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THE ONGOING TRANSFORMATION OF FAMILY AND REPRODUCTIVE BEHAVIOUR IN BRATISLAVA AND ITS HINTERLAND[1)]

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Abstract

The transformation of family and reproductive behaviour in Slovakia has significantly impacted not only the population of the largest cities since the 1990s and has also gradually given rise to key changes in smaller towns and rural municipalities, regardless of their size or region. Notable changes include a significant decrease in the rates of marriage and motherhood, an increase in the divorce rate, a tendency to marry and become parents at older ages, and a growing proportion of children born out of wedlock. These trends represent the new model of family and reproductive behaviour in urban areas and their suburbs. However, a comprehensive analysis of these changes over time, with a primary focus on the differences between Slovakia's largest city and its suburbs, has not been extensively developed. Although these trends have been observed in both urban and suburban populations, can we assume that there are differences in the dynamics of these trends and the extent of their spread as well as contrasting behaviours between the largest city and its suburb. Or, given the advanced stage of transformation, are we witnessing convergence in the intensity and timing of family and reproductive behaviours, suggesting that urban and suburban populations are becoming more alike. We aim to address these questions through a detailed analysis of key indicators related to fertility, marriage, and divorce. This study examines the characteristic features of family and reproductive behaviour among the populations of the largest city in Slovakia and its suburban area from the mid-1990s to 2023. The results will help identify potential differences and their development over time.

Keywords: Bratislava city, hinterland, fertility, marriage, divorce rate, mean age at first marriage, mean age at birth of first child, share of extramarital births

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INTRODUCTION

The last three decades have brought several dynamic and, in many ways, historically unique changes in family and reproductive behaviour in Slovakia. Among the most important phenomena are a significant decline in the intensity of marriage and fertility, their stabilisation at relatively low levels

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(*Fiala et al.*, 2018; *Vaňo et al.*, 2001; *Šprocha – Tišliar*, 2018, 2022), the postponement of marriage and maternity starts (*Šprocha*, 2016, 2021; *Šprocha – Ďurček*, 2018), and the disconnection between married life and childbearing (*Šprocha*, 2015; *Šprocha – Tišliar*, 2021). We are witnessing the more frequent occurrence of various alternative forms of couple cohabitation (*Džambazovič – Šprocha*, 2017; *Pilinská et al.*, 2005; *Mládek – Širočková*, 2004) and, until recently, a growing and relatively high level of legislative marriage dissolution (*Šprocha*, 2021). In general, we can say that in the new social, political, cultural, and economic conditions, the socialist model of reproduction (*Monier – Rychtaříková*, 1992; *Džambazovič*, 2022) did not take hold and was abandoned rather quickly in the cohorts of persons born from the end of the 1960s onwards (*Potančoková*, 2011; *Potančoková et al.*, 2008; *Šprocha*, 2023; *Šprocha – Ďurček*, 2018). Although these transformation patterns can be observed not only at the national level, several analyses (e.g., *Bleha et al.*, 2014; *Jurčová – Mészáros et al.*, 2010; *Šprocha et al.*, 2019) have indicated that significant regional differences persist in the intensity and timing of family and reproductive behaviour. As some specific articles on fertility have suggested (*Ďurček – Šprocha*, 2017, 2019), these differences can still be observed between urban centres and their hinterlands.

The more anonymous environments of cities, especially the largest cities, have long been perceived as areas where new reproductive patterns emerge and spread more quickly and easily (*Andorka*, 1982; *Livi-Bacci*, 1986; *Sharlin*, 1986; *Kulu*, 2013; *Kulu – Vikat*, 2017). In the sense of *Casterline et al.* (2001), urban centres often act as sites from which innovations – in our case, new patterns of familial and reproductive behaviour – spread further in space. In the context of diffusion theory (*Hägestrand*, 1967; *Haggett*, 2001), this should occur either through so-called neighbourhood diffusion, where new patterns are successively adopted by geographically proximate spatial units, or through hierarchical diffusion, that is, by leapfrogging from hierarchically higher to hierarchically lower territories. Because of the close connection between the centre, in this case Bratislava, and its hinterland through daily commuting flows to work, and because Bratislava represents the largest city in Slovakia, both principles of the diffusion of innovations can be assumed to apply. *Haggett and Cliff* (2005) confirmed that both forms inherently apply in the diffusion of any innovation. Available analyses (*Bleha et al.*, 2013; *Šprocha et al.*, 2017) suggest that Bratislava's population is pioneering in terms of the onset of changes in reproduction and heralds new trends that gradually spread to other cities and regions in the Slovak Republic. However, a detailed analysis comparing the evolution of the main demographic processes of family and reproductive behaviour (marriage, divorce, fertility) in Bratislava as a centre and in the municipalities in its hinterland since the beginning of the 1990s has not, to the best of our knowledge, been carried out to date. This is the main aim of this article. Such analysis also directly involves identifying the main trends in the intensity and timing of marital starts, childbearing, and divorce and attempting to answer whether and how any differences between Bratislava (the centre) and its hinterland have evolved. We can then assume that if the diffusion pattern of changes in family and reproductive behaviour is fulfilled, then there should be a convergence between the centre (Bratislava) and its hinterland.

A DEFINITION OF POPULATIONS ANALYSED, THE DATA, AND THE METHODOLOGY

To define Bratislava as the centre (core) and to demarcate its hinterland, we rely on the concept of functional city regions (e.g., *Bezák*, 1990; *Halás et al.*, 2014), and specifically a modified form of the concept based on daily commuting, as proposed by *Halás et al.* (2014). *Halás et al.* (2014) state that a functional region is defined by spatial flows or the interactions that are maximised within that area. Flows across the boundaries of an area thus defined are minimised in order to satisfy the principle of internal coherence and external enclosure (*Karlsson – Olsson*, 2006). As already indicated, daily flows to employment formed the basis for delineating the centre and the hinterland in this study. Indeed, daily flows to employment are the most numerous and, simultaneously, the most stable regular population movements with a daily periodicity (*Halás et al.*, 2014). Functional commuting regions

defined on this basis are suitable for use in detailed labour market analyses, as well as in demographic and socioeconomic analyses or forecasts (*Halás et al*., 2014).

Applying the classification of Slovak municipalities proposed by *Halás et al*. (2014), we identify two subgroups of population units that align with the objectives of our paper. The first is formed by all the urban districts of Bratislava, which together constitute the core (centre). The second is made up of the non-Bratislava municipalities identified based on daily commuting, which form the hinterland (or suburb) of the core (the city of Bratislava).

A particular limitation is the fact that this research aims to cover a longer period of time, during which there were changes not only in demographic behaviour but also in the intensity and directions of daily commutes (*Halás – Klapka*, 2020, 2024). While according to Bezák's analysis (*Bezák*, 2014), the Bratislava functional urban region, defined based on data from 1991 and 2001, was not characterised by significant deviations in spatial definition, some more recent works (*Halás – Klapka*, 2020, 2024) have pointed to specific differences. These differences may be the result not only of changes in daily commutes but also of the modified methodology and method used to distinguish functional urban regions (see *Halás – Klapka*, 2024). However, this would significantly complicate the possibility of the mutual comparability of the selected population units (centre and hinterland). Therefore, we decided to work with a uniform definition of the centre and the hinterland of the Bratislava functional urban region, based on the aforementioned work by *Halás et al*. (2014).

The data sources are the anonymised primary databases of the Statistical Office of the Slovak Republic (SOSR) on marriages, divorces, and births in Slovakia, obtained from the annual collection of data on the natural and migratory movement of the population. This data collection covers all demographic events that were recorded on the territory of Slovakia. All records of demographic events involving persons with permanent residence in the Slovak Republic are the subject of further processing by the SOSR. These data were available for our purposes from 1992 to 2023. The number of events in the demographic processes analysed are presented in the following table.

Figure 1: The functional urban region of Bratislava: a definition of the centre and the hinterland

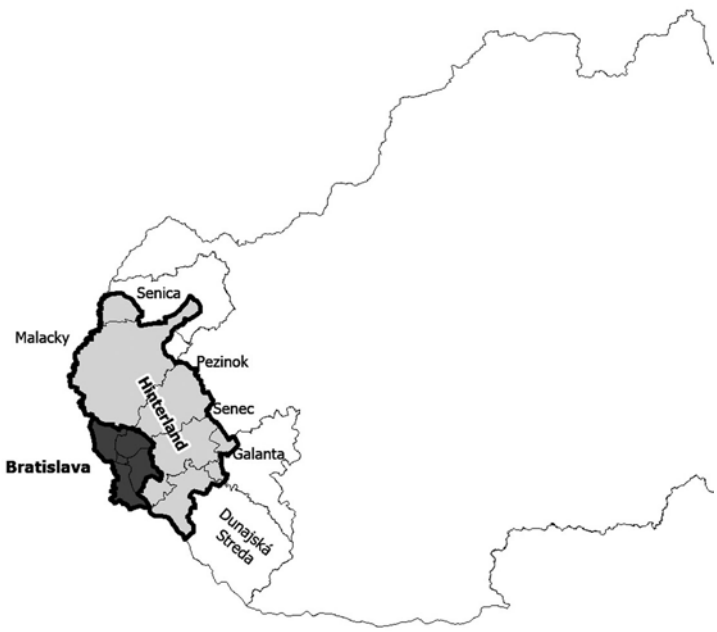


Table 1: Number of demographic events and their maximum and minimum in Bratislava and the Bratislava hinterland in the years 1992–2013

	Divorces	Marriages (males)	Marriages (females)	Live births
Bratislava				
Total	34,553	61,454	60,630	142,269
Minimum	654	1,473	1,507	3,139
Maximum	1,415	2,480	2,400	5,684
Hinterland				
Total	16,004	31,548	31,094	82,464
Minimum	291	786	756	1,689
Maximum	658	1,308	1248	3,372

Source: SOSR, author's calculation.

The age structure of males and females at the municipal level was also required in order to calculate the intensity and timing indicators. For the period from 1992 to 1995, we worked with data from the internal database of the Demographic Research Centre (DRC). We covered the period from 1996 to 2023 using freely available data from the SOSR DATAcube database.[3)]

The intensity of the demographic processes analysed is expressed through age-specific measures. In the case of first marriage rates, these are constructed (for men and women separately) using the following formula:

$$m_x^s = \frac{M_x^s}{P_x} \tag{1}$$

where

- m_x^s is the marriage rate of single men or women aged (x),
- M_x^s is the number of marriages of single men or women aged (x),
- P_x is the number of males or females aged (x) at the middle of the calendar year (1.7.).

Summing these rates for the 16–49 age interval yields the cumulative total marriage rate (TMR^S), expressing the average number of first marriages that would occur per man or woman by the end of their reproductive period:[4)]

$$TMR^s = \sum_{x=16}^{49} m_x^s \tag{2}$$

Similarly, we obtain age-specific fertility rates with the following formula:

$$f_x = \frac{B_x}{P_x} \tag{3}$$

while we also separately construct the fertility rate of first births:

$$f_x^{I.} = \frac{B_x^{I.}}{P_x} \tag{4}$$

Summing the fertility rates for ages 12–49[5)] yields the total fertility rate, indicating the average number

3) Available at https://datacube.statistics.sk/.

4) The first marriage rate is the dominant aspect of the overall marriage rate. Since its level at age 50+ is minimal, we restrict ourselves to the female reproductive period. Moreover, it is the changes and possible differences in the intensity of marriage in the reproductive period that may be an important determinant of possible changes and differences in the intensity and timing of fertility.

