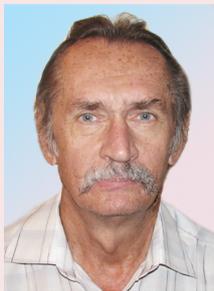


Women and Men: Differences in Fertility and Reproductive Behavior Indicators*



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Abstract. The search for the reasons that determine birth rate dynamics remains relevant from the practical and theoretical viewpoints. The aim of our research is to assess whether Russia's population complies with the stable population model in terms of stability of sex structure. We make an attempt to calculate and assess reproduction indicators for male population. Having revealed that such calculations have methodological limitations, we propose a way to overcome them. According to calculations, in 2019 in Russia, the total fertility rate for women (1.504) was 9.1% higher than for men (1.378). The difference in the gross reproduction rate was 3.1% (0.730 for women and 0.708 for men), in the net reproduction rate –

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6.0% (0.719 for women, 0.678 for men). The difference in the value of the rate of natural increase in women and men is 5.0% (-11.5 and -12.1%, respectively). Due to the presence of two quantitatively different reproduction modes in the female and male generations, we doubt it would be possible to implement a stable population model. The age-related model of fertility in men, as well as in women, is shifting toward older ages (in the groups aged 25–29 and 30–34). The average age when men become fathers has also increased: from 31.51 years in 2011 to 32.40 in 2019. We also analyze the fertility rate model according to the age of the mother and father. We have determined that in most cases (70% in 2019) the father is older than the mother, in 19% of cases the mother is older than the father, in 11% – both parents are of the same age. Fathers are 1–4 years older than mothers in 44–64% of cases (depending on the age of the mother). It is noteworthy that the difference in the age of parents is higher when children are born out of wedlock. In the future, we find it interesting to study gender-related differences in reproductive motivation and other determinants of male and female fertility.

Key words: stable population, age-related fertility model, reproduction of the male population, reproductive behavior, fertility, age difference between fathers and mothers.

Introduction

The gender aspect of reproductive behavior is one of the topical issues of contemporary demography and sociology. Transformation of marriage and parenthood, tolerance to unmarried state and childlessness, legitimization of cohabitation, “aging” of marriage and fertility as the norm of today regulate the lifestyle of Russians, affecting the demographic situation. Whether trends in population reproduction (and demographic behavior) currently being recorded should be considered a new social challenge or a manifestation of demographic self-regulation, an inevitable consequence and manifestation of the demographic transition is an open question. This is confirmed by the discussion of the leading Russian demographers A.B. Sinel’nikov and A.G. Vishnevskii presented in the *Sociological Journal* [1, p. 84; 2, p. 93]. In our opinion, the question about the ideal and desirable size of the human population and the idea of demographic self-regulation in the context of the demographic transition have their place in the theory of global demographic dynamics (although the whole concept is based on the demographic history of individual countries). Whereas for local human communities, which undoubtedly possess

not only demographic, but also social parameters determining population reproduction, at least migration and demographic behavior must be considered, and most importantly, the relevance of the methodology used for demographic analysis must be assessed. Demographic forecasts, determining the type and mode of reproduction as the basis and result of the theoretical foundations of population dynamics are most often based on the stable population model, which assumes that the age-specific intensities of fertility and mortality and the age-sex pattern are maintained over time. In this connection, it is reasonable to estimate the intensity of fertility and the reproduction of the male population. Anticipating possible skepticism let us offer as an argument for not only the structural factor itself, which manifests itself in the proportionality of the sexes, but also the features of reproductive behavior that determine the age-specific natality model. From this point of view, we are interested in the ratio of the age of fathers and mothers, the scale of its differences, and their influence (the possibility of increasing or balancing the disproportion) on the age-sex pattern of reproductive contingents.

The purpose of the work is an attempt to assess the Russian population in terms of compliance with the stable population model in the aspect of invariability of the sex-age pattern. In order to achieve the goal, we calculated the total fertility rate and reproduction indices for the male population according to a substantiated methodology; identified the age-specific natality model for men and evaluated the age differences between fathers and mothers, which is the scientific novelty of the study.

Experience in the study of male reproduction and reproductive behavior broken down by gender, the methodological basis of the study

Calculations of birth and reproduction rates for male population are extremely rare. We have met only isolated references to the possibility of such calculations¹ and their implementation. R. Dinkel and I. Milenovic [3, p. 148] in their work give the data of the sample surveys in Germany, used to compare male and female fertility according to birth year from 1902–1904 to 1959–1961. As a baseline they used special age-specific birth rate, calculated for both sexes. The authors found out that there was a “convergence” of the age pattern of male and female fertility. In older birth cohorts, young women had higher fertility, while at the age of 40+, men’s fertility was more than five times higher than that of women. In younger cohorts, birth rates gradually balanced and such significant differences were no longer observed.

Similar conclusions were obtained by I. Harris, C. Fronczak, L. Roth, R. Meacham [4, pp. 186–187] for the U.S. population. Calculations of age-specific birth rates revealed that since 1980, the birth rate among women over 35 years of age has increased by almost 60%, while among women aged 20–34 it has increased by only 10%. At the same time, since 1980, the birth rate for men in the age of 30 and older has increased by 21% and for men

aged 40 and older by almost 30%. In contrast, the birth rate for men younger than 30 years of age has declined by 15%.

A new pattern of correlation between socio-economic development and fertility was revealed by M. Myrskylä, H.-P. Kohler and F.C. Billari [5, p. 742; 6, p. 30]. They showed that in developed countries, after reaching a certain level of the Human Development Index (HDI), the total birth rate begins to increase. The publication provoked lively discussion in the global scientific community, as they largely contradicted the established ideas about the dynamics of birth rate in the world.

C. Dudel and S. Klusener assessed the dynamics of male fertility in developed countries, showing its convergence with fertility in women (as well as the convergence of the ages of fathers and mothers at childbirth, although fathers are on average 2–4 years older), which the authors explain by the spread of gender equality. For developing countries, the works of B. Schoumaker revealed that the fertility of men is up to two times higher than that of women [8], and the age of fathers at childbirth is significantly higher than that of mothers [9, p. 826]. Greek researchers C. Bagavos and A. Tragiki, studying the impact of employment and education on fertility, proved that the decline in men’s fertility in 2000–2014 was due to employment problems, while for women it was not so clearly related to the economic crisis [10, p. 1438].

Calculations of birth rates for the male population carried out by V.N. Arkhangelskii showed that in the 1970s the total birth rate of men was slightly higher than that of women [11, p. 15], and in 1996 it was lower [12, p. 20–21]. A.B. Sinel’nikov proposed a model of reproduction of married couples and “the method of marriage potentials as a way to escape from gender double standards”².

¹ Multilingual Demographic Dictionary. Available at: <http://www.demopaedia.org>

² Sinel’nikov A.B. Marriage and birth rates without a gender double standard. *Demoscope Weekly*. 2017, no. 725–726. Available at: <http://demoscope.ru/weekly/2017/0725/tema01.php>

Sociologists and demographers have repeatedly raised the question of the differences and mutual influence of men's and women's reproductive attitudes on reproductive behavior. Obviously, man's position will to some extent influence woman's reproductive decisions, so it is very important to understand men's preferences with regard to childbearing.

A review of surveys of reproductive behavior conducted in Russia reveals a very significant fact: the preferred number of children among men is slightly higher than among women (*Tab. 1*). In addition, over time, gender differences are decreasing, remaining at the expense of the population of the republics.

