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ORIGINAL ARTICLE

Demographic ageing, health status and life quality of the elderly in Russia

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Abstract

Within the context of the national policy on the elderly, the paper presents trends in demographic ageing, health and life quality of the elderly in Russia. Social and political consequences of the XX century have resulted in significant fluctuations in the number of individual generations, forming a long-term fluctuating trend in demographic ageing in Russia. These historical disproportions have overlapped with regional variations in ageing rates due to significant inter-regional population movements, rural–urban migration, substantial gender differences in trends and scales of mortality and fertility dynamics. As a result, levels of demographic ageing in Russia vary more than three-fold, worsening in females and rural population. Ageing-related problems are aggravated by unsatisfactory health status of the elderly, manifested in high burden of chronic diseases (especially cardiovascular diseases), leading to life restrictions up to loss of the ability to self-care. High-tech cardiac surgery contributes to life prolongation and improved physical and psychological functioning. However, during rehabilitation, most patients are reluctant to change their unhealthy lifestyle associated with cardio pathology. Polymorbidity and psychoactive substance abuse (in males) are the risk factors of suicidal behaviour, while accessibility of medications, including sleeping pills, firearms, etc. contributes to realization of this risk. Living conditions of the elderly and their access to quality social services are important components of wellbeing in terms of health. Despite satisfactory living conditions, the situation significantly differs by type (urban/rural) and size of the settlement. Maintaining microsocial contacts with children, family and friends is a powerful source of psychological comfort and social wellbeing.

Keywords Population ageing · National policy on the elderly · Age structure · Share of the elderly · Physical wellbeing · Psychological wellbeing · Social wellbeing · Polymorbidity · Comorbidities

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Extended author information available on the last page of the article

1 Relevancy

Demographic ageing is taking place all over the world. What matters is not only the rapid growth of both the share and absolute number of the elderly in the world's population, but also the fact that the rates of aging are accelerating. For example, it took France almost 150 years to adapt to the rise in the share of population aged over 60 from 10% to 20%, while countries like Brazil, India and China will need a little more than two decades to do so. This means that the adaptation that these countries are in for, should take less than it used to in the past.[1]

There are two key factors of the population ageing. The first one is increased life expectancy. The indicators differ across different regions of the world. In low and middle-income countries, the progress in life expectancy is associated with the decreased mortality in young ages against the background of the successful socio-economic development,[2] resulting in a higher number of people surviving until old ages. In high-income countries, higher levels of survival until old ages make a significant contribution to the increase in life expectancy.[3]

This growth may be due to a combination of such factors as improved health care, public health initiatives, and differences in people's lifestyle at earlier stages in life cycle. The second factor is reduced birth rate. This process is taking place globally against the background of socio-economic development, better coverage with education, especially coverage of girls, and changes in social norms.

Demographic ageing is fraught with both problems and opportunities. If people live healthy for additional years, then the ageing will be associated with a similar increase in human resources that will contribute to the life of society. If people live longer, yet with limited life activities, the need for health and social care will significantly increase, decreasing the contribution of the elderly to society.

To determine priority actions, it is necessary to find out which of the scenarios is currently on. Most data on health status of the elderly are from high-income countries, although the majority are uncertain about life quality of the elderly. Some studies indicate a decreased level of severe disability among people over 65, while others conducted in the same age group, indicate an increased prevalence of chronic and concomitant diseases with stable disability rates, while results of another group of studies indicate a higher prevalence of disability among people aged 60–70.[4,5,6,7] The situation may vary depending on the geography. Studies conducted in Europe show that indicators of healthy life expectancy vary significantly across countries.[8]

[1] World Health Organization (2015).
[2] Kusjakova (2016).
[3] Christensen et al. (2009).
[4] Manton et al. (2006).
[5] Seeman et al. (2010).
[6] Liao et al. (2001).
[7] Hung et al. (2011).
[8] Jagger et al. (2008).

There are even less reliable data on health status of the elderly in Russia. There are individual scattered studies on small samples that failed to provide representative results either at the national or regional level.

The international framework is set by the 2002 Madrid International Plan of Action on Ageing, and in its elaboration specific strategies have been adopted, including at the national levels.[9] Ageing of the population is a strong challenge for Russia. Needless to say, that this challenge affects many areas of the Russian society and requires a wide range of effective measures. Russia has adopted "Strategic roadmap for the benefit of the older generation until 2025"[10] and two Action Plans for 2016–2020 and 2021–2025 to implement the Roadmap; federal project "Older Generation" under the national project "Demography"[11]; regional programmes aimed at increasing active longevity and healthy life expectancy in the elderly.

Both programme development and performance evaluation of the developed strategies require analytical justification. The purpose of the study is to evaluate health status of the elderly in the context of physical, mental and social wellbeing among the ageing population in Russia.

2 Materials and methods

The study used several data sources. To analyze levels and trends in ageing, the study used the Russian Federal State Statistics Service (Rosstat) official data on age–sex composition of the Russian population during the years of the national censuses in 1939–2021 (1939, 1959, 1970, 1979, 1989, 2002, 2010, 2021). To implement a regional-level analysis, the study used census data for 1989, 2002, 2010 and 2021. The study used the following methods: grouping regions by the level of demographic ageing (the share of people aged 60 and over) in the years of the censuses and cartographic visualization of the results obtained.

To analyze life quality of the elderly in Russia, the study used information of the Rosstat sample survey "Quality and availability of services in education, healthcare and social service, and assistance in employment" implemented in 2019.[12]

The sampling size equaled to 48,000 private households countrywide (out of the total number of 54,560,000 households in Russia) with due regard to the required assurance of representativeness of the survey results for the population in general

[9] National report of the 4th cycle of the review and appraisal of the implementation of the Madrid International Plan of Action on Ageing and the Regional Strategy for its Implementation (MMDPS/RSO) for the period from 2018 to 2022. https://unece.org/sites/default/files/2021-11/mipaa20-report-russian-federation-rus.pdf.

[10] Strategy for Actions in the Interest of the Older Citizens of the Russian Federation until 2025 (approved by Decree of the Government of the Russian Federation No. 164-r as of February 5, 2016). https://mintrud.gov.ru/docs/government/173.

[11] Information about the national project "Demography" on the official website of the Ministry of Labor and Social Protection of the Russian Federation. https://mintrud.gov.ru/ministry/programmems/demography.

[12] https://gks.ru/free_doc/new_site/GKS_KDU_2019/index.html.

and by main demographic and socio-economic group.[13] People residing in shared living accommodations, i.e. living in specialized facilities (barracks and camps, hospitals, nursing homes, boarding schools, monasteries, orphanages, prisons, etc.) were excluded from the survey. The survey was implemented in all regions of the Russian Federation. The survey results are representative at the national level. Standard errors were calculated to evaluate statistical significance.

Results of the observation are relevant to all private households and the entire population living in them, using weighting coefficients calculated as inversely proportional to the probabilities of the selection.

To distribute the total sample size, a model of disproportionate placement within each of the selected analytical areas (urban and rural population) is used.

The unit of selection is the counting station (the first stage). The final unit of selection (the second stage) is a living accommodation (household address)—an individual house, an apartment, a room in a shared apartment, dormitory or in another residential building. If more than two households live in one living accommodation (at one selected address), one household is subject to selection, regardless of who is the actual owner of the premises. The units of observation are households and household members.

To analyze health status of the elderly in terms of physical wellbeing, the study used information of the sample survey conducted in the Nizhny Novgorod region in 2019. The region selection is substantiated by the fact that this region belongs to the group of regions with the highest share of the elderly in Russia. Furthermore, the Nizhny Novgorod region is rather homogeneous in its ethnic composition,[14] with standard living conditions typical of the majority of the European Russian regions.[12]

To date, no nationwide population health surveys, including the elderly, have been conducted in the Russian Federation. Most of the available data are obtained from small samples, focused on patients of outpatient and inpatient health care facilities rather than population in general, and are based mainly on survey data.

