

Late motherhood and spatial aspects of late fertility in Slovakia

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Abstract

Shifting childbearing to later reproductive ages is reflected in all European populations. Late motherhood also changes, from the point of view of parity structure, since nowadays, the beginning of reproductive pathways is increasingly realised at the age of 35 and over more often. The regional dimension of this phenomenon is significantly overlooked, however. The main aim of this paper is to explore how the level and the impact of late motherhood has changed from a spatial perspective. We use Slovakia as a case study population characterised until the end of the 1980s by an early beginning of reproduction and its concentration in the first half of the reproductive period, and by relatively significant socio-economic, cultural and demographic differences. At the same time, we point out the changes in late motherhood in terms of parity structure. Finally, through linear regression models, we try to identify which of the selected factors may condition the differences in share of late fertility and the significance of first births at advanced reproductive ages.

Key words: late fertility, parity structure, late motherhood factors, districts, Slovakia

Article history: Received 20 October 2021, Accepted 24 April 2022, Published 30 June 2022

1. Introduction

Significant and dynamic transformational changes in reproductive behaviour have been displayed in Slovakia in the last three decades. One of the main impacts of the new social, political, economic and cultural conditions is the rapid abandonment of the early concentrated model of fertility, almost universal and within a narrow age-range. As several recent works (Beaujouan, 2020; Beaujouan and Sobotka, 2019; Sobotka and Beaujuoan, 2018) show, late motherhood and parenthood represent one of the important aspects of massive family transformation and reproduction in all developed countries. In this context, Prioux (2005) and Kohler et al. (2002) add that never in history have women in Europe been, on average, becoming mothers so late. At the same time, however, attention needs to be paid to the changing structural patterns of late motherhood in all developed countries.

Whereas in the past, it was mainly the period to complete the size of the family and thus children of higher birth order were born in the advanced reproductive age, the current changes caused the reproductive path of women

only to begin in this age range (Prioux, 2005; Beaujouan and Sobotka, 2017, 2019). Broad attention is given to the late motherhood and overall reproductive ageing in the European area on the national level (e.g. Beaujouan and Sobotka, 2017, 2019; Billari et al., 2007; Prioux, 2005), but regionally these changes are analysed only exceptionally. Slovakia is no outlier in this respect; some partial studies (Potančoková et al., 2008; Šprocha and Bačík, 2020) even indicate an increase in the intensity of fertility in women of advanced reproductive age and its impact on overall fertility. Studies focusing directly on the issue of late motherhood and its development in the transformation period at the subnational level are absent. In this context, one should be aware that Slovakia represents an example of a small country in terms of population and size, but with significant regional socio-economic, cultural and demographic differences (Bleha et al., 2014).

The main aim of this paper, therefore, is to determine whether significant differences exist in terms of late motherhood. Another goal is to show if their spatial representation may have changed from the beginning of the

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transformation period to the present, and which of several possible factors determine any differences. In this context, we try to identify the relationships and possible impact between selected socio-economic, cultural and demographic characteristics of regions and their populations, with the share of late fertility and its composition according to birth order (parity).

At the same time, however, it must be said that the definition of late motherhood is not so clear. For example, Moguérrou et al. (2011) state that the age at which we can speak of a “late” mother or father is closely linked to a given period and country. Beaujouan (2020, p. 220) adds that the definition of late childbearing is subjective and embedded in the fertility levels and norms prevailing across time and space. Some older studies (e.g. Billari et al., 2007; Prioux, 2005) link late motherhood and an advanced reproductive age to 35 years and older. Recent studies (Beaujouan, 2020; Beaujouan and Sobotka, 2019; Sobotka and Beaujouan, 2018) work with a boundary at 40 years. Due to the later beginning of transformational changes in Slovakia, as well as the still very low current level of fertility in the last decade of the reproductive age (within the European area, see Šprocha and Bačík, 2020), the present study will work with the first-mentioned boundary of 35 years.

In addition, it is worth bearing in mind that this is not only a normative (Potančoková, 2009; Vidovičová and Gregorová, 2007) but also a biological boundary (Sobotka, 2010), beyond which the realisation of reproductive intentions is increasingly associated with several problems and with the growing risk of unsuccessful conception.

2. Theoretical background: Late fertility and its factors

The issue of late fertility has received much attention recently, but to date there is no specialised theory solely focusing on this phenomenon. In general, late fertility is based on theoretical frameworks anchoring the overall transformation of reproduction behaviours that has taken place in post-socialist countries since the early 1990s.

The first framework prioritises macro-structural change: the discontinuity in living conditions; the negative impact of factors associated with the transition from a centrally-managed to a market economy; and social anomie formation in post-socialist societies (Becker, 1981; Frejka, 2008). Especially in the initial phases of economic transformation, the uncertainty and discontinuity of living conditions may have brought about difficulties with the implementation of reproductive plans. With continuing economic transformation and the development of market mechanisms, some other structural factors (e.g. a tightening job market, a growing degree of labour market competition, new career opportunities, and rising direct and indirect costs of children) (Frejka, 2008) began to come to the fore, which may have contributed to the continuing increase in the intensity and share of late fertility.

A second theoretical framework is based on value and normative changes brought into society by the transformation period in post-socialist countries. The most comprehensive description of such changes is found in the theory of the second demographic transition (Lesthaeghe, 1995; van de Kaa, 1987). These changes are characterised primarily by the long-term transformation of values and life orientations towards individualism and self-expression, which have been supported by the emergence of new opportunities.

The main feature is a strong interest in self-realisation, freedom of choice, personal development and lifestyle, and emancipation – factors which are reflected in the concepts of family formation, attitudes towards fertility regulation, and motivations for parenthood (van de Kaa, 1997).

Especially relevant for countries of the former Eastern Bloc (Won Han and Brinton, 2022), are the issues of gender equality in paid and especially unpaid work, the possibilities of reconciling work and caring for the family and household, and the associated direct and indirect costs of lost opportunities, all strongly connected (McDonald, 2000).

Another important framework explaining the increase in intensity and late fertility is the postponement transition theory (Kohlet et al., 2002). As shown by Beaujouan (2020), late parenthood in recent decades has been linked mainly to the later onset of reproduction pathways. Several authors (e.g. Mills and Blossfeld, 2005; Adsera, 2004) indicate that the combination of an unstable position in the labour market, the threat of unemployment, insufficient salary evaluation and the need to work part-time, can all together create a milieu in young people where it is rational for them to strategically postpone fertility to a more appropriate period.

