

Urban fertility in Russia in 1859-1913: on commencement of demographic transition

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Received 11 March 2022 ♦ Accepted 30 May 2022 ♦ Published 1 July 2022

Citation: Mironov BN (2022) Urban fertility in Russia in 1859-1913: on commencement of demographic transition. Population and Economics 6(2): 1-13. <https://doi.org/10.3897/popecon.6.e83642>

Abstract

In the late Imperial period, a significant share of population of European Russia has demonstrated improved demographic indicators. The most important sign of demographic modernization is individual birth control. The available data suggest that transition from spontaneous fertility to the controlled one was first noted in St. Petersburg residents around the middle of the XIX century, disseminating among the entire urban population in the second half of the century, and extending to the rural population in the early twentieth century. Commencement of the demographic transition in Russia has been neglected by researchers for two reasons. First, demographic processes were studied country-wide, without any breakdown on urban and rural areas. With this approach, the urban population, accounting for only 10% in 1863 and 15% in 1914, blended with the general population; therefore, it was difficult to understand specifics of its reproduction. Second, age-specific and total fertility rates were not included in the analysis.

Keywords

demographic transition, late Imperial Russia, fertility, marriage, birth control

JEL codes: J0, J13

Demographic transition in Western Europe began at the turn of the XVIII–XIX centuries and ended mainly in the early XX century (Vishnevsky 2005: 165-166). In Russian historiography, chronology of demographic transition in Imperial Russia is a controversial issue. While most researchers attribute its completion in European Russia to the 1950s and 1960s in general, there is no common opinion about its beginning: some attribute its genesis to the late XIX - early XX century (Demograficheskaya modernizatsiya... 2006: 471-488; Zhiromskaya 2005: 269-278; Zhirov 2012: 280-286; Zverev 2014: 33-40; Fedoruk 2016: 311-313), while the others – to the 1920s-1930s (Isupov 2020: 143; Kanishchev 2016: 215, 218). Based on the All-Russia materials, the demographic transition was analyzed either for the entire population or rural population only, therefore we lack information about this

process in urban areas (Vishnevsky 1977, 1982, 2005; Population reproduction ... 1983). In papers on cities, the issue of demographic transition was framed, but not thoroughly studied (Mironov 1990: 9-10, 72-74). The first fundamental study on the history of fertility in Russia with a modern scientific apparatus, covers demographic transition among urban and rural population after 1897, and without any breakdown on rural and urban population in the earlier period (Coale et al. 1979). There is a significant gap in studies focused on changes in urban reproduction, since in Russia rural areas lagged far behind the urban ones in all respects, including demographic modernization. The article attempts to bridge the gap.

The author will analyze dynamics in *total fertility* rate among urban population in 50 governorates of European Russia (hereinafter referred to as European Russia) in 1861-1913. To tackle this issue, data on the size of urban population, its age structure, total and age-specific fertility are needed. Quality of sources provides for reliable data. Considering the *approximateness* of demographic data of the period under study (Köppen 1850: 4; Novoselsky 1916: 16, 17, 36), the obtained indicators should be considered as preliminary – they will more or less correctly identify only general trends in fertility.

Data on population in 50 provinces of European Russia in 1867-1913 were first systematized by S.A. Novoselsky in 1916 – for the entire (urban and rural) population. In 1927, they were revised by V.A. Zaitsev, and E.Z. Volkov in 1930. V.A. Zaitsev developed time series of the number of urban and rural populations in 50 provinces within the pre-war borders for 1871-1915, while E.Z. Volkov – for 1850-1930 within the USSR borders as of 1930. Both authors, assessing the weather dynamics, relied on current administrative statistics in the reference years with due regard to the natural population growth, making various adjustments. It is considered that Volkov's data better reflect actual dynamics in population, however they are not suitable for our purposes, since the borders of Imperial Russia and the USSR did not coincide (Zaitsev 1927: 65; Volkov 1930: 264-269). As a result, the annual size of urban population in European Russia for 1859-1913 was determined by interpolation based on available administrative statistics for the reference years (1856, 1863, 1870, 1885, 1897, 1910 years).

