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## Birth Rate, Number of Children and Family Income: Trends and Relationships*



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#### Abstract

The relevance of the study of the relationship between the trends of birth rate, the number of children and family income is increasing in the context of the unfavorable demographic dynamics in most regions of the country. In this regard, the search for ways to influence the achievement of a desirable model of childbearing simultaneously meeting the interests of society and families remains a priority task. The purpose of the article is to assess the impact of the level of the number of children on the conditions of family life support in the Northern sparsely populated region, where the signs of the traditional type of birth rate are preserved. In accordance with the goal and based on the materials of the Republic of Sakha (Yakutia), the authors systematized and considered the current trends in the processes of birth rate and childbearing of families, traced the influence of the birth order factor on the level and differentiation of income and consumer behavior of families. The methodological basis of the research are the methods of demographic analysis, comparison, generalization, as well as methodological tools based on the normative method and the absolute monetary approach to income assessment, socio-demographic survey. The scientific novelty of the work consists in choosing the research object which is a region with centers of multi-child parenting, assessing the differentiation of family life support conditions depending on the number of children, substantiating the factor of material security as a significant tool for state regulation of fertility processes. The results of the research can be applied in the activities of federal and regional authorities when developing the programs for demographic and family policy, adjusting measures for the implementation of the national project "Demography". In addition, the results obtained present a large empirical material which is necessary for further study of the issues related to the competition of individual or family life needs, the value of children, on the one hand, and investment in the human capital of children or in the family life support conditions, on the other.


Key words: family, children, birth order, multi-child parenting, material security, income, rating, Republic of Sakha (Yakutia).

## Introduction

One of the key tasks of modern Russian society is to achieve sustainable natural population growth. Solution of this task directly affects "Russia's fate and its historical perspective" ${ }^{1}$. Focusing on the historical perspective and strengthening the country's demographic potential makes it necessary to fully take into account the peculiarities of population reproduction and generation renewal in order to anticipate possible demographic "waves" and "pitfalls" and develop proactive measures to smooth them out.

[^1]The condition for leveling the consequences of demographic waves and pitfalls was and still is a high birth rate, including families having many children as its result. In modern conditions, multi-child parenting is observed only in certain regions of the country, where the traditional model of reproductive behavior of families is preserved. Families' sensitivity to demographic policy measures also contributes to the increase in the number of children born, including their high sequence. In this regard, there is an increasing need for a scientific search for ways to influence the achievement of a model of childbearing that meets the interests of the state and families at the same time. It is known that the regulators of family
reproductive behavior are variable over time, differ in the strength, nature and duration of exposure, and are selective in the coverage of objects and territories. Material well-being and especially the level of family income are comprehensive, constantly "acting" and quite easily managed by the state factors contributing to high birth rate.

Recognition of family as a "powerful moral framework" and the value of a large family at the state level is accompanied by the development and implementation of national projects ${ }^{2}$ and additional measures to support families with children, including in the regions ${ }^{3}$. At the same time, achieving the target indicators for the total birth rate in most regions of the country is problematic, which is due to the transformation of the system of population's life values, the aging of the age model and the increaseing age of those who become parents for the first time [1]. The emphasis on qualitative characteristics as opposed to the quantity ones, which is the basis of the "human capital" theory also leads to a decrease in demand and a declining number of children born and raised [2;3]. The family is considered as an economic organization that seeks to improve the spouses' well-being [4;5]. It should have a sufficient material basis that creates an opportunity for normal provision of children in families, the formation of human capital initial accumulation and improving the spouses' well-being [6; 7]. Numerous studies of economic motives and structural factors contributing to the birth rate indicate that the decrease in the intensity of

[^2]birth rate is associated with a high need of families with children to improve their living conditions. Recognition of their conditions as unsatisfactory becomes a factor of restriction or postponement, and often even rejection of subsequent births [8-11]. According to both domestic and foreign scientists, the revision of family plans for childbearing is closely related to the number of children, family wages and income, economic difficulties and problems in the labor market [12-15]. So, the researchers agree that the full implementation of even the existing reproductive plans on a national scale should not be expected without changing the real material, social, and especially housing conditions [16; 17].