As Billari et al. (2007) and Beaujouan (2020) add, it is now socially acceptable and often economically necessary to start a family much later. This is subsequently reflected in a sharp rise in late first and second births, and in overall late fertility over recent decades (Beaujouan, 2020). Although the process of voluntary and planned postponement of the beginning of reproductive pathways may be an important factor in the increasing impact of late fertility, it may not be a decisive factor. Several analyses (Berrington, 2004; Šťastná et al., 2017, 2019; Slabá et al., 2021; Toulemon and Testa, 2005) confirm that postponed reproductive plans are often not implemented by women in terms of the number of children and the age at which they want to give birth (Slabá et al., 2021). In this sense, Šťastná et al. (2017, 2019) point to the aspect of unplanned postponement, which can be one of the important factors in the growing impact of late fertility.

Research into the factors leading to late fertility is also important in this regard; however, the analysis of regional factors that may be directly related to late motherhood has so far only received limited attention. Spatial differences in late fertility can be the result of the characteristics of certain regions as well as due to differences in some important structures of their populations (Duchêne et al., 2004). In general, some authors (de Beer and Deerenberg, 2007; Duchêne et al., 2004; Hank, 2001) have identified two main groups of regional characteristics that can be related to fertility. The first group comprises economic opportunities and constraints that create local living conditions. In line with Beaujoan (2020), the rise in unemployment and worsening economic security are important variables for late fertility. According to some studies (Gauthier and Hatzius, 1997; Kravdal, 2002), high unemployment and low wages create an unfavourable reproduction climate. In such an environment, it is difficult for individuals to make long-term decisions and it is thus possible to expect their postponement as a reaction to structural barriers of parenthood (Hašková, 2006). On the other hand, Friedman et al. (1994) show that for some groups of women with low cultural capital and having difficulty entering the formal labour market, an earlier start to reproductive careers may be one way to reduce their insecurity. Hank (2001) also ranks the occupational structure in the local labour market among important regional economic fertility factors.

Following de Beer and Deerenberg (2007), the second group of regional characteristics consists of cultural factors which can affect regional differences in late fertility through different attitudes towards families and children. Cultural differences at the regional level are often measured indirectly using selected determinants assumed to reflect the differences in norms, values, and attitudes towards fertility (de Beer and Deerenberg, 2007). Education is one of the most frequently applied indirect cultural factors. According to work by Toulemon (2005), late motherhood has become more common among more educated women. In the case of higher education, it is to be expected that not only the direct impact of longer studies will be present (e.g. Blossfeld and Huinink, 1991; Kravdal, 1994; Kravdal and Rindfuss, 2008) but that indirect effects would be the most prominent. It was among highly educated women that Berrington (2004) found a trend leading to the long-term postponement of family formation.

Religiosity is also one of the very common cultural factors. While some older research (Andorka, 1978) present it as one of the strongest and most consistent factors, some recent studies (Frejka and Westoff, 2008; Sobotka and Adigüzel, 2002; Zhang, 2008) point to a weakening of the religiosity effect and a reduction in differences between religions. De Beer and Deerenberg (2007) also included the degree of urbanisation among the important cultural factors of spatial differences in fertility. Norms and attitudes towards children and families can have a stronger impact in the rural environment, as social control and direct social impact play more important roles in those areas.

According to Kulu (2013) and Kulu and Vikat (2007), the lives of young people in urban areas (especially in the largest municipalities) are more expensive and time-consuming. Direct and indirect costs for the care of children are higher. Kulu (2013) adds that it is possible to identify the specific selective migration of people planning to start a family into the hinterland of large cities and smaller municipalities, generally, as they are more suitable for the care and upbringing of children. On the other hand, larger towns are more likely to be in demand by people who (thus far) do not have reproductive aspirations and who are trying to forge a career or find work.

As mentioned above, in addition to regional characteristics in spatial differences in late fertility, demographic variables may also have an effect. As stated by de Beer and Deerenberg (2007), the structure of the regional population affects fertility because fertility differs between subcategories of the population. In general, the influences of marital status and the presence of ethnic groups are the most frequently discussed in this regard.

The partnership situation and the marital status of women are also important factors for late fertility (Toulemon, 2005; Beaujoan, 2020). Several studies (Berrington, 2004; Szalma and Takács, 2012; Miettinen et al., 2015) have identified clear relationships between a lack of suitable partners, the postponement of marriage, celibacy, late fertility, and even childlessness. This interconnection is recognised in the European area even today (Miettinen et al., 2015). Toulemon (2005) has pointed out the growing prevalence of late motherhood among single women and among women living in other partnerships. Beaujoan (2020) has highlighted the importance of re-marriage (or re-partnering) in the growth of late fertility.

When analysing regional differences in the intensity and share of late fertility in Slovakia, it is not possible to ignore ethnic composition. In segregated Roma settlements, the

birth of higher-order children is more frequent (Šprocha and Bleha, 2018), which could affect the regional level and the share of late fertility.

From the factors of late fertility operating at the aggregate level, it is necessary to identify those that are individual in nature. Some research (Beaujoan, 2022) shows that a significant number of childless women still wish to become mothers at an advanced reproductive age and that their representation is growing. This indicates a certain individual change in attitudes towards late motherhood, and it implies a considerable strength of obstacles acting against motherhood at a younger age (more appropriate for the realisation of reproductive intentions) (Beaujoan, 2022). It is problematic at the individual level, however, to associate late fertility with the dominant planned postponement of parenthood until this age. In this sense, it is necessary to realise that reproduction is the result of sequential decision-making, where people repeatedly make decisions and re-evaluate them under the influence of new experiences and circumstances (Hašková et al., 2019).

It is also important to distinguish between groups of women who became mothers for the first time at an advanced reproductive age and to whom a second or third child was born. Their reproductive history can be very different, and the factors that influenced the birth of a given child can be specific. In the case of childless women who have become mothers aged 35 and over, this may be due to a long (and often re-evaluated) postponement in the context of the non-fulfilment of personal or a partner's common preconditions for motherhood (e.g. housing, work, and partner situation). Second and possibly higher-order children born at an advanced reproductive age may more often be the result of a planned family size with a certain shift (e.g. due to the later birth of the first child), or they may be the result of an unplanned conception. As confirmed by several studies (Slabá et al., 2021; Šťastná et al., 2017, 2019), the birth of the first and second child at an advanced reproductive age can also often be the result of an unplanned postponement. It turns out that the most important individual factors of late fertility can include the health status of the woman and partner (and especially age-related problems to getting pregnant), labour market problems, and overall material conditions, as well as the absence of a suitable partner (Šťastná et al., 2017, 2019). It can therefore be said that several of these individual factors are similar in nature to those identified at the aggregate level.

