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Challenge 3 “Population ageing”

# Justification of the retirement age in compulsory pension insurance system of the Russian Federation

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Population ageing is one of the main reasons for the increase in the retirement age carried out in the late twenty-early twenty-first centuries in many countries. In the Russian Federation (hereafter, Russia), discussions about raising the retirement age as a way to solve the problems of the redistributive pension system have been conducted starting in the 1990s, fading during economically prosperous years and being more active during economically hard time when the level of pensions have been reduced and the budget deficit of the pension system increased.

Measures implemented in Russia in 2002 during the pension reform to improve the pension system did not resolve completely two of its main problems: low living standards of pensioners and dependence of the Pension Fund budget on transfers from the federal budget. The demographic ageing of the population compounded by recurrent economic crises further increased the risks of development of the distributional component of the pension system.



Unsolved problems intensified discussions about the need and ways of raising the eligibility age for an old-age insurance pension. In order to make a final and professional decision on the advisability of raising the eligibility age, the “Main Directions of the Government of the Russian Federation until 2018 (new version)”, approved in May 2015, indicated the need for a detailed analysis and wide discussion with the involvement of civil society institutions, including trade unions, employers’ associations, public organizations and the expert community [1].

This report analyzes the main external (demographic and macroeconomic) and internal conditions and factors affecting the functioning of the compulsory pension insurance system (CPIS) of the Russian Federation. It demonstrates significant regional and gender differences in key indicators related to increase in the retirement age, identifies the restrictions on its increase, and identifies the potential impacts of implementing of this measure on the level of pensions, the Pension Fund’s budget and the federal budget.

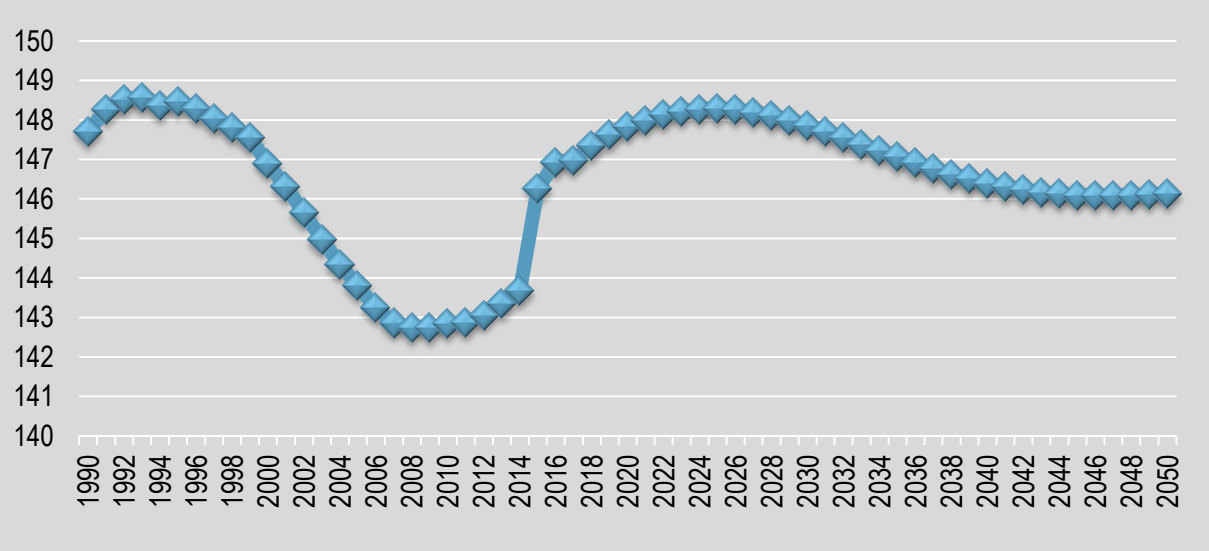
## 1. Demographic conditions affecting the development of the compulsory pension insurance system (CPIS) in Russia

The demographic conditions affecting the development of the CPIS in the last few years are the most favorable since the beginning of the 1990s.

In the beginning of 2017, the resident permanent population of Russia was 146.8 million, returning after a long period of decline to the level of 2000. However, it still remains lower than in the early 1990s (Figure 1).

In accordance with the medium variant of the long-term demographic forecast of the Russian Statistical Agency (Rosstat), the number of permanent residents will grow slowly for several years until it will reach a maximum of 148.3 million in 2024–2026. It will gradually decline afterwards and from 2037 is projected to be lower than today [2].

**Figure 1.** *Historical and projected evolution of the number of permanent residents of the Russian Federation (at the beginning of the year), millions.*



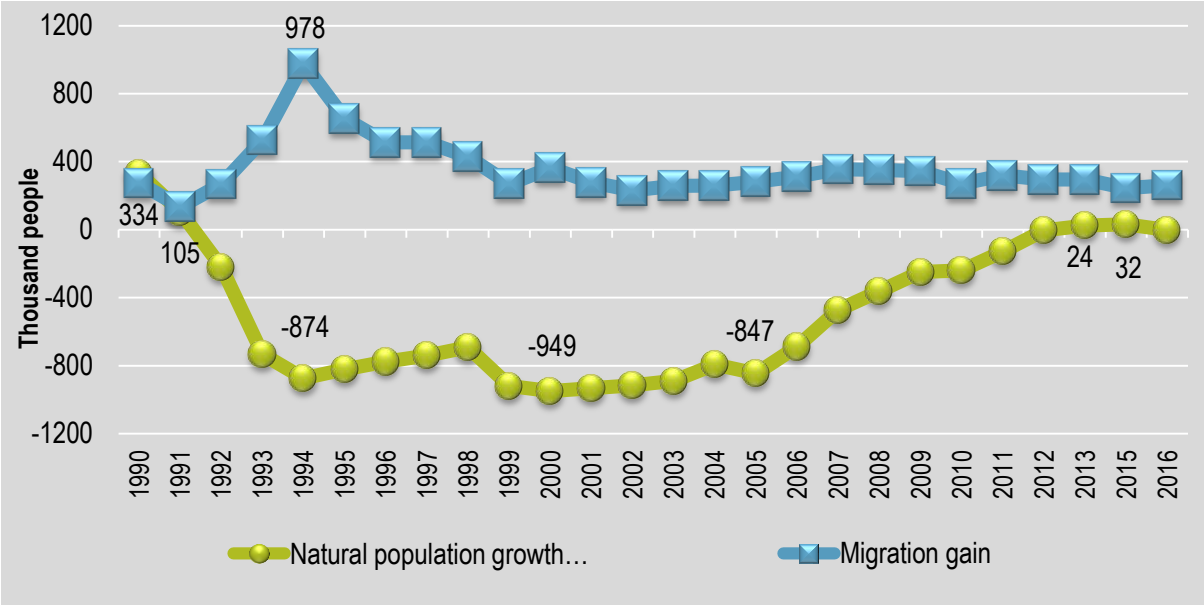

*Source:* Demographic forecast for the period 2017 - 2050 years, medium variant. Available at Rosstat. 2017 year.

Over the 26-year period 1990–2016, the population increased for 10 out of 26 years mainly due to migration growth (Figure 2). Moreover, during the most difficult period in terms of natural population growth (1999–2002), the number of births replaced only 56 to 60% of the number of deaths (Figure 3).

However, in 2013–2015 (after 20 years of excess of deaths over births) it was possible to achieve a natural population increase.

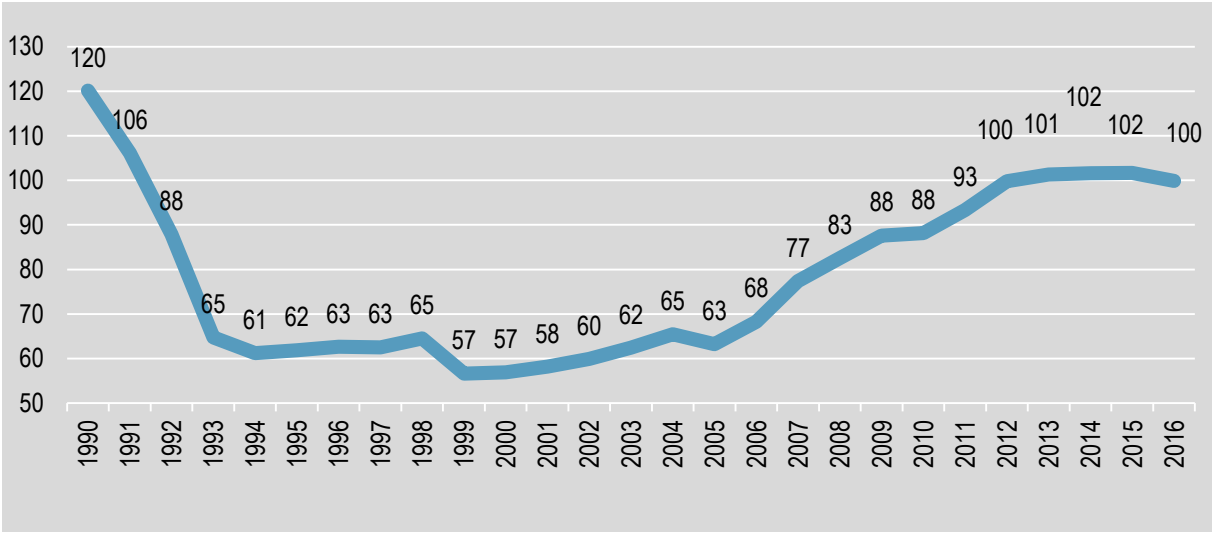
Resumption, albeit small, of natural increase was a consequence of increasing fertility, on the one hand, and reducing mortality, on the other hand.

**Figure 2.** *Natural population increase and net migration in Russia, thousands*




*Source:* [1].

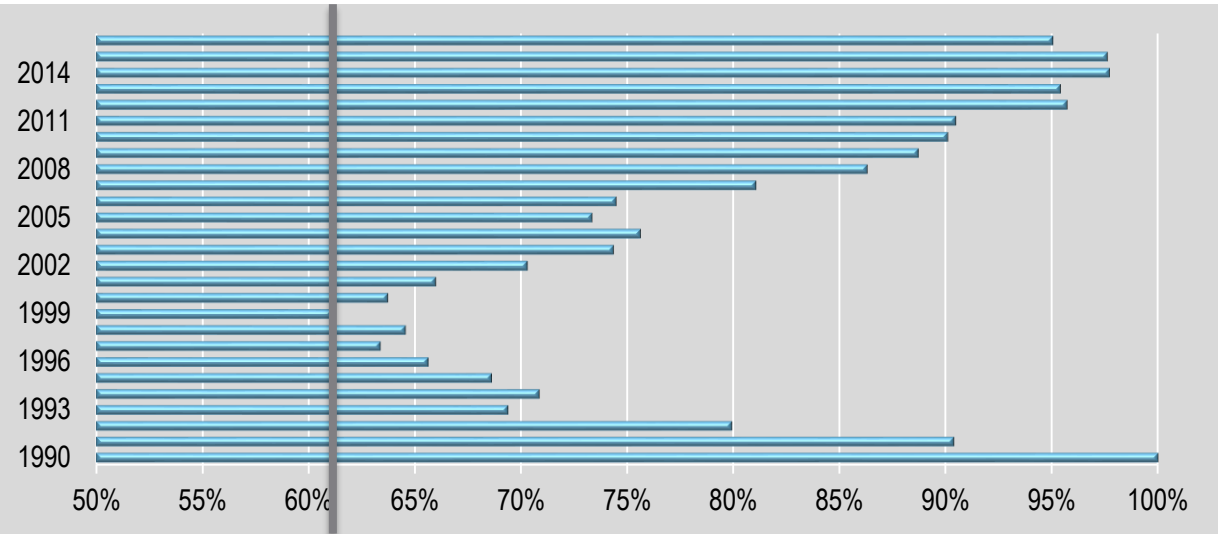
**Figure 3.** *Ratio of number of births to number of deaths, %*




*Source*: Calculation according to [4].

Until 1999, the number of births declined, falling to 61% of the 1990 level. Since 2000, the growth in the number of births has resumed, and in 2012–2016 it has come close to the maximum achieved in the last quarter of the 20th century, reaching 95 to 97% of the 1990 level (Figure 4). This is partially a result of the high number of women of reproductive age: until 2013 it exceeded the level of 1990 by 1 to 11%.

**Figure 4.** *Number of live births in relation to 1990 level (%)*

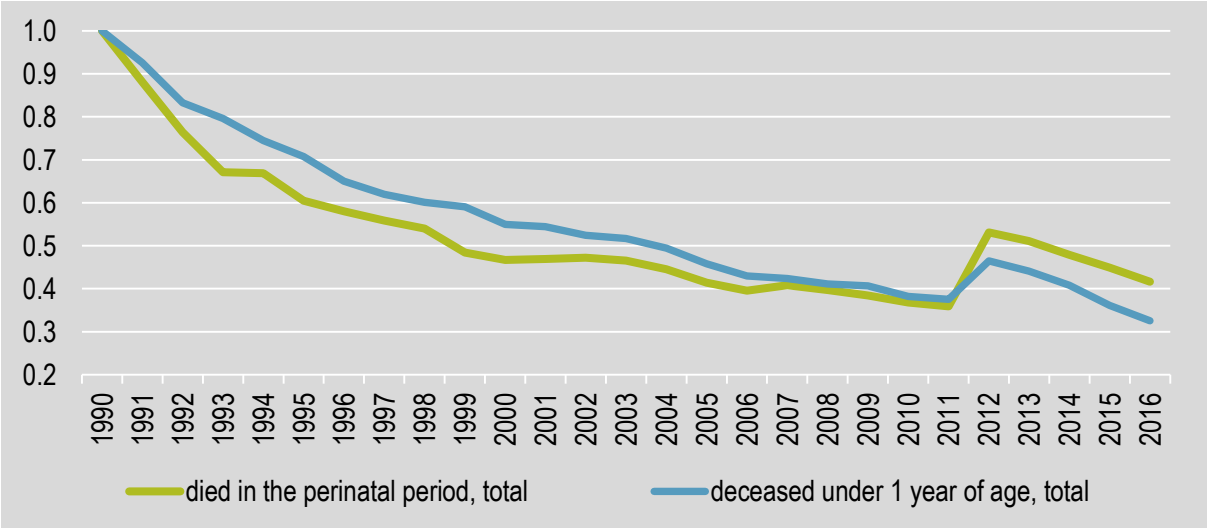



*Source:* Single interdepartmental information and statistical system (EMIS): www.gks.ru.

The growth of the number of births was also a result a decrease in perinatal and infant mortality, a reduction in the number of abortions, an increase in the share of second and subsequent pregnancies, and an increase in the proportion of multiple births.

By 2016, the number of deaths in the perinatal period was 2.4 times lower compared to 1990 (a decrease from 36,000 in 1990 to 15,000 in 2016), including a decrease in the number of stillborn (1.7 times less) and death within the first seven days following birth (4.3 times less). The number of deaths under the age of one was 3 times lower in 2016 compared to 1990 (a decrease from 35,000 in 1990 to 11,400 in 2016). Although the decline in perinatal and infant death rates is not stable, positive trends are present.

**Figure 5.** *Decrease in the number of deaths in the perinatal period and under the age of one year compared with 1990, (1990 = 1)*




*Source:* Calculation according to [3].

The number of abortions in 2016 decreased by almost 5 times in comparison with 1990 and by 2.6 times in comparison with 2000. On the contrary, the number of multiple births increased by 1.7 times in comparison with 1990 (the share of multiple births increased from 7 to 12 per 1000 births), and by 2.8 times compared with 2000.

A significant role in increasing the birth rate was played by the introduction in 2007 of maternal (family) capital (hereinafter, MFC).

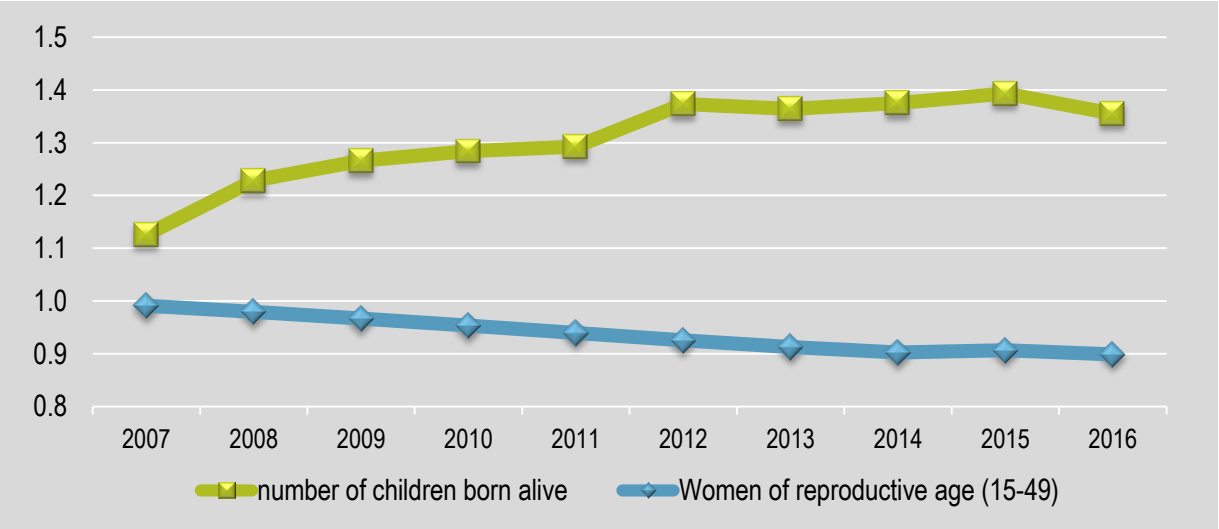
MFCs are funds of the federal budget that are transferred to the budget of the Pension Fund for the implementation of additional measures of state support for families with children. Starting from January 1, 2007, these funds can be paid to women who gave birth (adopted) to the second or subsequent child (and men who are the only adoptive parents of the second or subsequent children). The list of permissible use of MFC funds was repeatedly expanded during the period of its operation. MFC funds can be used to improve housing conditions, provide education to a child (children), purchase goods and services, provide goods and services to the disabled children's society, receive a monthly payment, and create a funded pension for a mother. Initially, the MFC program was expected to last from January 1, 2007 to December 31, 2016, but later, taking into account its results, the period of its operation was extended to December 31, 2021.

