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TIMING OF FIRST CHILDBIRTHS AND CHILDLESSNESS IN SLOVAKIA IN THE RESULTS OF THE 2021 POPULATION CENSUS

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Abstract: The early and almost universal model of motherhood did not apply in Slovakia's new social, economic, cultural, and political conditions after 1989. Dynamic changes in reproductive and family behaviour confirmed that young cohorts of women born since the late 1960s quickly and decisively rejected it. Postponing family transitions on the path to adulthood became a key element in their life paths. The most significant of these was, above all, postponing maternal starts. These changes resulted in a shift in the mean age at first birth and a significantly growing share of childless women. Never in the history of Slovakia have women become mothers for the first time at such a late age.

The paper aims to analyse the process of postponing the birth of first children and the associated period of childlessness among women in Slovakia through a specific analysis of data from the 2021 Population Census. We are attempting to quantify the timing and level of childlessness, specifically at the end of the reproductive period (final childlessness) and at the age of 35, which may indicate potential childlessness. No less important is the use of data from the 2021 Population Census for a differential analysis of the timing of first births and childlessness. The results confirmed both the continued postponement of giving birth to first children and the deepening of the share of childless women, but at the same time, indicate a significant slowdown of this process in the last intercensal period. The existence of substantial differences in the timing and childlessness of women in terms of their education, ethnicity, mother tongue, religion, or place of residence was also confirmed.

Keywords: singulate mean age at first birth, childlessness, education, religion, ethnicity, economic status, place of residence, the 2021 Population Census, Slovakia

1 INTRODUCTION

The trend of delaying childbirth, a topic of increasing relevance, has been evident since the cohorts of women born in the second half of the 1960s (Potančoková, 2011, 2013; Šprocha, 2014, 2015). This shift is most clearly reflected in the decline in early first births. However, studies (e.g., Sobotka et al., 2011ab; Šprocha, 2014; Šprocha and Ďurček, 2018) indicate that this delay is not fully compensated by in-

creased fertility at older ages, resulting in an overall decrease in completed fertility. Additionally, notable transformations are occurring in women's parity structures, with the timing of childbearing influencing whether women remain childless. A growing trend of childlessness is evident across Europe, irrespective of socio-economic or cultural factors (Billari and Kohler, 2004; Rowland, 2007; Tanturri et al., 2015; Sobotka, 2017). In some former Eastern bloc countries, including Slovakia, the share of childless women has risen sharply (Sobotka, 2017; Beaujouan et al., 2017).

An important question is whether this process can be observed in Slovakia, regardless of the actors' socio-economic, cultural, or geographical determinants. It is also essential to identify possible differences between these groups, not only in terms of childlessness but also in the timing of the birth of first children.

This paper aims to comprehensively explore these questions using data from the 2021 Population Census the only available source for a detailed analysis of fertility and the timing of childbearing while incorporating various structural variables. Unlike sample surveys, the census provides complete population data. This analysis will examine traditional demographic variables like age and marital status, economic factors (such as current employment), and socio-cultural variables (such as education, religious affiliation, nationality, and citizenship).

Given Slovakia's historical regional variation in fertility and birth timing (e.g., Bleha et al., 2014; Jurčová et al., 2006, 2010), one objective is to assess whether these regional differences persist in terms of childlessness and the timing of childbirth. Additionally, a geographical analysis will identify areas with higher rates of childlessness and areas where motherhood occurs at younger ages. The study will also explore differences based on municipality size and the urban-rural divide.

2 THEORETICAL FRAMEWORK

All available analyses of transformative changes in reproductive behaviour in Slovakia since 1989 (e.g., Potančoková 2008; Potančoková, et al. 2008; Šprocha and Tišliar 2016) confirm that there has been a gradual shift towards older ages for motherhood. This shift in Slovakia is reflected in the increasing mean age at first birth, even though a certain stagnation has characterised developments in the last decade. The inter-cohort rise in childlessness is also evident, with some projections (Sobotka, 2005; Šprocha, 2022) suggesting that this trend will continue among women born in the 1980s. These patterns are expected to be further reflected in the 2021 Population Census.

One of the most common and stable factors affecting the timing and intensity of childbearing is the highest level of education. It is generally associated with direct and indirect effects on fertility and average age. The first group includes mainly the aspect of incompatibility of motherhood and studies (Blossfeld and Huinink, 1991; Baizán et al., 2003). Therefore, we can expect that studying women try to prevent unwanted pregnancy and strategically postpone motherhood to a more suitable time

(Kohler et al., 2002) after completing education, establishing themselves in the labour market, or gaining residential independence. Although in older cohorts, some analyses (e.g. Šprocha and Tišliar, 2016) pointed to a somewhat more frequent beginning of motherhood during studies or of acquiring the status of mother already in the case of a woman studying, in the younger generations (70s – 90s) affected by the process of postponing the start of motherhood to an older age, women with the status of student are almost exclusively childless (Šprocha et al., 2017; Šprocha and Tišliar, 2016). In connection with this, we would like to make one more remark. The effect can (and probably is) be the opposite when pregnancy is the reason for ending education. Therefore, early pregnancy can be one of the "special" determinants of lower childlessness and mean age at first birth, especially in connection with women from marginalized communities, families with low social and cultural capital, etc. (Šprocha, 2014b; Šprocha and Tišliar, 2016). The lengthening period of study, in general, thus affects primarily the timing of childbirth and especially the beginning of motherhood. Foreign research also shows that it is less often a determinant of the resulting childlessness (Beaujouan et al., 2016). Some previous analyses from the Slovak environment (Šprocha and Tišliar, 2016; Šprocha et al., 2017) confirmed a positive gradient when the mean age at the birth of the first child increased with the increasing level of education. However, they did not identify such an obvious connection in connection with lifelong biological childlessness, with the decisive factor being whether the transitioning generations were older or younger. The positive gradient was confirmed to a certain extent in the first group. In younger cohorts, the situation becomes more complicated, and the childlessness rate takes on a U-shaped shape when not only the most educated women but also those with the lowest education (Šprocha et al., 2017) are more likely to be left without experience with biological motherhood.