According to the typology of the country's regions the Republic of Sakha (Yakutia) is classified as a territory with the signs of social disadvantage in terms of the level and quality of population's life. The share of the population with monetary incomes below the subsistence minimum in the Republic is almost twice the national average [18]. In this regard, the question arises, what is the nature of the relationship of the signs of social, and especially financial ill-being and level of the number of children, whether there is the rationalization of childbirth in the region where, as we have previously identified [19], the value of children in the public opinion transformed the concept of "family" and has a pronounced childrenfocused orientation. We believe that drastic changes in reproductive needs coincide with the periods of uncertainty, and lead to childlessness in conditions of fierce competition with nonfamily values.

The purpose of this paper is to assess the impact of the level of the number of children on family's provision with essential services in the Northern sparsely populated region, where the signs of the traditional type of birth rate
are preserved. To achieve this goal, modern trends of birth rate as the main component of natural population growth in the Republic of Sakha (Yakutia) are systematized and considered; positive changes and negative manifestations associated with the sequence of children born and the number of children in families are identified; it is traced how the factor of the number of children affects the level and differentiation of family incomes, consumer behavior; an assessment of the differentiation of families with different number of children by income indicators is made.

Despite the many-sided research on the problems of poverty of families with children, the obtained results are intended to show the degree of differentiation of families with children by the level of their material security in the region with centers of multi-child parenting and help in finding an effective tool for state birth control.

## Materials and methods

The information base of the research was made up by the statistical data of the Federal State Statistics Service of Russia, the Territorial body of Rosstat in the Republic of Sakha (Yakutia), the materials of all-Union (1979, 1989) and all-Russia (2002 and 2010) population census and micro-census of 1994 and 2015.

The authors used the methods of component analysis of the total coefficient on birth order, calculation of mother's average age at the birth of children, comparative analysis when assessing the potential fertility and the rate of change of urban and rural families by the number of children.

To construct the distribution of the respondents' families by income level, rating of families by income and individual indicators of material well-being, we used the materials of a sociological survey conducted in the form of a multi-stage quota stratified sample in seventeen
municipal districts of the Republic of Sakha (Yakutia) $(n=1670 \text {, sampling error }-2.8 \%)^{4}$.

The method of the respondents' families distribution by income level is based on a normative criterion. It is based on the classification of population groups by income, developed by the experts of the all-Russian center for living standards - having the least level of income (poor), having low income, having lower-middle income, having middle income, having high income [20]. The criterion of assignment to a particular group are social standards - a living wage, socially acceptable (recovery) consumer budget, average income consumer budget and high income consumer budget, the magnitude of which is approximately related as 1:3:7:11. In contrast to this classification, we have identified three groups of families by their income level (poor, low-income and middle-income), which is associated with a small share of middle-income and almost absence of high-income families in the analyzed population. In addition, the study focuses on income differentiation as the number of children in the respondents' families increases. When defining the poor, we follow an absolute monetary approach (households are recognized as the poor when their average per capita monetary income is below the minimum subsistence level). The threshold value separating the low-income and middle-income groups is 2.5 subsistence minimums, since the socially acceptable (recovery) consumer budget is at least $2.5-3$ subsistence minimums [21, p. 973]. The middle-income social group brought together lower-middle-income and middle-income families.

[^3]The rating on income indicators and their differentiation, as well as on individual characteristics of well-being is based on a comparison of these indicators in families by the number of children, where 1 is the best and 4 is the worst position.