5) The age of 12 years is the lowest age at which a live-born event has been registered in Slovakia.

of live births that would be born to a woman by the end of her reproductive years at the observed fertility level:

$$TFR = \sum_{x=12}^{49} f_x \tag{5}$$

The divorce rate (in our case for men) is constructed analogously:

$$d_x = \frac{D_x}{P_x} \tag{6}$$

From it, the total divorce rate of marriages is calculated, representing the average number of divorces per man:

$$TDR = \sum_{x=16}^{\omega-1} d_x \tag{7}$$

ω is the age at which no one gets divorced anymore.

The timing of selected demographic processes was analysed using:

1) the mean age at first marriage (for men and women separately)

$$MAM = \frac{\sum_{x=16}^{49} m_x^s \,.\, (x+0{,}5)}{\sum_{x=16}^{49} m_x^s} \tag{8}$$

2) the mean age at divorce (for men and women separately)

$$MAD = \frac{\sum_{x=16}^{\omega-1} d_x \cdot (x+0{,}5)}{\sum_{x=16}^{\omega-1} d_x} \tag{9}$$

3) the mean age at first birth (for women only)

$$MAFB = \frac{\sum_{x=12}^{49} f_x^{I.} \,.\, (x+0{,}5)}{\sum_{x=12}^{49} f_x^{I.}} \tag{10}$$

In addition, for marriage and fertility, we analysed the realised marriage and fertility rates among people under age 25 and among people aged 30 and over:

$$pTMR_{<25}^{s} = \frac{\sum_{x=16}^{24} m_x^s}{\sum_{x=16}^{49} m_x^s} \cdot 100 \tag{11}$$

$$pTFR_{<25} = \frac{\sum_{x=12}^{24} f_x}{\sum_{x=16}^{49} f_x} \boxtimes 100 \tag{12}$$

$$pTMR_{\geq 30+}^{s} = \frac{\sum_{x=30}^{49} m_x^s}{\sum_{x=16}^{49} m_x^s} \cdot 100 \tag{13}$$

$$pTFR_{\geq 30+} = \frac{\sum_{x=30}^{49} f_x}{\sum_{x=16}^{49} f_x} \cdot 100 \tag{14}$$

THE BASIC GEO-DEMOGRAPHIC CHARACTERISTICS OF THE ANALYSED POPULATIONS

The centre of the Bratislava functional urban region consists of a total of 17 urban districts, which, according to the results of the last population census in 2021, had 475 500 inhabitants. The hinterland is made up of 95 municipalities located in a semicircular around Bratislava (Figure 1) in the districts of Malacky, Senec, Pezinok, and Dunajská Streda. According to the 2021 Population Census, almost 290 000 inhabitants lived in these municipalities.

From the perspective of the demographic structure of the adult population of both analysed subpopulations, we can see that in the hinterland there are more married people among both men and women (Table 2), while there are fewer divorced and (especially among women) single people. We find relatively significant differences between subpopulations in terms of education. This is mainly due to the significantly higher share of people with university education in the centre of the Bratislava functional urban region (Table 2). We also find a higher degree of secularisation among the population in the capital city, while the hinterland population is dominated by members of the Roman Catholic Church. Conversely, differences in the structure of the adult population according to current eco nomic activity are almost negligible, and it is worth

Table 2: Selected demographic characteristics of the adult population (15 years and over) of Bratislava and the Bratislava hinterland according to the results of the 2021 population census

Indicator	Bratislava		Hinterland		Indicator	Bratislava		Hinterland	
	Males	Females	Males	Females		Males	Females	Males	Females
Ethnicity (%)					Religion (%)				
Slovak	83.4	87.2	80.8	83.0	Roman Catholic	33.1	42.1	50.4	58.5
Hungarian	2.9	3.2	12.9	13.0	Other	10.1	10.1	9.4	9.1
Other	4.3	3.5	2.8	2.5	No religion	46.5	40.9	33.6	28.1
Education (%)					Family status (%)				
Primary	7.0	7.7	11.9	15.3	Single	37.3	30.9	36.2	27.9
Secondary without general certificate	13.4	9.5	25.6	16.2	Married	47.4	43.1	51.5	49.5
Secondary with general certificate	29.9	26.6	33.8	29.7	Divorced	10.4	14.0	8.9	10.7
Tertiary	41.6	44.7	23.1	28.5	Widowed	2.7	10.9	2.5	11.5

Source: SOSR, author's calculation.

mentioning the overall very low share of unemployed people (Table 2) in both subpopulations. We also find only minimal differences in the structure according to nationality. People of Slovak nationality clearly predominate. A more detailed analysis reveals that in the centre the ethnic structure of the rest of the population is more diverse. At the same time, people of Hungarian nationality make up a significant share in the hinterland, mainly thanks to the municipalities located in the southwest (Table 2).

Potentially critical factors in the transfer and diffusion of new reproductive behaviour from the centre to the hinterland are migration and, in particular, the suburbanisation process of moving people from the capital to its adjacent rural municipalities. The influence of internal migration and suburbanisation have been elaborated in several studies (*Podolák – Šveda*, 2019; *Novotný – Pregi*, 2017, 2019), which also highlighted some specifics, such as migration selectivity in terms of age and education (*Novotný – Pregi*, 2017, 2019). Examining the analysed period we can clearly see that the hinterland of the Bratislava functional urban region showed a positive migration balance as a result of mutual migration with its centre. Moreover, the total volume of migration gains increased over time from fewer than 500 persons per year to more than 2000 persons per year. In the last decade, the hinterland's migration gains have been relatively stable at the level of 2000–2500 persons per year. Over the course of more than three decades this has amounted to a total of almost 55 000 people.

The average age of people moving from Bratislava to its hinterland was slightly lower (30 years) than the average age than the average age of people moving in the opposite direction (32 years). This difference was primarily caused by a higher proportion of children (26% vs. 19%) moving from the city to the hinterland. On the other hand, two-thirds of all migrants to the centre of the Bratislava functional urban region were people of reproductive age, while not even half of those migrating in the opposite direction were. Since it is mainly migrants of a certain age who can influence reproductive and family behaviour, in the following analysis we will limit ourselves to the age range of 15–49 years. It turns out that more young people of reproductive age moved to Bratislava from its hinterland, who were more often single (and therefore probably childless), while, conversely, while, conversely, the majority of those who moved in the opposite direction were married people. We can assume that these were more often married couples trying to solve their housing situation and young families with small children who migrated to the hinterland. These are groups who could

have strengthened some of the characteristics of reproductive and family behaviour in the hinterland, such as higher fertility and marriage rates and a lower share of children born out of wedlock. Conversely, flows in the opposite direction were more often made up of younger people without family obligations and focused on finding a job on the labour market and a career, who, by contrast, could have had an effect in terms of postponing family transitions and reducing the marriage and fertility rates. The educational differentiation of migrants could also have played an important role in the potential diffusion of new patterns of family and reproductive behaviour from the centre to the hinterland. However, as a detailed analysis showed, we do not find any significant educational differences in the monitored period. In both migration flows, we find essentially balanced shares of migrants with secondary education with a general certificate (43% from the centre to the hinterland, 45% from the hinterland to the centre) and with tertiary education (36% and 38%, respectively).

THE THEORETICAL BACKGROUND OF POSSIBLE DIFFERENCES IN FAMILY AND REPRODUCTIVE BEHAVIOUR BETWEEN THE CENTRE AND THE HINTERLAND

Two theoretical frameworks generally explain ongoing transformational changes in family and reproductive behaviour.

Traditionally, geodemography has focused on the differences in reproductive and family behaviour between urban and rural populations. However, as *Kulu et al.* (2007) point out, although urban-rural disparities may be narrowing over time, there are still some differences between different types of settlements. For example, fertility rates are high in rural areas, small towns, and suburbs, but low in large cities and metropolitan regions (*Campisi et al.*, 2020; *Kulu*, 2013; *Kulu – Washbrook*, 2014).

Until recently, relatively little attention was paid to analysing the differences in demographic behaviour between metropolitan areas, large cities, and their suburbs. It is only in the first decade of the 21st century that more comprehensive efforts have been made to analyse these differences and search for their causes (e.g. *Kulu*, 2013; *Kulu – Boyle*, 2009; *Kulu – Vikat*, 2007; *Kulu – Washbrook*, 2014; *Rieder – Beaujouan*, 2024). However, it can generally be said that in most cases attention was paid to the fertility process. In contrast, other demographic processes associated with family behaviour remained outside of scientific interest.

From the perspective of the spread of demographic changes after 1989 in post-socialist countries, we can talk about the importance of two main explanatory groups of factors. The first emphasises the importance of structural (socioeconomic) factors. In the sense of *Frejka* (2008), it can be assumed that the 1990s, in particular, brought about a marked discontinuity and a general deterioration in living conditions, which was reflected in a rapid decline in marriage and fertility rates. In the next phase of the transition from a centrally controlled economy to a market economy, according to *Frejka* (2008), the socioeconomic determinants associated with a market economy, such as the need for higher education, the insecurity of young people in the labour market, flexibility, etc., become more significant.

The second theoretical framework postulates that changes in values and norms are the primary factors driving the transformation of family and reproductive behaviour in post-socialist countries (e.g. the theory of the second demographic revolution; *van de Kaa*, 1987; *Lesthaeghe*, 2010). These should lead to a departure from traditional forms and the acceptance of new forms of family behaviour, an emphasis on self-fulfilment, and individualism.

In line with the information mentioned above, it is important to note that large cities and especially metropolitan areas have been described by several authors (*Lesthaeghe*, 2010; *Valkonen et al.*, 2008; *Walford – Kurek*, 2016) as the forerunners of changes in family and reproductive behaviour. This is due to the rapid spread of more flexible new norms and attitudes towards the family and non-marital couple cohabitation, while in rural areas traditional family patterns and behaviour have prevailed for a more extended period since the onset of transformational changes (*Riederer – Beaujouan*, 2021).

To explain in more detail the different reproductive behaviour of the population of cities and suburban areas, we have three explanatory frameworks (*Kulu*

– *Boyle*, 2009; *Kulu – Washbrook*, 2014). First, the compositional theory posits that the primary factor behind differences in family and reproductive behaviour lies in the distinct characteristics of the people residing in cities as opposed to suburban areas. Bratislava should therefore be characterised more by aspects such as a higher level of educational attainment, a higher degree of secularisation, a more homogeneous ethnic composition, higher economic activity, and, conversely, a lower unemployment rate, employment in the tertiary sphere, or certain demographic characteristics (a higher proportion of never-married, elderly persons, etc.) gain greater significance. Other characteristics closely linked to this include a longer period spent studying and preparing for a profession, which are not compatible with undertaking long-term commitments, including marriage and motherhood (*Baizán et al.*, 2003; *Blossfeld – Huinink*, 1991). The prolongation of study and the associated postponement of entry into the labour market and of economic and residential independence (*Kohler et al.*, 2002) must be viewed in the broader context of transforming life trajectories on the road to adulthood. We are witnessing a significant delay in entry into adulthood, the postponement of transitions in the life course trajectory, and increasing variability in terms of the timing, arrangement, and content of these transitions (*Arnett*, 2004; *Elzinga – Liefbroer*, 2007). In this regard, *Džambazovič* (2018) adds that a longer and more complex period of transition into adulthood can be interpreted as a quest for responsibility and a need to take all the steps necessary to be sufficiently prepared for the expectations associated with adulthood. Additionally, it highlights the growing trend of individualism, in which the emphasis is on personal freedom and independence. Equally important is the identified transition from a linear to a cyclical life course, which provides multiple opportunities for reconstituting life, family, and career transitions (*Džambazovič*, 2018, 2022). The transition to adulthood is becoming increasingly complex and life trajectories are more turbulent (*Aasve et al.*, 2007; *Chaloupková et al.*, 2010). *Mills and Blossfeld* (2005) note that young people face increasing uncertainty on the road to adulthood, which leads to the postponement of long-term commitments, such as marriage and motherhood. This process is more evident in urban areas in Slovakia (*Bleha et al.*, 2020; *Šprocha – Bleha*, 2021), particularly in the largest cities (*Bleha et al.*, 2020). Therefore, we can assume that the process of achieving adult status is more complicated and turbulent in the largest cities than in their hinterland.