At the time of its introduction, in 2007, the value of MFC was 250 thousand rubles. That was equal to 18.4 of country's nominal average monthly wage or 65 of monthly subsistence minimum. Every year, the MFC is indexed for inflation, but for the period 2015–2018 it was fixed at 453 thousand rubles. In 2017, this amounted to 11.5 country's nominally average monthly wage or 44 of monthly subsistence minimums.



In many respects, thanks to the MFC the number of children born in 2007–2017 was higher than in 2006 (by 13 to 39%), despite the fact that the number of women of reproductive age in the same period was constantly decreasing by 1 to 2% per year (Figure 6) and in 2016 was 90% of their number in 2006.

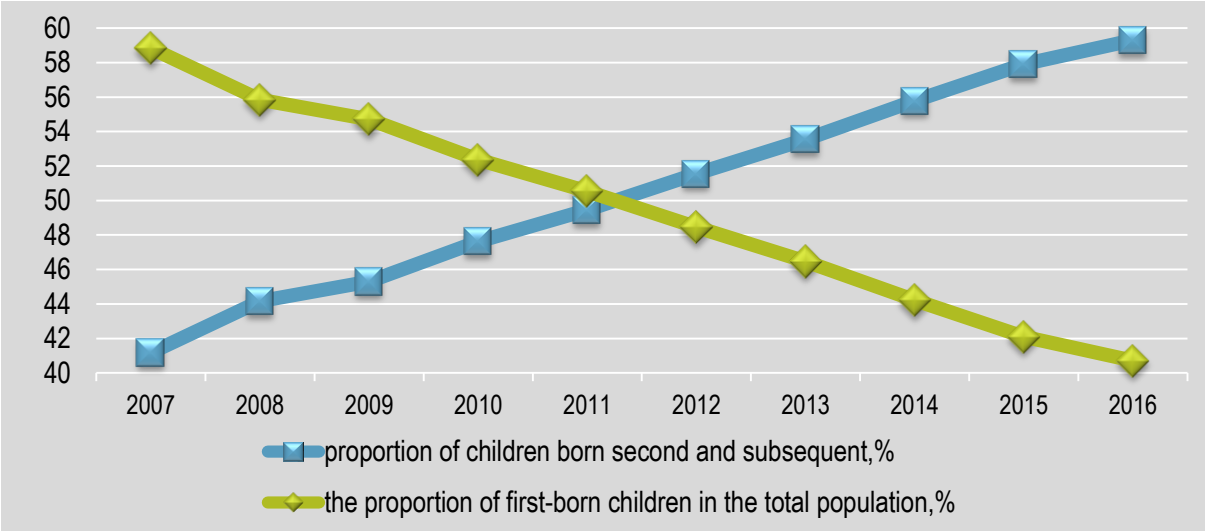
**Figure 6.** *Rates of growth in the number of women of reproductive age and the number of live births relative to 2006*




*Source:* Calculation according to [5].

The MFC program stimulated an increase in the proportion of second and subsequent births (Figure 7). If at the beginning of its operation, in 2007, the proportion of second and subsequent children was 41.2% of the total number of newborns, in 2016 it reached 59.3%. The share of the third and subsequent child increased from 10.6% to 18.9%.

**Figure 7.** *Evolution of the share of first-born children and the second and subsequent children, % of the total number of newborns*




*Source:* [6].

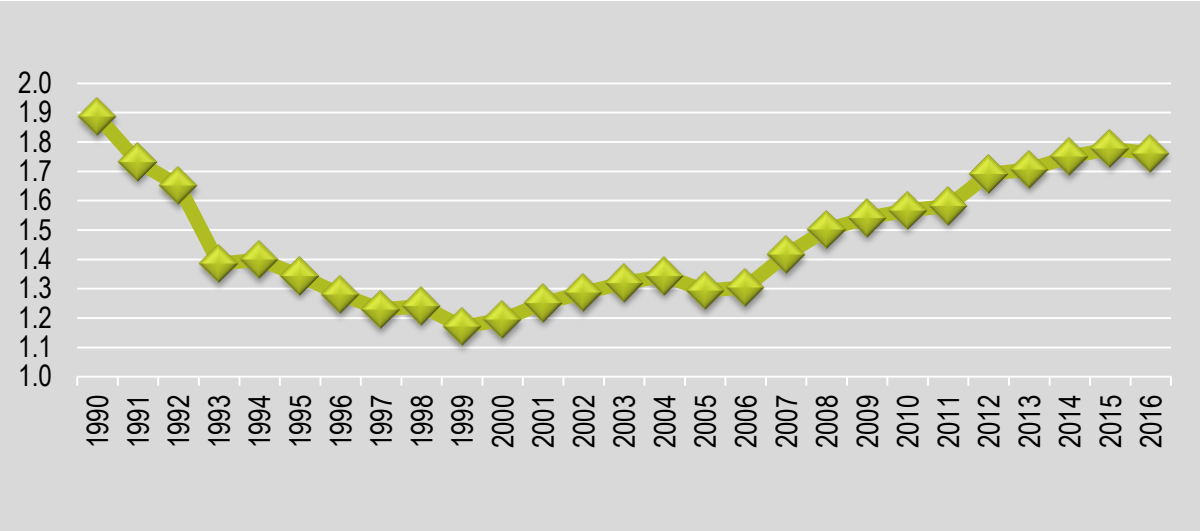


If the number of women of reproductive age did not decrease, the emerging trend of growth in the number of births would continue. However, having reached its maximum (since the beginning of the 1990s) of 40 million in 2003, the number of women of reproductive age began to decline and, since 2013, dropped below the 1991 level. This was one of the main reasons for the reduction in the number of births in 2016–2017, and, as a result, the natural decline of the population started again.

To reiterate, as a result of measures aimed at reducing perinatal and infant mortality, the MFC program, which stimulated the growth of second and subsequent births, and a significant reduction in the number of abortions, the total fertility rate from 2014 exceeded the level of 1991–2013, although remaining lower than in 1990 (Figure 8). The current fertility rate is at 83% of the fertility reproduction rate. This can't be called sufficient, but in comparison with 2000, when it was only 56.4%, the progress is obvious.

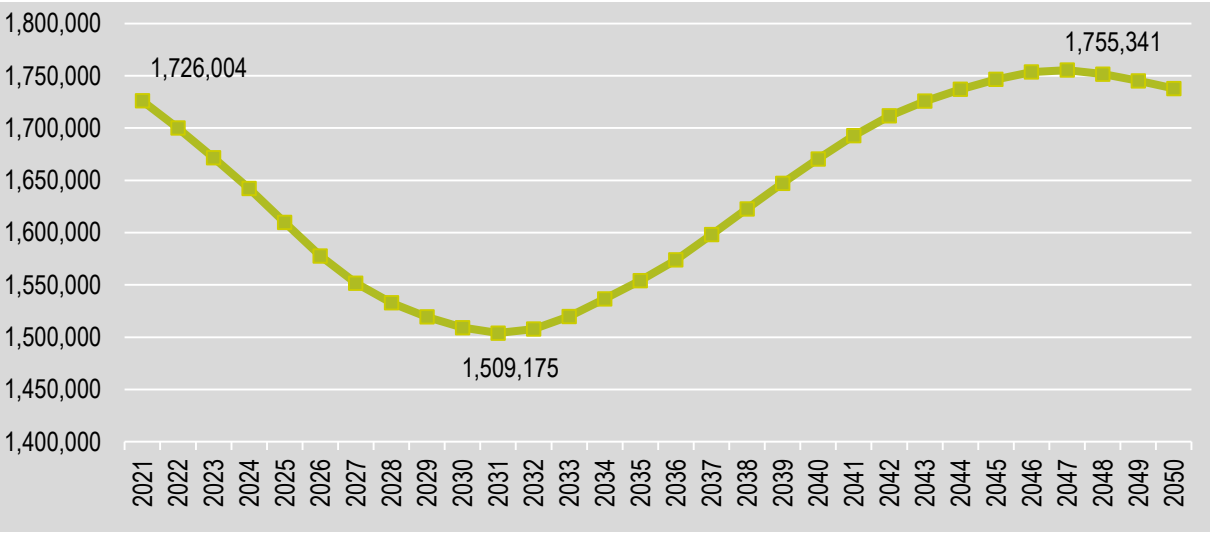
The growth of the birth rate has allowed in recent years to halt the decline in the population under the working age (as will be discussed below). In the long term, according to Rosstat's forecasts, the number of births will decline until the beginning of the 2030s, then its growth will resume, approaching in 2048–2050 the level projected for the beginning of the 2020s (Figure 9).

**Figure 8.** *Total fertility rate, number of children per woman*




*Source:* [7].

**Figure 9.** *Estimated number of births in the Russian Federation according to the medium variant of the forecast, person*

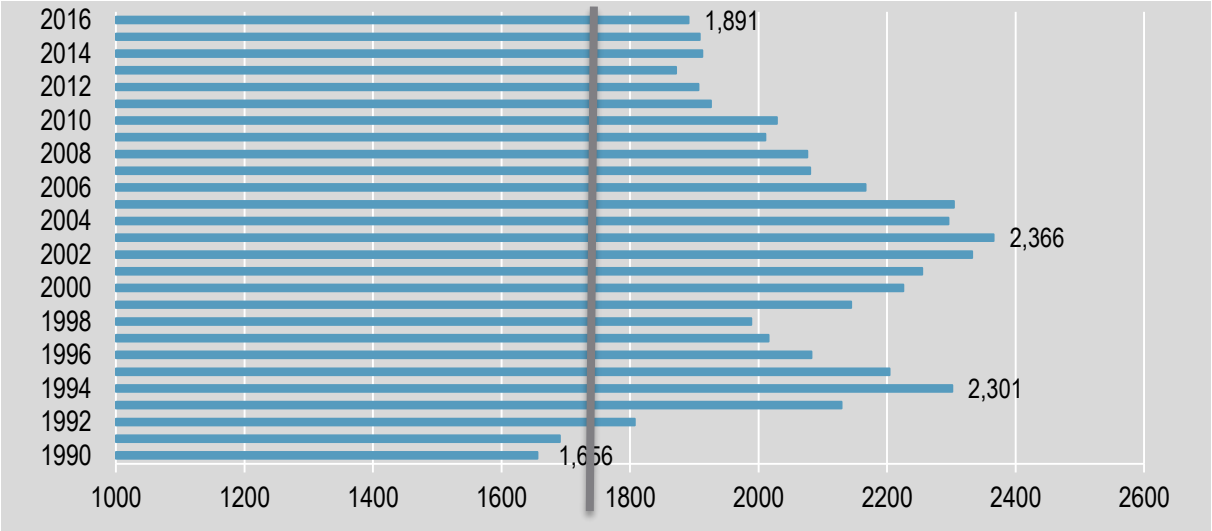



*Source:* [2].

The resumption of natural population growth was favorably affected by a decrease in mortality. It manifests itself in the reduction of both the absolute number of deaths and the age-specific death rates. However, this decrease is insufficient for stabilizing the demographic situation.

The number of deaths in 1990 was 1.66 million, in 1993 it exceeded 2.1 million and for all years before 2011 (except for 1998) did not fall below 2 million people (Figure 10).

**Figure 10.** *Dynamics of the number of deaths, thousand people*




*Source:* [4].

Years 2002 and 2003 became the peak in the number of deaths (2.33 and 2.37 million deaths, respectively). Then the gradual decline began and, in 2016, the number of deaths was 1.89 million or 114% of the 1990 level. Lower values for the number of deaths were recorded only in 1991–92 and 2013.

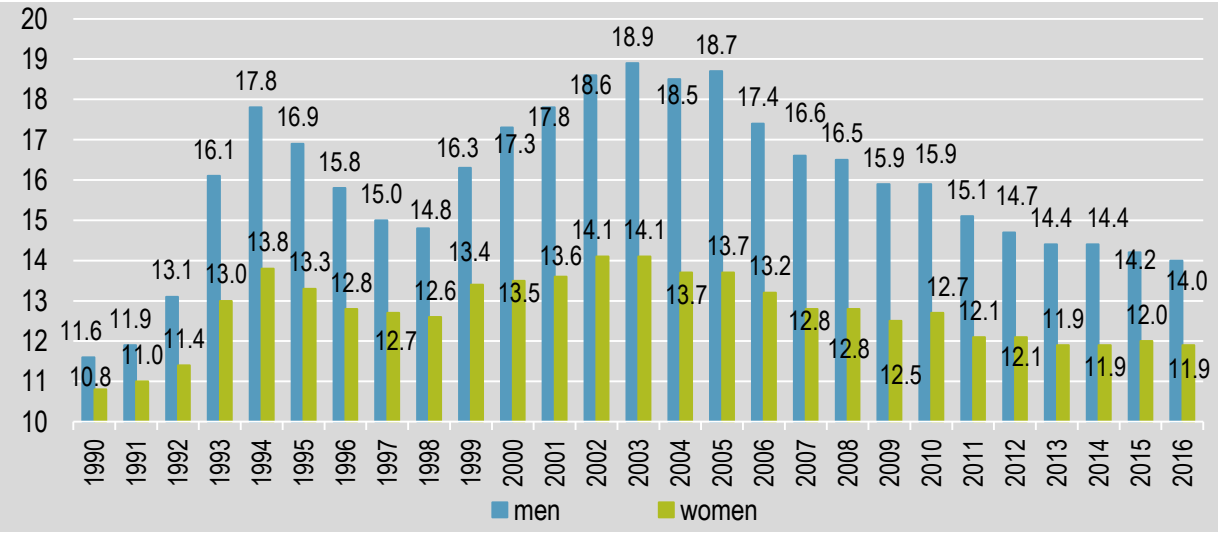


Mortality rates, like the total number of deaths, after a long period of increase ending in 2003 with a peak equal to 18.9 per thousand for men and 14.1 for women, gradually began to decline.

In 2016, female mortality returned to the level of the early 1990s (in 1992 the death rate was 11.4 per thousand, in 2016, 11.9 per thousand), although it remains higher than the benchmark of 10.7 per thousand corresponding to the year 1990.

For men, mortality rate decreased more markedly, from 18.7 to 14 per thousand. However, it still exceeds considerably the level of 1990, when its value was almost equal to that for females of 11.0 per thousand (Figure 11).

**Figure 11.** *Evolution of mortality rates by sex (deaths per 1,000 of population), 1990–2016*



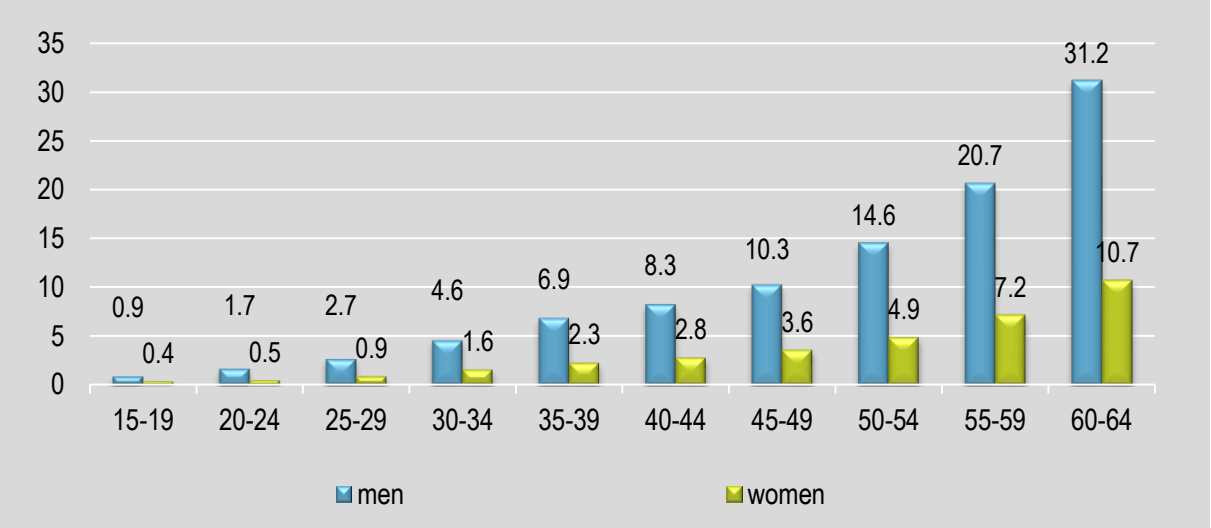

*Source*: [7].

As the statistics show, the greatest decrease in mortality rates occurred for newborns and for the age group of 1 to 4 years. By 2016, their value decreased to 36-39% from the level of 1990. At ages older than working age, the age-specific mortality rates in 2016 decreased to 75–93% of the 1990 level.

However, for working age groups, age groups of 25–29 years, 30–34 years, 35–39 years and 40–44 years for women, and 30–34 years, 35–39 years and 40–44 years for men there was an increase in mortality rates. Compared to 1990 levels, mortality rates increased by 7 to 53% for males. For women in these age groups, the increase in mortality was higher than for men. But compared to levels of 1995 or 2000, the decline in mortality occurred in all age groups.

An analysis of age-specific mortality rates shows another feature: the large (especially for working ages) gap in mortality rate of men and women (Figure 12). And if for ages younger than working age and in the young working age group this gap has narrowed over the last 25 years, for the pre-retirement (50–54 years) and retirement ages (60–64 years and 65–69 years), it either remained stables or increased.

