

# Demographic Changes and Labor Supply in Russian Regions

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Like most developed countries, the Russian Federation is experiencing serious changes in the size and composition of its population. On average, as a result of declining birth rates, each successive generation of children has been smaller than the generation of their parents. This incomplete replacement of generations predetermines the trend towards depopulation and ageing, which is exacerbated by the continuing decline in mortality in older age groups. Demographic waves are fluctuations in the number of births and individual age groups due to both demographic and socio-economic reasons. Some years, for example, the 2000s in Russia, smoothed them, while other years, as in the 2020s, make such trends more pronounced.

In many countries, depopulation and ageing is already accompanied by a decline in the working-age population. Forecasts indicate that process is stable in countries with low fertility rates (Table 1). The United States is an exception, thanks to a significant inflow of migrants. Potential workers in Russia are declining in number, – in Russia this process is accelerated by a downward demographic wave, – and are getting older. Thus, according to the medium forecast of the Institute of Demography of the National Research University Higher School of Economics made in 2021, the size of the population in the 20-59 age group will decrease by about 2.6 million people between 2022 and 2030. At the same time, the number of young workers aged 20-39 will drop by 6.6 million, while the number of older workers aged 40-59 will increase by 4.0 million. Obviously, such quantitative transformations will have a major impact on the country's economy in general and the labor market in particular.

**Table 1.**  
**Size of the population between 20 and 59 years old, Russia and selected countries (mln people)**

| Country               | Japan | Italy | Poland | Germany | China | Russia | France | U.S.A. |
|-----------------------|-------|-------|--------|---------|-------|--------|--------|--------|
| 2015                  | 63.4  | 32.5  | 21,8   | 44.3    | 853.8 | 86     | 32.7   | 171.9  |
| 2035                  | 51.8  | 26.7  | 18,5   | 38.4    | 747.8 | 76.3   | 31.4   | 181.1  |
| 2035 vs. 2015         | 0.82  | 0.82  | 0,85   | 0.87    | 0.88  | 0.89   | 0.96   | 1.05   |
| [2035] – [2015] (mln) | -11.6 | -5.8  | -3,3   | -5.9    | -106  | -9.7   | -1.3   | 9.3    |

Source: Russia – forecast by the NRU HSE Institute of Demography (2021), other countries – UN Population Division (2019)

## The key research question

Demographic changes primarily affect the size and socio-demographic composition of the labor force, and through them, other characteristics of the labor market, including wages and productivity. According to Rosstat estimates, between 2017 and 2021, the size of the labor force comprising permanent residents of Russia decreased from 76,285 thousand to 75,350 thousand, or by 935 thousand people<sup>1</sup>. At the same time, the share of those aged 39 and younger fell from 49.4% to almost 47%, with a respective increase of the share of those aged 40 and older.

Changes in the size and age composition of the labor force occur unevenly across the country. Thus, its largest reduction – by almost 470 thousand people – was recorded in the Volga Federal District, while in the Central Federal District the size of the labor force remained practically unchanged, and in the North Caucasus Federal District it increased by 65 thousand people. How will the size and age composition of the labor force in the Russian Federation and its constituent entities change as a result of demographic changes in the next 10-15 years, until 2035? This question determined the focus of the study, and the results at the level of federal districts are presented below. Obviously, the demographic processes in the period under study may follow different scenarios depending on the economic and socio-political situation, and its possible changes are considered in the multivariate demographic forecast. The study also took into account the continuing increase in the retirement age, which affects both the size and age composition of the labor force.

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<sup>1</sup> Labor force includes individuals aged 15 and older who in the period under consideration (survey week) are considered employed or unemployed (Rosstat, 2022 <https://rosstat.gov.ru/storage/mediabank/I24HLcSd/met-Tr1.pdf> as of May 6, 2022 ). Note that the definition applies to permanent residents in the country.