Contextual theory emphasises factors directly related to the nature of the living space and the society in which individuals reside. Suburban areas offer better environments for families, such as larger homes with gardens and green spaces (*Vobecká – Piguet*, 2012). Childcare and education are significantly more expensive in the largest cities (*Kulu*, 2013). Young people in suburban areas are more often surrounded by families with children. They are influenced by local norms and attitudes, which may also influence family planning among migrants from urban areas (*Kulu – Boyle*, 2009). This residential context may therefore affect the family and reproductive intentions of the population in suburban areas regardless of their socioeconomic characteristics (*Kulu – Boyle*, 2009).

The third important factor is selective migration. People planning to start a family or expecting a child and families with young children more often decide to move from large cities to suburban areas, which better suit the needs and activities of their children and are still close to the opportunities that the city offers (*Kulu – Boyle*, 2009; *Kulu – Washbrook*, 2014). Residential autonomy, an important prerequisite for entering marriage (or at least couple cohabitation), is more difficult to achieve in metropolitan areas than in rural hinterlands (*Šveda – Výbošťok*, 2020). Migration from the city to suburban areas is not linked to the direct experience of living in this environment but is prompted by decisions regarding family and reproductive intentions (*Kulu – Vikat*, 2007). People planning to start a family are more likely to migrate to the hinterland. In contrast, people who do not have plans to start a family in the coming years and are focusing more on building a career are more likely to move to larger cities (*Kulu – Boyle*, 2009).

The universality of the main transformational features in family and reproductive behaviour has led some authors (e.g. *Coleman*, 2002; *Wilson*, 2001; *Dorius*, 2008) to assume that there has been a narrowing of differences and thus a convergence of countries in terms of demographic behaviour.

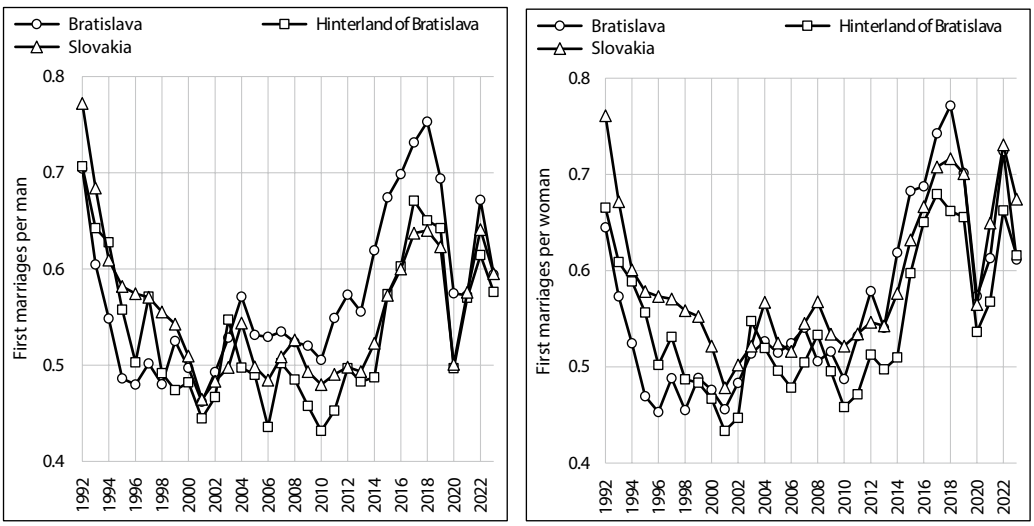
However, as *Billari and Kohler* (2002) and *Hank* (2001) argue, it can be assumed that the main differences are likely to remain, especially at the regional level. This assumption is explained by the persistence of significant historically formed cultural and normative differences, the influence of which is expected to outweigh socioeconomic determinants (*Lesthaeghe – Neels*, 2002). *Basten et al.* (2012) speak in this sense of potential divergence within convergence trends. In addition, some papers (*Carlucci et al.*, 2017; *Kroll – Kabisch*, 2012; *Rodrigo et al.*, 2021) also point to the connection between the urban cycles phase and the emergence of differences in reproductive behaviour between the centre and suburban areas. For example, *Rodrigo et al.* (2021) point out that in countries where the suburbanisation process began earlier and a phase of re-urbanisation can be identified, the higher intensity of childbirth in the hinterland compared to the centre has reversed.

RESULTS

Nuptiality in Bratislava and its hinterland

The lower marriage rate of men and especially women in the capital and its hinterland in the early 1990s was the result of a process of marital postponement that had started before that time and a long-existing lower marriage rate compared to the Slovak average overall (*Šprocha et al.*, 2017). Bratislava also lagged behind its suburbs in terms of marriage rates. For both men and women this was because there was a dynamic decline in the marriage rate in Bratislava, which only reached its peak at the beginning of the 21st century. The intensity of marriage between men and women also declined in the hinterland and throughout the population of Slovakia. As a result, in the first decade of the new millennium, it was possible to identify minor overall differences between the capital, its hinterland, and Slovakia. Further developments led to alternating periods of short recovery and sharp decline, during which the marriage rate likely reacted to negative socioeconomic factors (e.g. the 2008 economic crisis). In general, however, the magnitude of the increase in the marriage rate has been somewhat more pronounced in Bratislava (and especially for men), which has increased the intensity of first-marriage entries in the capital to a level above the national level or even beyond the level identified in its hinterland. Upon closer examination, it was found that this development was primarily caused by a more successful catch-up phase of delayed marital starts (*Šprocha et al.*, 2017). However, the population in the capital's suburbs did not recuperate as successfully, and in the second

Figure 2 and 3: Total first marriage rate in Bratislava, the Bratislava hinterland, and Slovakia in 1992–2023



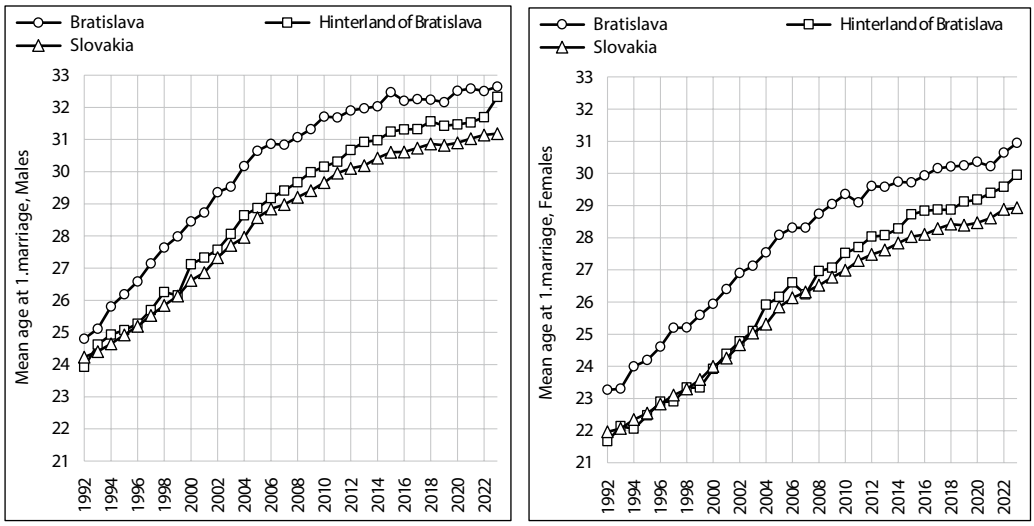
Source: SOSR, author's calculation.

decade of the 21st century the marriage rate there, especially for women, reached a rate that was even lower than the national average. From a development perspective, after the adverse effects of the global economic crisis faded in 2010, we see another phase of increased marriage rates for both men and women.

Again, the increase in the marriage rate was more dynamic in Bratislava. As a result, the differences between the populations analysed widened. In the capital the marriage rate peaked in 2018, while in the hinterland it began to show signs of decline during this period. A significant drop in the marriage rate was observed in 2020, a year marked by the pandemic. As a result, the biggest impacts on the marriage intensity of both men and women were in Bratislava. This also led to a renewed convergence between the populations analysed. This has not been altered by developments in recent years, which initially led to a compensatory phase and the recovery of marriage rates, only to be followed by a relatively significant year-on-year decline again in the last year analysed. As a result, the marriage rate for men in Bratislava has grown almost equal to the Slovak average, while for women it has fallen below the Slovak average. These significant fluctuations confirm how sensitively marriage rates in the capital and its hinterland (and, to a lesser extent, the Slovak population as a whole) can respond to changes in external conditions.

Remnants of the early marriage model, which historically emerged in the 19th century and was further entrenched by the specific conditions of the previous political regime (*Šprocha – Tišliar*, 2018), could still be identified in Bratislava, its hinterland, and the entire population of Slovakia in the early 1990s. For example, at that time the average age of men in Bratislava at first marriage was only 0.6 years higher than the Slovak average (24.2 years). In the case of women, the differentials were slightly more significant, as unmarried women in the capital married on average about one year later than the Slovak average. Interestingly, both men and women in the capital's hinterland married slightly earlier than the average for Slovakia. All three populations analysed underwent a significant transformation in the following two decades. The main feature of this transformation was the shift of marital starts to older ages. The early marriage model no longer applied in the new social, political, economic, and cultural conditions. At the same time, the results clearly show that the postponement process was most dynamic in the capital city. Therefore, by the beginning of the 21st century the differences between the timing of first

Figure 4 and 5: Mean age at first marriage in Bratislava, the Bratislava hinterland, and Slovakia in 1992–2023



Source: SOSR, author's calculation.

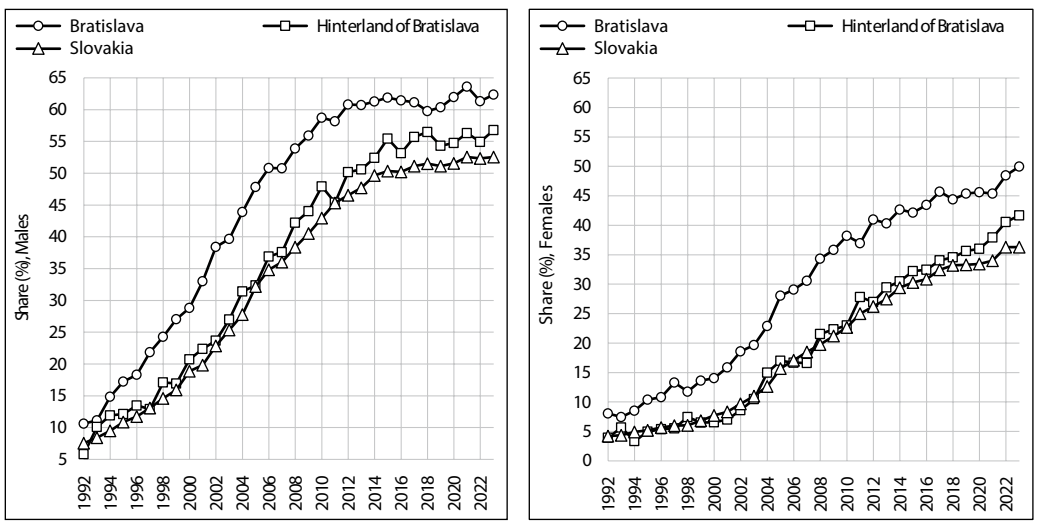
marriages in Bratislava, its hinterland, and Slovakia had only widened. For men, the average difference was almost 2 years; for women, it was even greater than that.

