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Demographic evolution trends and prospects in Russia and the Vologda Oblast *

The article deals with the analysis of demographic situation in the Vologda Oblast against the background of the global and Russian tendencies. It has been revealed that depopulation is observed in most developed countries, and depopulation growth rates are reduced in developing countries. Depopulation processes are retained in Russia, which can hinder social and economic development and contradict the country's geopolitical goals. The Vologda Oblast is one of the "typical" Russian regions, where demographics are close to average ones. The demographic prospects of Russia and the Vologda Oblast indicate negative trends in the medium term. It is possible to reverse the situation by increasing the number of children in families, that is by changing the model of population's fertility.

Demographic evolution, depopulation, birth rate, mortality rate.

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The second half of the 20th century left a grate mark in the demographic history. There has been an unprecedented population explosion, accompanied by the rapid growth of the population in many countries of Asia, Africa and Latin America. The Earth's population has increased 2.5-fold over this period with an average annual absolute growth of 70 – 80 and even 90 million people, which corresponds to the growth rate of 1.5 – 2% [8, p. 115-117].

However, the growth rates of total population are gradually reduced *(tab. 1)*. They have decreased from 22 to 6% over the past four and a half decades. This trend is strongly pronounced in the European region (from 9% in 1960 – 1970 down to zero in 2000 – 2005) and North America (from 14 to 5%, respectively). The population size in the Russian Federation was growing in the period from 1990 to 2000 due to the large migrant inflows from the former Soviet republics, but since the beginning of the 21st century there is a negative dynamics in population size that has declined by 3% over the first decade.

Reducing the growth rates of world population is caused by declining the birth rate, since the dynamics of mortality rate in the second half of the 20th – the beginning of 21st century is characterized by a decrease in its overall rate from 19.5 to 8.6‰ [16, 18].

At the same time, regional differentiation is retained: from 12.5‰ in the African region to 6 ‰ in Latin America in 2005 – 2010.

In the world the birth rate cut down from 37.2% in the middle of the 20th century to 20.0‰ in 2010. The most significant decrease in the birth rate over the period has been fixed in the European Region (from 21.5 to 10.5‰), Asian Region (from 42.3 to 19‰) and in Australia (from 23.0 to 12.9‰).

The total population of the Russian Federation is under double "pressure": high mortality and low birth rates; natural movement (loss) is not compensated by mechanical one *(tab. 2)*.

As a result, the total population in Russia had reduced by 3% (from 146 to 143 million people, *tab. 3*) over the period from 2000 to 2010.

Demographic processes are depopulated in nature in 85% of regions in the country. Decline in the population's size of the North-West Federal District and the Vologda Oblast was higher than in Russia on average, and it amounted to 5 and 6%, respectively (see tab. 3), despite the fact that the North-West Federal District was the second district attractive for migrants after the Central District in 2009 (migration gain rate – 21 and 46 per 10 000 people, respectively).

Table 1. Population size, mln. persons

World, region	Year						Growth rates, %				
	1960	1970	1980	1990	2000	2010	1970/ 1960	1980/ 1970	1990/ 1980	2000/ 1990	2010/ 2000
World	3032	3699	4451	5295	6124	6987	122.0	120.3	119.0	115.7	114.1
Europe	605	657	693	721	729	740	108.6	105.5	104.0	101.1	101.5
Africa	282	364	480	637	821	1051	129.1	131.9	132.7	128.9	128.0
Asia	1704	2139	2636	3181	3705	4216	125.5	123.2	120.7	116.5	113.8
Latin America	220	288	364	444	523	596	130.9	126.4	122.0	117.8	114.0
North America	204	232	256	284	316	346	113.7	110.3	110.9	111.3	109.5
Australia and Oceania	16	20	23	27	31	37	125.0	115.0	117.4	114.8	119.4
Russia	*119*	*130*	*138*	*138*	*146*	*143*	*109.2*	*106.2*	*100.0*	*105.8*	*97.0*

Sources: Europe in Figures. Eurostat Yearbook, 2009. P. 130. Available at: http://epp.eurostat.ec.europa.eu (Access Date: 25.10.2011); Russia's Demographic Yearbook, 2001. P. 19; World Population Data Sheet 2011; The World at 7 billion. Population Reference Bureau. P. 6–9.