In terms of childlessness, the indirect effects of higher education are, therefore, more important. These include aspects of different values and normative settings between individual educational groups, different socioeconomic capital, position on the labour market and related income levels, housing conditions, and overall living standards. Equally important are the direct and indirect costs of lost opportunities linked to motherhood and parenthood. These are generally higher for better-off people, women building a career, striving for a good position in the labour market, i.e. people with higher education (Sobotka et al., 2008). Given the above, it can be said that even the explanation of the relationship between education and childlessness is inconsistent. Especially in the countries of the former Western bloc, the expansion of higher education was perceived as an important prerequisite for the growing share of women actively working in the labour market and thus not only postponing their motherhood but also for increasing childlessness (Sobotka, 2017). However, recently, the situation has no longer been so unequivocal (Matysak and Vignoli, 2008; Sobotka, 2017). In the case of Slovakia, this was already partially signalled by some findings of previous differential analyses (Šprocha and Tišliar, 2016). We can, therefore, assume that this phenomenon has deepened even more towards the younger cohorts, which the results of the latest SODB 2021 should also

confirm. (Matysak and Vignoli, 2008; Sobotka, 2017). In the case of Slovakia, this was already partially signalled by some findings of previous differential analyses (Šprocha and Tišliar, 2016). We can, therefore, assume that this phenomenon has deepened even more towards the younger cohorts, which the results of the latest 2021 Population Census should also confirm.

There is also an equally ambiguous relationship between childlessness and the economic position of women in the labour market. In the past, their penetration into the labour market positively influenced the growing childlessness. For example, the theory of the second demographic revolution (transition, e.g. van de Kaa, 1987; Lesthaeghe, 1995; Lesthaeghe and Neels, 2002) or Becker's economic framework of fertility (Becker, 1993) also operated with this. It was assumed that leaving a job due to caring for a child(ren) not only brings the most significant direct financial losses but is also the reason for the most significant indirect costs of lost opportunities. These are primarily associated with the fact that women not only do not participate directly in their job position and, therefore, do not experience further natural development of their human capital, but they also lose contact with employment. Furthermore, the pressure on time management in paid and unpaid work is deepening. At the same time, the mere care of children and family also deprives them of a particular segment of time that, as childless people, they could spend on other activities (e.g. travelling, further education, work).

Some older specialized studies (Šprocha and Tišliar, 2016) also point to the existence of differences in female childlessness in Slovakia in terms of ethnicity and religion. Although there are specific signals of fertility convergence between individual religious denominations (Frejka and Westoff, 2008; Zhang, 2008), we assume that specific differences in the case of Slovakia will continue to be identified in the results of the 2021 Population Census. Especially in connection with the specific reproductive behaviour of the Roma population (Šprocha, 2014), it can be expected that ethnicity will continue to be an important differential factor in the timing of first childbirth and the associated childlessness in Slovakia. Several previous analyses (Mládek et al., 2006; Jurčová et al., 2006, 2010; Bleha et al., 2014) identified the persistence of spatial differences in the timing of first childbirth. We expect that spatial differences should also be confirmed by the results of the 2021 Population Census. We assume that we will find a longer period of childlessness and a higher level overall in the Bratislava region, urban areas, and the largest cities. The opposite situation should be found mainly in the eastern Slovak regions, rural areas and smaller municipalities.

3 DATA SOURCES AND METHODOLOGY

The primary data source is the results of the 2021 Population Census. We use the question about the number of live births to women and their age. We also combined this data with some of the other structural characteristics surveyed to perform a differential analysis. In our case, these were the highest completed education, na-

tionality, mother tongue, religion, economic activity and place of permanent residence. We exclude from the analysis those records for which data on the number of live births, or in the case of the differential approach, information on the population characteristic in question, was not provided. Given the relatively low frequency of undetected data in the 2021 Population Census, this approach cannot significantly distort the obtained results.

In the context of the methodological approach used (see below) and since our goal is not an intergenerational analysis of the development of childlessness, we limit ourselves to the age definition of 15–54 years. Although the 2021 Population Census is the first in the history of Slovakia also to survey the number of live births to men, we limit ourselves to the analysis of childlessness and the timing of maternal starts in women. The reason is that a significant part of children (currently more than 40%) are already born to unmarried women, and therefore, data on live births reflect only that part of reproduction that was carried out in a marriage or in cases where a man knows about his paternity and declared it in the census. In connection with individual structural characteristics, we do not use the entire range of surveyed categories in all cases, but we combine these into broader groups in justified cases.

In the case of education, which expresses the highest level of education a person has completed by obtaining the relevant document, we have merged the original 15 categories into five main ones:

1.) Primary education,
2.) Secondary technical (vocational) education (with no graduation),
3.) Complete secondary education (with graduation),
4.) Post-secondary and higher vocational education,
5.) Higher education.

