Factors and influence of modern challenges on demographic situation in Siberian regions

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Abstract. The article determines basic factors that influence on demographic processes in Siberia. It is underlined that fall of relative reproduction indices reflects natural transition of population groups born in 1990s to reproductive age. We analysed indices of birthrate, death rate and natural population growth among Siberian regions. It is distinguished that natural population growth is typical for districts with traditionally high relative birthrate indices and for those with high salary level. The author underlines that value of average total birthrate coefficient is not enough for simple reproduction of population in the region. In the article we have presented the reasons of migration outflow from Siberian subjects to the west of the country. It is emphasized that modern social tendencies in the society are challenges for demographic situation in Siberia: high indices of divorces, late giving birth to the first child, orientation for having one child in a family.

1. Introduction
Demographic situation in the Siberian regions is characterized by significant differentiation of birthrate, death rate, natural and migration growth indices. Researchers in different branches of science underline that the group of interrelated factors influences on demographic processes: natural (the severity of a climate), economical (availability of jobs, salary level), social (development of the region and the level of necessary infrastructure objects), cultural (particularly – higher birthrate indices in the regions with aboriginal people of Siberia) [1-5].

2. Models and Methods
Demographic data of the Siberian macroregion, including the regions of Siberian Federal District, the Republic of Sakha (Yakutia) and the Tumen oblast with autonomous districts: Khanty-Mansiysk Autonomous Okrug – Ugra (KhMAO – Ugra) and Yamalo-Nenets Autonomous okrug (YNAO). The author relied on the analysis of literature and statistic sources, demographic, statistic and comparative-geographical methods.

Different demographic indices were chosen as indicators, that are formed under influence of different factors. These demographic indices reflect the quantitative and qualitative sides of the demographic situation in the region: natural and migration growth, sum coefficient of birthrate, average age of the population, population structure by employability, marriage instability rates, number of abortions. The values of demographic indices were compared with the average values for Siberia, and for Russia. Original demographic indices were received from the database of the Federal State Statistics Service and territorial statistics authorities of Siberian regions.
3. Results and Discussion

The main factor that determined the peculiarities of demographic processes in Siberia is transition of small generation born in 1990-s to the reproductive age. In the period of 2015-2020, Siberia was characterized by a sharper decrease of birthrate: from 16.1 to 11.8 per 1,000 people, comparing with the average for the Russian Federation (RF): from 13.3 to 10.1 per 1,000 people. This decrease in percentage is 27 (Siberia) and 24 (RF). Average value of the birthrate coefficient in Siberia in 2020 was 11.8 per 1,000 people, that is higher than average in Russia – 10.1 per 1,000 people. In absolute indices of 2019, the largest number of children were born in Krasnoyarsk Krai – 21,800, Novosibirsk oblast – 21,500, Irkutsk oblast – 20,000. In regions with high relative indices: the Republic of Tyva – 3,000 children, the Altai Republic – 1,500.

Mortality rates decreased by 3.3% (from 11.5 to 11.1 per 1,000 people) over the period of 2015-2020 in the Siberian regions. On the territory of the RF there was a 5% decrease – from 13.0 to 12.3 per 1,000 people (Table 1).