Our knowledge about the age structure before 1897 is incomplete. All revisions contained information about age profile of the taxable persons, however the data were not introduced into scientific use. The author had information about age composition of the population of Nizhny Novgorod, Yaroslavl, Kiev and Simbirsk provinces according to the 9th revision (1850), and Grodno, Kaluga, Minsk, Simbirsk and Courland provinces according to the 10th revision (1857) for (Information about ages 1871: 198-208). Since the 1860s, population censuses with age data have been conducted in a number of provinces and cities (Gozulov 1941: 249-307), however, they remained undeveloped. Administrative statistics of the XIX – early XX century neglected age composition of the population. Local government statistics contain age-specific information about peasants in Zemstvo provinces (Svavitsky 1961), however they have not been developed, verified or validated. Fortunately, for the years 1850-1890, the Russian statisticians and mathematicians were able to reconstruct age structure of urban and rural Orthodox population in European Russia as a whole on the basis of the all-Russia metric data. For the first and the last time sufficiently reliable and complete data on age structure for the period of the Empire were obtained in 1897 by the Russian Imperial Census. A comparative analysis of all currently available data suggests that the population age structure hardly changed in 1862-1897. Small fluctuations in the male share could be explained by their high social mobility, which made registration difficult. With a certain degree of conditionality, it could be stated that the share of women of reproductive age remained stable (Table 1).

Table 1. Age composition of the Orthodox population of 50 provinces in European Russia

Age	Women					Men				
	1862	1867–1890	1897	1863–1869	1897	1862	1870	1884	1867–1890	1897
	Rural and urban			Urban	Rural and urban					
0–9	26.8	28.2	26.9	21.3	20.7	27.6	27.0	27.0	28.6	27.7
10–19	20.9	20.2	21.4	20.2	20.7	21.0	20.0	19.6	20.2	21.3
20–29	16.8	16.3	16.0	18.6	18.5	17.1	16.6	16.5	16.2	15.7
30–39	12.5	12.9	12.4	15.4	14.3	13.3	13.6	13.5	12.9	12.4
40–49	8.7	10.0	9.4	11.0	10.3	9.4	10.4	10.3	9.9	9.4
50–59	7.6	7.0	6.8	7.0	7.5	6.4	6.7	7.4	6.7	6.6
60+	6.7	5.5	7.2	6.5	8.1	5.2	5.6	5.6	5.6	6.8
total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
15–49	48.2	48.8	48.1	55.4	54.2	50.0	50.3	49.7	48.6	47.4

Sources: (Besser, Ballod 1890: 51, 54; Bortkevich 1890: 97-98; Bortkevich 1891: 3-18; Bunyakovsky 1865: 86; Bunyakovsky 1866: 3-39; Bunyakovsky 1875: 32; Bunyakovsky 1880: 3-10; General Code... 1905: 36-55; Information about ages 1871: 199-208).

Data of the parish registers on fertility, marriage and mortality for 1796-1866 were summarized and published by the Synod with a breakdown on individual provinces and Russia as a whole, and then by the Central Statistical Committee until 1917. The consolidated materials until 1866 contain serious shortcomings, while they are considered more or less reliable for 50 provinces of European Russia for 1867-1916 (Kabuzan 1963: 82-84; Mironov 1977: 207-217).

Annual demographic indicators have been significantly fluctuating over the years (Fig. 1).

Data variation suggests the following trend – decrease in crude birth rate both in urban and rural areas. The average five-year *crude* birth rates (number of births per 1000 population) clearly show this trend (Table 2).

From 1859-1863 to 1911-1913 in European Russia, crude birth rates in urban areas decreased by 13 ppm points, and – by 7 in rural areas, and by 6 among general population. The share of urban dwellers in population was insignificant, therefore overall and rural fertility rates did not differ much. As a rule, crude birth rates in urban areas were *lower* than in the countryside – by 9% on average for the entire period under study (Table 3).