As the process of marriage postponement became more dynamic in Bratislava's suburban hinterland, there was some convergence of the timing of marriage starts between the populations in the hinterland and the capital over the next decade. Towards the end of the analysed period, the differences in the average age at first marriage between Bratislava and its hinterland were essentially the same for men as they had been in the early 1990s and were only minor for women. However, we do not see as dynamic a postponement of marriage for the population of Slovakia as a whole. In the second decade of the 21st century, although some convergence occurred, there was little narrowing of the differentials. That is why, according to the latest available data, we find that unmarried men in Bratislava marry on average 1.5 years later and women marry almost 2 years later than the rest of the Slovak population.

Another essential feature of the old model of nuptiality was its significant concentration in the first half of reproductive age (*Šprocha*, 2014). This feature could still be identified in all three populations in the early 1990s. The marriage rate of men over the age of 30 accounted for about a tenth of the total first-marriage rate and that of women of this age accounted for only 8%. In the hinterland and Slovakia, marriages at this age accounted for an even smaller proportion of the total marriage rate (6–8% for men, 4% for women). In contrast, for men under the age of 25, first marriages in the capital accounted for more than 60% of the total first marriage rate, while for women the share was about three-quarters of total first marriages. The concentration under the age of 25 was slightly more pronounced in the Slovak population as a whole, with 68% of men and 85% of women. The largest share of first marriages in this age spectrum occur in the capital's hinterland, at 70% for men and 88% for women. However, the postponement process in the following years led to a significant shift in the centre of gravity of marriage to the second half of the reproductive age and a sharp decline in marriages in the under-25 age group.

Again, this development was more dynamic in the capital, which differentiated the population of Bratislava from its hinterland and the country of Slovakia as a whole in terms of marriage behaviour. A convergence phase only began in the first decade of the 21st century, as the postponement of marriage

Figure 6 and 7: Share of marriage rates from total marriage rate at the age of 30+ in Bratislava, the Bratislava hinterland, and Slovakia



Source: SOSR, author's calculation.

in the hinterland and to some extent in Slovakia as a whole became more dynamic. Nevertheless, compared to Slovakia, the timing and concentration of marriage in the second half of the reproductive period remain significantly different in Bratislava. The following empirical data confirm this. The share of marriage rates among men under 25 in Bratislava has fallen below the 5% threshold. In the hinterland, the rate is around 8%, but in Slovakia as a whole almost 15% of all marriages occur at this age, according to the latest available data.

The differences are even more significant for women, with fewer than 12% of marriages under age 25 occurring in the capital, approximately 16% in the hinterland, but nearly a quarter in Slovakia as a whole. Similarly, we can observe significant differences in the share of unmarried people in the second half of reproductive age in Bratislava, especially compared to the national level. For men, however, the differences between Bratislava and the suburbs are minimal, as the share of unmarried at this age is approximately 62% in both populations. However, the average for Slovakia is approximately 10 percentage points lower. For women, the differences between the core and the suburb are also significant. About half of first marriage rates among women in the capital were among those in the 30+ age group. In the hinterland, the figure in this age range is less than 42%. In comparison, in Slovakia as a whole, it is only about 36%. This shows that the timing and age distribution of first marriages are currently the more important factors in the nuptiality patterns of the capital city, its hinterland, and especially the entire population of Slovakia.

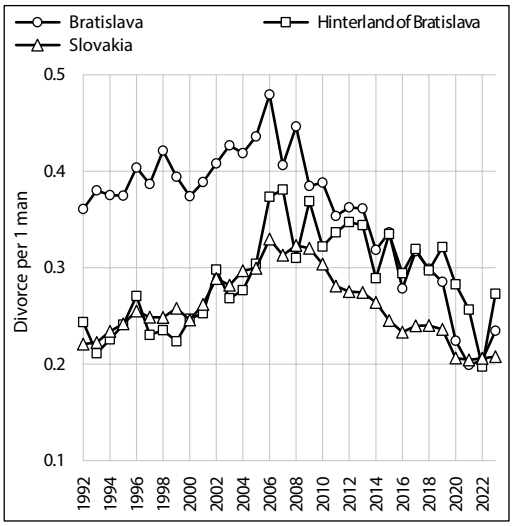
Divorce in Bratislava and its hinterland

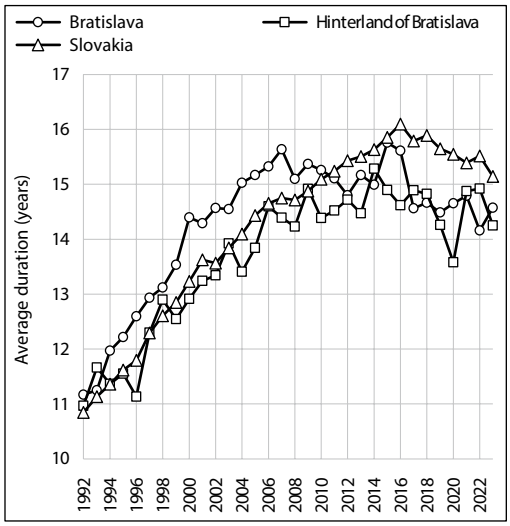
The 1990s also brought an intensification of the divorce rate in Slovakia. In this period, the divorce rate was higher in Bratislava than in its hinterland or in Slovakia. However, the differences between the suburbs of the capital city and the Slovak average were minimal. An upward trend was observed in all three populations analysed until the end of the first decade of the 21st century. Between 1992 and 2006, the total divorce rate in Bratislava increased from 0.36 divorces per person to 0.45 divorces. In the hinterland, the growth dynamics were more pronounced, with the total divorce rate rising from 0.24 divorces per person to 0.38 by 2007. Meanwhile, the average for Slovakia increased from 0.22 to nearly 0.33 divorces per person. However, further developments led to a significant decline in the divorce rate, which slightly accelerated during the COVID-19 pandemic. This was particularly the case in Bratislava. Consequently, the divorce rate in the capital city has in recent years already reached the national level for Slovakia as a whole. In the Bratislava hinterland, we initially observed stagnation, but there has been a slight decline over the last decade. As a result, the divorce rate in the Bratislava suburb has come to surpass the Slovak average and, gradually also, the divorce rate in Bratislava. As a result, the current divorce rate in Bratislava is already significantly lower than it was at the beginning of the transformation. In Slovakia, the situation is similar, and only in the hinterland of the capital city does it remain slightly higher than its initial position.

In addition to the increase in intensity, the divorce rate has undergone several other significant changes since the early 1990s. In particular, we are witnessing a shift in the risk of divorce to later in life. The average duration of a marriage at divorce has increased from approximately 11 years (across all three populations) to nearly 16 years in Bratislava and Slovakia and to 15 years in the capital's hinterland. Although recent developments have shortened this interval somewhat (to 14–15 years), the differences described above have remained.

Later marital starts and the lengthening of marriage duration at divorce have also led to a shift in the timing of divorces. The mean age at divorce for men in Bratislava has now risen above 48 years, and for women it exceeds 43–44 years. In the hinterland and Slovakia, the age at which men and women are divorcing is roughly 2.5–3.0 years younger than it was. Given this shift towards the end of the reproductive period, the importance of divorce as a disruptive factor for the realisation of reproductive intentions or the socialisation of children is diminishing. This is confirmed by the actual proportions of divorced childless marriages and the average number of children affected by marital dissolution. Owing to the long-term lower fertility rate in Bratislava, as well as the smaller families in the capital (see below), the average

Figure 8 and 9: Total divorce rate and average duration of marriage at divorce in Bratislava, the Bratislava hinterland, and Slovakia in 1992–2023





Note: Divorce intensity is constructed from male divorce rates.
Source: SOSR, author's calculation.

number of minor children in a divorced marriage is significantly lower there. Conversely, the proportion of childless marriages ending in divorce has always been lower there.

The existence of certain differences in the intensity of divorce between Bratislava and its hinterland in the 1990s is indirectly indicated by the share of divorced persons. Especially in older age groups (essentially in post-reproductive age), we find a higher share of divorced men and women in Bratislava. If we do not take into account potential differences in the intensity with which these persons enter into marriage or differences in migration (or possibly mortality), then the results could be caused by from a previously higher divorce rate in the capital of Slovakia. On the other hand, at younger ages the differences are negligible. This would confirm the identified equalisation of the divorce rate in the last 10–15 years.

Table 3: Share of divorced people by age in Bratislava and its hinterland – the 2021 Population Census

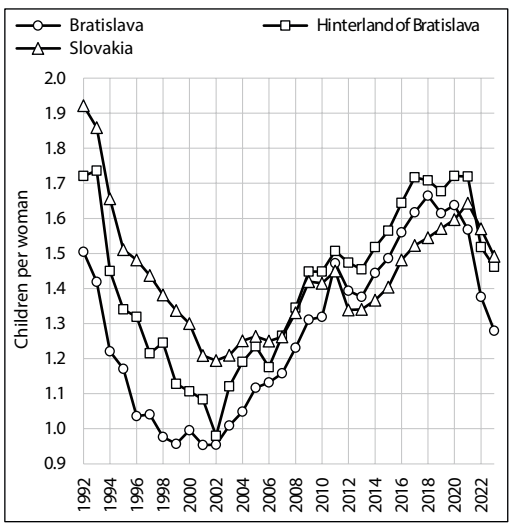
Age	Bratislava		Hinterland	
	Males	Females	Males	Females
–24	0.0	0.1	0.0	0.1
25–34	1.1	2.1	1.4	2.7
35–44	6.1	8.9	7.2	10.6
45–54	18.3	22.5	17.2	20.0
55–64	21.8	24.7	17.1	18.2
65+	13.4	18.0	8.5	9.9

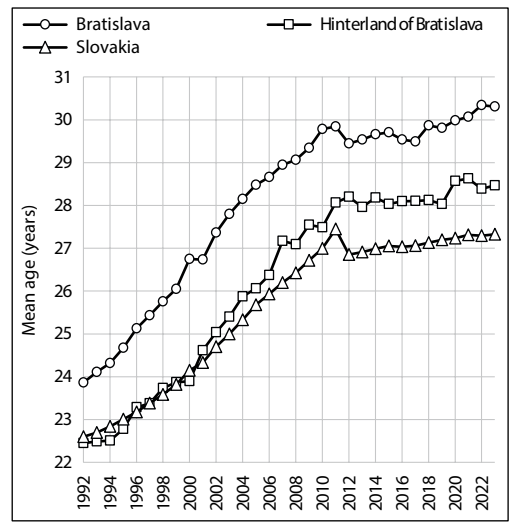
Source: SOSR, author's calculation.

Fertility in Bratislava and its hinterland

At the beginning of the 1990s, Bratislava was already a place with a very low total fertility rate, below 1.5 children per woman. As shown by *Šprocha et al.* (2017), this was a result not only of the long-term persistence of lower fertility in the capital city but also of the earlier onset and the more dynamic fertility decline from about the mid-1980s onwards. This affected women under the age of 20, especially those aged 20–24. It can, therefore, be concluded that the process of postponing childbearing in this environment began to find its application somewhat earlier than it did in the Bratislava hinterland or in the population of Slovakia as a whole. In the years that followed, developments led to a significant decline in fertility in the Bratislava hinterland. However, as the fertility rate of women in Bratislava declined, the differentials between the three populations analysed initially remained at approximately similar levels. It was only in the second half of the 1990s that there was a more significant convergence of the centre with its hinterland and with the Slovak average. The reason for this was a less dynamic year-on-year decline in fertility intensity in Bratislava, followed by stagnation at around one child per woman in the late 1990s and early 2000s. The decline continued essentially until 2002 in Bratislava's suburb and Slovakia. From that point on we then see gradual and, after 2007, more dynamic growth in fertility in Slovakia. However, in Bratislava the recovery of childbearing started earlier and was more dynamic. At the same time, a similar development is observed in the suburbs. The reasons for this are found primarily in the more successful catch-up of postponed reproductive intentions in the capital (*Šprocha et al.*, 2017). All indications suggest that the catch-up of postponed reproduction was similarly successful. Thanks to the more dynamic recuperation, the intensity of childbearing in Bratislava and its hinterland was already higher than the national level by the end of the first and the beginning of the second decade of the 21st century. As changes in the centre and the hinterland occurred at approximately the same rate, the differences in the total fertility rate remained essentially unchanged. However, trends changed significantly in the last 5 years analysed. Initially, there was some year-on-year stagnation in the capital's hinterland, which was followed by a relatively significant two-year decline after 2021. In Bratislava, the first sign of decline was already identified in 2019. However, it was only after a slight year-on-year recovery in 2020 that there was also a dynamic reduction in the intensity of childbearing.