## Data and method

The impact of demographic changes on the labor force in Russia and its constituent entities up to 2035 was studied using the forecasting method. As is known, the size of the labor force at age  $x$  or  $LF(x)$  is determined by two variables:  $P(x)$  – the population at age  $x$  and  $pr(x)$  – the labor force participation rate at age  $x$ . In other words,  $LF(x)=P(x)*pr(x)$ . Accordingly, projections of the population and its age groups were made for each constituent entity of the Russian Federation, as well as estimates of labor force participation rates from 2021 to 2035. The total size and age composition of the labor force for the whole of Russia and its federal districts were determined as the sum of identical indicators for the constituent entities. In total, four variants of the demographic forecast were developed – “Low”, “High”, “Medium” and “Medium without migration”; they are based on different scenarios of fertility, mortality and migration growth. It is the latter two processes that determine the dynamics of the labor force, since those born in the period under study will enter the labor market already after 2035.

The “Low” forecast included a scenario of a slow increase in life expectancy (LE) and a declining migration growth every year. Thus, for Russia as a whole, life expectancy for both sexes was modeled to increase from 71.5 years in 2020 to 73.4 years in 2030. The average annual migration growth in the period from 2022 to 2035 was set at 120 thousand people. In 2015-2019, it was about 230 thousand. The low variant reflects a crisis scenario of the country’s economic development with slow pace of overcoming the consequences of COVID-19. The optimistic “High” variant conforms to the targets set forth in the National Goals<sup>1</sup>, and assumes vigorous economic and social development of the country with a high demand for labor force. It is expected that in such event the LE for the entire country in 2030 will reach 77.7 years, and the average annual migration growth in 2022-2034 will be about 400 thousand people.

The “Medium” variant actually reflects the previously established trends, taking into account overcoming the consequences of the COVID-19 pandemic. Under this option, the life expectancy in Russia increases to 74.9 years by 2030, and the average annual migration growth for the entire projection period will be about 250 thousand people. The last forecast variant “Average without migration” repeats the fertility and mortality scenarios of the “Average” variant with zero migration growth. It allows to assess the impact of migration on the dynamics of the size and composition of the labor force.

Forecast estimates of participation rates were preceded by a comparative analysis of their dynamics for the constituent entities of the Russian Federation according to the data from the sample labor force survey (LFS) for 2010-2020, as well as for Russia and OECD countries over the last quarter of a century. Since both men and women of average working age have achieved high economic activity rates by international standards, it was assumed that these rates would not change in the future. The hypothesis of the rates being constant was also applied to young (under 25) working ages, with the growth of their economic activity constrained by high school enrollment rates. It is expected that in the future the main changes in participation rates for males and females will occur at ages 50 and older, which is associated with an increase in the

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<sup>1</sup> Targets under the National Goal “Population Preservation, People’s Health and Well-Being”: ensuring sustainable growth of the population of the Russian Federation; increasing life expectancy up to 78 years. See.: Decree of the President of the Russian Federation No. 474 of July 21, 2020 “On National Development Goals of the Russian Federation for the period until 2030”. URL: <http://kremlin.ru/events/president/news/63728>

statutory retirement age. For Russia as a whole, a model of changes in participation rates at older ages was constructed based on data from those OECD countries where the retirement age has been raised. The analysis of the participation rate dynamics across the constituent entities of the Russian Federation in most cases does not allow to identify clear trends. Therefore, it is assumed that in all entities the changes in participation rates at older ages will follow the all-Russia model. Such a simplification of the predictive model will not affect the estimates of the impact of demographic factors on the number and composition of the labor force in the regions, but will allow to trace how they are affected by the increase in the retirement age.