**Figure 12.** *Age-specific death rates in 15-64 years in 2016, per thousand*



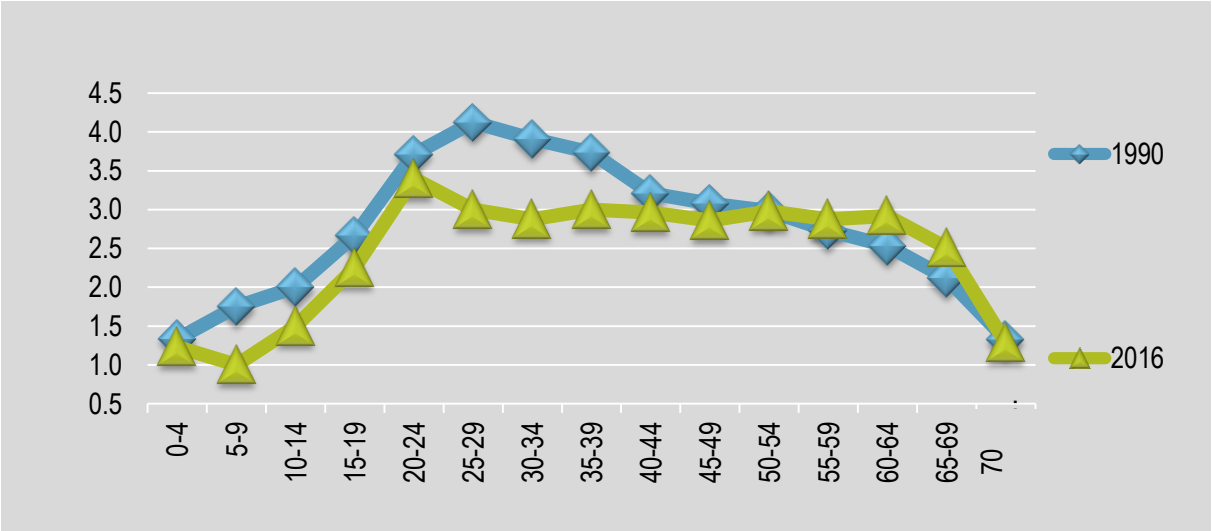

*Source*: [7].

The largest gap in the age-specific death rates between men and women (3.4 times) is for the age group of 20–24, slightly and  (at about ) for ages 25 to 64. (Figure 13).

Thus, a gender disproportion is established among the current contributors (most of whom will start retirement earlier because they are women), and among future pensioners (most of whom will live longer).

The consequence of a prolonged decline in the birth rate and an increase in mortality was the change in the relative size of three main age groups of the population.

**Figure 13.** *Ratio between males and females age-specific mortality rates in 1990 and 2016*

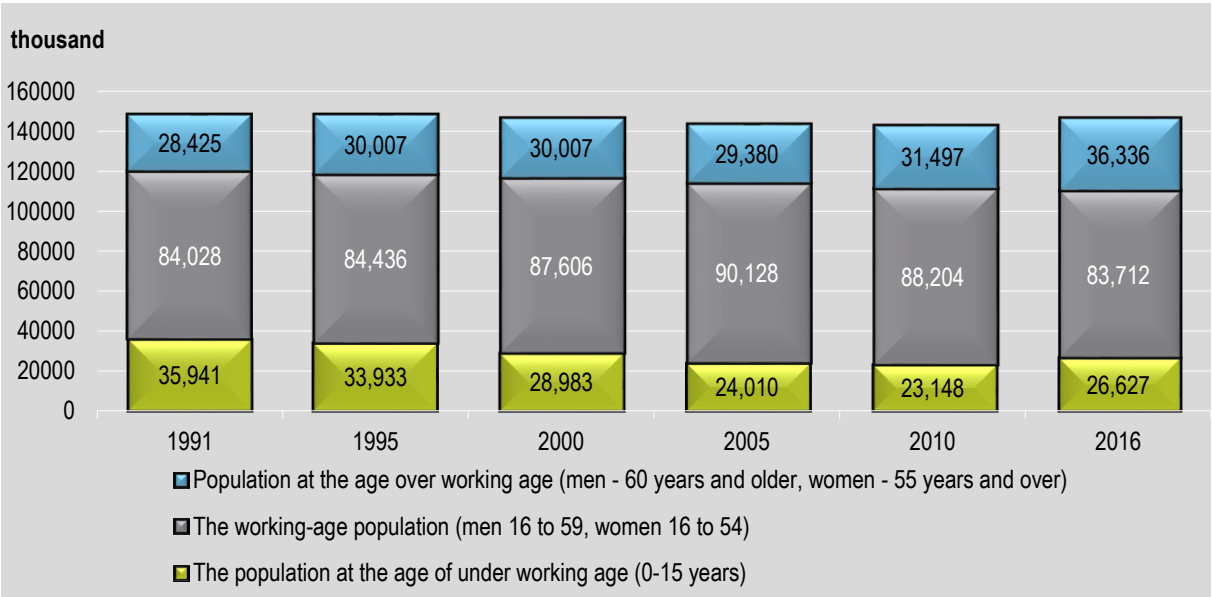



*Source:* Calculation according to [7].

The population under working age (future labour resources and contributors to the pension system) has decreased by 36% over 18 years: from 35.9 million people in 1991 to 22.8 million people in 2008. However, the above-mentioned increase in the birth rate made resulted in the reversal of this trend, and, in 2016, the population under working age increased to 26.6 million. (Figure 14).



**Figure 14.** *Average annual population of the Russian Federation by major age groups, thousands.*




*Source:* Calculation according to [4].

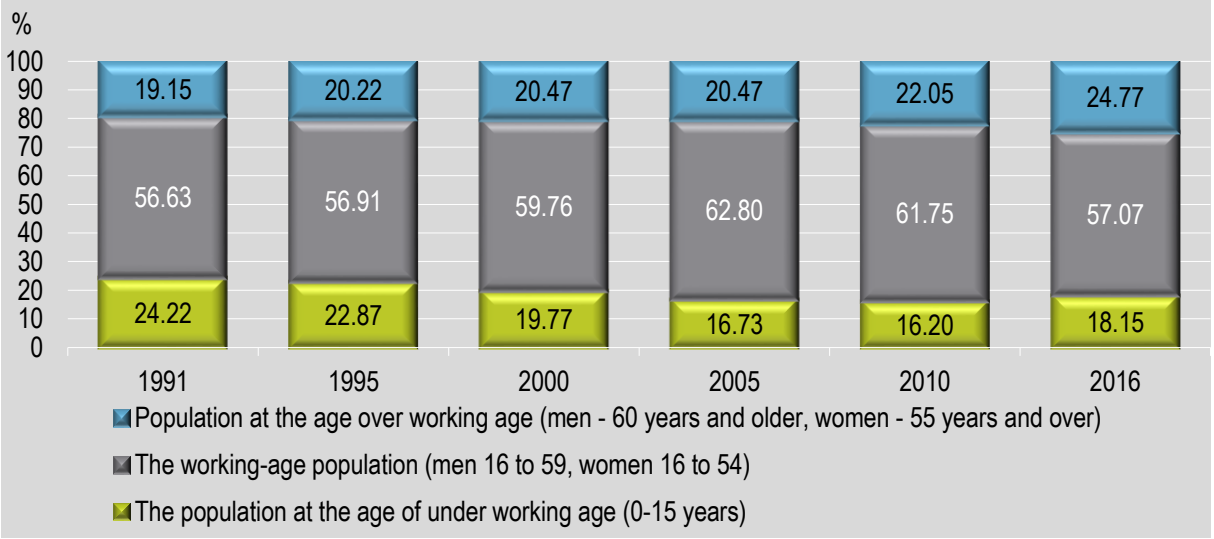
The especially strong decrease for this age group was observed between 1991 and 2008, when the share of population of these ages decreased from 24.2% to 16%. After 2008, the recovery resulting from the increase in fertility started, and the share of population in this age group reached 18.2% of population by 2016.

The number of working-age population (the main source of contributors to the pension system) decreased slightly from 84.0 million in 1990 to 83.7 million in 2016 (in the mid-2000s it

reached 90 million). On the contrary, its share increased from 56.6% in 1991 to 57.1% in 2016 (in the mid-2000s, it represented 63%of the population).

The seniors' population (the main source of recipients of old-age pensions) is growing quickly. Its number increased from 28.4 million in 1991 to 36.3 million in 2016, i.e. by 27.8%, and their share in the population increased from 19.2% in to 24.8% between 1991 and 2016.

**Figure 15.** *Structure of the population of the Russian Federation by major age groups, %*

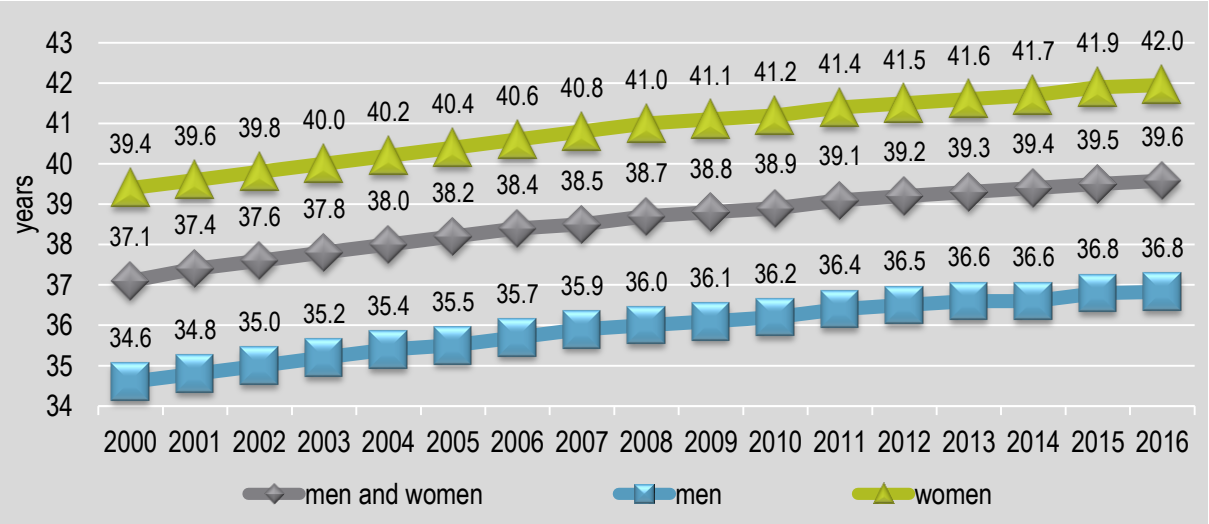



*Source:* calculation according to [4].



The increase in the proportion of the elderly population together with the decrease of the share of population younger than 15 years old, led to an increase in the average age of the population from 34.6 years in 1991 to 39.1 years in 2016, an increase of 4.5 years. Over the last 17 years the average age of population increased by 2.5 years (by 2.6 years for women and by 2.2 years for men) (Figure 16). Due to a significant gap in mortality rates, the male population of Russia in on average 5.2 years younger than the female population.

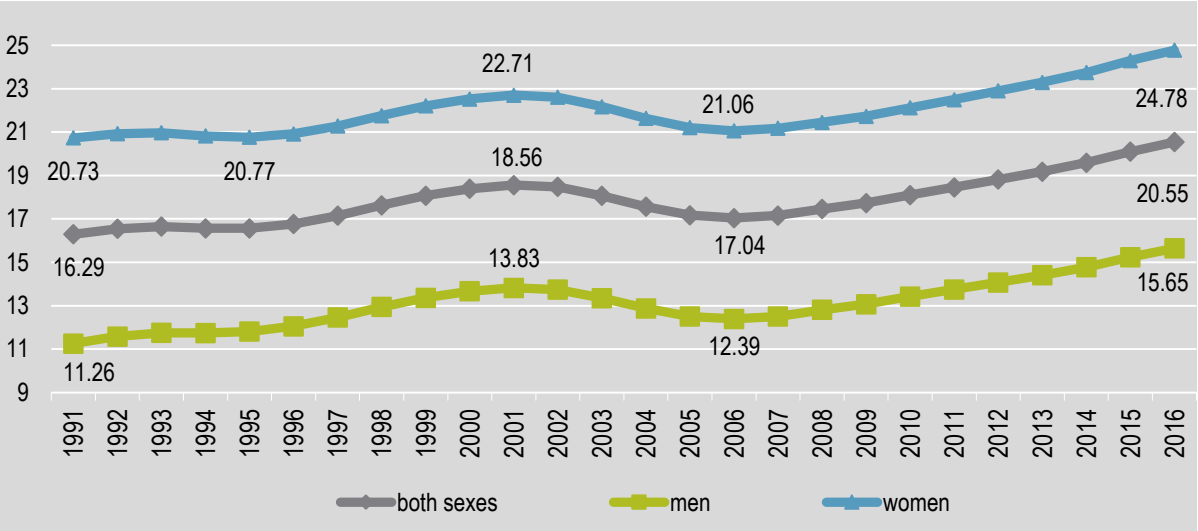
**Figure 16.** *Average age population as of January 1, years*




*Source:* [3].

The same processes resulted the increase in the share of the population over age 60 from 16.3% in 1991 to 20.1% in 2016 (Figure 17). Moreover, the population of Russia during the recent history of the country twice passed from high to very high level of demographic ageing (in 1999–2003 and from 2010 to the present).

**Figure 17.** *The ageing of the population in the Russian Federation, %*




*Source:* Calculation according to [4].

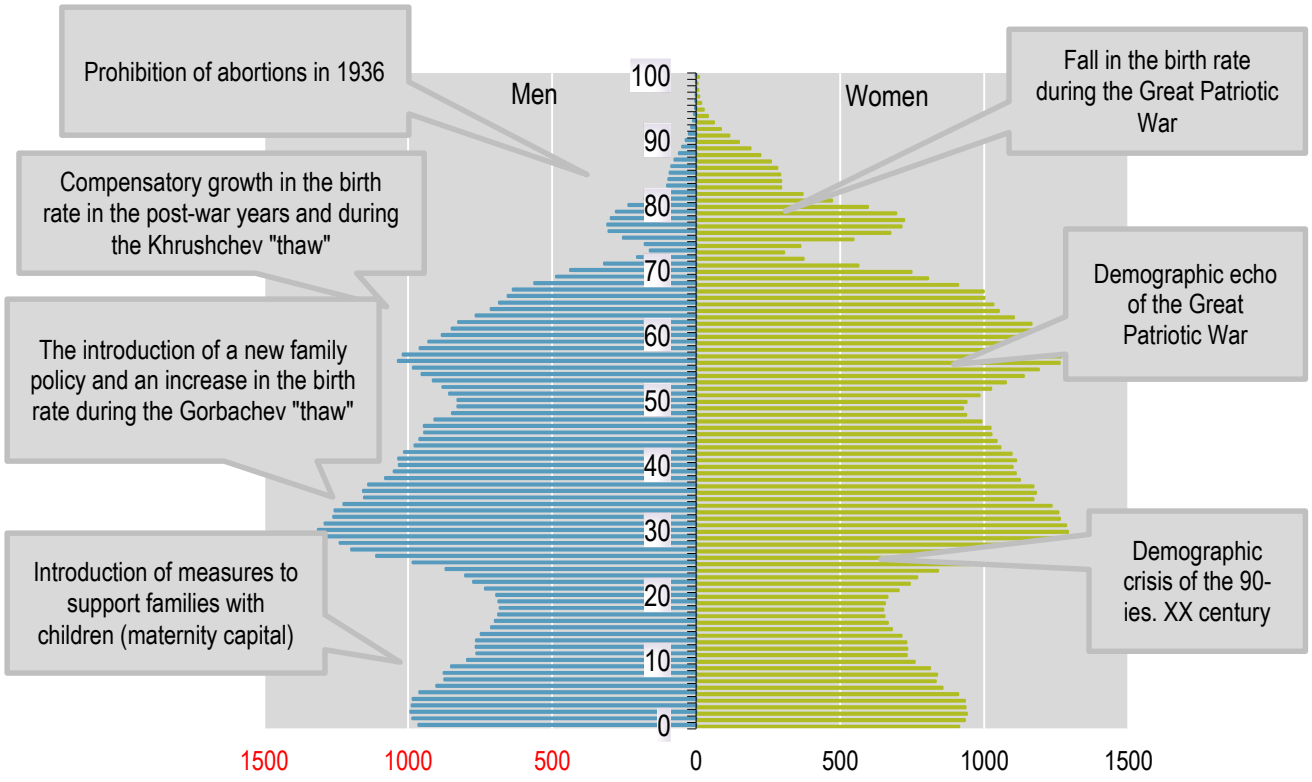


At the same time, the proportion of men aged 60 years and over is only 15.7%. So while male population has not yet reached a high level of demographic ageing, women are ageing at a very high rate: for them the ageing factor is 24.8%.

The previous peak in the growth of the ageing factor, which happened at the beginning of the 2000s, was significantly lower than the current one: the proportion of men and women aged 60 years and over was 13.8% and 22.7%, respectively.

In the long term, this ageing trend is likely to continue. According to Rosstat's forecast (medium variant), the ageing rate is projected to be 24.6% in 2030, 26% in 2040 and 28.5% in 2050. The observed fluctuations in fertility and mortality, e.g. waves of growth / decrease in the ageing of the population, are resulting of the echoes of two world wars that occur every 25–30 years and change the age pyramid (Figure 18).

**Figure 18.** *Age and sex structure of population in 2017, thousand people*

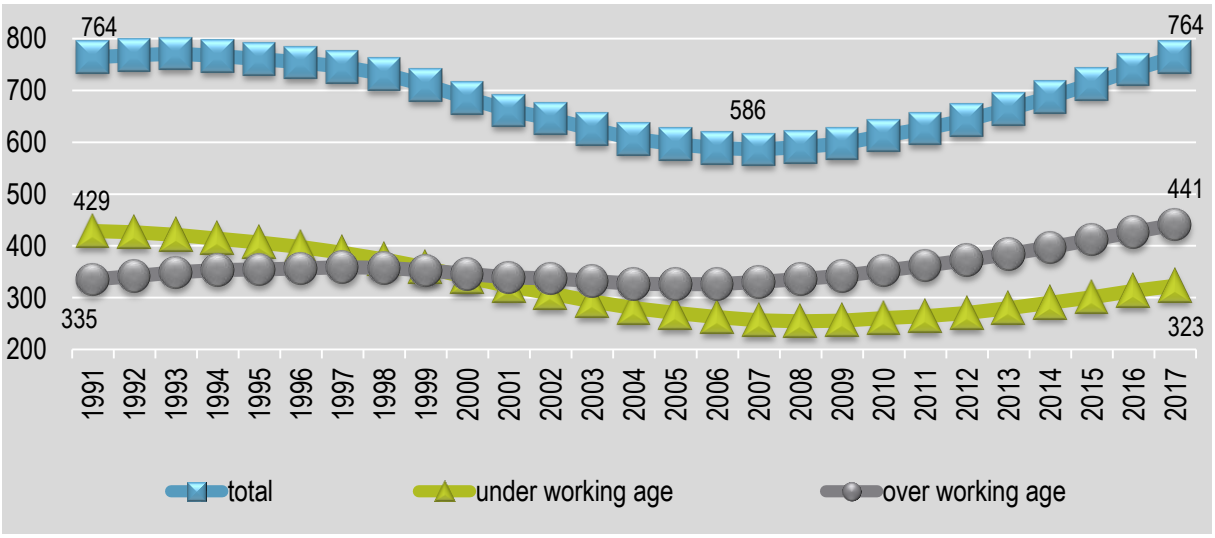



*Source*: [5].



