From Birth to Marriage:
Sex Ratios in the Late Imperial and Early Soviet Urals*

Elena Glavatskaya
Elizaveta Zabolotnykh

[1]Institute of History and Archaeology,
Ural Branch of the Russian Academy of Sciences;
[2]Ural Federal University,
Yekaterinburg, Russia

Aleksander Bobitsky
Dmitry Bakharev

Institute of History and Archaeology,
Ural Branch of the Russian Academy of Sciences,
Yekaterinburg, Russia

This article analyses sex ratios in late nineteenth – to early twentieth-century Russia focusing on the easternmost frontier of its European part – Perm Province with a population of about 3 million. High sex ratio at birth, in infancy, and childhood has been widely used to assess gender discriminatory practices in several countries, including some European ones. Russia is usually depicted as highly patriarchal with a low social status of women, always subordinated to their fathers and husbands. However, little has been done to study sex ratios. This article presents the first long-term research on sex ratio which relies on county (uyezd)-level information from the 1897 Russian census and the first Soviet 1926 census as well as the household censuses of 1887, 1900, and 1912. The authors also used local statistics based on the parish records with vital events. Additionally, they computed the sex ratios in different groups from birth to age at marriage, their dynamics over almost 40 years and their correlation with several factors including infant mortality rates, religious adherence, and occupations. They did not find signs of gender specific practices discriminating females right after their birth, during infancy or childhood. The research shows that average sex ratios at birth in Perm province were close to the biological norm 105, and its dramatic decrease in the following months was due to the high infant

mortality rate combined with the girls' biological advantage. This advantage, however, ended once they reached marriageable age.

Keywords: Russia, population, census, historical demography, sex ratio, infant mortality, 'missing girls'

Рассмотрено соотношение полов у населения на территории Пермской губернии в конце XIX в. – начале XX в. Исследования соотношений полов в возрастных группах от ноля до четырех лет позволили выявить распространенные в некоторых странах отклонения от биологического стандарта при рождении (105 мальчиков на 100 девочек), как правило, в пользу мальчиков. Историки интерпретируют этот феномен существованием, в том числе в прошлом европейских стран, дискриминационных практик в отношении девочек – инфантицида сразу после рождения и/или недостатка кормления и ухода в период взросления. Анализ соотношения полов в аналогичной возрастной группе в Российской империи конца XIX в., изображаемой глубоко патриархальной страной с низким социальным статусом женщины, наоборот, показал значительный перевес в пользу девочек. В представленной работе авторы впервые предприняли исследование проблемы соотношения полов в разных возрастных группах от рождения до брака; оценили его корреляцию с такими факторами как младенческая смертность, религиозная принадлежность и основное занятие; проследили динамику на протяжении 40 лет. В качестве источников были использованы результаты Первой всеобщей переписи 1897 г., Всесоюзной переписи 1926 г., подворных переписей Екатеринбургского уезда 1887, 1900 и 1912 гг., а также данные о естественном движении населения. По итогам исследования не было обнаружено свидетельств существования дискриминации девочек при рождении или в детстве. Соотношение полов при рождении было близко к биологической норме, но стремительно падало в течение нескольких месяцев вследствие высокой младенческой смертности, сильнее поражавшей мальчиков в силу их меньшей биологической защищенности. Были выявлены серьезные различия в соотношении полов между православным и мусульманским населением, связанные с разницей в режимах смертности в младенчестве и подростковом возрасте. Высокая смертность мальчиков наряду с воинским призывом приводила к деформации брачного рынка.

Ключевые слова: Россия, население, перепись, историческая демография, половое соотношение, младенческая смертность, «пропавшие девочки»

Resent interest in sex ratio studies was inspired by the "missing girls' phenomena that has revealed gender discriminative practices, including female infanticide and the mortal neglect of girls, practiced not only in Asian countries but also in pre-industrial Europe. It has been shown for example that child sex ratios in the 19th and the early 20th century Southern and Eastern Europe were abnormally higher than contemporary gender neutral – 105 boys per 100 girls[1].

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[1] For the comprehensive historiography on the "missing girls" phenomena see [Beltrán Tapia, Szołtysek].