Table 1. Average preferred number of children (desired/expected)

Year of study, title (if there is any)	Region of study	Desired/expected number of children among men	Desired/expected number of children among women	Source**
1973, 1983, 1993 – rural area	Republic of North Ossetia–Alania	4.39/-*, 4.27/-, 3.65/-	3.62/-, 4.00/-, 3.27/-	1
1974, 1984, 1994 – city		3.80/-, 3.83/-, 3.55/-	3.39/-, 3.68/-, 3.20/-	
1973–1974	Saint Petersburg	2.03/1.73	2.04/1.56	[13, pp. 129–137]
1979–1981	Republic of Mordovia (Saransk)	2.79/-	2.16/-	2
1981 (couples)	Saint Petersburg	2.70/-	2.50/-	[14, p. 106]
1982 (couples)	Moscow	1.91/-	1.88/-	3
1983–1984 (couples)	Makhachkala	2.87/-	2.75/-	3
1982	Moscow	2.56/1.97	2.44/1.81	[15, p. 62]
1983 “Children in an Urban Family”	Moscow	2.58/1.91	2.32/1.75	[16, p. 23]
1984 “Children in an Urban Family”	Saratov	2.52/2.04	2.42/1.92	[17, p. 7]
1984 “Children in an Urban Family”	Ufa	2.76/2.25	2.59/2.13	[17, p. 7]
1982–1983	Chelyabinsk Oblast (Zlatoust, Magnitogorsk)	2.79/2.15	2.51/1.90	[18, p. 96]
1986–1987	Yekaterinburg	2.49/1.78	2.36/1.60	[19, p. 42]
1993 (rural area)	Republic of Bashkortostan	3.46/2.69	2.77/2.62	[20, p. 170]
1989	Altai Republic and Altai Krai	-/2.72	-/2.33	[20, p. 170]
1994 Microcensus of RF population	Microcensus of RF population	2.25/-	2.18/-	[21, p. 96]
1994	Pskov Oblast	2.26/1.94	2.22/1.90	[22, p. 436]
1996–1997	Veliky Novgorod	2.38/1.89	2.40/1.82	[23]
1997 (couples under 5 years of marriage)	Naberezhnye Chelny	2.66/1.88	2.58/1.96	4
1997	56 constituent entities of RF	1.83/- 24 years old 1.90/- 31 years old	1.81/- 1.86/-	5
1999	Khanty-Mansi Autonomous Okrug –Yugra	2.42/1.69	2.19/1.54	[24, p. 136]
2000 (city)	Khanty-Mansi Autonomous Okrug –Yugra (Pokachi)	2.35/2.03	2.22/1.87	[25, p. 146]
2001	Public Opinion Foundation RF	2.51/-	2.40/-	6

End of Table 1

Year of study, title (if there is any)	Region of study	Desired/expected number of children among men	Desired/expected number of children among women	Source**
2001	Republic of North Ossetia–Alania	3.03/-	2.82/-	7
2003	Novgorod Oblast	2.5/2.02	2.42/1.92	[26, p. 66]
2005–2015 (rural area)	Republic of Sakha (Yakutia), Primorsky and Khabarovsk Krai.	-1.74	-1.52	8
2011–2012	Arkhangelsk Oblast	2.9/2.4	2.3/1.9	[27, p. 71]
2012 “Selective observation of the reproductive plans of the population”	All subjects of RF	2.30/1.92	2.28/1.92	9
2005–2021	Vologda Oblast	2005 – 2.16/1.77 2008 – 2.00/1.88 2011 – 2.04/1.83 2014 – 2.02/1.83 2017 – 2.22/1.93 2019 – 2.11/2.01	2005 – 2.14/1.70 2008 – 2.01/1.83 2011 – 2.10/1.87 2014 – 2.02/1.80 2017 – 2.22/1.89 2019 – 2.16/1.99	10 [28, pp. 51; 29, p. 37]
2017 “Selective observation of the reproductive plans of the population”	All subjects of RF	2.16/1.88	2.15/1.88	11
2018–2019 (city, couples) a family with children lifestyle	Cities in several regions of RF	2.8/2.0	2.7/1.9	[30, p. 63]
2020 “Demographic health of Russian regions”	10 constituent entities of RF	2.27/1.96	2.31/1.91	12
* No data.				
** Compilation according to:				
1 – Dzutsev Kh.V. Evolution of the Ossetian family and interfamily relations: An ethnosociological analysis: Doctor of Sciences (Sociology) dissertation. Vladikavkaz, 1998.				
2 – Savinov L.I. The impact of free time on the reproductive behavior of married couples (Case study of Saransk, 1979). <i>The Family and the Social Structure of Socialist Society</i> , Moscow, 1980. 123 p.				
3 – Aligadzhieva Z.M. Family as a subject of social life activity: Candidate of Sciences (Philosophy) dissertation. Moscow, 1986.				
4 – Aligadzhieva Z.M. Family as a subject of social life activity: Candidate of Sciences (Philosophy) dissertation. Moscow, 1986.				
Sadykova R.G. Comprehensive socio-hygienic study of the family and the health status of children raised in it: Candidate of Sciences (Medicine) dissertation. Kazan, 1998. 12 p.				
5 – <i>Kul'turnye miry molodykh rossiiyan: tri zhiznennye situatsii</i> [The Cultural Worlds of Young Russians: Three Life Situations]. Moscow, 2000. 95 p.				
6 – Available at: http://bd.fom.ru/report/map/tb011813 ; https://bd.fom.ru/report/cat/socium/demo/of011805				
7 – Lalaeva L.E. Reproductive potential of the modern family: Status and trends of development (Case study of the Republic of North Ossetia–Alania): Candidate of Sciences (Sociology) dissertation. Vladikavkaz, 2004. 15 p.				
8 – Trusova E.A. Features of reproductive behavior of rural residents. In: <i>Smysl, funktsii i znachenie raznykh otraslei prakticheskoi psikhologii v sovremennom obshchestve: sb. trudov Vseros. nauch.-prakt. konf. s mezhdunar. uchastiem</i> [The meaning, functions and significance of different branches of practical psychology in modern society: Collection of Scientific Works of the All-Russian Scientific-Practical Conference with International Participation]. Khabarovsk, 2017. 252 p. Available at: https://www.elibrary.ru/download/elibrary_35030263_75670449.pdf				
9 – Selective observation of the reproductive plans of the population. <i>Rosstat</i> , 2012. Available at: https://gks.ru/free_doc/new_site/RPN/Publisher/index.html				
10 – Monitoring data on the reproductive potential of the Vologda Oblast population, VoIRC RAS.				
11 – Selective observation of the reproductive plans of the population. <i>Rosstat</i> , 2017. Available at: https://gks.ru/free_doc/new_site/RPN17/index.html				
12 – Rostovskaya T.K., Kuchmaeva O.V., Zolotareva O.A. Evaluation of demographic attitudes by the eyes of men and women under conditions of fertility deficiency. <i>Zhenshchina v rossiiskom obshchestve=Woman in Russian Society</i> , 2021, Special Issue. DOI: 10.21064/WinRS.2021.0.8 (https://womaninrussiansociety.ru/wp-content/uploads/2021/01/%D0%A0%D0%BE%D1%81%D1%82%D0%BE%D0%B2%D1%81%D0%BA%D0%B0%D1%8F.pdf)				

How does a man's position affect the final fertility of a couple/woman? What is the childbearing potential of a modern Russian family, based on the reproductive intentions of men and women? A unique study on the identification of value orientations of husbands and wives, carried out by a research team led by A.I. Antonov, answers these questions [31]. Using the proprietary methodology, we evaluated the childbearing potential of families depending on the consistency of reproductive attitudes in the couple. We found that 26.5% of couples have a strong childbearing potential (couples with coincident and noncoincident attitudes toward having many children), 34.6% of couples have a weak potential, and 28.4% have a minipotential [31, p. 33]. The higher the similarity of wives' and husbands' attitudes toward multi-child parenting, the more likely their realization and the higher percentage of families with three or more children [31, p. 21]. In this regard, the importance of men's reproductive attitudes in the final number of children in families, and consequently in the process of population reproduction, is undeniable.