Ethnicity was a self-declarative item in the 2021 Population Census and expressed a resident's affiliation with an ethnic group. Neither citizenship nor the mother tongue or language that the person predominantly used or best mastered was considered. The specifics of the census were that the so-called other ethnicity was also determined. It allowed the residents to declare their first and second ethnicity if they felt intrinsically connected to it. It was defined in the same way. Given the ethnic structure and, therefore the number of individual ethnic groups, we worked with the following categories in both cases:

1) Slovak,
2) Hungarian,
3) Romani,
4) Ruthenian,
5) Czech, Moravian and Silesian,
6) Other.[1]

[1] The data were processed according to the first ethnicity. The reason is that processing the data on the timing of the birth of first children and childlessness according to another ethnicity did not give significantly different results. In addition, in some cases the numbers are relatively small, since in total only approximately 306 thousand people in Slovakia reported an another ethnicity.

Mother tongue was defined for the 2021 Population Census as the language spoken most often during childhood. It was a self-reported item. We will analyse differences in the timing of childbearing and childlessness among women with Slovak, Hungarian, Romani, Ruthenian, Czech, and other mother tongues.

Similarly, a self-declarative item was religious belief. It expressed a person's membership or relationship to a church, religious community, religion, or participation in religious life. In our analysis, we work with the following groups:

1) Roman Catholic,
2) Evangelical Church of the Augsburg Confession,
3) Greek Catholic,
4) Calvinist,
5) Orthodox,
6) Other denomination,
7) No religious belief.

In addition, we created an artificial group of "with religious belief" population from groups 1 to 6.

The current economic activity presented the position of a person in the labour market at the time of the census. A total of 13 categories were defined in the 2021 Population Census. However, not all of them are the subject of our analysis due to age (e.g. primary and secondary school students, university students). In addition, others (e.g. a person receiving income from capital income) have a low number in the analyzed age spectrum. Therefore, we also made some adjustments in this case. Overall, for our purposes, we use the following categories of current economic activity:

1) working,
2) working pensioner,
3) unemployed,
4) person in a household,
5) pensioner.

For the 2021 Population Census, a working person was considered a person who was employed or engaged in entrepreneurial activity, including under an agreement to perform work or work activity. If they also received a pension (old age, early old age, seniority, disability), they were classified as a working pensioner. However, if such a person had no other source of income (only the above-mentioned types of pensions), they were considered a pensioner. The census considered an unemployed person to be a person without a job actively looking for work and registered with the employment office. A person in a household is a resident who does not have their source of income, is voluntarily unemployed, is not looking for work, and is financially dependent on another household member.

The second part of our analysis focused on spatial differences in childlessness and timing of maternal starts. According to the place of permanent residence of the woman, we analyze the fertility characteristics in question separately for urban and rural municipalities and size groups of municipalities. In our analysis, we use the following categorization of size groups of municipalities:

1) up to 500 inhabitants,
2) 500–999 inhabitants,
3) 1000–1999 inhabitants,
4) 2000–4999 inhabitants,
5) 5000–9999 inhabitants,
6) 10,000–19,999 inhabitants,
7) 20,000–49,999 inhabitants,
8) 50,000–99,999 inhabitants,
9) 100,000 and more inhabitants.

In the last part of our spatial analysis, we tried to identify possible differences between regions (NUTS3) of Slovakia.

From a methodological perspective, we rely on the SMAFB (singulate mean age at first birth) construction (Bongaarts and Blanc, 2015), which is based on John Hajnal's earlier approach applied to the marriage process (for more details, see Hajnal, 1953). The SMAFB indicator presents the average number of years a person (in our case, a woman) will survive childless until the end of reproductive age. By the classical definition of the reproductive period in demography, we defined this as the age of 50.

The lower interval is given by the number of live births, which was carried out in the 2021 Population Census for people aged 15 and over. The calculation itself is then based on the following sequence of steps:

1) for all 1-year age groups in the interval 15–49 years, the proportion of childless women is calculated

$$p_x^{childless} = \frac{P_x^{childless}}{P_x^{total\ women}}$$

$P_x^{childless}$ number of childless women aged (x),

$P_x^{total\ women}$ number of total women aged (x).

2) In the second step, the number of person-years spent childless is calculated. This is based on the proportion of childless women and the width of the age interval. Since we assume a uniform distribution of events during the calendar year, if the width of the age interval is one year (1-year age groups), then the number of years a woman spends childless in it is equal to the proportion of childless women at that age:

$$L_x^{childless} = p_x^{childless} \cdot a_x$$

$L_x^{childless}$ the number of person-years that a woman of age (x) remains childless,

$p_x^{childless}$ share of childless women at age (x),

a_x width of the age interval (x).

