Correlates of Longevity in Rural Eastern Europe in the 18–20th Centuries

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Abstract

Eastern-European peasants in the 18th–19th centuries rarely lived beyond the age of 50 years. However, some families and individuals did demonstrate considerable longevity. The current study focused on the influencing factors on the peasants' length of life. Following previous research, it was hypothesized that longevity was associated with a lower fertility and living in a marriage (being neither widow(er) nor unmarried). Statistical information on 1,986 Polish, Belorussian, Russian, and Ukrainian individuals was collected on the basis of church books and census data. Influencing factors on the length of life were scrutinized by means of univariate and multivariate statistical methods. A higher length of life was associated with moving from rural to urban areas, a lower number of children and siblings, a higher length of life of parents and the spouse, being neither twin nor orphan, a higher age of marriage and birth of the first child, survival until the foundation of the Soviet Union (on the territory of the former Russian Empire). To sum up, peasants who lived longer stem from families with a low fertility and also gave birth only to 1–2 children. They were supported by both parents at younger age and by their spouses at older age. They profited from a better healthcare system either by moving to urban areas or due to their survival until the introduction of large-scale vaccination programs in the 1920s–1930s in the Soviet Union. Living in a marriage into old age showed the highest predictive power for the longevity of both sexes.

Keywords: life expectancy, genealogy, length of life, Eastern Europe

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Introduction

Previous research found a number of influencing factors directly or indirectly associated with the life expectancy: diet, socioeconomic status, "life radius" (mobility), diseases, stress level, depression level, socialisation (Castruita et al., 2022), physical activity, smoking cessation, mid-day naps (Panagiotakos et al., 2011), and many more. Also, there were numerous contradicting findings regarding such factors as a number of children and age of child birth (Alter et al., 2007; Dribe, 2004). Most of data stem from the Western-European countries and refer to people born in the 20th century. Historical data are often based on the sources that can be considered well-preserved and comparatively reliable: genealogical sources on aristocratic families (often published as books), church books from (usually Western-European) regions that did not suffer considerable damage in wars. Very little evidence is available from Eastern-European regions, especially those that belonged to the former Russian Empire and now constitute territories of Poland, Russia, Ukraine, and Belarus.

Many archives on the territory of the former Russian Empire, especially in its Western regions, suffered severe damage in numerous wars, especially in the Second World War. Hundreds of thousands of church books and population censuses were lost in fire. Remaining documents are often in a very bad condition or hard to find because after the fall of the Russian Empire in 1917 and of the Soviet Union in 1991 documentation on one village can be scattered among archives of several countries. For instance, documents on the village Pacewicze (now Belarus) that were analyzed for the current study can be found in the historical archives of Lithuania, Poland, Belarus, and Russia. Church books and population censuses on the village Mostowlany (now Poland) are not only scattered among archives in the same four countries but are also written in three languages: Russian, Latin, and Polish. Collection and processing of such documents is extremely time-consuming and costly. However, if only "convenient" Western-European samples are analyzed, this can lead to bias in the data on longevity research. Without samples from other parts of the world, it would remain unclear which findings can be generalized to other populations and which findings are valid only for Western Europeans or, more specifically, for certain nations or territories.

The current study is based on the data from a family tree, that is, on results of genealogical research. This means that all individuals in the sample are relatives. Calculations were carried out after all relevant documents in all relevant archives had been studied in detail. Gaps in the data that remain cannot be closed. For instance, almost all church books of the Russian Orthodox Church in the village Mostowlany were lost in fire in the 1980s. Respective branches of the family tree can be reconstructed only on the basis of (a) several population censuses, (b) church books of the Catholic Church (however, most inhabitants were not Catholics), (c) remaining church books of the Russian Orthodox Church (available only for several years). Fortunately, counter-examples do exist. Church books from the village Belenkoye (now Ukraine) are well-preserved and contain almost no gaps.

Of course, church books and population censuses do not provide any information on the most factors mentioned in the first paragraph: diet, stress level etc. They document dates of birth, marriage, and death. This reduces the scope of possible influencing factors on the length of life to those related to these three events. However, numerous other variables can be derived from these data: birth rank in the family, mean time span between birth of children, age of birth of the first or last child, number of siblings, of children, of marriages etc. The current study focused on these variables in search of possible influencing factors on the length of life in predominantly rural Eastern-European regions.

