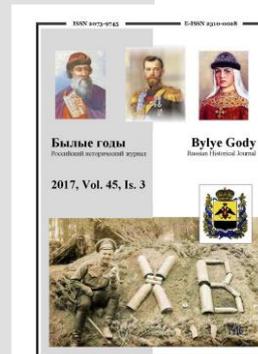


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## The Fertility of Women in Subcarpathian Russia in the Second Half of the Nineteenth Century and the First Half of the Twentieth Century

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### Abstract

In the second half of the nineteenth century, most of the countries in western and northern Europe underwent a transformation in reproductive behaviour. The majority of countries in central and especially Eastern Europe experienced this trend later in both quantitative and qualitative terms. Additionally this transformation did not affect a whole country at once but was subject to social and spatial differentiation. One of the most interesting regions in which to study this phenomenon is Subcarpathian Russia, which was incorporated into Czechoslovakia after the First World War. It was the country's least developed region in every way, with an exposed peripheral position without connection to the main development networks. At the other end of the country, Bohemia was one of the most developed areas in Europe and the demographic transformation began at around the same time as in other advanced countries.

The present paper aims to make a detailed analysis of the reproductive behaviour of the population in Subcarpathian Russia from the second half of the nineteenth century to the mid-1930s. Research findings are used to define the main characteristics of the fertility schedule and its changes in the context of the rise and spread of the demographic transition in both cross-sectional and cohort perspectives. The intensity and character of reproductive behaviour in Subcarpathian Russia is also compared with the broader European context. For this purpose the authors have constructed Coale indices, indicators for the Coale-Trusell fertility model and cohort parity progression ratios.

**Keywords:** Subcarpathian Russia, fertility, women.

### 1. Introduction

Subcarpathian Russia is a historical region most of whose territory is now part of the Zakarpattia Oblast in Ukraine. It was fully incorporated into the Habsburg monarchy at the end of the seventeenth century and was part of the Kingdom of Hungary until the end of the First World War. In 1919 Subcarpathian Russia became part of the new Czechoslovak Republic, in which it remained until 1939 when it was seized by Hungary. After the Second World War, in 1945, Subcarpathian Russia was ultimately incorporated into the Soviet Union. Whichever state ruled the territory, it was always in the exposed periphery of their territory and was outside the main areas of social and economic development. This is one of the factors that make Subcarpathian Russia a special region. As will be shown below, its special characteristics affected the region's population and their reproductive behaviour in the period covered by the study. In the second half of the nineteenth century and at the beginning of the twentieth century, Europe underwent a qualitative and quantitative transformation in the character of reproductive behaviour that is historically unique. In general terms, it was a transition from extensive reproduction with a high death rate and high fertility to intensive reproduction with lower fertility and lower death rates. These changes did not spread across Europe all at once and it has been shown that different countries and different regions within countries differed

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significantly in when the changes started and how they developed (Coale, 1986). Some authors have demonstrated that the situation was no different within the Kingdom of Hungary or the Russian Empire (Demeny, 1968; Andorka, 1971; Coale et al. 1979; Andorka, Balazs-Kovács, 1986). It is still not clear how the transformation process took place in a peripheral region like Subcarpathian Russia. The present paper is concerned mainly with the fertility schedule and its character in the second half of the nineteenth century and the first half of the twentieth century, not only analysing its development and changes but also setting it in its broader international context. The findings will then be used to identify the start date of the transformation of reproduction in the population of Subcarpathian Russia with regard to fertility and how the transformation developed.

## 2. Materials (Data) and methods

Based on the available published data and the methods used, the paper focuses on the period from the second half of the 1860s to the second half of the 1930s.

Initial data comes from the regularly published statistical yearbooks of the Kingdom of Hungary (M.S.E. 1872–1892 and M.S.E – Ú.f. 1893, 1897–1899) for the period 1866 to 1899 and the population movement (M. K. országainak 1900–1902; M. K. országainak 1903–1905; M. K. országainak 1906–1908; M. K. országainak 1909–1912) for the period 1900–1912. In the interwar period 1919–1937, Czechoslovakia published a special series on changes in the population that included demographic data on Subcarpathian Russia (Pohyb obyvateľstva 1919–1920, 1921–1922, 1923–1924, 1925–1927, 1928–1930, 1931–1933, 1934–1937).

Very useful data for the present research was also obtained from the Hungarian censuses of 1880, 1890, 1900 and 1910, and the Czechoslovak censuses of 1921 and 1930. The censuses provided data on age, sex and family status that could be used to construct an estimate of the age structure during the inter-census periods (1900–1912, 1919–1937) from which to calculate indicators of the intensity of fertility (fertility rate, total fertility rate) and indicators of the timing of the process (mean age at birth, mean age at first birth). These data are also used to the construction of Coale indices, indicators for the Coale-Trussell model of fertility and the singulate mean age at marriage, which characterises the mean age at which single people get married.

The Coale indices are based on indirect standardisation, where fertility is compared against a standard population that is seen as making no deliberate effort to limit the number of children born. The population chosen for this purpose was married Hutterite women, who belong to a religious community in North America that is strongly opposed to any limitation of fertility (Pavlik et al., 1986). The present research makes use of three basic Coale indices:

1) the index of overall fertility (If), expressing the extent to which the number of children born to women in the studied population differs from the theoretical number that would be born assuming the same level of fertility as Hutterite women.

2) the index of marital fertility (Ig), expressing the extent to which the number of children born in marriage differs from the theoretical number that would be born in conditions of maximum fertility.

3) the marriage index (Im) expresses the contribution that family status makes to achieving maximum possible fertility.

The Coale-Trussell model is based on a comparison of two schedules of marital fertility – the studied population and a population with natural fertility, which Coale and Trussell estimated based on real data (Coale, Trussell, 1974). Calculations usually leave out the marginal age intervals to 20 years and above 45 years because of low incidence and, in the case of the youngest age groups, the high prevalence of premarital conception. In the next step, the series are compared to a model population that deliberately limits its fertility.

The result of the mathematical model is a numerical estimate of the level of deliberate efforts to limit family size (small “m”). The general interpretation of this variable is that the higher its value, the greater the effort to control marital fertility. Negative values of small “m” and levels to around 0.3 indicate either no or very little effort to limit fertility. Essentially it is only with values of 0.5 or greater that one can safely talk about a conscious effort to limit family size.

There is one very important item of information that is recorded only once in the period under study, in the second Czechoslovak census of 1930 (Sčítání lidu, 1930). This census asked how many times married women or women who had been married at least once had given birth. This information is a fundamental resource for constructing certain longitudinal (generational) fertility indicators. These make it possible to track the development of real fertility and its character. At times of dramatic changes in the character of reproduction, the generational perspective is crucial for correctly understanding and identifying its movements, because these apply and spread across individual cohorts. In studying this perspective the paper looks at the development of final fertility, final childlessness, the structure of women in terms of numbers of births and the probability of an increase in family size.

