mortality rates, the observed sex-specific differentiation in LEB is typical for many developed countries; in Russia, it is primarily determined by behavioral risk factors [5]. According to authors' calculations, 2–3 years out of the 10.7-year difference can be caused by unhealthy alcohol use; 3–4 years, tobacco smoking and associated diseases [5]. Contributions made by various causes of death to reserves of LEB growth are provided in Table.

Just as it was the case with mortality, basic reserves for growth can be found among conditionally avoidable deaths, namely, people who died at the age younger than 70 years and external causes of mortality. An increase in an average age of death can be reached by placing the greatest emphasis on reducing mortality among working age people (first of all, men). Work with this group will bring about the effect of a 'fast victory' achieved by state social policies.

Differences in LEB are smaller as compared to differences in the total mortality; still, considerable differences in the indicator are observed between different RF regions. However, distribution of regions into groups depending on their population size does not allow identifying any substantial differences in LEB and does not give any evidence of possible correlations between these two parameters (Figure 10).

The analysis of LEB in dynamics over 2019–2023 established that it grew against its 2019 level in 32 RF regions; LEB is still

[8] World Health Statistics 2024: Tables of health statistics by country and area, WHO region and globally. *WHO*. Available at: https://www.who.int/data/gho/whs-annex/ (March 01, 2024).

Table

Reserves of LEB growth given the reduction in mortality based on the 2023 model data considering the age and sex profile

Disease	Both sexes			Men			Women		
	All ages	0–70	15–59	All ages	0–70	15–59	All ages	0–70	15–59
All causes of death	13.18	8.82	5.63	14.36	10.76	7.16	10.86	5.90	3.42
Diseases of the circulatory system	5.08	2.81	1.60	5.29	3.54	2.11	4.40	1.72	0.83
Tumors	1.96	1.46	0.82	1.99	1.50	0.77	1.94	1.41	0.85
External causes of mortality	1.25	1.22	1.01	1.78	1.73	1.48	0.53	0.50	0.42
Diseases of the digestive system	0.91	0.80	0.67	0.95	0.90	0.76	0.78	0.65	0.54
Diseases of the respiratory system	0.55	0.42	0.31	0.72	0.58	0.38	0.35	0.23	0.12
Endocrine diseases	0.28	0.21	0.10	0.19	0.19	0.08	0.33	0.23	0.10
Symptoms, signs and abnormal clinical and laboratory findings	1.03	0.81	0.70	1.24	1.08	0.94	0.68	0.44	0.33
Diseases of the nervous system	0.49	0.16	0.05	0.46	0.26	0.15	0.52	0.11	0.00
Other causes of death	1.63	0.93	0.37	1.74	0.98	0.49	1.33	0.61	0.23

Note: calculations are based FRMDD data over 12 months of 2023.