Figure 10 and 11: Total fertility rate and mean age at first birth in Bratislava, the Bratislava hinterland, and Slovakia in 1992–2023





Source: SOSR, author's calculation.

Although this development can also be observed at the national level, it has so far been much less dynamic, which is why Bratislava and its hinterland again have an overall fertility rate lower than the Slovak average. The problematic situation during the COVID-19 pandemic and the deteriorating economic and foreign policy situation in its aftermath are significant factors in family planning and motivated strategic postponement. The dynamism with which young men and women in the capital and its hinterland approached this, to some extent, confirms our assumption that there are potentially higher risks and higher opportunity costs in uncertain times, particularly in the metropolitan areas.

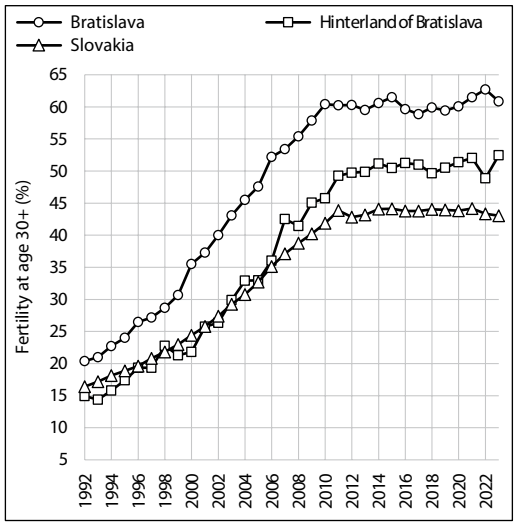
An analysis of the internal aspects of the fertility process at the beginning of the 1990s suggests that Bratislava did not differ significantly from its hinterland or Slovakia as a whole, despite what might be assumed from the above-mentioned differences in childbearing intensity. This was a result of the socioeconomic and cultural convergence in fertility brought about by the specific conditions of the so-called socialist greenhouse, which shaped the nature of reproduction during the previous political regime (*Sobotka*, 2002). Therefore, in Bratislava, it was also possible to identify a considerable concentration of fertility in the first half of reproductive age. For example, only about one-fifth of the total fertility rate in the Slovak capital was realised by women aged 30 or older. In the suburbs the figure was 15%, and the average for Slovakia was 16%. Approximately half of all reproduction in Bratislava was realised by the age of 25. The situation was similar in Bratislava's hinterland (58%) and Slovakia (55%). This concentration of fertility in the first half of reproductive age was also reflected in the mean age at first birth. In Bratislava, women in the early 1990s became mothers for the first time on average at age 24, whereas in its suburbs and in Slovakia as a whole, this occurred about 1.5 years earlier. Subsequently, the process of postponing childbearing, especially for first children in Bratislava (see also *Šprocha et al.*, 2017), changed the picture from the ground up.

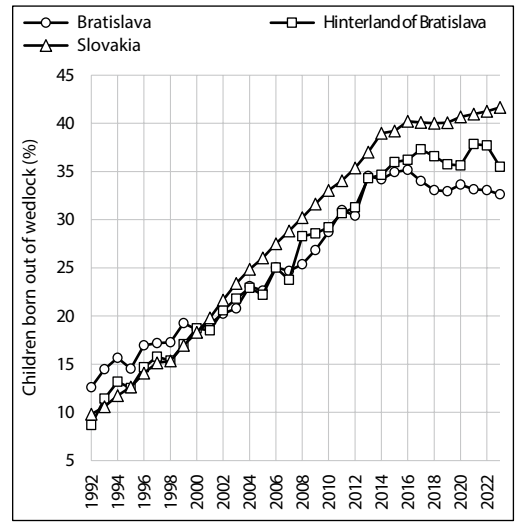
The share of fertility under the age of 25 in Bratislava has fallen below 10%. On the other hand, the fertility rate of women aged 30 and over has already surpassed 60%, and the average age of a woman at the birth of her first child has risen above the age of 30. Similar changes can be identified in the Bratislava hinterland and throughout Slovakia. The difference, however, lies in the dynamics with which the changes have taken place. Especially in the 1990s, a clear divergent trend is observed, where Bratislava, in terms of the fertility timing indicators in question, was moving away not only from the national average but also from its hinterland's average. For example, on average, women in Bratislava became mothers for the first time 2.5–3.0 years later than in the hinterland or Slovakia as a whole. However, since approximately the beginning of the new millennium, there has also been an acceleration of the postponement process in the capital's suburbs, which have gradually entered a phase of some convergence with the core. In the case of the entire Slovak population, no such dynamic postponement has yet occurred. Therefore, the differences between the timing of the first child in the capital or its hinterland compared to Slovakia as a whole have further widened. It was only the cessation of the postponement of fertility at the beginning of the second decade of the 21st century that stopped this difference. The mean age of women at the birth of their first child was just under 30 years in Bratislava and 28 years in its hinterland, while in Slovakia it was 27 years. The differences between the analysed populations remained within this range essentially until the COVID-19 pandemic.

Subsequent years, however, brought a further slight increase in the mean age and rate of fertility in Bratislava and its hinterland for those over the age of 30. These results thus confirm the above-mentioned assumption of the further strategic postponement of maternal starts, as well as a decline in overall fertility, owing to unfavourable life circumstances in Slovakia's largest city and its suburbs.

Another essential feature of reproductive behaviour that has changed significantly since 1989 is the disconnection of the historically close link between married life and childbearing. Developments since the 1990s have led to a gradual increase in extramarital childbearing. However, this has been highly spatially differentiated (*Bleha et al.*, 2014; *Jurčová – Mészáros*, 2010; *Šprocha et al.*, 2019). Although Bratislava continued to have a slightly higher proportion of children born out of wedlock until the end of the

Figure 12 and 13: Share of fertility realised at age 30 and over and extramarital births in Bratislava, the Bratislava hinterland, and Slovakia in 1992–2023





Source: SOSR, author's calculation.

1990s, since then there has been a gradual convergence between it and the national average in Slovakia. Because of the slower increase in extramarital births in Bratislava and its suburbs since the new millennium, the figures there are now lower than the figure for Slovakia as a whole. Moreover, these differentials have continued to deepen over time.

In the last decade, there has been a halt in the increase in the proportion of children born out of wedlock. In Bratislava, there has even been a slight decrease to one-third. According to the latest available data, the average for Slovakia is just below 42%, with a slight increase after the COVID-19 pandemic. In the capital's hinterland, children of unmarried women account for approximately 36–38%. The results presented here do not support the idea that the largest cities are environments where anonymity and higher social tolerance lead to a higher incidence of extramarital births. As some other specialised studies show (*Šprocha – Tišliar*, 2019, 2021; *Zeman*, 2007), children born outside marriage as not as common among women with higher education or persons living in the largest settlements but are rather more often born to persons with low education from smaller towns and larger rural villages.

DISCUSSION

Although foreign research has relatively consistently (*Kulu*, 2013; *Kulu – Washbrook*, 2014) pointed to a higher intensity of childbearing in the hinterland of the largest cities, our results did not confirm this assumption for the entire analysed period in the case of Bratislava and its suburban areas. These findings were also not valid in terms of marriage and lower divorce rates (*Gautier et al.*, 2009). These assumptions from foreign studies were valid in the case of Bratislava and its hinterland only roughly in the first decade of the transformation period after 1989. As several authors have already indicated (*Bleha et al.*, 2013; *Šprocha et al.*, 2017), Bratislava can be perceived as a forerunner of transformational changes in family and reproductive behaviour in Slovakia. The changes in the capital probably contributed to the rapid and relatively dynamic establishment of the main developmental tendencies in terms of marriage, fertility, and divorce rates (*Bleha et al.*, 2013; *Šprocha et al.*, 2017). Therefore, by the 1990s it was already possible to see a significant decline and low level of single people entering marriage and having children in Bratislava. At the same time, it was possible to identify a higher divorce rate in the capital, which was still increasing.

The dynamic diffusion of new patterns reproductive behaviour in Bratislava in the 1990s was driven by a combination of specific structural factors (people with higher education, more people working in the tertiary sector, a focus on building a career) and by the effects of the first years of economic transformation and the discontinuity of living conditions (the termination of some family policies, the elimination of the housing allocation policy, problems with the availability of kindergartens), which may have affected young people in the largest city much more than in the city's hinterland. It is important to note that with the gradual transition to a market economy these losses had both direct and indirect costs, including so-called opportunity costs (*Becker*, 1993; *Hašková*, 2009), which comprise all the resources, activities, and opportunities that a woman (or a couple) must give up to care for a child. Theoretically, these indirect costs of increasing education and career orientation, or the nature of certain professions, can be significantly more important obstacles than the direct financial penalisation of motherhood and parenthood. We agree with *Sobotka et al.* (2008) that more educated women in large cities are mor likely to achieve a stable position in the labour market, thereby obtaining sufficient financial security and adequate housing, which should be associated with the strategic postponement of some family and reproductive transitions to a later age

In the Bratislava hinterland, in the initial phase of the transformation of family and reproductive behaviour this connection may be more complicated in specific subpopulations or the opposite tendencies may even be observed. This may have to do with the lower educational level of women living in suburban areas. As some works (*Friedman et al.*, 1994; *Hechter – Kanazawa*, 1997) state, for these persons, the indirect opportunity costs associated with motherhood in the form of lost opportunities are low. In times of economic uncertainty in the labour market and deteriorating living conditions, the strategic postponement of family and reproductive intentions will be increasingly promoted by women for whom motherhood is associated with higher risk and higher indirect costs. However, our results indicate that in the hinterland of the capital these tendencies were evident for only a very short period, and by the second half of the 1990s a relatively dynamic decline was already being observed in nuptiality and fertility, along with the postponement of marriage and motherhood to an older age. We can assume that contributing factors to this were not only the increase in the educational level of the youngest cohorts in the suburban area of Bratislava but also the onset of suburbanisation tendencies. However, selective migration itself probably played only a limited role in mitigating the differences in the intensity and timing of nuptiality and fertility, as, for example, the flows between Bratislava and its hinterland were almost the same in terms of education. More important factors might be the migration motives behind migration itself. In the case of migration to the hinterland, these flows were mainly made up of young families, people planning to get married, or people who had just married, who were primarily trying to solve their housing situation. These were groups that were planning or realising their reproduction, which would then be reflected in increased nuptiality and fertility. Moves in the opposite direction were mainly made up of slightly younger and single people, who were primarily looking for job opportunities in the capital and intending to build a career. This would confirm some findings (*Kulu*, 2013; *Kulu – Vikat*, 2017) indicating that couples planning to start a family move to smaller municipalities with a more suitable environment for raising children, while those without reproductive intentions or those delaying childbearing are more likely to seek out larger settlements.