As a result of the observed decline in the birth rate, the increase in mortality and the cessation of natural population growth caused by these processes, the absence of migratory growth and changes in the age structure, the total dependency ratio, which dropped from 764 dependent per 1,000 people at the working age at the beginning of 1991 to 586 in 2007, returned by the beginning of 2017 to the level of 1991 (Figure 19).

**Figure 19.** *Dependency ratios per 1,000 people of working age (at the beginning of the year)*




*Source:* [5].

The old-age dependency ratio (which is the determining factor for the development of the "pay-as-you-go" systems) has increased noticeably. If at the beginning of 1991, there were 335 people over working age per 1,000 people of working age, then by the beginning of 2017 this number was 441, an increase of 130%. The support ratio (the inverse of the old-age dependency ratio) decreased from 2,985 to 2,268 per 1,000 people.

According to Rosstat's long-term forecast (medium variant), the proportion of the working-age population will decrease to 53.4% by 2030, and to 49.9% by 2050. The share of population under working age will remain approximately at the same level as today ( in 2030 it is projected to be 18.7%, and in 2050) 18.6%. However, the share of population over working age is expected to increase to reach 27.8% in 2030 and 31.6% in 2050.

Accordingly, the old-age dependency ratio is projected to increase to 0.522 by 2030, and to 0.633 by 2050. The support ratio is projected to be 1.92 in 2030 and 1.58 in 2030 (compared to 2.27 in 2017).

However, the predicted demographic trends, which are currently unfavorable for the development of the pension system, can be changed through, for example, such measures as programs of state support for families, mothers and children implemented in Russia. These programs may, despite the reduction in the number of women of reproductive age, increase the birth rate and stop the reduction of the population under working age. In such way, the dependency and support ratio can be improved.



## 2. Increase of dependency ratio by pensioners who have not reached retirement age

Today, the level of demographic burden in Russia is such that each person of working age pays for the maintenance of a pensioner an amount that is less than a half of the required amount.

However, directly in the pension system, old-age dependency ratio is significantly higher, and the support ratio is significantly lower than those determined by demographic indicators.

Increasing burden within the pension system is related, on the one hand, with legislative norms that establish pension rules, and on the other hand, with the macroeconomic and labour market environments.

Let's consider the first of these factors – how the pension legislation determines eligibility for pensions and benefits amounts.

As of January 1, 2017, the population over working age was 36.7 million (Table 1). The total number of recipients of pensions as at the same date was higher by 6.5 million, or 17.7% and was 43.2 million. Since 2004, the total number of pensioners is constantly increasing.

**Table 1.** *Dynamics of the population over working age and the pensioners (at the beginning of next year), thousand people*

| Year | The population over the age of working (men – 60 years and older, women – 55 years and older) | Number of pensioners – total | Number of recipients of insurance pensions – total | Including, recipients of insurance pensions for old age |
|---|---|---|---|---|
| 2002 | 29,643 | 38,432 | 36,528 | 29,542 |
| 2003 | 29,346 | 38,164 | 36,215 | 29,080 |
| 2004 | 29,353 | 38,184 | 36,227 | 29,025 |
| 2005 | 29,408 | 38,317 | 36,179 | 29,194 |
| 2006 | 29,732 | 38,330 | 36,031 | 29,365 |
| 2007 | 30,161 | 38,472 | 35,958 | 29,791 |
| 2008 | 30,541 | 38,603 | 35,734 | 30,156 |
| 2009 | 31,186 | 39,095 | 36,109 | 30,831 |
| 2010 | 31,809 | 39,711 | 36,564 | 32,466 |
| 2011 | 32,434 | 40,167 | 36,916 | 32,985 |
| 2012 | 33,100 | 40,578 | 37,251 | 33,454 |
| 2013 | 33,789 | 41,025 | 37,655 | 33,954 |
| 2014 | 35,163 | 41,462 | 38,022 | 34,426 |
| 2015 | 35,986 | 42,735 | 39,146 | 35,534 |
| 2016 | 36,685 | 43,183 | 39,548 | 36,008 |

*Source:* [7], [8].



If we compare the total number of pensioners as of January 1, 2017 with the working age population (83.2 million), the dependency ratio will be 0.519 instead of previously calculated 0.441 for the population (an increase of 17.7%), and the support ratio will decrease accordingly from 2.3 to 1.9 (s decrease of 17.4%) This is due to the inclusion of younger age groups in the total number of pensioners.

Thus, in the pension system, the existing demographic burden on the working-age population by the population over the working age increases by 17.7%, and support is reduced by 15% due to the inclusion of other age groups in the total number of pensioners.

The total number of pensioners includes all pensioners who receive pensions from the Pension Fund of the Russian Federation under:

- Compulsory Pension Insurance (insurance pensions, depending on the work period and contributions); and
- State Pension Provision (it includes those who (1) are not eligible to a pension from the CPIS, and therefore become eligible for a social pension 5 years later than the general retirement age, (2) retired military personnel, (3) persons who have suffered in the radiation and man-caused disasters, (4) astronauts, (5) family members of these categories of recipients, (6) federal civil servants, etc.).

The number of recipients of pensions under State Pension Provision as of 01.01.2017 was 3.64 million people (8.4% of the total number of pensioners). Out of this number, only 0.49 million people (13.4%) are over working age, the remaining 3.15 million have not reached age 55 (women)/60 (men).

The main contingent of pensioners (more than 91% of the total number) received insurance pensions from the CPIS. As of January 1, 2017, their number was 39.55 million people, which is 2.9 million people or 7.8% higher than the number of people over working age.

In the CPIS currently there are 475 pensioners per 1,000 of contributors.

The number of recipients of an insurance pension after a short period of growth will begin to decline in the long term (Table 2), due to the stricter eligibility conditions for the length of the work period and the amount of pension rights. In 2030, the number of pensioner is projected to reach 40.95 million people, an increase of 3.5% compared with 2016. In 2050, according to estimates, the number of recipients of insurance pensions will decrease to 39.58 million, i.e. to the level of early 2017.

The number of pensioners of the CPIS relative to the working-age population will increase until the mid-2020s (in 2025 it will reach 520 recipients of insurance pensions for 1,000 working-age people). In the 2030s it will stabilize at the level of 518, and by 2050 will again grow to 542 recipients of insurance pensions for 1,000 working-age people.



***Table 2.*** *Forecast of the population of working age, recipients of insurance pensions and load factors*

| | 2020 | 2025 | 2030 | 2035 | 2040 | 2050 |
|---|---|---|---|---|---|---|
| Working-age population, millions | 80.91 | 79.02 | 79.05 | 78.98 | 77.50 | 72.96 |
| Recipients of insurance pensions, millions | 40.73 | 41.09 | 40.95 | 40.91 | 40.83 | 39.58 |
| The load factor of the population over working age to the population under working age, per thousand | 47.8 | 51.1 | 52.2 | 53.6 | 56.4 | 63.3 |
| The load factor of recipients of insurance pensions to working-age population, per thousand | 50.3 | 52.0 | 51.8 | 51.8 | 52.7 | 54.2 |

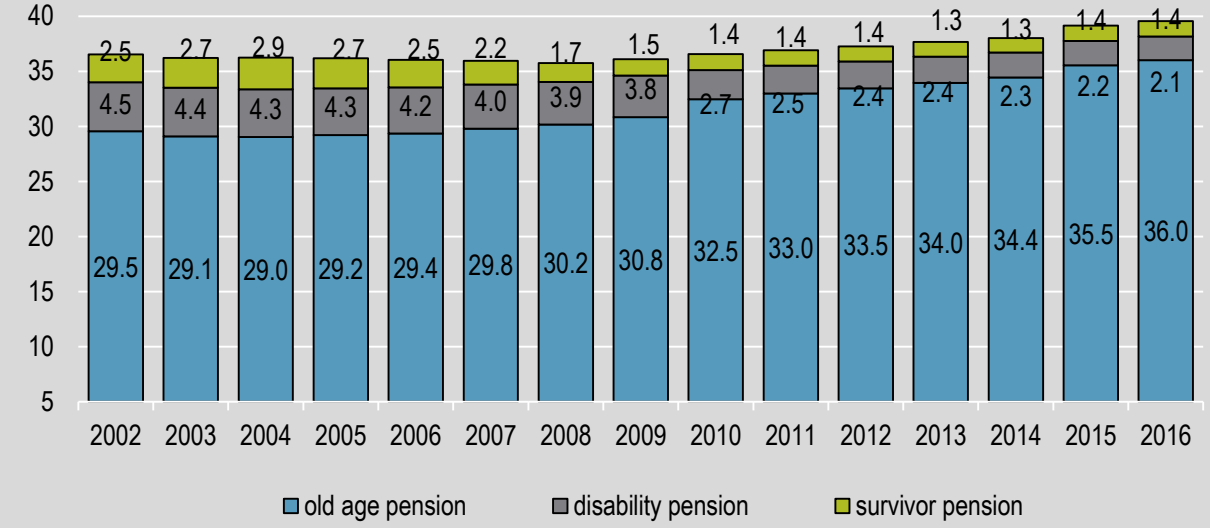
*Source:* [2], [9].

At the beginning of the forecast period, similar to today's situation, the burden on the working-age population is higher for recipients of insurance pensions than if determined based on the number of the population over working age. However, already by the 2030s, due to the strengthening the eligibility criteria introduced tin 2015, an increasing number of people reaching retirement age will either have to continue working to earn the necessary pension rights, or to wait for the eligibility for a social pension at the age of 60 (women)/65 years (men). Therefore, the burden on the working-age population of the recipients of the insurance pension will be significantly lower (in 2050 – by 15%) than the population old-age dependency ratio.

The current relationship between the load factors calculated using general population over working age and the number of recipients of insurance pensions is a result of the age structure of pensioners.

The CPIS pays insurance pensions of three types: old age, disability and survivor pension. The number of the recipients as of January 1, 2017 was 36.01 million, 2.14 million, and 1.4 million, respectively (91%, 2.1% and 1.4%) (Figure 20).

**Figure 20.** *Evolution of the number of recipients of an insurance pension (by type of pension), millions*




*Source:* [8].

Recipients who have not reached the generally established retirement age, exists for each type of insurance pension. Their total number is 5.53 million, or 14% of the total number of recipients of insurance pensions, including: 317 thousand people aged under working age and 5.21 million people of working age.



Thus, in the pension system, there are 5.53 million beneficiaries of insurance pensions and 3.15 million of recipients of State Pension Provision pensions who do not reach the general retirement age. These people increase the burden on the working-age population. Such beneficiaries represent 20% (8.68 million) of the total number of pensioners who receive pensions from the Pension Fund.

Over the age of working age (55 years and older for women and 60 years and older for men) there are 34.03 million people or 86% of recipients of insurance pensions.

Together with the recipients of pensions under State Pension Provision, the number of pensioners over working age is 79.8% (34.52 million). This number is lower by 5.9% (2.17 million) than the general population in these age groups. Individuals included in these 2.17 million are either not eligible for insurance pension and are still working or wait for the eligibility age for the social pension, social pension) or receive pensions from other organizations[1].

Let's consider the impacts of the distribution of people below retirement age and whether these impacts can be reduced without increase in the legislated retirement age.

1. In addition to the pensions from Pension Fund, pensions could be paid by the Ministry of Defense of the Russian Federation and some other departments.

The share of beneficiaries younger than the statutory retirement age varies depending on the type of pension from 7.4% to 99.3% (Table 3).

**Table 3.** *Age structure of recipients of insurance pensions*

| Age | Old age | Disability | Survivor |
|---|---|---|---|
| *thousand people* | | | |
| under working age | 0 | 0 | 317 |
| working-age | 2,653 | 2,126 | 427 |
| over working age | 33,355 | 15 | 656 |
| *% of the number of recipients of a pension of the corresponding type* | | | |
| under working age | 0.0 | 0.0 | 22.6 |
| working-age | 7.4 | 99.3 | 30.5 |
| over working age | 92.6 | 0.7 | 46.9 |

*Source:* [8].

99.3% of the recipients of disability insurance pensions or 2.1 million people are below the general pension age. This is due to the legislation that provides for the automatic conversion of eligible disability pensioners to the old-age insurance pensioner when they reach retirement age. The remaining 0.7% of pensioners who are older than retirement age but continue to receive an insurance disability pension are not eligible to the old-age insurance pension, and after reaching age 60/65 (respectively, women and men) will be transferred to the State Pension Provision System on a social pension.



Among the recipients of insurance survivor pensions 53.1% have not reached retirement age. The smallest proportion of people of below retirement age is among old-age pensioners and it is equal to 7.4%. However, but the number of people in this group is 2.6 million which is comparable to the number of disability pensioners in the same age group.

Such a significant number of old-age pensioners who have not reached the generally established retirement age is explained by the existence in the Russian pension system of so-called pre-term (preferential) pensions. These pensions are paid according to the rules established in the period of the USSR. These rules cover individuals working in harmful and dangerous working conditions, in the health care, education, etc., as well as working and living in extreme climate conditions - in the regions of the Far North and comparable locations. As a rule, the age of eligibility for early ol-0age insurance pension is 5 (and in some cases, 10 or more) years below the general established retirement age.

Out of 36.01 million old-age pensioners, slightly more than 2/3 (24.56 million) retired at the generally established retirement age. The remaining 11.45 million (31.8%) retired before reaching it the generally established retirement age (Table 4). About a quarter of this subpopulation (2.65 million people) are still below the generally established retirement age.

**Table 4.** *Number of recipients of early insurance pensions for old age, millions*

| The name of indicators | As at 31.12.2002 | As at 31.12.2014 | As at 01.01.2017 |
|---|---|---|---|
| Insurance old-age pension – total | 29.54 | 34.43 | 36.01 |
| including: | | | |
| on a universal basis | 20.28 | 23.14 | 24.56 |
| early – total | 9.26 | 11.29 | 11.45 |
| Out of them: | | | |
| Preferential grounds | 1.65 | 1.38 | 1.40 |
| List 1 | 2.03 | 1.91 | 1.86 |
| List 2 + related conditions | 2.68 | 3.17 | 3.21 |
| Far North | 1.96 | 2.86 | 2.92 |
| Length of service | 0.91 | 1.94 | 2.06 |
| Other | 0.03 | 0.03 | 0.00 |

*Source:* [8].

The largest proportion of individuals who have not reached the statutory retirement age into either the subgroups for which the lower age limits for retirement have been established – for example, List No. 1 (45 years of a woman and 50 years of age for a man), or for which the eligibility to retire is determined based on the length of service in the specific working conditions - such categories include teachers and medical workers (Table 5).



**Table 5**. *Age structure of recipients of certain types of early insurance pensions as of 01.01.2017, %*

| Age | List 1 | List 2 | Similar to List 2 conditions ("small lists") | Pedagogical workers | Medical workers | Worked in the Far North |
|---|---|---|---|---|---|---|
| under working age | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| working-age | 25.90 | 18.48 | 27.05 | 31.99 | 35.05 | 19.79 |
| over working age | 74.10 | 81.52 | 72.95 | 68.01 | 64.95 | 80.21 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Source:* [8].

The number of new early retirement beneficiaries of old-age insurance pensions and their proportion are gradually decreasing (Table 6), which is related to the improvement of working conditions and the certification of workplaces for the presence of harmful and dangerous conditions that give the right to early retirement. Today it is 21.7%, although in the early 2000s it reached 34 to 37.5%.

Thus, as at January 1, 2017, the demographic burden of 441 people over working age for 1,000 people of working age, translates to 519 people inside the pension system as a result of 8.68 million of pension recipients who have not reached the generally established pension age.

64% of the additional increase in the dependency ratio (reduction in support) is accounted for by recipients of insurance pensions that have not reached the generally established retirement age – they are recipients of early retirement pensions, disability pensioners and survivors.

These recipients account for 33% of new beneficiaries. They will significantly reduce the impact of reducing the number of pensioners in the case of a decision to raise the retirement age.

**Table 6.** *Number of recipients of old-age insurance pensions, appointed in the reporting year*

| | Old age | Including: | | The share of early retirement pensions in new old-age pensions, % |
|---|---|---|---|---|
| | | on a universal basis | early | |
| 2002 | 1.27 | 0.83 | 0.44 | 34.65 |
| 2003 | 1.14 | 0.72 | 0.42 | 36.84 |
| 2004 | 1.41 | 0.88 | 0.53 | 37.59 |
| 2005 | 1.45 | 0.92 | 0.53 | 36.55 |
| 2006 | 1.47 | 0.98 | 0.49 | 33.33 |
| 2007 | 1.59 | 1.08 | 0.50 | 31.45 |
| 2008 | 1.54 | 1.05 | 0.49 | 31.82 |
| 2009 | 1.71 | 1.20 | 0.51 | 29.82 |
| 2010 | 1.85 | 1.33 | 0.52 | 28.11 |
| 2011 | 1.65 | 1.16 | 0.50 | 30.30 |
| 2012 | 1.65 | 1.19 | 0.46 | 27.88 |
| 2013 | 1.65 | 1.21 | 0.44 | 26.67 |
| 2014 | 1.55 | 1.17 | 0.37 | 23.87 |
| 2015 | 1.63 | 1.27 | 0.36 | 22.09 |
| 2016 | 1.57 | 1.23 | 0.34 | 21.66 |

*Source:* [8].



The increase in the generally established retirement age can lead to a reduction in this part of the dependency ratio only if the number of the recipients of early retirement pensions would reduce as well. However, given that the early old-age pensions are granted in connection with the work in unhealthy working conditions or place of residence, a change in the retirement age for such people should be done only after a full assessment of the consequences of such a step on the health and disability of people.

It is possible to eliminate the burden of early retirement benefits from the CPIS by creating additional pension programs for the relevant categories of insured persons, participation in which will ensure that they are paid a separate benefit between their retirement and the general established pension age. But such a measure can be implemented without raising the pension age.

The number of new disability insurance pensions and survivor pensions can only increase with an increase in the retirement age due to the age groups that will become a part of the new working age labour force.