Late Imperial Russia's demographic regime differed from the Western European in many ways. Especially, the early age at marriage and the patriarchal families made the Russian women subordinate to their fathers and husbands. Meanwhile, the analyses based on the 1897 Russian census aggregates show that the child sex ratios were, on average, relatively low – around 98 boys per hundred girls[2]. The authors linked the low sex rate to the high infant mortality rate and meant that the geographical variation in sex ratios were caused by economic and cultural factors. Moreover, they expected the son preference traditions in these territories, mostly beyond the Russian Federation borders, even nowadays result in gender imbalances and possible female discrimination [Malein, Beltrán Tapia]. The ethnographic literature based on the descriptions made by eyewitnesses and folklore support the theory about the low social position of Russian women. However, there are no precise references to the Russian girls' miserable childhood. In fact, svadebnye prichitania – wedding lamentation songs known all over Russia stress that the "disaster" started along with the change of marital status. The intrinsic exaggeration of the genre stresses the happy and wealthy life of the bride while in her father's household. Moreover, it seems that rural agricultural society valued female labor to the degree that families would postpone their daughters' marriage. This resulted in the 18th century practice when grooms in some agricultural Russian provinces were several years younger than their brides [Рязанов, с. 27].

This article focuses on sex ratio analyses of the Perm province population with regard to the geographic, ethnic, religious and age specifications during the late 19th to early 20th centuries. The province had the highest infant mortality rate in Russia, reaching 437 % in 1896–1897, especially among the Russian Orthodox population involved in agriculture, while the national average was 270 % [Bakharev, Glavatskaya, p. 204, 206; Баха-рев, Главацкая]. There is an interesting correlation between sex ratios and infant mortality rates, and some authors even suggest that an IMR around 350 % should correspond to a sex ratio around 97 and lower [Malein, Beltrán Tapia]. If that assumption is correct, then Perm province with its high IMR should have a sex ratio under 97 boys per 100 girls and since the IMR drastically improved in the province, the long-term study should show significant changes. Our main exploratory aim is to find out if there were any gender discrimination practiced against females right after the birth, during infancy or childhood, which could be traced in sex ratio changes over the time in different Perm province counties.

Geographic setting

Perm province with its 12 uyezds (counties), seven in the European part and five in the Asian, embraced a vast territory over 330 000 sq km stretching on both slopes of the Ural Mountains. Its population reached

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[2] It is comparatively low, because biological – "natural" sex ratio at birth is 105 boys per 100 girls [Szołtysek, Ogórek, Gruber, Beltrán Tapia, p. 114].

2 994 302 in 1897, only 6 % of which (179 339) were city dwellers. It was also one of the least densely populated provinces in the European part of the Russian Empire with about 13 persons per sq km and highest infant mortality rate (fig. 1).
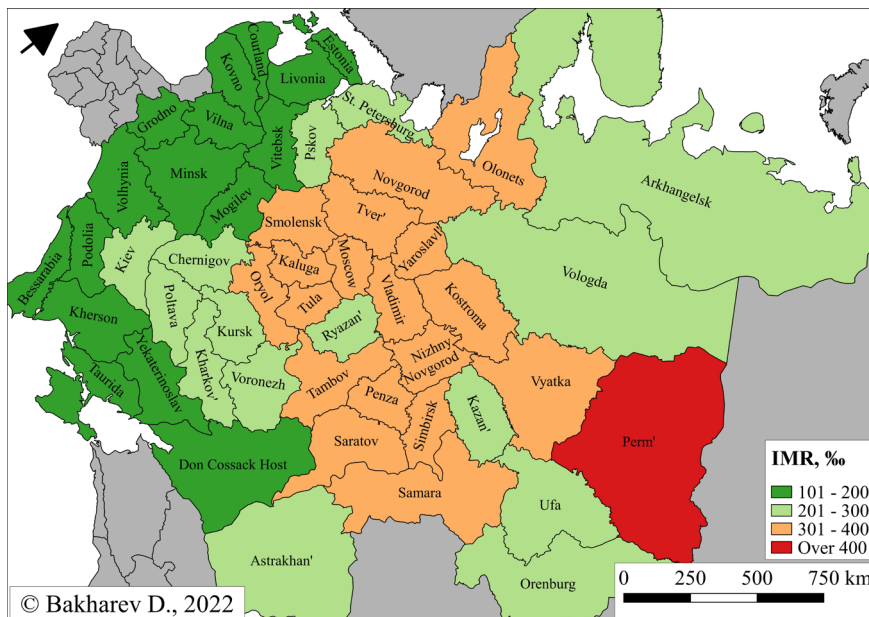
1. Infant mortality rate in European Russia, 1893–1896 [Bakharev, Glavatskaya, p. 205]