In terms of the above theoretical background and existing empirical knowledge, there can be an expectation for the persistence of significant spatial differences in the intensity of late fertility in Slovakia. The impact of late fertility on overall fertility also appears to have increased since the first half of the 1990s in virtually all districts. As significant transformational changes in terms of the parity structure of late fertility are confirmed at the national level (Šprocha and Fitalová, 2022), these are also expected at the regional level. Due to the effects of various regional specifics, however, it can be assumed that there has been some spatial diversification in the influence of individual parity groups.

3. Data and methods

The main data source is the anonymised primary database of the Statistical Office of the Slovak Republic (SO SR) from the annual comprehensive survey of the Population Council 2–12 Birth Report for the period 1992–2019.

It contains all collected data on children born and their mothers with permanent residence in Slovakia. Given the information on permanent residence, mother's age at birth and vitality, it was possible to classify all relevant demographic events (or their records) into individual regions of Slovakia. The objectives of the research as well as the population size of some districts indicated that we work with 5-year time intervals. The analysis looked more closely at the first period 1992–1996, which characterised the beginning of transformation processes. The second period of 2015–2019 represents the latest known situation. This enables us to identify not only development-related changes in the level and significance of fertility in the advanced reproductive period, but also possible shifts in regional differences. An important input for the calculation of selected fertility indicators was the database of the social structure of women by age and district of permanent residence. It is available from the primary balanced SO SR database for the years 1992–1995 and the SO SR DATACube online database for the years 1996–2019.

Indicators of fertility quanta in the form of age-specific fertility rates for all 79 districts of Slovakia were constructed for the observed 5-year periods (t):

$$f_x^{t,d} = \frac{N_x^{t,d}}{P_x^{t,d}}$$

where

- $f_x^{t,d}$ is the age-specific fertility rate of women of age (x) in period (t) in district (d);
- $N_x^{t,d}$ is the number of live births to women of age (x), in period (t) in district (d); and
- $P_x^{t,d}$ is the number of women aged (x), in period (t) in district (d).

From this we derived the cumulative fertility of women aged 35 and over:

$$f_{35+}^{t,d} = \sum_{x=35}^{49} \frac{N_x^{t,d}}{P_x^{t,d}}$$

as well as contributions to the total fertility rate:

$$pf_{35+}^{t,d} = \frac{f_{35+}^{t,d}}{TFR^{t,d}} \cdot 100 = \frac{\sum_{x=35}^{49} \frac{N_x^{t,d}}{P_x^{t,d}}}{\sum_{x=15}^{49} \frac{N_x^{t,d}}{P_x^{t,d}}} \cdot 100$$

where $TFR^{t,d}$ represents the total fertility rate in period (t) in district (d).

In the next analysis, we expanded the previous indicators to include the aspect of biological parity by constructing age-specific fertility rates of the first, second, third and further order. These rates were derived by analogy to achieve total fertility of women aged 35 and contributions of individual parity groups to total fertility in the advanced reproductive period. These enabled us to determine what changes in late motherhood have been realised in the Slovak districts in terms of the parity structure. In addition, based on the quartile position of the districts in terms of the contributions

of individual parity groups to total fertility in the advanced reproductive ages, a typology was developed for the period 2015–2019.

Multiple linear regression models were used to identify the factors that could account for the variations in the identified (current) regional differences. Two models were developed. The first model determines the fertility rates of women aged 35 and over from the total fertility in districts in 2015–2019. In the second model, the dependent variable was the share of the first birth rates from total fertility in advanced reproductive age. As independent (explanatory) variables, we use some indicators available at the district level from 2015–2019 (or from 2011: see Note 1). The source of data is the database of the Statistical Office of the Slovak Republic DATACube and data from the Ministry of Labour, Social Affairs and Family. If possible, we work directly with data for the population of women in childbearing age. In line with the previous theoretical background and the availability of data at a district level, we worked with three main groups of independent variables:

- Socio-economic indicators reflecting regional differences in opportunities and constraints: unemployment rate; the percentage of long-term unemployed; employment rate (women); average monthly nominal wage (women); average number of job seekers per 1 job offer; the percentage of recipients of benefits in material need over the age of 15; the percentage of employed women in the tertiary sector; and the percentage of women in management positions or as legislators;
- Cultural factors¹ indirectly reflect regional differences in norms, values and attitudes towards fertility: mean years of schooling (women); the percentage of women with basic education and without education; the percentage of women without religious affiliation; and the proportion of women who live in municipalities with 5,000 or more inhabitants; and
- Demographic factors that reflect differences in the selected population structures in districts: the percentage of at least once married women of childbearing age; the percentage of population living in Roma segregated settlements; and the percentage of persons other than Slovak nationality.

Models were estimated by stepwise multiple regression in IBM SPSS software. The basis of this method is in selection of an independent variable, the addition of which into the regression model will contribute the most to the explanation of the variability of the dependent variable. A standardised regression coefficient is then calculated for the independent variable that entered the regression model. In the second step, one of the remaining independent variables, which contributes most to explaining the variability of the dependent variable, is added into the existing regression model, and standardised regression coefficients are calculated for both independent variables. The procedure is repeated in phases until the model includes all independent variables contributing significantly to the explanation of the dependent variable. This approach gives us an idea of which independent variables have the most influence on the variance of the dependent variable and which, on the contrary, have the smallest contribution. The aim is to find the potentially best model accounting for current regional differences in late motherhood in Slovakia.

¹ The source of data is the Population and Housing Census 2011 and the Atlas of Roma communities in Slovakia (2019)

4. Results

4.1 Fertility intensity in advanced reproductive age

The total fertility rate of women aged 35 and over was relatively low in almost all districts of Slovakia in the first half of the 1990s. This confirms for Slovakia the model of a significant concentration of reproduction in the first half of the reproductive years, and only minimal effects of advanced reproductive age. Up to 53 of all 79 districts showed fewer than 0.1 children per woman of advanced reproductive age (see Fig. 1).

In another 22 districts, the fertility level of women aged 35 and over ranged from 0.1 to 0.2 children per woman. Only in four districts in the north (Námestovo) and northeast of Slovakia (Kežmarok, Stará Ľubovňa, Sabinov) did it exceed the limit of 0.2 children. Overall, the higher late fertility in some units in the north and northeast of Slovakia was mainly due to a significantly higher share of third and higher-order fertility (Fig. 1). In the mentioned four districts, it reached a significantly above-average level (90% and more).

The results of our analysis confirmed that in all districts the fertility of women aged 35 and over has increased. It also turned out that this process was spatially highly differentiated. The rate of late motherhood increased fastest in the capital city's districts and its wider hinterland. In these areas, several analyses (Jurčová et al., 2010; Bleha et al., 2014) have also confirmed the dynamic delay in the onset of the reproductive pathways.