| Region                  | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|-------------------------|------|------|------|------|------|------|
| Republic of Altai       | 7.9  | 8.1  | 6.1  | 5.2  | 3.5  | 3.5  |
| Republic of Tyva        | 14.4 | 13.5 | 13.4 | 13.2 | 11.4 | 10.3 |
| Republic of Khakassia   | 2.1  | 1.3  | 1.3  | -0.2 | -0.8 | -2.1 |
| Altai Krai              | -1.0 | -1.5 | -2.0 | -3.2 | -4.2 | -4.2 |
| Krasnoyarsk Krai        | 1.7  | 1.7  | 1.4  | 0.1  | -0.7 | -1.7 |
| Irkutsk oblast          | 1.7  | 1.4  | 0.5  | -0.3 | -1.4 | -1.4 |
| Kemerovo oblast         | -1.4 | -2.0 | -2.2 | -3.6 | -4.5 | -5.2 |
| Novosibirsk oblast      | 0.7  | 1.1  | 0.8  | -0.5 | -1.3 | -2.0 |
| Omsk oblast             | 1.0  | 0.1  | -1.4 | -2.0 | -2.8 | -6.2 |
| Tomsk oblast            | 2.1  | 1.8  | 0.5  | -0.2 | -1.9 | -1.4 |
| Tyumen oblast:          | 5.4  | 5.2  | 4.5  | 3.5  | 2.8  | 2.1  |
| KhMAO-Ugra              | 10.8 | 10.2 | 9.5  | 7.9  | 7.3  | 6.4  |
| YNAO                    | 11.8 | 11.3 | 10.1 | 9.1  | 8.7  | 7.9  |
| Republic of Buryatia    | 5.9  | 5.2  | 3.8  | 3.4  | 1.7  | 1.7  |
| Zabaikaltsky Krai       | 2.5  | 2.3  | 1.7  | 0.4  | -0.6 | -1.9 |
| Republic of Sakha (Yakutia) | 8.6  | 7.6  | 6.4  | 5.9  | 5.4  | 5.4  |
| **Average in Siberia**  | **4.6** | **4.2** | **3.4** | **2.4** | **1.4** | **0.7** |
| **Average in Russia**   | **0.2** | **0.3** | **0.0** | **-0.9** | **-1.6** | **-2.2** |

Currently, the Siberian Federal District leads in terms of mortality from tuberculosis, respiratory diseases, infectious and parasitic diseases, suicides. Mortality rates are cumulatively influenced by difficult working conditions, high rates of alcoholism, high HIV incidence and poor medical care.

A considerable variation in birthrate indices has defined differentiated natural growth (decrease) indices throughout Siberia: from 10.3 (the Republic of Tyva) to 6.2 per 1,000 people (Omsk oblast). Over the five-years period, natural growth was replaced by natural decrease of population in seven regions.

Natural growth indices are observed in the regions with high relative indices of birthrate: in the Republics of Altai, Tyva, Buryatia, Sakha (Yakutia); and in the regions attracting people with jobs and living standards: Tyumen oblast, Khanty-Mansiysk Autonomous Okrug – Ugra and Yamalo-Nenets Autonomous okrug.

The next factor influencing the demographic situation is the change in the age at which the first child is born and the orientation of the population towards one child in the family, or even no children.
It is known that simple reproduction of the population requires the value of the total fertility rate (TFR) to be 2.1 per woman of reproductive age. According to statistics in Russia this index in 2020 was 1.50, among the Siberian regions – 1.73, and only in two regions the TFR exceeded the value of more than two children per woman (Table 2).

Table 2. Total fertility rate (TFR) in Siberian regions, 2020 [6].