3) then the total number of person-years that the woman lived in reproductive age (from 15 to 49 years) as childless is calculated

$$L_{15\to 49}^{childless}=\sum_{x=15}^{49} L_x^{childless} \quad .$$

Since the results of the 2021 Population Census do not allow us to determine the proportion of those who have already had a child for the younger age groups (12^2 –14 years), for our purposes we will have to assume that these women are all childless. Given the very low fertility at this age, any possible distortion of the obtained results is negligible.

$$L_{15\to 49}^{childless}=15+\sum_{x=15}^{49} L_x^{childless}$$

4) The share of childless women at age 50 is calculated from the results of the 2021 Population Census. This represents the level of final childlessness. In case data on the structure of women by the number of live births in combination with one-year age groups are not available, then the average of the two closest age groups (e.g. 45–49 and 50–54 years) can be used as an approximation:

$$p_{50´}^{childless}=\frac{\left(p_{45-49}^{childless}+p_{50-54}^{childless}\right)}{2}$$

from which it is possible to calculate the number of person-years that a woman lived childless until the age of 50:

$$L_{50}^{childless}=50\cdot p_{50´}^{childless}$$

and also the proportion of women who have given birth to at least one child by the age of 50:

$$p_{50´}^{at\ least\ one\ child}=1-p_{50}^{childless} \quad .$$

By combining the above partial steps, we subsequently obtain the resulting relationship for calculating SMAFB in the form:

$$SMAFB_{15}^{49}=\frac{\left(15+L_{15\to 49}^{chidless}-L_{50}^{childless}\right)}{p_{50´}^{at\ least\ one\ child}}=\frac{\left(16+\sum_{16}^{49} p_x^{childless}\cdot a_x-50\cdot p_{50´}^{childless}\right)}{1-p_{50´}^{childless}} \quad .$$

4 RESULTS

The early start of the reproductive paths of Slovak women observed essentially until the end of the 1980s (Potančoková et al., 2008; Šprocha and Tišliar, 2016), was also reflected in the representation of childless persons by age. According to the results of the 1980 and 1991 censuses, at the age of 20, only slightly more than 70% of women remained childless, while at 22, more than half of women in Slovakia had at least one child. At the age of 25, only a quarter remained childless, and at the end of the first half of the reproductive period, this was only about one-tenth of women. Considering also the identified final childlessness of women born in the

[2] The youngest age at which a live birth was identified in Slovakia was 12 years old.

1930s–1950s, ranging from approximately 5–10%, it is clear that giving birth to first children was primarily a matter of a narrow age interval. Between the ages of 20 and 25, almost half of all women in Slovakia became mothers. The influence of the entire complex of political, economic and normative factors (for more details, see Frejka, 2008) contributed to the relatively rapid abandonment of the model of early maternal debuts. It did not find application in the new social conditions, and gradually, the period of childlessness was prolonged. Thus, the share of childless women also dynamically increased, especially in the first half of the reproductive period. These changes were also confirmed by the population censuses from 2001, 2011 and 2021. According to them, the share of childless women first increased to 83% at the age of 20 (2001 census), and according to the 2011 census it already reached almost 90% (Figure 1). However, the share of childless women also increased significantly at other ages. According to the results 2011, almost three-quarters of women remained childless at 25, and at 30, it was slightly more than 40% (Figure 1). However, in the last intercensal period, the situation changed. Slowing down or stopping the process of postponement primarily led to a significant decrease in the dynamics of increasing childlessness. Moreover, slight increase in childlessness almost exclusively affected only the second half of the reproductive period. At the same time, at younger ages (roughly up to the age of 27), it was possible (Figure 2) to identify a slight decrease in childlessness compared to the 2011 Population Census. This phenomenon results from a revival of fertility, which, however, did not occur only in older age groups as a factor of catching up on postponed reproductive intentions but also in these younger and youngest ages (Šprocha and Tišliar, 2022). We can assume that this is a manifestation of the increasing share of women in Slovakia with a specific reproductive strategy of early onset of reproductive paths (e.g. from marginalized Roma communities) within cohorts at the beginning of the reproductive period.

It is also clear from the above overview that in the 1980s, there were essentially no changes to the model and that key shifts in childlessness occurred only in the first two decades of the transformation period. Given the gradually increasing mean age at the birth of the first child from the original level of around 22 years, it is logical that in the 1990s, the share of childless women under the age of 22 increased, and only the first decade of the new millennium brought a dynamization of the increase in childlessness among older women. There was a significant slowdown and some retrograde shifts in the last analysed decade. It can, therefore, be assumed that postponing the birth of first children in the given social, economic and cultural conditions has reached its maximum and, without further changes in external factors, should no longer significantly affect childlessness. The increasing share of childless women under the age of 30 is also closely related to the increase in completed childlessness. However, the resulting level depends not only on the postponement process and, therefore, the increase in the representation of childless women in the first half of the reproductive period but also on the recovery factor. As some special analyses have shown (Potančoková, 2011; Šprocha and Ďurček, 2018; Šprocha, 2022), the situation in Slovakia is not as dramatic when it comes to catching up with firstborn children, and the key factor in declining fertility is primarily the low level of reco-

very of second and subsequent children. That is why we have witnessed only a gradual inter-cohort increase in final childlessness. According to data from the 2021 census, approximately 13% of people were childless at 45, i.e. among women born in the mid-1970s. Given the level of first births at this very advanced reproductive age in Slovakia (see Šprocha and Tišliar, 2022), it can be expected that this value is already a very accurate estimate of final childlessness. For women born in the early 1970s, i.e. in cohorts for which the process of postponing maternity leave began to deepen dynamically, the final childlessness level reached approximately 10%. However, the situation in younger cohorts of advanced reproductive age is more complicated. At 40 (women born in 1980), according to the results of the 2021 population census, the share of childless people was slightly more than 17%, and at 35 (women from the 1985 cohort), it was already almost 25%. Especially in the case of the latter group, a certain reduction can still be expected. However, it is relatively realistic to expect that the final childlessness of these women will be approximately double that of women in the early 1970s. The dynamic increase in the share of childless women of reproductive age, especially in the 1990s and the first decade of the 21st century, is also reflected in the lengthening of the period that these people spend on average without experience of biological motherhood. This aspect of the transformation of reproduction in Slovakia can also be expressed empirically through the average number of years a woman will survive until she reaches the age of 50 (i.e. the end of the reproductive period) as childless (singulate mean age at first birth).