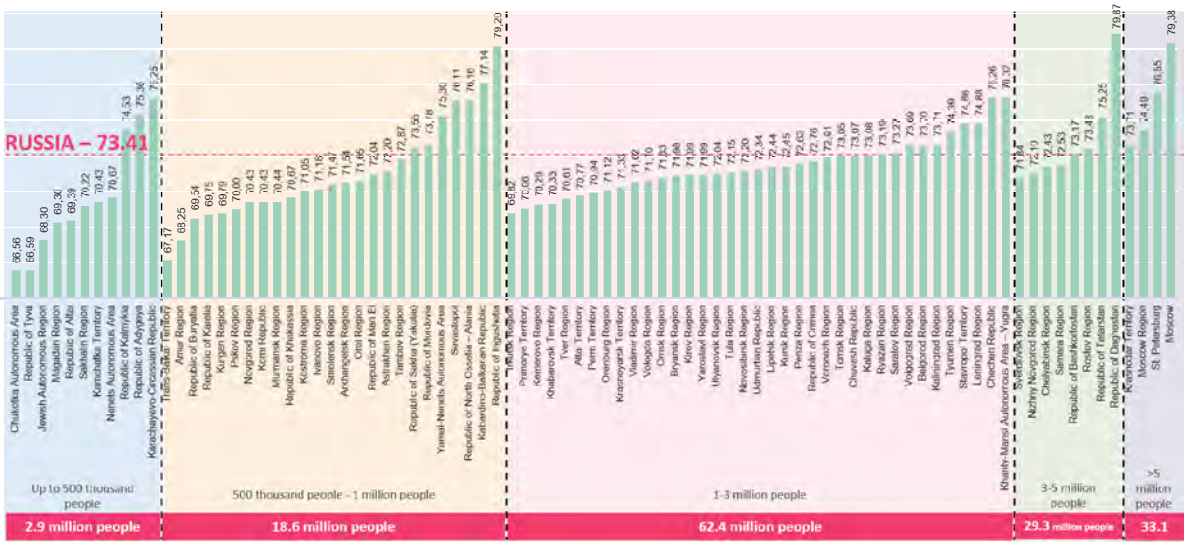

Figure 10. LEB per groups of RF regions depending on population size (2023)

recovering to its pre-pandemic level in 53 RF regions. In Russia as a whole, LEB has grown by 0.07 years other the analyzed period (Figure 11).

Just as it was the case with mortality, LEB for men and women differs considerably in different regions. The smallest difference was identified in republics located in the North Caucasus, Moscow, and Saint Petersburg, between 4 and maximum 8 years. The greatest difference of 12 and even more years was identified in the Bryansk, Kostroma, and Kurgan regions, in the Altai Republic, Chuvashia, Mari El, Udmurtia and Buryatia.

Reserves of LEB growth as per classes of diseases are also extremely heterogeneous in different RF regions. If we analyze the structure of reserves eligible for promoting LEB growth on the example of the Samara region, Ingushetia, and Tyva, we can see that the proportion of external causes of mortality can differ by 2 and even more times. The same conclusion can be drawn for CSDs, which, considering age-specific mortality due to these pathologies, clearly indicates different amounts of LEB growth reserves due to conditionally avoidable causes of death (Figure 12).

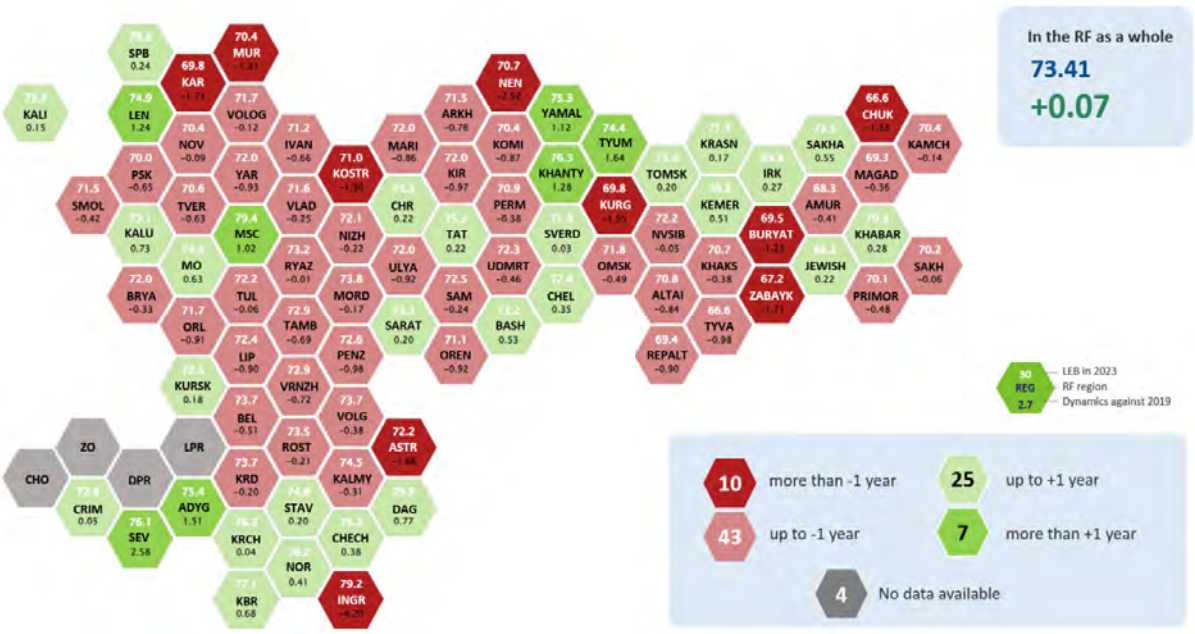

Figure 11. LEB in 2023 and the differences between LEB level in 2019 and 2023, years (Rosstat data)