| Region                       | Age of woman when she gives birth, years |
|------------------------------|-----------------------------------------|
|                              | 20  | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | TFR |
| Republic of Altai            | 25.1| 104.0 | 139.2 | 87.6  | 50.7  | 11.8  | 0.6   | 2.11 |
| Republic of Tyva             | 34.9| 142.9 | 169.4 | 110.1 | 61.9  | 17.0  | 0.9   | 2.72 |
| Republic of Khakassia        | 20.8| 86.6  | 92.4  | 69.0  | 39.1  | 9.0   | 0.4   | 1.59 |
| Altai Krai                   | 17.5| 75.2  | 84.3  | 69.3  | 36.2  | 7.6   | 0.2   | 1.46 |
| Krasnoyarsk Krai             | 17.4| 77.5  | 90.5  | 69.8  | 37.4  | 8.4   | 0.3   | 1.51 |
| Irkutsk oblast               | 23.0| 88.3  | 101.3 | 78.2  | 43.5  | 9.2   | 0.5   | 1.72 |
| Kemerovo oblast              | 17.7| 74.4  | 84.9  | 62.9  | 31.8  | 6.6   | 0.4   | 1.40 |
| Novosibirsk oblast           | 18.3| 77.0  | 88.6  | 75.3  | 41.5  | 9.3   | 0.6   | 1.56 |
| Omsk oblast                  | 16.9| 75.5  | 86.7  | 70.2  | 37.9  | 7.9   | 0.4   | 1.48 |
| Tomsk oblast                 | 15.1| 59.0  | 70.0  | 66.1  | 40.0  | 9.1   | 0.6   | 1.30 |
| Tyumen oblast:               | 17.6| 87.3  | 102.9 | 84.0  | 46.6  | 11.3  | 0.5   | 1.75 |
| KhMAO – Ugra                 | 12.8| 87.7  | 117.6 | 80.9  | 43.1  | 9.1   | 0.5   | 1.76 |
| YNAO                         | 12.6| 82.3  | 131.8 | 84.8  | 40.1  | 9.5   | 0.4   | 1.83 |
| Republic of Buryatia         | 26.0| 100.5 | 105.2 | 80.9  | 50.7  | 12.3  | 0.6   | 1.89 |
| Zabaikalsky Krai             | 30.3| 99.2  | 98.8  | 71.0  | 38.2  | 8.3   | 0.3   | 1.74 |
| Republic of Sakha (Yakutia)  | 21.3| 93.2  | 105.1 | 79.6  | 50.5  | 13.5  | 0.9   | 1.82 |
| Siberian average             | 20.5| 88.2  | 104.3 | 77.5  | 43.1  | 10.0  | 0.5   | 1.73 |
| Russian average              | 14.6| 74.8  | 91.2  | 71.6  | 38.7  | 8.9   | 0.5   | 1.50 |

Over the past decade, the age limit for women of reproductive age (15-45 years) has shifted in almost all Siberian regions. The age maximum used to be 20-24 years old (only Zabaikalsky Krai has retained it), but now it has shifted to 25-29 years old.

One more unfavourable circumstance for the demographic situation in Siberia is high indices of marriage instability coefficient (MIC – ratio of registered divorces amount to 1,000 marriages). Average value of MIC in Russia in 2020 was 612 per 1,000 people, in Siberia – 685 per 1,000 people. The national average is not exceeded only in one Siberian region – the Republic of Tyva (343 per 1,000). Absolute maximum of MIC was registered in Zabaikalsky Krai (1,171 per 1,000), where the amount of divorces exceeded the amount marriages in 2020 year.

The current generation finds itself in a period of political and economic changes, radical changes in values and needs. The image of the woman-mother lost its popularity and attractiveness; it has been replaced by a glossy ideal of a woman striving for career growth and professional success, sacrificing marriage, family relationships and maternity. Family has become out of fashion, maternity – a hindrance to success [7].

The next factor that makes demographic situation in Siberia difficult is migration outflow toward the western parts of the country. According to preliminary data, in January-September 2020 the migration loss of population in the Siberian Federal District (SFD) amounted to 14,500 people, that is 2.5 times more than in January-September 2019. The most migration outflow was in Omsk oblast (almost 7,000 people). Migration growth was observed in five regions of the SFD, the largest was in Novosibirsk oblast (7,000 people).
The existing ideas about the standard of living in other regions, dissatisfaction with the real economic situation and comfort of living in their own region cause the desire to change the quality of their lives, motivate them to take decision on a possible change of residence, to choose promising and suitable options to move to another region [8].

The determining factor in migration processes is sharp difference in salary levels in Siberia. In opinion the Governor of Omsk oblast, Alexander Burkov, low salaries in regions influence population outflow: “The key problem now is income level”. In six Russian regions (Chukotsky, Yamalo-Nenets and Nenets autonomous okrugs, Moscow, Magadan oblast and Sakhalin oblast) one fifth of the population earns more than 100,000 rubbles, when the average salary in the country varies from 23,000 to 56,000 rubbles. According to Rosstat, in Omsk oblast the average month salary in January 2021 was 36,000 rubbles, in Novosibirsk oblast – 40,000 rubbles [9].