The study used data of the survey, conducted in the Nizhny Novgorod region, which is one of the major and representative surveys that included both urban and rural population (the survey sample added up to 22,500 people aged 60+; it is 2.57% of the total number of the elderly in the region (875,000 people).

Selection of individual rural and urban settings was guided by the interest of the local authorities to obtain more detailed data on health status of the elderly and their needs in health care. This approach made it possible to receive commitment and ensured feasibility of the survey. A total survey of all people aged 60+was conducted in the selected settings (7809 people in urban settings and 14,691 people in rural settings).

Identification of diseases, assessment of the ability to self-care and health self-assessment were carried out during a regular medical examination of the population residing within the catchment area of a healthcare facility according to the "Register

[13] The annually updated information array of a multi-purpose territorial sample based on the information array of the 2010 All-Russa Population Census was used as the basis for the sample formation.

[14] https://rosstat.gov.ru/vpn_popul.

of the elderly and senile persons", including during household surveys of the pensioners with limited mobility. Relative risks of disease prevalence were calculated, standard errors and confidence intervals for disease prevalence indicators were determined, and statistical significance was evaluated.

The described specifics of the sample formation do not allow us to consider them strictly representative outside the Nizhny Novgorod region. However, given the "typical demographic profile" of the region for the European part of the country, the results can be extrapolated without any fundamental error to a third of the Russian regions with a predominantly ethnic Russian demographically old population.

To evaluate effectiveness of high-tech interventions in treating elderly patients with cardiac conditions, the authors used data of a pilot study. The pilot study covered patients aged 65 + at the rehabilitation unit of the A.N. Bakulev National Medical Research Center of Cardiovascular Surgery. The sample included patients with cardiovascular diseases after open-heart surgery and X-ray endovascular treatment (stenting or angioplasty). The sample of the pilot study included 96 patients, men and women on a 50/50 basis (mean age 74.6 years), who were admitted to the rehabilitation unit within three months (October–December, 2019). The patients are characterized by higher levels of education and employment, better financial status, a lower share of single people compared to similar age groups. The data of the pilot study are not representative, however, due to their uniqueness, they are important for understanding the factors limiting effectiveness of high-tech medical care.

To analyze mental wellbeing of the elderly, the study used data on suicide in the context of multiple causes of death. Since national data are not available, the study used data on the Moscow population. The information source of the study was all cases of death by suicide registered in people aged 60 + during 2019—October, 2022. The analysis is based on data of the RFS-EMIAS database,[15] which contains medical death certificates issued by the Moscow Bureau of Forensic Medical Examination.

3 Results

3.1 Demographic ageing trends in Russia

In the XX century, the Russian population underwent fundamental changes. Against the background of dramatic socio-economic and political transformations, the country made a demographic transition in less than half a century, resulting in critical changes in the population reproduction pattern, demographic dynamics and its sources.

The first Population census after World War II—the1959 Census, recorded deep "wounds" in the age-sex population structure inflicted by revolutions, world and civil wars (Fig. 1). However, this was still demographically young population with

[15] Death registration under the Unified medical information and analytical system of Moscow.

the share of children (0–14 years) adding up to about a third of the total population (29.2%) and the elderly share (60 + years) equaling to less than a tenth (9.0%).

The post-war population census has reflected the phenomenon of differences between urban and rural population structures (Table 1). In rural population, the share of children was higher (32.1% vs 26.4%) due to sustained higher birth rates, however, the share of the elderly was higher than the one among urban population (10.5% vs 7.6%) due to constant migration of the working-age residents to cities. On the eve of World War II (in 1939), rural population equaled to 2/3, whereas in 1959 it was already less than half (66.5% and 47.6%, respectively) of the total population (Fig. 2).

Until the end of the 1980s, the size of the Russian population has been increasing primarily due to the potential of demographic growth because the net reproduction rate had already fallen below one by mid 1960s (0.971 in 1964–1965) and never exceeded even the replacement level[16] ever since. Furthermore, Russia was losing its population because of migration exchange with the USSR republics,[17] inevitably resulting in demographic ageing, with the rates being only constrained by a rather high mortality among the elderly.[18,19,20] According to the 1989 Population census, the share of the elderly in Russia equaled to 15.3% (14.2% in urban population and 18.4% in rural population) (Table 1).[21]

As a result of the accelerated demographic ageing in rural settlements, potential of the rural–urban migration turned out to be greatly exhausted by the end of the 1980s with the share of rural population reaching one quarter of the total population and hardly changing over the next three decades (from 26.7% in 1989 to 25.0% in 2021).

Exhausted by the beginning of the 1990s potential of the age structure against the background of negative trends towards reduced fertility and increased mortality inevitably resulted in depopulation in Russia.[22,23] These processes were aggravated by negative consequences of the USSR collapsing and political and economic reforming in Russia. As a result, the population decline happened earlier, and the magnitude of the loss turned out to be heavier than projected in early 1980s.[24,25] Only the 2021 Population census reported the population size slightly over the 1989 level. However, within the comparable boundaries (without Crimea and Sevastopol) the Russian population in 2021 was 2.3 million lower than the number in 1989, the pre-reform period.

[16] The Demographic Yearbook of Russia (2021).
[17] Rybakovsky (1973).
[18] Vorobyeva et al. (2016).
[19] Ivanova (2022).
[20] Ryazantsev (2020).
[21] The Demographic Yearbook of Russia (2002-2021).
[22] Starodubov et al. (2003).
[23] Corresponding Member of the Russian Academy of Sciences Doctor of Economics and Ryazantsev (2019).
[24] Starodubov and Ivanova (2012).
[25] Karelova and Rybakovsky (2001).

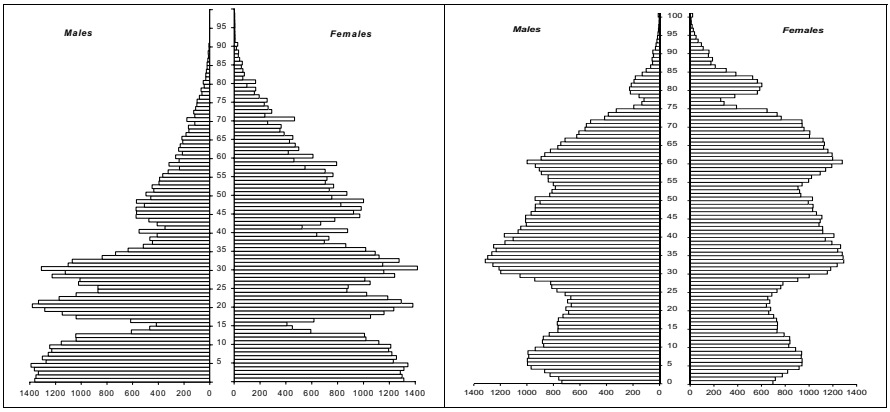
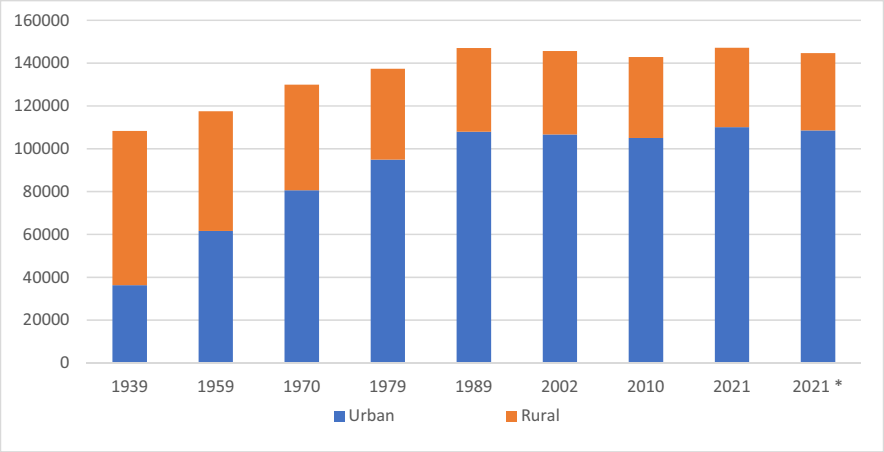