Most of the Perm province population were ethnic Russians[3] (90,3 %) and members of the State Orthodox Church (86,7 %). The province also had a significant number of Old Believers (7,3 %) – predominantly Russian[4] nonconformists that split from the Church in the 17th century. The biggest non-Russian and non-Christian minority were the Muslims (5,1 %) – predominantly ethnic Bashkir, Tartars and Mishars. Fenno-Ugric people – Komi-Permyak (3,1 %), Mari (0,5 %), Udmurt (0,2 %), Komi-Zyrian (0,1 %) and Mansi (0,09 %) mostly were Russian Orthodox church members, whose ancestors were Christianized over the period of the 18th and 19th centuries. There was a small group of Islam followers among the Udmurts (0,2 %), while the rest of them along with the Mansi and some Mari people (about 0,7 % of the whole Perm province population) preserved their indigenous religions. In addition, there were Lutherans (0,04 %) – predominantly Germans; Catholics (0,1 %) – predominantly Poles and Jews (0,07 %), voluntary or forced migrants

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[3] Based on mother tongue specification.

[4] There were also some Fenno-Ugric people among them.

from the western provinces settled in the few cities, usually in connection with their employment. Perm province was one of Russia's main centers of mining and metal production.

Ekaterinburg county was the fourth largest in Perm province and occupied an area of 29,000 square km. Its rural population (369 057 according to the 1897 census) was predominantly Russian (96,6 %) and the Russian Orthodox Church members (92,6 %). Muslims, most of whom were involved in agriculture, made up 3,3 %. The most populous villages had up to 2 000 inhabitants. Ekaterinburg county had several zavody – factory settlements, specialized in mining and metal production, which were not inferior in population to many county towns[5].

Data and methods

Our research relies on the aggregates from the 1897 Russian census and the first Soviet census of 1926; the household censuses of 1887, 1900 and 1912; as well as local statistics based on vital events. We also used individual level data extracted from the parish registers of vital events transcribed into the Ural Population Project dataset[6]. We focus on two basic variables in the censuses and vital event records: age and sex statistics, from which age-specific sex ratios were calculated. We checked the accuracy of data entry by comparing census data and vital statistics on births and deaths and analyzed its development over a period of almost 40 years. To find out if there were any male preferences in childcare reflected in the statistics, we analyzed the sex ratios in Perm province's different parts, considering both rural and urban cases with focus on the ethnoreligious affiliations and age groups. We analyzed sex ratios among the stillborn children as well.

The first All-Russian census conducted in 1897 was carefully prepared, run and processed according to contemporary international enumeration standards. However, most of the microdata were destroyed after the information was processed, aggregated, and published. Therefore, we could analyse only the published aggregates. After this otherwise successful start of modern population census taking, there was a long break due to the early 20th century wars and revolutions [Thorvaldsen, Glavatskaya]. The next full count census taken only in 1926, had different administrative divisions due to the reforms run by the Soviet state. The former Perm province became part of the Ural'skaia oblast' with a vast territory over stretching far beyond the Polar circle and a population over 6 million. We included in our analyses only data for 7 out of the 16 okrugs (administrative units) with a population of 2 792 620, territories roughly corresponding to those in the former Perm province. The census reported male and female cohorts born in

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[5] For example, Berezovsky zavod had more than 10 000 inhabitants and Nev'yansky – over 12 000.

[6] For the data description see: [Glavatskaya, Borovik, Thorvaldsen].

different years, allowing the computing of the sex ratio dynamics and patterns over a period of 30 years.

We also analysed data extracted from the Podvornye perepisi – household censuses, run by the Zemstvo[7]. The zemstvos needed reliable information about the population in order to determine their practical actions and calculate the budget. Statisticians used questionnaires to collect information from the residents whom they trusted or ran household inventories themselves interviewing all household heads. We used three sets of household census aggregates from the Ekaterinburg uyezd (county) for three years: 1887, 1900 and 1912.

