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FORECASTING THE POPULATION OF RETIREMENT AGE IN RURAL RUSSIA

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Population aging and an increase in the number of older age cohorts are demographic constraints and barriers to sustainable rural development. Rural areas of Russia have been affected by demographic aging to a greater extent than urban areas; the proportion of the population of retirement age in rural areas is higher than in urban areas. The purpose of the study is a forecasting the rural population of retirement age and changes in the demographic load in Russia. To construct a demographic forecast, the component method was used. The results show that the number of rural population of retirement age in 2020-2029 will decrease by 4.2-7.3% with zero migration and 5.8-8.9% taking into account the scale of rural-urban migration. From 2034, an increase in the number of persons of retirement age is projected. In 2020-2049 the number of rural pensioners will grow in the medium and high scenarios of demographic development by 4.4-5.5%, excluding migration. The article calculates coefficient of demographic load. The analysis shows that the rural population 0-15 years old is steadily declining. At the same time the number of persons of retirement age in Russia is steadily increasing, both in rural and urban areas. The decline in the birth rate has led to a decrease the demographic load coefficient by children and an increase of the old-age dependency ratio. Upcoming demographic changes must be taken into account in the strategic planning and development of regional programs.

Keywords: rural population of retirement age, forecast, Russian Federation.

INTRODUCTION

The population of Russia in 2020 decreased by more than 0.5 million and as of January 1, 2021, it was 146.2 million (Rosstat, 2021). The main reason is the high natural population decline, which was only partially compensated by the migration gain. Simultaneously with the increase in the death rate, which during the COVID-19 pandemic reached its maximum value in the last 10 years, the birth rate decreased, and the natural population decline increased. In January 2021, compared with January 2020, a decrease in the number of births occurred in 80 regions of the Russian Federation, and an increase in the number of deaths in 84. The number of people infected with the COVID-19 coronavirus amounted to more than 7.0 million people, of which 6.3 million recovered, more than 188 thousand people died (Rosstat, 2021). By January 2021, the number of deaths from all classes of causes of death exceeded the number of births by 2.1 times; natural population growth was recorded only in 9 regions of Russia (Rosstat, 2021). The rural population decreased and as of January 1, 2021 amounted to 36.9 million people (Rosstat, 2021). Every fourth resident of the country lives in rural areas, and the share of the rural population is 25.2% (2021). At the same time, in such regions of Russia as the Republic of Dagestan, the Republic of Altai, the Republic of Kalmykia, the Republic of Adygea, the Chechen Republic, the Karachay-Cherkess Republic from 50 to 70% of citizens live in rural areas. Demographic constraints are a barrier to sustainable bioeconomy and rural development. Unfavorable demographic trends in the development of rural areas, including aging, decrease of the working-age population, decline in the birth rate, reduction in the number of women of fertile age, increase the demographic load, actualize the assessment of promising changes.

In addition to the natural population decline, the regions of Russia are aging, and the proportion of elderly people is increasing. Researchers believe that currently in Russia “there is an increase in the rate of population ageing which the countries of Western, Central and Southern Europe (Spain, Portugal, Greece and Italy) experienced in the 1970s and 1980s, and the Baltic States (like the rest of Eastern Europe) - in the 1980s and 1990s” (Petrosian et al., p. 46). Population aging having a negative impact on economic growth, the national labor market, and the pension system (Kim, Hewings, 2013; Kudo et al., 2015; Lin et al., 2018; Lee, Petrosian et al, 2019; Shin, 2019; Blinova, 2021). “The most significant consequence of an aging population is the ever-increasing load on the able-bodied population, and primarily due to the load from above (due to with an increase in the proportion of the elderly), while the load from below (children) is gradually decreasing due to a decrease in the birth rate in almost all developed countries” (Karpova, Proklova, 2020, p. 53).

Demographic aging is a challenge for the economies of most countries of the world, adapting to which, society increases the retirement age. In Russia the pension reform started in 2019, when the Federal law No. 350 (2018) was adopted. According to this law, by 2028, it will be a gradual increase in the retirement age for men – up to 65 years (from 60), for women – up to 60 years (from 55). Population aging and an increase in the number of older age cohorts are demographic constraints and barriers to sustainable rural development. Rural areas of Russia have been affected by demographic aging to a greater extent than urban areas; the proportion of the population of retirement age in rural areas is higher than in urban areas.

The object of the research is the rural population of retirement age. The purpose of the study is a forecasting the rural population of retirement age and changes in the demographic load in Russia. To achieve this aim, the tasks of theoretical analysis of the patterns of aging were solved, and the assessment of the impact of the pension reform in Russia on changes in the population of retirement age and demographic load.