Fig. 1 Age–sex structure of the Russian population according to the 1959 and 2021 Population census, thousand

Table 1 Age structure of the Russian population during the census years, %

	1939	1959	1970	1979	1989	2002	2010	2021
Urban and rural population								
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60–64	2.6	3.1	4.2	3.7	5.7	6.0	5.0	7.2
65–69	1.9	2.3	3.2	4.0	3.1	4.1	3.2	6.1
70 and over	2.2	3.7	4.5	6.0	6.6	8.5	9.8	10.1
Urban population								
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60–64	2.1	2.8	4.0	3.4	5.4	5.9	5.2	6.9
65–69	1.5	1.9	2.9	3.6	2.9	3.9	3.2	6.0
70 and over	1.6	2.8	3.7	5.1	5.9	8.0	9.4	10.2
Rural population								
Total population	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60–64	2.8	3.3	4.7	4.2	6.5	6.3	4.4	8.2
65–69	2.1	2.6	3.7	4.9	3.5	4.8	3.2	6.4
70 and over	2.6	4.6	5.7	7.9	8.3	10.0	10.7	9.5

The past three decades have been marked by both population decline and high rates of demographic ageing. According to latest data, the share of the elderly added up to one quarter of the population (23.4%), while the share of children (0–14 years) reduced to 15.8%. As to the level of demographic ageing, there is a significant convergence in urban and rural population, according to the 2021 Population census, the share of people aged 60 + equaled to 23.2% in urban and 24.1% in rural settlements (Table 1). This was facilitated by reduced differences in birth rates among urban and rural females,[5] as well as minor differences in life expectancy of the elderly by place of residence.[6]



* within comparable boundaries (without Crimea and Sevastopol)
**in 1939 and 1959 – de-facto population, in subsequent years – residential population

Fig. 2 Dynamics in the Russian population size during the census years, as of January, 1st of the corresponding year

The current pattern of the population age structure is aggravated by the "echo" of demographic waves (Fig. 1). Thus, the elderly groups are replenished with relatively more numerous generations born after World War II. In turn, small generations of females born in the 1990s enter the active reproductive age—the period of significant decline in fertility. This leads to lower number of births even against the background of a light fertility increase due to family support measures. Therefore, between the 2010 and 2021 censuses, the rate of population ageing was unprecedented: the share of the elderly increased from 17.9% to 23.4%.

General trends of the demographic ageing have been overlapped with regional variations in ageing rates due to significant inter-regional population movements, substantial gender differences in trends and mortality rates, as well as fertility dynamics.[26]

According to the latest Soviet census, 11 out of 79 regions of Russia had the elderly share less than 10%, including three regions with the share under 5%: the Chukchi autonomous district (1.4%), Magadan region (3.5%) and Kamchatka territory (4.1%). Maximum shares (slightly higher than 20%) were registered in seven regions. A general vector of distribution by level of ageing was characterized by maximum levels in Central and North-Western Russia and minimum ones in the Russian Far East, mainly in the North-Eastern regions (Fig. 3).

Three decades later, according to the 2021 Population census, the level of demographic ageing increased throughout the Russian Federation (Fig. 4). Moreover, "younger" regions were characterized by higher rates of population ageing. The share of the elderly increased by 14–15 percentage points (p.p.) in the Magadan,

[26] Rybakovsky (2019).

Sakhalin regions and Kamchatka territory as well as Murmansk region and Komi Republic, while in 1989 it used to range within 4.1–8.0%. Increase in the share of the elderly in the regions of Central Russia, especially in Central Chernozem district (the Voronezh, Kursk and Belgorod regions) was minimum, ranging within 5–6%, in Central Russia ageing rates equaled to 19–21% even in 1989 except for ethnic minority republics (the Republic of Dagestan, Karachay-Cherkessia, Kabardino-Balkaria, Chechen republics and Republic of Ingushetia) and Siberia (the Republic of Tyva and Altai Territory), where ageing rates were low and hardly increased due to the sustained relatively high fertility. Relatively low ageing rates were also characteristic of Moscow and St. Petersburg, with migration being the main enabling factor in the capital cities.

Apart from regional variations in the levels of demographic ageing, disproportional distribution by gender and place of residence (urban/rural) is also important.

At the country level, the share of the elderly is generally higher in rural population (although not much—24.1% and 23.2%, respectively). Similar shares are registered in majority of the regions. According to the 2021 Census, the share of the elderly was higher in urban population in 17 regions only, however this excess (by 3–6%) is noticeable in five regions only. In other regions, the level of ageing is higher among rural population, yet, the excess is significant only in half of them (32 regions)—by more than 3%, including over 6% in six regions.

Regions with a noticeable excess of the level of ageing among rural population are demographically old regarding both rural and urban population and are mainly located in the Russian Central and North-Western districts, and partly in the Volga and Ural districts. As for the regions with younger rural population, they differ either in the relatively low number of the total population (the Northern Ossetia and Karachay-Cherkessia republics, Jewish Autonomous Region), or in the low number of rural population (the Yamal-Nenets Autonomous District, Chukotka Autonomous Region, Murmansk Region).

Gender disparities in ageing, in contrast to the rural–urban ones, are more pronounced and universal for all the Russian regions. According to the 2021 Census, in Russia, the share of males aged 60 + equals to 18.8%, and 27.5% in their female peers. There is a close relationship between the size of the gender gap in the share of the elderly and the level of demographic ageing in the Russian regions (the rank correlation coefficient equals to 0.91). In other words, the greatest differences in the level of ageing between men and women are characteristic of demographically old regions. And vice versa. Thus, in the Russian Central and North-Western regions, the share of males and the share of females aged 60 + differ by 10–12%. Whereas in the republics of the North Caucasus, Eastern Siberia and the Far East, differences in the level of ageing among male and female population range from 2–4% (mainly in the North Caucasus) to 6–8% (mainly in Eastern Siberia and the Far East).

3.2 Health status and quality of life of the elderly

Ageing problems are aggravated by unsatisfactory health status of the elderly. Life expectancy of the elderly in Russia is on the rise: from 2000 to 2019 it increased

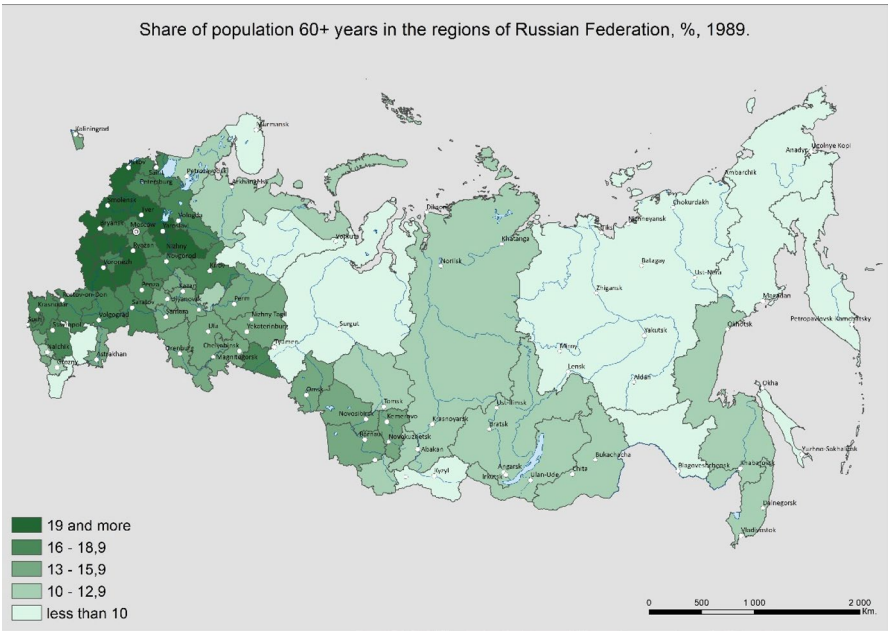


Fig. 3 Level of demographic ageing (share of population aged 60+) in the Russian regions according to the 1989 Population census, %