This may be explained by a significant preponderance of male population over female population in urban areas, concentration in urban areas of a high number of workers and lower military ranks living without their families. In urban setting similar to administrative district units (*uyezds*) in terms of gender, family and professional structure of population, fertility was higher than in rural areas (Military Statistical collection 1871:66; Mironov 2018: 508-509). Due to different gender and age composition of urban and rural population (both in individual provinces and cities, and in European Russia as a whole), crude birth rates cannot correctly assess the *actual fertility*, i.e. the one that does not depend upon gender

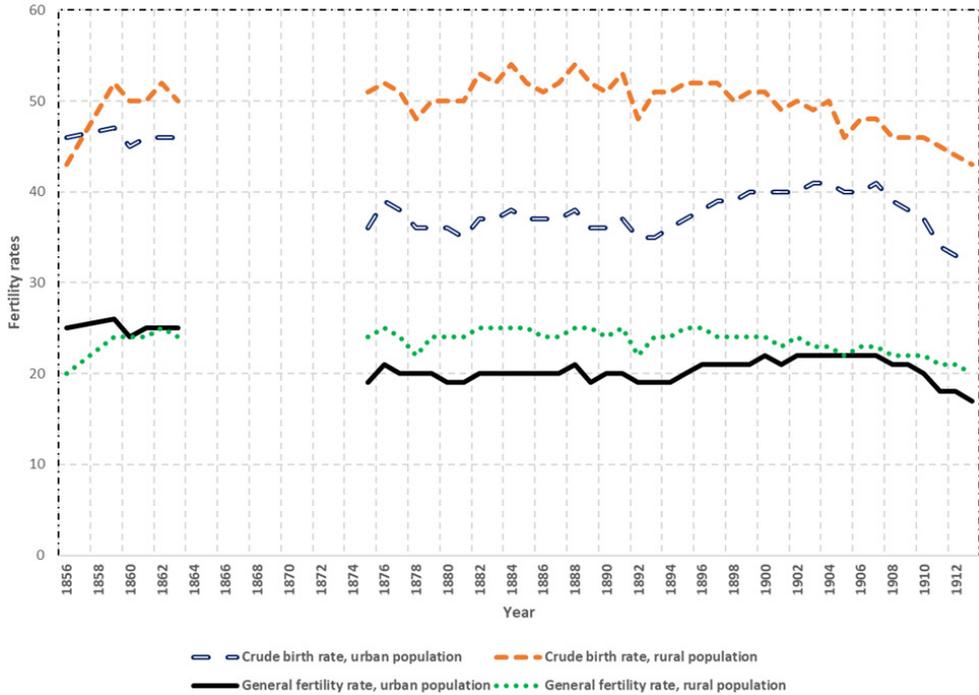


Fig. 1. Crude birth and general fertility rates among urban and rural population in European Russia in 1856-1913, %. Sources: (Military Statistical collection 1871: 53-67; Population movement... 1861-1916; Novoselsky 1916: 36-37; Report on ... 1898-1916).

Table 2. Crude birth and general fertility rates among rural and urban population in European Russia in 1859-1913., %^{*}

Years	1859-1863	1861-1865	1867-1870	1871-1875	1876-1880	1881-1885	1886-1890	1891-1895	1896-1900	1901-1905	1906-1910	1911-1913
Crude birth rate												
Rural	51	50	50	51	50	52	52	51	51	49	47	44
Urban	46	51	46	40	37	42	37	36	39	40	39	33
Total	50	51	50	51	49	51	50	49	49	48	46	44
General fertility rate												
Rural	24	24	24	24	24	25	25	24	24	23	22	21
Urban	25	28	25	22	20	23	20	20	21	22	21	18
Total	24	25	24	25	24	25	24	24	24	23	22	21

* Hereafter only live births. Calculated by the author according to: (Military Statistical collection 1871: 53-67; Population Movement 1861-1916; Novoselsky 1916: 36-37; Report on ... 1898-1916).

Table 3. Age structure of female population in European Russia, 1897 %

Age, years	under 1 year	1-9 years old	10-19	20-29	30-39	40-49	50+	Total	15-49
Population									
Urban	2.8	18	20.7	18.5	14.3	10.3	15.5	100	54.2
Rural	3.7	24.1	21.5	15.7	12.1	9.2	13.8	100	47.2

Calculated by the author according to: (Empire-wide summary... Vol. 1: 36-55).

and age structure. This can be done by *general fertility rate* (the annual number of births per 1000 women of reproductive age from 15 to 50 years – hereinafter referred to as GFR) or *total fertility rate* (the average number of children that would be born to a woman over her reproductive lifetime– hereinafter referred to as the TFR).