This link between longer postponement and the dynamics of increasing late fertility is also supported by the finding that most of these districts are also characterised by the highest fertility parity one in advanced age (see Fig. 2). The districts of Bratislava have a specific position, where the late fertility of the first order exceeds the level of 0.1 first child per woman. It is not possible, however, to talk only about the process of postponing maternal starts to an advanced reproductive period as the primary factor of increasing late fertility in these districts. A more detailed analysis of fertility by parity also identified, in this area, the above-average level of birth of second children.

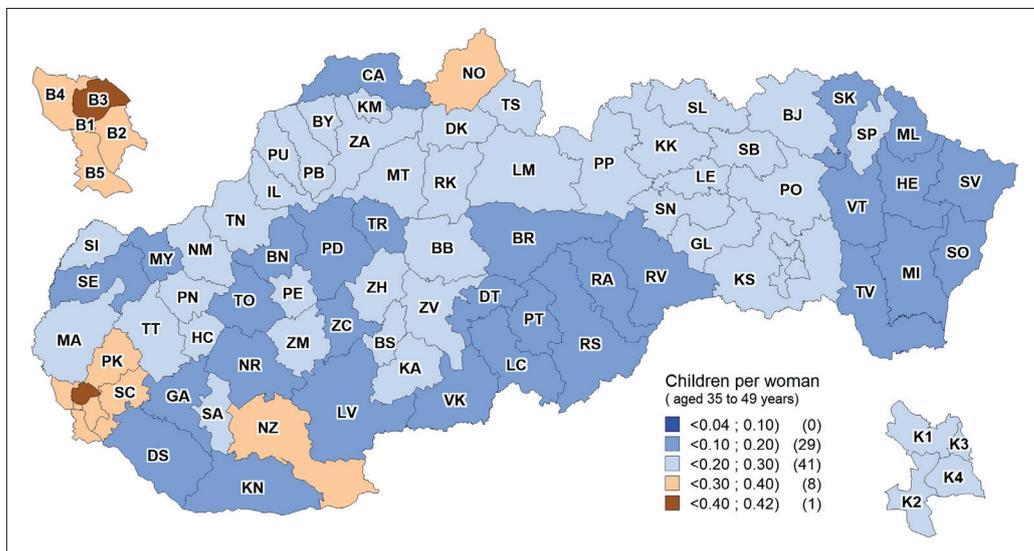


Fig. 1: Late fertility in districts of Slovakia, 2015–2019
Sources: SO SR 2015–2019; authors' calculations

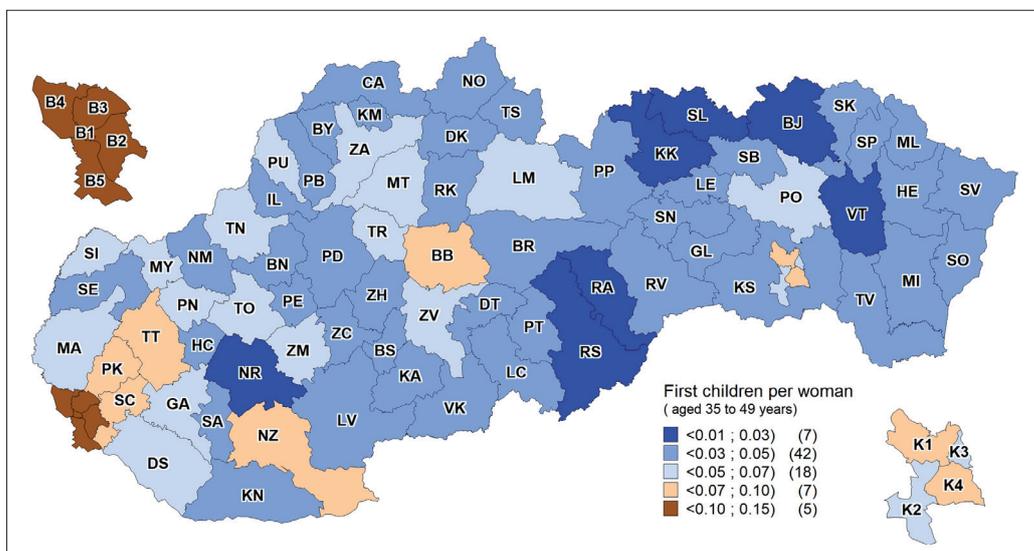


Fig. 2: Late first order fertility in districts of Slovakia, 2015–2019
Sources: SO SR 2015–2019; authors' calculations

The situation in some districts of eastern Slovakia, which can also be included in the group of regions with faster growth of late motherhood, is specific. In their case, however, it turns out that the fertility of the first order in advanced reproductive age is one of the lowest (Fig. 2). On the contrary, these districts represent an area with significantly above-average fertility of the second and especially the third and higher order (see Fig. 4).

4.2 The importance of late motherhood for total fertility and its changes

The significance of advanced reproductive age fertility was generally low in all districts in the early 1990s (Fig. 3). The share of late fertility in total fertility was over 10% only in Námestovo district, while 32 regions did not even reach 5%. Another 24 districts ranged from 5 to 6% (Fig. 3). The observed increase in the late fertility rate in all regions of Slovakia, however, contributed to a greater impact on total fertility. In the last period 2015–2019, the contributions of late fertility did not exceed the 10% boundary in only two districts. On the other hand, a total of 40 districts were already above 15% and in 6 districts fertility in advanced reproductive period accounts more than a fifth of total fertility. That includes all five districts of Bratislava and Košice I district. We can, however, also identify some other districts with a significant impact of late fertility on the

overall reproduction rate. We can include in this group mainly districts from the broader area of the capital, as well as districts of central Slovakia with important economic centres. These administrative regions also generally belonged to the group with the fastest-growing percentage of late motherhood on total fertility in Slovakia.

A significantly different situation is developing in most of the districts of eastern and southern central Slovakia. This area is characterised by the lowest percentage of fertility among women aged 35 and over on total fertility. Several districts in this area experienced only a gradual change in the age profile of fertility. The model of a relatively early beginning of reproductive pathways and only a limited reproduction postponement to the second half of the reproductive years remains significant.

4.3 Transformation of the parity structure of late motherhood

A specific feature of the population reproductive model of former Eastern Bloc countries was the considerable concentration of reproduction in a narrow age interval in the first half of the reproductive years with an early motherhood and a gradual intercohort tendency towards the two-children family model. As a result, childbearing in the second half of the reproductive age had an ever smaller effect on the overall fertility intensity, mostly with children of higher birth order.