### 3. Discussion

#### 3.1 Certain external factors affecting fertility

Age structure is a reflection of past developments in the population and is also one of the most important factors affecting the future development of the population. Every change in the character of reproduction is reflected in the population's composition by age and sex. The dominant part of the age structure of the population in Subcarpathian Russia in the second half of the nineteenth century and at the start of the twentieth century was children under the age of 15 years. Their share of the population long remained stable within the band 40 % to 42 % and fell to around 38 % just before the First World War (Šprocha, Tišliar, 2009a: 38). The situation did not change greatly between the wars, with children making up more than 37 % of the population (Šprocha, Tišliar, 2009a: 38). Persons aged 50 years or over made up a little more than 12 % of the population. The very young age structure of the population in Subcarpathian Russia was also reflected in the average age, which was in the range 24 to 25 years (Šprocha, Tišliar, 2009a: 41). Comparison can be made using the aging index, which is based on the ratio of elderly persons to children. While this ratio gradually approached equilibrium in the demographically more developed countries, Subcarpathian Russia had just 30–35 elderly people for every 100 children (Šprocha, Tišliar, 2009a: 49).

The fertility of women in Subcarpathian Russia was long linked closely with life in marriage, because less than 10% of the total number of births were to unmarried women (Šprocha, Tišliar, 2009b: 93). This means that one of the most important factors affecting the reproduction of the population in Subcarpathian Russia was their marriage behaviour. In general terms marriage in Subcarpathian Russia reflected its position east of the Hajnal line with a high incidence of marriage and a very low average age of first marriage (especially for women). This can be seen in the census returns from the late nineteenth century and the early twentieth century, when women's *singulate mean age at first marriage* was 21–22 years and the percentage of women who never married by the end of reproductive age was only 2–4 %. Very early and intensive entry into marriage is reflected in the numbers of single women in younger age groups. For example, the census returns for 1900 and 1910 show that around 70 % of all women had been married at least once by the age of 25 years.

Foreign migration had a negative effect on reproduction. Subcarpathian Russia was long a territory with a high rate of emigration. As this emigration was mainly economically motivated, it chiefly affected persons in productive and reproductive age and had both direct effects (decrease of the population) and indirect effects (long separations, unbalanced numbers of women and men). The scale of this emigration can only be estimated. During the nineteenth century and the early years of the twentieth century before the First World War, the decrease in population due to emigration was around 3–5 % per decade. Even more of the population of Subcarpathian Russia was lost due to migration in the years 1910–1921. This was caused both directly by military operations in the first two years of the First World War and post-war developments when the territory was attached to Czechoslovakia after the break-up of the Kingdom of Hungary. Many Hungarian families, especially those who had been part of the state administration, relocated to territory still ruled from Budapest. Between the wars, foreign migration had a smaller impact on the development of the population because the main countries of immigration, especially the USA, imposed more restrictive migration policies.

A high death rate also had a negative effect on reproduction. At the turn of the nineteenth and twentieth centuries the death rate fell permanently below 30 deaths per 1,000 persons and with the exception of the war years and the immediate post-war period it continued to decrease. Even so, life expectancy at birth was very low. Only in the interwar period did it rise above 40 years (Šprocha, Tišliar, 2009b: 153–154). The main cause of this low life expectancy was high child and infant mortality (Šprocha, Tišliar, 2009b: 132), but people faced poor survival prospects even in reproductive age (Šprocha, Tišliar 2009b: 158). As a result, more than 10% of women aged 30–39 years were widows in the second half of the nineteenth century, while in the 40–49 age group more than a quarter of women had been widowed. In the first half of the twentieth century, there was a certain reduction in widowhood but even so, the death of a husband cut into the reproductive period of a not insignificant number of women and reduced their total number of children.

The social and economic characteristics of the population that are most frequently cited as influences on reproduction are economic activity, education (literacy) and the national and religious structure of the population.

Literacy was for a long time very poor in Subcarpathian Russia although it did show some gradual improvement over time. In 1880 just under 20 % of the population aged 6 years or over was able to read and write. By 1900 the proportion had risen to a third and on the eve of the First World War, 40 % of people were literate. Improvement accelerated between the wars and in 1930 nearly three quarters of people over six years of age were able to read (Šprocha, Tišliar, 2009a: 74). It should also be noted that women tended to lag behind men in literacy in Subcarpathian Russia. The first Czechoslovak census in 1921 found that more than 55 % of women could not read or write but only 45 % of men aged 6 years or more were illiterate. By 1930 just under a third of women and a fifth of men were illiterate (Šprocha, Tišliar, 2009a: 76).

In economic terms Subcarpathian Russia was one of the least developed parts of the Kingdom of Hungary and interwar Czechoslovakia. Agriculture remained the main source of livelihood for a long time, with two thirds of the population being dependent on growing crops or keeping animals (Šprocha, Tišliar,

2009a: 132; Tvrdoňová, 2016; Janto, 2016: 95-98). What little industry or trades there were could not provide jobs for people and over-employment in agriculture was usually resolved by emigration to seek work outside the region. Another complicating factor were feudal obligations to provide work, produce and money to the church ("*kobliny and rokoviny*"), which remained in force until 1920 (Švorc, 2007: 102). The development of industry was stifled by a shortage of capital and poor transport infrastructure. Women's engagement in work was typically limited to auxiliary work in the household. Only a tenth of women were directly economically active (Šprocha, Tišliar, 2009b: 78). These phenomena – high dependence on the primary sector and very low economic activity of women were important factors influencing the overall high level of fertility (Šprocha, Tišliar, 2015: 653).

Religious belief has long been seen as one of the most important and most consistent factors affecting fertility schedules (Andorka, 1982: 298). It has been found that in general persons belonging to the Catholic churches (Roman Catholics, Greek Catholics) were more fertile than persons belonging to the Protestant denominations (Lehrer, 2004; Zhang, 2008). In the other direction, Jews are seen as forerunners of the transformation in fertility (Livi-Bacci, 1986). In the second half of the nineteenth century and the first half of the twentieth century, the dominant religion in Subcarpathian Russia was Greek Catholicism (50–65 %). Their proportion tended to fall in favour of the Orthodox Church, but both churches tended to support high fertility of women. The proportion of Protestants was in decline. For a long time, Jews were the second most numerous religious community in Subcarpathian Russia. It must be noted that these were Orthodox Jews who were characterised by high fertility and large families unlike Neolog Judaism and other branches of Judaism typical for Western Europe (Mendelsohn, 1983: 6-7).