## Main results

Against the background of a long and significant drop in the birth rate in most Russian regions, Yakutia is seen as a territory where a relatively high birth rate remains. The total birth rate in 2018 was 1.85, compared to the average in Russia of 1.58 . At the same time, there is a noticeable differentiation of birth rate in the Republic depending on the type of the territory: for example, if the considered indicator in urban areas in 2018 was 1.58 ( $\mathrm{RF}-1.49$ ), in rural areas its value reached $2.47(\mathrm{RF}-1.87)$. In the birth rate dynamics, a sharp jump occurred in 2007, as a response to additional measures of material assistance to families, encouraging repeated children births (maternity capital, increased benefits, covering children's stay in preschools, etc.). According to our assessment, in 2007, the increase in the birth
rate was determined by an increase in its age coefficients by $88 \%$, the increase in the intensity of births was especially marked in rural areas of the republic ( $92 \%$ of the increase in births) [22]. Baby boom was also observed in 2012 in response to the measures of the regional demographic policy: the republican maternity capital "Family", the allocation of land plots to families with many children. The maximum value was reached in 2014.

The effectiveness of demographic policy measures has affected the increase in the average order of children births. At the same time, in urban areas, there is a clear decrease in the total coefficient for first births, which indicates the postponing of the first child's birth. This is also caused by later marriages. The average age of the mother at birth increases; the trend is especially significant in urban areas. The average age of birth debut increased, having reached 25.4 years among urban women and 23.2 years among the rural ones in 2018 (Table 1).

The contribution of first births to the total rate decreased from $42.8 \%$ in 2007 to $33.6 \%$ in 2018. The share of second births in the structure

Table 1. Total birth rate by the order of births and average age of the mother at birth of children, Republic of Sakha (Yakutia)

| Year | Total birth rate, number of children | Including births, number of children |  |  | Average age of the mother at birth, years |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | firs | second | third and following | All births | First birth |
| Total population |  |  |  |  |  |  |
| 2007 | 1.911 | 0.817 | 0.650 | 0.444 | 26.1 | 22.8 |
| 2014 | 2.255 | 0.811 | 0.770 | 0.674 | 28.0 | 24.2 |
| 2018 | 1.849 | 0.622 | 0.613 | 0.614 | 28.6 | 24.6 |
| Urban population |  |  |  |  |  |  |
| 2007 | 1.725 | 0.820 | 0.627 | 0.278 | 26.2 | 23.1 |
| 2014 | 1.801 | 0.663 | 0.664 | 0.474 | 28.5 | 24.9 |
| 2018 | 1.581 | 0.554 | 0.566 | 0.461 | 29.2 | 25.4 |
| Rural population |  |  |  |  |  |  |
| 2007 | 2.305 | 0.805 | 0.684 | 0.816 | 26.0 | 22.3 |
| 2014 | 3.379 | 1.186 | 1.036 | 1.157 | 27.2 | 22.8 |
| 2018 | 2.474 | 0.752 | 0.715 | 1.007 | 27.6 | 23.2 |
| Calculated by: Primary data of the statistical registration of births of Sakha (Yakutia)stat. |  |  |  |  |  |  |

of the total birth rate remains relatively stable, about $34 \%$, being ahead of the contribution of first-born births. Third and subsequent births received a noticeable increase in 2014, their share in the total birth rate reached $30 \%$. According to the results of 2018, every third newborn in Yakutia appeared in a large family. Compared to 2007, the component of the total coefficient determined by third and subsequent births increased by $38.3 \%$ by 2018, while the first-born births registered a $23.9 \%$ decrease. The decline in the birth rate observed in recent years has mostly related to the first-born children. The decrease in the contribution of this group of newborns outpaced the decrease in the total coefficient for the births of all other orders.

In urban areas of the Republic a trend to reduce the contribution of first births is clearly visible, in rural areas there is an increase in births of all orders; as a result a significant potential of increasing fertility and preservation of large families traditions is revealed here: over $40 \%$ of rural infants in 2018 were born in families with many children.

The emerging trend in the birth rate is the result of the regulation of childbearing in families, which can be seen in the analysis of women's reproductive behavior by the year of their marriage. According to the 1994 microcensus, 4,545 newborn children were accounted for by 1,000 women who married for the first time in 1950-1954, including 3,026 in urban and 5,082 in rural settlements. According to the 2015 population micro-census, this figure was 1,865, 1,642 and 2,199 children, respectively, for the generation of women who married in 1990-1994.