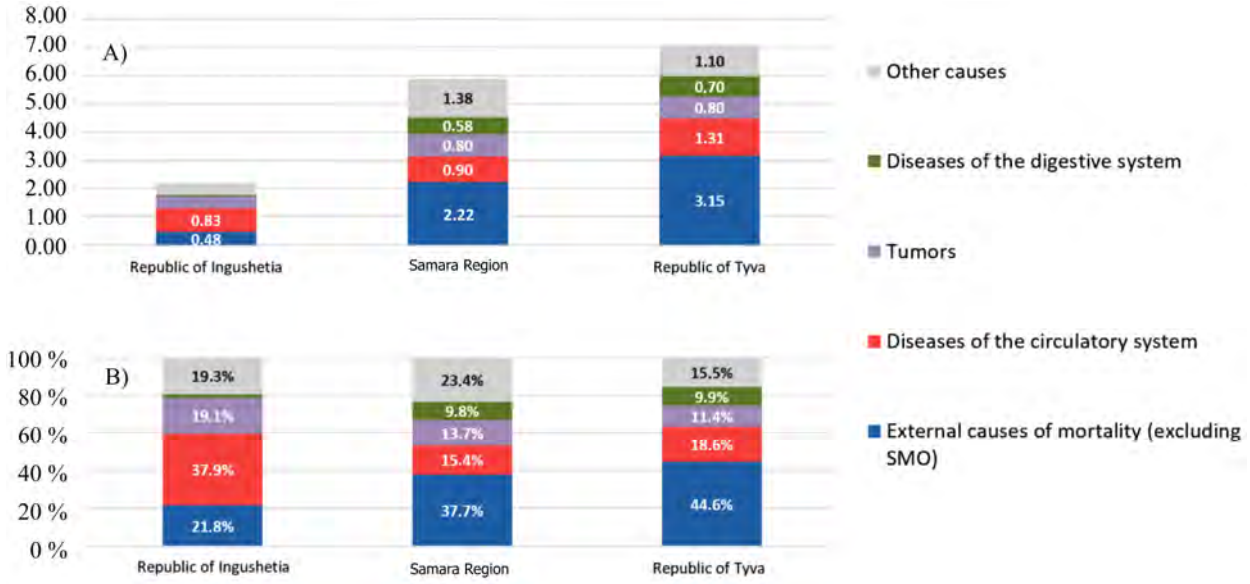

Figure 12. Differences in LEB growth reserves in different classes of diseases in 2022: A) LEB growth reserves excluding mortality due to the analyzed disease class in the age group of 15–59 years, years; B) the structure of LEB growth reserves excluding mortality due to the analyzed disease class in the age group of 15–59 years, %

Discussion. On the one hand, the existing demographic trends in the Russian Federation align with global trends and are described by the demographic transition theory. On the other hand, significant regional heterogeneity is noted. Therefore it is challenging to develop a unified universal approach to transforming the healthcare system. Nonetheless, it is possible to identify relevant directions for all regions of the Russian Federation to increase or stabilize the population size.

A goal is to realize the existing demographic potential (that is, boost up births among women of reproductive age). To achieve it, given the retrospective assessments of birth rates, as well as foreign and Russian

experience, it seems advisable to continue and develop the current state policy aimed at stimulating birth through financial support in many different forms; to create mechanisms that help women work and tend to their offspring comfortably; to provide healthcare for women of older reproductive ages [6–9]. A key role in the process may belong to expanding and prolonging the Maternity (Family) Capital program. Some effective solutions here might include indexation of payments proportionally to a growth in housing costs (since a purchase of housing is the basic trend in spending the Maternity Capital and housing availability as a factor imposes serious limitations on a decision to have a second, third and next child [10]); introduction of additional payments upon the second, third and next childbirths given the ongoing reduction in the number of women in their reproductive age. In addition to that, we should consider sociocultural factors that create regional differences in birth rates.