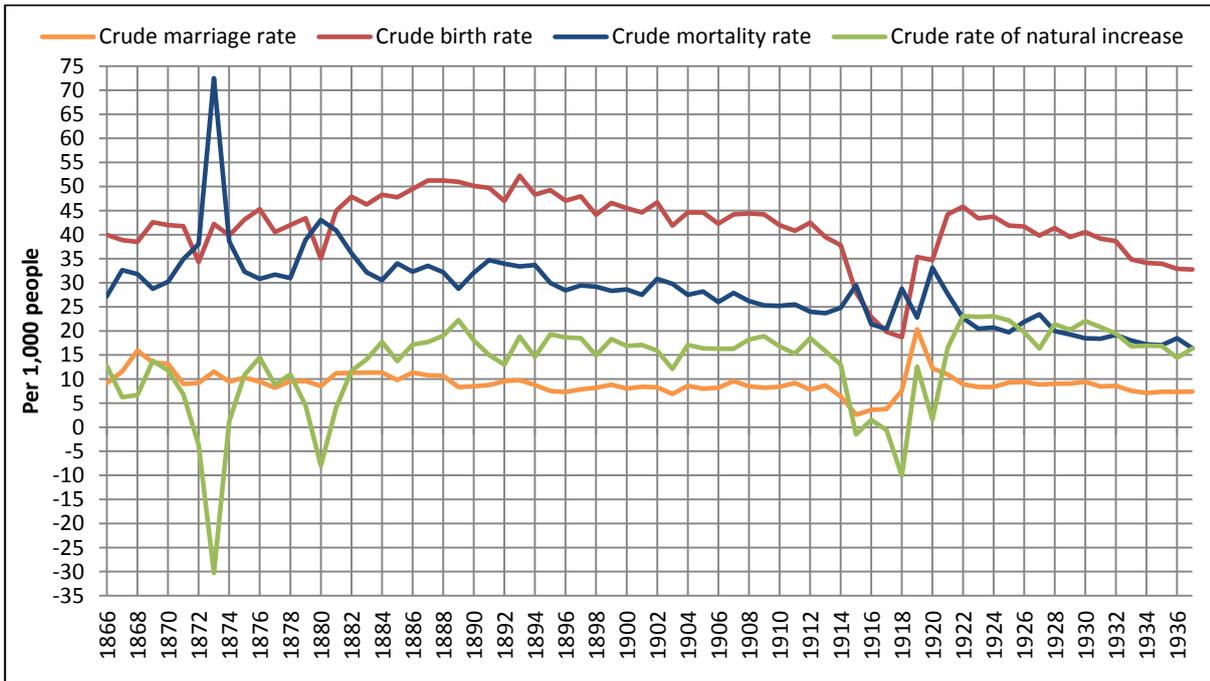
Until the break-up of the Austro-Hungarian Empire, the main population group was Russians/Rusyns (56–62 %) followed by persons who declared Hungarian as their native language (25–30 %). After the establishment of independent Czechoslovakia, the proportion of Hungarians declined sharply both because of a change in the method of reporting nationalities and the emigration of Hungarian families. A change that probably played an important role in changing reproductive behaviour was the arrival of Czech civil servants and other professionals. During the interwar period the transformation of fertility was gradually completed (Fialová et al., 1991).

## 4. Results

### 4.1 Overall character of reproduction in Subcarpathian Russia

For most of the nineteenth century, reproduction in Subcarpathian Russia was highly extensive. This is reflected in the crude birth and death rates for the period, both of which were high. In the 1870s and 1880s there was a cholera epidemic that caused a sharp rise in mortality and overall decreases in the population. The difference between the number of births and deaths per thousand inhabitants representing the natural increase in population tended to be very low. Two fundamental changes can be observed from the 1880s. On the one hand there is a slow decrease in the crude death rate to below 25 per thousand reflecting an overall improvement in all areas of mortality but especially in infant and child mortality. At the same time, there is a gradual increase in the birth rate. It went up from around 40 per thousand to nearly 50 per thousand. In the second half of the 1890s the crude birth rate began a continuous decline and on the eve of the First World War it was back at 40 per thousand. Subsequent developments were strongly affected by the military conflict. The first two years saw a dramatic decrease due to several related events. The first was the recruitment of many young men into the army, which separated them from their partners and reduced their chances to conceive a child. There was also a sharp decrease in marriages. This was caused both by the absence of many potential bridegrooms and the delay of marriage until a better time. It must also be borne in mind that in the winter of the first year of the war the front line of the conflict was in the Eastern Carpathians and worsened the overall population climate. The crude marriage rate fell from its stable pre-war level of 9–10 per thousand to just under 3 per thousand in 1915 and the crude birth rate fell from just over 40 per thousand to below 30 per thousand. The negative effect of the war continued to affect the population of Subcarpathian Russia and the decreases continued, reaching their minimum, just under 19 per thousand, in 1918. There was a certain increase in the death rate to nearly 30 per thousand in the second and last year of the war, a major cause of which was the epidemic of Spanish flu.