Table 2. Demographic situation in Russia in comparison with some countries of the first type of population reproduction

G8 countries	Aggregate birth rate, pers.		Born, pers.		Died, pers.		Natural population increase (loss)		Migration population increase (loss)		Life expectancy		Difference in life expectancy of men and women
	per 1000 people										*years*		
	2000	2010	2000	2010*	2000	2010*	2000	2010	2000	2010	2000	2010*	2010*
Germany	1.4	1.4	9.3	8.1	10.2	10.4	-0.9	-2.2	2.0	2.0	77.9	79.8	5.2
Italy	1.3	1.4	9.5	9.5	9.8	9.8	-0.3	-0.4	3.1	6.0	79.4	81.4	5.2
Canada	1.5	1.7	10.7	11.2	7.1	7.4	3.6	3.8*	6.5	7.0	79.2	80.7	3.6
Russia	**1.2**	**1.6**	**8.7**	**12.5****	**15.3**	**14.2****	**-6.6**	**-1.7**	**2.5**	**1.0**	**65.3**	**68.6**	**11.9**
Great Britain	1.6	2.0	11.5	12.8	10.3	9.1	1.2	3.9	2.5	2.0	77.7	80.1	4.0
USA	2.1	2.0	14.4	13.8	8.5	8.4	5.9	5.4*	4.6	3.0	76.6	78.1	4.9
France	1.9	2.0	13.1	12.8	9.1	8.5	4.0	2.0	1.2	1.0	79.0	81.1	6.7
Japan	1.4	1.4	9.4	8.5	7.6	9.1	1.8	-0.6*	0.3	0.0	81.1	82.9	6.8

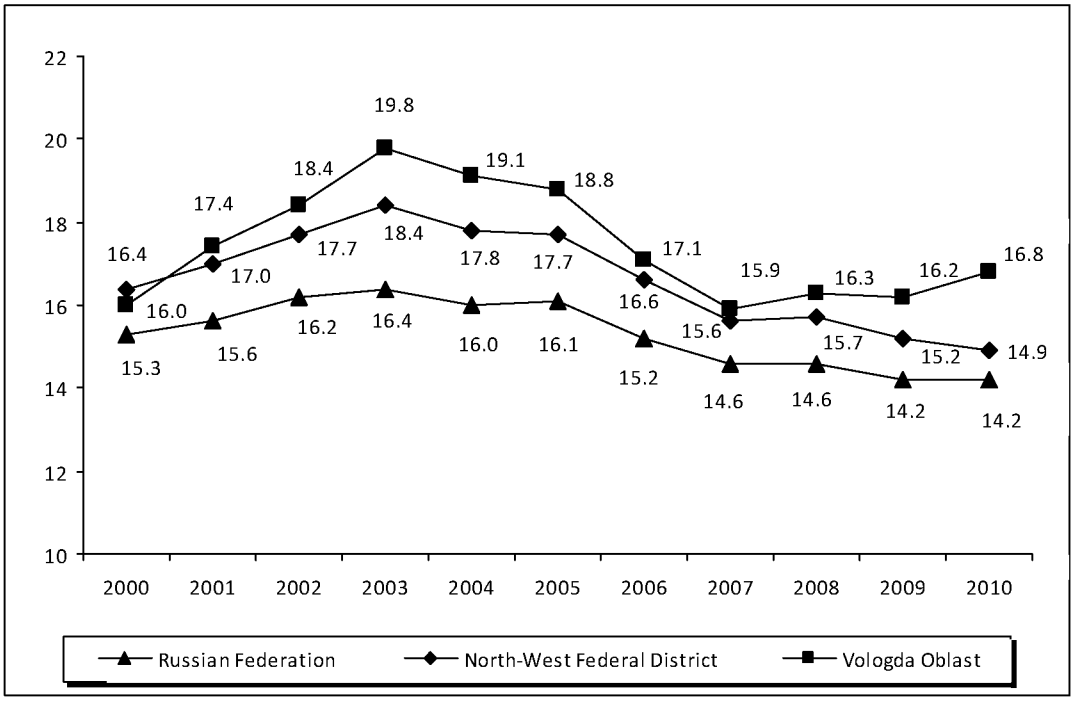
* 2009.
** 2010.
Sources: World Development Indicators. World Bank, 2006, 2011. Available at: http://www.worldbank.org; European Commission. Eurostat. Available at: http://epp.eurostat.ec.europa.eu; 2011 World Population Data Sheet. The World at 7 billion. Population Reference Bureau. P. 6-9.