Methodological foundations of the study. Age and total birth rates are traditionally calculated only for women. However, the statistical information annually developed in Russia (statistical form p248) contains data on the distribution of children by age of mother and father, on the basis of which age-specific birth rates can be calculated for men as well. But when calculating these indicators, men, as compared to women, have two limitations.

The first limitation is due to the fact that while for women the proportion of unspecified age is very small (e.g., 0.06% in 2019 for the whole of Russia), for men it is substantial (10.2% in 2019 for the whole of Russia). Almost all cases (2019 – 96.6%) where the age of the father is not specified refer to the children registered on the mother's statement. Among them, there were 97.9% of such cases in 2019. Among those born in registered marriages,

the proportion of those whose father's age is not specified – 0.07%, and among those registered by joint statement of parents – 0.14%.

The second limitation is that the statistical treatment does not and cannot contain data on the distribution of children according to the father's age and succession of child's birth, because this information is indicated only with respect to the mother.

The first limitation can, with some convention, be overcome. Those children born with an unspecified age of the father can be conventionally distributed on different bases.

First, all children may be distributed according to the age of the father in the same proportion as in those cases where the age is given. Such an approach would probably be appropriate if the proportions of children with an unspecified age of the father were approximately equal for different birth registrations (in registered marriage, on a joint statement of the parents, on the statement of the mother). However, as noted above, the vast majority of cases in which the father's age is not specified occurs in the registration of children on the mother's statement, so the extent to which this approach is correct will depend on how close at different registrations the distribution of children by age of the father is. It is likely that they differ significantly. For example, in 2019, the average age of the father at birth of all children (for which the age of the father is indicated) in Russia was 32.8 years, for those born in registered marriage – 32.7 years, registered on the joint statement of parents – 33.5 years, registered on the statement of the mother – 34.6 years (calculated for 2.1% of children registered on the statement of the mother, for which the age of the father is indicated)³.

³ The average age of the father at birth in this case is not quite correct, as it is calculated not on the basis of age coefficients of birth rate, but on the basis of the distribution of absolute numbers of children by the age of the father, i.e. it depends on the age distribution of men in general. However, this dependence manifests itself here approximately equally for all variants of children registration. Thus, the values of the average age of the father at birth themselves are not quite correct in this case, but their correlation is quite correct.

Given such differences, it is apparently not correct to distribute children with an unspecified age of the father, in the vast majority of cases registered on the mother's statement, in proportion to the distribution of all children according to the age of the father.

Second, children registered on the mother's statement, for whom the age of the father is not specified, could be distributed according to the age of the father in proportion to the distribution of children registered on the joint statement of the parents, given that both were born outside of registered marriage. However, as shown above, the average age of the father differs significantly.

Third, we can assume that all children registered on the mother's statement are distributed according to the age of the father in the same way as those whose father's age is indicated. But there are only 2.1% of them, and there is no reason to assume that they are representative by this criterion (however, there is no reason for the opposite assumption either).

Fourth, we can assume that those born in registered marriage, registered on the joint statement of the parents and on the statement of the mother, differ in the average age (respectively, according to the age distribution) both of the father, and of the mother, and the distribution of those born by the age of the father for each age of the mother could be approximately the same. In this case, it would be possible to proportionally distribute children with an unspecified paternal age separately for each maternal age.

The average age of the mother of children born in registered marriage in Russia in 2019 (30.0 years) was almost the same as the average age of children born in registered joint statement of parents (30.1 years). The average age of the mother of children registered under the mother's statement, as well as the average age of the father, is different. But if the average age those children's fathers is higher than that of registered marriages and registered on the

joint statement of parents, the average age of the mother is, on the contrary, lower. In 2019, it was 28.9 years old⁴.

Thus, the difference in the average age of the father and mother in Russia in 2019 was greater for those born in registered marriages and those born under joint statement of the parents. The issue of differences in the ratio of the age of the father to the mother will be discussed in more detail below. Here we just note that the distribution of children by age of the father for each age of the mother is different for each category of registered children, judging by the average age of the father and mother. Consequently, a proportional distribution of children whose father's age is not specified separately for each age of the mother would not provide a more correct estimate of the distribution by age of the father for those born registered according to the mother's statement.

There was a relatively large difference in the average paternal and maternal age for children born as registered on the mother's statement in Russia in 2019 for almost all maternal ages (*Tab. 2*).

Thus, there is no unambiguously most acceptable basis for distributing children registered by mother's statement according to the age of the father. Relatively the most acceptable, apparently, is the conventionally accepted distribution of them, the same as for those children in this category of registration whose father's age is not stated. Calculation of the most accurate age coefficients of birth rates will provide relevant indicators of fertility and reproduction of the male population.

The difference in the birth rates of women and men is due to differences in the denominator, i.e. their numbers, whereas the numerator (the number of children born) is, of course, the same. This statement is true if we are talking about relative indicators of birth rate, in the calculation of which

⁴ The above discussion of calculating the average age of the father on the basis of the distribution of absolute numbers children born also applies here to the average age of the mother.

Table 2. Average age of the father depending on the age of the mother for those born in a registered marriage, registered on the joint statement of the parents and the mother's statement, in Russia in 2019, years

Mother's age	Average father's age			
	all children born	children born in a registered marriage	children born, registered on the joint statement of the parents	children born, registered on mother's statement
under 16	20.2	21.1	20.0	19.7
16	22.1	22.3	21.8	22.6
17	23.0	22.8	23.2	22.2
18	24.0	24.0	24.2	25.7
19	24.9	24.7	25.3	25.7
20	25.6	25.5	26.0	25.6
21	26.3	26.2	26.7	26.5
22	27.0	26.9	27.7	27.7
23	27.6	27.5	28.4	28.8
24	28.3	28.2	29.3	30.0
25	29.0	28.9	30.1	30.7
26	29.8	29.7	30.9	30.9
27	30.6	30.5	31.7	32.2
28	31.4	31.3	32.4	33.3
29	32.2	32.1	33.1	34.3
30	33.0	32.9	34.0	34.5
31	33.9	33.8	34.7	36.3
32	34.7	34.6	35.5	36.2
33	35.6	35.5	36.2	36.8
34	36.4	36.3	36.9	39.0
35	37.3	37.2	37.7	38.0
36	38.1	38.0	38.3	39.1
37	38.9	38.9	39.0	39.5
38	39.7	39.7	39.8	39.7
39	40.6	40.6	40.2	41.5
40	41.3	41.4	41.0	42.0
41	42.1	42.2	41.8	41.3
42	43.0	43.2	42.5	43.7
43	43.8	44.0	43.1	42.2
44	44.7	44.8	44.2	41.8
45	45.5	45.8	44.1	44.7
46	46.3	46.8	43.9	48.2
47	47.3	47.4	46.6	46.6
48	46.3	46.4	46.1	46.5
49	47.6	47.6	47.4	50.2
50	48.1	48.5	48.1	32.5
51	48.0	47.7	49.2	–
52	50.9	51.5	46.0	55.5
53	52.0	53.4	41.5	49.5
54	45.7	44.1	–	50.5
55 and older	52.4	53.0	46.8	60.5

Source: own compilation hereinafter, unless otherwise noted.

the numerator uses the total number of births (for example, if we calculate a special birth rate by relating the total number of births to the number of women or men of reproductive age; though, it is not very clear which upper limit of this age interval to use when calculating the indicator for men).