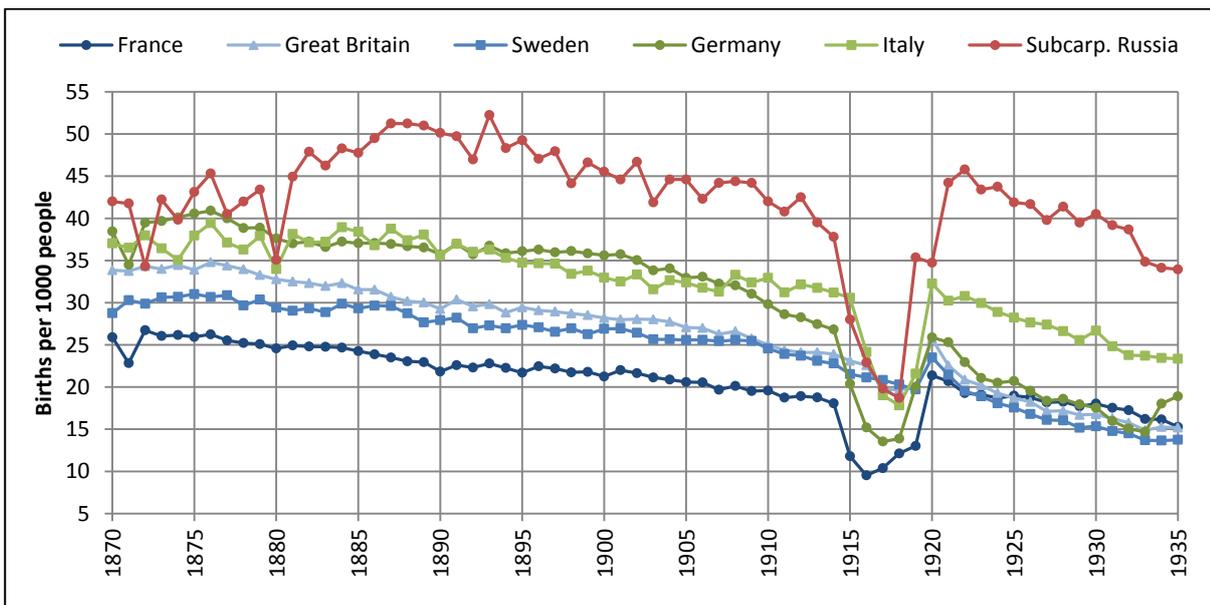
In 1919 there was a dramatic increase in the crude marriage rate, reaching 20 per thousand inhabitants. The next two years had lower rates but the number of marriages remained above average. The post-war compensation phase saw a significantly higher intensity of marriages including both the delayed marriages of the previously unmarried and the remarriage of persons who had lost their partner. The sharp rise in marriages was closely followed by an increase in the birth rate. The peak years were 1921 and 1922, when 44-46 children were born per thousand people. The crude birth rate remained above 40 per thousand until the second half of the 1920s. This shows that the positive effect of the compensation phase gradually expired and population growth gradually returned to pre-war levels. These included a gradual downward trend in the intensity of births. At the start of the 1930s the threshold of 40 per thousand was definitively broken and the fall in the birth rate was probably accelerated by the effects of the Great Depression in the first half of the 1930s, when the birth rate fell from 39 per thousand in 1932 to below 35 per thousand in 1933. At the end of the studied period in 1937, the crude birth rate had fallen further, to 33 per thousand.



**Fig. 1.** Long-term development of crude marriage rate, crude birth rate, crude mortality rate and crude rate of natural increase in Subcarpathian Russia

There was also a gradual decrease in the crude death rate. During the post-war compensation phase, there was a slight worsening because of the increased infant mortality when a very large number of children were born, but subsequently the crude death rate decreased again, stabilising below 20 per thousand in the second half of the 1920s and declining even further to 16 per thousand in 1937.

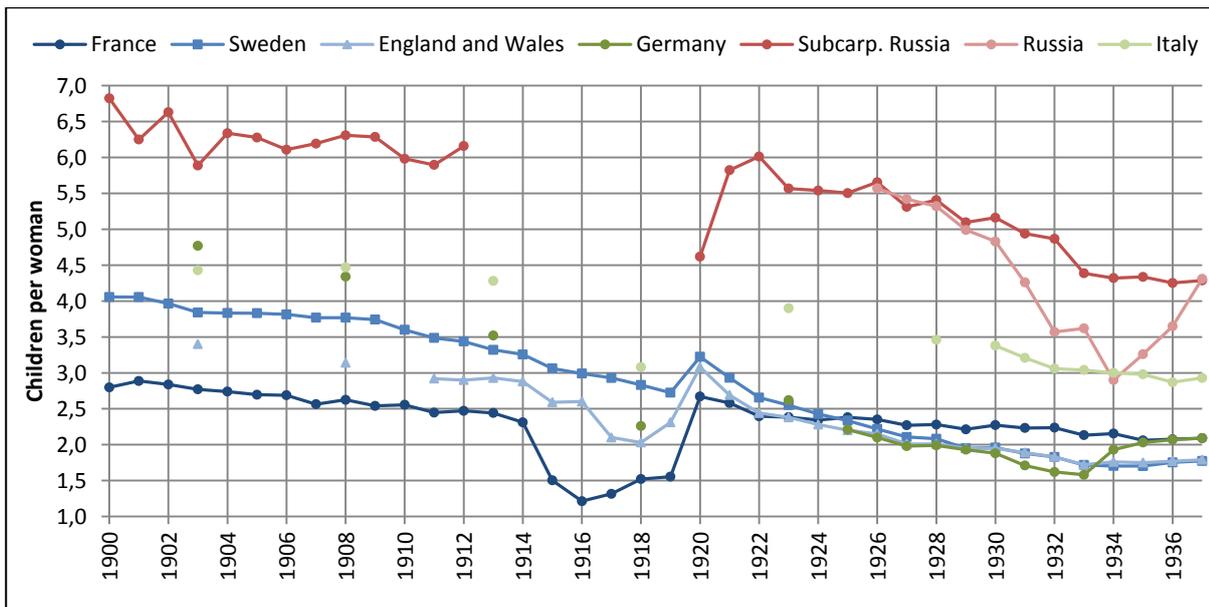
Changes in the crude birth rate over a longer period can serve as a rough outline for the start and end of the transformation of reproduction in the first demographic transition. For example, Pavlík (Pavlík, 1977: 169) defines the threshold at which one can safely talk about a transition in the fertility regime when the crude birth rate permanently falls below 35 per thousand persons. According to our data, this took place in Subcarpathian Russia in the 1930s. Under Chesnais's definition (Chesnais, 1992: 117), which sets the threshold at 30 births per thousand persons, the transformation of fertility could only be talked about with confidence after the Second World War. In any case, the first comparison with certain demographically advanced countries in Europe (Figure 2) shows that Subcarpathian Russia long had the highest intensity and the transition took place with a significant delay.



**Fig. 2.** Crude birth rate in Subcarpathian Russia and selected European countries.

#### 4.2 Cross-sectional analysis of women's fertility in Subcarpathian Russia

The high intensity of fertility of women in Subcarpathian Russia can also be demonstrated by the values of the total fertility rate, which indicates the number of children who would be born per woman if there were no change in the intensity and character of child bearing. As mentioned earlier, it is only possible to calculate this indicator for Subcarpathian Russia from the start of the twentieth century. In the pre-war years, the total fertility rate was in the range 6.0–6.5 children per woman with a slow falling trend. In France, where the transition in reproduction began, the average number of children was less than three. Sweden and England and Wales also had low total fertility rates. Figure 3 shows that these countries experienced a fairly rapid continuous decrease in the total fertility rate. The post-war compensation phase caused an increase in the total fertility rate in Subcarpathian Russia from just over 4.5 children per woman to around 6 children per woman. After the first half of the 1920s, Subcarpathian Russia began to show a continuous decreasing trend in fertility that accelerated between 1932 and 1933 as a result of the Great Depression. On the eve of the break-up of Czechoslovakia, the total fertility rate fell below a level of 4.5 children per woman. Most of the central and western European countries where the demographic transition was ongoing or had already culminated had a fertility rate of nearly 2 children per woman or even lower.