However, over time, the differentiation in the number of children born by urban and rural mothers started showing signs of smoothing. This trend is formed by a noticeable change
in the rural mothers' behavior. For example, rural women who married in the first half of the 1950s were 5.3 times less often than urban women likely to have only one child, and among women who married in the 1990s, the difference was only 1.5 times. A similar ratio is observed for women who gave birth to both two ( 4.9 and 1.4 times) and three ( 3.2 and 0.7 times) children.

The birth rate observed in Yakutia in the 1970s and 80s provided a fairly high rate of growth in the number of families with children and, accordingly, their high share in the total number of families (about 75\%). The decrease in the birth rate naturally led to a decrease in the share of families with children: $58.9 \%$ on average in the Republic in 2010, 54.6\% in urban and $67.7 \%$ in rural settlements. In urban settlements in the 1970 s, despite the predominance of women who gave birth to two children, every second child was the only one in the family. According to the 2002 and 2010 censuses, the percentage of families with one child here exceeded $60 \%$. And in rural families, the visible gap between single-child families and families with more children is observed only during the last census.

It was noted above that the distribution of urban women by the number of children they have is very smooth, and the composition of urban families by the number of children is sharply differentiated. Thus, the proportion of families with one child in 1979 was 1.5 times higher than the relative number of families with two children, and more than six times higher than the proportion of families with three or more children. In 2010, this preponderance increased even more ( 2 and 7.1 times, respectively). In turn, the number of families with two children in 1979 exceeded the share of multi-child families 4 times, in 2010 - 3.6 times.

Figure 1. Dynamics of urban and rural families share by the number of children under 18 for the period of 1979-2010, \%


Calculated by: Results of the all-Russian population census of 2002: Stat. Coll.: Vol. 13. Number and composition of families of the Republic of Sakha (Yakutia) / Sakha(Yakutia)stat. Yakutsk, 2007, pp. 13-15; Results of the all-Russian population census 2010: stat. coll. Vol. 6. Number and composition of households in the Republic of Sakha (Yakutia) / Sakha(Yakutia) stat. Yakutsk, 2013, pp. 220-222.

The data shown in figure 1 illustrate not only quantitative changes in the number of children directly in urban or rural families, but also significant differences in the patterns of childbearing in them. It is clear that the structure of urban families in terms of the number of children is markedly differentiated, in contrast to rural families. Although the decline in the number of children in families is in line with the global trend in the birth rate, the republic, especially its rural areas, demonstrate a high proportion of families with many children.

Despite the identified changes in reproductive behavior (including the postponement of first-born births, an increase in the average
age of birth debut), the Republic of Sakha (Yakutia) still has the potential to increase its birth rate. This is evidenced by the results of micro-censuses of the population in 1994 and 2015. The average number of expected children in 1994 was 2,623 per 1,000 women aged between 18 and $44^{5}$.

Despite the decrease in this indicator (according to the results of the 2015 microcensus, it reached 2,100 children), its value is significantly higher than the average Russian value of the average number of expected births
${ }^{5}$ Marriage status and birth rate in the Republic of Sakha (Yakutia). Results of micro-census of the population in 1994. Vol. 3. Yakutsk: Goskomstat RS(Ya), 1995, p. 45.
$(1,730)$, as well as the values of almost all regions of Russia, with the exception of the North Caucasus Federal district $(2,250)^{6}$.

At the same time, the birth of each subsequent child affects the decline in the material well-being of families and their income [23], as evidenced by both the data from sample surveys of household budgets and the materials from sociological research. According to the results of a sample survey of the population's income and participation in social programs in 2016, $61.3 \%$ of Yakutia's households living in rural areas fell into the category of poor, which is 1.6 times higher than for urban households (38.7\%) ${ }^{7}$. Families consisting of three or more
people are at significant risk of falling into the category of poor ( $88.4 \%$ ). For small families (1-2 people), this risk does not exceed $12 \%$. The same ratio applies to households with minor children and those without children. A just noticeable risk reduction is recorded for families with children under $16(84.5 \%)^{8}$.