Information on the population was also collected by the Ministry of Inner Affaires. They used the data on births, deaths and marriages extracted from the metricheskie knigi – parish records of vital events. Russian legislation regulated the parish registers and their accuracy. The religious community board had to check and verify the books frequently and religious leaders and communities were to be fined was there any disorder found in the records [Glavatskaya, Borovik], and their quality improved significantly from the mid-19th century [Миронов]. The institutions that processed the primary information – the provincial and central statistical committees – consisted of professional statisticians. We used their statistics for three years 1896–1898, including the census year 1897. In distinction to the commonly practiced analyses of age groups under 10 years old, we decided to extend the observation and stretched the sex ratios analyses towards the minimum marriage age – 16 for females and 18 for males according to the Russian legislation. That allowed deeper and more comprehensive understanding of the low sex ratio's effects on the marriage pattern.

Findings and interpretations
Sex ratios in Perm province: rural vs urban

According to the 1897 census data, females outnumbered males in the Perm province', especially in rural area. There were more girls than boys aged 0–4; 5–9; and 10–17 in all the counties[8]. According to the 1897 census data, the biggest difference in sex ratios among the children aged 0–4 was between Krasnoufimsk (98,9) and Perm (91,1) counties; among the children aged 5–9 the biggest difference was between Verkhoturye (98,5) and Perm (92,4) and among those aged 10–17 – between Osa (95,5) and Kungur (86,8). The average sex ratio increased slightly among those aged 5–9 but then decreased again among the cohort aged 10–17 to 93,1 (table 1).

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[7] Zemstvo – self-government elected county level institution, that was introduced in 1865 to manage local affairs, such as road building and maintenance, improvement of economic development, oversee medical services and sanitation, public education and other socially important activities.

[8] The Pearson correlation coefficient for sex ratios in age groups 0–4 and 5–9 is 0.74, for age groups 5–9 and 10–17 is 0.65, which suggests relatively good data quality.

Table 1

Sex ratio among the Perm province rural population in 1897 by cohorts
[Первая всеобщая перепись населения]

County	N 0–4	SR 0–4	N 5–9	SR 5–9	N 10–17	SR 10–17
Krasnoufimsk	40 469	98,9	31 009	98,3	43 239	95,0
Shadrinsk	43 343	97,0	34 238	96,7	53 753	95,1
Kamyshlov	34 273	96,0	28 287	98,0	41 412	91,7
Ekaterinburg	55 899	95,9	44 232	97,4	63 163	94,2
Okhansk	38 195	95,6	29 100	94,1	43 307	90,2
Verkhotur'e	38 082	95,4	28 185	98,5	40 045	92,8
Cherdyn'	16 494	94,9	13 162	96,1	17 459	95,3
Osa	47 373	94,8	38 046	96,1	53 706	95,5
Kungur	17 772	94,4	13 671	93,3	19 379	86,8
Irbit	20 203	94,3	15 811	96,5	22 785	93,7
Solikamsk	32 766	93,9	25 327	94,8	35 451	92,1
Perm	31 363	91,1	24 439	92,4	33 920	90,5
Sum and average	*416 232*	*95,4*	*325 507*	*96,3*	*467 619*	*93,1*

In general, the sex ratio was somewhat lower in the western counties, except of Krasnoufimsk and Okhansk. Based on the household census data, we can see that there was a slight trend to a more harmonised sex ratio over time among infants and children aged under seven in Ekaterinburg County (table 2).

Table 2

Sex ratio among children under 7 years old in Ekaterinburg
[Краткая подворная перепись]

Age groups	1887	1900	1912
Infants	96,9	99,3	99,9
Under 7 years	96,9	96,8	98,9
N	58 600	70 800	83 400

Sex ratios in cities showed more variety from cohort to cohort, likely due to the small population size and local peculiarities. The sex ratio among the urban population aged 0–4 was on average a bit higher (table 3). To some extent that can be explained by the relatively lower infant mortality rate in cities in the late 19th century Perm province. According to our calculations, IMR in Ekaterinburg was around 369 %, while in Ekaterinburg County – it was 377 % in 1898–1900 [Bakharev, Glavatskaya, p. 10]. However, a city's peculiar landscape and institutions perhaps played the most important role. The abnormally high sex ratio in the age group 0–4 and even higher in the age group 5–9 in Dalmatov was likely due to the Dalmatov monastery, which school attracted male children.