However, as development trends have shown, the impact of selective migration has probably had only a minimal effect on marriage, fertility, and divorce. It turns out that since the beginning of the 21st century, Bratislava has recorded a relatively significant and more dynamic revival of marriage and birth rates compared to its hinterland. In fact, in most years of this period, marriage and fertility rates in the capital Bratislava were higher than in its hinterland. Only in the last few years have the crisis conditions changed this situation to some extent or have instead led to a rapprochement of both analysed populations. This indirectly suggests that the population of Bratislava is more sensitive to external negative factors or reacts to them earlier (which was also possible to observe in the first half of the 1990s).

In terms of the developments observed and conclusions obtained in this analysis, it cannot unequivocally be said that the different environment of the capital city (contextual theory) or the different structural composition of the population of Bratislava and its hinterland (which have become significantly more alike in terms of the main population structures over the past three decades) played a more significant role in the intensity of selected demographic processes. In our view, much more important as an explanatory framework is the different beginning and initial state before the onset of transformational changes. This would explain why reproduction revived earlier in Bratislava than in its suburban areas. At the same time, however, we cannot completely ignore the structural effect. Some analyses (*Šprocha – Tišliar*, 2019) confirm that in Slovakia, men and women with higher education have higher chances of marriage. It is also confirmed that the intensity of childbearing among women with higher education (*Šprocha – Tišliar*, 2019) has undergone the least change. The structural effect itself, and especially differences in educational structure, could be the key to explaining the existing relatively significant differences in the timing of marriage and motherhood, as well as the somewhat higher rate of extramarital births in the hinterland of Bratislava.

CONCLUSION

The results of our analysis confirmed that Bratislava, as hierarchically the highest-ranking urban centre in Slovakia, reacted earlier to the discontinuity of political, economic, cultural, and social conditions after 1989 and more dynamically than its hinterland or Slovakia as a whole. Moreover, certain signs of emerging changes could be identified in Bratislava even before the fall of the Iron Curtain. This is why, especially in the 1990s, the differences in the intensity and timing of marriage and fertility, particularly between Bratislava, its hinterland, and Slovakia, were the greatest. At the same time, the differences in divorce rates were also quite pronounced, with Bratislava having the highest risk of divorce among the analysed populations. As a result of the significant decline in marriage and fertility rates in the 1990s, Bratislava became the area where both men and women entered into marriage at the lowest rates in Slovakia and where the intensity of childbearing was also extremely low. However, a significant role in this decline was played by the postponement of marital and maternal starts, as well as the associated rejection of the early marriage and fertility model by the cohorts of men and women born since the late 1960s. As our findings have shown, these transformational shifts were also gradually reflected in the hinterland and the population of Slovakia as a whole during the 1990s. As a consequence, a certain convergence in the intensity of the analysed processes gradually began to occur.

The sharp decline in marriage and fertility rates and, conversely, the increase in the risk of divorce meant that around the beginning of the new millennium, Bratislava became significantly closer to its hinterland and even to Slovakia in terms of marriage, childbearing, and divorce rates. Moreover, the earlier start of the transformational changes in the capital also led to the earlier onset of the recovery phase. The latter was primarily conditioned by a halt in the decline of marriage and fertility indicating the stabilisation of the postponement process at a younger age, and by the onset of the recuperation phase. The catching up of 'postponed' marital and maternal starts implied an increase in the intensity of marriage and fertility at approximately age 27 and above. Thus the intensity of marriage and fertility shifted more into the second half of the reproductive period. In addition, Bratislava proved to be quite successful in the process of catching up. Therefore, not only did it match its hinterland and Slovakia in terms of fertility and, to some extent, the marriage rate at the end of the first decade of the 21st century, but it also gradually reached a situation where the fertility and marriage rates in the capital city were above the average for Slovakia. The divorce rate developed in the very opposite way. In Bratislava, especially in the second decade of the 21st century, there was a relatively significant decline in the divorce rate. As a result of these developments, the capital city is now in the position of having a below-average risk of divorce. At the same time, divorce generally is increasingly affecting older people at the end of the reproductive period, and children are more often not affected by divorce.

A recuperation process has also been identified in the hinterland of the capital and in Slovakia as a whole.

However, it has not been as pronounced in the case of marriage rates, which is why, especially for women in the hinterland, we identify below-average levels of marital starts in the long run. The situation is different in the case of fertility, which, by the second decade of the 21st century, was not only above the Slovak average but also higher than in the capital. However, developments in the recent post-pandemic years in all the populations analysed brought a significant decline in both marriage and fertility rates. Again, the population of the capital city reacted earlier and more dynamically. Consequently, the current fertility level in Bratislava is again lower than the level for Slovakia as a whole or its hinterland. In terms of marriage rates, there are no significant differences between the centre and the hinterland. Similarly, there are no significant differences in terms of divorce rates.

Thus, the main differentiating factors, such as family and reproductive behaviour, between Bratislava, its hinterland, and Slovakia as a whole are the timing of marital and maternal starts and the associated age distribution of the fertility and marriage processes. In general, our results showed that the process of postponing marriage and fertility was more dynamic in Bratislava and was also accompanied by the most pronounced shift of entry into first marriage and childbearing to later ages overall. There were no such significant changes in timing in the hinterland or Slovakia.

Extramarital fertility has also gradually become an interesting differentiating factor. Although Bratislava was one of the areas with a slightly higher proportion of children born out of wedlock in the early 1990s, the more dynamic growth in extramarital births in its hinterland and especially in Slovakia as a whole has resulted in a situation where Bratislava now has a below-average share of children born to unmarried women.

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Graduated from the programme in demography at the Faculty of Science, Charles University in Prague (2011). In 2021, he completed his habilitation in the field of Human Geography. Since 2007, he has been a researcher at the Institute of Informatics and Statistics at the Demographic Research Centre in Bratislava, and since 2009, he has been a researcher at the Institute for Forecasting, Slovak Academy of Sciences. In demography, he specialises in the study of nuptiality, divorce, population development, and the transformation of reproductive behaviour after 1989 and its impact on society. He also analyses population structure, the reproductive behaviour of the Roma population in Slovakia, and population projections.

Konference RELIK 2025

Ve dnech 13. a 14. listopadu 2025 se na půdě Vysoké školy ekonomické konala mezinárodní konference Reprodukce lidského kapitálu – vzájemné vazby a souvislosti. Jednalo se o 18. ročník této dnes již tradiční konference, kterou pořádá Katedra demografie VŠE za podpory Interní grantové agentury na Fakultě informatiky a statistiky. Akce probíhala hybridní formou přímo v prostorách VŠE. Konference byla určena pro odbornou veřejnost, pracovníky veřejného i soukromého sektoru, zástupce neziskových organizací, a především pro studenty a všechny zájemce o demografickou problematiku i témata týkající se lidských zdrojů. Díky podpoře z Fakulty informatiky a statistiky byla konference přístupná pro všechny zájemce zdarma bez výběru vloženého.

Na letošní konferenci bylo přítomno celkem 134 účastníků, z toho bylo 44 zahraničních a 34 studentů, což nás velmi potěšilo. Díky hybridní formě konference se mohlo zúčastnit 16 kolegů ze zahraničí. Komunikace po celou dobu konference byla zajištěna prostřednictvím platformy MS Teams a technicky při ní vypomáhali právě vybraní zapojení studenti.

Konference měla za cíl konfrontovat a propojit demografický pohled s pohledem dalších disciplín – ekonomie, sociální politiky, regionálního rozvoje, mapovat a analyzovat vývoj lidských zdrojů, demografické trendy, stárnutí populace, migraci, změny ve vzdělávání a na trhu práce a jejich dopady na ekonomiku.

Příspěvky se netýkaly pouze ČR a Evropy, ale zazněly také informace o Africe, Asii, Moldavsku i dalších regionech. Témata zahrnula řadu oblastí – od problematiky investic do vzdělání, demografie a dostupnosti bydlení, mezigenerační solidarity, dopadu automatizace a technologií na pracovních trh až po problematiku týkající se tzv. měkkých dovedností, udržitelnosti a regionálního vývoje.

Tradičně byl velký prostor dán začínajícím vědcům a studentům v sekci mladých výzkumníků, kteří se tak mohli zapojit do diskuzí a seznámit se s dalšími kolegy a vědci.

Atmosféra na konferenci byla velmi přátelská, a především pro začínající vědce akademicky podnětná. Všichni si velmi chválili možnost vyměnit si svoje názory na danou problematiku a získat zpětnou vazbu na svůj výzkum.

Příspěvky z konference budou dostupné na stránkách konference https://relik.vse.cz/cz/conference ve sborníku s ISBN 978-80-245-2571-6.

Jitka Langhamrová

10. ročník soutěže České demografické společnosti o nejlepší kvalifikační práci v oboru demografie

V září 2025 vyhlásila Česká demografická společnost, z. s. již desátý ročník soutěže o nejlepší kvalifikační práci v oboru demografie. Do soutěže bylo možné přihlásit v akademickém roce 2024/2025 obhájené bakalářské, diplomové nebo doktorské práce z oboru demografie a jí příbuzných oborů (např. sociologie, geografie, epidemiologie, ekonomie), které se věnují populační problematice.

Do soutěže se tentokrát přihlásilo šest bakalářských a sedm diplomových prací (žádná dizertační), což splnilo podmínky pro vyhlášení tří nejlepších prací v každé kategorii. Vyhlášení výsledků proběhlo 2. prosince 2025 v prostorách Českého statistického úřadu. Autoři oceněných prací obdrželi finanční odměnu, poukaz na roční předplatné časopisu Demografie a měli možnost prostřednictvím krátké prezentace svou práci ostatním účastníkům setkání představit. Svou prezentací se autoři zároveň zařadili mezi kandidáty na získání „Ceny publika pro nejlepší prezentaci" (napříč oběma kategoriemi), která vzešla z hlasování přítomných posluchačů. Vítěz získal další peněžní odměnu formou poukazu do knihkupectví. Oceněny byly následující práce:

KATEGORIE BAKALÁŘSKÉ PRÁCE

1. místo – Kristýna Dvořáková za práci **„Analýza šíření onemocnění COVID-19 v Ústeckém kraji";** práce obhájená na katedře statistiky a pravděpodobnosti FIS VŠE (vedoucí práce: Ing. Jakub Danko, Ph.D.).

Ze zdůvodnění hodnotící komise*: Bakalářská práce se zaměřuje na analýzu šíření onemocnění COVID-19 a úmrtnost v Ústeckém kraji v průběhu pandemie, především v roce 2021, kdy se virus šířil na našem území celý rok. Zpracování tématu vyžadovalo kombinaci demografických, statistických a epidemiologických přístupů. V přehledně zpracované teoretické části autorka shrnuje poznatky o šíření viru SARS-CoV-2, vysvětluje základy agentního modelování a popisuje relevantní datové a metodologické nástroje. V samotné analytické části autorka provádí kvantitativní analýzu demografických a epidemiologických ukazatelů o nakažených, úmrtnosti dle věku, pohlaví a věkové struktuře v geografickém členění na úrovni krajů, v Ústeckém kraji a jeho okresů. Na tuto analýzu navazuje konstrukce vlastního agentního modelu zobrazujícího šíření onemocnění COVID-19 v Ústeckém kraji v roce 2021 (v prostředí NetLogo). Model, jeho parametry a výsledky jsou detailně popsány, výsledky jsou pak srovnávány i s reálnými daty. Kvalita této bakalářské práce spočívá zejména v tom, že text celé práce je psán s porozuměním problematiky, datům, statistickým metodám i samotnému agentnímu modelu, výsledky jsou interpretovány správně, práce je přehledně strukturována, psaná srozumitelně a čtivě. Práce vysoce převyšuje požadavky kladené na bakalářské práce.*

2. místo – Filip Vinter za práci **„Regionální diferenciace úmrtnostních poměrů v Itálii: vymezení regionů a jejich srovnání"**; práce obhájená na katedře demografie a geodemografie PřF UK (vedoucí práce: Mgr. Ivana Kulhánová, Ph.D.).