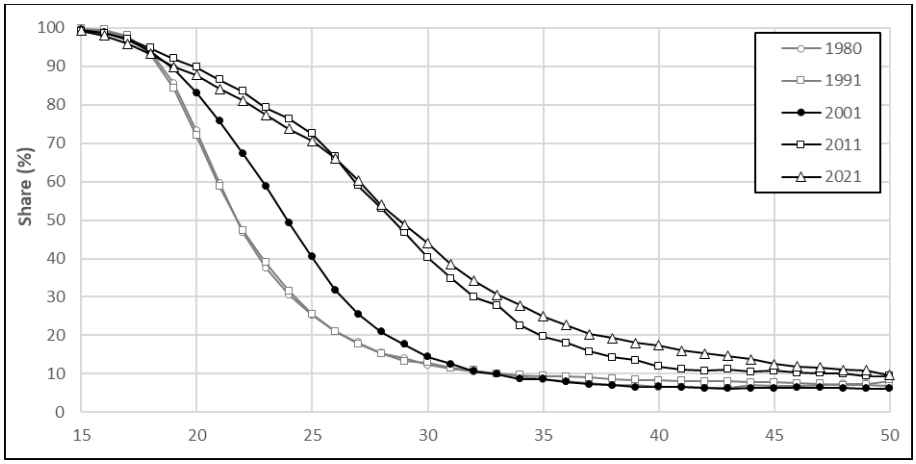

Figure 1 Childlessness of women of reproductive age (15–50 years) in Slovakia between the population censuses 1980–2021. Source: the 1980, 1991, 2001, 2011, 2021 Population Census, author's calculations

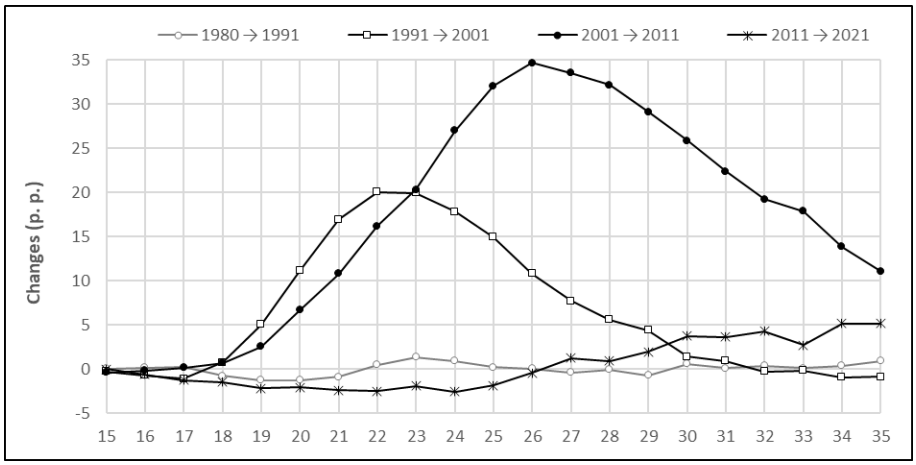

Figure 2 Changes in childlessness among women aged 15–35 in Slovakia between the censuses 1980–2021. Source: the 1980, 1991, 2001, 2011, 2021 Population Census, author's calculations

The early onset of motherhood, which was a typical element of reproductive behaviour in Slovakia in the previous political regime, was also confirmed by the values of SMAFB indicator computed from results of the 1980 and 1991 Population Census. According to the first census, the average number of years lived without experience of motherhood was 22.6 years; in the second, it only slightly increased to a little more than 23.1 years. As mentioned above, in the first decade of transformation, childlessness grew mainly at younger ages, so the SMAFB value in the 2001 Population Census reached approximately 24.5 years. The following intercensal period was crucial for the process, especially the extent of postponement, which was also reflected in the average number of years lived in the childless state. According to data from the 2011 Population Census, this reached 28.4 years (an increase of almost 4 years). The last intercensal period was marked by reduced dynamics of postponement and increased childlessness. Therefore, the SMAFB value increased by only about 0.6 years to less than 30 years. According to the latest available data from the 2021 Population Census, women in Slovakia without experience of motherhood are expected to survive approximately 40% of the total reproductive period (15–49 years) on average. In contrast, in the early 1990s, this was only around a quarter. The results of the differential analysis of childlessness and the timing of the birth of first children from the 2021 census data confirmed the significant influence of women's education. Women with primary education achieved the lowest SMAFB values. Women with secondary education with no graduation followed by a relatively significant gap (about 3.8 years) and women with secondary education with graduation and higher technical education, approximately 4 years later. Women with a university degree survive most of the years of the reproductive period without experience of motherhood. At the same time, it was also true that these people remained permanently childless somewhat more often (Table 1).