It goes without saying that the length of life in Europe, especially in the former Russian Empire, was very short in comparison with that in the 20th–21st centuries (Reshetnikov et al., 2019). The mortality was especially high among babies and children of what is now called pre-school age (Reshetnikov et al., 2019; Tymicki, 2009). However, some long-living individuals and families did exist (Cherkasov et al., 2021). Such individuals often enjoyed a very high social status in their communities and – fortunately for researchers – were prioritized in church books. Whereas the death of yet another baby was of little interest for priests, they did document deaths of many adults aged 60+ years. Generally, it should be taken into account that most priests did not document all births, marriages, and deaths. They were quite choosy and sometimes completely abandoned church books for weeks or months. Furthermore, a large majority of records in church books refers to births. After this very first record, many individuals do not re-appear in the documentation. Although some counter-examples exist, that is, people whose burial was recorded in church books but no information on birth or wedding can be found, especially in the data before 1850, such cases are comparatively rare. In most cases, priests tried to document as many births as possible but many of them did not care much about documenting weddings and deaths, especially if respective individuals had a low social status. Numerous gaps in the data can result in too low correlation coefficients and missing statistical significance in calculations. However, such limitations are unavoidable in work with the genealogical data.

To sum up, the current study focused on the statistical analysis regarding length of life of Eastern-European inhabitants of predominantly rural areas, including possible influencing factors on the life expectancy. All influencing factors were derived from records on the date of birth, marriage, and death.

Methods

Sample

The sample consists of 1,986 individuals who lived on the territory of the former Russian Empire in the 18th–20th centuries: 988 males (49.7%), 998 females (50.3%). The largest subgroups lived in the following regions:

- Kursk region (villages Pavlovka, Tazovo etc.), now Russia: 258 (13.0%),
- Grodno region (villages Pacewicze, Mostowlany etc.), now Belarus and Poland: 629 (31.7%),
- Zaporozhye region (villages Belenkoye, Marievka etc.), now Ukraine: 851 (42.2%).

Further 248 individuals (12.5%) were found in other regions. Not all individuals lived in villages: 44 lived in towns (2.2%), 164 in cities (8.3%), 1,778 in villages (89.5%), but even those who lived in towns and cities were the first or – very seldom – the second generation that moved from rural to urban areas.

Out of 1,986 individuals, 12 (0.6%) were born in the 17th century, 115 (5.8%) in the 18th century, 796 (40.1%) in the 19th century, and 960 (48.3%) in the 20th century. In 103 cases (5.2%), the century of birth remains unknown. Due to gaps in church books and legal restrictions, there is no information on the date of death of 1,275 individuals (64.2%) and no information on the date of marriage of 1,225 out of 1,700 adults (61.7%).

On average, adults from the sample had 3.6 children (span 0–14), 1.1 marriages (span 0–3), and length of life of 35.7 years (0–100). They married for the first time at the age of, on

average, 21.8 years (16–50), for the second time at the age of 26.8 years (18–38), and for the third time at the age of 34.7 years (23–38). Males became fathers for the first time at the age of, on average, 25.9 years (18–53), females at the age of 23.3 years (17–41). The last child was born, on average, at the age of 36.1 years (19–63) by males and 33.0 years (17–49) by females (sometimes the first child was also the last child).

Regarding the occupation, 898/1,986 individuals (45.2%) were peasants/farmers, 29 (1.5%) were workers, 74 (3.7%) had various other professions that can be considered non-intellectual (e.g., driver) and 58 (2.9%) professions that can be considered intellectual (e.g., engineer), 7 (0.4%) individuals were housewives, 5 (0.3%) professional soldiers, 286 (14.4%) died as children. Professions of 785 individuals (39.5%) remain unknown but the probability is high that most of them were peasants/farmers and some of them died in childhood but their death was not recorded in church books.

From the modern point of view, virtually all individuals in the sample lived under conditions of extreme poverty. Other negative factors that shortened their life expectancy were frequent outbreaks of infectious diseases (especially epidemic typhus), years of hunger, several wars (e.g., Napoleon's invasion in 1812, the First and Second World Wars), absence of medical care and many more.