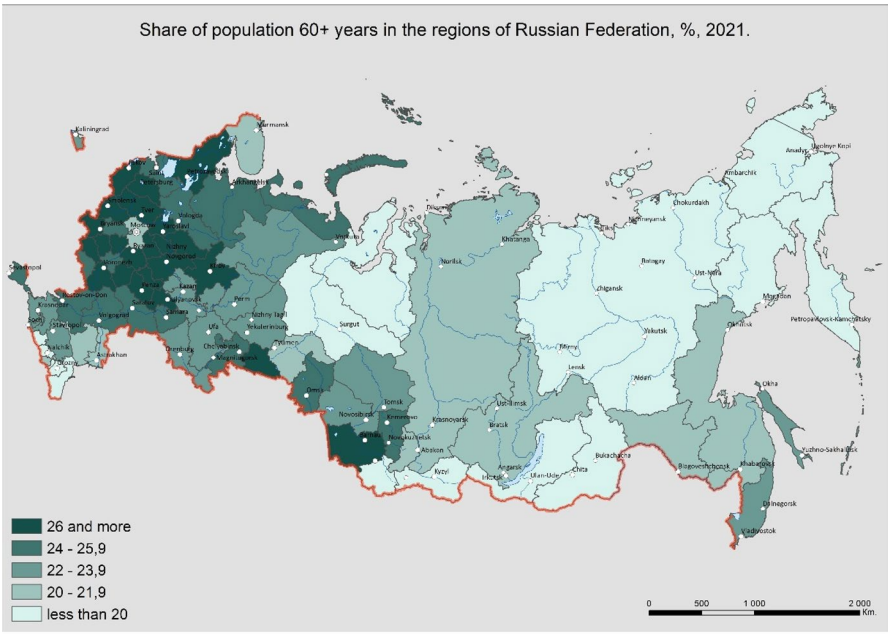


Fig. 4 Level of demographic ageing (share of population aged 60+) in the Russian regions according to the 2021 Population census, %

from 13.3 to 16.9 years in males and from 18.7 to 22.4 years in females (people aged 60). However, these indicators are noticeably lower than the European levels, especially in males. Furthermore, a considerable part of the additional years of life falls within the years of ill health. In terms of healthy life expectancy, Russia lags behind even more than in terms of total life expectancy.[27] Prevalence of mental disorders is a heavy burden. Depression is becoming a more common condition in the elderly and persists for longer. In addition to the fact that there is a relationship between mental health and other chronic conditions in older life, mental distress provokes suicide and self-harm.

Achieving a better health includes both extended years of life without illness and well-being.[28] As part of the growing recognition that well-being is an important indicator that is not dependable upon traditional health data, mortality, risks and uptake of services, greater efforts are being made to capture the level of well-being in the form of a quantitative evaluation or index. This approach can be exemplified by the Better Life Index developed by the Organization for Economic Cooperation and Development (OECD) to measure material conditions (income and well-being, employment and earnings, housing conditions) and quality of life through a set of indicators.[29] The Index recognizes the importance of long-term sustainability of well-being, considering resources such as human, social, natural and economic capital as important components of its provision and emphasizing the interrelated and complementary nature of all aspects of well-being.

The sections below will review the health-related situation in the Russian elderly population, using the available data to analyze it in terms of physical, mental and social well-being.

3.3 Health as physical wellbeing

It's well known that multiple pathology and involution processes in various physiological systems,[30,31,32,33,34] are rather common among the elderly and senile. We have analyzed polymorbidity as potentially unrelated multiple pathologies,[35] a priori reflecting effects of various risk factors.

Since living conditions in urban and rural settlements are different (including access to health care) and so is behaviour of the population in terms of health protection, it is reasonable to expect a different structure of chronic pathologies

[27] https://gateway.euro.who.int/ru/datasets/european-health-for-all-database/#demographic-and-socio-economic-indicators.
[28] WHO Regional Office for Europe (2015).
[29] Eurostat (2016).
[30] Vertkin et al. (2012).
[31] Kaurov and Matyukhina (2014).
[32] Kirshina and Gabdrafikova (2014).
[33] Mitrofanov et al. (2013).
[34] Proshchaev et al. (2011).
[35] Lazebnik (2005).

among urban and rural citizens within one region. This hypothesis has been proved by the research project implemented in the Nizhny Novgorod region.

The survey showed that just 0.7% of males and 1.1% of females could boast absence of any chronic diseases. The share of such people among rural males and females equaled to 0.3% only.

Diseases of the circulatory system play the leading role in pathology accumulation (Table 2), these diseases are more prevalent among urban dwellers ($p < 0.0001$, RR = 1.20 [1.17–1.23] in males and $p < 0.0001$, RR = 1.21 [1.19–1.22] in females). In cities, hypertensive heart disease without (congestive) heart failure is more prevalent out of all the diseases of the circulatory system (I11.9—hypertensive heart disease without (congestive) heart failure, 35.5% of cases among males and 32.6% of cases among females). The share of cerebrovascular diseases (I67—other cerebrovascular diseases) in rural areas is lower compared to urban ones: 20.3% among males and 22.8% among females vs 27.4% and 25.6%, respectively. The share of angina pectoris in the structure of diseases of the circulatory system hardly differs among urban and rural residents (I20—angina pectoris, 28.2% of cases among urban males and 26.4% among females vs 28.9% and 27.8% of cases among rural residents, respectively).

In urban residents, diseases of the musculoskeletal system rank second** out of all accumulated chronic pathologies, which are also more prevalent compared to rural residents ($p < 0.0001$, RR = 1.78 [1.61–1.99] and $p < 0.0001$, RR = 1.85 [1.72–2.0], respectively).

Diseases of the digestive system rank second in the structure of diseases of the elderly living in rural settlements, including chronic cholecystitis (K81.1—chronic cholecystitis), accounting for 31.7% of cases among males and 30.5% of cases among females in cities, while in rural areas—79.2% and 83.3%, respectively. Digestive diseases are more prevalent among urban females than their rural peers ($p < 0.0001$, RR = 1.24 [1.15–1.34]), whereas differences are not statistically significant in males.

Diseases of the endocrine system (mainly diabetes mellitus) rank third among urban females, which are twice as prevalent among urban residents as among rural residents ($p < 0.0001$, RR = 1.78 [1.55–2.05] in males and $p < 0.0001$, RR = 1.89 [1.74–2.06] in females).

Infectious and parasitic diseases (B18.2—mainly chronic viral hepatitis C), diseases of the blood and blood-forming organs (D50.0—mainly iron deficiency anemia secondary to blood loss), mental disorders (in all cases, F03—unspecified dementia) and diseases of the sensory organs are more prevalent among urban residents ($p < 0.0001$).

Diseases of the genitourinary system are almost sixfold more common among urban males compared to their rural peers ($p < 0.0001$, RR = 5.41 [4.43–6.60]). There is hardly any statistically significant difference in prevalence of this pathology among females.

Diseases of the respiratory system are more prevalent among urban females ($p = 0.005$, RR = 1.31 [1.09–1.59]), whereas the frequency of these diseases is not dependable upon place of residence in males.