At the same time, an active state policy aimed at creating conditions for increasing the employment of disabled people can help reduce the burden of the pension system on the employed population by increasing the number of persons with disabilities who pay insurance contributions to the Pension Fund.

The number of recipients of pensions of various types, who are disabled, as of January 1, 2016 was 12.4 million people; as of January 1, 2017, it reduced to 11.9 million. Men make up 43% of disabled people registered with the Pension Fund of the Russian Federation, women 57%.

The most common disability group is the second. It includes 47% of disabled people, out of which 18% are men and 29% are women.

Within the gender groups, the second group of disabilities is also the most widespread – 43% and 50% of disabled men and women, respectively, fall into this group.

Together with the disabled of the group with most severe disability – the first (12% of men and women fall into this group) for men, the share of disabled people with high (impossible to work) disability is 55% for men and 62% for women. In relation to the total number of people with disabilities, the relative importance of the first and second disability groups is 59%.

Children with disabilities represent 5% of disability pensioners.

30% of the disabled, of which 19% are men and 11% are women, are people of the working age. It is this subgroup (Table 7) that can become one of the reserves to increase the number of contributors, provided that conditions are created for their involvement in labour activity. And only 3.5% of disabled people who are of the working age belong to the first (most severe) group of disability. Even in this case, for some people this is not an obstacle for labour force participation (2.8% of disabled pensioners of the first group work).

**Table 7.** *Distribution of disabled persons, information on whom is contained in the Federal Register of Persons Eligible for State Social Assistance by Age Group,%*



| Age | Disabled persons (%) | of them: | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Men | | | | Women | | | |
| | | I dis. group | II dis. group | III dis. group | Children with dis. | I dis. group | II dis. group | III dis group | Children with dis. |
| 0–15 | 4.5 | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 0.0 | 1.9 |
| 16–19 | 1.1 | 0.1 | 0.1 | 0.1 | 0.3 | 0.0 | 0.1 | 0.1 | |
| 20–24 | 1.3 | 0.1 | 0.3 | 0.3 | | 0.1 | 0.2 | 0.3 | |
| 25–29 | 2.2 | 0.2 | 0.5 | 0.5 | | 0.1 | 0.4 | 0.4 | |
| 30–34 | 2.8 | 0.3 | 0.7 | 0.7 | | 0.2 | 0.5 | 0.5 | |
| 35–39 | 3.2 | 0.2 | 0.8 | 0.7 | | 0.2 | 0.7 | 0.6 | |
| 40–44 | 3.7 | 0.3 | 0.9 | 0.9 | | 0.2 | 0.8 | 0.7 | |
| 45–49 | 4.3 | 0.3 | 1.0 | 1.0 | | 0.2 | 0.9 | 0.9 | |
| 50–54 | 6.5 | 0.3 | 1.4 | 1.6 | | 0.3 | 1.3 | 1.5 | |
| 55–59 | 9.9 | 0.5 | 2.1 | 2.6 | | 0.4 | 2.0 | 2.3 | |
| 60–64 | 11.5 | 0.6 | 2.2 | 2.7 | | 0.6 | 2.6 | 2.9 | |
| 65–69 | 12.9 | 0.7 | 2.3 | 2.3 | | 0.8 | 3.7 | 3.1 | |
| 70+ | 36.1 | 1.6 | 5.9 | 2.9 | | 4.0 | 15.5 | 6.2 | |
| Total | 100 | 5.2 | 18.2 | 16.5 | 2.9 | 7.0 | 28.6 | 19.4 | 2.2 |

*Note*: dis = disability. *Source:* [10].

65% of the disabled (about 8 million people) are over working age. Out of this number, 2 million people will be counted as working age people in the case the retirement age were to be increased to 65 (55to 64 years for women/60 to 64 years for men). These people will automatically be excluded from the number of those who will be affected by the increase the retirement age.

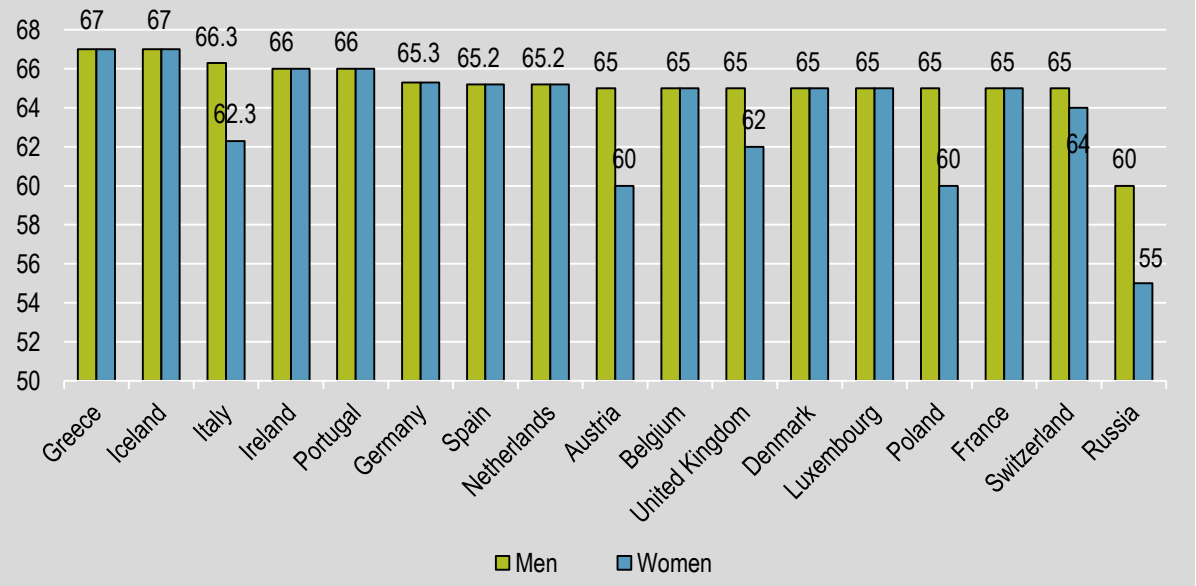
10.2% of current disability beneficiaries become disabled between ages 55 and 59, and 13.3% between age 60 and 64. With an increase in the generally established retirement age to, for example, 65 years, it should be taken into account that the expected number of working-age people who are expected to continue working will be reduced at least by the number of disabled pensioners between ages 55 and 64 (taking into account gender differences in the current retirement age, this is 16% of the number of disabled people), converted to the equivalent of the population of this age group (about 2.8 million people as of 01.01.2017).

## 3. Demographic criteria for choosing a retirement age: life expectancy and probability of surviving to a pension

Russia's established retirement age is one of the lowest compared to the EU and OECD countries (Figure 21). But there are objective reasons for that, including demographic conditions driven by the specifics of the ageing process and the life expectancy of the population of Russia.



**Figure 21.** *Eligibility age for full pension in OECD and Russia, years*




*Source*: [11], [12], [13].

The ageing of the population is driven by two factors: on the one hand, a decrease in the birth rate (the so-called "ageing from below"), and on the other, a decrease in the mortality of elderly (ageing from the top) [14]. In Russia, the demographic situation reflects the ageing "from below", that is, the Russian population is ageing primarily because of low birth rates. At the same time, the mortality of the elderly is still quite high.

The achieved increase in life expectancy at birth in our country is mainly a result of the reduction in infant mortality, which just counteracts ageing and amounts to an increase in the birth rate [14].

Life expectancy at birth (hereinafter, $LE_0$) as a whole for the population of Russia in 2016 was 71.87 years, having increased by 6.53 years from 2000, i.e. by 10%.

For women, $LE_0$ increased by 4.8 years, or 6.6%, for men – by 7.5 years or by 12.6% (Table 8). At the same time, women's $LE_0$, which in 2016 was 77.06 years, exceeded the $LE_0$ of men by 10.56 years. However, compared to 2000, the gap between men and women life expectancy at birth has decreased by 2.67 years (from 13.23 years).

**Table 8.** *Evolution of life expectancy at birth, years*

| Year | Both sexes | Men | Women |
|---|---|---|---|
| 2000 | 65.34 | 59.03 | 72.26 |
| 2001 | 65.23 | 58.92 | 72.17 |
| 2002 | 64.95 | 58.68 | 71.90 |
| 2003 | 64.86 | 58.56 | 71.86 |
| 2004 | 65.31 | 58.91 | 72.36 |
| 2005 | 65.37 | 58.92 | 72.47 |
| 2006 | 66.69 | 60.43 | 73.34 |
| 2007 | 67.61 | 61.46 | 74.02 |
| 2008 | 67.99 | 61.92 | 74.28 |
| 2009 | 68.78 | 62.87 | 74.79 |
| 2010 | 68.94 | 63.09 | 74.88 |
| 2011 | 69.83 | 64.04 | 75.61 |
| 2012 | 70.24 | 64.56 | 75.86 |
| 2013 | 70.76 | 65.13 | 76.30 |
| 2014 | 70.93 | 65.29 | 76.47 |
| 2015 | 71.39 | 65.92 | 76.71 |
| 2016 | 71.87 | 66.50 | 77.06 |

*Source:* [15].

Demographic processes, like any other phenomenon occurring in Russia, have their own unique regional specifics. Russia, being a multinational state with the largest territory, includes more than 80 federal subjects - regions with different economic, social, national, genetic, climatic and so on environments that somewhat affect the life expectancy of the population.

The $LE_0$ for women, which in Russia as a whole was 77.06 years in 2016, varies by region: from 69.35 years in the Republic of Tyva to 83.62 years in the Republic of Ingushetia (15 years difference). At the same time, in 2016, 54 subjects of the Federation, where 54% of newborn girls live, have $LE_0$ below the average level.

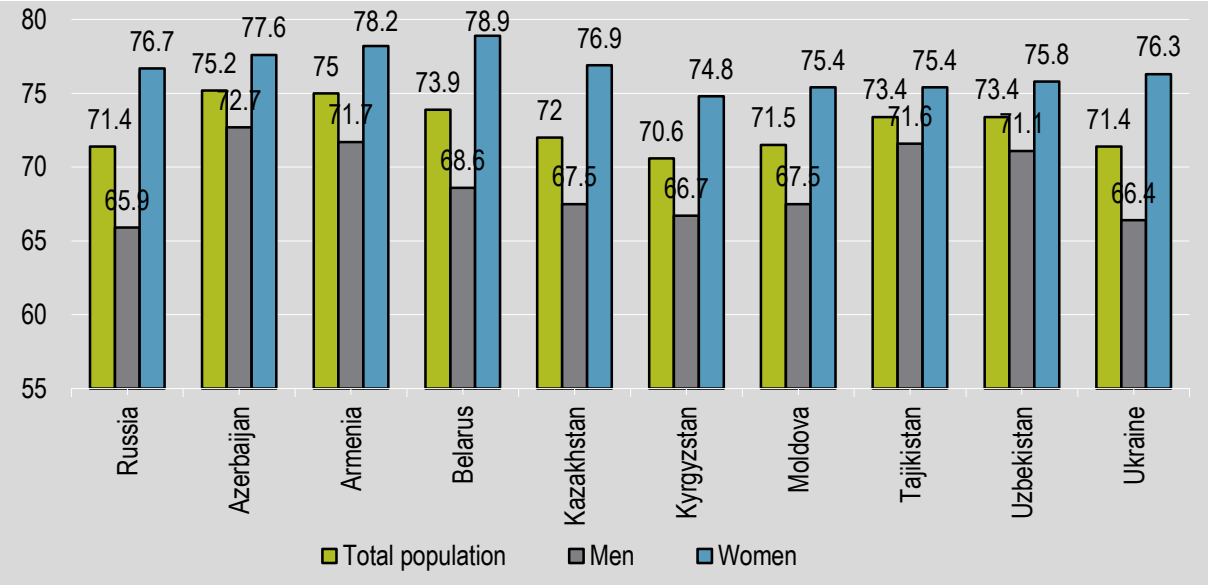
The $LE_0$ of men in 2016 in Russia as a whole was 66.50 years, i.e. 10.56 years lower than $LE_0$ of women. By regions, the indicator varies from 59.13 years in the Republic of Tyva to 77.35 years in the Republic of Ingushetia (difference of 18.22 years), i.e. the minimum regional

$LE_0$ for men is at the level of the average for Russia in 2000. The lower limit of $LE_0$ for men is 10.22 years lower than one for women, and the upper limit is 6.27 years lower. The maximum $LE_0$ in men is higher than the average for Russia in women only by 0.29 years. The $LE_0$ of boys in 2016 was lower than the national average in 61 regions of the Russian Federation that cover 56% of newborn boys.

Thus, more than half of the newborn girls and boys have life expectancy at birth lower than the national average. From the point of view of the current level of $LE_0$, the issue of raising the retirement age is not relevant for the population (especially the male population) in most of the country's regions.

Despite the growth of the $LE_0$ in Russia, its value is much lower than that of our neighbors and partners: the CIS countries (Figure 22), BRICS, and the EU countries.

**Figure 22.** *Life expectancy at birth in Russia and CIS countries in 2015, years*




*Source:* [16].

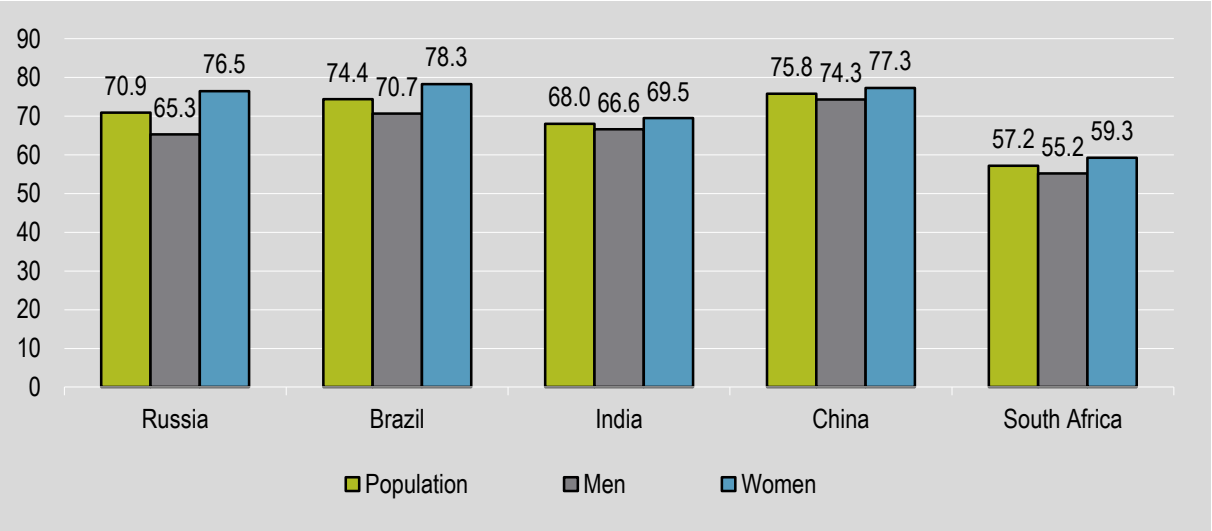
In 2015, the $LE_0$ of men in Russia was the lowest among the CIS countries. $LE_0$ of women relative to other CIS countries is at the average level. The indicator's value for the whole population (71.4 years in 2015) was also one of the lowest - it is lower only in Kyrgyzstan.

Among the countries that are part of the BRICS group, according to data for 2014, Russia was only ahead of South Africa in terms of $LE_0$. In respect of the women's $LE_0$, Russia is on the third place, behind China and Brazil, but noticeably ahead of India and South Africa (Figure 23).

$LE_0$ in Russia is significantly lower than in EU countries (Figure 24): by 7 to 8 years for men and by 5 to 6 years for women (according to data for 2014). Even the lowest values of $LE_0$ in the EU countries are higher than in Russia – by 3.3 years for men (Lithuania) and by 2.2 years for women (Romania).

For men, the gap between most EU countries and Russia exceeds half of the actual period of payment of the old-age insurance pension, while for women it is about a third of its duration.

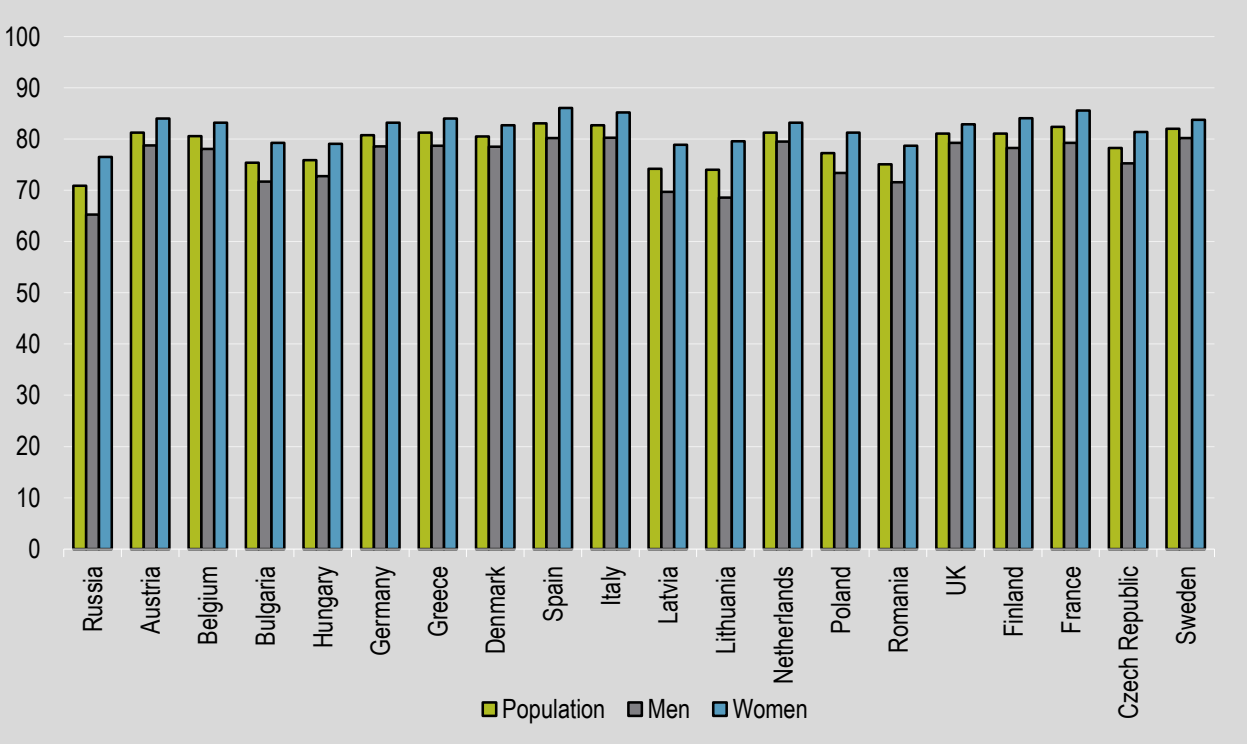
**Figure 23.** *Life expectancy at birth in Russia and the BRICS countries in 2014, years*




*Source:* [16].