Table 3. Resident population size at the end of the year, thousands of people

Federal district, subject	Year					2010 to 2000, %
	2000	2005	2008	2009	2010	
Central	38228	37546	37151	37120	n/a	97.1
North West	14199	13628	13462	13450	n/a	94.7
Karelia Republic	*729*	*698*	*687*	*686*	*645*	*94.1*
Komi Republic	*1043*	*985*	*959*	*955*	*902*	*91.6*
Arkhangelsk Oblast	*1369*	*1291*	*1262*	*1258*	*1228*	*91.9*
Vologda Oblast	*1290*	*1235*	*1218*	*1216*	*1202*	*94.3*
Kaliningrad Oblast	*958*	*940*	*937*	*938*	*942*	*97.9*
Leningrad Oblast	*1680*	*1644*	*1632*	*1631*	*1713*	*97.1*
Murmansk Oblast	*923*	*864*	*843*	*840*	*796*	*91.0*
Novgorod Oblast	*710*	*665*	*646*	*643*	*634*	*90.6*
Pskov Oblast	*782*	*725*	*696*	*692*	*674*	*88.5*
St. Petersburg	*4715*	*4581*	*4582*	*4591*	*4849*	*97.4*
South	22743	22821	22835	22935	n/a	100.8
Volga	31703	30710	30241	30134	n/a	95.1
Ural	12515	12279	12241	12268	n/a	98.0
Siberian	20464	19794	19553	19553	n/a	95.5
Far Eastern	6913	6593	6487	6450	n/a	93.3
Russia	***146304***	***142754***	***141904***	***141909***	***142905***	***97.0***

Source: Federal State Statistics Service. Available at: http://www.gks.ru

Figure 1. Crude death rate (per 1,000 people)



Source: Regions of Russia. Socio-economic indicators, 2009. Available at: http://www.gks.ru

The mortality rate in Russia was so high in the first half of the 1990s that scientists and politicians began to speak about the mass extinction of the population, demographic catastrophe and even genocide of the Russian people [2, 7, 12]. Only since 2003 there has been a decrease in the crude death rate *(fig. 1)*.

Since 2000, there has been a tendency to increase the total birth rate in Russia *(fig. 2)*. But this result is largely caused by the effect of "population waves": young people who were born in the 1980s have entered the childbearing age.

The birth rate in the Vologda Oblast corresponds to the national average level. The total birth rate has increased from 8.7 to 12,5‰ over the period from 2000 to 2010 (see fig. 2). On average, since the beginning of the century the total birth rate hasn't dropped below 9.7‰ in the Vologda Oblast (in Belozersky District); and the maximum value (12.5‰) has been fixed in Verhovazhsky District *(fig. 3)*.

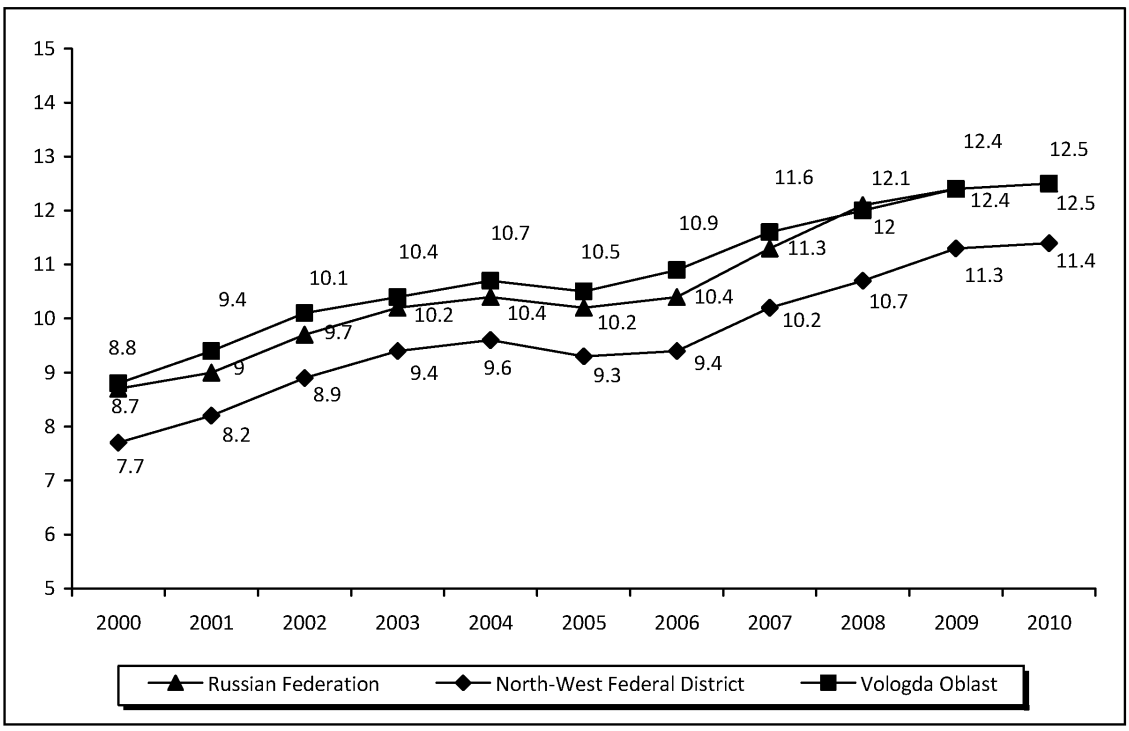
Most municipalities of the region (15 of 28) remained the indicator average value above the average regional level in the period under our review.