Table 3

Sex ratios among the Perm province urban population in 1897
[Первая всеобщая перепись]

City	N 0–4	SR 0–4	N 5–9	SR 5–9	N 10–17	SR 10–17
Dalmatov	66	120	63	152	109	98,2
Osa	597	112,5	543	97,5	842	101
Solikamsk	412	107	395	101,5	731	127,7
Alapaevsk	1 022	106	864	94,6	1 423	110,2
Cherdyn'	370	104,4	339	84,2	624	86,3
Ekaterinburg	4 301	103,3	3 670	89,9	7 556	85
Shadrinsk	1 305	102,3	1 016	104,4	1 985	83,8
Krasnoufimsk	726	100	611	89,8	1 135	119,1
Perm	4 481	97,8	3 429	94,4	6 750	98,9
Kungur	1 554	95	1 352	96,8	2 261	102,1
Kamyshlov	776	93	723	93,3	1 438	111,5
Ohansk	187	90,8	161	80,9	314	113,6
Irbit	754	87,6	637	101,6	1 871	113,6
Dedukhin	473	86,2	405	104,5	545	101,1
Verkhotur'e	295	82,1	221	137,6	415	108,5
Sum and average	*17 319*	*99,3*	*14 429*	*95,1*	*27 999*	*97,5*

The 1926 census data analyses for the territory similar to what was Perm Province in 1897, showed that the sex ratio became a little bit higher among the 0–4 years old – 97,9 against 95,4 in 1897, likely due to the decrease of infant mortality, which increased the weakest boys' chances for survival. These benefits were not experienced by those aged 5–9, whose infancy and childhood were in the period of Revolution and civil war (table 4). The age group 10–17 sex ratio could also be affected by the migration. And the western okrugs – Perm and Kungur kept their status as territories with the lowest sex ratio among the age group of 0–4 years old.

Table 4

Sex ratios among the selected okrugs (counties) of Ural'skaya oblast' rural population in 1926 [Первая всеобщая перепись]

Okrug	N 0–4	SR 0–4	N 5–9	SR 5–9	N 10–17	SR 10–17
Kurgan	73 919	99,7	42 008	95,9	88 168	94,8
Sverdlovsk	42 980	99,5	26 912	96,6	50 533	95
Irbit	41 207	98,9	24 389	97,1	46 430	97,3
Shadrinsk	99 429	98,7	61 790	98	121 294	95,1
Tagil	35 393	98,1	22 826	98,1	40 234	95,5
Perm	68 923	96,2	45 528	92,7	85 259	90,3
Kungur	65 309	94,9	40 743	93,8	79 705	89,1
Sum and average	*27 160*	*97,9*	*264 196*	*95,9*	*511 623*	*93,5*

Sex ratio at birth. To calculate sex ratio at birth we used aggregates published by the Perm province officials, who used the metricheskie knigi data from parish books with vital events. These aggregates are based on the baptism records, however the Russian Orthodox Church parish books contained data on birthdays as well. According to our calculations based on the individual level data for one of Ekaterinburg city Orthodox parishes, the time between births and baptisms did not exceed 3–4 days in the late 19th century [Bakharev, Glavatskaya, p. 216]. If there was a danger that the new-born might die, the midwives would perform the baptism at once to secure the babies' admission to paradise. As some of the death records prove, these worries were not without good reason [Заболот-ных]. We assume that in the countryside where the Orthodox church's rules were reinforced by the community's habits, the time between births and baptisms should be the same. Table 5 shows that sex ratios at birth even if differing slightly by year and county, on average were close to the 'biological' norm of 105–104 boys to 100 girls.

Sex ratio at birth among the Perm province rural population
[Адрес-календарь, 1899; 1901; 1902; 1909]

County	SR born in 1897	SR born in 1898	SR born in 1899	SR born in 1900	SR born in 1909	Average SR
Perm	101,7	103,5	102	105,6	103,9	103,3
Verkhotur'e	101,2	105,6	103,9	107,1	101,6	103,9
Ekaterinburg	105,9	104,2	102,2	106,4	106,3	105
Irbit	105,8	105,5	103,4	104,4	107,1	105,2
Kamyshlov	99,7	104,6	103,2	104,9	105,8	103,6
Krasnoufimsk	104,7	104,6	96	104,2	106,5	103,2
Kungur	103,4	104,4	106,2	105,7	105	104,9
Osa	104,9	103,2	103,5	104,5	106,2	104,5
Ohansk	107,5	106	104,1	100,8	105,9	104,9
Solikamsk	102,6	102,9	103,1	103,2	106,1	103,6
Cherdyn'	103,5	102,2	97,6	103,5	107	102,8
Shadrinsk	105,3	102,4	102,1	106,7	100,5	103,4
Average	*103,9*	*104,1*	*102,3*	*104,8*	*105,2*	*104*