The demographic data were taken predominantly from church books, but also from population censuses, private documents such as passports, lists of penitents, and documentation in civil registration offices. Also, several graveyards were visited to document years of life from gravestones. Gaps in the data can be explained by the following factors:

- church books missing for some years,
- records in church books predominantly on the date of birth, but not on marriage or death,
- bad condition of many church books,
- no information on most people who moved to other villages or towns/cities,
- no information on most people who lived after 1920s (due to legal restrictions),
- all church books end short after the Russian revolution (1917),
- old language with many contractions, ungrammatical forms, errors.

Data on births, marriages, and deaths were predominantly found in the following archives: National Historical Archives of Dnepropetrovsk, Zaporozhye, Odessa, and Kirovograd (all in Ukraine), Lithuanian National Historical Archive (Vilnius, Lithuania), Vrublevskis' Library of the Lithuanian Academy of Sciences (Vilnius, Lithuania), National Historical Archive of Belarus (Grodno, Belarus), National Historical Archive of Grodno Region (Grodno, Belarus), National Library of Belarus (Minsk, Belarus), National Archive of Tver Region (Tver, Russia), National Archive of Kursk Region (Kursk, Russia), Russian State Archive of Ancient Documents (Moscow, Russia), Russian Historical State Archive (St.-Petersburg, Russia), Arolsen Archives (Bad Arolsen, Germany). The latter archive provides documents on deaths in Germany during the Second World War.

Statistical Analyses

Possible influencing factors on the length of life were scrutinized by means of univariate and multivariate statistical methods.

First, Spearman's correlations were calculated between length of life in years and metrical or ordinal variables that can be considered possible influencing factors (e.g., number of children). Kruskal-Wallis *H* test was utilized to quantify differences in the length of life among regions. Mann-Whitney *U* test was the statistical method of choice for dichotomous influencing variables such as biological sex. The analyses were repeated for the dichotomized length of life: 18–79 years vs. 80–100 years. Thus, cases of exceptional longevity became a subject of additional analyses.

Among multivariate methods, classification trees (method "Exhaustive Chi-squared Automatic Interaction Detection") were utilized to depict hierarchies of influencing factors on the length of life as metrical (years) and dichotomized (18–79 vs. 80–100 years) dependent variables. The same factors entered a factor analysis (method: Principal Component Analysis with varimax rotation) to find variables with the strongest predictive power for the length of life in years.

Influence of biological sex (as one of the most well-known factors) on the length of life was scrutinized in two logit-loglinear models. Such models allow only for a small number of variables. The first model was calculated to quantify the influence of factors "biological sex" and "widow/widower" on the dichotomization "length of life 18–79 vs. 80–100 years". The second model was calculated to differentiate between individuals who died as children vs. adults. Possible influencing factors were "biological sex", "very young (18–20 years) vs. relatively old fathers (40+ years)", and "(semi-)orphans or not" (many other models were tried out but did not deliver noteworthy results).

Results

The average length of life mentioned in the Methods (35.7 years) refers to the whole sample including children. Here, more detailed descriptive statistics are presented. Those who died as children lived on average 2.3 years (span 0–17), those who died as adults 58.4 years (18–100). Out of 286 children with known length of life, 208 died at the age of 0–2 years (72.7%) and 78 at the age of 3–17 years (27.3%); 116 children (40.6%) died in the first year of life. Out of 421 adults with known length of life, 197 lived for 65+ years (46.8%) and 69 for 80+ years (16.4%). Again, it should be emphasized that most people disappeared from church books after birth.

An average father lived for 58.6 years (25–97), an average mother for 63.0 years (19–100). Individuals were on average 26.9 years old when their fathers died (-1–67; the value "-1" means that the father died 9 months before the birth of his child) and 34.0 years old when their mothers died (0–72 years). An average mother lived for only 8.6 years (0–25) as mother-in-law and, thus, as a potential grandmother. An average father-in-law survived in this status for 10.8 years (0–39). However, it does not mean that men lived longer than women did. An average length of life of (adult) men constituted 54.8 years (18–97), and that of women 64.3 years (18–100).

Differences in the length of life of men and women are depicted in Figures 1 and 2. Figure 1 shows that (a) a lot of individuals of both sexes died as babies, especially males, (b) women lived longer than men. Figure 2 shows improvement of the life expectancy since the beginning of the 20th century, especially for men. Men born in the first quarter of the 20th century managed to achieve a higher length of life compared to women. However, this

finding should be considered preliminary because some individuals born in this time period are still alive or information on their death is not yet available due to legal restrictions.