However, with regard to the total birth rate it should be borne in mind that it is calculated on the basis of age-specific birth rates, hence the differences in its value for women and men depend on the distribution of children by age of mother and father and the ratio of women and men by age, or rather on the combination of these two characteristics.

Reproduction rates essentially refer to the so-called stable population, which is “a theoretical

model of the population with age-specific birth and death rates and the age structure of the population unchanged over time”⁵. The net coefficient shows in what proportion among the population the replacement of generations will occur at a given level of fertility and mortality, the mode of reproduction, and the intrinsic rate of natural increase shows how the population will change annually.

Research results

It seems appropriate to make a comparative assessment of age and total birth rates for males, using all the above approaches to estimate the paternal age distribution of children registered on the mother's statement, for whom the age of the father is not specified (*Tab. 3*).

Table 3. Age and total birth rates for men in Russia in 2019 with different methods of estimating the distribution of children born according to the father's age

Father's age	All children born are distributed according to the age of the father in the same proportion as they are distributed in those cases where the age of the father is indicated	Children registered on the mother's statement, with the father's age not specified, are distributed according to his age in proportion to such distribution of children registered on the joint statement of the parents	All children born registered on the mother's statement are distributed according to the age of the father in the same way as those who have the age of the father indicated	Children with a father's age unspecified are allocated separately for each age of the mother	Average
under 16	0.1	0.1	0.1	0.1	0.1
16	0.3	0.5	0.7	0.6	0.5
17	1.1	1.5	2.1	1.6	1.6
18	3.1	3.8	3.3	4.2	3.6
19	6.1	6.8	6.8	7.6	6.8
20	11.8	13.1	13.1	13.8	12.9
21	21.2	22.7	21.9	23.8	22.4
22	32.6	34.1	33.8	35.4	34.0
23	43.4	44.3	44.3	45.9	44.5
24	56.6	57.0	56.2	58.7	57.1
25	66.5	66.3	65.6	67.9	66.6
26	73.5	72.7	72.7	74.3	73.3
27	78.7	77.4	76.7	78.7	77.9
28	80.7	79.3	78.2	80.2	79.6
29	81.8	80.2	78.7	80.8	80.4
30	83.6	82.0	80.8	82.4	82.2
31	82.4	80.7	80.4	81.1	81.1
32	79.4	78.0	77.8	78.0	78.3

⁵ *Population: An Encyclopedic Dictionary*. Moscow: Great Russian Encyclopedia, 1994. 475 p.

End of Table 3

Father's age	All children born are distributed according to the age of the father in the same proportion as they are distributed in those cases where the age of the father is indicated	Children registered on the mother's statement, with the father's age not specified, are distributed according to his age in proportion to such distribution of children registered on the joint statement of the parents	All children born registered on the mother's statement are distributed according to the age of the father in the same way as those who have the age of the father indicated	Children with a father's age unspecified are allocated separately for each age of the mother	Average
33	72.6	71.4	70.7	71.4	71.5
34	67.4	66.4	66.6	66.3	66.7
35	62.0	61.5	61.2	61.0	61.4
36	57.4	57.1	57.2	56.6	57.1
37	50.0	50.1	50.2	49.4	49.9
38	42.6	42.9	43.1	42.2	42.7
39	37.0	37.4	38.2	36.7	37.3
40	32.8	33.4	33.8	32.7	33.2
41	27.9	28.5	28.7	27.9	28.2
42	23.2	24.0	24.5	23.2	23.7
43	18.9	19.7	20.4	19.0	19.5
44	15.2	15.9	16.5	15.2	15.7
45	12.5	13.3	13.6	12.6	13.0
46	10.2	10.8	11.4	10.2	10.7
47	8.3	9.0	9.2	8.4	8.7
48	6.5	7.0	7.6	6.5	6.9
49	5.1	5.6	6.4	5.2	5.6
50	4.4	4.9	5.2	4.5	4.7
51	3.5	4.0	4.1	3.6	3.8
52	2.8	3.1	3.7	2.8	3.1
53	2.1	2.4	2.7	2.1	2.3
54	1.7	1.9	2.1	1.7	1.8
55	1.2	1.4	1.7	1.3	1.4
56	1.0	1.2	1.5	1.0	1.2
57	1.0	1.1	1.3	1.0	1.1
58	0.7	0.8	0.9	0.7	0.8
59	0.5	0.6	0.7	0.6	0.6
60 and older	1.9	2.2	2.8	1.9	2.2
under 20	2.1	2.4	2.5	2.7	2.4
20-24	34.0	35.0	34.6	36.3	35.0
25-29	77.0	75.9	75.0	77.0	76.2
30-34	77.1	75.7	75.3	75.8	76.0
35-39	50.1	50.1	50.3	49.5	50.0
40-44	23.7	24.4	24.9	23.7	24.2
45-49	8.6	9.2	9.7	8.6	9.0
50-54	2.9	3.2	3.5	2.9	3.1
55 and older	1.0	1.2	1.5	1.1	1.2
Total birth rate	1.373	1.378	1.379	1.381	1.378

The total birth rate for males in Russia in 2019 barely varies (ranging from 1.373 to 1.381), depending on which way the children registered by their mother's statement, whose father's age is not stated, are distributed according to their father's age (see Tab. 2).

The greatest differences in birth rates are observed in the age group of 20–24 years old (from 34.0 per 1,000 men (‰) to 36.3). In the age group of 25–29 years old, the value of this indicator ranged from 75.0 to 77.0‰, 30–34 years old – from 75.3 to 77.1‰, 40–44 years old – from 23.7 to 24.9‰, 45–49 years old – from 8.6 to 9.7‰. In other age groups (including 35–39 years old), the range of variation of birth rate does not exceed 1.0‰ points.

Among the one-year age groups, the widest range of variation in the birth rate is at the ages of 29 years (3.1‰ points), 22 years (2.8‰ points), and 30 years (2.8‰ points); it exceeds 2‰ points in only five other ages.

Thus, probably, we can consider that the age and total birth rate for men differ not very significantly, depending on the way the estimated age of the father is allocated to the births registered on the mother's statement, for which the age of the father is not

specified. As already noted, the difference between the maximum and minimum values of the total birth rate is 0.008.

At the same time, the average (from different ways of assessing the distribution of children born by their father's age) value of this indicator coincides with that calculated on the basis of the distribution of children registered on the mother's statement with unspecified age of father, in proportion to such a distribution of children registered by joint statement of parents. The greatest closeness of the indicator based on such calculation to the average also takes place for almost all age-specific birth rates (the only exceptions are the 30–34 age group and the one-year ages 17, 26, 31, 34, 37, and 38; see Tab. 2).