**Fig. 3.** Total fertility rate in Subcarpathian Russia and selected European countries.

A more detailed analysis of the age-specific fertility rate indicates that the cause of the significantly higher number of children per woman in Subcarpathian Russia was that in every age group of women, the women from Subcarpathian Russia had higher fertility than women in selected countries of northern and western Europe (Figure 4). The largest differences were for ages above 30 years, which is an indirect signal of a more frequent preference for larger families and the resulting birth of a larger number of children. On the other hand, it is also evidence of a later start in the deliberate limiting of fertility, which is one of the main indicators of internal changes in the character of reproductive behaviour in the demographic revolution.

After the end of the compensation phase in the first half of the 1920s, some age groups show a relatively large decrease in fertility. The main age groups affected are 20–24 years and 25–29 years. They were gradually joined by the 35–39 years age group and, from around the start of the 1930s, also the 30–34 years age group. For essentially the whole of the period between the wars, the age group with the highest fertility was the 25–29 years age group, followed at a certain distance by the 30–34 years age group. From the start of the 1930s (and also during the compensation phase) the fertility of the 20–24 years and the 30–34 years age groups were equal. The oldest and youngest age groups made the smallest contribution to the total fertility rate. There were some changes in the intensity of fertility between the wars resulting in a decrease of fertility across the whole spectrum of reproductive age (with the exception of the youngest age group to some extent), there were no major changes in internal structure or the contributions of individual age groups to the total fertility rate. The long-term situation was that the largest contribution to the total fertility rate came from women aged 25–29 years, making up around a quarter. The 30–34 and 20–24 years age groups made up together over 40 % and the 35–39 years age group around 16–18 %. The youngest age group under 20 years contributed less than 5 % and women aged 40 years and over contributed around a tenth.

Changes in the level of fertility by age concealed changes in the intensity of order-specific fertility. The largest falls related to the fourth child birth rate (-29 %) and even more so to the third child birth rate (-35 %). The smallest decrease was in the first child birth rate and the fifth and higher order birth rate.

The statistics indicate there were some women in Subcarpathian Russia who were making a deliberate effort to limit their fertility and their family size and increasingly trying to limit themselves to two or three children. On the other hand, there are also indications of a relatively large group of women having five or more children, who continued to make a large contribution to overall fertility in interwar Subcarpathian Russia (accounting for more than a third of the total fertility rate).

It would be reasonable to look for an explanation of this phenomenon in the way it is supposed that the demographic revolution spread. By analogy with other European populations, it is known that the transition does not take place in the whole population at once but proceeds gradually through different ethnic and social layers; it proceeds differently in the town and in the countryside, and in different regions, from which it then spreads to other areas and social groups (Pavlik et al., 1986: 527). It is likely that in the territory of Subcarpathian Russia, a group of women began the deliberate limiting of their family size at the start of the interwar period (or earlier) and therefore they had fewer fifth or higher order children, and also fewer third and fourth children. At the same time, there was still a large number of women who had five or more children during their reproductive period.

An interesting item of related information is the development of the interbirth intervals. These represent the period between the birth of one child and the following one. If these intervals grow longer, it indicates an attempt to defer the birth of another child or the existence of obstacles affecting the timing of further births. If habits such as the length of breastfeeding do not change and in the presence of a natural fertility regime without deliberate efforts to limit fertility, the length of the interbirth intervals mainly reflect the biological capability of a couple to conceive, carry to term and give birth to a live child. This capability declines with age and biological order causing interbirth intervals to grow longer. This reflects natural conditions rather than efforts to control the birth of a subsequent child. The data analysis for this paper showed that between 1925 and 1937 there was a certain extension of the interbirth interval with the largest change being between third and fourth children, which was also the category with the largest fall in the intensity of fertility. On the other hand, these changes were significantly slower than they were in, for example, Slovakia, which only confirms how far Subcarpathian Russia lagged behind in the transformation of fertility schedules.

Another important and frequently used characteristic of the timing of fertility is average age at birth of first child. The reduction in fertility and the lower concentration of births at higher age was reflected in a fall in the average age of women at the birth of a child from nearly 31 years to around 30 years. The average age of women at the birth of the first child in Subcarpathian Russia can be determined only from 1925. From a development perspective, it appears that there was no significant change in the age at which women first became mothers. The close link between reproduction and married life influenced the values for average age at the birth of a first child. Because women in Subcarpathian Russia entered into their first marriage very early, they also become mothers at an early age.

The findings of the present research on children's legitimacy confirmed that marriage was a very important milestone in life for the achievement of reproductive aims. From the viewpoint of social standards enforced by the church and local customs, marriage was the ideal space for couples to live together and produce children in a socially accepted environment. The importance of marriage for reproduction in the view of the population of Subcarpathian Russia is indirectly documented by the percentage of children born to unmarried women. Although this increased gradually throughout the studied period, even at its end in the late 1930s it was barely greater than 10%. The presence of a certain part of the population who had sex outside marriage is indicated by information on "premarital" conceptions. These are cases where married women give birth less than eight months after their wedding. This means that the children were conceived before the parents got married. They make up around 9-13% of all births in Subcarpathian Russia in the first half of the twentieth century. The limited data suggests that there was a slight growth trend, as in the case of children born to unmarried mothers.

#### **4.3 Coale's indices and the Coale-Trussell model of fertility**

Coale's indices and the Coale-Trussell model were used to identify the start of deliberate fertility control in the demographic transition and the dynamic of its spreading in the population of Subcarpathian Russia. The available data provide a time series for the Coale indices covering the years 1890, 1900, 1910, 1921 and 1930 and indicators for the Coale-Trussell model of fertility for the years 1900, 1910, 1921 and 1930. The most important value documenting the transformation of fertility is the level of the marital fertility index. E. van de Walle has demonstrated that researchers can safely speak of a decrease in fertility resulting from deliberate fertility control using contraceptive methods if the marital fertility index falls permanently below 0.5 (van de Walle, 1974). If the index is around the level 0.6, fertility control is only likely. The lower threshold, when the transition in fertility is completed, is 0.35. (Coale, Treadway, 1986: 37) proposed an alternative way to characterise the start of the demographic revolution. It is a period when marital fertility falls permanently and irreversibly from its previous stable value by 10% or more.