Table 2 Frequency of chronic diseases of the main disease classes detected in urban and rural residents of the retirement age in the Nizhny Novgorod region (per 1000 examined)

Disease classes	Urban population		Rural population	
	Males	Females	Males	Females
Certain infectious and parasitic diseases	3.5	5.1	0	0
Neoplasms	16.9	15.6	31.6	36.0
Diseases of the blood and blood-forming organs	9.1	4.5	2.8	2.2
Endocrine, nutritional and metabolic diseases	140.8	180.2	74.5	87.7
Mental and behavioural disorders	2.6	1.6	0.4	0.3
Diseases of the nervous system	5.6	4.4	6.6	9.9
Diseases of the eye and adnexa	123.1	117.5	2.8	4.1
Diseases of the ear and mastoid process	11.3	7.1	0.6	0.9
Diseases of the circulatory system	1995.7	2045.5	1241.7	1258.6
Diseases of the respiratory system	38.1	33.1	40.5	25.0
Diseases of the digestive system	158.6	178.2	145.1	138.4
Diseases of the musculoskeletal system**	245.2	219.5	123.4	107.4
Diseases of the genitourinary system	150.8	12.7	24.8	12.1

*Indicators of diseases of the circulatory system exceed 1000 per 1000 population. This is due to the fact that some of the examined elderly people have several cardiovascular conditions, for example: hypertension, chronic ischeamic heart disease, obliterating arteritis

Prevalence of diseases of the nervous system among males does not depend upon their place of residence, while there are differences among females. Among urban females these diseases are twice as rare as among their rural peers ($p = 0.0002$, RR = 0.44 [0.28–0.69]).

The overwhelming majority of city dwellers (90.8%) have more than one chronic disease (90.0% of males and 91.1% of females). Among the elderly rural dwellers, more than one chronic disease was registered in 68.6% of males and 69.7% of females. The number of diseases varied from one to six (Fig. 5). On average, there are 2.86 chronic diseases per urban male aged 60 + and 1.68—per rural male aged 60 +, and 2.82 diseases per urban female and 1.69—per rural female.

Within the framework of the survey, during patients' examination, doctors also reported complications of the underlying disease (which maximum deteriorates the life quality of the examined person). Complications were registered in 7.8% of urban males and 10.2% of urban females. Frequency of complications of the underlying disease among rural residents is much lower: 1.4% in males and 1.6% in females.

With age, the burden of chronic diseases changes. The expected average number of chronic diseases per retired person aged 75–84 is higher compared to people aged 60–74 (3.06 diseases per urban man and 3.07 per urban woman vs 2.84 and 2.76, respectively; and 1.84 diseases per rural man and 1.80 per rural woman vs 1.64 and 1.58, respectively). However, the burden of chronic diseases decreases among people aged over 85 (among urban residents: 2.71 per man and 2.75 per woman) or practically remains unchanged (among rural residents, 1.86 and 1.84, respectively).

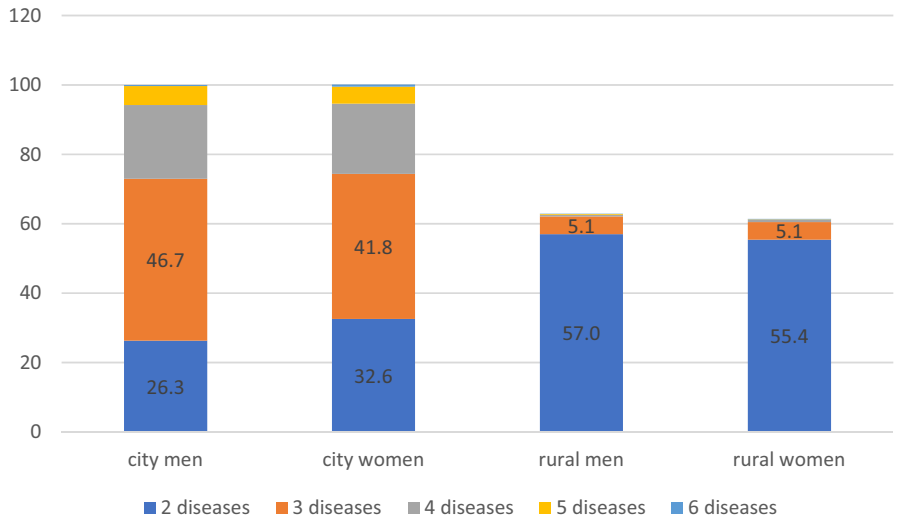


Fig. 5 Distribution of the elderly with more than one chronic disease by number of diagnosed diseases in the Nizhny Novgorod region, % * Each category is distributed by the number of present diseases: urban males, rural males, urban females, rural females

Table 3 Share of people of the retirement age who are not able to self-care, the Nizhny Novgorod region (%)

Age groups	Urban population		Rural population	
	Males	Females	Males	Females
60–64	0.4	0.2	1.8	1.1
65–69	0.3	0.2	1.3	1.7
70–74	1.3	1.1	1.5	2.9
75–79	0.7	1.1	2.9	4.1
80–84	3.8	3.7	2.8	3.8
85–89	3.8	9.0	10.0	9.9
90–94	89.7	89.6	9.4	14.3
95 and over	91.7	88.1	28.6	17.0
Total	3.5	3.8	2.3	3.7

*Assessment of the ability to self-care was based on the respondents' answers to the relevant questions: dressing, toileting, cooking and eating. At least one negative answer to any of such questions qualified the respondent as unable to self-care

It is fair to assume that a lower burden of chronic diseases among the oldest-old (85 years and over) is associated with a certain "selection" by risk of death, so that people with high burden of chronic diseases fail to survive until the old age. However, this assumption disagrees with data on the ability of the elderly to self-care (Table 3).

In general, throughout the sampling, the share the of elderly who are not able to self-care is small, adding up to 3.7%. However, with age, the prevalence of this

Table 4 Share of the respondents aged 65 + with different chronic comorbidities, % (Rehabilitation unit, A.N. Bakulev National Medical Research Center of Cardiovascular Surgery)

Diagnosed pathologies	Share of the respondents, %
Hypertensive disease	76.4
Ischaemic heart disease	67.7
Arrhythmia	9.4
Congenital heart disease	5.5
Acquired heart valvular disease	21.3
Bronchial asthma	3.9
Chronic bronchitis	8.7
Peptic ulcers	6.3
Cholelithiasis	11.0
Diseases of the thyroid gland	11.8
Diabetes mellitus	52.8
Osteochondrosis	73.2
Arthropathies (arthritis, arthrosis)	33.1
Urolithiasis	3.9
Allergic diseases	21.3

Table 5 Average scores for the restriction of physical activity among the respondents aged 65 + by severity of surgical treatment** (Rehabilitation unit, A.N. Bakulev National Medical Research Center of Cardiovascular Surgery)

Physical activity	Stenting	Open-heart surgery
Heavy physical activity (running, power lifting, power sports)	1.2 ± 0.06	1.2 ± 0.07
Moderate physical activity (moving a table, vacuum cleaning, gardening, outdoor walks)	2.6 ± 0.08	1.9 ± 0.18
Lifting and carrying a bag of groceries	2.3 ± 0.17	1.8 ± 0.15
Going upstairs for several floors	2.1 ± 0.12	1.5 ± 0.10
Going upstairs for one floor	2.9 ± 0.10	2.4 ± 0.15
Bending over, kneeling, squatting	2.2 ± 0.14	1.9 ± 0.11
Walking a distance of more than 1 km	2.8 ± 0.10	2.0 ± 0.15
Walking a distance of several blocks	2.2 ± 0.15	2.0 ± 0.19
Walking a distance of one block	2.9 ± 0.12	2.2 ± 0.19
Washing yourself, getting dressed	2.9 ± 0.04	2.3 ± 0.11

**1—considerable, 2—moderate, 3—no limitation

category increases, becoming huge among urban residents over 90 years. Among the elderly rural residents, the share of this category is also increasing with age, yet failing to reach a third among males and a fifth among females (28.6% and 17.0%, respectively), even in the oldest-old ages. However, the share of the elderly rural residents who are unable to self-care is slightly higher in ages under 75, compared to their urban peers.

Table 6 Share of the respondents aged 65 + who agreed that certain actions should be taken to maintain health, % (Rehabilitation unit, A.N. Bakulev National Medical Research Center of Cardiovascular Surgery)

Actions necessary to maintain health	Share of the respondents in agreement, %
Physical activity, sports	39.4
Quit smoking	40.9
Quit drinking alcohol	37.0
Follow diet, neither overeat, nor starve	61.4
Getting enough sleep	54.3
Active recreation, active lifestyle	39.4

Thus, it can be assumed that the urban lifestyle contributes to accumulation of chronic diseases in the elderly and senile ages, however, with better access to medical and social services, urban pensioners are more likely to survive until extreme old ages, although with a high burden of chronic diseases and significant limitations of like activities.