Considering this, it seems appropriate to estimate the distribution of children registered on the mother's statement by the age of the father (if it is not specified) in proportion to the distribution of children registered on the joint statement of the parents.

The available statistical data allow calculating age-specific birth rates for men for 2011–2019 (Tab. 4).

Table 4. Age-specific birth rates for men in Russia in 2011–2019
(number of children born per 1,000 men of a given age)

Father's age	2011	2012	2013	2014	2015	2016	2017	2018	2019
under 16	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1
16	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.5	0.5
17	2.5	2.6	2.6	2.4	2.3	2.1	1.6	1.5	1.5
18	6.4	6.4	6.4	6.3	5.9	5.6	4.9	4.3	3.8
19	10.9	11.1	10.7	10.8	9.9	9.5	8.4	7.9	6.8
20	20.9	21.0	20.6	19.5	18.9	16.7	15.4	14.2	13.1
21	34.5	35.6	35.2	33.6	31.8	29.7	25.7	24.6	22.7
22	50.3	49.2	48.6	47.6	46.1	42.9	38.6	35.8	34.1
23	64.8	64.4	61.2	58.8	58.1	54.3	50.7	48.1	44.3
24	78.7	80.7	74.8	72.0	70.3	67.5	61.3	59.5	57.0
25	87.2	93.3	89.4	86.3	82.3	78.1	71.8	68.3	66.3
26	94.7	98.4	99.5	97.5	95.4	88.7	79.2	77.1	72.7
27	99.9	102.5	101.1	104.7	103.6	97.5	85.9	81.2	77.4
28	100.0	105.2	103.7	104.0	108.7	104.7	92.0	84.6	79.3

End of Table 4

Father's age	2011	2012	2013	2014	2015	2016	2017	2018	2019
29	97.3	103.7	102.8	103.9	106.1	106.7	94.4	88.9	80.2
30	91.2	100.0	101.1	102.5	105.1	103.7	94.4	90.1	82.0
31	85.5	91.7	94.7	97.9	100.8	99.8	88.4	88.6	80.7
32	83.7	85.1	85.6	91.2	94.4	94.4	84.1	80.8	78.0
33	78.0	82.2	78.7	81.4	86.2	87.6	79.2	76.8	71.4
34	71.8	76.1	75.6	75.0	76.4	79.3	73.1	70.8	66.4
35	64.1	70.0	69.7	70.9	69.5	70.3	66.7	66.2	61.5
36	57.4	62.6	63.9	65.3	65.5	62.8	58.6	59.1	57.1
37	52.2	54.8	55.9	58.3	58.8	58.7	52.3	50.8	50.1
38	45.7	48.4	48.4	50.7	51.3	51.9	46.7	45.0	42.9
39	40.2	42.2	42.8	43.7	44.2	45.3	41.8	40.4	37.4
40	33.8	37.6	37.5	38.0	37.5	38.3	36.2	35.4	33.4
41	28.0	30.6	32.2	32.7	32.1	31.5	30.1	29.8	28.5
42	24.7	25.4	25.7	27.4	27.0	26.8	25.1	24.5	24.0
43	19.9	21.4	21.7	21.9	22.8	22.4	20.9	19.8	19.7
44	16.2	17.4	18.0	18.6	18.0	18.9	17.2	16.9	15.9
45	12.4	14.5	14.9	15.4	14.8	14.9	14.4	13.5	13.3
46	10.1	10.9	12.2	12.7	12.4	12.1	11.3	11.4	10.8
47	8.2	8.6	9.4	10.0	10.0	10.2	9.2	9.0	9.0
48	6.4	6.9	7.3	7.9	8.1	8.4	7.7	7.4	7.0
49	5.2	5.5	5.7	6.2	6.3	6.7	6.2	6.2	5.6
50	3.8	4.8	4.7	5.0	4.9	5.1	5.2	5.1	4.9
51	3.1	3.3	3.6	3.9	3.9	4.1	4.0	4.1	4.0
52	2.7	2.8	2.8	3.2	3.2	3.2	3.0	3.1	3.1
53	2.0	2.1	2.3	2.4	2.6	2.7	2.6	2.5	2.4
54	1.6	1.6	1.9	2.0	2.0	2.2	2.0	1.9	1.9
55	1.3	1.2	1.4	1.6	1.6	1.6	1.6	1.5	1.4
56	1.2	1.2	1.2	1.2	1.3	1.3	1.2	1.3	1.2
57	0.8	1.1	1.0	0.9	1.0	1.1	1.0	1.0	1.1
58	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
59	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6
60 and older	1.8	2.2	2.3	2.2	2.2	2.4	2.3	2.2	2.2
under 20	4.6	4.5	4.4	4.3	3.9	3.6	3.1	2.8	2.4
20–24	51.0	52.1	50.5	49.0	47.4	44.0	39.6	37.5	35.0
25–29	95.7	100.5	99.3	99.4	99.5	95.7	85.4	80.9	75.9
30–34	82.3	87.2	87.4	89.9	92.9	93.3	84.0	81.5	75.7
35–39	52.2	55.9	56.3	57.9	58.1	58.2	53.5	52.7	50.1
40–44	24.8	26.8	27.2	27.9	27.6	27.8	26.1	25.4	24.4
45–49	8.3	9.1	9.8	10.4	10.4	10.6	9.9	9.6	9.2
50–54	2.7	2.9	3.1	3.2	3.2	3.4	3.3	3.3	3.2
55 and older	1.1	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.2

The age pattern of birth rates for men in Russia is shifting to older ages, with the highest birth rates in the 25–29 and 30–34 age groups. In 2011, the birth rate of 25–29-year-old men was significantly higher than that of 30–34-year-olds (by 16.3%). In subsequent years, the difference between the two steadily decreased and was 13.6% in 2013, 7.1% in 2015, and 1.7% in 2017. In 2018 and 2019, we can essentially talk about equality in birth rates for males in these two age groups: in 2018, the rate was slightly higher (0.7%) at ages 30–34, and in 2019, it was 0.3% higher at ages 25–29.

While in 2011 the birth rate for men in the 35–39 age group was only 2.4% higher than in the 20–24 age group, in 2019 the difference between the two increased to 43.1%. Accordingly, the average age of fathers at birth of children is also increasing: 2011 – 31.51 years; 2012 – 31.63; 2013 – 31.77; 2014 – 31.92; 2015 – 31.97; 2016 – 32.16; 2017 – 32.26; 2018 – 32.34; 2019 – 32.40.

One might think that the shift of the male birth rate model to older ages should contribute to relatively more positive dynamics of the total birth rate than that of women, as the contribution of birth rates at relatively older ages, in which the proportion of women is higher, increases in this indicator, which contributes to the underestimation of age-specific birth rates for them. For the same reason, the increase in the average age of the mother at birth, occurring almost to the same extent as that

of the fathers, should also contribute to this: 2011 – 27.75; 2012 – 27.86; 2013 – 27.98; 2014 – 28.13; 2015 – 28.24; 2016 – 28.43; 2017 – 28.51; 2018 – 28.65; 2019 – 28.70.

However, there is an opposite situation: if in 2011 the total birth rate for men in Russia was higher than for women, then since 2012, on the contrary, the value of the indicator for women has been higher than for men, and the difference between them is increasing every year (*Tab. 5*).