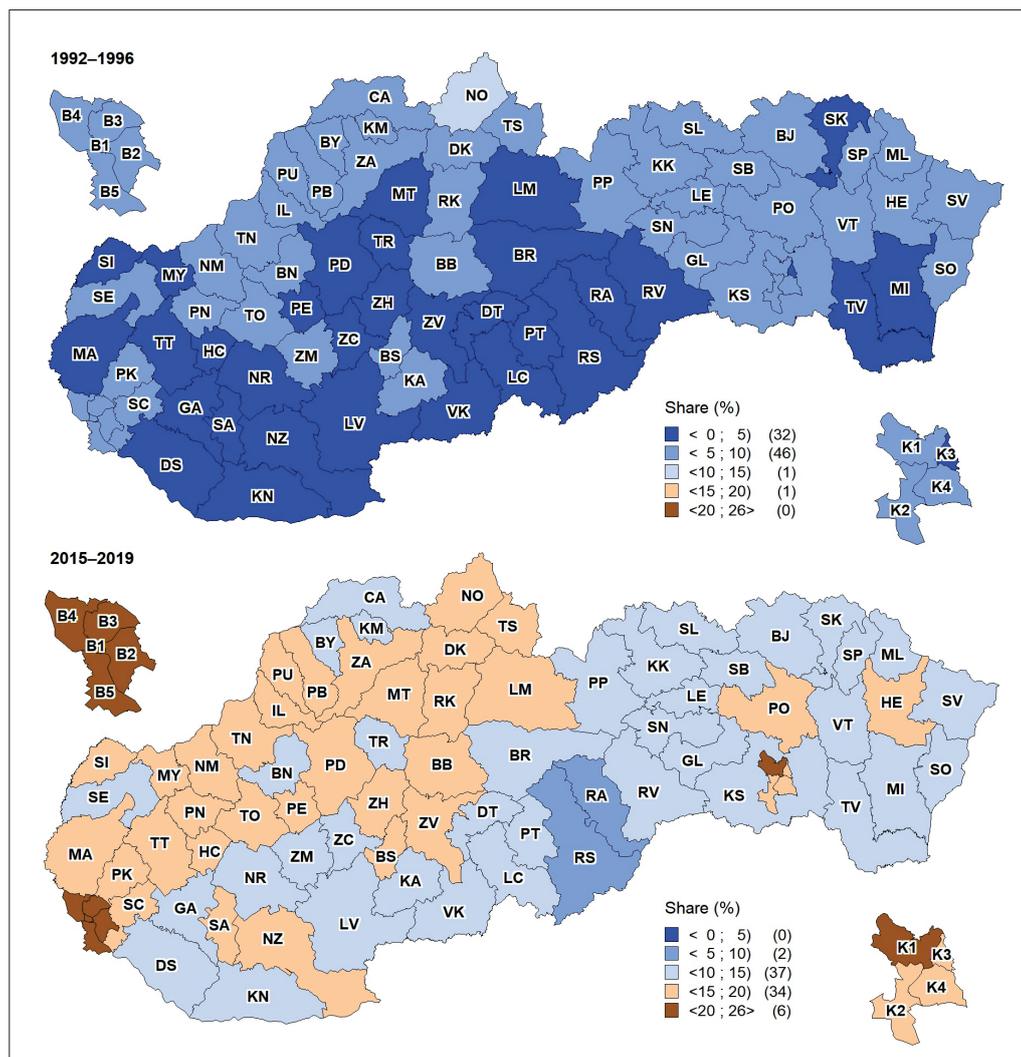


Fig. 3: Share of late fertility in total fertility in districts of Slovakia, 1992–1996 and 2015–2019
Sources: SO SR 1992–1996, 2015–2019; authors' calculations

In the first half of the 1990s, the higher level of late motherhood in some northern and eastern Slovak districts was mainly due to the more frequent births of third and further children. Overall, the birth significance of this parity group exceeded up to three quarters in a third of the districts (Fig. 4). Also, however, we find the influence dominance of the birth of third and further children in other regions. According to our data, in principle, their share was only below 50% in four capital districts. In the other 11 districts, it ranged from 50 and 60% (see Fig. 4).

Developments in the following decades brought significant changes, mainly based on increasing the intensity of the birth of the first and the second child. The most significant increase in maternity onset at an advanced reproductive age was seen in the urban districts of the capital, Košice and some regions in the suburban area of Bratislava and central Slovakia with important economic centres. In contrast, in the east and north-east of the country, clearly, the lowest shift of the birth of the first children to women aged 35 and over is seen. This area was mainly affected by the increasing intensity of second pregnancies and, in some cases, the birth of third and higher order children.

In the first half of the 1990s, the share of first-order fertility in total fertility at an advanced reproductive age exceeded 20% in only five districts of Slovakia (Fig. 4). In most districts, especially in western and central Slovakia, its share ranged from 10 to 20%. In eastern and northern Slovakia, the share of first-order fertility was even lower. An extremely low level was identified in five districts in the northern part of central Slovakia (Čadca and Námestovo) and

eastern Slovakia (Kežmarok, Stará Ľubovňa, and Sobrance), where first-order fertility did not account for even 5% of total fertility at this age (Fig. 4).

The situation in the period 2015–2019 witnessed a significant change. Above all, the share of first-order fertility in total late fertility was strengthened in virtually all districts. The influence of this parity group grew most dynamically in most districts of western and a large part of central Slovakia. The opposite situation was found especially in eastern Slovakia, with the exception of the easternmost districts and the city districts of Košice. As a result of these changes, this parity group had the greatest influence from 2015 to 2019 in the capital (more than a third of the total late fertility rate), while in several regions in the north and east of the country it reached only a below-average level (less than 20%). From the above, it is clear that despite a significant increase in first births, this parity group did not hold a dominant position in late motherhood formation in any of the districts.

In the first half of the 1990s, the proportion of second-order fertility at an advanced reproductive age ranged from 5 to 35%. Above-average values were mainly identified in some city districts of Bratislava, in the district of Myjava (with more than 30%), and in the city districts of Košice. Some districts in the south of western and central Slovakia and some other units with important economic centres can be included in this group (Martin, Banská Bystrica district). The situation was quite the opposite, especially in the north of central and eastern Slovakia, where the fertility of the second order did not make up even a tenth of total late fertility.