Since diseases of the circulatory system are the leading condition in old ages, issues related to specialized care provision, including high-tech with modern surgical interventions, seem extremely relevant. The rehabilitation process of cardiac surgery patients after open surgeries and interventions is aimed at life prolongation and quality improvement, including through changing the patient attitude towards health.

The presence of concomitant diseases (Table 4) and their number (on average, 3.9 ± 0.30 established diagnoses per patient aged 65 and over) is undoubtedly an aggravating factor of low self-assessment of health (2.0 ± 0.02 scores) in patients after cardiosurgical intervention in the rehabilitation unit* [* Patients assessed their health status against a five-grade scale (1—very bad, 5—very good)].

Self-assessment of health reflecting physical wellbeing after surgical treatment corresponds to the severity of the surgery performed. Respondents after open-heart surgeries are less satisfied with their ability to implement physical activity and activities of daily living compared to patients after interventional procedures (Table 5). In case of any type of surgery, a more pronounced restriction of physical activity is naturally noted by patients of older ages.

As for the psychological status, its relationship with the surgery severity has not been identified. There are differences neither in the frequency of anxiety about uncertainty of the future (on average, 64.6% of the patients experience anxiety), nor in the frequency of confidence in the future (22.0% of the respondents are confident) between patients of different age groups and between patients after endovascular intervention and after open surgery, nor in the frequency of feeling of loneliness (it was often experienced by 4.7% of the respondents), nor in satisfaction with quality of their sleep (8.7% of the respondents are not satisfied).

Development of a heart disease requiring surgical treatment is mainly determined by the attitude of the patient towards their health and their lifestyle. This view is also shared by the respondents: 92.1% of the elderly patients believe that their health is in their hands. Less than half of the elderly patients consider it necessary to quit

Table 7 Suicide structure among people aged 60 + by mechanism of injury events (Moscow, 2019—October, 2022)

Mechanism of injury event	Males				Females			
	60–74 years		75 + years		60–74 years		75 + years	
	Number of cases	%	Number of cases	%	Number of cases	%	Number of cases	%
X61—Intentional self-poisoning by psychotropic drugs	4	5.9	1	1.7	10	26.3	13	27.1
X64—Intentional self-poisoning by unspecified drugs and medicaments	4	5.9	1	1.7	1	2.6	9	18.8
X70—Intentional self-harm by hanging	24	35.3	35	59.3	8	21.1	11	22.9
X72–X74—Intentional self-harm by firearm	13	19.1	8	13.6			2	4.2
X78—Intentional self-harm by sharp object	12	17.6	6	10.2	2	5.3	7	14.6
X80—Intentional self-harm by jumping from a high place	5	7.4	5	8.5	7	18.4		
X83—Intentional self-harm by other specified means	1	1.5	2	3.4				
Other suicides	5	7.4	1	1.7	10	26.3	6	12.5
Total	68	100.0	59	100.0	38	100.0	48	100.0

smoking, while more than half disagree with the doctor's opinion that smoking has a negative effect on their physical status. Also, a smaller part of the respondents shares the opinion about negative effects of using alcohol (Table 6).

However, the situation of patients shows a negative impact of smoking on the heart: higher frequent of the use of minimally invasive interventions was registered among non-smokers compared to smokers: 40.2% vs 33.9%, although the difference is not statistically significant. As for the alcohol dose, there is neither relationship between frequency of endovascular interventions and alcohol dose nor severity of surgical treatment. Apparently, this is due to the fact that most patients are moderate drinkers.

Although recognizing active lifestyle as necessary for maintaining health, very few people mentioned outdoor activities when asked about options for recreation, most typical of their daily life.

Out of the sum of all the possible answers, active recreation accounts for 3.1% of all the responses of the elderly patients. Passive leisure (sleeping, TV, reading, computer, music) accounts for 68.5%.

Therefore, a high-tech cardiac surgery contributes to life prolongation in the elderly patients and improvement of their physical and psychological functioning, especially in case of interventions compared to open-heart surgery. However, during rehabilitation, most patients are reluctant to change their unhealthy lifestyle, that has caused their cardiac condition, reducing effectiveness of high-tech interventions and consequent rehabilitation activities.

3.4 Health as psychological wellbeing

Suicide is likely to be the most demonstrative marker of psychological wellbeing of the population, including, and perhaps, above all, the elderly. Current pattern of the age profile of suicide mortality in well-off regions of the world is characterized by relatively low indicators in young and middle ages and higher indicators in older and especially senile ages. However, a number of post-industrial states with strong social policies currently reports a certain decrease in indicators in the oldest-old (70 + years), and this phenomenon is more often registered among females. Thus, in 2012, such situation was registered among people of both sexes in Canada, the Netherlands, Norway, Sweden with the highest rates among people aged 50–69.[36] In Russia, unfortunately, the maximum mortality from suicide is registered in older ages.

Background of chronic somatic and infectious diseases as well as consequences of psychoactive substance abuse are peculiar features of suicide mortality among the elderly. Therefore, these circumstances necessitate a comprehensive evaluation of health in general i.e. with due regard to the entire complex of all pathologies—multiple death causes.

The first thing to note when analyzing the suicide pattern in older ages in Moscow, as an example, is gender differences in mechanisms of injury events (Table 7).

[36] WHO (2014).

Thus, hanging undoubtedly dominates in males (X70—intentional self-harm by hanging, strangulation and suffocation) with its contribution increasing with age from 35.3% to 59.3%. Gunshot wounds (X72—intentional self-harm by handgun discharge, intentional self-harm by rifle, X73—shotgun and larger firearm discharge, X74—intentional self-harm by other and unspecified firearm discharge) in males rank second with the share reducing with age from 19.1% to 13.6%. Intentional self-harm by sharp object (X78—intentional self-harm by sharp object) ranks third, usually injury of blood vessels, more often—on the upper extremities.

Intentional self-poisoning (X60—Intentional self-poisoning by and exposure to nonopioid analgesics, antipyretics and antirheumatics; X61—Intentional self-poisoning by and exposure to antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified; X62—Intentional self-poisoning by and exposure to narcotics and psychodysleptics [hallucinogens], not elsewhere classified; X63—Intentional self-poisoning by and exposure to other drugs acting on the autonomic nervous system; X64—Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances; X65—Intentional self-poisoning by and exposure to alcohol; X66—Intentional self-poisoning by and exposure to organic solvents and halogenated hydrocarbons and their vapours; X67—Intentional self-poisoning by and exposure to carbon monoxide and other gases and vapours; X68—Intentional self-poisoning by and exposure to pesticides; X69—Intentional self-poisoning by and exposure to other and unspecified chemicals and noxious substances) turned out to rank fourth with its cumulative contribution decreasing with age from 17.6% to 5.1%. The main toxic agent is drugs (X60–X64), their contribution to suicide mortality among the elderly equaled to 13.2% among people aged 60–74 and 3.4% in senile ages, with 5.9% and 1.7% of cases being self-poisoning by antiepileptic, sedative-hypnotic, antiparkinsonism and psychotropic drugs, not elsewhere classified (X61), respectively.

It is also necessary to note intentional self-harm by jumping from a high place (X80—Intentional self-harm by jumping from a high place), with the share slightly increasing with age (7.4% vs 8.5%).

Intentional self-poisoning undoubtedly takes the lead among older females, with the contribution increasing with age from 55.3% to 58.3%, out of which, drugs prevail with the cumulative contribution to suicide mortality increasing with age from 28.9% to 47.9%. It is interesting that, the share of hypnotics and sedatives that prevail among poisoning hardly changes with age (26.3% and 27.1%, respectively), while increase in the share of drug poisoning was due to "other and unspecified drugs" (X64—Intentional self-poisoning by and exposure to other and unspecified drugs, medicaments and biological substances) with their contribution increasing with age from 2.6% to 18.8%. A more detailed analysis showed that the term "unspecified" is associated with peculiar features of the classification, and in overwhelming majority of cases (8 cases out of 10) these were agents primarily affecting the cardiovascular system (T46—Poisoning by agents primarily affecting the cardiovascular system).