Table 1 Singulate mean age at first birth and childlessness at selected ages by women's educational attainment in Slovakia, the 2021 Population Census

Education	SMAFB (years)	Childlessness at age (in %)	
		50	35
Primary	22,2	10,1	13,5
Secondary technical (vocational) (with no graduation)	26,0	8,7	21,3
Complete secondary (with graduation)	29,3	9,6	23,8
Higher vocational and post-secondary	29,1	11,2	24,9
Higher (tertiary)	31,3	14,6	29,1

Source: the 2021 Population Census, author's calculations

Religious affiliation is also an important differentiating factor for the timing of maternity starts in Slovakia. According to the results of the 2021 census, the SMAFB value of religious women was significantly lower than that of women without a religion. However, in terms of childlessness itself, we do not find such apparent differences. In this case, too, the differences increase towards younger cohorts and women without a religion remain childless somewhat more often. If we look more at the individual religious groups, then from Table 2, we find that women of Protestant religious groups become mothers for the first time later on average, while women declaring the Greek Catholic and especially the Orthodox faith achieved lower SMAFB values.

Table 2 Singulate mean age at first birth and childlessness at selected ages by women's religious belief in Slovakia, the 2021 Population Census

Religious belief	SMAFB (years)	Childlessness at age (in %)	
		50	35
with no religious belief	30,9	11,4	32,4
with religious belief	28,5	10,9	23,1
Roman Catholic	28,5	10,7	22,7
Evangelical Church of the Augsburg Confession	29,2	11,9	24,8
Greek Catholic	28,1	10,2	22,9
Calvinist	29,0	10,7	25,3
Orthodox	27,5	10,8	22,4
Other	29,0	15,4	30,0

Source: the 2021 Population Census, author's calculations

On the other hand, differences in the level of final childlessness were negligible. Significant differences do not arise even in younger cohorts, which at the time of the census were in the second half of the reproductive period. Specific differences in the number of years lived without experience of motherhood can also be identified from the perspective of ethnicity. Women declaring Roma ethnicity experience the shortest period without motherhood on average. However, other ethnic groups did not differ significantly from each other. These minor differences can be identified even in the case of final childlessness. Women of Roma ethnicity achieved the lowest share of childless women, while the differences between other ethnicities were within a few percentage points. The differential analysis also provided a similar picture according to the mother tongue (Table 3).

Table 3 Singulate mean age at first birth and childlessness at selected ages by women's ethnicity and mother tongue in Slovakia, the 2021 Population Census

Ethnicity, mother tongue	SMAFB (years)	Childlessness (in %)	
		50	35
Ethnicity			
Slovak	29,3	11,1	25,8
Hungarian	28,9	10,2	25,8
Romani	20,4	5,9	10,7
Ruthenian	31,0	12,7	25,4
Czech, Moravian and Silesian	27,9	7,1	20,0
Other	30,1	13,4	22,2
Mother tongue			
Slovak	29,5	11,2	26,0
Hungarian	28,4	10,3	25,8
Romani	20,2	5,2	7,2
Ruthenian	30,0	11,0	27,4
Czech	27,8	6,6	20,7
Other	29,4	11,7	21,7

Source: the 2021 Population Census, author's calculations

Certain groups of current economic activity have a negative impact on the timing of the birth of the first child and the prevalence of childlessness. These are primarily retired women and, to some extent, working pensioners. Due to their age, these are people with some health handicap or disability who are excluded or whose participation in the labour market is significantly complicated. These problems are also reflected in their relatively high average number of years that they survive as childless, or in the case of retired women, also in significantly above-average final childlessness. In terms of the average time without experience with motherhood, the situation is different for person at home (Table 4). Women at home have the lowest

SMAFB values. However, the situation is atypical in terms of the share of childless women aged 35 and 50. The slightly higher childlessness at the end of reproductive age is probably more a result of the small number in this specific economic group than of real inter-cohort differences in the intensity of first childbearing. Unemployed women also achieved lower SMAFB values than working women. However, we do not observe differences in final childlessness between them. However, in this case, the situation changes radically towards younger cohorts, and the differences in childlessness increase significantly. It is also true that working women are characterised by higher childlessness.

Table 4 Singulate mean age at first birth and childlessness at selected ages by women's current economic activity in Slovakia, the 2021 Population Census

Current economic activity	SMAFB (years)	Childlessness (in %)	
		50	35
Working	32,7	9,9	35,4
Working pensioner	34,3	10,3	44,3
Unemployed	28,0	9,81	19,9
Person at home	19,8	11,5	6,9
Pensioner	35,9	25,9	63,8

Source: the 2021 Population Census, author's calculations

The urban environment represents a space in which women in Slovakia have been having children later in life (Šprocha and Tišliar, 2016). The results of our analysis also confirmed this. According to the results of the 2021 census, the average number of years that women in cities spend without children is almost 30 years, while in rural municipalities, it is more than 2 years less. These differences are subsequently reflected in the level of childlessness as well. At the end of reproductive age, it is women living in urban areas who remain permanently childless somewhat more often. Towards younger cohorts, it appears that the differences in childlessness could deepen between these groups. The results for the size groups of municipalities are also closely related to this. As shown in Table 5, in the largest cities, especially those with 20,000 or more inhabitants, the average number of years spent without children exceeded average values. In small municipalities with up to 5 thousand inhabitants, however, we do not find any major differences between the individual size groups. This is also largely true of final childlessness, which in cities with more than 100,000 inhabitants reached more than 15%. Our findings also confirmed potential divergence tendencies towards younger age groups, as we again identify a relatively significant increase in childlessness, especially in the largest cities.