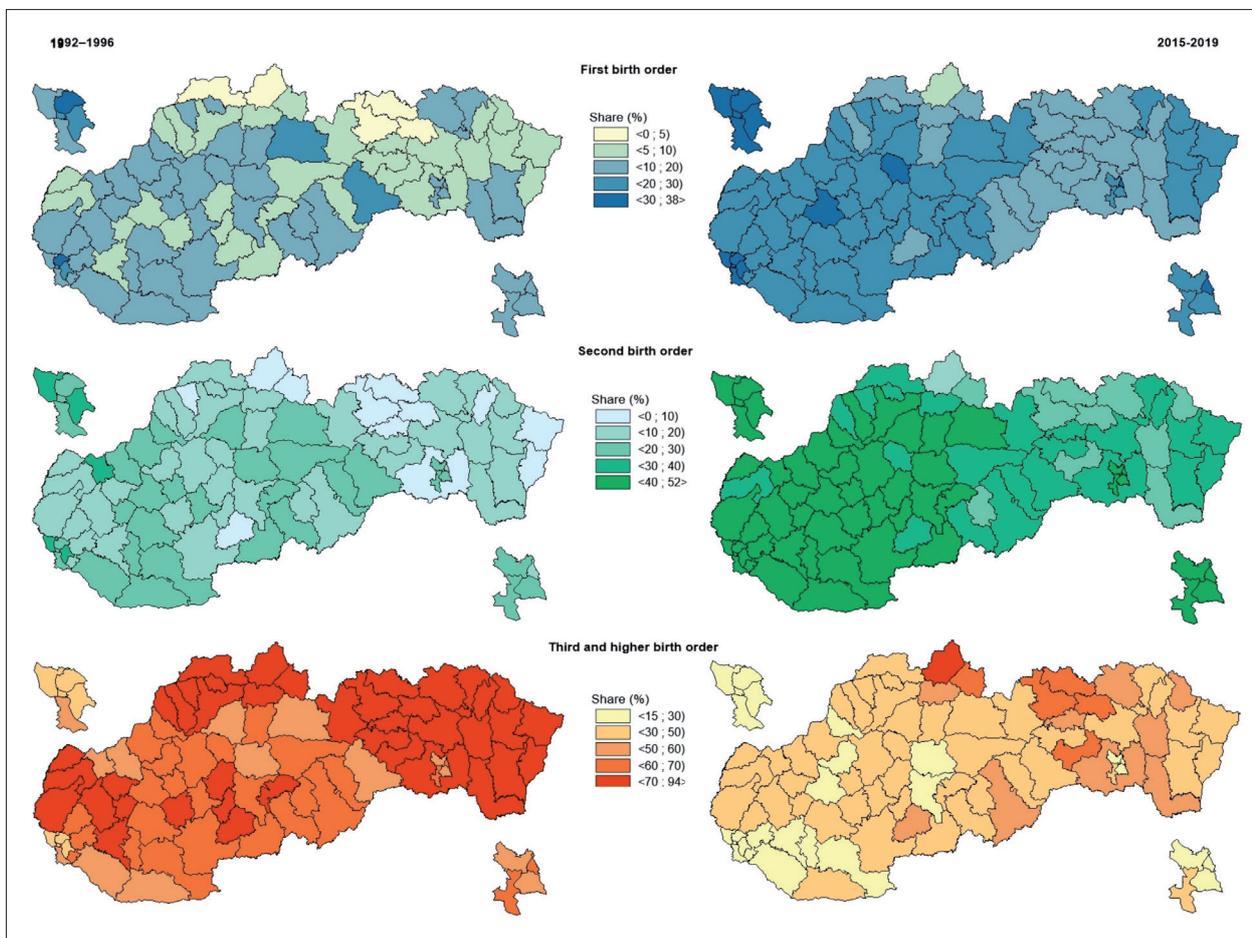


Fig. 4: Share of late fertility by birth order in total late fertility in districts of Slovakia, 1992–1996 and 2015–2019
Sources: SO SR 1992–1996, 2015–2019; authors' calculations

From 2015 to 2019, there was a significant increase in the impact of second-order fertility on overall late fertility in virtually all districts. The intensity of the birth of second children was already contributing to a decisive influence on the overall late fertility in more than 40 districts. These are mainly the districts of the west and south-west of Slovakia and the city districts of Košice, as well as some districts of central Slovakia with important economic centres. In these areas, it makes up 40 to 50% (Fig. 4). Northern districts and some districts in eastern Slovakia remained in a different situation.

In this area, the fertility rate of second children at an advanced reproductive age is still less than 30%. In the first half of the 1990s, with the exception of four Bratislava districts (Bratislava I, II, III, and IV), the share of fertility of the third and higher order accounted for more than half of the total late fertility in Slovakia. The dominance of this parity group on late fertility in this period in virtually all districts is documented by other findings. In 54 out of 79 districts, the fertility of the third and higher order accounted for more than two thirds, and in the fifteen administrative units with the highest share, even the fertility of the third and higher order accounted for more than 80% of fertility at an advanced reproductive age. As can be seen from Figure 4, this was mainly the case in districts of northern and eastern Slovakia. From 2015 to 2019, all districts of Slovakia saw a relatively significant decrease in the share of fertility of the third and higher order in total late fertility. The smallest dynamics of this process can be found in several districts of eastern and northern Slovakia. Due to this, these areas are still characterised by a significantly higher share of this parity group in late fertility. In the Námestovo district, this share exceeded 72%. In the other five districts of northern and eastern Slovakia (Stará Ľubovňa, Sabinov, Kežmarok, Gelnica, and Tvrdošín), it made up 60 to 66%. Another nine districts were above the level of 50%. Again, this was mainly in northern and eastern Slovakia (Fig. 4). The situation was quite the opposite in the city districts of Bratislava, Senec, Banská Bystrica, and in the district of Košice III, where the fertility of the third and higher order does not make up a quarter of the total late fertility (Fig. 4). Overall, the districts of western Slovakia have a lower impact on the fertility of third and other children on fertility in the advanced reproductive period.

Given the structure of late fertility by parity, it is possible to identify two main groups of districts in Slovakia from a spatial point of view, which can still be differentiated into two partial subgroups (see Fig. 5). Cluster 1a is characterised by the highest proportion of first-order fertility and a high weight of second-order fertility with the lowest impact of the intensity of birth of third and further children on late fertility. This can be seen mainly in the districts of Bratislava and Košice as the two largest cities, in southwestern Slovakia, and in two districts in central Slovakia with important economic centres (Banská Bystrica and Zvolen). The majority of districts in western Slovakia, together with some districts in central Slovakia with larger centres (Martin, Žilina, and Liptovský Mikuláš), and the district of Košice II form cluster 1b. This is characterised by a high proportion of first- and second-order fertility and a low proportion of third and subsequent children in fertility at an advanced reproductive age. The opposite setting of late fertility is in the clusters of districts in the north of central Slovakia and in most of eastern Slovakia (2a and 2b). In cluster 2a, there is the highest share of fertility of the third and higher order with the lowest representation of fertility of the first and second order. Cluster 2b consists of districts with a high proportion of fertility of third and subsequent children and a low proportion of the first and second order. The clusters 2a, 2b and 2c are formed by districts with mixed structures of late fertility according to parity. As can be seen from Table 1, cluster 2a is characterised by a relatively high proportion of second, third, and other children with low first-order fertility. Cluster 2b is a specific polarised space with a high proportion of first and third and higher fertility at low birth rates of second children. The last identified cluster (2c) had a high second-order fertility effect with low proportions of the first and third and subsequent children.