As Table 1 shows, the marital fertility index at the end of the nineteenth century was not only stable at around 60 % of the fertility of Hutterite women, but was also showing some signs of increasing. This finding corresponds to developments in the crude birth rate, which rose to a peak in the 1880s and 1890s. Although there was a small decrease in the marital fertility index in the years before the First World War, it remained

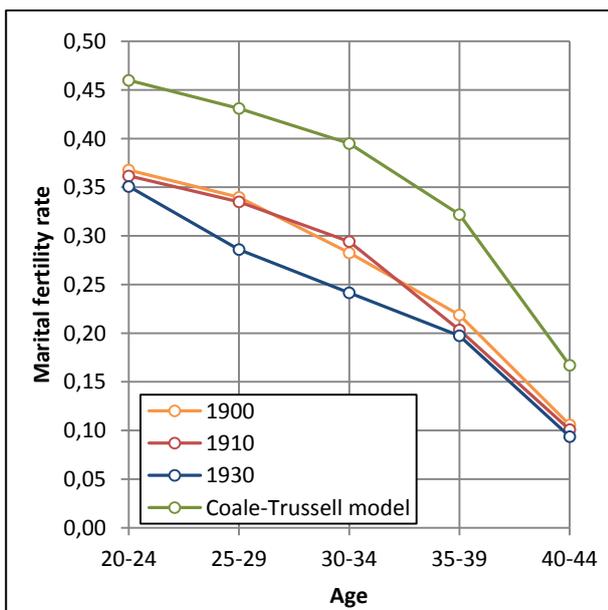
well above 60 % and the decrease was less than 10%, which is often cited as critical for determining the timing of the onset of deliberate changes in fertility schedules (Coale and Treadway, 1986: 37).

During the post-war compensation phase, the fertility rate increased and the marital fertility index came close to 65 %. It then decreased and some of the changes mentioned above in the character and intensity of fertility in Subcarpathian Russia began to have an effect at the start of the 1930s. The marital fertility index fell significantly below the 60% threshold and achieved the criterion of a 10 % fall mentioned above. It can thus be said that the fertility transformation process began in this region in the period between the wars, which is significantly later than in the most demographically advanced countries of Europe.

**Table 1.** Coale indexes in Subcarpathian Russia

Year	Coale indexes			
	Ig	Ih	If	Im
1890	0,60	0,21	0,50	0,75
1900	0,64	0,15	0,49	0,70
1910	0,63	0,14	0,46	0,66
1921	0,65	0,07	0,42	0,61
1930	0,57	0,10	0,39	0,63

The Coale-Trussell model represents another method for the indirect determination of the extent of deliberate control of family size. For the purposes of the present paper, deliberate control of means a couple's deliberate decision to end further reproduction, the main motive for which is the number of children already born and the wish not to have more. The model is based on the assumption that this decision is reflected in the development of the age-specific fertility rate of females. The intensity of marital fertility will decrease more rapidly with increasing age when couples prevent the birth of an additional child. As is clear from Figure 4 and Table 2 showing the value of small "m" in the Coale-Trussell model for the population of Subcarpathian Russia, there is no indication of any change in reproductive behaviour in either the development of the fertility rate or the empirical expression of the level of fertility control at the start of the twentieth century or before the First World War. It is only at the start of the 1930s that there are signs of a change in the marital fertility curve between the ages of 25 and 34 indicating that the value of small "m" has reached the level 0.3. However, even in this period older age groups do not show a major change and the overall value of small "m" is still only approaching the level of 0.3 that can be considered the start of a transformation. It would appear that the figures from the start of the 1930s capture the initial phase of the process, in which younger generations of women are taking their first steps towards deliberate fertility control while the phenomenon is not yet visible in higher age groups and the older generation.



**Fig. 4.** Age-specific marital fertility rate in Subcarpathian Russia and the Coale-Trussell model

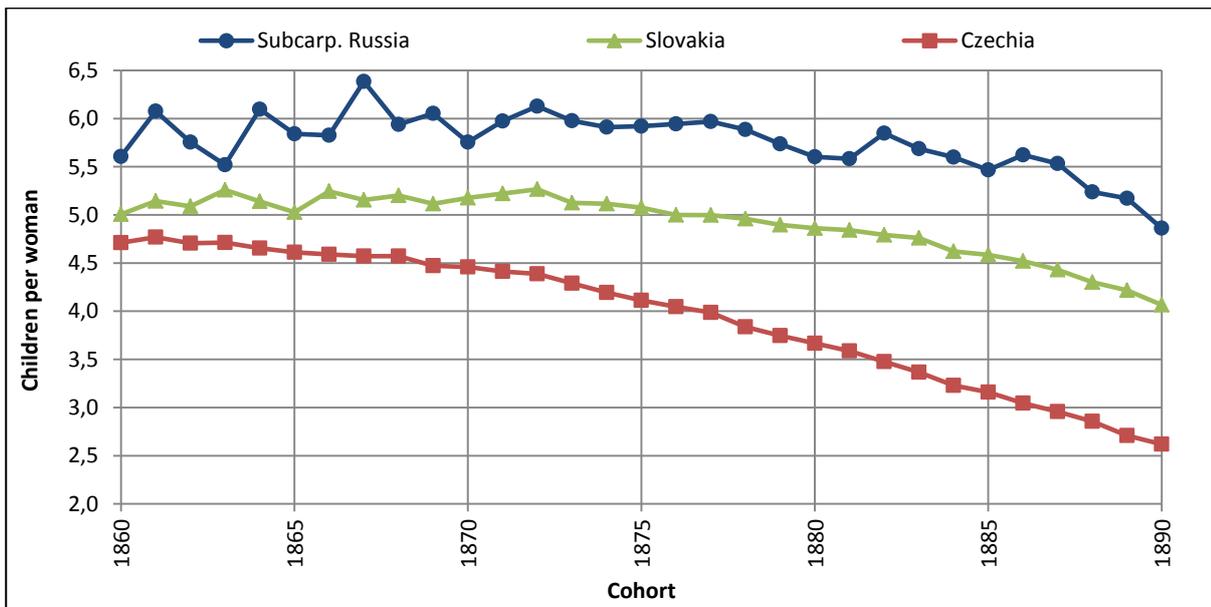
**Table 2.** Small “m” in the Coale-Trussell model in Subcarpathian Russia

Year	"m"	Age group			
		25–29	30–34	35–39	40–44
1900	0,17	0,10	0,19	0,17	0,17
1910	0,21	0,15	0,13	0,24	0,21
1921	0,14	0,02	0,21	0,10	0,14
1930	0,27	0,33	0,29	0,16	0,18

**4.4 Longitudinal analysis of fertility**

Total fertility, as the main generational indicator, is concerned with the actual outcome of reproduction in the sense of the actual average number of children born per woman. Generational indicators are much more stable than cross-sectional indicators and they change only in response to long-term significant changes in reproductive behaviour.