One should recall another factor mentioned above, which may influence the ratio of total birth rates for women and men and their dynamics. This is the ratio of the number of women and men in active reproductive ages (*Tab. 6*).

The proportion of men in the 25–29 age group increased significantly over the period under consideration (in Russia the highest birth rates were recorded for both women and men in this age group). Accordingly, the proportion of men in this age group increased, which relatively (as compared to women) increased the denominator when calculating the age-specific birth rate for men and, consequently, decreased its value. The increase in the proportion of men in the 30–34 age group was slightly smaller, but also very significant (since 2017, there have been more men in this age group than women). Until 2014, the proportion of men in the 20–24 age group increased slightly; in subsequent years, the proportion of men in the 35–39 age group increased.

Table 5. Total birth rates for women and men in Russia in 2011–2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Women	1.582	1.691	1.707	1.750	1.777	1.762	1.621	1.579	1.504
Men	1.603	1.688	1.681	1.700	1.705	1.674	1.518	1.464	1.378
Difference	-0.021	0.003	0.026	0.050	0.072	0.088	0.103	0.115	0.126

Table 6. The number of men per 1,000 women aged 20–39 in Russia in 2011–2019 (annual average)

Age	2011	2012	2013	2014	2015	2016	2017	2018	2019
20–24	1,032	1,035	1,037	1,041	1,042	1,041	1,042	1,041	1,039
25–29	1,009	1,013	1,017	1,021	1,025	1,030	1,034	1,038	1,045
30–34	983	989	994	998	998	999	1,003	1,007	1,011
35–39	955	954	955	957	961	965	971	976	981

Table 7. Indicators of female and male reproduction in Russia in 2011–2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gross reproduction rate									
Women	0.769	0.822	0.830	0.849	0.863	0.856	0.787	0.764	0.730
Men	0.824	0.868	0.864	0.874	0.877	0.860	0.781	0.752	0.708
Net reproduction rate									
Women	0.752	0.803	0.813	0.832	0.847	0.841	0.774	0.752	0.719
Men	0.770	0.811	0.809	0.820	0.827	0.815	0.742	0.720	0.678
Intrinsic rate of natural increase (‰)									
Women	-10.3	-7.9	-7.4	-6.6	-5.9	-6.1	-9.0	-10.0	-11.5
Men	-8.4	-6.7	-6.7	-6.3	-6.0	-6.4	-9.3	-10.2	-12.1

Thus, the more significant decrease in mortality among men compared to women caused relatively lower age-specific birth rates and, as a result, contributed to the less positive dynamics of the total birth rate of men.

The age and total birth rates for men, which differ from those for women, also predetermine other indicators of population reproduction (Tab. 7).

While the total birth rate for men in Russia has been lower than for women since 2012, the gross reproduction rate has been lower only since 2017. These differences are due to the fact that when calculating the gross reproduction rate, the proportions of girls and boys among newborns are used, respectively, and more boys are born than girls.

However, a lower net reproduction rate for men than for women has been observed since 2013, and the gender difference in this value is greater in subsequent years than in the gross reproduction rate. The fact is that when calculating the net reproduction rate, the numbers living from the mortality tables are used, and men's numbers are lower than women's due to a relatively higher mortality rate.

The intrinsic rate of natural increase of the population is calculated as the natural logarithm of the net reproduction rate divided by the generation length (the average age of mothers/fathers at birth of daughters/sons who survive to the age of mother/father). Men have a longer generation length because they have a higher average age at first childbirth than women. For example, in 2019,

the generation length for women in Russia was 28.66 years and for men – 32.18 years. A higher denominator value when calculating the intrinsic rate of natural increase in men reduces the value of the rate (of course, we are talking about the absolute value of this rate, without considering the sign, and since it is negative in Russia, the relatively large length of male generation underestimates the relative natural decrease in this indicator). While the net reproduction rate for men has been lower than for women since 2013, the relatively large natural decrease (in terms of the intrinsic rate) has been since 2015.

Available annual statistical information makes it possible not only to calculate birth and reproduction rates for women and men, but also to analyze the distribution of children by age of mother and father.

The above (see Tab. 2) shows that in 2019 for women of all one-year age groups in the interval from 18 to 37 years old, the smallest difference in the age of father and mother was recorded for those who were born in a registered marriage. On the other hand, the most significant difference in most one-year age groups of women in this age interval (except for ages 20–22 and 26) is in the age of the father and mother of the children registered on the mother's statement.

In addition, the average difference between the age of fathers and mothers decreases for relatively older women. For those women who, in a registered marriage, became mothers at the age of 18 it is 6.0 years; at 20 years old – 5.5; at 25 – 3.9; at 30 – 2.9; at 35 – 2.2; at 40 – 1.4; at 45 – 0.8. On average, a

Table 8. Combination of maternal and paternal age depending on maternal age at birth in Russia in 2019, %

Mother's age	All children born			Children born in a registered marriage			Children born, registered on the joint statement of the parents		
	age of the mother and father coincides	father is older than mother	mother is older than father	age of the mother and father coincides	father is older than mother	mother is older than father	age of the mother and father coincides	father is older than mother	mother is older than father
under 16	4.5	95.5	–*	2.6	97.4	–	4.9	95.1	–
16	3.8	95.3	0.9	2.1	97.8	0.1	6.9	90.8	2.3
17	4.6	93.6	1.8	3.3	95.9	0.8	6.3	90.6	3.1
18	5.0	93.2	1.8	4.4	94.5	1.1	6.4	89.9	3.7
19	4.6	93.3	2.1	4.5	93.7	1.8	4.9	91.8	3.3
20	5.5	91.5	3.0	5.3	91.9	2.8	6.1	89.7	4.2
21	6.4	89.8	3.8	6.2	90.3	3.5	7.0	87.1	5.9
22	7.3	87.6	5.1	7.3	87.9	4.8	7.1	85.5	7.4
23	8.4	85.0	6.6	8.5	85.3	6.2	7.4	83.4	9.2
24	9.6	82.4	8.0	9.8	82.4	7.8	7.7	82.0	10.3
25	10.3	79.4	10.3	10.5	79.4	10.1	8.1	79.9	12.0
26	10.6	77.7	11.7	10.9	77.7	11.4	8.1	77.8	14.1
27	11.4	75.5	13.1	11.8	75.4	12.8	7.8	77.1	15.1
28	11.9	73.3	14.8	12.3	73.2	14.5	8.3	73.4	18.3
29	12.2	70.8	17.0	12.6	70.8	16.6	9.1	70.6	20.3
30	12.4	68.2	19.4	12.7	68.2	19.1	9.1	68.4	22.5
31	12.4	65.8	21.8	12.9	65.7	21.4	8.5	66.8	24.7
32	12.3	62.9	24.8	12.8	62.7	24.5	8.3	64.0	27.7
33	11.6	61.3	27.1	12.1	61.3	26.6	8.2	61.1	30.7
34	11.0	59.7	29.3	11.5	59.8	28.7	7.5	58.4	34.1
35	11.2	58.2	30.6	11.6	58.3	30.1	8.2	57.4	34.4
36	11.0	56.2	32.8	11.5	56.5	32.0	8.2	54.5	37.3
37	10.0	55.5	34.5	10.5	55.7	33.8	7.5	54.6	37.9
38	10.1	54.5	35.4	10.6	54.9	34.5	7.3	52.4	40.3
39	9.9	53.7	36.4	10.4	54.5	35.1	7.1	50.0	42.9
40	9.3	52.4	38.3	9.9	53.2	36.9	6.2	48.1	45.7
41	9.3	51.7	39.0	9.8	52.6	37.6	6.7	48.2	45.1
42	9.0	51.2	39.8	9.4	52.5	38.1	7.3	45.4	47.3
43	10.2	49.7	40.1	10.7	50.9	38.4	8.1	45.0	46.9
44	10.1	48.8	41.1	10.7	50.4	38.9	7.6	43.1	49.3
45	9.5	47.6	42.9	10.1	49.9	40.0	6.5	37.1	56.4
46	9.6	45.6	44.8	8.9	48.9	42.2	12.1	27.5	60.4
47	9.2	48.8	42.0	10.0	50.0	40.0	7.1	40.5	52.4
48	4.9	37.3	57.8	6.1	36.5	57.4	–	41.7	58.3
49	13.2	33.0	53.8	14.1	33.8	52.1	5.9	29.4	64.7
50	8.1	43.2	48.7	9.5	44.5	46.0	–	44.4	55.6
51	12.8	33.3	53.9	13.3	33.3	53.4	11.1	33.3	55.6
52	–	47.4	52.6	–	46.7	53.3	–	33.3	66.7
53	10.5	47.4	42.1	12.5	56.2	31.3	–	–	100.0
54	8.3	8.3	83.4	11.1	11.1	77.8	–	–	–
55 and older	1.5	51.5	47.0	1.7	55.0	43.3	–	14.3	85.7