The assumption that the increase in the birth rate is largely caused by the demographic structure of the population is proved by the changes in the aggregate birth rate. This indicator gives a more faithful representation of the number of children and reflects the average reproductive guidelines of population. The aggregate birth rate in Russia increased from 1.2 to 1.5 in the period from 2000 –2009, but it did not provide the level of zero natural increase during those eight years[1] *(fig. 4)*.

The aggregate birth rate in the Vologda Oblast that repeated All-Russian tendencies had declined to 1.2 by 2000; then there was a

[1] The level of zero natural increase was calculated by the method of V.N. Arkhangelskiy (Borisov V.A. Demography. Moscow: NOTABENE, 2001. P. 164).

Figure 2. Total birth rate (per 1,000 people)



Source: Regions of Russia, 2008: Stat. Col. Rosstat. Available at: www.gks.ru; Demographic Yearbook of the Vologda Oblast: Stat. Col. Vologdastat, 2009.

Figure 3. Total birth rate in the Vologda Oblast, on average over the period from 2000 to 2010, Ppm

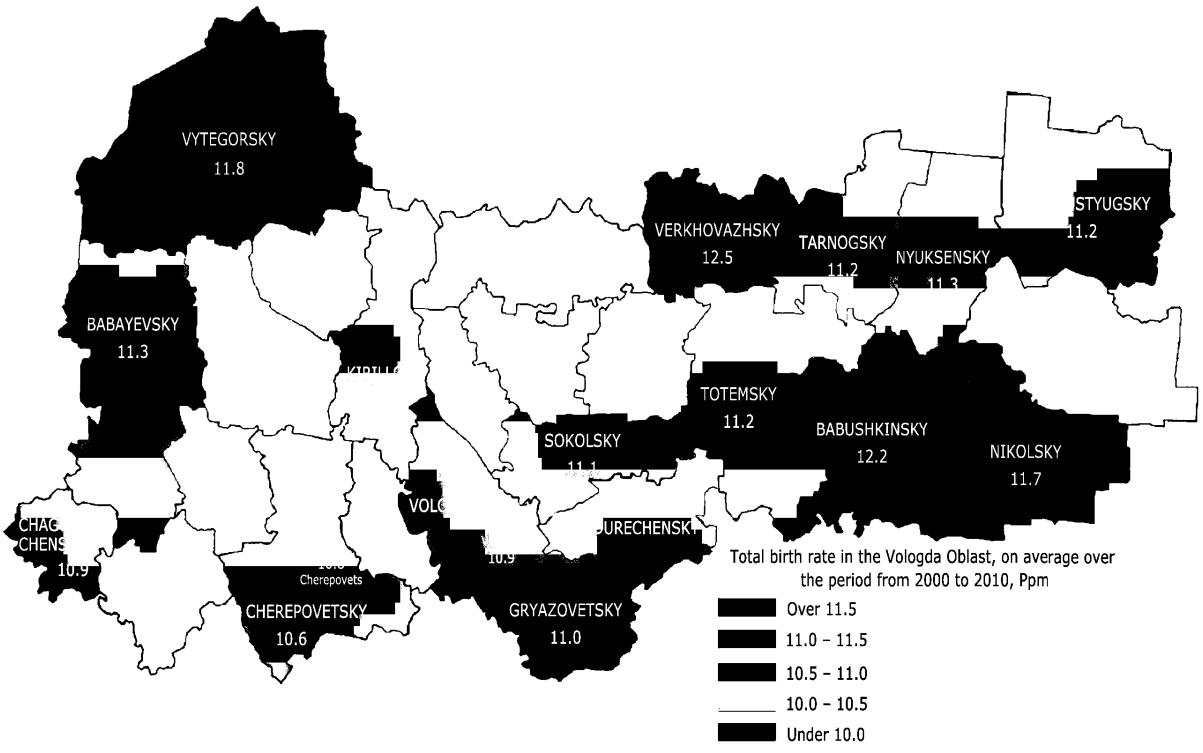
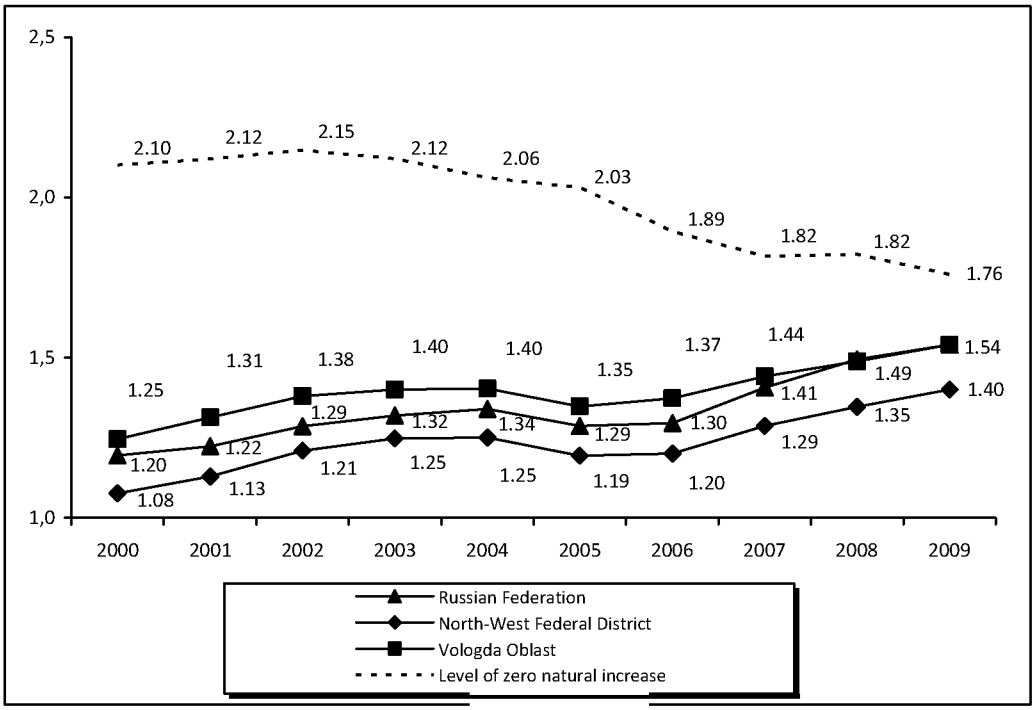


Figure 4. Aggregate birth rate



Source: CBSD / Rosstat. Available at: www.gks.ru (Access date: 05.12.2011); author's calculations.

certain increase in the period till 2004 (from 1.2 to 1.4); in 2005 it reduced again to 1.3, and then the aggregate birth rate had increased to 1.49 by 2008 (see fig. 4).

In 2009, the Vologda Oblast ranked first among the regions of the North-West Federal District according to this indicator. At the same time, its territorial differentiation was remained: rural population showed both the higher values of aggregate birth rate and more substantial increase in aggregate birth rate as compared with the 2000 level. This fact proves that lifestyle influences the population's reproductive behavior.