As already noted, participation rates are calculated on the basis of the LFS data. It is used to generate an official estimate of the labor force in Russia, which is 74.9 million people in 2020. The weighting and dissemination of the survey data is carried out at the level of the constituent entity of the Russian Federation. Data from current population estimates at the beginning of the relevant year, stratified by sex, five-year age groups and type of settlements (urban, rural) are used as the general population<sup>1</sup>. However, combining the participation rates derived from the LFS data with the number of individual age-sex groups according to current estimates gives for 2020 and for previous years labor force estimates that differ from those of Rosstat. The annual average data are the most accurate in the LFS. There are several reasons for the differences. First, there are small differences between the age composition of the population according to the LFS and the age composition in the current population estimates at the beginning of the year. Second, in this study, the estimates were made for the entire population of the constituent entities without splitting into urban vs. rural. Third, and most importantly, in this case there was no complete information on the institutional population. As a result, in our proposed calculations the estimate of the total labor force for Russia as a whole for 2020 is 74.3 million, which is about 0.6 million less than the Rosstat estimate. Almost the same difference was recorded for 2019, for which the official and received estimates were 75.4 million and 74.7 million people, respectively. In total, between 2017 and 2020, this difference for the whole country ranged between 0.25% (in 2017) and 0.95% (in 2019) with respect to the official labor force estimate. At the same time, in 2019, the difference was minimal in the North Caucasus District; in the Central, North-Western and Southern Federal Districts it was within the range of 0.7-0.8%, and in the remaining Federal Districts it exceeded 1.1%, being the highest in the Volga Federal District (1.6%). In order to obtain forward-looking estimates of the labor force in the Russian Federation that are consistent with the official estimates of Rosstat, a value corresponding to the order of the above deviations should be added to the results presented below.

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<sup>1</sup> The Federal State Statistics Service (Rosstat). Results of the sample labor force survey: 2020. Moscow 2021. <https://rosstat.gov.ru/folder/111110/document/13265>



## Labor force dynamics

The size of the labor force changes under the influence of the following demographic factors: (1) the number of young people entering the labor market and persons reaching retirement age, (2) migration, (3) mortality. The parameters of migration and mortality, as already mentioned, changed in the study in accordance with the selected prognostic scenarios. The number of those entering the labor market and leaving it as they reach retirement age was determined by the initial age mix of the population for 2020. Another factor, participation rates, change in the study primarily as a result of retirement age increases, but, unlike demographic variables, follow the same pattern.

The results of calculating the future size of the labor force under different variants of the demographic forecast are shown in Table 2. Despite the drop in the number of those aged 20 to 59 between 2019 and 2030 by 6.3 million (medium variant of the demographic forecast) due to the specifics of the age mix of the Russian population, the number of employed and unemployed will drop by only 1.9 million due to the increase in the retirement age and, accordingly, greater

Table 2  
The labor force size estimates for RF Federal Districts, 2025, 2030 and 2035  
(thou. people)