* The youngest group by age of father and mother in the statistical development is "under 16 years old", so the combination of age of father and mother in this case is defined rather conventionally. The coincidence of the age of the mother and father is noted when the age of both is indicated as "under 16 years old". Among them, there are probably those children whose father is older than the mother, or, on the contrary, the mother is older than the father, but it is impossible to identify them.

larger difference in father's and mother's age is true for older mothers, whose children were registered under the statement of both parents. For 18-year-old mothers, it is 6.2 years; for 20-year-olds – 6.0 years; for 25-year-olds – 5.1 years; for 30-year-olds – 4.0 years; for 35-year-olds – 2.7 years; for 40-year-olds – 1.0 year; as for mothers aged 45 and older, the fathers are on average younger (see Tab. 2).

In 2019, in Russia the age of mother and father coincided in 10.6% of children. This indicator was slightly higher for children born in registered marriage (11.0%) and lower for those born under joint statement of parents (7.8%). The proportion of children born with a father older than their mother is 70.2%, and for those with the mother older than their father – 19.2%. For children born in registered marriages, these indicators are 70.3% and 18.7%, respectively. The proportion of those with the father older than the mother (69.3%) is slightly lower, but the proportion of children with the mother older than the father (22.9%) is higher among those registered by joint statement of parents.

As shown above, the difference in the average age of the father and mother differs significantly depending on the age of the mother at childbirth. These differences are also evident in the rates of the combination of maternal and paternal age (*Tab. 8*).

The proportion of children whose mothers and fathers are of the same age increases with the age of the mother and reaches a maximum at the age of 30–31, amounting to 12.4% (Russia, 2019). It decreases relative to older mothers.

Among those children born in registered marriages, the proportion of those whose parents are of the same age is significantly higher than among those born under joint statement of the parents. The only exception is observed for children of mothers under the age of 22. The maximum value of this indicator is among children who were born in a registered marriage and whose mothers were 31 years old (12.9%; it is even higher among mothers aged 49 (14.1%) and 51 (13.3%), but because of

the relatively small numbers of children there may be random fluctuations in the index), and among those registered under joint statement of parents, whose mothers are aged 29–30 (9.1%; there may also be random fluctuations in the numbers born to mothers aged 46 (12.1%) and 51 (11.1%)).

The proportion of children whose father is older than the mother decreases with the older age of the mother. For those children whose mother's age is under 21, the father is older than the mother in more than 90% of cases, with the mother's age 23 – 85.0%, 25 years – 79.4%, 30 years – 68.2%, 35 years – 58.2%, 40 years – 52.4%, and starting at 43 years, less than 50% (Russia, 2019).

The proportion of those born in registered marriages whose father is older than the mother is higher than among those registered under joint statement of parents in the age range of mothers under 25. In the age range of mothers from 25 to 32 years old, the situation when fathers are older tends to occur more often among those born under joint statement than among those born in registered marriages (with the exception of mothers aged 29). When mothers are at an older age, the proportion of children born with an older father is again higher among those born in registered marriages.

In contrast to the decreasing proportion of children born by older women whose fathers are older than their mothers, the proportion of those whose mothers are older than their fathers is, on the contrary, increasing. At the mother's age of 22 years 5.1%, 25 years – 10.3% (the same number as the coincidence of the age of mother and father), 30 years – 19.4%, 35 years – 30.6%, 40 years – 38.3%, 45 years – 42.9%.

Among children born under joint statement of parents, the proportion of those whose mother is older than their father is higher than among those born in registered marriages. Differences in older ages of mothers are most significant; for example, in 2019 in Russia, they exceeded 5 percentage points for those born whose mothers were aged 34, 36, and

38 or older. Beginning at age 42, among children born under joint statement of parents, those whose mothers are older than their fathers outnumber those whose fathers are older than their mothers, and from the age of 45, the proportion of the former exceeds 50 percent (see Tab. 8).

Fathers of the majority of children born are older than their mothers. The age difference between them and the way it differs depending on the age of the mother and the nature of birth registration (registered marriage, joint statement of parents) are shown in *Table 9*.

Table 9. Distribution of children born whose father is older than their mother, by age difference of parents in Russia in 2019, %