Family's balancing on the poverty line is determined by the amount of available resources, while their size in families with children has always lagged behind the average values (Fig. 2). The peak of the increase in figures in comparable prices was in 2014 making up 2.4 times higher than in 2005. After that, its decrease is observed again.

Figure 2. Dynamics of disposable resources in the households of the Republic of Sakha (Yakutia) for the period of 2005-2018, thousand rubles


Calculated by: Consumer price indices (tariffs) for goods and services. Available at: https://sakha.gks.ru/folder/ 32336 (accessed 21.10.2019); Composition of available resources of households of various socio-economic categories. Available at: https://sakha.gks.ru/folder/32339 (accessed 21.10.2019).

[^4]In this regard, it is important to determine the role of children in the subjective assessment of the level of material well-being of a family based on the results of a sociological study conducted in Yakutia in 2017. According to the data provided, there is no "high-income" category in the distribution of families with children at all. In addition, it can be seen that each subsequent birth leads the family towards a low yield. Thus, the share of average-income
families with many children is 2.4 times lower than the share of those with no children. Conversely, the proportion of poor families with three or more children is twice that of those without children (Fig. 3).

An increased risk of reducing the material well-being of families with arrival of children is accompanied by a deterioration in consumption (Table 2). $30.4 \%$ of families without children and $41-67.8 \%$ of families with children have

Figure 3. The distribution of the respondents' families by level of income depending on the number of children, \%


Calculated by: The materials of the sociological survey, 2017.

Table 2. Differentiation of consumption of respondents' families depending on the presence of children, \%

| Consumer characteristics | Number of children in families |  |  |  |  |
| :--- | :---: | :---: | :---: | :---: | :---: |
|  | 0 | 1 | 2 | 3 | 4 and more |
| Money is not enough even for food | 3.0 | 5.4 | 4.3 | 7.0 | 9.7 |
| Everything is spent on everyday expenses | 13.7 | 22.5 | 21.5 | 23.5 | 38.7 |
| Money is enough for everyday expenses, but buying <br> clothes is difficult | 13.7 | 13.1 | 18.4 | 19.1 | 19.4 |
| Money is generally enough, but we need to take out a <br> loan to buy expensive items | 31.8 | 36.7 | 34.0 | 33.0 | 12.9 |
| Money is enough everything almost for everything, we <br> can buy large purchases on credit (apartments, cars, <br> cottages, and so on) | 21.7 | 10.4 | 16.0 | 11.3 | 9.7 |
| We do not deny ourselves almost anything, we can buy <br> everything without credits | 13.1 | 6.3 | 4.0 | 3.5 | 3.2 |
| No answer | 3.0 | 5.4 | 1.8 | 2.6 | 6.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Calculated by: The materials of the sociological survey, 2017. |  |  |  |  |  |

difficulties in purchasing food, daily expenses and clothing. A third of families have enough money generally, but expensive items are purchased on credit. Families provided with everything they need and which can afford large purchases on credit (or without it) make up 34.8 and $13-20 \%$, respectively. We assume that families without children can make large purchases by saving money for them, while families with children are forced to take out a loan for these purposes.

The frequency of mentioning individual expenditure items varies slightly in families with and without children, but there are
certain changes in the formation of family expendi-tures due to the appearance and increase in the number of children (Table 3). Detailing consumer characteristics by expenditure items shows that, regardless of the family composition, the largest share of expenditures falls on food (just below $40 \%$ ). A significant item of expenditure is loans (about a quarter of all households' expenses), which increase the security of durable goods and real estate. However, low family income reduces the ability to use money for other expenses and savings, thereby limiting families' consumption. In addition, with