|                                       | Estimate* | Medium |      |      | High |      |      | Low  |      |      | Medium w/o migration |      |      |
|---------------------------------------|-----------|--------|------|------|------|------|------|------|------|------|----------------------|------|------|
|                                       | 2019      | 2025   | 2030 | 2035 | 2025 | 2030 | 2035 | 2025 | 2030 | 2035 | 2025                 | 2030 | 2035 |
| Russian Federation                    | 74.7      | 73.9   | 72.8 | 73.2 | 74.4 | 74.2 | 75.7 | 73.6 | 71.7 | 71.1 | 73.3                 | 71.4 | 70.8 |
| Central Federal District              | 21.2      | 21.1   | 20.8 | 20.9 | 21.2 | 21.2 | 21.7 | 20.9 | 20.4 | 20.2 | 20.6                 | 19.8 | 19.3 |
| including:                            |           |        |      |      |      |      |      |      |      |      |                      |      |      |
| Moscow and Moscow region              | 11.5      | 11.8   | 11.8 | 12.0 | 11.8 | 12.0 | 12.4 | 11.7 | 11.6 | 11.6 | 11.3                 | 10.9 | 10.7 |
| other regions                         | 9.7       | 9.3    | 9.0  | 8.9  | 9.4  | 9.2  | 9.3  | 9.3  | 8.8  | 8.5  | 9.3                  | 8.9  | 8.6  |
| North Western Federal District        | 7.4       | 7.4    | 7.3  | 7.4  | 7.5  | 7.5  | 7.7  | 7.4  | 7.2  | 7.1  | 7.3                  | 7.0  | 6.9  |
| including:                            |           |        |      |      |      |      |      |      |      |      |                      |      |      |
| Saint-Petersburg and Leningrad region | 4.0       | 4.2    | 4.2  | 4.3  | 4.2  | 4.3  | 4.4  | 4.1  | 4.1  | 4.1  | 4.0                  | 3.9  | 3.8  |
| other regions                         | 3.4       | 3.3    | 3.1  | 3.1  | 3.3  | 3.2  | 3.2  | 3.2  | 3.1  | 3.0  | 3.3                  | 3.2  | 3.1  |
| Southern Federal District             | 8.1       | 8.1    | 8.0  | 8.1  | 8.2  | 8.2  | 8.3  | 8.1  | 7.9  | 7.8  | 8.0                  | 7.8  | 7.7  |
| North Caucasus Federal District       | 4.6       | 4.9    | 5.0  | 5.1  | 4.9  | 5.0  | 5.2  | 4.9  | 5.0  | 5.1  | 4.9                  | 5.0  | 5.2  |
| Volga Federal District                | 14.6      | 14.0   | 13.5 | 13.4 | 14.1 | 13.7 | 13.8 | 14.0 | 13.3 | 13.1 | 14.0                 | 13.6 | 13.4 |
| Urals Federal District                | 6.2       | 6.1    | 6.1  | 6.2  | 6.2  | 6.2  | 6.4  | 6.1  | 6.0  | 6.0  | 6.1                  | 6.0  | 6.0  |
| Siberian Federal District             | 8.4       | 8.2    | 8.0  | 8.0  | 8.2  | 8.2  | 8.3  | 8.1  | 7.9  | 7.8  | 8.2                  | 8.1  | 8.1  |
| Far Eastern Federal District          | 4.2       | 4.1    | 4.1  | 4.1  | 4.1  | 4.2  | 4.3  | 4.1  | 4.0  | 4.0  | 4.2                  | 4.1  | 4.2  |

Note: \* – authors' estimate.

labor force participation at older ages. By the mid-2030s, the situation will improve as numerous generations born in the years of fertility boom (2007-2015) enter working age. The greatest decline is expected in the Volga regions. All forecast variants suggest an increase in the labor force in the Moscow and St. Petersburg metropolitan areas and in the North Caucasus.

Comparison of different forecast variants emphasizes the importance of both international and interregional long-term migration for the development of the labor market in Russia and its regions. In the “High” scenario, which features strong migration growth, all federal districts benefit; however, under all scenarios (except for the no-migration scenario) the districts that attract both international and internal migrants stand to benefit the most. The forecast with zero migration growth shows an accelerated loss of labor force. In this variant, the labor availability in the regions that attract migrants worsens, while that in the sending regions improves.

Labor supply in the economy will increase due to international temporary labor migration. According to our estimate based on the data of the Main Department of Internal Affairs of the Ministry of Internal Affairs of Russia, the number of migrants in the years before the pandemic was as high as 4 million people. However, more than 60% of them worked in the Moscow and St. Petersburg metropolitan regions. The Urals and Far Eastern Federal Districts received more migrants compared to other regions.

Internal labor migration significantly redistributes the labor force between regions, – according to the LMS, its size is estimated at 1.8-1.9 million people. The Moscow metropolitan region, the Tyumen region, the Khanty-Mansiysk and Yamalo-Nenets Okrugs, as well as the regions of the North and the East of the country reap the greatest benefits from it. In turn, the regions of the Volga, North Caucasus and Central (except Moscow and the Moscow region), the south of the Urals and Siberia are labor force “donors”. Thus, temporary migration will significantly adjust the size of the labor force at the regional level in favor of the most advanced regions.