4.4 Some factors in spatial differences of late motherhood

Statistical findings (the F-Ratio in the Analysis of Variance) indicate that independent and statistically reliable factors significantly predicted both dependent variables. When explaining the share of late fertility in total fertility in the districts of Slovakia, the values of R, R Square, and Adjusted R Square were even at or above the limit of 90%. This highlights the suitability of the model and its considerable explanatory power in the context of the share of late fertility

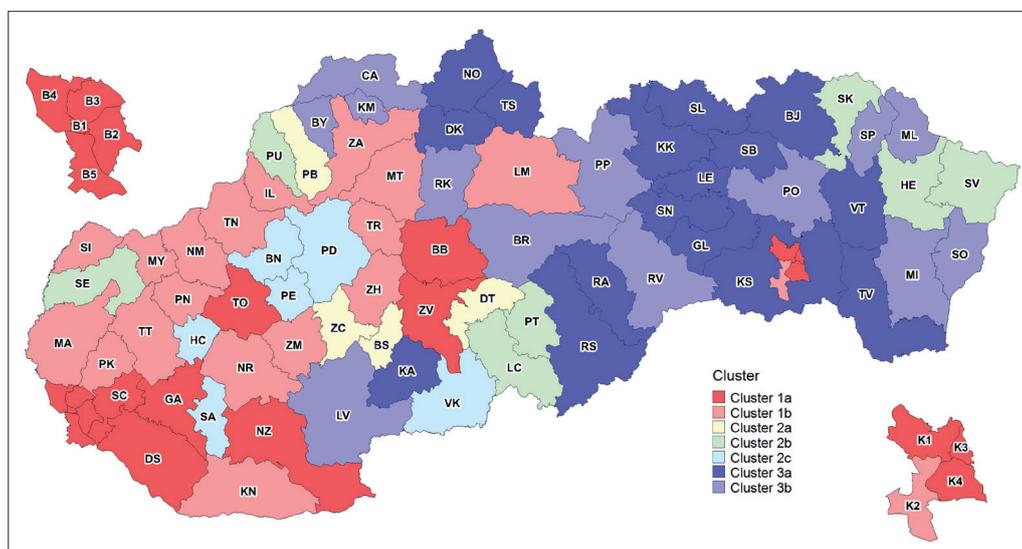


Fig. 5: Typology of districts in Slovakia according to the share of late fertility by birth order in the period 2015–2019
Sources: SO SR 2015–2019; authors' calculations

Cluster	Main characteristics of late fertility	Average share of late fertility by birth order in total late fertility (%)		
		First order	Second order	Third and higher order
1a	The highest first order; high second order; lowest third and higher order	31.1	44.3	24.6
1b	High first and second order; low third and higher order	24.6	43.1	32.3
2a	High second and third and higher order; low first order	20.6	41.7	37.7
2b	High first and third and higher order; low second order	23.5	35.2	41.3
2c	High second order; low first and third and higher order	21.1	45.5	33.4
3a	The lowest first and second order; the highest third and higher order	14.9	27.6	57.5
3b	Low first and second order; high third and higher order	19.9	35.7	44.4

Tab. 1: Characteristics of identified clusters of districts in Slovakia according to the structure of late fertility by birth order, 2015–2019. Sources: SO SR 2015–2019; authors' calculations

in total fertility. The second model, which tries to explain the influence of first-order fertility on late fertility, did not reach such high values of R, R Square, and Adjusted R Square. Nevertheless, a level above 70% (in the case of R Square and Adjusted R Square) means that the model is sufficient for present needs. Both models saw a significant reduction in the number of explanatory variables and the selection of only the most important ones.

As can be seen from Table 2, the largest part of the variability of the share of late fertility in districts in Slovakia is accounted for by the variable 'length of the education of women'. It is clear that the higher the value of this indicator, the greater the impact of late motherhood on overall fertility. Later on, the model was enriched with other variables based on the significance of their influence. Their influence on the model and its explanatory power were significant for the resulting model. It is interesting that in explaining differences in the impact of late fertility on overall fertility in the districts of Slovakia, the factors of socio-economic conditions prevail among the other indicators added to the model. Apart from this group, only the share of people in segregated Roma settlements was included in the model.

This result may thus indicate the significant impact of economic opportunities and constraints at a regional level in relation to late fertility. The direction of influence of the given indicators is also important. While the share of fertility at an advanced reproductive age is increasing alongside better average monthly nominal wages and employment in

the tertiary sector, indicators showing economic problems in the region (unemployment rate and job seekers per job offer) reduce this share.

It is also important to note that the effect of a higher proportion of people from segregated Roma settlements runs against the trend of increasing the share of late fertility in total fertility. One explanation could be in the early beginning of reproductive pathways, which may also imply an earlier completion of the size of the family. In this regard, it is necessary to realise that the effort to regulate the number of children has been identified even in the segregated Roma settlements (Šprocha and Bleha, 2018). As a result, a relatively rapid decline in fertility was identified in this environment after the age of 25. The differences in late fertility compared to the Slovak average are therefore relatively small.

These findings are largely supported by the identified spatial differences in the share of late fertility. Districts primarily in western Slovakia and partly in central Slovakia with a higher share of late fertility have a more frequent occurrence of women with a higher level of education and are areas with better economic conditions, lower unemployment rates, and more frequent employment in the tertiary sector. By contrast, several eastern and northern districts in Slovakia are characterised by worse economic conditions and shorter lengths of education, which ultimately is probably largely reflected in their low to very low shares of late fertility. As many of these regions are also marked by an early start to reproduction, it can be expected that family size is completed here earlier than in the advanced reproductive period.