Table 3. Distribution of expenditure items in the family budget depending on the composition of the respondents' families, \% by frequency of response selection

| Expenditure item | Families |  |  |
| :--- | :---: | :---: | :---: |
|  | Without children | With one child | With two and more children |
| food | 36.3 | 38.9 | 38.4 |
| utilities, Internet, communications | 16.2 | 17.1 | 16.4 |
| transportation expenses | 10.0 | 9.5 | 9.5 |
| credit | 22.3 | 23.0 | 26.3 |
| buying clothes | 12.9 | 11.4 | 12.4 |
| eating out | 8.2 | 5.6 | 5.7 |
| university education, courses | 14.8 | 11.4 | 14.2 |
| sports sections, fitness | 5.8 | 5.7 | 7.5 |
| travelling | 16.6 | 15.4 | 13.4 |
| Calculated by: The materials of the sociological survey, 2017. |  |  |  |

Table 4. Ranking of families in terms of income and material well-being

| Rating indicator | Number of children |  |  |  |
| :--- | :---: | :---: | :---: | :---: |
|  | no | 1 | 2 | 3 and more |
| Provision of durable goods | 3 | 4 | 1 | 2 |
| Owning real property | 4 | 3 | 2 | 1 |
| Income from renting or leasing property | 1 | 2 | 4 | 3 |
| Savings | 1 | 4 | 3 | 2 |
| Per capita monetary income, rubles per month | 1 | 2 | 3 | 4 |
| Modal income, rubles per month | 1 | 2 | 3 | 4 |
| Median income, rubles per month | 1 | 2 | 4 | 3 |
| Decile coefficient of differentiation, times | 4 | 1 | 2 | 3 |
| Gini index | 1 | 3 | 2 | 4 |
| Poor | 1 | 2 | 3 | 4 |
| Low-income | 3 | 4 | 2 | 1 |
| Average-income | 1 | 2 | 4 | 3 |
| Calculated by: The materials of the sociological survey, 2017. <br> Note: 1 - best position, 4 - worst position. |  |  |  |  |

an increase in the number of children in families, the share of credit expenses increases to $26.3 \%$.

A significant item of families' expenditure, regardless of its composition, is utility bills, payment for the Internet. Family composition also does not significantly affect the differences in clothing and transportation costs. While, the expenditure items for travelling, education, sports, and eating out are largely determined by the number of children in families.

Comparison of the main indicators of families' material well-being depending on the number of children in them allows to build a rating (Table 4).

It can be seen that having many children is accompanied by the worst position of the family in the rating scale for average per capita income, modal income, and the Gini index, and is characterized by a high risk of family transition to the category of poor. Limiting a family to two children affects the family's position in the rating to varying degrees. In general, two-child families are more likely to be middle-income. The birth of the first child leads to a shift in the family's position towards a downgrade. The successful implementation of the national project "Demography" and other Federal and regional projects will help to reduce the degree of differentiation of families with children by the level of material security.

## Conclusion

Thus, the global trend of declining birth rates has affected the Republic of Sakha (Yakutia) too. A component analysis of the total fertility rate revealed a high contribution of third and subsequent births, which affected the rate of change in the share of multi-children families, especially in rural settlements. According to the results of the population micro-census in 2015, the potential of birth rate
growth in the republic is higher than the average in Russia. It shows the positive demographic intentions of the population.

The socio-demographic survey confirmed that the objective obstacle to the reproductive intentions' implementation is the level of family income. Thus, every second large family belongs to the poor, with incomes below the subsistence minimum per a family member. As the number of children decreases, the share of the second group of families, the low-income ones, increases. The increase in the number of children is accompanied by an increase in the gap in the families' consumer opportunities, the share of spending on everyday needs. Having many children leads to the worst position of a family in the rating scale for average per capita income, modal income, and the Gini index.

Increasing families' income by taking measures to reduce the level of poverty and prevent its "reproduction" through income and employment policies will expand the opportunities for implementing reproductive plans. In this context, the impact on the material security of families is perceived as an important tool for state regulation of the birth rate in parameters that meet the interests of the state and the family.

Systematization of stable trends of fertility, number of children and family income will serve as a methodological basis for the preparation of demographic development scenarios aimed at anticipating the adverse impact of subsequent demographic "waves". The results and empirical material presented in the paper are of scientific and practical interest in the study of problems related to the life needs of an individual or family, the value of children, on the one hand, investments in the human capital of children or in the conditions of family life support, on the other.

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