Mother's age	All children born			Children born in a registered marriage			Children born, registered on the joint statement of the parents		
	the father is older than the mother by:			the father is older than the mother by:			the father is older than the mother by:		
	1–4 years	5–9 years	10 years and more	1–4 years	5–9 years	10 years and more	1–4 years	5–9 years	10 years and more
16	44.3	38.9	16.8	42.4	42.5	15.1	47.7	32.0	20.3
17	44.4	38.8	16.8	49.0	36.8	14.2	38.2	41.4	20.4
18	41.6	42.4	16.0	42.4	43.2	14.4	39.6	40.6	19.8
19	43.3	42.5	14.2	44.1	43.1	12.8	40.5	40.3	19.2
20	46.5	40.1	13.4	47.2	40.6	12.2	43.4	37.7	18.9
21	48.2	39.5	12.3	49.1	39.6	11.3	43.8	38.9	17.3
22	50.5	38.4	11.1	51.4	38.6	10.0	44.0	37.5	18.5
23	53.1	37.1	9.8	54.2	37.0	8.8	44.5	38.5	17.0
24	55.6	35.5	8.9	56.9	35.3	7.8	44.9	37.5	17.6
25	58.5	33.3	8.2	59.7	33.1	7.2	47.2	35.1	17.7
26	60.2	31.6	8.2	61.6	31.3	7.1	47.2	34.6	18.2
27	61.9	30.1	8.0	63.4	29.8	6.8	48.8	33.2	18.0
28	63.2	28.6	8.2	64.7	28.3	7.0	49.1	32.1	18.8
29	63.6	28.2	8.2	65.1	27.8	7.1	49.3	32.3	18.4
30	63.1	28.2	8.7	64.9	27.6	7.5	47.6	33.3	19.1
31	62.9	27.9	9.2	64.6	27.4	8.0	49.5	31.9	18.6
32	62.0	27.9	10.1	63.9	27.4	8.7	48.1	31.6	20.3
33	61.0	28.3	10.7	62.9	27.9	9.2	47.9	30.9	21.2
34	60.5	28.6	10.9	62.6	28.1	9.3	46.5	31.9	21.6
35	59.7	28.8	11.5	61.6	28.4	10.0	47.4	31.4	21.2
36	58.4	29.6	12.0	60.6	29.0	10.4	45.7	32.8	21.5
37	57.7	29.9	12.4	59.7	29.3	11.0	47.1	33.5	19.4
38	58.1	29.4	12.5	60.5	28.8	10.7	45.5	32.6	21.9
39	57.4	29.9	12.7	59.2	29.6	11.2	48.2	31.4	20.4
40	57.2	29.7	13.1	59.3	29.3	11.4	46.1	32.2	21.7
41	57.0	30.1	12.9	59.1	29.6	11.3	46.9	32.4	20.7
42	57.1	29.3	13.6	59.3	28.8	11.9	46.4	31.3	22.3
43	59.0	28.8	12.2	61.1	28.2	10.7	48.6	31.2	20.2
44	56.7	28.6	14.7	60.3	27.0	12.7	39.2	36.9	23.9
45	56.9	29.4	13.7	58.8	28.7	12.5	46.4	33.3	20.3
46	52.3	29.9	17.8	52.0	30.7	17.3	56.0	24.0	20.0
47	57.4	24.6	18.0	56.0	29.0	15.0	58.8	5.9	35.3
48	56.6	26.4	17.0	59.5	23.8	16.7	50.0	40.0	10.0
49	50.0	33.3	16.7	58.3	25.0	16.7	20.0	80.0	0.0
50*	59.4	34.4	6.2	57.2	35.7	7.1	75.0	25.0	0.0

* For older mothers, it is impossible to single out a group with a difference in the age of the father and mother "10 years and more", since the last age group for fathers is "60 and older".

In 2019, among children born in Russia whose father is older than their mother, the proportion of those with a 1–4 year difference in the age of their parents increased with the age of the mother and peaked for 29-year-old mothers. It exceeded 60% in the age range of 26- to 34-year-old mothers and was slightly lower at older ages. The highest proportion of those whose father is 5–9 years older than the mother occurs in relatively younger women, the highest in 2019 when the mother is 18 (42.4%) and 19 (42.5%) years old. This proportion is lower at older ages (20 years old – 40.1%; 23 years old – 37.1%; 27 years old – 30.1%). If the mother is older than 28 years, the proportion of children born whose father is 5–9 years older than the mother no longer exceeds 30% (except for some ages) and is in the range of 28–30%.

The highest proportion of children whose father is 10 years or more older than the mother is typical for the youngest mothers and, conversely, for those who gave birth at age 35 and older. In 2019, it was 16% or more for mothers in the age of 16–18 and 46–49; less than 10% for women who gave birth at the age of 23–31 (less than 9% at the age of 24–30, and the lowest at 27 – 8.0%).

While the proportion of those whose father is older than the mother does not differ significantly in the groups of those born in registered marriage and those registered under joint statement of parents (see Tab. 9), variations in their distribution by the age difference between father and mother are significant. The proportion of those with a father 1–4 years older than the mother among those born in a registered marriage is greater than 50% for all mothers aged 22 years and older, and exceeds 60% for mothers aged 26–36 years. Among children registered under joint statement of parents, it is the highest (not including women over 45 years of age, because random fluctuations can occur in this group due to the relatively small number of children born) among mothers aged 31 years (49.5%).

The proportion of children whose father is 5–9 years older than their mother, at the age of the mother between 23 and 45, is slightly higher among registered under joint statement of parents (the difference tends to be 2 to 4 p.p.) than among those born in registered marriages.

Significantly larger differences are typical for the proportion of children born whose father is 10 years or more older than the mother. It is much higher among those born under joint statement of parents than among those born in registered marriages. At the most active reproductive ages (age of mother from 25 to 36) the difference in the value of the indicator between them exceeds 10 p.p. If among children born in registered marriages the proportion of those whose father is 10 years or more older than the mother decreases slightly at the active reproductive age of mothers, then among those born under joint statement of parents the value of this indicator differs little depending on the age of the mother (it is slightly higher among women aged over 32 years; see Tab. 9).

One can assume that older parents “compensate” for their age with significantly younger partners. These couples are often without registration at the civil registry offices and with a high probability of having few children.

Discussion and conclusions

The problem of calculating birth and reproduction rates for the male population is relevant in modern demographic studies not only in Russia. Thus, the website of Statistics Sweden presents the total birth rate for women and men. At the same time, it is noted that data on some fathers are missing, and this leads to an underestimation of the birth rate for men⁶. At the same time, given the methodological options outlined above, such calculations are possible and allow expanding the understanding of demographic reality.

⁶ http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__BE__BE0101__BE0101H/FruktsamhetSum/

In 2019, Russia's total birth rate for women (1.504) was 9.1% higher than for men (1.378). The difference in the value of the gross reproduction rate was significantly smaller, amounting to 3.1% (0.730 for women and 0.708 for men). The net reproduction rate for women (0.719) was 6.0% higher than for men (0.678). The difference in the value of the intrinsic rate of natural increase between women and men was 5.0% (-11.5 and -12.1‰, respectively).

The existence of two quantitatively different regimes of reproduction in the female and male populations casts great doubt on the fundamental possibility of implementing the model of a stable population, for the change in the sex composition (due to the sex differentiation of the reproduction regime) makes the population unstable. This issue has long been considered in the scientific literature (one of the most famous works in Russian is a translated article by L. Taba [33]), but there is still no satisfactory solution to the problem. Thus, our work confirms the existence of a problem related to the application of the stable population concept for forecasting the demographic situation in Russian reality.

Age-specific natality model for men and women changes toward a shift in childbearing to older ages, and more often fathers are older than mothers. The favorability of the sex ratio decreases with age, and

there are no longer enough peers for women after the age of 35 (981 men per 1,000 women aged 35–39). Taking into account the revealed difference in the ages of the fathers and mothers, we can confidently state that the chances of finding a partner and having children are significantly lower for women in the age of 30 and older (for 1,000 women aged 30–34 there are 932 men aged 35–39 and 815 men aged 40–44; for women aged 34–39 – 858 men aged 40–44 and 780 men aged 44–49), while the ratio of 20–24-years old women and peer men as well as men of older age groups is quite favorable (for 1,000 women aged 20–24 there are 1,039 men aged 20–24, 1,462 men aged 25–29 and 1,855 men aged 30–34). In this regard, increasing age of mothers giving the first birth and age of marriage carries the risk of the consolidation of few-child parenting in the reproductive behavior of Russians, further transformations of the institutions of family and parenthood. In terms of demographic policy, it is advisable to pay more attention to young families. Measures to support the birth of first-borns have been expanded in time, which will help to curb postponement of giving first birth and reduce the protogenetic interval. However, the introduction of an age limit for receiving support after 2030, when the structural factor becomes more favorable, will contribute to higher birth rate among young people, especially young men.

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