The baptismal records did not include the records of still born, and such data is rare. According to the Perm province police statistics, there were 2513 still born registered in 1889 (1,7 %); 1448 males and 1065 females which gives a sex ratio around 136 – much higher than among those born alive –104,4. This means that there were no signs of female infanticide right after the delivery. The sex ratio of infants who died in the cities during the same year was 107 and in the countryside 114. The infant mortality rate in the province in 1889 was 431 % [Памятная книжка]. The sex ratios at birth together with the sex ratios of the still born and those who died in infancy, do not give grounds to suspect discrimination against female children in Perm province during the first days of life, even if parents perhaps were happier to get sons. It also suggests that there are no obvious signs of systematic under-registration of boys or girls in the Perm province counties.

To understand at what age the sex ratios changed from the average 'biological' 105 to the average 95,4 for the late 19th century Perm province, we used data on mortality, also based on the local statistics and available for the period from 1867 until 1881. We computed the sex ratios of children who died when under 5 years old during consecutive 5-year periods (table 6).

Table 6

**Sex ratio of children died in Perm province
before 5 years old [Смертность младенцев]**

AGE	SR 1867–1871	SR 1872–1876	SR 1877–1881	SR 1867–1881
< 1 Month	119,2	114,3	116,6	116,5
1–3 M	114,2	110,8	112,4	112,4
3–6 M	109,2	107,4	108,3	108,3
6 M – 1Y	108,4	104,2	106,2	106,2
1–2 Y	100,6	102,7	101,7	101,7
2–3 Y	99,1	98,2	98,6	98,6
3–4 Y	99,8	94,4	96,8	96,8
4–5 Y	100,3	96,8	98,4	98,5

As the table shows, the highest sex ratio was among the group who died during infancy, especially among the neonatal deaths; it flattened out after 1 year and lowered further after the children reached 2 years of age. The weakest boys died before their first birthday, and their biological disadvantage was worsened by local factors, which we shall refer to later. The table also shows slight sex ratio levelling over time, which likely was due to the infant mortality rate decline in the province, as suggested above. Our calculations showed high correlations between county-level infant mortality rates in 1893, 1896 and 1897, which made differences between the counties' sex ratios (among children aged 0–4) rather stable. That stresses the influence of the IMR on the sex ratios in the counties.

Sex ratios in the counties of Perm province: searching for possible background factors. Since the mortality environment alone cannot fully explain the variation in child sex ratios, we analyzed other factors, distance from the county's capital to the nearest big city (Ekaterinburg or Perm) or the share of Old Believers and Muslims in the population, displayed no effect. However, two groups of variables, connected to nuptiality and women's involvement in agriculture, correlated with the sex ratio in the age group 0–4. We found statistically significant and negative correlation between the sex ratio 0–4 and males' singulate mean age at marriage ($r = -0.6$), the share of never married women ($r = -0.7$), the share of women in the population living on incomes from agriculture ($r = -0.6$) and share of women (with only farmers' family members included) in the population living on incomes from agriculture ($r = -0.7$).

Even if we found no statistically significant correlation between sex ratios in the group 0–4 years old and the counties' proportion of Muslims,