Thus, if $LE_0$ is considered as a basis for raising the retirement age – as advocated by some supporters of this measure in Russia - then the comparison with the EU countries shows that this decision is premature.

**Figure 24.** *Life expectancy at birth in Russia and the EU countries in 2014, years*





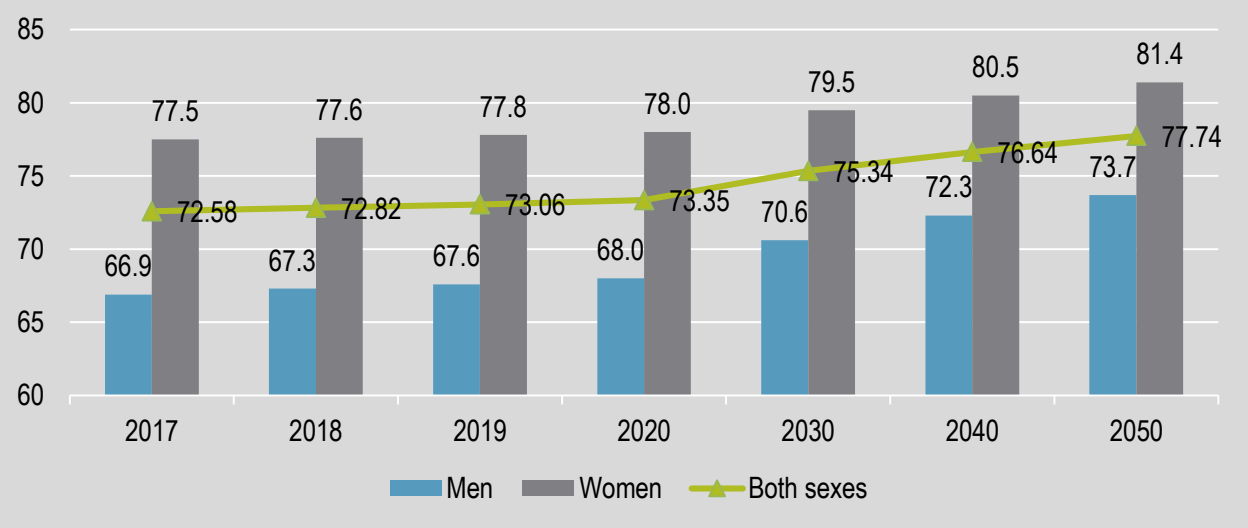

*Source*: [16].

In the long term, the life expectancy at birth is projected to increase (Figure 25). However, it is impossible to rely on projected but not achieved values in such an important issue as establishing a retirement age.

Life expectancy at birth does not show how many newborns will survive to retirement and how many years these people will live after reaching retirement age, and therefore cannot be used as a criteria for justifying the increase in retirement age.

Thus, we need to focus on life expectancy at retirement age. For Russia, these are currently life expectancy indicators at the age of 55 years ($LE_{55}$) for women and at the age of 60 years ($LE_{60}$) for men.

**Figure 25.** *Forecast of life expectancy at birth in Russia, years*






*Source:* Calculation according to [2].

The growth of LE the pension age in absolute terms was significantly less than at birth. Thus, the life expectancy at reaching the generally established retirement age in 2016 was 25.8 years for women, and 16.08 years for men (Table 9). If $LE_0$ for women for the period since 2000 has grown 4.8 years, then $LE_{55}$ increase only by 3.27 years and $LE_{60}$ by 2.97 years. $LE_0$ for men increased by 7.47 years, while $LE_{60}$ increased only by 2.87 years.

The values of this indicator achieved to date are only slightly higher than the level of the mid-twentieth century. The LE of 55-year-old women is only 1.6 years higher than the level at the end of 1958–59. $LE_{60}$ of men was, as recently as in 2012–13, lower than in 1958–59, and, in 2000, it was at the level of the end of the 19th century. In 2016, it was only 0.18 years higher than the values at 1959 (Table 10).

Thus, if we are guided by the achieved increase in the LE at age 55 and 60, then it is necessary to raise the generally established retirement age in Russia by 0.18 years for men and by 1.6 years for women.

Raising the retirement age to 65 is considered by its supporters as the most promising option, which has the maximum effect for stabilizing the financial state of the Pension Fund of the Russian Federation [18]. Therefore, we estimate the increase in the value of the LE at these ages.

Evolution of LE at the age of 63 and 65 years ($LE_{63}$ and $LE_{65}$) indicates to even a lesser degree than the evolution of $LE_{55}$ and $LE_{60}$, indicates the readiness of Russia to change the retirement age.

**Table 9.** *Life expectancy at selected ages, 2016, men and women*

| Age, years | Average in Russia, years | Absolute growth of 2016 by 2000, years | Minimum/maximum LE by subjects of the Russian Federation, years | Span of variation, years | The growth rate of LE in 2016 in comparison with 2000 |
|---|---|---|---|---|---|
| *Women* | | | | | |
| 0 | 77.06 | 4.80 | 69.35/83.62 | 14.27 | 1.066 |
| 55 | 25.80 | 3.27 | 21.64/30.89 | 9.25 | 1.145 |
| 60 | 21.64 | 2.97 | 18.03/26.37 | 8.34 | 1.159 |
| 63 | 19.24 | 2.82 | 16.07/23.65 | 7.58 | 1.172 |
| 65 | 17.69 | 2.69 | 14.73/21.98 | 7.25 | 1.179 |
| *Men* | | | | | |
| 0 | 66.50 | 7.47 | 59.13/77.35 | 18.22 | 1.127 |
| 55 | 19.25 | 3.40 | 15.91/27.40 | 11.49 | 1.215 |
| 60 | 16.08 | 2.87 | 13.25/23.29 | 10.04 | 1.217 |
| 63 | 14.43 | 2.62 | 11.60/20.98 | 9.38 | 1.222 |
| 65 | 13.38 | 2.48 | 10.94/19.57 | 8.63 | 1.228 |

*Source:* calculation according to [15].

**Table 10.** *Evolution of LE at retirement age in Russia in the 19th and 20th centuries, years*



| Sex and age | 1896-1897 | 1926-1927 | 1958-1959 | 2000 | 2012 | 2013 | 2016 |
|---|---|---|---|---|---|---|---|
| Men age 60 | 13.9 | 14.5 | 15.9 | 13.21 | 15.38 | 15.73 | 16.08 |
| Women age 55 | 17.2 | 20.7 | 24.2 | 22.53 | 25.05 | 25.36 | 25.8 |

*Source:* [15], [17].

$LE_{63}$ in 2016 was 14.43 years for males and 19.24 years for females. Compared to 2000, the increase was 2.62 and 2.82 years, respectively.

$LE_{65}$ was 13.38 years for males and 17.69 years for females, and the increase from 2000 is as insignificant as at the age of 63 years – 2.48 and 2.69 years.

For men at the age of 60-65 years, this increase is 2.6–3 times lower than the one at birth, and for women it is 1.6 to1.8 times lower.

Thus, the increases in overall LE in Russian at current retirement age as well as at age up to age 65, are substantially lower than the amount by which the retirement age is proposed to be raised.

The differences in LE by region is too large to focus only on the all-Russian level.

The number of regions in which the LE at ages 55–65 is below the national average varies from 59 to 63 for women and from 65 to 66 for men.

For men, the values of LE at age 6 vary by region from 13.25 to 23.29 years (i.e. by 10 years), at 65 years – from 10.94 to 19.57 years (that is, by 8.63 years).

For women, the LE at the current retirement age varies between 21.64 and 30.89 years (that is, the range of 9.25 years), and at the age of 65 varies by 7 years (from 14.73 and 21.98 years).

Given such significant variation in the values of the LE, the impact of the change in the retirement age on the benefit payment period will be barely noticeable for the population of some regions, but may be critical and even catastrophic for others.

Another demographic indicator that measures how well characterizes the pension system fulfill its function of providing support for citizens is the probability of surviving to the retirement age.

According to the life tables and life expectancy of the population in 2015, in the Russian Federation, 90.7% of women and only 68.17% of men will survive from birth to the general established retirement age. Thus, for newborn girls, the proportion of those who can use the accumulated pension rights (start receiving a pension) is 22.5% higher than for newborn boys.

With the increase of the retirement age to the maximum discussed limit of 65 years in today's conditions, more than 80% of women will be able to use their pension rights, whereas for men the today's low probability of surviving (less than 67%) will decrease even more.

For women, there is no contraindication to raising the retirement age from the point of view of regional differentiation of the probability of surviving to it, except for a few regions with very low probability of surviving to age 65 (this probability differ from 64.81% in Tyva (minimum) to 91.65% in Ingushetia).



For the male population of many regions, even a slight increase in retirement age is unacceptable.

In 2015, in 61 regions, the probability for men to survive to age 60 is below the national average (68.17%), and in 5 regions it was below 60%. This is the Jewish Autonomous Region (59.92%), the Amur Region (59.41%), the Irkutsk Region (58.25%), the Chukotka Autonomous District (57.23%), and the Republic of Tyva (53.38%, minimum among all regions) [15]. In these regions, even the generally established retirement age for the male population is too high.

In 63 regions, the probability for men to survive to age 65 is below the national average (equal to 58.14%). These regions cover 62% of the male population of this age. In 10 out of these regions, less than half of the male population survives to age 65: 49.96% in the Pskov region, 49.56% in the Novgorod region, 48.93% in Karelia, 49.58% in the Sakhalin region, 49.14% the Amur Regions, 48.96% in the Trans-Baikal Territory, 48.44% in the Chukotka Autonomous District, 48.29% in the Irkutsk region, 43.11% in the Republic of Tuva, and 42.75% in the Jewish Autonomous Region.

With a rapid (for example, year after year) and a significant increase in retirement age, the risk is high that almost half the male population of the country will not be able to live to see their retirement benefits. This suggests that there is no demographic reason for raising the retirement age for men.

Therefore, considering the issue of raising the retirement age, it is necessary to take into account not only the average demographic for the whole country, but also differences by region.

In the long term, according to Rosstat's forecast (medium variant), at the current retirement age, the average life expectancy for women in Russia will increase from 25.3 years in 2015 to 27.9 years in 2050, and for men from 16.0 in 2015 to 18.3 years in 2050. In 2030[2], it will be 26.7 years and 17.7 years (Table 11), respectively.

For women, the life expectancy at the age of 55 is already close to the average length of the insurance period, which is 33.5 years. Therefore, for women, raising the retirement age is justified by the need to create conditions for them to "earn" pension rights.

**Table 11.** *Life expectancy and probability of surviving to a generally established retirement age in the long term*

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|
| Life expectancy, years | | | | | | | | |
| Men (60 years) | 16.0 | 17.2 | 17.5 | 17.7 | 17.9 | 18.1 | 18.2 | 18.3 |
| Women (55 years) | 25.3 | 26.0 | 26.4 | 26.7 | 27.0 | 27.2 | 27.6 | 27.9 |
| Probability to live up to this age, % | | | | | | | | |
| Men (60 years) | 68.4 | 71.2 | 74.7 | 77.5 | 79.8 | 81.8 | 83.5 | 85.2 |
| Women (55 years) | 91.5 | 92.7 | 93.7 | 94.6 | 95.3 | 95.8 | 96.1 | 96.3 |

*Source:* Calculation according to [2].

For men whose life expectancy at age 60 in 2030 is 1.5 times lower than for women (17.7 years), and 1.8 times lower than the current work period, there is no acute need to increase retirement age. With such payment period, in order to "earn" a pension replacing 40% of salary with a period of service equal to the current average (i.e. 33.5 years), the necessary rate of insurance contributions to be paid by men will be 21.85% ( this is by 0.15 % lower than paid by the insured employers for the insured persons at present).



The probability of surviving to the current generally established retirement age, according to the forecast of the Federal State Statistics Service, will increase to 87% by 2030 (in 2015–16 it was 82%), and to 90% by 2050 (on the both gender basis). For men, the probability to survive to age 60 will still be significantly lower than the probability for women to survive to age 55. The situation will gradually begin to level off: in 2015, the difference was 21.8% (probability of surviving of 69.3% for men against 91.08% for women), and this difference is expected to decrease to 17.1% by 2030 (probability of surviving of 77.5% for men against 94.6% for women) and to 11.1% by 2050 (probability of surviving of 85.2% for men against 96.3% for women).

If the existing regional differentiation remains constant, then in 2030 - by the time of the end of the Strategy of long-term development of the pension system – the LE of men aged 60 will vary from 14.58 to 22.63 years, and from 22.4 to 31.97 years for women aged 55. For men, the maximum value of the indicator will remain below the average life expectancy of 55-year-old Russian women in 2016. The probability of surviving to age 60 in region with the lowest

2. The strategy for long-term development of the pension system, adopted in 2013 is designed for the period until 2030 [19].

current value in 2030 will increase from 59.92% today to 68.1% in 2030 (i.e. to the average for Russia in 2015).

# 4. Macroeconomic reasons of increasing of the demographic burden in the CPIS

Even in the presence of objective demographic prerequisites manifested through increasing life expectancy, the issue of increasing the retirement age must be considered by taking into account the development of the macroeconomic situation, the labour market and the specifics of the pension system itself. In this context, the impact of demographic characteristics of Russia today is not the most significant factor.

Achievement of expected positive impacts of raising the retirement age on the pension system will be possible only under the appropriate macroeconomic conditions:

- the availability of jobs for people who are no longer eligible for retirement;
- the availability of employment for this age group in the formal, rather than the shadow economy, so that the Pension Fund receives additional insurance contributions
- no risk of increasing the unemployment rate for young people and maintaining their ability to accumulate pension rights to receive a decent pension.



At present, there is no confidence in the ability to fulfill these al conditions, since the existing structure and level of employment do not provide sufficient employment for the population of today's working age. The confirmation of this is the increase of the demographic burden as the result of the norms of the pension legislation (discussed above) and the macroeconomic factors that will be analyzed in this section.

The ratio of the working-age population to those over the working age determines the value of the demographic load and support factors. As the analysis showed, as of 1 January 1 2017, the population over working age was 441 people per 1,000 working-age population, and the support ratio was 2.268, respectively.

If today the retirement age is increased to 65 years for both genders, the support ratio would more than double increasing to 4.906 (the number of people of working age in the new 16–64 age range amounting to 99.84 million people, over the age of working to 20.35 million people). The dependency ratio would be reduced to 0.204. Such a ratio – if it is based on the number of contributors and pensioners – would stabilize the financial state of the Pension Fund of the Russian Federation and the level of pensions over the long time.

However, due to provisions of the pension legislation in respect to the eligibility for pension before the retirement age, the dependency ratio in the pension system as at January 1, 2017 is 0.519 (including 0.475 arising from recipients of the insurance pensions of the CPIS). The support ratio in the CPIS is at the expense of 2.104, and 1.927 in the overall pension system.

The other component of the dependency / support ratios is the number of insured persons who pay contributions to the Pension Fund (contributors). This number is impacted by the macroeconomic factors, the labour market, the legal norms regulating the population registration as taxpayers and contributors. These factors include a high level of unemployment at working age, widespread informal and shadow employment, the opportunity to carry out

economic activities without registering as an individual entrepreneur and paying insurance contributions to the PFRF, etc.

As a result, the 2016 number of contributors to the CPIS was 62.3 million people, which is 25% lower than the working-age population (even if employed persons over retirement age are taken into account).

Therefore, the total dependency ratio for the CPIS is 634 recipients of insurance pensions for 1,000 contributors (39.5/62.3) instead of 441 determined using pure demographic indicators. The support ratio is 1,575 contributors per 1,000 recipients of insurance pensions.

Thus, due to the pension eligibility provisions and the macroeconomic situation that determines the level of unemployment of the population, the demographic dependency ratio for CPIS is higher than for the society.

In addition, two more factors reduce the number of contributors.

The first is the legislation governing the amount of insurance contributions to the Pension Fund paid by self-employed. On average, contributions of a self-employed is 4.7 times lower than of an average salaried employee. This means that for the income part of the budget of the Pension Fund of the Russian Federation, one self-employed person should be considered as 21% of the average salaried worker. Based on the insurance contributions to the budget of Pension Fund, 2 to 3.7 million of self-employed people should be considered only as 0.42 to 0.78 million people.



Finally, the last factor that reduces amount of contributions is the duration of employment of salaried workers within a year. On average, it is 9.5 months (79% of the maximum duration).

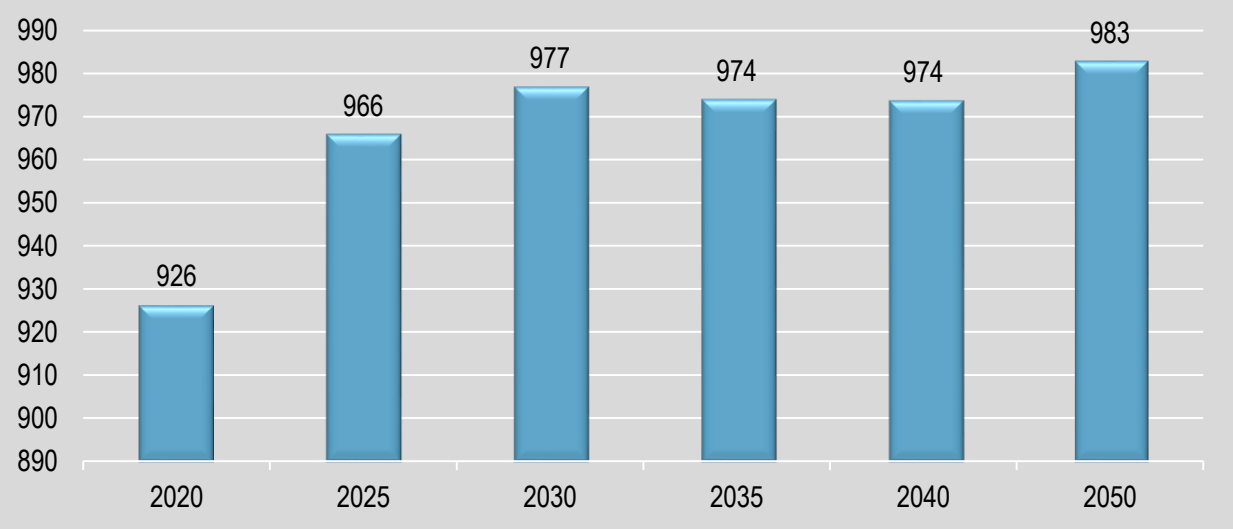
As a result, the number of contributors to the Pension Fund is reduced to 45 million. Thus, the dependency ratio in the pension system in 2016 was 0.879 and the support ratio was 1.139.