MATERIAL AND METHODS

Methods for predicting the size and structure of the population of the countries of the world are widely known (Rowland, 2003; Alho, Spencer, 2005; Alho et al., 2006). To construct a demographic forecast, the component method was used. This method has been tested previously (Blinova et al., 2020). Scenarios of demographic development of rural areas in 2029-2049 are described: Baseline, Medium, High, Baseline with migration, Medium with migration, High with migration. The database was formed on the basis of statistics presented on the official website of Federal State Statistics Service - Rosstat (Rosstat, 2002; Rosstat, 2007; Rosstat, 2012; Rosstat, 2015; Rosstat, 2017; Rosstat, 2019; Rosstat, 2020, Rosstat, 2021). The calculations were performed using Mathcad 14.0. The baseline scenario is based on the assumption that the age-specific fertility of rural population remain unchanged throughout the forecast period (until January 1, 2049). The medium scenario was developed on the basis of the expected birth rate increase at the age of 15–19 years and over 35 years old until 2028, the prevailing trends in rural mortality rates are extrapolated up to 2028. A high forecast scenario can be called normative, because it is based on the targets presented in the National Project “Demography” (2019). When assessing the results of migration, Rosstat data were used, and also the patterns and trends in the scale of rural-urban migration during the Covid-19 pandemic were taken into account (Mkrtychyan, 2019; Blinova et al, 2020). The forecast for the population of retirement age took into account the specifics of the pension reform in Russia.

RESULTS AND DISCUSSION

Forecast of the rural population at retirement age

As a result of the aging of the population, the number and proportion of people of retirement age is increasing. Table 1 shows the dynamics of the rural and urban population of retirement age in Russia.

Table 1. Population at retirement age in Russian Federation, 2015-2020, thousand people

Population at retirement age	2015	2016	2017	2018	2019	2020
Rural population	9242.2	9459.3	9647.6	9827.4	10005.1	9629.5
Urban population	25921.2	26527.0	27037.5	27535.2	27983.9	26999.0
Total population	35163.4	35986.3	36685.1	37362.6	37989.0	36628.5

Source: Rosstat data (2017; 2019; 2021)

As the data in the table show in 2015-2019 the number of pensioners in Russia increased by 8%, while the number of rural pensioners increased by 8.3%. The growth rate of rural pensioners is higher than that of urban ones. In 2019-2020 an increase in the retirement age during the pension reform in Russia, as well as an increase in mortality during the Covid-19 pandemic, led to a decrease in their number in rural areas by 3.8%, in the city - by 3.5%.

The forecast of the rural population of retirement age (2029-2049) is presented in Table 2.

Table 2. Rural population of retirement age, 2020–2049, thousand people (women aged over 60; men aged over 65)

Scenarios	2020	2029	2034	2039	2044	2049
Baseline	9630	8931	9039	8949	8704	8496
Medium	9630	9230	9771	10010	10069	10055
High	9630	9197	9791	10036	10170	10160
Baseline with migration	9630	8777	8792	8617	8296	8022
Medium with migration	9630	9073	9511	9673	9607	9504
High with migration	9630	9044	9533	9736	9705	9623

Source: own calculations based on Rosstat data (2002; 2007; 2012; 2015; 2017; 2019; 2021)

The data show that the number of rural population of retirement age in 2020-2029 will decrease by 4.2-7.3% with zero migration and 5.8-8.9% taking into account the scale of rural-urban migration. From 2034, an increase in the number of persons of retirement age is projected. In 2020-2049 the number of rural pensioners will grow in the medium and high scenarios of demographic development by 4.4-5.5%, excluding migration.

Forecast of the rural population below the working age

As the data show (table 3), the number of the rural population of Russia below the working age will decrease until 2039 according to all alternative scenarios of demographic development, except for the «High» one.

Table 3. Rural population below the working age (0–15), 2020–2049, thousand people

Scenarios	2020	2029	2034	2039	2044	2049
Baseline	7414	5958	5204	5091	5203	5207
Medium	7414	5978	5255	5175	5302	5307
High	7414	6236	5820	6052	6286	6320
Baseline with migration	7414	5831	5039	4900	4971	4923
Medium with migration	7414	5856	5096	4989	5067	5018
High with migration	7414	6106	5644	5836	6008	5977

Source: own calculations based on Rosstat data (2002; 2007; 2012; 2015; 2017; 2019; 2021)

Then, a gradual increase in the size of this age group is predicted. The current migration dynamics may have a negative impact on the rural population under the age of less than the able-bodied population in the period from 2044 to 2049.

Predicted shifts in the age group of rural population will inevitably affect the size of the demographic load on the working-age population.