Differentiation of demographic indices and socio-economical differences in development among the regions defined significant difference in age structure of Siberian population due to employability. Maximal values of employable age population are peculiar to Khanty-Mansiysk Autonomous okrug (60%) and Yamalo-Nenets Autonomous okrug (64%). Because of the workforce attracted to these resource regions, the shares of people over working-age are at their lowest, at 17% and 12%, respectively. A high share of the working-age population (53-57%) can be observed in Krasnoyarsk Krai, Novosibirsk and Tomsk Oblast, which have large developed multipurpose centres. The lowest shares of the working-age population (53%) are in the Republic of Altai and Altai Territory, where the age structure is a mirror image. The Republic of Altai is 28:53:19 (with a high share of children) and Altai Krai is 19:53:28 with the highest share of pensioners in Siberia. The age structure by average value among 16 regions corresponds to the formula – 23:56:21. The age structure of the population by employable age is more favourable to the demographic reproduction potential than the Russian average of 19:55:26, with a higher share of persons above employable age.

The “youngest” region due to index of average age of population is the Republic of Tyva – 29.8 years, in Altai Krai average age is exceeded 40 years. The group of regions with average age 30-35 years includes: the Republic of Altai, the Republic of Khakassia, Khanty-Mansiysk Autonomous okrug – Ugra, Yamalo-Nenets Autonomous okrug, Zabaikalsky Krai and the Republic of Sakha (Yakutia); the group of 36-40 years – Krasnoyarsk Krai, Irkutsk oblast, Kemerovo oblast, Novosibirsk oblast, Omsk oblast, Tomsk oblast, Tyumen oblast, and the Republic of Buryatia. Average age in Siberia is 36.6 years, in Russia – 40 years.

4. Conclusion

In view of natural demographic processes and migratory movements, seven Siberian regions are experiencing population decline due to natural and migratory losses: the Republic of Khakassia, Altai Krai, Krasnoyarsk Krai, Kemerovo oblast, Omsk oblast, Irkutsk oblast and Zabaikalsky Krai. The demographic situation has been aggravated by a decline in the birth rate due to a small group of mothers born in the 1990s, who are now entering their reproductive years. The population of the regions is differentiated by fertility, mortality, natural increase and migration. The main factor behind the migration movement is the difference in socio-economic development and wages among the Siberian regions. Socio-demographic potential is cumulatively negatively influenced by several factors: harsh climate, economic situation, underdeveloped social infrastructure, and environmental conditions.

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References
[1] Borobyev N V, Valeeva O V, Dmitrieva Yu N and Rykov P V 2020 Implementation of the socio-demographic potential of Siberia Geography and Natural Resources 5 33-9
[2] Zvereva N V 2012 Living conditions and demographic behavior (Moscow: Moscow State University Press) p 103
[3] Leshchenko Ya A 2012 Structural changes Siberia’s demographic potential: main trends and consequences Izvestiya of Irkutsk State Economics Academy 5 137-42
[4] Rybakovskii L L and Kozhevnikova N I 2019 Depopulation in Russia: its stages, features and possibilities of neutralization Social and Labour research 2(35) 6-15
[5] Tarasevich T S 2014 Dynamics of demographic processes: the reasons behind depopulation Christian Reading 1 183-96
[6] Federal State Statistics Service 2020 Indicators of Municipalities of the Database, Income http://www.gks.ru/free_doc/new_site/bd_munst/munst.htm (accessed 13 May 2021)
[7] Shelekhov I L, Berestneva O G and Yasukevich Yu V 2013 The analysis of the factors defining the demographic situation in the Siberian federal district East Siberian Biomedical Journal 3-1(91) 131-5
[8] Shvorina K V and Faleychik L M 2018 Main directions of migration mobility in Siberian and Far Eastern Federal Districts Economy of Region 14(2) 485-501
[9] Smolin O N 2018 Some aspects of migration processes: Siberia and Omsk region Proc. Int. Conf. “Migration processes in Siberia: people, cultures, stat policy” (Omsk: KAN Press) 95-109