The average number of children born per woman in Subcarpathian Russia in the generations between the 1860s and 1880s was stabilised at around 5.5 children. It is only in the generations coming after the 1880s that it is possible to see a slow decrease in total fertility. Comparison with the other parts of interwar Czechoslovakia confirmed the hypothesis that Subcarpathian Russia lagged behind both in the onset and the extent of the changes in the character and intensity of fertility. This situation is well illustrated by a comparison with Bohemia, where the transition in fertility can be detected in women born in the 1870s. While the total fertility of women born in Subcarpathian Russia in the first half of the 1860s was higher by “only” 1.0–1.5 children, for women born in 1890 the difference was more than 2.2 children per woman.



**Fig. 5.** Completed cohort fertility rate in Subcarpathian Russia, Slovakia and Czechia for women born in 1860–1890

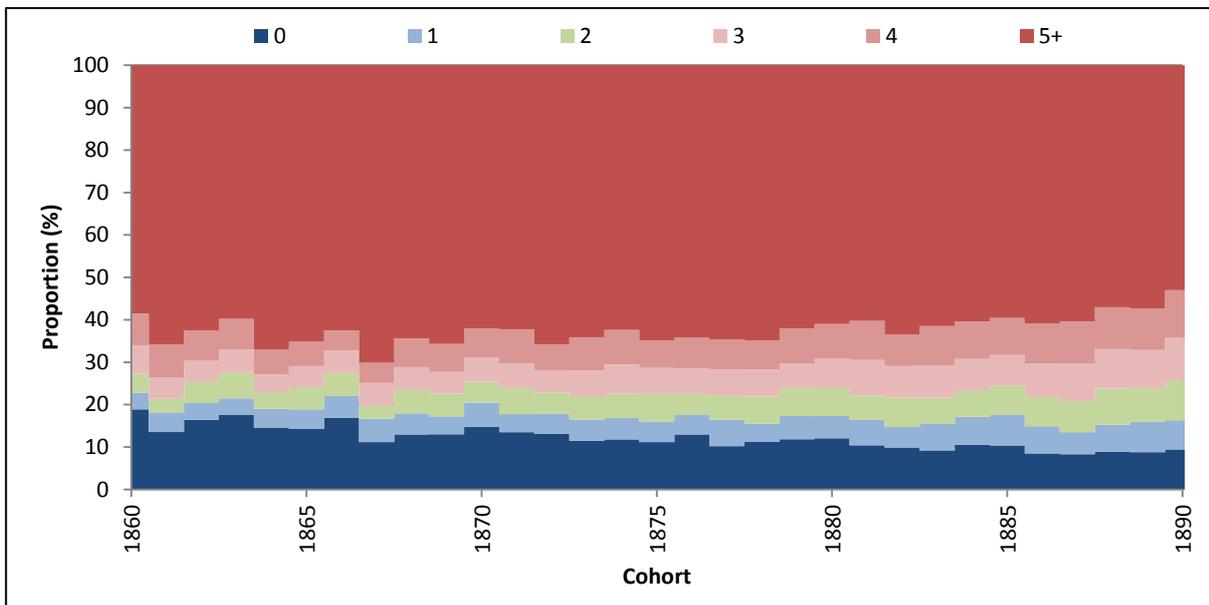
Significant differences in cohort fertility persisted in younger generations. This suggests that the significantly higher average number of children born per woman in Subcarpathian Russia formed at an earlier age. For example, at age 26 years the difference was already equal to around one child on average. At age 30, the difference was nearly 1.6 children per woman.

It is interesting that Subcarpathian Russia entered the demographic transition with a higher level of total fertility than the other regions of interwar Czechoslovakia. The explanation of these differences is complicated. Important factors could include the younger average age at first marriage of women in Subcarpathian Russia and also the higher percentage of women who got married at least once.

Cohort fertility is measured by the average number of children born. It is the product of various models of reproduction that produce a varied structure of women based on the number of children born. In the old demographic schedule, the number was not limited to any significant extent by the number of children born previously (Henry, 1961, 1964) but as the fertility transition took effect, couple’s conscious control of family size became more important. The changes in the values for total fertility cover changes in the internal structure of women by number of births. In general, fertility control can be seen in terms of women trying to avoid maternity and parenthood entirely, which would lead to a rise in childlessness and a

greater proportion of childless women, or an attempt to limit fertility to a number of children perceived to be optimal. The transformation of fertility in the demographic transition mainly involves women's deliberate control of the size of their family and therefore these changes should be reflected in an intergenerational decrease in the proportion of women with a larger number of children towards a three-child model of the family.

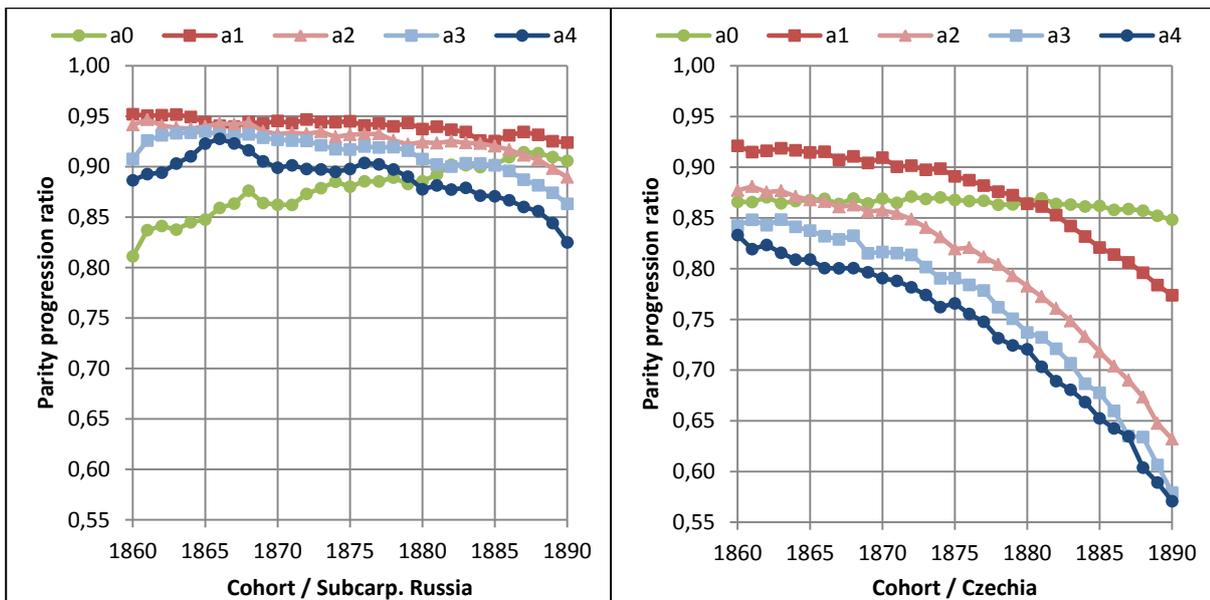
The data from the 1930 census actually suggest that there had been a decrease in the rate of childlessness for women in Subcarpathian Russia. While the rate of childlessness for women born in the 1860s was in some cases as high as 15 %, it was in the range 8-10% for women born in the 1880s. At this point it must be emphasised that the results for older generations could have been influenced by a selection effect because childless women tend to live longer and this cohort were aged 60-70 years when the data was collected for the 1930 census (Šprocha et al., 2017). Even so, it is clear that the changes in total fertility referred to above cannot be the result of significant changes in childlessness. Figure 7 shows the changes in the numbers of women having different numbers of children from the cohorts born in the second half of the 1880s. The proportion of women having five or more children decreased to below 60% and there was a corresponding increase in the proportions of women having four, three and to some extent also two children. These findings also support the view that the transformation of fertility in Subcarpathian Russia was still only beginning during the interwar period and especially just after the First World War.