Figure 1

Length of Life of Males and Females in Percent

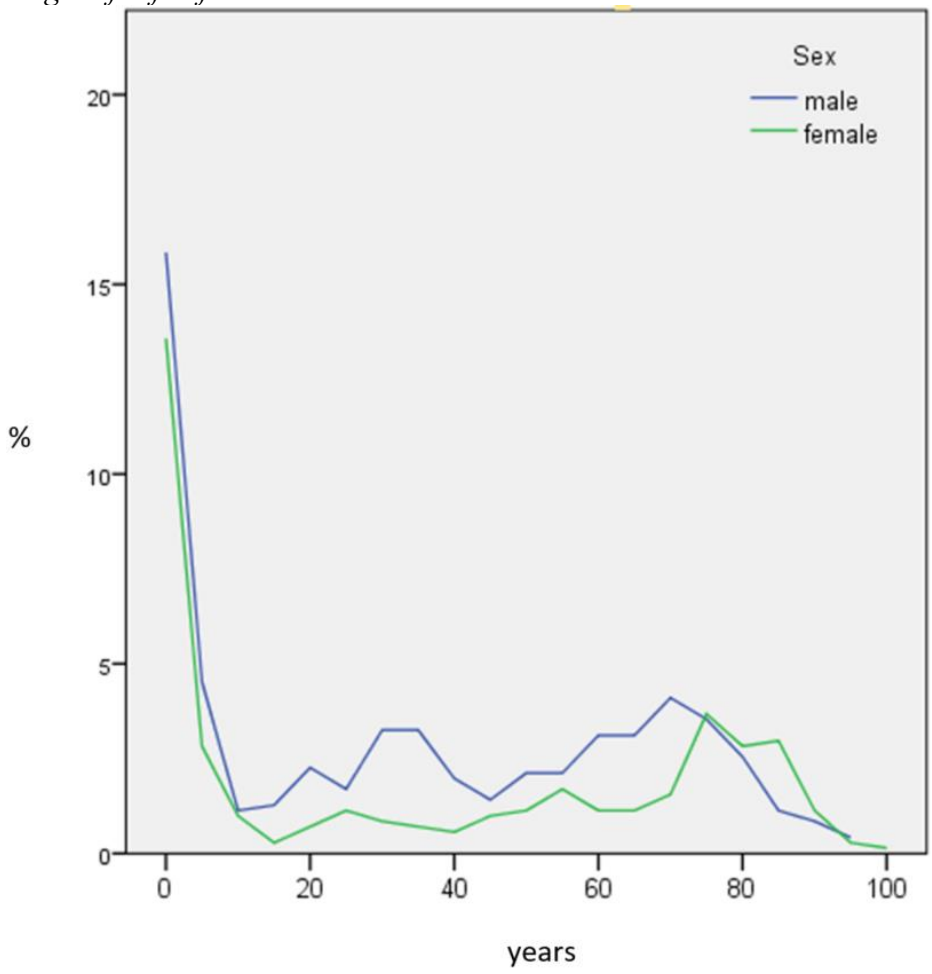
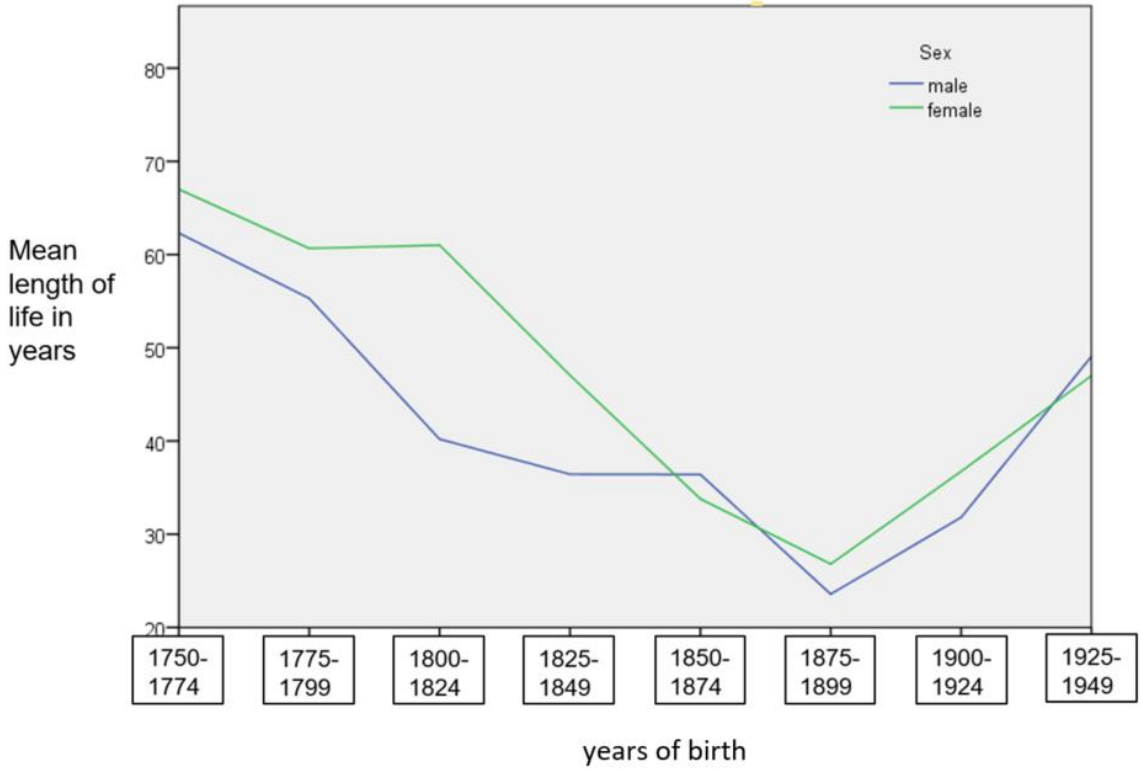