Ze zdůvodnění hodnotící komise*: Cílem této bakalářské práce byla analýza regionálních rozdílů v úmrtnosti v Itálii na různých řádovostních úrovních a vymezení nových (úmrtnostních) regionů, jako homogenních celků na základě podobných charakteristik úmrtnosti, které nemusí korespondovat s administrativním členěním. K tomu byla využita metoda hierarchického shlukování. Díky tomuto*

zajímavému metodickému přístupu se ukážou některá lokální specifika – výsledky poukazují na vyšší úmrtnost např. v industriálním trojúhelníku Milan-Turín-Janov či neapolské aglomeraci. Tradiční dělení Itálie na severní, jižní část a popř. střední část je tak v případě regionální diferenciace úmrtnosti v Itálii příliš zjednodušující. V teoretické i metodické části autor využívá širokou škálu relevantních a aktuálních odborných zdrojů, schopnost práce s literaturou prokazuje také při interpretaci výsledků, neboť diskuze výsledků nezahrnuje pouhou deskripci grafických výstupů, ale i jejich věcně podloženou interpretaci. Práce je navíc velmi zdařilá i po formální, stylistické a grafické stránce, je přehledná a systematicky strukturovaná.

3. místo – Jana Němcová za práci **„Úmrtnost na nepřenosné nemoci ve vybraných státech subsaharské Afriky v prvních dvou dekádách 21. století“**; práce obhájená na katedře demografie a geodemografie PřF UK (vedoucí práce: doc. RNDr. Klára Hulíková Tesárková, Ph.D.).

Ze zdůvodnění hodnotící komise: *Práce se zabývá tématem, které v českém prostředí není příliš rozšířené, neboť většina prací zabývajících se úmrtností v subsaharské Africe se soustředila hlavně na přenosné nemoci. Samotná analýza úmrtnostních poměrů je založena na datech reprezentujících čtyři státy subsaharské Afriky – Niger, Lesotho, Rwanda, Kamerun, které reprezentují různé subregiony a různé fáze demografického a epidemiologického přechodu v těchto státech. Jejich specifika jsou dobře popsána. Analýza je provedena na základě vhodně zvolených datových zdrojů (Global Burden of Disease a Global Health Estimates), autorka si je velmi dobře vědoma jejich omezení (jsou z velké části založeny na modelech a odhadech) a tím, že tam kde to jde, jsou uváděny výsledky s využitím obou zdrojů, vyjadřuje tak potřebnou nejistotu a nižší spolehlivost výsledků. Přesto prezentované výsledky odhalují zajímavé trendy i vzájemná porovnání mezi státy. Autorka se nevěnuje jen popisu výsledků, ale hodnoty prezentovaných ukazatelů se snaží interpretovat a vysvětlovat, hledá důvody jednotlivých trendů a vrací se k prostudované literatuře. Silnou stránkou práce je totiž také rozsáhlá a velmi pěkně zpracovaná teoretická část, která čtenáři umožní hlouběji pochopit demografický a epidemiologický kontext subsaharské Afriky, který nemusí být každému předem znám. Analytická část práce je velmi zdařilá nejen díky vhodně zvoleným metodám demografické analýzy, ale právě i díky množství prostudované literatury a skutečnému proniknutí do tématu.*

KATEGORIE DIPLOMOVÉ PRÁCE

1. místo – Sára Adámková za práci **„Sociodemografické faktory pandemie COVID-19 v České republice, Dánsku a Itálii“**; práce obhájená na katedře demografie FIS VŠE (vedoucí práce: RNDr. Markéta Majerová, Ph.D.).

Ze zdůvodnění hodnotící komise: *Diplomová práce je multidisciplinární analýzou zdařilým způsobem propojující demografické, sociologické a epidemiologické přístupy k průběhu pandemie COVID-19 v Evropě. Na příkladu vývoje nákazy a opatření k zabránění šíření onemocnění ve třech evropských zemích analyzuje průběh pandemie z hlediska onemocnění jako takového, variability cílených opatření k zabránění šíření nákazy, z hlediska strategií očkování i zavádění potřebné legislativy. Autorka zpracovala rozsáhlou rešerši relevantní literatury a kriticky ji zhodnotila. Úspěšně se vypořádala s množstvím dat pocházejících z různých zdrojů, na něž aplikuje odpovídající demografické ukazatele a interpretuje data v souvislostech sociodemografických faktorů, jako jsou struktura populace, prevalence chronických onemocnění či specifika očkovacích strategií. V závěru práce je použito agentního modelování ABMShare, což přineslo zajímavý pohled na testování hypotéz o vlivu vládních opatření a míry proočkovanosti na průběh pandemie. Autorka tím úspěšně spojila teoretickou analýzu s modelováním reálných procesů. V tom je práce výjimečná nejen na úrovni diplomových prací v rámci studentských projektů, ale i v širším akademickém kontextu. Autorka během zpracování využila znalostí programování (jazyky R nebo LaTex). Práce má logickou strukturu, je psána velmi přehledně, pečlivě, jasně a srozumitelně. Jedná se práci nadprůměrnou nejen obsahově, ale i technicky.*

2. místo – Adéla Pospíšilová za práci **„Perfectly Mismatched? Educational Assortative Mating in Online and Offline Dating: A Cross-National Perspective“**; práce obhájená na katedře sociologie FSS MUNI (vedoucí práce: prof. Martin Kreidl, Ph.D.).

Ze zdůvodnění hodnotící komise: *Tato práce se zabývá zajímavým, relativně novým, a atraktivním*

tématem online seznamování, které analyzuje a srovnává s tradičním seznamováním „offline". Práce je psána v anglickém jazyce, jazyková kvalita je na vysoké úrovni. Čtenáře hned v úvodu zaujme uvedení do tématiky pomocí citací literárního díla Jane Austen Pride and Prejudice (Pýcha a předsudek). Práce dále přináší obsáhlý teoretický background a bohatý přehled literatury. Srovnání online a offline strategií při seznamování je stěžejním tématem celé práce a analyzuje data z druhého kola GGS za 13 zemí s daty sbíranými od roku 2020. Jedná se o evropské země včetně Česka, Hong Kong a Uruguay. Práce využívá statistický software STATA, a kromě deskriptivní analýzy též binární a multinomiální logistickou regresi, a soustředí se na analýzu average marginal effects (AME). Grafy a tabulky jsou přehledné a vkusné. Práce se zaměřuje na rozdíly v dosaženém vzdělání mezi partnery a ukazuje, že online páry jsou vzdělanostně více heterogamní, zejména proto, že ženy se párují s méně vzdělanými partnery. Online prostor tedy představuje větší svobodu při výběru partnera, nežli je tomu v omezené bublině offline sociálních kontaktů.

3. místo – Tereza Trčková za práci **„Konzumace alkoholu a úmrtnost v Česku"** práce obhájená na katedře demografie a geodemografie PřF UK (vedoucí práce: Mgr. Ivana Kulhánová, Ph.D.).

Ze zdůvodnění hodnotící komise: *Diplomová práce se zabývá aktuálním a značně diskutovaným tématem vztahu konzumace alkoholu a úmrtnosti. Ačkoliv se zabývá situací v Česku, je zpracována v širším geografickém a kulturním kontextu. Teoretická část práce je podrobně zpracována s využitím relevantní odborné literatury, její značný rozsah včetně rešerší zahraničních studií na dané téma svědčí o dobrém přehledu v dané problematice. Text této části je podaný čtivě; osvěžuje jej například vtipně zařazená „kapitolka" o historii pivovarnictví. Analytická část prokazuje schopnost autorky propojovat a využívat několik zdrojů dat – individuální data z několika výběrových šetření propojuje s agregovanými administrativními daty. Ve vlastní analýze jsou kombinovány pokročilejší demografické, statistické a epidemiologické metody, jež jsou vhodné pro analýzu vlivu konzumace alkoholu na úmrtnost. V rámci práce byl vypočítán epidemiologický ukazatel AAF (alcohol-attributable fraction), byly zkonstruovány úmrtnostní tabulky s eliminací vybraných příčin smrti a byla použita logistická regrese. Výsledky práce jsou následně přehledně prezentované v tabulkách nebo v grafech a náležitě interpretované. Diplomová práce je tedy nejen kvalitním akademickým textem, ale má i společenský přínos, neboť přináší poznatky, které mohou být využitelné i pro tvorbu zdravotní politiky a aplikaci preventivních opatření.*

CENA PUBLIKA O NEJLEPŠÍ PREZENTACI

Kristýna Dvořáková za práci **„Analýza šíření onemocnění COVID-19 v Ústeckém kraji"**; práce obhájená na katedře statistiky a pravděpodobnosti FIS VŠE (vedoucí práce: Ing. Jakub Danko, Ph.D.). Pro výherní prezentaci hlasovalo 39 % hlasujících.

Česká demografická společnost, z. s. gratuluje autorům oceněných prací a děkuje všem účastníkům soutěže za přihlášení své práce. Stejně jako předchozí ročníky, také 10. ročník soutěže byl realizován díky finanční podpoře Rady vědeckých společností České republiky v rámci Akademie věd ČR, které rovněž patří poděkování. Další ročník soutěže, v pořadí již jedenáctý, by měl být vyhlášen na podzim roku 2026. Přehled výsledků soutěže za všechny ročníky lze nalézt na stánkách https://www.czechdemography.cz/soutez.

HV ČDS

Kulatý stůl na téma Připravenost obcí na demografické změny

Česká demografická společnost ve spolupráci s Českým statistickým úřadem pořádala 3. prosince 2025 další kulatý stůl na téma **Připravenost obcí na demografické změny.** Akce, která probíhala na půdě ČSÚ, se zúčastnilo zhruba 60 osob z řad akademiků, zástupců státní správy či místních samospráv, ale např. i studentů. Akce byla otevřena široké veřejnosti.

Ondřej Junášek (Informační služby KS Středočeský kraj, ČSÚ) se ve své prezentaci s názvem **Údaje za obce poskytované ČSÚ** zaměřil na to, odkud se údaje získávají a kde je mohou uživatelé naleznout. Údaje za obce získává ČSÚ buď z vlastních zdrojů (sčítání, hlášení, výkazy, registry) nebo z jiných administrativních zdrojů dat (ČUZK, MPSV, ÚZIS, MF, MŠMT). Všechna data zveřejňovaná na webových stránkách nebo v aplikacích (např. DataStat) jsou zdarma. Zájemci mohou využívat i datové sady (OpenData, Datový portál GIS). Ve svém příspěvku se podrobněji věnoval Statistickému geoportálu, který nabízí aplikace Statistický atlas, Mobilita s vizualizací proudů, Statistické georeporty a Tematické publikace obsahující například mapy s příběhem na téma povodně v roce 2024.

Prezentace *Tomáše Brabce* (Institut plánovaní a rozvoje hl. m. Prahy, kancelář analýz měst) s názvem **Plánovaní veřejné vybavenosti v Praze v kontextu demografického vývoje** se zaměřila na hlavní demografické výzvy Prahy, prognózu obyvatel a veřejné vybavenosti v Praze a na její navrhování. Poslaním Institutu plánovaní a rozvoje hl. m. Prahy je zastupování hl. m. Prahy v územním řízení, vytváření klíčových městských dokumentů, sběr dat a zpracování analýz a studií. V Praze se předpokládá růst počtu obyvatel, především ve vyšších věcích. Přednášející podrobně představil přípravu publikace Prognóza obyvatel a veřejné infrastruktury v Praze 2024–2050 i samotné výsledky.