Several previous analyses (e.g. Jurčová et al. 2006, 2010; Katuša and Šprocha, 2012; Bleha et al. 2014) confirm the persistence of relatively significant spatial differences in the timing of the birth of first children. Our results also demonstrated it. On average, women in the Prešov and Košice regions experienced the shortest

period without experience with biological motherhood. The situation is opposite in the Bratislava region, where the SMFB value was almost 2.7 years higher, according to the 2021 Population Census (Table 6). It is also likely related to the higher overall rate of final childlessness.

Table 5 Singulate mean age at first birth and childlessness at selected ages by women's size group and type of residence in Slovakia, the 2021 Population Census

Size group, type of residence	SMAFB (years)	Childlessnes at age (%)	
		50	35
Size group of municipalities			
-500	28,2	11,1	22,4
500 - 999	28,0	10,0	21,4
1000 - 1999	28,1	9,5	21,0
2000 - 4999	27,7	9,3	20,6
5000 - 9999	28,6	9,5	22,9
10000 - 19999	29,1	8,9	24,5
20000 - 49999	29,9	10,4	27,1
50000 - 99999	30,4	11,8	28,3
100000 and more	30,8	15,3	32,5
Type of residence			
Urban	29,92	11,5	28,2
Rural	27,88	9,67	20,8

Source: the 2021 Population Census, author's calculations

Table 6 Singulate mean age at first birth and childlessness at selected ages by women's region of permanent residence in Slovakia, the 2021 Population Census

NUTS3 region	SMAFB (years)	Childlessness at age (in %)	
		50	35
Bratislavský	30,4	14,4	30,1
Trnavský	29,3	9,9	24,3
Trenčiansky	29,8	10,2	24,6
Nitriansky	29,6	10,3	25,0
Žilinský	29,2	10,2	23,3
Banskobystrický	28,6	9,8	25,2
Prešovský	27,7	10,3	21,9
Košický	27,7	10,0	23,4

Source: the 2021 Population Census, author's calculations

On the other hand, its level in other regions of Slovakia was very similar and oscillated around the 10% mark. At age 35, potential differences in the shares of childless women increased between regions. Once again, the Bratislava region achieved the highest representation. Lower values were found primarily in the Prešov region (Table 6), which has generally been characterised by the highest fertility rates in Slovakia for a long time (Katuša and Šprocha, 2012; Bleha et al., 2014).

5 CONCLUSION

The process of postponing maternity starts in Slovakia represents one of the key transformational features of the reproductive behaviour of young generations entering reproductive age after 1989. Its main effects include a relatively sharp increase in the share of childless women, especially in the first half of reproductive age, and thus the extension of the period of childlessness. It was also confirmed by our analysis of data from the 1980–2021 population censuses. However, as inter-census changes in the representation of childless women have shown, this process has not occurred with the same dynamics in the last three decades. This shift was most intensely reflected in the birth of first children in the 1990s, particularly in the first decade of the 21st century. However, in the last decade, we have already observed a significant slowdown in postponement. Moreover, in connection with a certain revival of fertility at a young and very young age, there has even been a slight decrease in the share of childless women in these age groups. So far, the postponement of childbearing has had only a limited impact on final childlessness. It is important to note that at the end of the reproductive period, there are still women (cohorts from the late 1960s and early 1970s) for whom changes in the timing of childbearing began in the first half of the 1990s. Their average age at the birth of their first child was still relatively low. However, childlessness is increasing quite significantly towards younger cohorts. Even though these women still have a certain part of their reproductive period ahead of them, it can be assumed, given the identified share of persons without experience of motherhood, that final childlessness will continue to grow in Slovakia between cohorts and could reach or even exceed the 20% mark. The process of postponing the birth of first children has also been confirmed empirically through the SMAFB indicator. The average number of years of life that a woman in Slovakia will live without children between the 1991 and 2021 censuses increased from approximately 23 years to almost 30 years. As mentioned, the 1990s and the first decade of this century was crucial for this development. The concept of the population census, in general, represents an irreplaceable source of data for differential analysis in Slovak conditions. The combination of data on realised fertility with age and selected structural variables (education, ethnicity, religious beliefs, current economic status, and place of residence) confirmed the existence of significant differences in timing, final childlessness, and potential childlessness in younger cohorts. In general, it can be said that on average, the lowest number of years women in Slovakia will survive as childless persons with the lowest education, Roma ethni-

city and mother tongue, person at home, with religious belief (mainly Orthodox and Greek catholic), living in rural municipalities, municipalities with 2000 – 4999 inhabitants, with place of residence in Prešov and Košice region. These persons also had lower final childlessness rates more often. At the same time, however, it was confirmed that more significant differences in childlessness between individual groups only emerged in younger cohorts, i.e., groups more significantly affected by postponing childbearing. The opposite situation – i.e. the highest values of SMAFB and, to a greater extent, also final childlessness – was registered among persons with tertiary education, pensioners and working pensioners, with no religious belief, Ruthenian ethnicity and mother tongue, living in the Bratislava region and largest cities (100 thousand and more inhabitants).

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Časovanie rodenia prvých detí a bezdetnosť na Slovensku vo výsledkoch sčítania obyvateľov 2021

Summary

Model skorého a takmer univerzálneho materstva nenašiel v nových spoločenských, hospodárskych, kultúrnych a politických podmienkach po roku 1989 na Slovensku svoje miesto. Generácie žien narodené od konca 60. rokov začalo z jeho pomerne dynamickou transformáciou, ktorej kľúčovým znakom sa stalo odkladanie rodenia prvých detí do vyššieho veku. S predlžovaním obdobia bez skúseností s materstvom bolo spojené aj rastúce zastúpenie bezdetných osôb najmä v prvej polovici reprodukčného obdobia. Otázkou však zostáva, či a ako sa bezdetnosť zvyšovala na jeho konci, teda u žien, ktoré s touto transformáciou v prvej polovici 90. rokov začínali. Nemenej dôležitou je tiež otázka, či medzi určitými populačnými podskupinami existujú signifikantné diferencie v načasovaní rodenia prvých detí a tým aj potenciálnej bezdetnosti, a to aj napriek prevládajúcemu modelu odkladania materských štartov v slovenskej populácii.