Indicators in model	Unstandardised Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	– 25.415	4.834		– 5.257	0.000
Mean years of schooling (women)	2.844	0.394	0.498	7.214	0.000
Unemployment rate (total population)	– 0.070	0.036	– 0.172	– 1.956	0.054
Employment in tertiary sector (women)	0.039	0.011	0.159	3.558	0.001
Population in Roma segregated settlements (total population)	– 0.089	0.029	– 0.228	– 3.044	0.003
Average monthly nominal wage (women)	0.004	0.001	0.146	2.785	0.007
Job seekers per 1 job offer (total population)	– 0.002	0.001	– 0.092	– 2.142	0.036

Tab. 2: Multiple linear regression between share of late fertility in total fertility in districts of Slovakia and selected indicators, 2015–2019 (Model summary: R = 0.949; R Square = 0.901; Adjusted R Square = 0.892)

Source: authors' calculations

The second model attempted to explain the influence of selected variables on the regional differences of the proportion of the first childbearing in women aged 35 and over in the overall level of late motherhood. The main explanatory factor in this model became the mean years of schooling (Tab. 3). The length of education in the districts of Slovakia increases the share of late fertility and emphasises the fertility of the first order. This is also supported by previous findings, where in districts with the highest mean years of schooling (especially in the west of Slovakia and in city districts in Bratislava), there was generally a higher proportion of first-order fertility and vice versa. The employment rate of women also had a positive effect on increasing the impact of first-order fertility on late fertility. This may be related to the problems of reconciling work and home and family care as well as the lack of institutional care for young children, which, with the growing employment of women, increases the impact of first children on late fertility in some regions. The cost of lost opportunities for employed women can be equally important. The unfavourable economic conditions of a given region may also prove to be an important factor. The growing share of first-order fertility in late fertility seems to be influenced by the problems associated with women's employment and by the degree of maternal deprivation and the need to receive social benefits.

The last two indicators that were included in the model included the percentage of people of non-Slovak ethnicity and the share of women living in municipalities with more than 5,000 inhabitants. In this sense, it was confirmed that urban spaces could be a factor in Slovakia that influences the timing of family formation and their more frequent shift to an advanced reproductive age. Explaining the ethnic indicator seems more complicated. In the case of persons of Roma ethnicity, it was not possible to expect their positive impact on the higher share of first-order fertility in total late fertility due to the very early timing of the beginning of reproductive pathways; however, later maternal starts were identified in some other ethnic groups in Slovakia. In this context, it is also necessary to discuss the mechanisms of postponing the reproductive intentions of people living in non-Slovak ethnic environments as a strategy enabling their easier establishment in society.

5. Discussion and conclusions

Our results confirmed the existence of relatively significant spatial differences in the late fertility level and share of late fertility in total fertility. It is mainly the area of the capital and its wider hinterlands, the districts of the second largest

city in Slovakia and some regions of western and central Slovakia with important economic centres. Late fertility also plays an important role in some districts in north and north-east Slovakia. Identified changes in the parity structure of late motherhood at the subnational level were associated with the conclusions of Toulemon (2005). In general, the birth of the first and second children increasingly takes place at an advanced reproductive age. On the other hand, there were relatively considerable regional differences.

We have identified a total of three main types and their several subtypes of district clusters according to the structure of late fertility by birth order. Especially in districts in the west of Slovakia, in the city districts of Košice and some districts with important economic centres in central Slovakia, we can find a significant impact of first and second children and, conversely, a low to very low fertility rate of third and subsequent children. This is in line with some other studies from non-ECE countries (Berrington, 2004; Kulu, 2013; Toulemon, 2005), which found among more educated women and people living in cities and especially in the largest municipalities, a more significant shift to maternal onset. In this environment, higher direct and indirect costs (Becker, 1997) in connection with caring for a child/children at a younger age, the need for flexibility, mobility and competitiveness are to be expected (McDonald, 2000, 2002). This is probably also related in this area to the more frequent tendency of women to build careers (Hakim, 2003), that takes precedence over long-term commitments such as motherhood. Normative and value intentions related to higher education, social and cultural living space and the higher anonymity of the urban environment, can also be important postponement aspects (Potančoková, 2009). The influence of individual factors conditioning the unplanned postponement of childbearing to an advanced reproductive period also remains an issue. On the other hand, some districts of northern and eastern Slovakia are still characterised by a model of late fertility with a very low to low share of first and second order fertility rate and the highest impact of the birth of third and subsequent children. At the same time, however, it must be said that late fertility in this area is generally lower.

These districts combine a lower rate of urbanisation, poorer socio-economic conditions, specific ethnic structure and, especially in the north, a factor of higher religiosity (Bleha et al., 2014; Halás, 2008; Korec et al., 2005). In addition, we can identify a lower quality of educational attainment. It seems, therefore, that the earlier start of reproductive pathways and the less frequent use of advanced reproductive

Indicators in model	Unstandardised Coefficients		Standardised Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	– 85.423	17.061		– 5.007	0.000
Mean years of schooling (women)	4.961	1.367	0.445	3.630	0.001
Employment rate (women)	0.674	0.107	0.734	6.328	0.000
Recipients of benefits in material need (total population)	1.069	0.278	0.468	3.844	0.000
Other than Slovak nationality (total population)	0.055	0.027	0.145	2.076	0.041
Women in municipalities with 5000+ inhabitants	0.057	0.028	0.197	2.065	0.043

Tab. 3: Multiple linear regression between share of first birth order late fertility in total late fertility in districts of Slovakia and selected indicators, 2015 – 2019 (Model summary: $R = 0.860$; R Square = 0.739; Adjusted R Square = 0.721). Source: authors' calculations

age for maternal onsets could be related to the existence of a large group of women from disadvantaged backgrounds and with difficulties in job search in the official labour market. According to Friedman et al. (1994), for these women, the early parent role is one of the tools to reduce one's life insecurity. The second important group can be religious women increasing their social status with early motherhood. These women are being influenced by their peer groups and communities to an earlier start of reproduction. A tendency to have a completed family by the age of 35 is very common.

The educational factor was confirmed as a great influence in terms of factors affecting late motherhood in Slovakia. Thus, it is confirmed that the longer women study, the more important their fertility (very often are these just first pregnancies) at the age of 35 and over. Some factors related to the position of women in the labour market (employment rate, employment in the tertiary sector) and wage levels also proved to be important in increasing the share of late fertility and the importance of the first children in reproduction at advanced ages. The degree of female population urbanisation resulted in the same effect. This confirms some of the results of non-ECE studies linking the phenomenon of late motherhood to higher-income workers and the urban population (e.g. Kulu, 2013; Mills et al., 2011; Toulemon, 2005). Some factors that indicate socio-economic problems (unemployment, number of job seekers per one job offer) work in the opposite direction, along with some ethnic variables (proportion of population in Roma settlements). This would suggest that in areas with poorer socio-economic conditions and more frequent representation of people from segregated Roma settlements, an earlier start into motherhood could be a model for reducing life insecurity, subsequently reflected in the parity character of fertility in advanced reproductive ages.

Acknowledgement

This paper was written with funding from VEGA No. 2/0064/20.

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Please cite this article as:

ŠPROCHA, B., FITALOVÁ, A. (2022): Late motherhood and spatial aspects of late fertility in Slovakia. *Moravian Geographical Reports*, 30(2): 86–98. doi: <https://doi.org/10.2478/mgr-2022-0006>