If finally the number of contributors is reduced by the number of working beneficiaries (7.1 million people), adjusting their number for the duration of employment within a year (i.e. reducing to 5.6 million people), the number of contributors will be almost equal to the number of beneficiaries: 39.4 million against 39.5 million people. Thus, the dependency and support ratios will be equal.

In the long term, the dependency ratio of pension system is close to one (Figure 26). If working beneficiaries over working age stop working, for all projection years the number of contributors will be lower than the number of beneficiaries.

These issues arising from the labour market environment almost completely eliminate any possible positive results of increasing the retirement age. As a result, the above-mentioned maximum demographic effect from a one-time increase in the retirement age to 65 of an increasing the support ratio to 4.906 as of January 1, 2017, transforms to an actual support ratio of 2.641 (4.906/1.993). This is comparable to the value of the current support ratio.

**Figure 26.** *The number of beneficiaries per 1,000 of contributors*




*Source:* [9].

With a gradual increase in retirement age, even this reduced effect will be achieved only by the end of the transition period and only if the labour market conditions will allow for the employment of all who is affected by the increase in the retirement age as well as younger population (i.e. there will be no increase in the unemployment stemming from the increase in the retirement age and the older workers will be able to find jobs as well).



In connection with the development of the digital economy, there is every reason to assume that the level of employment of the population will decrease. This may further reduce the dependency ratio.

Therefore, the increase in the retirement age should be precluded by the overcoming the tendency for the increase in the unemployment of the working-age population which will be exacerbated throughout the reform of the pension system.

# 5. The level of pensions and the amount of financial obligations of the CPIS

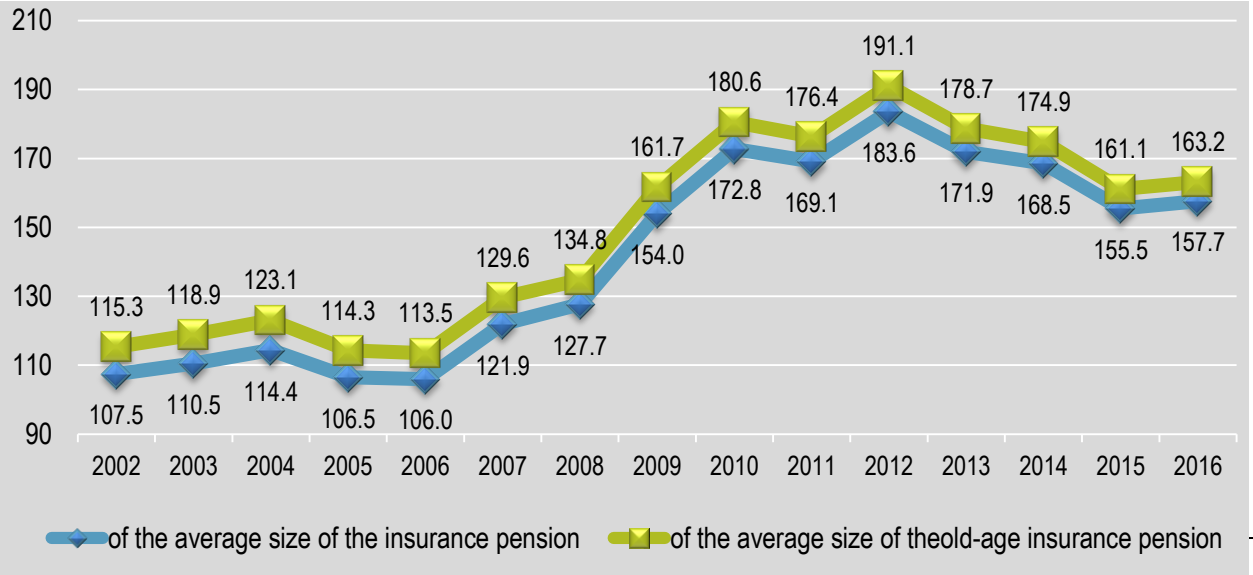
The strategy for long-term development of the pension system adopted in 2013 and designed for the period until 2030 [19], establishes criteria for assessing the attainment of the target goals for the development of the pension system:

- the replacement rate of an old-age retirement pension of 40% pre-retirement earnings based standard insurance period and average salary, and
- the average size of the old-age employment-related pension is at least 2.5 to 3 times the subsistence minimum of pensioners.

However, the above-discussed negative impact of the macroeconomic situation on the development of the CPIS is one of the main reasons why the level of pensions remains low, despite the 2002–2015 changes. Thus, the achievement of the Strategic Goals requires further reforms.

For several years the level of insurance pensions and their level in relation to the subsistence level of the pensioner (SLP) have been growing steadily, thanks to the consistently implemented measures to change the pension system. In 2012, the ratio of an average the old-age insurance pension to the SLP reached 191%, and this ratio for all types of insurance pensions was183.6%. Then a gradual decrease in this ratio followed. In 2016, these ratios decreased to 163% and 158%, respectively (Figure 27), and by 2017 they decreased to 162% and 156%.

**Figure 27.** *Ratio of the average size of the insurance pension and old-age insurance pension and SLP, %*

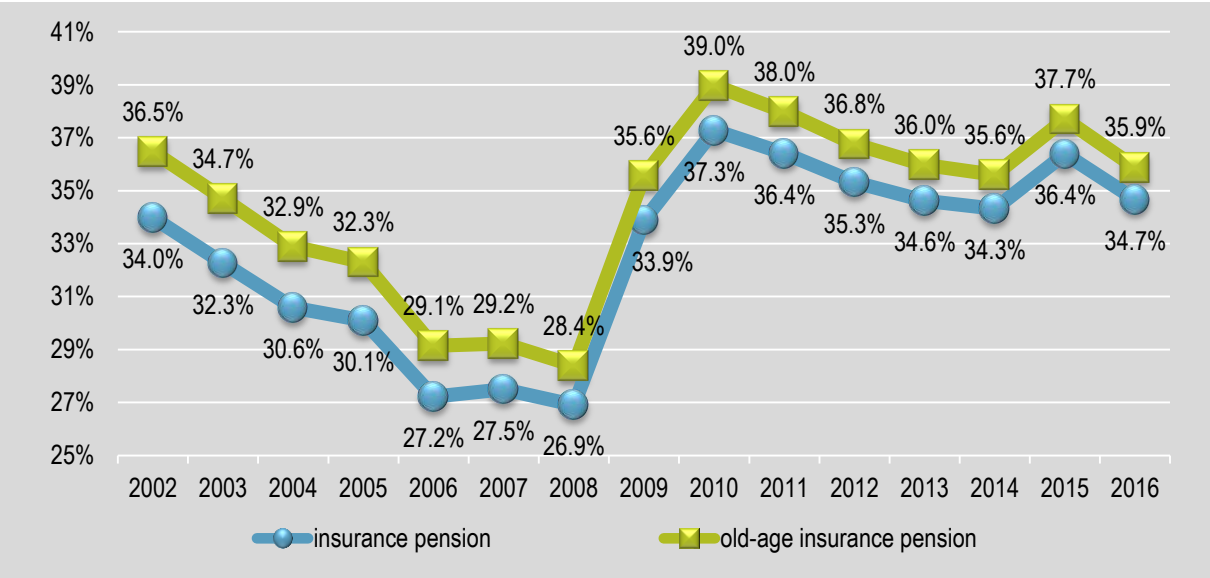





The ratio of the average size of the insurance pension and the old-age insurance pension to the average nominal wages in the economy increased by 2010 to 37.3% and 39%, respectively, due to the changes in the pension system, then began to decline. In 2015, when a new pension law "On insurance pensions" was introduced, the ratio of average pensions to the average salary in the economy increased again to 36.4% and 37.7%, respectively, for insurance pensions and old-age insurance pensions. However, the replacement rate started to decline again. At the end of 2016, the ratio of the average size of the insurance pension to the average nominal salary in the economy was 34.7%, and the average size of the insurance pension was 35.9%. In October 2017, it slightly increased, respectively to 34.9% and 36.1% (Figure 28).

In general, for the period from 2002 to 2016, rates of indexation (increase) of the insurance pension outstripped the growth of the Consumer Price Index (CPI) by 1.56 times, and the rate of indexation of the fixed supplements to the insurance pension – by 2.4 times. However, in comparison with the growth in the average nominal wage in the economy, the indexation of insurance pensions lagged noticeably. In 2016, the cumulative increase of an insurance pension was 57.4% of the increase in the average wage. This figure was 88.9% for a fixed supplement to the insurance pension. This lag is the main reason for the decreased replacement ratio.

**Figure 28.** *Ratio of the average size of the insurance pension and the average size of the old-age insurance pension to the average monthly nominal wages in the economy, %*




Under the current pension law, the ratio of the old-age pension to the SLP in 2030 is projected to be from 140 to 156% (depending on the macro variant used). This compares to the target of 250 to 300% defined by the Strategy. The ratio to the average country wage is projected to be 28%, and the individual replacement rate based on maximum contribution period and the average salary is projected to be 35% instead of the required 40%.



Therefore, the targets of the Development Strategy for the pension system in respect to the level of pensions are not expected to be achieved.

The budget dependence of the Pension Fund of the Russian Federation on transfers of the federal budget will decrease slightly. However, the existing dependence is not, in our opinion, critical.

Expenditures of the Pension Fund of the Russian Federation increased from 2002 to 2016 from 4.7% of GDP to 9.1%, or by the factor of 23. The GDP for the same period increased in nominal terms by 11.8 times. The growth of the Pension Fund expenditures was almost 2 times higher than the GDP growth.

The main component of the expenditures of the Pension Fund is the cost of the insurance pension: in 2016, as compared to 2000, their volume increased from 4.2% of GDP to 7% of GDP. In absolute terms, the increase in expenditures on insurance pensions amounted to 19.9 times, i.e. the growth of spending on insurance pension drives a high growth rate of the total expenditure of the Pension Fund.

However, the marked increase in expenditures are not related to the increase in the payment of insurance pensions. These expenditures take into account significant expenses not related to the pension insurance rights of the insured persons as follows:

- for a fixed payment to an insurance pension beneficiaries – a fixed amount paid to all recipients of an insurance pension, regardless of their work period and the amount of contributions paid or salary;

- on the increase of a fixed payment. These are paid to the recipients of insurance pensions in the presence of dependents, if there is a disability of group 1 (for old-age pensioners), at the age of 80, for living in the Far North and equivalent areas;

- for valorisation – a payment introduced in 2010 and increasing the pension rights of insured persons (at that time the insurance pension was called the insurance part of the labour pension, and a fixed payment to the insurance pension was called the basic part of the labour pension), who had worked before 2002 , by 10%, and by an additional 1% for each year of service before 1991;

- for reimbursement of expenses for non-insurance periods - periods during which the insured person did not engage in labour activity and for which contributions were not paid (for example, military service, etc.). However, due to the fact that these periods are taken into account in the insured period, the federal budget finances them on the basis of the value of the individual pension coefficient that is legally required for each of such periods;

- for compensation for the falling incomes of the budget of the Pension Fund of the Russian Federation in connection with the establishment of reduced tariffs for the insurance pension (without taking into account the falling income of the funded pension);

- for the payment of an old-age insurance pension before the general established retirement age (so-called early retirement pensions).



Financing of expenses for these payments, which are part of insurance, is a responsibility of the federal budget as a part of targeted transfers to the budget of the Pension Fund of the Russian Federation.

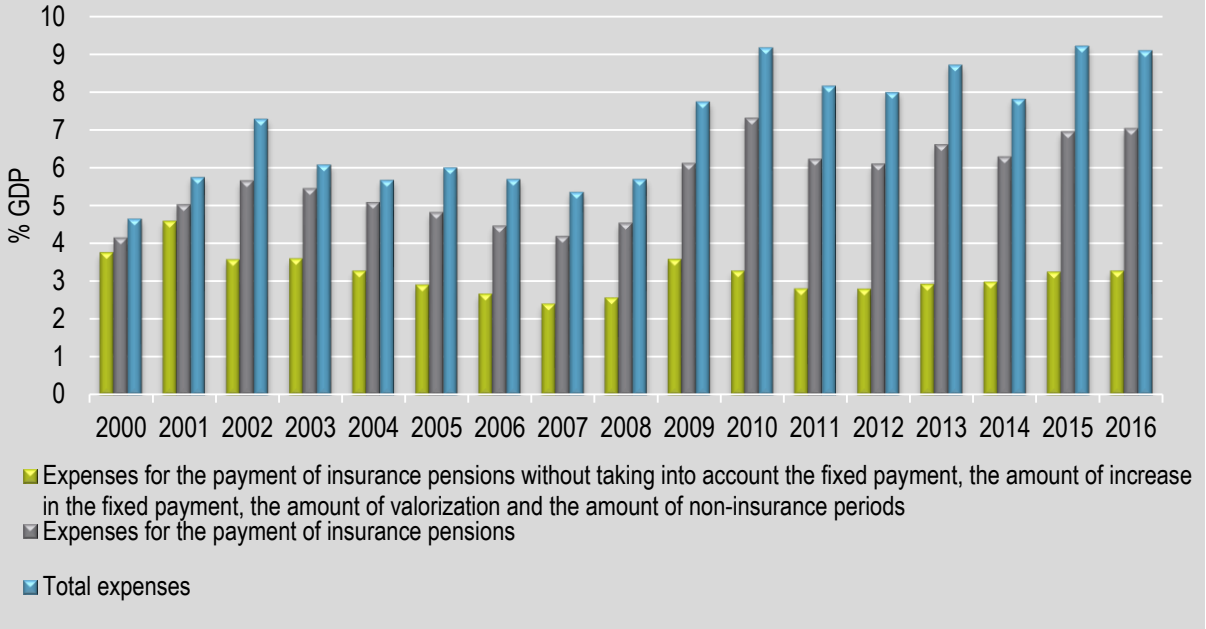
Without these non-insured expenses, the cost of insurance pensions amounted to only 3.3% of GDP in 2016, and compared to 2000, they decreased by 0.4 percentage points of GDP. The volume of such expenditures in nominal terms grew more slowly than not only the total expenditure of the Pension Fund of the Russian Federation, but even than the GDP (10.27% versus 11.8%) (Figure 29).

Dependence of the Pension Fund budget on the federal budget in respect to insurance payments, i.e. those that are determined by accumulated insurance pension rights, is about 1% of GDP. So, in 2017, the transfer from the federal budget to the Pension Fund budget on the CPIS (i.e. without taking into account the transfer for valorization, compensation for lost income and expenses for non-insurance periods of service) was 989.1 billion rubles or 1.1% of GDP.

As shown by the macroeconomic conditions forecast based on the current pension legislation, the transfer from the federal budget to the CPIS by the end of the Strategy period will increase in absolute terms to 1.23 trillion rubles, but its share in GDP will decrease by 0.7% of GDP.

Thus, the main share of federal budget expenditures on the pension system is not directly related to insurance pension rights of insured persons. Therefore, raising the retirement age cannot significantly change or cancel these expenditures of the federal budget.

**Figure 29.** *Pension Fund budget expenditures, % of GDP*




# 6. Choice of approach for raising the retirement age



The main proposals of Russian and foreign experts on the ranges of the new retirement age in CPIS of Russia vary between 58–65 years for women and 60–65 years for men, and the rate of increase (step) varies from one to twelve months per year.

In order to choose the most acceptable option, it is necessary to understand clearly the purpose of the planned changes and their immediate and long-term impacts on citizens, the pension system and the country's economy.

The retirement age should contribute to the achievement of the goals of the pension system and the long-term targets set out in the Strategy for the ratio of SLP and the replacement rate.

In order to achieve the target of the Strategy in 2030 in respect to the ratio of the average old-age pension to the SLP, the forecasted ratio under the current legislation should be increased by 94 to 151 %, and an individual replacement rate should increase by about 5 %.

To estimate the retirement age, which will provide such an increase, we perform actuarial calculations for two scenarios:

- Scenario 1 assumes that the number of employed does not increase with the increase in the retirement age (in comparison with the basic variant that provides for development under current legislation), since the necessary socio-economic conditions have not been created;

- Scenario 2 suggests higher increase in the number of employees with an increase in the retirement age compared to the base variant, even if, the conditions for this have not been created at the present time.

Calculations were made at a contribution level of 26%, provided under the current legislation. The retirement age assumed to be the same for men and women, which makes it possible to level out a significant difference in the life expectancy and, correspondingly, the difference in the duration of the periods of formation and realization of pension rights.

Actuarial calculations for Scenario 1 show that in order to ensure an average old-age pension equal to 2.5 SLP, the retirement age in 2020 (as well as in 2016) should be 66.7 years (i.e. 6.7 year higher men and 11.7 years higher for women than today). In 2030, the retirement age should be equal to 69.9 years. To maintain the old-age pension at the level of 2.5 SLP and beyond the horizon of the Strategy, the retirement age will have to exceed 70 years in the early 2030s: in 2035 it will be 70.5 years, and in 2050, 70.9 years.

The probability of surviving to the age that provides an average old-age pension at 2.5 SLP was 70% for both sexes in 2016 and 72% for 2020-2030 compared to 82-90% for the retirement age. At the same time, the expected duration of the period of receiving a pension for 2016–2020 will be slightly above 15 years (today it is 22.2 years on average for 55-year-old women and 60-year-old men). For the remaining years of the forecast period it will be 13–13.5 years, while if the current retirement age is maintained in 2030, according to Rosstat estimates, pension payments duration will be 22.9 years, i.e. 9.9 years higher (Table 12).