To ensure comparability of these two indicators, we transform *general fertility rate* as follows: calculate the number of live births *per woman* of reproductive age per year, then multiply it by the length of reproductive lifetime of 35 years (per se it is *proxy GFR* – thereafter referred to as GFR_{35}). In this form, GFR_{35} will hardly differ from total fertility rate. This is only natural: GFR_{35} and TFR show the average number of children that would be born to a woman over her reproductive lifetime if fertility rates for each age remain unchanged for the reference year regardless of mortality and changes in age composition. Small differences in the absolute value of the coefficients are explained by a more correct method of calculating TFR – it is calculated by summing the age- specific fertility rates for all age groups and multiplying the resulting amount by the length of the corresponding age group. However, GFR_{35} does not require data on age-specific fertility, missing in Russia in the XIX century. E.M. Andreev and S.V. Zakharov calculated total fertility rates for the entire population of European Russia for 1871-2000 (Demograficheskaya modernizatsiya... 2006: 157, 169]), which nearly coincided with GFR_{35} (7.07) and TFR (7.20) for the entire population for the period 1896-1900 (Demograficheskaya modernizatsiya... 2006: 157)¹.

In 1859-1897 the level of GFR_{35} among *rural population* of European Russia hardly changed – peasant women gave birth about 7 times in their lifetime. However, in *towns-women* GFR_{35} dropped from 6.34 to 5.29. *Such a significant decrease in actual fertility may indicate commencement of its control* (Table 4).

Reduced marriage, decreased child mortality, emigration and spread of contraception are considered to be factors for declining fertility in late Imperial period (Demograficheskaya modernizatsiya... 2006: 153; Novoselsky 1978: 127). Indeed, the marriage rate did decrease, however, first, the reduction was unstable and insignificant; second, in rural areas, despite decrease in marriage, total fertility rate remained unchanged (Table 5).

Decrease in marriage rates is usually accompanied by increased celibacy and later marriage. However, in post-reform Russia (period after abolishment of serfdom and prior to Revolution), the share of people who abstained from marriage hardly changed equaling to

¹ The method of indirect estimation of the total fertility rate used in the article is one of many. All methods can be divided into the following three groups: 1) based on the structural ratios of population in childhood and maternal ages; 2) based on the idea of standardization, 3) using transformation of gross rates into net ones. For the level of demographic analysis adopted in the article, which does not claim (due to relative accuracy of the initial demographic data) to be super-accurate estimates, the chosen method of indirect estimation is acceptable and reliable, despite its simplicity [Singh et al. 2021: 296-314; Manual X 1983: 1-5].

about 3-4% among rural population and about 11-12% among urban population (Tolts, 1977: 139-140). The average age at marriage increased by only 5 months from 1867 to 1910. At the same time, in contrast to rural areas, in urban settings the average age of men at marriage decreased (Table. 5), while the fertility rate decreased more than in territorial and administrative units (uyezds). All this indicates a weak influence of the dynamics in marriage on decline in fertility.

High infant mortality during the period under study had also contributed to higher fertility, since a baby's death encouraged a new pregnancy and birth (Novoselsky 1978: 146, 149). However, the real decrease in infant mortality began at the end of the XIX century (Table. 7), while fertility rate had been declining since the 1860s.

Table 4. Total fertility (GFR₃₅) among women aged 15-49 in European Russia in 1859-1863 and 1896-1900.

Indicators	Urban areas	Rural areas	Total
1859-1863, GFR₃₅			
Total fertility	6.34	7.28	7.11
Ratio between urban and rural rates (urban area = 1)	1.00	1.15	1.12
1896-1900, GFR₃₅			
Total fertility	5.29	7.35	7.07
Ratio between total urban and rural rates (urban area = 1)	1.00	1.39	1.34

Sources: please, refer to *footnote* to Table 1.