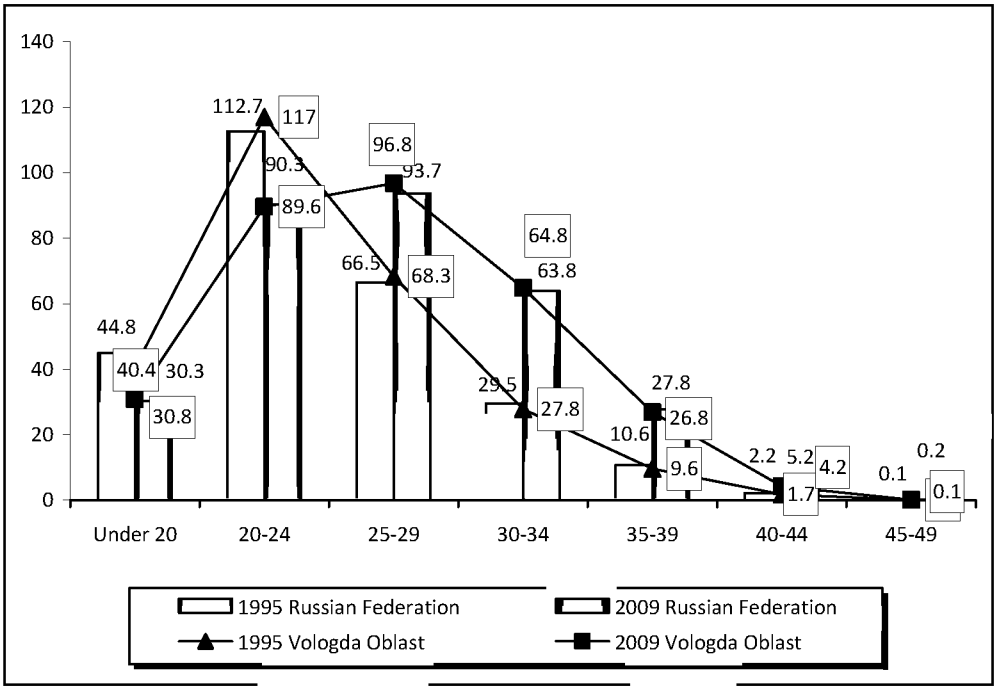
One of the important reasons for the decline in the birth rate in retrospect was the transformation of reproductive behavior, caused by the specifics of socio-economic life, in particular, by involving women to take part in production and improving their economic activity in general.

In the early 1990s, European researchers noted the intensified will of women to self-realization in the profession, which resulted in the extension of training period and marriage age, as well as in putting off births, which, in turn, led to the fact that the first child was the only one [15, p. 37].

There are the similar processes in today's Russia (2005 – 2010) despite the patriarchal views *(fig. 5)*.

In 1995, fertility peak was registered among the women aged 20 – 24, and it was fixed in the group of women aged 25 – 29 in 2009. In addition, there was a parallel decrease in births in the group of women aged under 20 (from 44.8 to 30.5 per 1,000 women of the same age) and an increase in the number of births in the older age groups (30 – 34, 35 – 39 and 40 – 44 years old). There were the similar trends both in the regions of the North-West Federal District and in other federal districts.

Figure 5. Age-specific birth rates (the number of children who have been born over a year per 1000 women of age), years



Source: Rosstat. Available at: gks.ru

It should be also noted that the state of population makeup according to sex and age that determines a birth rate along with reproductive behavior corresponds to regression (depopulation, degradation) [1, p. 56] mode of reproduction.

The distribution of Russia's population within the main age groups indicates a very high level of demographic aging (according to G. Bojio-Garnier – E. Rosset scale) and tends to increase the share of persons aged 60 and older *(fig. 6)*.

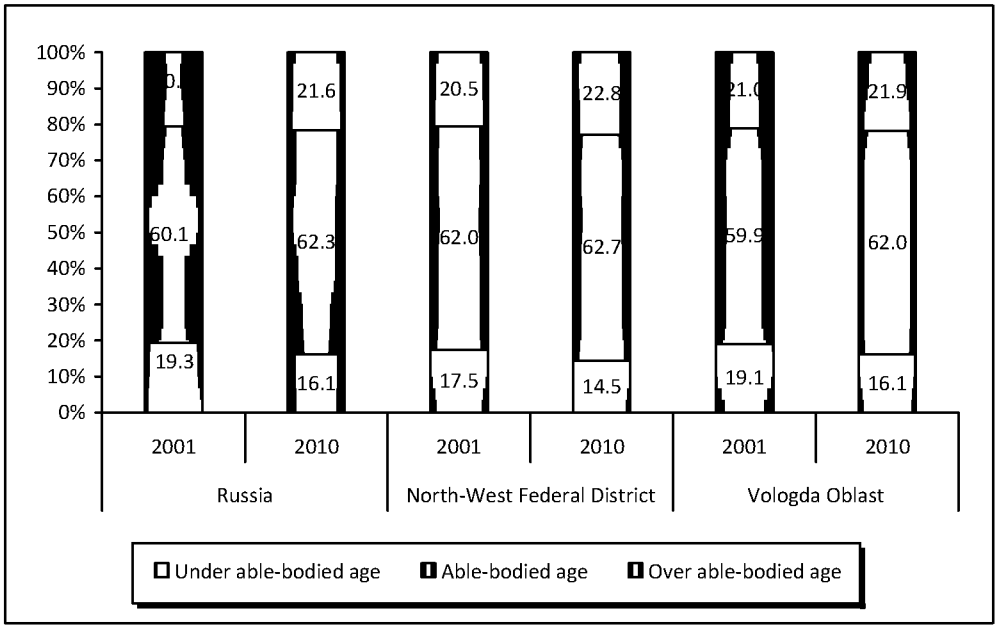
Moreover, the process of aging "goes upwards" due to reducing the birth rate (for example, such as in Japan). I.e. able-bodied population replacement is not provided, demographic load will increase with no prospect of decline in the case of keeping the trends in the population's reproductive behavior.