the religious affiliation obviously influenced the sex ratio. The Russian Orthodox population compared with the Muslims, had fewer men than women in all age groups, with the difference increasing from age group to age group (fig. 2).
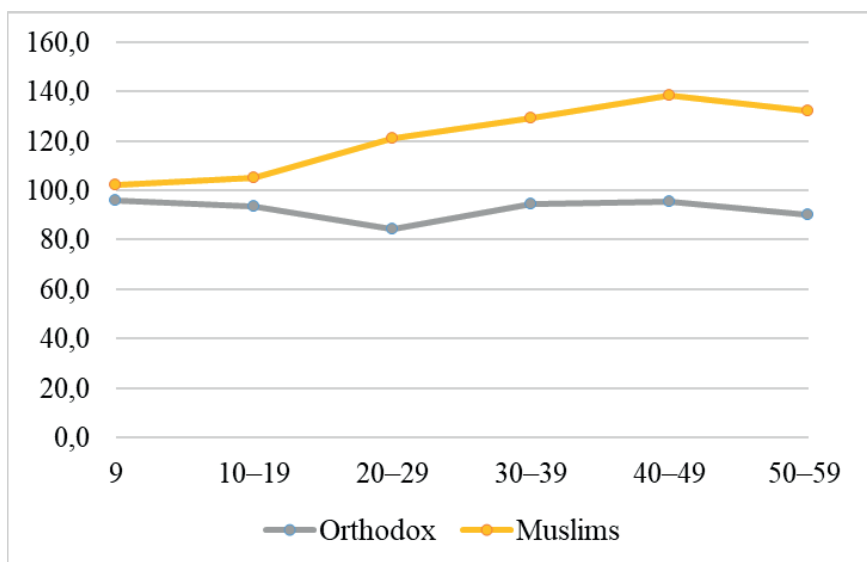
2. Sex ratios in Perm province by religion (Orthodox and Muslims)
[Первая всеобщая перепись]

The lack of men among the Russian Orthodox adult population we can attribute to the sex ratio pattern formed at age 0–4, outmigration to the cities and conscription, particularly for the age group 20–29. However, the lack of Muslim females in rural areas requires additional research. According to the Ministry of Inner Affairs statistics based on the metricheskie knigi with vital events, sex ratios at birth among the Russian Orthodox and the Muslims was 105 and 103,6 in 1896; 103,9 and 103,4 in 1897; 104,2 and 102,1 respectively in 1898. That proves that there was neither obvious under-registration of boys among the Russian Orthodox population, nor under-registration of girls among the Muslims. It also suggests that there were no specific gender-favouring practices performed right after the birth. The differences in sex ratio among Orthodox and Muslims were likely rather determined by different mortality regimes and higher IMR among the Russian Orthodox population. Table 8 shows different mortality patterns among children under 10; there was a high sex ratio among the infants who died neonatally in both religious denominations. However, in Orthodox communities the sex ratio fluctuated along with the age, while among the Muslims it dropped after one month and increased again among the 2–3 years old children. The main difference in the children's mortality regime occurred at age one among the Orthodox and at age two among the Muslims (table 7). Thus, the difference in mortality structure between

Russian Orthodox and Muslim children was shaped during infancy or the first two years of their life. According to the mortality statistics there was a dangerous period only for the Muslim boys when they reached 10–15 years of age. We may assume that it could be influenced by the circumcision rite. If not mortally dangerous in itself, it could provoke an infection so that boys with general weaknesses were unable to face other illness. The most important is that the biological advantage of the Russian Orthodox girls and even more of their Muslim peers drastically ended once they reached the time of marriage. High mortality among the women compared with the men was likely connected to the childbirth: it peeked among 25–30 years old Muslims, when 100 women died per 48,8 men.

Table 7

Sex ratios among Orthodox and Muslims dead in 1896–1898
[Движение населения в Европейской России, 1899; 1900; 1903]

Age	N (Orthodox)	SR (Orthodox)	N (Muslims)	SR (Muslims)	Difference
Before 1 month	57 386	125,7	471	122,2	3,5
1–3 m	56 652	114,9	707	107,3	7,6
3–6 m	49 552	112	744	108,4	3,5
6m–1y	46 704	110,1	1 418	106,1	4
1–2	23 129	100,4	1 689	103	−2,6
2–3	11 224	97,7	1 064	98,9	−1,1
3–4	7 262	96,1	764	96,9	−0,8
4–5	5 253	95,1	475	100,4	−5,3
5–10	11 612	99,4	985	98,6	0,8
10–15	4 026	94,9	352	107,1	−12,2
15–20	4 218	75,6	292	66,9	8,7
20–25	4 860	70,4	346	53,8	16,6
25–30	4 835	71,1	424	48,8	22,3
30–35	4 363	71,1	304	56,7	14,4
35–40	5 331	82,8	307	65,1	17,8
40–45	5 058	90,7	283	69,5	21,3
45–50	5 416	103,6	230	96,6	7
50–55	5 369	93,1	266	121,7	−28,6
Sum and average	*312 250*	*107,4*	*11 121*	*94,3*	*13,2*

* * *

Gender studies with a focus on sex ratios is a rather new topic in Russian historiography, but already analyses of the historical gender composition helps understand some basic principles of how the societies functioned in the past.