Table 5. Marriage rates in European Russia in 1859-1913, ‰

Years Po- pulation	1861- 1865	1867- 1870	1871- 1875	1876- 1880	1881- 1885	1886- 1890	1891- 1895	1896- 1900	1901- 1905	1906- 1910	1911- 1913
Rural	10.5	10.3	10	-	9.7	9.2	9.4	9.2	8.4	8.6	-
Urban	9.7	9.3	9.6	-	7.2	6.9	7	7.5	7.6	8.3	-
Total	10.4	10.2	10	8.9	9.4	8.9	9.1	9	8.6	8.6	8.1

Sources: please, refer to *footnote* to Table 1.

Table 6. Average age at marriage in European Russia in 1867 and 1910, (years)

Gender	Year	Urban areas	Rural areas	Total
Men	1867	29.2	24.3	24.8
	1910	27.4	24.8	25.2
Women	1867	23.6	21.3	21.5
	1910	23.7	21.6	21.9

Sources: (Population Movement 1872: 406-407, 412-415; Population Movement 1910: 88-89).

Table 7. Infant mortality in European Russia in 1867-1911 per 1000 births, ‰

Years	1867— 1871	1872— 1876	1877— 1881	1882— 1886	1887— 1891	1892— 1896	1897— 1901	1902— 1906	1907— 1911
Mortality, ‰	267	273	270	271	269	275	260	253	244

Source: (Novoselsky 1916: 65-66).

Emigration cannot be considered a serious reason for decline in fertility either, because the latter, started to decrease long before the beginning of the XX century, when emigration significantly expanded. Second, until the 1890s, emigration was fully compensated by immigration and re-emigration, and by 60% in 1891-1920. (Kabuzan 1998: 116; Mironov 2013: 78-79).

Contraception remains one of the listed factors for declining fertility. There is a widespread perception that birth control in Russia has been practiced extremely rarely and almost exclusively by the privileged segments of the population since the end of the XIX century. However, ancient Russian pieces of history of the XI–XVII centuries do contain evidence that women were using contraceptives. At confession, priests usually asked women: «Did you poison a baby inside you? Did you kill a baby inside you?» Men were called (according to the lists of questions compiled by monks to be asked during confession) to repent for evading the sinless methods of sexual intercourse used to prevent conception (the husband must make love to his wife, lying on top of her). Beside other questions, a list of questions a priest could ask at confession at the beginning of the XVIII century included as follows: «Shalt the husband let himself unto his wife, whilst the seeds shalt not spring?» (i.e., did the husband have sexual contact with his wife after eruption?) (Almazov 1894: 156-296; Korogodina 2006: 158-163). This indicates the use of coitus interruptus practice that was considered sinful at the time.

Lack of information about birth control is explained by the fact that according to spiritual laws, all contraceptives were considered a sin and were punished with a long penance* in line with the Church statute, for example, from 5 to 15 years of penance for poisoning a fetus. Under secular law, doctors and pregnant women were both liable for a forced abortion. According to the 1845 Code of Punishments active until the beginning of the XX century, fetal expulsion was equated to infanticide and punished with 4 to 10 years of hard labour. Therefore, women were keeping a tight lid on using any methods of birth control until the 1920s. (Sinkevich 1929: 46).

A spiritual corrective measure aimed at punishing a person for a sinful act: excommunication from communion for a certain period of time, additional fasting, doing a number of prayers and bows.

In the second third of the XIX — early XX century high fertility became an urgent social problem; much more information on this issue became available, however, it looks like most of the current birth control methods have been used earlier, but the scale of their use remains unclear. According to correspondents of the Russian Geographical Society, there were «specialists» in this matter in each village. Miscarriage was forced mechanically (jumping and tight bandaging, intensive kneading of the abdomen and shaking of the whole body, lifting weights, etc.), with the use of medications (from herbs to phosphorus and mercury, per os); swallowing tin circles and taking corrosive sublimate. To prevent conception, women after having an affair would take a spoonful of water with gunpowder, wash their hands with