Structure and dynamics of population mortality in Russia as a whole and in RF regions makes it possible to identify two priority areas for improving the medical and demographic situation: 1) activities aimed at increasing the average age of death from chronic non-communicable diseases (hereinafter CNCDs) that account for over 70 % of deaths both in Russia and other developed countries [11]; 2) activities aimed at minimizing deaths from external causes and infectious diseases.

Analysis of Russian regional practices as well as foreign experience allowed identifying several measures that can promote a decline in conditionally avoidable mortality and are eligible for use at the federal and regional level.

Risk factors that cause CNCDs are practically the same for all pathologies in this group and are divided into behavioral (unhealthy alcohol use, smoking, stress, low physical activity, and unhealthy diets) and metabolic ones (overweight, elevated blood pressure, hypercholesterolemia, and hyperglycemia).

Development and implementation of activities aimed at reducing prevalence of unhealthy alcohol use plays a key role not only in CNCDs prevention but also in reduction of deaths due to external causes [5]. Measures implemented in Russia have been quite effective; however, it is important to further raise taxes and prices on alcohol, first of all, strong spirits; to make alcohol less available as regards time and points of sales as well as a legal age for buying alcohol, especially in those regions where alcohol consumption is high [12]. In addition to that, it is necessary to intensify prevention of unhealthy alcohol use by expanding psychological advice practices not only within preventive check-ups but also when other types of healthcare are provided (by trauma surgeons, cardiologists, gastroenterologists, etc.) [13].

Effective tobacco control policies include raising tobacco taxes and prices, introducing standardized package for cigarettes, prohibiting use of aromatizers, reducing the number of points of sales where tobacco products can be bought, mass media campaigns and wider introduction of nicotine dependence treatment [14]. To promote commitment to healthy diets, it is necessary to introduce front-of-package labels for foods, prohibit any advertising of unhealthy foods, raise taxes and prices of sweetened carbonated beverages, conduct mass media campaigns that emphasize the importance of keeping a healthy diet, and iodize salt [15–18]. Promotion of physical activity includes making a healthy lifestyle ‘fashionable’, using social networks and influencers, granting tax benefits to sporty people and companies etc. [19, 20].

Healthcare for patients with metabolic risk factors includes active diagnostics and treatment of essential hypertension, hypercholesterolemia and diabetes mellitus; use of electronic registers to make proactive phone calls and invite patients to have regular check-ups; delegating some workloads of therapists to support staff; full financing of medications to treat cardiovascular diseases provided from the state budget [21].

To reduce mortality due to external causes, in addition to anti-alcohol measures and investigation what causes accidents, it is necessary to continue active prevention of deaths due to TA

including speed limits and automated control; fighting against driving under influence; active use of helmets, safe belts and children car seats; development of road infrastructure and information exchange with the Main Directorate for Traffic Safety of the Ministry of Internal Affairs of the Russian Federation [22]. In addition to that, it is important to implement activities aimed at suicide prevention; to do that, it is necessary to make mental care more available for population [23].

Conclusion. Population ageing is accelerating unavoidably given the existing trends of growing LEB and declining birth rates. Despite some regional peculiarities, these trends are observed in each RF region, the only difference being their speed and intensity. Bearing high inertia of demographic processes in mind, we can expect similar dynamics to persist and even intensify in middle- and long-term outlook.

At present, it is still relevant to further develop and improve the existing state demographic policy. To strengthen the country demographic potential, it is advisable to scientifically substantiate trends and instruments for minimizing risks of medical and demographic losses. This includes transformation of the healthcare system for the period up to 2046 at the federal and regional level as well as in healthcare organizations considering regional demographic peculiarities. Some new measures should be developed within the federal legislation to achieve both immediate and strategic results as regards population health promotion.

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