If, on the other hand, we strive to achieve the maximum target declared in the Strategy of 3 SLP only by increasing the retirement age, in 2016–2020, the retirement age should already be 69.5 years; in 2030, 72.6 years; and in 2050 it will reach 73.9 years. Only 66% of men and women who will survive to this age will be able to take advantage of an increased pension. The period of receipt of the pension will decrease from the present to 13.7 years in 2020 and 11.8 years in 2030. The establishment of such a pension age is unrealistic.



Under Scenario 2, it is assumed that the level of employment typical for men aged 55–59 and women ages 50–54, is maintained up to the retirement age. There is no reason for assuming a more significant increase in the level of employment, as shown by the above analysis. It is also expected that such increase in the level of employment at older ages will not lead to a decrease in the level of youth employment, i.e. as a result, the number of employed will increase in comparison with the macro-forecast used in the calculations, total salary will grow and, accordingly, the income of the Pension Fund from insurance contributions to the CPIS will increase as well.

Under these conditions, to increase the old-age pension to 2.5 SLP, an increase in the retirement age in 2030 to 68.6 years is required, which is 1.3 years lower than under Scenario 1. The life expectancy at the new retirement age will be significantly lower than at the current generally established age in Russia and in most countries that have increased the retirement age: in 2020–2025, it will slightly exceed 15 years, but it will decrease to 14.3 years in 2030 and to 14.2 years in 2050.

**Table 12.** *Retirement age, life expectancy and probability of surviving to a new retirement age, ensuring the achievement of the target of the strategy on the level of ratio to SLP*

| Ratio of old-age pension to SLP, times | | 2016 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|
| *Scenario 1. Without an increase in employment* | | | | | | | | | |
| 2.5 | Age. years | 66.7 | 66.7 | 68.4 | 69.9 | 70.5 | 70.0 | 70.2 | 70.9 |
| | LE. years | 15.2 | 15.4 | 14.4 | 13.5 | 13.1 | 13.4 | 13.4 | 13.0 |
| | Probability of surviving. % | 70 | 72 | 72 | 72 | 73 | 74 | 76 | 77 |
| 3 | Age. years | 69.6 | 69.5 | 71.2 | 72.6 | 73.6 | 73.6 | 73.4 | 73.9 |
| | LE. years | 13.4 | 13.7 | 12.7 | 11.8 | 11.1 | 11.1 | 11.3 | 11.1 |
| | Probability of surviving. % | 65 | 67 | 66 | 66 | 66 | 68 | 70 | 71 |
| *Scenario 2. With an increase in employment* | | | | | | | | | |
| 2.5 | Age. years | 66.0 | 65.9 | 67.4 | 68.6 | 68.9 | 68.5 | 68.6 | 69.2 |
| | LE. years | 15.7 | 15.9 | 15.1 | 14.3 | 14.1 | 14.4 | 14.5 | 14.2 |

*Source:* Authors' calculations.

The obtained results demonstrate that the achievement of the targets of the Strategy in respect to the level of the ratio of pension to SLP based on the change in the retirement age will mean:



- the need to raise the age to a level that is unacceptable from social and demographic points of view, since the proportion of those who survive to the new retirement age will be extremely small;

- that individuals who are supposed to be affected by the increase of the retirement age within the framework of the Strategy will already retire by the time the retirement age is increased (i.e. in 2020, the new retirement age will be 66 to 72 years, depending on the tariff of insurance contributions and the level of the ratio of old-age pensions to SLP, but insured persons who have reached this age, would have retired even before the beginning of the increase in retirement age: in 2014 in case of the retirement age of 66 years and in 2009 in case of the retirement age of 72 years.

In addition, the pension rights that can be earned by the insured as a result of increasing age will exceed the value of the target, and will require additional spending of budget funds for their implementation.

The second target of the Strategy is an individual replacement rate for an old-age labour pension of at least 40% for an employee who has worked out the standard length of the length of insurance (established by the Strategy at 35 years) and had a wage at the level of the average salary in the economy.

To achieve it without increasing the level of employment in pre-retirement age (Scenario 1), the desired retirement age is 57 years in 2020 and 61 years in 2030, which is close to the current one (Table 13). If you set a retirement age based on gender differences, then the age of men should be 3 years higher than the age of women.

If the increase in retirement age is accompanied by an increase in the level of employment and, correspondingly, the number of employed (Scenario 2), the length of the insured work period will also increase, which will lead to an increase in the amount of their pension rights. Thus, in order to achieve a replacement rate of 40% in 2030 with 35 years of payment of contributions and a salary equal to the average in the economy, the retirement age should not be less than 63 years for men and women, i.e. for two years higher than under Scenario 1.

**Table 13.** *Retirement age to provide a target for the replacement rate of 40%, years*

| | 2020 | 2025 | 2030 | 2040 | 2050 |
|---|---|---|---|---|---|
| Scenario 1. Without an increase in employment | 57 | 59 | 61 | 61 | 63 |
| Scenario 2. With an increase in employment | 58 | 60 | 63 | 62 | 65 |

*Source:* Authors' calculations.

As the calculations have shown, the achievement of the target for the ratio of the average size of the old-age pension to SLP requires a greater retirement age increase than the achievement of the target for the replacement rate. However, the use of retirement age as the only way to achieve the targets of the Strategy will lead to the need to increase the retirement age beyond the level acceptable for the socio-economic characteristics of the country.

To find a compromise that will make it possible to approach to achieve the targets without raising the retirement age beyond socially and economically acceptable limits, it is necessary to determine the highest value to which it is possible to raise the retirement age, the rate (step) of increase and the rules for such increases (by birth year or by year of retirement).



The upper limit of the retirement age should be determined, first of all, by the demographic characteristics of the population, reflecting the remaining LE and the survival probabilities, i.e. the proportion of men and women who will be entitled to a pension.

The establishment of the retirement age should ensure that the insured persons have the opportunity to use their pension rights (i.e. to survive to the retirement age and to receive the pension rights created in the form of a pension). The increase in retirement age should ideally be conducted in such way that the probability for insured persons to survive to retirement either will not decrease in comparison with the current level, or even will increase.

The choice of the upper limit of retirement age is complicated by the absence in the Russian legislation of the definition of the term "old age" for the appointment of a pension.

If the old age is a loss of ability to work, the retirement age must be individually determined for each person, taking into account the state of his/her health and occupation. As such for someone who can work until his/her death, the notion of retirement age will not exist.

If we consider old age as a deserved holiday from the period of labour activity, then the retirement age should be set at a level at which most people will retain for the future sufficient potential for social activity and the opportunity to live independently.

The third and fourth approaches are not directly related to the concept of "old age". The third approach may envisage the preservation of the probability to survive to the retirement age achieved today or at the time when the decision is made about increasing the age.

The fourth approach is to establish the duration of the old-age pension payment on the basis of the ratio of the period for the formation of pension rights and the LE at retirement age. Alternatively, a certain minimum limit, below which the duration of the pension payment period cannot go down.

However, this report proposes to consider a combination of the last two approaches - maintaining the existing probability of surviving to retirement age and setting a lower minimum limit for the expected period of pension payment - and assessing how this achieves the Strategy's targets.

This is the strictest scenario that doesn't any pension improvements.

To establish the lower permissible limit for the duration of pension payments, we use the so-called dynamic age limit or the prospective age, proposed by Sanderson and Shcherbov [20] and applied by World Health Organization (WHO) as part of the system of indicators of ageing [21]. Moreover, this age limit is determined not by the number of years lived from birth, but by the "duration of the old age", expressed by a numerical value of the projected life expectancy. As A. Vishnevsky points out [14], the choice of the prospective age is arbitrary and is most often defined as 15 years. Thus, in each year the prospective threshold of old age changes and is equal to the age, in which the projected life expectancy of the population for a given year will be equal to 15 years.

According to Rosstat's forecasts Table 14), the prospective age will gradually increase: for men from 63–65 years, for women from 69–70 years.



**Table 14.** *Prospective age of the Russian population and retirement age, based on the different probability of survival*

| | 2016 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|
| Age in which the population of Russia has life expectancy of at least 15 years (15+), both sexes | 67.0 | 67.4 | 67.4 | 67.6 | 67.6 | 67.7 | 67.9 | 68.1 |
| men | 63.0 | 63.7 | 64.0 | 64.2 | 64.3 | 64.4 | 64.6 | 64.7 |
| women | 69.1 | 69.3 | 69.4 | 69.4 | 69.5 | 69.6 | 69.8 | 70.1 |
| The age to which men will survive with a probability of 68% | 60 | 61.9 | 64.1 | 65.8 | 67.1 | 68.2 | 69.1 | 70.0 |
| The age to which the entire population will survive with a probability of 78% | 60 | 61.7 | 63.8 | 65.4 | 66.8 | 67.9 | 68.9 | 69.6 |
| Minimum age to be chosen as a pension age, years | 60 | 61.7 | 63.8 | 64.2 | 64.3 | 64.4 | 64.6 | 64.7 |

*Source*: [16], authors' calculations.

Given the significant gender differences in life expectancy, we will determine the prospective age not by age of the population as a whole, but by age of representatives of the sex whose life expectancy is lower, i.e. use the prospective age of men.

At the prospective age of men, if taken as the general retirement age, the women's LE will be higher than that of men by 4 years in all years of the forecast period, which may serve as another

argument in his favor of this approach, since both sexes will be put in almost equal from the point of view of the possibility of forming pension rights.

If the prospective age approach reflects mortality rates of the population after the chosen age, then the approach based on maintaining the current probability of surviving to the retirement age reflects the mortality rates of the population to the specified age.

According to this criterion, the age to which the probability of survival for men will be 68% is acceptable. It is also legitimate to consider another current probability of survival to the age of 60 (the same age for both sexes, as we decide to equalize the retirement age). It is 78% for the general population. These probabilities are determined in 2016 – the last year for which there are reported data. And if we take it as a basis the probability of survival of women to age 55, the retirement age for men would need to be lowed.

Based on Table 14, the acceptable retirement age for 2025 is determined as the age to which the population will survive with a probability of 78%, and from 2026 it will be equal to the prospective age of men.

There are two possible ways for raising the retirement age: by the year of birth and by the year of retirement. Under the approach that is based on the year of retirement, the pension age is set for a specific calendar year. Under this approach, only those people who will reach a new retirement age this year will retired. Persons who have not reached this age this year will move on to the next year. Next year they will retire only if they reach a new age for the given year.

An increase based on the year of birth means that the retirement age is set for the specific year of birth. People of the same year of birth will retire at the same age.



With the same step in raising the retirement age, the approach based on the year of birth is slower and the transition period lasts longer than under the approach based on the year of retirement.

The rate of increase should take into account the difference in the magnitude of the increase between women and men, and be acceptable from the socio-economic point of view. It is proposed to raise the age evenly to a chosen, unified value for men and women. Thus, for women, every year, the age should increase by a greater increment than for men.

Limitations on the rate of increase are a social issue and require a political solution rather than an actuarial one. At the same time, it is obvious that the rate of increase, as well as the retirement age, should not be determined by the need to increase the revenue of the budget of the Pension Fund. Approaches that can be considered acceptable are a rate of increase of no higher than six months per year and no slower than 3 months per year. The full year increase seems to be an unacceptably tough option that is not consistent with the accepted demographic criteria. Moreover, and at the end of the transition period, it will require a high increase in federal budget transfers to the Pension Fund budget due to the increased amounts of accrued pension rights.

The most stringent permissible approach aimed at implementing the quickest increase in the retirement age in order to move as close as possible to the Strategy's targets, while simultaneously taking into account the limitations imposed by the dynamics of LE and the probability of surviving to a new age, is as follows:

- year of the beginning of the increase – 2019;
- year the desired increase is achieved – 2038;
- the age to which the increase is carried out – 65 years (for both sexes);
- the approach of increase – by the year of retirement, which is equivalent in terms of results to the approach "by year of birth" with an increase of six months per year;
- step increase – 3 months per year for men and 6 months per year for women.

There are possible milder schemes of increase, but the size of the pension and, consequently, the degree of achievement of the target of the Strategy will be lower (or the deficit will be higher).

It should be noted that only two demographic constraints were included in the choice of the approach for raising the general established retirement age: the life expectancy and the probability of surviving to a certain age. An important indicator, but little developed and rarely used in Russia due to the lack of state statistics, is healthy life expectancy of the population. The use of this indicator helps to estimate how long seniors will be able to live without the need for outside care and without serious limitations of activities - which is fundamentally important for determining the retirement age. However, this indicator was not taken into account in the above calculations and justifications.



The calculations in regard to the over compromise approach are based on the actuarial forecast model that takes into account the norms of pension legislation, as well as the macroeconomic and demographic conditions of the country's development. It is assumed that all insurance contributions are directed to insurance pension (the moratorium introduced in 2014 is prolonged), and two scenarios are considered:

- no increase in the level of employment in new pre-retirement ages and, accordingly, no increase in the number of employed in comparison with the development in the current pension age, and
- with an increase in the level and number of employees, the consequence of which will be the growth of the total wages, an increase in the length of service and pension rights of insured persons.

The selected compromise approach (Table 15), similar to any approach under which the retirement age does not reach 70–72 in 2030, doesn't achieve the target of the size of the average old-age pension being at 2.5 SLP, let alone at the level of 3 SLP by 2030. In 2030, this ratio is expected to be from 184% to 188%, depending on whether or not the increase in age is accompanied by an increase in the level of employment and the number of employed. In 2050, the old-age pension will grow to 191 to 201% of the SLP.

Under the proposed approach, the individual replacement rate in 2030 will be 45-46%, and by 2050 will grow to 47–50%, i.e. the target of the Strategy will be reached in a timely manner.

The transfer of the federal budget to the distributive component of the CPIS will amount to 2.3% of GDP in 203 to 1.3% in 2050. Under the proposed approach, the transfer in 2030 is projected to be 0.4% of GDP higher than under the status quo, and in 2050 only higher by 0.2% of GDP.

The transfer directly to the CPIS will be substantially less - 0.6% in 2030 and 0.7% of GDP in 2050, and in 2030 it will be lower than in the status quo by 0.1% of GDP.

If a decision is made to bring the average old-age pension to 2.5 SLP in ways other than increasing the age, then the required amount of funds for these purposes will be equivalent to an additional rate of insurance contributions equal to

- in 2030, 8.2% (without growth employment) and 7.5% (with employment growth);
- in 2050 – respectively, 7.1% and 5.6%.

Under the status quo, increase in contribution rate of 13% in 2030 and 15.9% in 2050 would be needed to achieve this target.

**Table 15.** *The main results of the implementation of the compromise approach for raising the retirement age to 65 years with a step of 3 months per year for men and 6 months per year for women*

| Scheme | Employment growth | 2030 | 2050 |
|---|---|---|---|
| *Ratio of the average size of the old-age labour pension to the SLP, %* | | | |
| Basic (existing legislation) | | 149.1 | 136.6 |
| Compromise | no | 184.4 | 191.3 |
| | yes | 188.4 | 200.9 |
| *Individual replacement rate for normative experience and average salary in the economy, %* | | | |
| Basic (existing legislation) | | 35 | 32 |
| Compromise | no | 45 | 47 |
| | yes | 46 | 50 |
| *The share of the federal budget transfer to the budget of the Pension Fund of the RF,% of GDP* | | | |
| Basic (existing legislation) | | 1.6% | 1.1% |
| Compromise | no | 2.0% | 1.3% |
| | yes | 2.0% | 1.3% |
| *The share of the federal budget transfer to the budget of the Pension Fund of the RF on the CPIS,% of GDP* | | | |
| Basic (existing legislation) | | 0.7% | 0.5% |
| Compromise | no | 0.6% | 0.7% |
| | yes | 0.6% | 0.7% |
| *Additional rate of insurance contributions needed to bring the average old-age pension to the level of 2.5 SLP,%* | | | |
| Basic (existing legislation) | | 13.0% | 15.9% |
| Compromise | no | 8.2% | 7.1% |
| | yes | 7.5% | 5.6% |

# 7. Conclusions

The analysis showed that the demographic conditions in the country are not ready to raise the retirement age, and the macroeconomic situation will not allow to take advantage of its positive effect provided by the increase in the supply of labour.

The most stringent pattern of increase in retirement age that is acceptable for the country in terms of demographic and macroeconomic conditions can be based on the following characteristics: an increase in the age to 65 years by the year of retirement with a gradual increase of 3 months per year for men and 6 months per year for women. For all indicators, with the exception of the size of the transfer and the number of recipients of pensions, the compromise approach is better than the basic variant based on the current legislation.

However, the savings in budget expenditures from raising the retirement age will be achieved exclusively in the first years of the transition period and will be completely eliminated in the future. They will be replaced by the higher growth in the expenditures of the Pension Fund budget, the total amount of which exceeds the cost of the base option by more than 10% in 2050, and the totals payment of insurance pensions (without taking into account a fixed payment) by one third.

Actuarial calculations contradicts the widespread view that increasing the retirement age will reduce the volume of transfers from the federal budget to the Pension Fund budget, since in the long term the need for interbudgetary transfers will increase.



It should be noted that the change in retirement age will affect the duration of disability insurance pensions, early insurance pensions for old age, pensions of state and municipal employees, as well as the expected period of payment of a funded pension.

In order to achieve the predicted effect from the implementation of the compromise approach, it is necessary to increase the age of eligibility for early old-age insurance pensions at the same rate as for old-age insurance pensions. But due to the complexity of this problem (in particular, the need to assess the impact of employment in adverse industrial and climatic conditions on the ability to continue working), it requires additional serious study taking into account the specific nature of the relevant types of work, working conditions, gender characteristics and other criteria.

Before making a decision to raise the retirement age, it is necessary to create appropriate socio-economic conditions that will ensure that these actions reach the desired effect. This can include expansion of the population's coverage by the pension system, reduction in the morality and disability rates, change the contribution rates policy, etc. One of the solution that can have a huge impact (not only to cover the budget deficit of the Pension Fund, but also to ensure the achievement of targets for long-term development of the pension systems) is to expand the coverage of compulsory pension insurance by reducing the share of shadow employment

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