Figure 2
Historical Development of Life Expectancy of Males and Females (in Years)



Information on causes of death is fragmentary and available only for 411 individuals: 16/411 died "naturally" because of a high age (3.9%), 327 died from various illnesses or diseases (79.6%), 46 were murdered or fell in action during wars (11.2%), 14 died in accidents (3.4%), 4 died of hunger (1.0%), 4 mothers died after birth of a child (1.0%). Most frequent illnesses were tuberculosis (27), "sudden infant death" (61), and pneumonia (25). However, diagnoses appeared in church books only at the beginning of the 20th century. Up to the end of the 19th century, documentation of burials in church books was accompanied by comments such as "from stomach aches", "from head [aches]" or "from very painful ulcers".

People died somewhat more often in winter (163/580, 28.1%) than in other three seasons, especially compared to summer (133/580, 22.9%). January was the month with the highest percentage of deaths (57, 9.8%), June the month with the lowest percentage (47, 8.1%).

Spearman's correlations between length of life and possible influencing factors can be found in Table 1.

Table 1
Factors Associated With a Higher Length of Life: Spearman's Correlations

Factors	*ρ*	*n*
Less siblings	-.157***	537
Higher length of life of the father	.146*	296
Higher length of life of the mother	.221**	242
Higher age at the time point of the first marriage	.203**	167
Spouse's higher age at the time point of the first marriage	.226**	165
Higher age when the father died	.116*	297
Higher age when the mother died	.221**	243
Higher length of life of the spouse	.277***	179
Higher age when the first child was born	.217***	295
Higher age when the last child was born	.190**	234
Higher number of children who survived until the age of 18 years	.197*	110
Longer mean time span between births of children (in years)	.257***	234
Longer time span between birth and baptism (in days)	.129*	293
Century in the middle of life (20^{th} rather than 18^{th}–19^{th})	.206***	707

Note. *** $p < .001$, ** $p < .01$, * $p < .05$

According to the Kruskal-Wallis *H* test, regional differences regarding the length of life were statistically significant: $\chi^2_{(5)} = 26.3$, $p < .001$. Among other things, life expectancy in Grodno region was higher than that in Zaporozhye region.

Results of Mann-Whitney *U* tests are described in Table 2. It shows statistically significant factors associated with a shorter length of life. People whose lives were comparatively short, were twins, orphans, widows/widowers, they lived in rural areas, their jobs can be described as not intellectual, they belonged more often to the Russian Orthodox Church than to the Catholic Church, they were born before the foundation of the Soviet Union rather than in the Soviet Union, they had very young fathers. The most important factor was being a widow/widower, which supports findings in Table 1 where the highest correlation with the length of life was shown by the factor "length of life of the spouse".