Forecast of demographic load coefficient

In the papers of Russian authors, three types of demographic load coefficient are discussed, firstly, the demographic load by children (the number of people 0-15 years old per 1000 people of working age), secondly, the demographic load by the elderly (the number of people of retirement age per 1000 people of working age), in - third, the general demographic load (the number of persons 0-15 years old plus the number of persons of retirement age per 1000 persons of working age) (Karpova, Proklova, 2020). The article calculates coefficient of general demographic load. The analysis shows that the rural population 0-15 years old is steadily declining (Blinova et al, 2020). At the same time the number of persons of retirement age in Russia is steadily increasing, both in rural and urban areas. Lutz and other authors (2008) notes that the future paths of population ageing result from specific combinations of declining fertility and increasing life expectancies in different parts of the world. The decline in the birth rate has led to a decrease the demographic load coefficient by children and an increase of the coefficient of demographic load of the elderly.

In order to construct a forecast of the number of persons of retirement age and calculate the demographic load, it is necessary to know the stages of raising the retirement age until 2028 (Table 4).

Table 4. Scheme for increasing the retirement age in Russia in 2021-2028

Years	Working age for men	Retirement age for men	Working age for women	Retirement age for women
2021	16-60 years	61 and over	16-55 years	56 and over
2022	16-61 years	62 and over	16-56 years	57 and over
2023	16-61 years	62 and over	16-56 years	57 and over
2024	16-62 years	63 and over	16-57 years	58 and over
2025	16-62 years	63 and over	16-57 years	58 and over
2026	16-63 years	64 and over	16-58 years	59 and over
2027	16-63 years	64 and over	16-58 years	59 and over
2028	16-64 years	65 and over	16-59 years	60 and over

Source: Rosstat data

The data in the table show that only from 2028 onwards, the retirement age is 65 years for men and 60 years for women.

The article calculates coefficient of general demographic load. The analysis shows that the rural population 0-15 years old is declining. At the same time the number of persons of retirement age in Russia is increasing, both in rural and urban areas. The decline in the birth rate has led to a decrease the demographic load coefficient by children and an increase of the coefficient of demographic load of the elderly.

Table 5. The demographic load on the working-age rural population, 2020–2049, people per 1000 working age (women aged 16–59; men aged 16–64)

Scenarios	2020	2029	2034	2039	2044	2049
Baseline	898	712	693	712	744	778
Medium	898	725	725	759	807	852
High	898	734	752	804	854	889
Baseline with migration	898	712	692	713	745	780
Medium with migration	898	726	725	762	809	855
High with migration	898	735	752	809	856	893

Source: own calculations based on Rosstat data (2002; 2007; 2012; 2015; 2017; 2019; 2021)

By 2029, a decrease in the level of the general demographic load is forecasted to be 16.9–19.5% from the level of 2019, and then it will gradually increase. These changes are explained by the influence of the pension reform, which resulted in a decrease in the population at retirement ages. By 2049, the demographic load will increase by 0.7% from the level of 2019 only in the optimistic scenario, in all other scenarios it is expected a decrease to 88–96.5% relative to the data in 2019.

Forecast of old-age dependency ratio

As the data in the table show, in 2020-2049 old-age dependency ratio will increase by 32.6%-54.3%. After declining in 2020-2024 by 0.3%-0.7% the old-age dependency ratio increases until 2039 (17.5%-22.0%), and then the growth rate slows down.

Table 6. Old-age dependency ratio (persons over 65 years of age per 1 thousand persons of working age (women aged 16–59; men aged 16–64)

Scenarios	2020	2029	2034	2039	2044	2049
Baseline	291	342	358	369	377	386
Medium	291	354	387	414	435	445
High	291	352	389	416	435	448
Baseline with migration	291	343	359	370	378	386
Medium with migration	291	355	388	415	435	446
High with migration	291	353	388	417	436	449

Source: own calculations based on Rosstat data (2002; 2007; 2012; 2015; 2017; 2019; 2021)

The old age dependency ratio in Russia is lower than in other countries, such as Germany, Italy and so on, this is explained by the fact that different countries are at different stages of the demographic transition (Petrosian et al, 2019). An assessment “of the prospects of the pension burden shows only a temporary effect of raising the retirement age to solve the problem of imbalance in the joint pension system: an increase in the burden of pensioners after 2028 will be observed in almost the majority of regions» (Petrosian et al., p.67).

CONCLUSION

The paper presents a medium-term forecast and six alternative scenarios of the size of the rural population of retirement age up to 2049 in Russia. The research results led to the following conclusions.

The results show that the number of rural population of retirement age in 2020-2029 will decrease by 4.2-7.3% with zero migration and 5.8-8.9% taking into account the scale of rural-urban migration. From 2034, an increase in the number of persons of retirement age is projected. In 2020-2049 the number of rural pensioners will grow in the medium and high scenarios of demographic development by 4.4-5.5%, excluding migration.

The rural population below the working age (0-15) will decline in 2020-2039 for all scenarios of demographic development, in 2039-2049 a gradual increase in the size of this age group is projected.

The demographic load on the working-age population initially decreases from 898 people per 1000 (2020) to 712–734 people (2039), but subsequently increases to 778-889 people (2049).

Upcoming demographic changes must be taken into account in the strategic planning and development of regional programs.

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