Most significantly is poisoning with other and unspecified chemical and toxic substances, the significance of which has reduced in half with age (21.1% vs 10.4%). These types of poisoning are the result of the toxic effect of corrosive acids and

Table 8 Comorbidity structure (%) against the background of suicides in people aged 60 + (Moscow, 2019—October, 2022)

Comorbidities	60–74 years		Comorbidities	75 + years	
	Number of indications	%		Number of indications	%
Males					
C00-C97—Malignant neoplasms of different sites	6	27.3	C61—Malignant neoplasm of the prostate gland	1	9.1
F10, Y90—Pathologies caused by alcohol use	9	40.9	Y90—Evidence of alcohol involvement determined by blood alcohol level	1	9.1
U07.1–U07.1—COVID-19	1	4.5	U07.1-U07.1—COVID-19	2	18.2
I20–I25—Ischaemic heart disease	4	18.2	I20-I25—Ischaemic heart disease	6	54.5
R78.8—Finding of other specified substances, not normally found in blood	1	4.5	S00-S09—Injuries to the head	1	9.1
S10–S19—Injuries to the neck	1	4.5			
Informative indications	22	100.0	Informative indications	11	100.0
Women					
C00–C97—Malignant neoplasms of different sites	2	15.4	C00-C97—Malignant neoplasms of different sites	6	28.6
E10–E14—Diabetes mellitus	1	7.7	E10-E14—Diabetes mellitus	2	9.5
U07.1–U07.1—COVID-19	1	7.7	U07.1-U07.1—COVID-19	2	9.5
I10–I15—Hypertensive diseases	1	7.7	I10-I15—Hypertensive diseases	2	9.5
I20–I25—Ischaemic heart disease	6	46.2	I20-I25—Ischaemic heart disease	7	33.3
I60–I69—Cerebrovascular diseases	1	7.7	K51—Ulcerative colitis	1	4.8
J84—Other interstitial pulmonary diseases	1	7.7	T42—Poisoning by sedative-hypnotic drugs	1	4.8
Informative indications	13	100.0	Informative indications	21	100.0

acid-like substances (T54.2—Corrosive acids and acid-like substances). It looks like the choice of such a painful death as poisoning with acetic essence is still relevant.

Significance of intentional self-harm by hanging among older females is substantially lower than among their male peers, and hardly changes with age, adding up to 21.1% and 22.9%, respectively.

It should be noted here that in females, suicides are quite often realized by jumping from a high place, while with age the frequency of such cases decreases, although significantly to a lesser degree than could have been assumed (18.4% vs 14.6%).

Discussing suicide comorbidities, we'd like to point out that they are registered in about a third of cases in males aged 60–74, while with age the frequency of comorbidities significantly decreases (from 32.4% to 18.6%). In females, the frequency of suicide-related conditions significantly increases with age (from 34.2% to 43.8%).

It is characteristic that, according to available information, mental disorders associated with alcohol abuse (F10—Mental and behavioural disorders due to use of alcohol) and evidence of alcohol involvement determined by blood alcohol level (Y90—Evidence of alcohol involvement determined by blood alcohol level), top the list of associated causes of death among males aged 60–74 with their cumulative contribution adding up to 40.9%. Neoplasms of various localizations rank second with the share exceeding a quarter of all pathologies. Ischaemic heart disease ranks third (18.2%). Intriguingly, COVID-19 in cases of suicide among people aged 60–74 is reported only once (Table 8).

In males aged 75 +, ischeamic heart disease is indicated as a comorbidity in more than half of all the cases followed by COVID-19 (18.2%), while neoplasms (C61—prostate cancer), as well as the evidence of alcohol involvement determined by blood alcohol level (Y90—Evidence of alcohol involvement determined by blood alcohol level), are rarely registered in isolated cases. Another case indicates traumatic subarachnoid hemorrhage (S06.6—Traumatic subarachnoid haemorrhage) due to jumping from a high place (X80—Intentional self-harm by jumping from a high place).

In females, the age profile of the comorbidity structure looks physiologically conditioned. Ischaemic heart disease prevails, and with age its contribution is decreasing from 46.2% to 33.3% against the background of the increased share of neoplasms from 15.4% to 28.6%. Among females aged 60–74 and senile females there are isolated cases with indication of COVID-19, diabetes mellitus and hypertension (7.7% and 9.5%, respectively) (Table 8).

Thus, it can be concluded that according to available data, the number of comorbidities increases only among females (from 34.2% to 43.8%), also the share of pathologies that can provoke a suicide (malignant neoplasms) increases with age only in females as well. However, the impact of alcohol abuse has been convincingly confirmed in males: in people aged 60–74, it is the pathologies associated with alcohol abuse that substantially prevail among the comorbidities in suicides.

Discussing the results obtained, it is necessary to raise the following important issues.

Since we are talking about external causes, each case, according to the Legislation of the Russian Federation, is subject to forensic medical examination. On the other hand, since we are talking about the elderly, comorbidities among people aged

60–74 are almost universal, while among people aged 75, their presence is physiologically inevitable. Consequently, the share of indications of comorbidities in medical certificates should increase with age. However, de facto, the situation is reversed. Comprehension of causes lies in the fact that the main purpose of the forensic medical examination is to determine between violent and non-violent nature of death, all other issues being secondary. Therefore, completeness of the description of comorbidities is rather subjective. Furthermore, it is important to consider the fact that the current medical death certificate provides for indicating the diagnosis of only one comorbidity, so the expert, with the best will in the world, cannot specify the whole range of causes. As a result, extremely insufficient information base makes results of death registration in Russia purely estimative with regard to multiple causes of death.

3.5 Health as social wellbeing

Aspects of social wellbeing in the context of health characteristics mean satisfaction with life, no matter how speculative it may sound. If we are talking about measurements, they include both objective and subjective indicators.[37,38]

To characterize objective indicators, we will use data of the "Comprehensive Monitoring of the living conditions of the population in 2019"[39] in relation to the households with older people.

More than 90% of the households, according to their own estimates, do not experience any tight housing conditions with an average of 23.4 m2 per household member and an average of 2.4 living rooms per household. Urban households residing in apartment buildings in large cities are in the worst situation: 14.5% of them report tight housing conditions with an average of 17.0 m^2 per household member and an average of 2.0 living rooms per household.

In addition to quantitative characteristics of the housing conditions, quality of housing is an important factor as well. 35.5% of the households with the elderly reported one or more disadvantages of the occupied residential premises: lack of heat (7.7%), insufficient sunlight (5.4%), dampness (6.9%), presence of insects, rodents (5.6%). Problems related to the improvement of the surrounding were mentioned as well: 9.4% of the respondents reported noise, pollution due to transport, enterprises, shops; 13.1% of the respondents mentioned insufficient lighting of the territories adjacent to the house and/or in the entrance; and 3.4% of the respondents noted violation of public order near the house and/or in the entrance. In general, almost half of the households (48.2%) assessed the condition of their living quarters as satisfactory.

Almost across all the parameters, except for dampness and presence of insects, as well as insufficient lighting of the territories adjacent to the house, conditions in urban settlements are worse compared to rural ones. However, in small towns

[37] WHO Regional Office for Europe (2013a).
[38] WHO Regional Office for Europe (2013b).
[39] https://gks.ru/free_doc/new_site/GKS_KOUZH-2020/index.html.

(with population under 50 thousand people), as well as small rural settlements (under 200 people), the problems related to dampness (7.9% and 10.7%, respectively) and insects in residential premises (7.5% and 8.2%, respectively) as well as insufficient lighting of the adjacent territories (15.1% and 16.0%, respectively) are more common due to prevalence of private, often old housing; in middle-size cities (with population 100–500 thousand people)—noise, pollution due to transport, enterprises, shops (16.0%); in large cities (with population over 500 thousand)—insufficient sunlight in residential premises (9.0%), as well as violation of public order near the house or in the entrance (6.9%).