There were 606 nonworking persons per 1000 able-bodied people in the Russian Federation in 2009: 259 persons aged under 16; 347 persons – over able-bodied age. Since 2000, the total demographic load decreased by 8.5% (the share of children reduced by 20%, and the share of pensioners increased by 2%). In 2009 as compared to 2000, the demographic load due to the individuals under able-bodied age decreased in all the regions, the demographic load due to the people over able-bodied age decreased in 36 regions, and these figures increased in other regions (57%).

Although the level of demographic load in Russia is slightly greater than in the European Union [3], the problem is in the fact that the economic activity of people over able-bodied age is lower [6], and their health is worse and it requires significant social transfers.

These features of population's demographic structure, a shift of birth rates towards older women and reproductive health deterioration lead to the reduction not only in the quantitative

Figure 6. Changes in the population's age structure, %



Source: Rosstat. Available at: gks.ru

characteristics but also qualitative parameters of reproduction, which, in turn, is a risk factor for demographic safety and socio-economic development .

Consider the predictive estimates of demographic processes in order to identify structural reserves to increase the birth rate. According to the latest assessments of Rosstat, the total population in the country will have amounted to 139 041.8 thousand people on average by 2030; these figures are lower by 2% as compared with 2009 *(tab. 4)*.

According to the Ministry of Health and Social Development of the Russian Federation, the number of women in reproductive age will decrease by 4.1 million persons or by 10.7% in 2020 as compared with 2009. Moreover, this reduction will be in the most active childbearing period: the number of women aged 20 – 29 will decreased by 4.6 million persons or by 38%. After 2010, active reproductive age will include small contingents of women who were born in the 1990s.

The share of women aged 20 – 29 in the total population will have decreased from 8.6% in 2009 to 7.2% by the beginning of 2015,down to 5.2% by the beginning of 2020 and to 4.8% by the beginning of 2025. There will be the most significant reduction in this category of population in the period from 2012 to 2021. High birth rates will be required to stop the natural population loss (when the 2010 mortality rate is constant): 2.14 in 2015, 2.55 in 2020 and 2.91 in 2025[2].

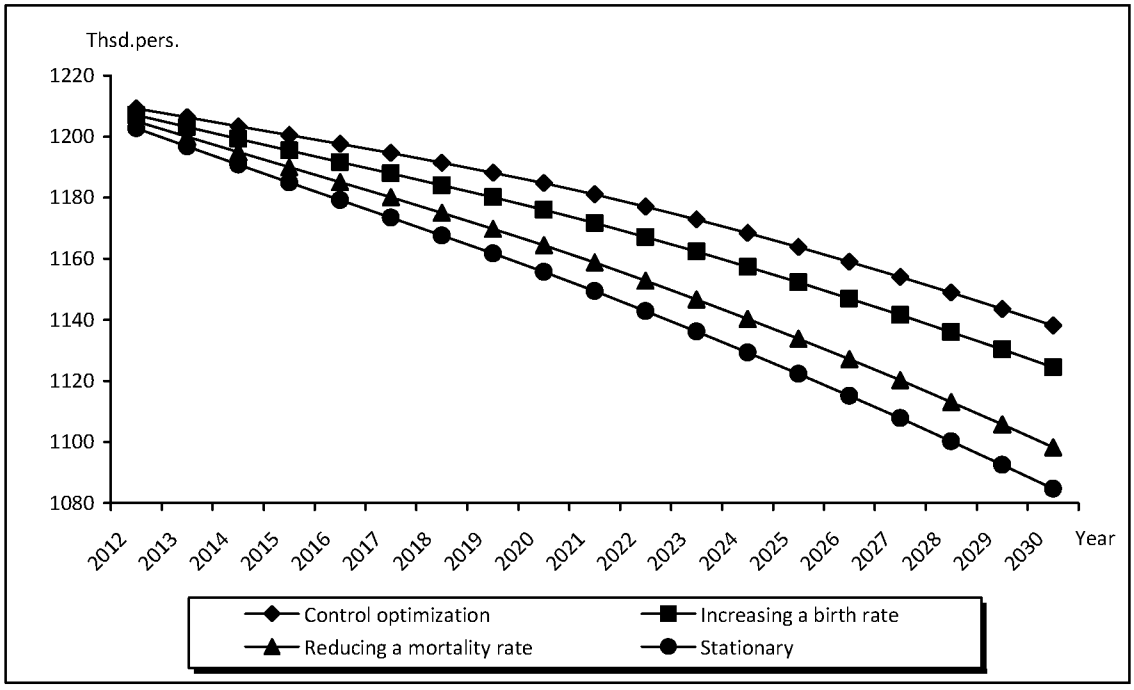
Medium term population forecast for the Vologda Oblast (till 2030) allowed us to assess the effects of the current demographic situation and possible trajectories in its changes. In constructing the model, the authors have made a number of assumptions about the demographic dynamics. Firstly, they have taken into account the possible changes in the key demographic component – a birth rate, a mortality rate and