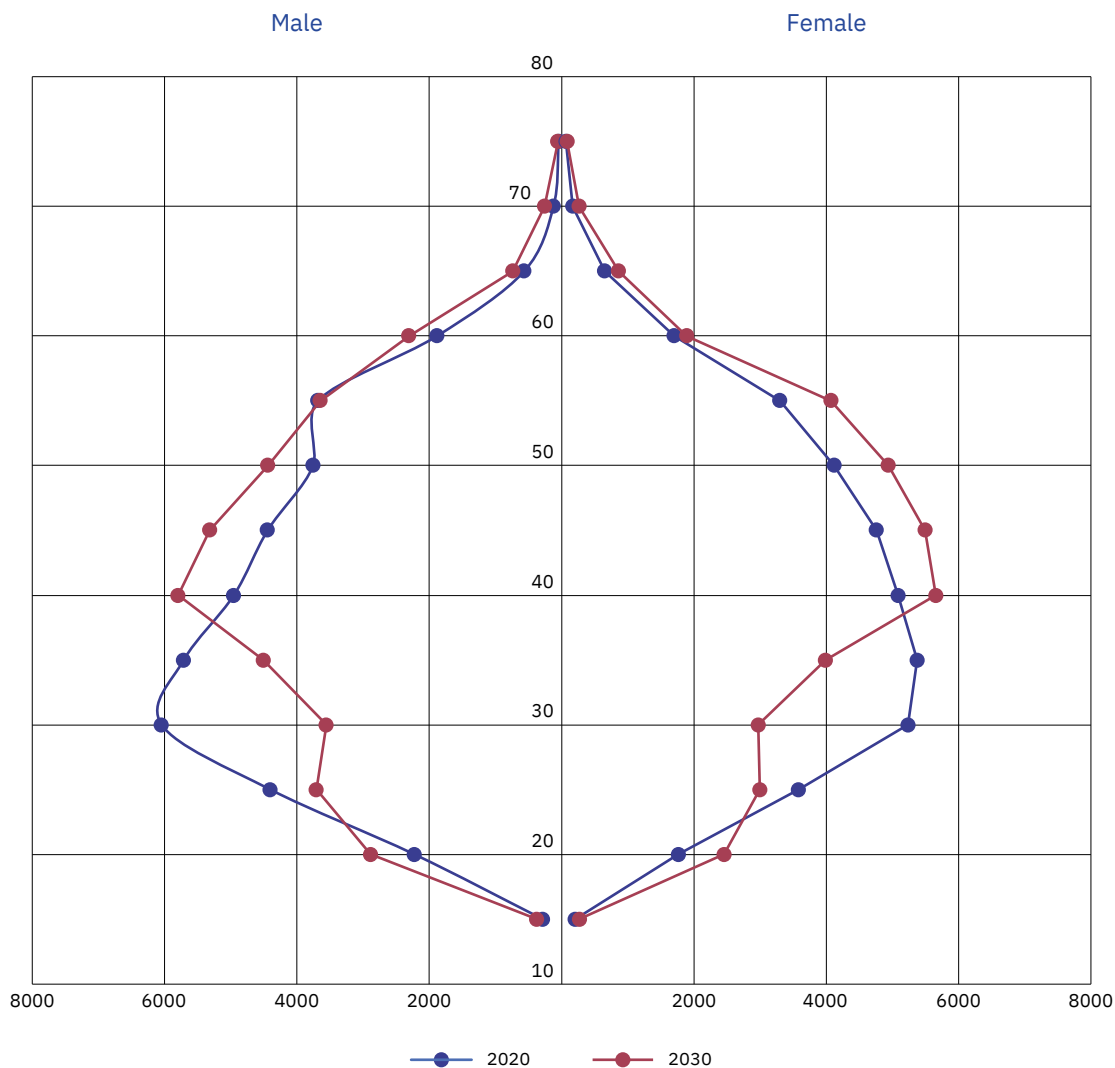
The effect of mortality reduction on the labor market should not be underestimated. Comparing the outcomes of the “High” and “Low” options without migration, the gain is estimated at 0.6 million working-age lives saved, or almost a quarter of the difference in labor force size.