Table 2
Dichotomous Conditions Associated With the Shorter Length of Life: Mann-Whitney U Tests

Conditions	*Z*	Yes: *M* (years)	No: *M* (years)	*n*
Twin	-3.38**	5.2	27.5	531
Orphan	-2.40*	30.5	42.2	252
Living in a rural area (in contrast to urban areas)	-7.55***	33.2	70.1	707
Not intellectual job (in contrast to intellectual jobs)	-3.66***	56.6	75.1	354
Russian Orthodox church (in contrast to the Catholic church)	-2.08*	33.3	45.3	399
Born before the Soviet Union (in contrast to those born in the Soviet Union)	-3.84***	33.4	47.9	707
Children of very young fathers (aged 18–20 years, compared to fathers aged 40+ years)	-2.78**	13.3	31.8	110
Widow/widower	-6.25***	57.0	74.5	177

Note. *M* = mean, *** $p < .001$, ** $p < .01$, * $p < .05$

In the classification tree with the length of life (in years) as dependent variable, the most important influencing factor was the number of children ($F(2, 704) = 298.69$, $p < .001$, $n = 707$):

- Individuals with 0–2 children lived on average 63.3 years ($n = 123$). Those with 3+ children lived on average 59.2 years ($n = 177$).
    - Among individuals with 0–2 children, the next influencing factor was age when the first child was born ($F(1, 121) = 11.91$, $p = .001$, $n = 123$). If this age was below 27 years, then the length of life was on average 58.9 years ($n = 72$). If this age was 27+ years, then the length of life amounted to 70.7 years ($n = 51$).
    - Among individuals with 3+ children, the next influencing factor was year of the first marriage ($F(1, 175) = 15.71$, $p < .001$, $n = 177$). If the individual married before 1911, then he or she lived on average 53.4 years ($n = 78$), and if later, then the length of life increased to 63.7 years ($n = 99$).
- For some individuals, there was no information on children. For this subgroup, the classification tree found one more influencing factor: century of birth ($F(1, 405) = 23.68$, $p < .001$, $n = 407$). Those who were born before the 20th century ($n = 192$) survived until the age of 10.6 years, that is, died as children. Those who were born in the 20th century lived longer: on average, 23.0 years ($n = 215$).
    - For those who died as children, the most important influencing factor on their length of life was the length of life of their mothers ($F(1, 190) = 8.17$, $p = .005$, $n = 192$). If mother survived up to the age of 47 years, then her child lived until the age of 4.4 years ($n = 54$). If mother lived longer than 47 years, then her child also lived longer, on average 13.1 years ($n = 138$).
    - Most of those born in the 20th century died in older age than those born in the previous centuries. For them, the classification tree found only the regional distribution as the relevant factor for the length of life ($F(1, 213) = 21.28$, $p < .001$, $n = 215$).

- Those born in the regions that now belong to Russia and Belarus lived on average 34.7 years (n = 80).
- Those born in the regions that now belong to the Ukraine lived on average 16.0 years (n = 135).

In the following analyses, two subgroups of adults were compared: those who lived for 18–79 years (n = 352) vs. those who lived for 80–100 years (n = 69). Table 3 shows factors that yielded significant results for these two subgroups in Mann-Whitney U tests. Individuals in the subgroup of 80–100-year-olds had older spouses at the time point of the first marriage, their spouses lived longer, the first child was born later, the mean time span between births of children was longer, and the total number of children was lower. All other univariate calculations yielded no significant results.

Table 3
Dichotomous Conditions Associated With the Length of Life 18–79 vs. 80–100 Years: Mann-Whitney U Tests

Conditions	***Z***	**18–79: *M* (years)**	**80–100: *M* (years)**	***n***
Age of the spouse at the 1st marriage	-2.65**	21.8	24.3	165
Length of life of the spouse	-2.66**	64.7	71.5	179
Age when the 1st child was born	-2.28*	24.8	26.6	295
Mean time span between births of children	-2.63**	3.4	4.5	234
Total number of children	-3.04**	4.2	2.9	300

Note. M = mean, *** $p < .001$, ** $p < .01$, * $p < .05$

In the classification tree with subgroups "18–79 vs. 80–100 years" as dependent variable, the most important influencing factor was, again, length of life of the spouse ($\chi^2_{(2)} = 34.0$, $p < .001$, $n = 421$):

- If the spouse did not survive up to the age of 75 years, then the individual reached the age of 80+ years only in 18.5% of cases (20/108).
- If the spouse survived up to the age of 75+ years, then the percentage of those in the subgroup 80–100 years was higher: 38.0% (27/71).
- If there was no information on the length of life of the spouse, then the most important influencing factor was the biological sex ($\chi^2_{(1)} = 11.1$, $p = .001$, $n = 242$):
  - Males achieved only seldom the age of 80+ years: 5.2% (9/173).
  - Females achieved this age much more often: 18.8% (13/69).