[2] Data of the Ministry of Health and Social Development of the Russian Federation. Available at: http://www.minzdravsoc.ru/health/prior/52

Table 4. Population changes in Russia according to alternative forecasts, thsd. pers.

Year	Lower forecast	Normal forecast	Upper forecast
2015	139639.9	142168.6	143848.9
2020	136231.9	141770.7	145623.2
2025	131778.0	140643.3	146862.0
2030	126916.9	139041.8	147772.3
Source: Estimated population of the Russian Federation until 2030: Stat. Bull. Moscow, 2010. Available at:: http://www.gks.ru			

Figure 7. Population forecast for the Vologda Oblast according to four alternative forecasts, thsd. pers.



migration. The population's marriage and divorce rates, as well as socio-economic factors (e.g., population income, education, housing, etc.) are not considered. It is possible to assume that their influence is reflected in the number of births and deaths of people.

The calculations are performed in four hypothetical variants of demographic development through the classification by the year of birth. According to each variant, the population size in the region will have reduced by 2030 in regard to the 2010 figures *(fig. 7)*.

Lower estimate in this forecast amounts to 1085 thousand persons by 2030 (according to the inertial scenario of development) and upper estimate is 1138 thousand persons (control optimization scenario, including a reduction in mortality and an increase in the birth rate). The predicted values of population size, which are given by the scenarios of reducing mortality and increasing birth rates, are laid within the boundaries of this interval. This confirms the predominant role of comprehensive measures to improve the situation among the similar ones.

The comparison of different scenarios (see fig. 7, *tab. 5*) shows that a significant deviation for the better is possible only in a few years of this practice even with the government support (significant difference in predicted scenario values will begin in 2015: the difference is more than 15 thousand people).

Table 5. Variable-based demographic forecast for the Vologda Oblast

Scenario	Population size, thsd. pers.			The share of able-bodied population, %			Demographic load, persons of nonworking age per 100 able-bodied people		
	2010	2020	2030	2010	2020	2030	2010	2020	2030
Inertial	1214	1156	1085	62	55	54	61	82	83
Control optimization		1185	1138		54	53		86	88
Reducing a mortality rate		1164	1098		55	54		83	84
Increasing a birth rate		1176	1124		52	52		87	91

The share of people aged 60 and over will have increased to 23% by 2030 (with a value of 18% in the base year of the forecast). The region's population aging will continue in the period from 2010 to 2030, which effects will be significant for the demographic (the "base" for the lower birth rates and high mortality), economic (slowdown in labour replacement, increase in the load on the able-bodied population) and social (increases in costs of social security, increased pressure on social infrastructure) components of society.

Further increase in gender disparity is expected in 2010 – 2030, and therefore there will be 81 man per 100 women in the Vologda Oblast by the beginning of 2030 (85 man in 2010). The number of women in reproductive age will be reduced each year; these figures have been reduced by 19% on average over the whole forecasting period.

Variative demographic forecast of changes in the Vologda Oblast and Russia's total population till 2030 indicates depopulation even with the planned increase in the birth rate. Reducing the number of women of reproductive age in future raises the problem of increasing the numbers of children in families, which actualizes studying the features of population's reproductive behavior.

Thus, the demographic situation in Russia and the Vologda Oblast at the present time and in foreseeable future allow to increase a birth rate only through correcting reproductive behavior and increasing the numbers of children in families.

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