# Demographic changes and age composition of the labor force

The current age composition of the population at the national and subnational level, as well as the regularities of demographic development, define the nature of changes in the age composition of the labor force, which will have a strong impact on labor markets. The labor force is aging, which can be clearly seen in Figure 1. This process will accelerate in the next decade, first, by small-numbered generations born in the 1990s and early 2000s moving to working-age cohorts, and, second, by the extension of the working lives of older workers. The share of age cohorts under 40 in the labor force will fall from 42.0% in 2019 to 37.4% in 2030.

Figure 1  
**The Russian labor force broken down by age and gender, 2020 vs. 2030 (thou. people)**



The process of labor force aging affects all regions of the country. However, the share of young people will shrink most of all in Moscow and the Moscow region, St. Petersburg and the Leningrad region. The population of these regions grew most actively due to migrants arriving at young age, but in the current decade the migrants are actively moving into older age cohorts. At the same time, a comparison of different forecast scenarios' outcomes suggests that in those regions that will remain attractive for migrants the process of labor force aging is slowing down, and vice versa, – in regions where population outflow will continue, this process is accelerating.

**Table 3**  
**The share of individuals 40 years of age and older in the labor force, Russia, 2019 vs. 2023, %**

| Region                                | Estimate 2019 | Medium, 2030 | High, 2030 | Low, 2030 | Medium, no migration, 2030 |
|---------------------------------------|---------------|--------------|------------|-----------|----------------------------|
| Russian Federation                    | 52.0          | 62.6         | 62.7       | 63.2      | 63.2                       |
| Central Federal District              | 54.8          | 66.9         | 66.9       | 67.2      | 67.8                       |
| including:                            |               |              |            |           |                            |
| Moscow and Moscow region              | 55.1          | 69.6         | 69.6       | 69.9      | 71.0                       |
| Other regions                         | 54.4          | 63.3         | 63.4       | 63.7      | 63.9                       |
| North-Western Federal District        | 52.6          | 64.8         | 65.0       | 65.2      | 65.8                       |
| including:                            |               |              |            |           |                            |
| Saint-Petersburg and Leningrad region | 52.7          | 67.5         | 67.6       | 67.9      | 69.0                       |
| Other regions                         | 52.4          | 61.3         | 61.4       | 61.7      | 61.9                       |
| Southern Federal District             | 51.8          | 62.1         | 62.5       | 57.5      | 62.4                       |
| North Caucasus Federal District       | 47.2          | 55.1         | 56.0       | 51.3      | 55.2                       |
| Volga Federal District                | 51.7          | 61.1         | 61.2       | 56.7      | 61.3                       |
| Urals Federal District                | 50.5          | 60.7         | 60.0       | 56.4      | 60.8                       |
| Siberian Federal District             | 49.7          | 60.2         | 60.2       | 56.0      | 60.4                       |
| Far Eastern Federal District          | 50.3          | 59.2         | 58.9       | 55.7      | 59.4                       |

Thus, demographic changes will impact the size and composition of the labor force in Russia's regions in different ways. The size and composition of the labor force will be largely determined by greater labor participation at older ages, as well as by the ability of regions to attract migrants – both long-term and temporary labor migrants. Labor force will inevitably grow older, and this is a very serious challenge to the Russian economy. The aging of the labor force will be widespread, but in regions that manage to attract migrants – both international and internal – these negative processes will be significantly mitigated.