A factor analysis explained 67.4% of the variance and identified 7 components (correlations below .3 are not included in this description):

- Component 1: time span between the birth of the first child and of the last child (.889), age when the last child was born (.843), total number of children (.789), percentage of children who survived until the 18th birthday (.378),
- Component 2: age when the first child was born (.870), age of the first marriage (.808), age of the spouse at the first marriage (.458),
- Component 3: age of the mother when the child married (.938), age of the father when the child married (.936),

- Component 4: mean time span between births of children (.920),
- Component 5: age when mother died (.733), age when father died (.722),
- Component 6: time span between birth and baptism (.771), number of brothers and sisters (-.712),
- Component 7: length of life of the spouse (.744), one's own length of life (.694).

Only component 7 is of relevance for the present study. It shows that individuals' length of life correlates, first and foremost, with the length of life of their spouses. Indirectly, the same finding is reflected in the component 5: fathers died approximately at the same age when mothers died, that is, the time span between their deaths was usually quite short. All other components describe the way of life of peasants and deliver no additional information on their length of life. For instance, component 6 shows that parents who did not baptize their children immediately after birth, did not have many siblings (typical for Grodno region). Component 2 shows that the age of brides and bridegrooms at the time point of marriage was comparable, and if it was higher, then the age when the first child was born was also higher.

In the first logit-loglinear model (n = 177), widows/widowers (Z = -3.69, p < .001), especially widowers (Z = -2.16, p = .031) were at a higher risk of not surviving until the age of 80+ years. In the second logit-loglinear model (n = 150), individuals who died as children, and not as adults, were more often

- boys than girls (Z = -15.83, p < .001),
- children of very young fathers: 18–20 vs. 40+ years (Z = -13.88, p < .001),
- (semi-)orphans (Z = -12.83, p < .001),
- boys born to very young fathers (Z = -22.81, p < .001),
- male (semi-)orphans (Z = -17.76, p < .001),
- (semi-)orphans born to very young fathers (Z = -14.67, p < .001).

Discussion

Several factors were identified that contributed directly or indirectly to the higher length of life:

- less siblings and children (cf. Caselli & Luy, 2013; Dribe, 2004; Tabatabaie et al., 2011), that is, individuals with a higher length of life stem from families with few children and also gave birth to few children, which was very unusual for peasants,
- higher age when children were born (cf. Caselli & Luy, 2013; Tabatabaie et al., 2011): this finding supports the previous one, that is, people who lived longer gave birth to children comparatively late because they did not aim at a high fertility,
- older fathers (again, probably connected with the previous two factors): obviously, older fathers had a higher social status, income, and were more experienced, which made the survival of their children more probable,
- spouse was alive for longer time (cf. Alter et al., 2007; Dribe, 2004; Kaplan & Kronick, 2006; Manor & Eisenbach, 2003): mutual support extended the life expectancy and reduced the probability of depressions, among other things,
- better access to the healthcare system:
    - moving from rural to urban areas (Gagnon et al., 2009; Temby & Smith, 2014),
    - survival until the foundation of the Soviet Union (where large-scale vaccination programs were introduced, cf. Reshetnikov et al., 2019), year of

marriage short before the Russian Revolution (1917) in one of classification trees also belongs into this category,