their urine (Afinogenov 1903: 57; Popov 1903: 327). Until the 1920s, extended breastfeeding “beyond the legally accepted duration of two Lenten fasts” i.e. over two years was a widely used practice (Gilyarovskiy 1866: 50). This method to some extent could postpone a new pregnancy; according to the Russian doctors, about 80% of the breastfeeding women did not menstruate. There were other very imperfect practices (Pilsudsky 1910: 14-16). Since the 1880s, abortions performed by healers and uncertified midwives have come into practice in villages, especially suburban ones (Afinogenov 1903: 57, 99; Dyachkov 1999: 74). Urban dwellers started to practice induced abortion earlier (Chukhnin 1894: 533). By the beginning of the XX century the range of available contraceptives has increased: condoms, contraceptive caps, uterine rings, vaginal douching, suppositories, calendar methods. A survey of 2150 students at the Moscow University in 1904 showed that 57% used birth control methods (25% — *coitus interruptus*, 16% — condoms, 15% — others) (Chlenov 1907: 1072-1111). A popular birth control manual by K. I. Drexler underwent 7 editions in 1907-1914 (Drexler 1929).

In the 1860s there were numerous testimonies of contemporaries that mothers sought to limit births by any means, and the number of such testimonies were only increasing over time. A higher number of foundlings indicates a higher number of unwanted children. According to data on annual admission of foundlings to the largest foundling homes of the Empire – in St. Petersburg and Moscow – in 1791-1910, for 120 years the number of foundlings increased 5.8 times, while the Russian population – 2.9 times (Table 8):

Table 8. Dynamics in the number of infants placed in foundling homes in Moscow and St. Petersburg, 1791-1910

Period	1791–1800	1841–1850	1871–1880	1881–1890	1891–1900	1901–1910
Number of foundlings	3342	13092	20169	24298	17785	19218

Source: (Ransel 1988: 303-308)

Decline in the number of foundlings in 1891-1910 was solely explained by restrictions on their admission, which immediately reduced their number.

So, in the second half of the XIX — early XX century hundreds of thousands of Russian women began to think about relieving the burden of motherhood, and they had an idea how to do it. Demographic statistics show that this knowledge was applied, however, prior to the beginning of the twentieth century it was mainly used in urban settings. This may be amazing, since about half of the urban dwellers were peasants closely associated with the village. This gap between rural and urban settings was explained by the fact that the moral censorship in rural communities remained very strict, and violators of traditional morality were subject to punishment. Citizens who were freer in their behaviour used contraception in the post-reform period achieving a significant success: in 1896-1900 the total rural fertility rate was 1.39 times higher than the urban one (for more details see: Mironov 2019: 256-300).

A widescale birth control is likely to have started in the capital at the turn of the XVI–II–XIX centuries, just like in France, since fertility in St. Petersburg in 1781-1860 was low (Table 9).

Table 9. Dynamics in natural population movement in St. Petersburg in 1764-1860, ‰

Years	Births	Deaths	Increment
1764–1770	31.9	29.2	2.7
1771–1780	32.1	26.9	5.2
1781–1790	30.5	31.4	–0.9
1791–1800	32.3	31.5	0.8
1801–1810	29.0	36.3	–7.3
1811–1820	23.1	27.2	–4.1
1821–1830	21.5	21.7	–0.2
1831–1840	24.3	30.6	–6.3
1841–1850	31.5	42.7	–11.2
1851–1860	34.4	42.5	–8.1
1764–1860	29.1	32.0	–2.9

Source: (Saint Petersburg. 1703-2003 2003: 58-60).

Let us summarize the results. In European Russia, in the Imperial period, there was a certain modernization of demographic behaviour among a significant share of the urban population, which, in particular, manifested in spread of individual birth control. Demographic transition in the Russian provinces predominantly populated with Orthodox Christians was initiated in urban settings in the second half of the XIX century – earlier than it is considered in historiography. St. Petersburg province – the most urbanized and one of the most cosmopolitan, and St. Petersburg – the most cosmopolitan city in Russia with intensive economic and cultural bonds with the West, especially with France, where the demographic transition had already begun at the end of the XVIII century were taking the lead.

Beginning of the demographic transition in Russia remained unnoticed by researchers for two reasons. First, demographic processes were studied countrywide, without any breakdown on urban and rural areas. With this approach, the urban population, which accounted for only 10% in 1863 and 15% in 1914, was blended with and lost in the general population making it difficult to understand specifics of its reproduction. Second, general and total fertility rates were not included in the analysis.

Acknowledgements

The author is expressing his gratitude to two anonymous reviewers for their valuable comments

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