Na uvedené otázky sme sa snažili odpovedať prostredníctvom špecializovanej analýzy výsledkov posledného sčítania obyvateľov z roku 2021. Pre širšie zarámcovanie celkových zmien (a ich intercenzálnej dynamiky) v časovaní rodenia prvých detí a úrovne bezdetnosti na Slovenska však boli využité aj údaje zo starších sčítaní obyvateľov 1980 – 1991. Na základe kombinácie zastúpenia bezdetných žien podľa veku bol konštruovaný syntetický indikátor časovania známy ako SMAFB. Ten udáva priemerný počet rokov, ktoré osoba prežije ako bezdetná do dovŕšenia 50. roku života. Uvedený metodický prístup sme aplikovali aj pri diferenčnej analý-

ze. Jej cieľom bolo identifikovať prípadné rozdiely v časovaní a úrovni bezdetnosti vo veku 35 a 50 rokov vo vybraných populačných podskupinách. Konkrétne sme pracovali so vzdelaním, etnicitou, materským jazykom, súčasným ekonomickým statusom a náboženstvom žien. Z priestorového hľadiska bola diferenčná analýza aplikovaná na veľkostné skupiny obcí, dichotomické rozdelenie mestské a vidiecke obce a kraje Slovenska.

Z hľadiska dynamiky zmien časovania a bezdetnosti získané výsledky upozornili, že proces odkladania na Slovensku neprebiehal v posledných troch desaťročiach s rovnakou dynamikou. Najintenzívnejšie zmeny bolo možné identifikovať v 90. rokov a predovšetkým v prvej dekáde 21. storočia. Posledné intercenzálne obdobie prinieslo nielen útlm, ale v mladších vekoch dokonca bolo možné pozorovať aj určité zníženie bezdetnosti. Toto retrográdne smerovanie bolo výsledkom určitého oživenia rodenia detí práve u najmladších žien na Slovensku.

V spojitosti s údajmi o konečnej bezdetnosti síce môžeme konštatovať jej medzigeneračne rastúci trend, no tento proces bol zatiaľ pomerne málo dynamický. V tomto kontexte je však potrebné si uvedomiť, že vo veku 45 – 54 rokov sa v čase sčítania 2021 nachádzali skupiny žien, ktoré na začiatku 90. rokov len s procesom odkladania materských štartov začínali. Preto ich bezdetnosť v mladom veku nedosahovala ani zďaleka také vysoké hodnoty, ako je tomu u žien narodených 80. rokoch. U mladších generácií sa bezdetnosť signifikantne zvyšuje. Aj keď ide vzhľadom na ich vek zatiaľ len o predbežné údaje, intercenzálny nárast vo veku 35 rokov signalizuje, že potenciálna konečná bezdetnosť by na Slovensku mohla dosahovať alebo aj prekračovať hranicu 20 %.

Proces odkladania rodenia prvých detí, ako aj jeho rozdielnu dynamiku v 90. rokoch, v prvej a druhej dekáde 21. storočia potvrdil aj indikátor SMAFB. Priemerný počet rokov života, ktoré žena na Slovensku podľa tohto ukazovateľa prežije ako bezdetná, medzi sčítaniami obyvateľov z rokov 1991 a 2021 vzrástol z približne 23 na takmer 30 rokov. Kľúčovým pre tento vývoj boli 90. roky a predovšetkým prvá dekáda nového milénia.

Z hľadiska diferenčnej analýzy sa ukázalo, že v priemere najkratšiu fázu bezdetnosti môžeme identifikovať u žien so základným vzdelaním, deklarujúcich rómsku národnosť alebo materinský jazyk, veriacich, hlásiacich sa ku pravoslávnej alebo gréckokatolíckej viere, u osôb v domácnosti, žijúcich vo vidieckom prostredí, ale skôr vo väčších vidieckych obciach (s 2000 – 4999 obyvateľmi) a majúcich trvalý pobyt v Prešovskom a Košickom kraji. Aj keď diferencie v úrovni konečnej bezdetnosti neboli až tak výrazné, predsa sa len dá konštatovať, že tieto skupiny sa vyznačovali pri určitom zovšeobecnení aj nižším podielom bezdetných. Z vývojového hľadiska získané výsledky tiež naznačili, že smerom k mladším generáciám by mohlo dôjsť k určitému prehlbovaniu rozdielov čiastočne potenciálny ako dôsledok rozdielnej dynamiky a rozsahu procesu odkladania materských štartov.

Naopak najvyššie hodnoty SMAFB, ako aj vyššia bezdetnosť je podľa našich výsledkov spájaná najmä so ženami s vysokoškolským vzdelaním, rusínskej národnosti a materinského jazyka, dôchodkýň a pracujúcich dôchodkýň, bez náboženského vyznania, ako aj osôb žijúcich v mestskom prostredí, obzvlášť v najväčších mestách Slovenska a majúcich trvalé bydlisko v Bratislavskom kraji.