Our long-term research focused on the Perm province, which had the highest infant mortality rate in Russia, and revealed that the sex ratio was low in all counties already among the age group 0–4; it tended to decrease among the older age groups, stressing the biological disadvantage of the boys. The low sex ratio in Perm province was a long-lasting phenomenon. There were 95,4 boys to 100 girls aged 0–4 years registered in the 1897 Census and their numbers increased only to 97,9 boys per 100 girls in 1926. The increase of boys' survival could be attributed to the decrease of the infant mortality rate in late 1920-s Soviet Union. The cross checking of the 1897 census data by using the household census, collected by different agencies for several years, and vital events records proved its accuracy. According to household census data, the sex ratios among infants and children under 7 was 96,9 and increased slightly till 98,9 by 1912.

Another finding is that sex ratios among the urban population according to the 1897 census on average was a bit higher (99,3) than among the rural (95,4), which can be explained by the lower infant mortality rate in cities in the late 19th century, giving the city boys some advantage over their rural counterparts.

We also found out that the sex ratio at birth in Perm province, even if differing slightly from year to year (within the interval 102,3–105,2) and from county to county (from 102,8 to 105,2) was close to the biological norm of 105. Since there was no time gap between birth and baptism, we may assume that the data was rather accurate, and there were no systematic under-registration of girls or boys in the province. The average sex ratio further decreased in favour of girls from 105 till 95,4 during their first years of life, but most during infancy, especially in the neonatal period. According to the death records, the sex ratio reached 119 dead boys per 100 girls, flattened after 1 year, and decreased further after the children reached age two. The weakest boys seemingly died before their first birthday, and their biologically explained disadvantage was worsened by local factors, which were reflected in sex ratio difference on the county level. Strongest was likely the effect of the infant mortality rate. We found no correlation between the proportion of Muslims and the sex ratio in the age group 0–4 in the counties; however, religious affiliation influenced the sex ratios. According to the 1897 census data, the sex ratio in each age group of Muslims was higher than among the same group of the Russian Orthodox population, except that sex ratio at birth was a bit higher among the Russian Orthodox babies. The latter could be explained by the fact that the registration in the church books followed the birth almost immediately, while the Muslims who had no religious requirements usually registered their new-born much later.

According to the entries in the Ekaterinburg Mosque's books of vital events, it could take few weeks before the Muslim baby's registration. Considering the high infant mortality rate in the province, some of the Muslim boys may not have been registered at all if they died during their first month. The differences in sex ratio between the Orthodox and Muslims reflected in the census were likely determined by different mortality regimes and higher IMR among the Russian Orthodox population. These patterns were shaped during infancy or at least within the first two years of life. We also noticed an increase in sex ratio among the Muslim teens aged 10–15 years in the death records, likely influenced in our view by the circumcision rite performed at the age of 10–12. Followed by possible infection and natural weakening this may have exposed the boys to dangerous diseases.

The girls' biological advantage was reinforced due to the Perm province's constantly high infant mortality rate but disappeared slowly as they grew until the age of marriage. The unbalanced gender composition of the population aged 17+ with female surplus already from infancy, increased also by the compulsory conscription, which left many girls on the side-lines of the marriage market. The Russian Orthodox old maidens and young widows had to suppress their sexuality or confront the moral condemnation and increasing number of illegitimate children [Главацкая, Заболотных]. The adult females' disadvantage increased further due to the high danger of dying during delivery, especially for the Perm province Muslim women, which is clearly reflected in the sex ratio of the dead adults (48.8 males per 100 females).

We conclude that our exploratory analyses of the sex ratios covering several decades did not give grounds to suspect obvious gender specific discrimination practiced by the Russian Orthodox population against the girls right after their birth, during infancy or childhood. The high infant mortality rate, occasionally reaching 700 % in Perm province rural settlements, resulted in the low sex ratio due to the girls' biological advantage. However, that advantage ended once the girls reached the age of marriage, a change vividly described in the brides' wedding lamentation songs. We also found that sex ratios in the age group 0–4 was connected with nuptiality and the women's involvement in agriculture, which requires additional research.

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