**Fig. 7.** Parity structure of women in Subcarpathian Russia born in 1860–1890

When a population did not make a deliberate effort to control family size, the probability of the birth of another child was mainly dependent on the biological ability of a couple to conceive, carry to term and give birth to a live child. This meant that the chance of higher order children was relatively strong and the difference between the probability of the birth of a second or third child was significantly smaller than it would be in a population where couples deliberately tried to limit their family size with a desired number of children.

Women born in Subcarpathian Russia in the 1860s and 1870s showed a clear high probability of having larger numbers of children and this probability changed very little between generations. On the other hand a stable decrease can be detected in the children fifth in order (a4) starting approximately with the generations born at the start of the 1880s. This decrease can also be detected for the fourth child starting from the generations born in the mid-1880s. A possible conclusion is that the irreversible change in the fertility schedule began with the women born in the second half of the 1880s but that it began in a very limited scope. This is supported by comparisons with the probabilities of larger families in the same generations of women living in Bohemia.



Note: a0 – the probability of the birth of the first child for the childless woman, a1 – the probability of giving birth to another child for a woman with 1 child etc.

**Fig. 8 and 9.** Parity progression ratio, Subcarpathian Russia and Czechia, cohort 1860–1890

There was also an interesting development in the probability of birth of a first child. In essentially all the studied generations, women in Subcarpathian Russia had a lower chance of starting maternity and parenthood than of having a second child, and in older generations also a third or higher order child. On the one hand, this may again be a distortion resulting from the numbers in the studied population, especially mortality selection, because women who have not given birth are more likely to live to a higher age. On the other hand, it can also be a typical characteristic of a population that has not yet adopted widespread deliberate family size control.

There is a logical explanation for this apparent paradox. In every population there are some women who are unable to have children whether for biological or other reasons. Furthermore, it must be noted that the cause of infertility need not be on the woman's side; infertility affects a couple, even though historically problems tended to be blamed on women. If a population does not control the fertility of women who have already once become mothers (and therefore successfully "tested" their fertility and the fertility of their partner), there is a greater chance of a second child being born than that a woman will be childless, because the group already excludes persons or couples who cannot have a child.

The probability of birth of a first child showed a relatively fast increase between generations and women who were born in the second half of the 1880s had approximately the same chance of having a first child as women with one child had of having a second child.

## 5. Conclusion

Reproductive behaviour in Subcarpathian Russia in the second half of the nineteenth century and the beginning of the twentieth century differed significantly from other countries. The analysis in the present paper has shown that in the 1870s and at the start of the 1880s, there was very little difference between the birth and death rates although both were relatively high, which demonstrates the extensive character of overall reproduction. Mortality in this period was also negatively influenced by a cholera epidemic. A very important factor demographic behaviour and high fertility resulted from the way in which the population got married. The findings reported herein show that Subcarpathian Russia was a region with "non-European" marriage behaviour characterised by a high intensity of inputs to marriage with very women remaining permanently single and marriage taking place at a very young age. In the second half of the 1880s the established reproduction model gradually began to change. While mortality shows a continuous decline, the birth rate increased to almost 50 per thousand. The outcome was faster population growth. At the turn of the nineteenth and twentieth centuries the birth rate also began to decrease. The transition that had just begun was interrupted by the First World War. As in other European countries, there was steep drop in the number of marriages and births and an increase in the death rate in Subcarpathian Russia. The post-war compensation phase was the last short period of revival of the birth rate and fertility in Subcarpathian Russia. When it ended in the 1920s the pre-war trend returned and the birth rate began to decrease again. This trend was accelerated by the poor conditions created by the Great Depression at the start of the 1930s.

A more detailed analysis of the onset and spread of the changes in the fertility schedule showed that change only became evident in Subcarpathian Russia after the First World War and they were first taken up by women born in the last years of the nineteenth century. The later onset of the demographic transition is

one of the main factors affecting the character of reproductive behaviour and the differences compared to countries in northern and Western Europe.

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УДК 93

### Фертильность женщин в Закарпатской Руси во второй половине XIX – первой половины XX веков

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**Аннотация.** Во второй половине XIX века большинство стран Западной и Северной Европы претерпели трансформации в репродуктивном поведении населения. Большинство стран Центральной и Восточной Европы пережили эту тенденцию позднее как в количественном, так и в качественном отношении. Кроме того, эта трансформация не повлияла на всю страну целиком, но оказала свое воздействие на социальную и пространственную дифференциацию. Одним из самых интересных регионов для изучения этого явления является Закарпатская Русь, которая была включена в Чехословакию после Первой мировой войны. Это был наименее развитый регион страны во всех отношениях, с открытой периферийной позицией без подключения к основным сетям развития. На другом конце страны Богемия была одной из самых развитых областей в Европе, и демографическая трансформация началась примерно в то же время, что и в других развитых странах.

В работе представлен детальный анализ репродуктивного поведения населения в Закарпатской Руси со второй половины XIX века до середины 1930-х годов. Результаты исследований используются для определения основных характеристик графика рождаемости и его изменений в контексте роста и распространения демографического перехода как в перекрестных, так и в когортных перспективах. Интенсивность и характер репродуктивного поведения в Закарпатской Руси также сравнивается с европейской обстановкой. С этой целью авторы представили индексы Коула, показатели для модели рождаемости Coale-Trussell и когортные соотношения коэффициентов прогрессирования.

**Ключевые слова:** Закарпатская Русь, рождаемость, женщины.

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