In general, households with the elderly reside in relatively satisfactory sanitary and hygienic conditions. However, there are noticeable differences by type of the settlement. 80% of the households reported a bath/shower in the house, including 90.3% in cities and 60.1% in rural settlements. Households in small towns (under 50 thousand people)—82.0% and households in small rural settlements (up to 200 people)—41.6% find themselves in a worse situation. 82.9% of the households, including 92.8% in urban settings and 63.7% in rural settlements, report a toilet in the house. Small settlements, both urban and rural ones, are equipped the worst (87.3% and 47.2%, respectively).

Households with the elderly often need personal transport to ensure mobility, including for medical and social purposes. This is especially important for those living in rural settlements due to insufficient development of public transport. In general, one third of the households (32.9%) have got a car, including 30.3% of those living in cities and 37.9%—in rural settlements. Depending on the size of the urban settlement, the share of car owners decreases, whereas in rural settlements the pattern is reversed. Both material security of the population and development of public transport are important. The latter factor makes it optional to have your own car, although material resources of residents of large cities are generally higher.

In general, the country has almost a universal TV and communication coverage. Mobile communication is available in all urban households and 98% of rural ones, including 96.7% in small rural settlements under 200 inhabitants. Home Internet access is available in 76% of urban households and 56.5% of rural households. For small rural settlements, this is a significant negative factor, especially in case if emergency medical counselling is needed.

Only a little more than a half of the elderly people (57.7%) apply for medical care within a year. Almost everyone applied has received care. Only 5.1% of the respondents indicated lack of assistance. Since the study was conducted in 2020—during the Covid-19 pandemic—in half of all cases, the elderly who failed to receive health care mentioned that they could not get into a health care facility due to quarantine measures. Other significant reasons included as follows: a proper specialist was missing, long waiting lines in front of the doctor's office, inability to make an appointment. All these circumstances were mainly determined by the pandemic. In general, during the pandemic, about a third (36.6%) of the elderly did not visit health care facilities if they needed health care.

Assessing living conditions in their locality, the elderly generally noted that they liked their place of residence (95.4%). However, the majority (76.6%) shared

a number of problems (Fig. 6). The most frequently mentioned problems are as follows: state of roads and road safety, poor organization of housing and communal services, environmental pollution. Also, about a third of the elderly noted remoteness of recreational areas, facilities for physical activity, and cultural institutions.

Accessibility of cultural and recreational facilities is really important for the elderly. Thus, 21.4% of the elderly respondents attended at least one cultural and recreational event within a year. Most often (27.2%), it was a visit to a religious institution or meeting of believers, cinema (16.9%), restaurant or cafe (15.9%), concert (9.7%).

About a third of the elderly respondents (31.2%) made a tourist or sightseeing trip over the past year. Almost half of all trips are related to visiting relatives and friends, while going hunting and fishing, picking berries and mushrooming are also often reported. In a quarter of cases, trips are associated with sanatorium treatment, recreation, and wellness. In fact, activities of the elderly could have been more active. Among those who have not made tourist or sightseeing trips, only 14.2% indicated that they were not interested in such leisure. The most frequent reasons were health problems and financial constraints (13.5% and 26.0%, respectively). Since the study was conducted in 2020, the epidemic situation was also a significant barrier (20.7%).

Maintenance of contacts is an important element of social wellbeing. It is especially important to maintain contacts with adult children who live separately. 77.9% of the elderly respondents (81.2% of males and 76.4% of females) have children who live separately, with 2/3 of them living in the same area and 1/3—in another locality. Only 2.4% of the respondents reported that children live abroad. The majority of the elderly who need assistance receive it from children who live separately, including: monetary assistance (54.3%), household assistance (73.5%), purchase of groceries, goods (62.2%), nursing during illness (79.7%). Only 7.5% of the elderly who need assistance do not get any help from children who live separately. In turn, the elderly themselves help their children who live separately as mentioned by 57.5% of the respondents. First of all, this is relevant to school children and students under 18.

In addition to children, especially if they live far away from their parents, it is important that the majority of the elderly can ask for help of a person who is not a household member (84.7%). Almost all the elderly respondents noted that they have a person with whom they can discuss their personal issues (93.9%). Two-thirds of the respondents mentioned meeting with friends, relatives or colleagues (informally /outside of work) at least once a week. Therefore, maintenance of rather close microsocial contacts contributes to better psychological comfort of the elderly.

4 Conclusions

Consequences of the Russian social and political history in the XX century have resulted in significant fluctuations in the number of individual generations, forming a long-term fluctuating trend in the level of demographic ageing. These historical disproportions have overlapped with regional variations in ageing rates due to substantial inter-regional movements as well as rural–urban migrations, significant gender differences in trends and scales of mortality and fertility dynamics. As a result,

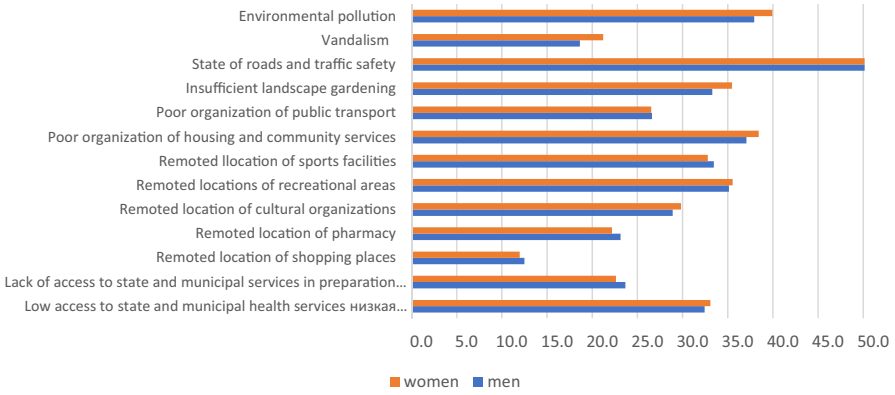


Fig. 6 Opinion of the elderly about problems in their place of residence, %

levels of demographic ageing in Russia differ by more than three-fold, worsening among females and rural residents.

The problems of ageing are aggravated by unsatisfactory health status of the elderly, manifesting in high burden of chronic diseases (with cardiovascular diseases prevailing), resulting in life restrictions up to loss of the ability to self-care.

High-tech cardiac surgical interventions contribute to longer life of the elderly patients and improved physical and psychological functioning, especially in case of interventions compared to open surgeries. However, during rehabilitation, most patients are reluctant to change their unhealthy lifestyle, associated with the development of their cardiac condition.

Multiple chronic diseases and substance abuse (in males) are a risk factor for suicidal behavior, while availability of medications, including sleeping pills, firearms, etc. contributes to realization of this risk.

Living conditions of the elderly and their access to quality social services are important components of well-being in the context of health. Despite satisfactory housing conditions, quality characteristics of housing and its sanitary and hygienic condition, as well as availability of communications significantly differs by type of the settlement (urban/rural) and well as its size. The most common problems related to the improvement of settlements are as follows: state of roads and road safety, poor organization of housing and communal services, environmental pollution as well as remoteness of recreational areas, facilities for physical activity, and cultural institutions. In fact, maintenance of microsocial contacts with children, including those living separately, relatives and friends is a powerful source of better psychological comfort and social well-being of the elderly.

As part of the development of the modern Russian strategy for socio-economic development and migration concept, it is necessary to keep in mind demographic characteristics of ageing and accessibility of medical and social services, especially, to the elderly, regardless of their place of residence.

To improve health and quality of life of the elderly, targeted actions are needed to form motivation for healthy lifestyle throughout life, which, among other things,

will contribute to lower demand for high-tech interventions and increase in their effectiveness.

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Declarations

Conflict of interest The authors have no competing interests to declare that are relevant to the content of this article.

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