- intellectual professions (cf. Caselli & Luy, 2013; Kashtanova et al., 2022): people with such professions lived in urban areas and had a better access to the public healthcare services,
- Possible biological or genetic factors (cf. Capri et al., 2006; Caselli & Luy, 2013):
    - both parents were alive for longer time (cf. Dutta et al., 2011): if both parents survived much longer than their peers, it can be assumed that their health or physical condition was above average and that their children were also comparatively healthy,
    - more survivors among children: again, if children in one family survived more often than children in other families, then it can be assumed that representatives of this family were comparatively healthy, maybe due to a lower number of mutations or due to other genetic factors,
- being neither twin (cf. Hammel & Gullickson, 2010; Tymicki, 2009) nor orphan (cf. Alter, 2007; Tymicki, 2009): in case of twins and orphans parental care was reduced to non-existent, which sometimes resulted in early deaths of children,
- longer time span between birth and baptism means that the child was not brought to the church immediately after birth and thus was protected at least for one or two days from cold weather, snow storms, and other unfavorable conditions that can put an end to the newborn's life (e.g., presence of infectious individuals in the church),
- regional differences (cf. Abdiraimova, 2025; Hammel & Gullickson, 2010): these can be related to such factors as access to medical services, food supply, geographical distribution of epidemics etc.,
- religion (cf. Kashtanova et al., 2022): being Catholic increased the life expectancy in comparison with the believers of the Russian Orthodox church, which, however, may reflect other variables (e.g., Catholics were more often free people, not serfs, and, thus, wealthier, with a better access to medical services etc.),
- being a woman (cf. Abdiraimova, 2025; Kashtanova et al., 2022; Tymicki, 2009): this is a well-known finding that reflects a lower number of mutations in women compared to men.

Interestingly, there were short time periods when men showed slightly higher length of life than women. However, it cannot be excluded that this phenomenon is a result of some anomalies in the documentation (e.g., gaps in church books). Before the 20th century, women had a much lower social status than men. Therefore, they disappeared from church books more often, that is, priests sometimes considered it not worth mentioning that a woman was buried. The same is relevant for babies: huge numbers of children disappeared from church books because deaths of babies occurred daily and were often considered not worth documenting. Many of these babies were buried not on graveyards but near houses of their parents. Only after the foundation of civil registration offices all births, marriages, and deaths were documented properly, but this information is available only for the 1920s because many people born in the 1930s and later are still alive. Thus, due to legal restrictions, gaps in the documentation of people who were born, married or died since 1930s can be closed only in the distant future. Missing data probably also explain why most influencing factors showed only very low predictive power for the length of life.

Some factors showed no associations with the length of life:

- ranking of the child birth in the family (the 1st, 2nd … last child in the family),
- time span between wedding and birth of the first child,

- born in a marriage vs. out of wedlock (but very few children were born out of wedlock),
- born during wars vs. times of peace (but very few children were born during wars),
- having young (18–20 or 18–25 years old) vs. older mothers (40+ years old).

Again, it can be assumed that most of these factors did not reach the level of statistical significance due to gaps in the data or too low sample sizes in respective subgroups.

Figure 2 shows one contra-intuitive finding that needs special attention. Although the life expectancy of people born in the 20th century improved in comparison with that of people born in the previous centuries (cf. Caselli & Luy, 2013; Tymicki, 2009), it does not presuppose that the life expectancy of individuals born in the 18th–19th centuries had always been short. According to Figure 2, the length of life decreased until the end of the 19th century. However, instead of believing in "good old times" when people reached Methuselah's age, this unexpected finding should be discussed in terms of limitations of the study. Church books were becoming more reliable in course of the 19th century and, therefore, the time period at the end of the 19th century was much better documented than earlier periods. It cannot be excluded that priests who lived and worked in the 18th century and in the first half of the 19th century tended to document deaths of individuals with a comparatively high social status. Taking into account that old people were seldom exceptions and indeed possessed this high social status, they had a higher priority in the documentation. Children and young adults were of less importance. Therefore, it appears probable that the decreasing life expectancy in the 19th century is an artefact that demonstrates the growing number of records on deaths of children and young adults.

Conclusion

To sum up, individuals with a higher length of life had some unusual sociodemographic characteristics: Whereas their peers tried to marry as early as possible and to give birth to as many children as possible, these individuals married later and had only few children. Also, they stem from families with few children. Furthermore, these individuals were lucky enough to be supported by both parents in their childhood (that is, did not become orphans) and by their spouses in the old age (did not become widows/widowers). Moving from rural to urban areas also contributed to a higher length of life. Some findings seem to point at a better health of these individuals and, thus, a certain genetic predisposition for a higher life expectancy (e.g., more survivors among children, higher length of life of both parents). Growing life expectancy in the 20th century can be linked, among other things, to large-scale vaccination programs in the 1920s–1930s as well as to free healthcare services in the Soviet Union.

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