Starosta Žďáru nad Sázavou *Martin Mrkos* v prezentaci na téma **Připravenost obcí na demografické změny – město Žďár nad Sázavou** představil základní údaje o městě, historický kontext pro pochopení současného stavu a výzev a aktuální výzvy a problémy. Posluchače seznámil se způsobem hledání řešení s využitím základních demografických dat.

Místostarostka městské části Brno-Černovice *Mirka Wildmannová* prezentovala **Jak se městská část připravuje na demografické změny.** Nejprve posluchače seznámila se základnímu údaji a demografickým vývojem Brna a své městské části. Následně se věnovala oblastem, ve kterých je možné na základě demografických dat plánovat. Dále se zaměřila na plánování sociálních služeb a způsob práce se seniory.

Výkonná ředitelka Svazu měst a obcí *Radka Vladyková* se zaměřila na informace ohledně využívání dat městy a obcemi. Data jsou využívána zejména pro tvorbu strategických dokumentů – plánování občanské vybavenosti, škol, sportovišť, sociálních programů či bytové výstavby. Upozornila také na to, že data je nutné správně analyzovat a interpretovat, a ne vždy se tak děje. Někdy na základě správných dat dochází k mylným závěrům. Vyjádřila také potřebu podrobnějších dat, např. za městské části statutárních měst.

Po zaznění jednotlivých příspěvků proběhla diskuse, která se týkala např. bližších informací o dostupných datech a plánech ČSÚ směrem do budoucnosti v této oblasti, o tom, jak zástupci místních samospráv pracují (nejen) s demografickými daty, jakým způsobem vstupuje politika na komunální úrovni do stěžejních rozhodnutí, které mají vazbu na očekávaný budoucí populační vývoj apod.

Akce ukázala, že pro efektivní rozhodování a správu měst a obcí jsou kvalitní a podrobná demografická data, a na ně navazující populační analýzy a prognózy, nezbytná. Demografové jsou ochotni v těchto otázkách aktivně pomoci, neboť si uvědomují důležitost včasné reflexe demografických změn do místních politik, neboť to sebou nese nejen praktické, ale i finanční konsekvence.

Všechny prezentace jsou dostupné na: https://www.czechdemography.cz/akce/kulate-stoly/pripravenost-obci-na-demograficke-zmeny/.

Redakce Demografie a HV ČDS

DIVERSITY IN THE DEMOGRAPHIC CHARACTERISTICS OF THE MIDDLE CLASSES IN SELECTED CENTRAL EASTERN EUROPEAN COUNTRIES

Joanna Muszyńska[1)] – Ewa Wędrowska[2)] – Małgorzata Szczepaniak[3)]

Abstract

This study analyses demographic diversity in the middle-income class in six Central and Eastern European countries – Poland, Hungary, Czechia, Slovakia, Lithuania, and Estonia – in 2005 and 2021. Using EU-SILC microdata and the concept of economic stratification based on equivalised household disposable income, the analysis distinguishes lower, core, and upper middle-income groups. The main objectives are: (1) to examine how the size of middle-income classes has changed over time; (2) to assess differences in their demographic composition, particularly with regard to age, birth cohorts, and household type; and (3) to identify which cohorts experienced the greatest upward mobility on the income ladder. The results show that the middle class generally expanded, its income situation improved, and younger cohorts progressed the most. Households with children advanced economically, while single-person and elderly households remained vulnerable. Demographic shifts underline the evolving structure and economic relevance of the middle class in post-communist societies.

Keywords: middle class, demographic diversity, income stratification, Central and Eastern Europe, EU-SILC
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1. INTRODUCTION

After the demise of communist rule in the late 1980s, Central and Eastern European (CEE) countries underwent a period of rapid systemic transformation, including liberalisation, macroeconomic stabilisation, structural adjustment, and institutional reforms (*Gomułka*, 2023; *International Monetary Fund*, 2000; *Sachs*, 1996). Because of the deep structural transformation from state-led economies to market economies, Central and Eastern European countries have shared a trend of increasing income inequalities (*Brzeziński*, 2018; *Cakal-Velagic et al*., 2024; *World Bank*, 1996), which is considered the economic dimension of stratification (*Domański*, 2009). Moreover, income were observed to be highly diverse both at the start of the transformation in the early 1990s and after the countries' accession to the European Union (EU) in 2004, with Baltic countries

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presenting much greater income inequalities than what was seen in Poland, Slovakia, Czechia, and Hungary (*Brzeziński*, 2018; *World Bank*, 1996). Although income inequalities, which are closely related to income class stratification, have been relatively broadly discussed in the post-communist period (*Brzeziński et al.*, 2019; *Dorjnyambuu*, 2024; *Porras*, 2010; *World Bank*, 1996), not enough attention is paid to income distribution from the perspective of income class stratification, in particular in the middle-income groups (*Atkinson et al.*, 2013).

Central and Eastern European countries share the experience of being a post-communist type of welfare state and have many similarities in terms of their relatively worse social indicators and social stratification performance (*Aidukaite*, 2011). However, with the development of a capitalist labour market, a middle class evolved in the post-communist states (*Domański*, 2012; *Kochnar*, 2020) and is still in the process of taking shape (*Wyżnikiewicz*, 2021). It is recognised that the middle class is important for achieving strong economic growth (*Dabla-Noris et al.*, 2015) and economic stability (*Pressman*, 2007). In some post-communist countries, the middle class promoted the development of strong institutions, which were crucial to economic growth in the systemic transformation (*Cakal-Velagic et al.*, 2024; *Piątkowski*, 2020). On the other hand, class stratification is based on an institutionalised pattern of inequalities and is regulated by law and social norms (*Domański*, 2020).

The middle class is clearly definable from a sociological perspective, with occupation considered the identifying criterion of the middle class (*Erikson et al.*,1992). An economic perspective, which considers an economic criterion (i.e. equalised disposable income per person in the household or the share of the middle, i.e. between the 3rd and the 8th decile, in income distribution) is rare, particularly when it comes to analyses of the middle classes in post-communist states. Although the middle class has been described as vanishing in the United States (*Temin*, 2018) and other developed Western European countries (*OECD*, 2019; *Vaughan-Whitehead*, 2016), in most post-communist countries the middle class has grown in the period since accession to the European Union (*Panek*, 2017; *Vaughan-Whitehead*, 2020). There are also expectations that the middle class in post-communist countries will continue to expand, particularly in high-income economies (*Tvaronavičienė et al.*, 2017). Like the middle class in the rapidly transforming economies of East Asia and the Middle East, many people in CEE countries have entered the middle class (*Marsh et al.*, 2016).

The middle class in post-communist states is an interesting phenomenon not only because it evolved in similar historical circumstances but also because of the historically determined stronger preference for income equality in these states than in Western European countries (*Graham et al.*, 2017). What is more, given that in CEE countries in the post-communist period social status and criteria of class positioning became more closely connected to a person's material standard of living (*Zawadzka*, 2018), studying this group of society from an economic perspective is both worthwhile and justified. The value system of members of the middle class in CEE countries also changed from collectivist to more individualist (*Zagórski*, 2011), focusing more on individual effort to move up the economic ladder than on getting a higher education, which used to be related to being a member of the intelligentsia (*Kulas*, 2017), which was believed to be the equivalent of the middle class in the communist period (*Domański*, 2012). It was with the change in regime that meritocracy began to have an influence on the social hierarchy (*Domański*, 2020). The decrease in the strength of the correlation between education, occupation, and affluence causes frustration, which in post-communist societies is expressed by people blaming the government for their failures more often than members of the middle class in Western countries tend to do (*Domański*, 2020). Moreover, a downturn has been observed in the degree of tolerance there is of differences between the top and bottom income groups in post-communist states (*Grosfeld et al.*, 2008).

With the rise of the middle class, the group also became more complex. When the middle class is considered in economic terms based on OECD criteria, namely equalised disposable income per person in the household, the analysis includes people with different levels of education, age (generations), and gender, as well as diverse household structures. However, the demographic structure of the middle class in CEE countries is not well recognised in the

literature. The present study aims to fill this gap, focusing on changes in the period after the accession of Central and Eastern European countries to the European Union.

The political and socioeconomic transformation that Central and Eastern European countries underwent had an impact on many fields of life, including the demographic behaviour of the population (consistently low birth rates, the systematic postponement of marriage and parenthood, the rise of alternative forms of partnerships, parenthood outside marriage, and changes in nationality). Declining fertility rates and the possibility of emigration resulting from the accession to the European Union caused a decrease in the population in most countries. Compared to 1990, Eurostat data in 2005 show slight population only in Slovakia (+1.6%) and Poland (+0.4%), with a decline in Estonia (–13.5%), Lithuania (–9.2%), Hungary (–2.7%), and Czechia (–1.6%). In turn, in 2021, compared to 1990, we observe more dramatic population declines in Lithuania (–24.3%) and Estonia (–15.3%), but also in Hungary (–6.2%) and Poland (–0.5%). At the same time, the population increased in Slovakia (+3.3%) and Czechia (+1.3%). Populations are also ageing, and the old-age dependency ratio is rising in all countries. Although the population in Central and Eastern Europe is still younger on average than in Western Europe, some countries are ageing even faster than in Western Europe. Key demographic trends are becoming less favourable for the selected CEE countries.

The main aim of this study is to identify and characterise the diversity of the demographic characteristics of the middle class in Central and Eastern European countries. Considering equalised disposable income per person in the household as the criterion of membership in the middle class (in economic terms), we conducted an analysis of the middle-income class (MC). Given the relatively large and growing share of members of the MC in CEE countries, in-depth analysis of the MC was carried out on three of its subclasses: the lower middle-income class (LMC), the core middle-income class (CMC), and the upper middle-income class (UMC). The demographic characteristics of these three middle-class groups in post-communist states were assessed in terms of selected demographic aspects, including, among others, structure by age and household type. The research was conducted using EU-SILC microdata for 2005 and 2021, covering the period after the accession of Central and Eastern European countries to the European Union in 2004. The countries considered in the study included selected CEE countries for which data were available: Poland, Slovakia, Czechia, Hungary, Estonia, and Lithuania.

The research questions are as follows:

RQ1: How much did the size of the middle class change between 2005 and 2021 in Central and Eastern European countries?

RQ2: Is the middle class ageing in CEE countries?

RQ3: How diverse is the middle class in terms of demographic factors such as household type, age, and birth cohorts?

RQ4: Which birth cohort (generation) or household type experienced the greatest upward mobility on the income ladder in CEE countries?

RQ5: How diverse is the middle class in terms of income structure and distribution?

The analysis contributes to the existing literature from different angles. First, it provides a comparison of within-country analyses of the demographic characteristics of different classes in regard to income stratification. Three middle classes were distinguished to examine the differences between members of the middle class: the lower middle-income class, the core middle-income class, and the upper middle-income class. Our study is also novel for incorporating demographic variables, such as age and household type. When age is considered, there are six generations to study: the Silent Generation (born before 1946), the Baby Boomer Generation (Boomers, born 1946–1964), Generation X (born 1965–1980), Generation Y (Millennials, born 1981–1996), Generation Z (Zoomers, born 1997–2012), and Generation Alpha (born 2013–2025) (*Dimock*, 2019; *Twenge*, 2023). We use the definition of a generation (birth cohort) as the totality of people born within the same period of about 20 years (in one phase of life) (*Strauss et al.*, 1991). The boundaries between generations were slightly adjusted to fit the demographic structure of Central and Eastern European countries. The first generation (Silent) is an open time interval that encompasses individuals

born before 1946 because of their smaller share of the population and greater internal heterogeneity. This approach ensures comparability across countries and reflects the differences in the historical and socioeconomic experiences that shaped the demographic composition of successive cohorts. To date, such a detailed analysis of the characteristics of the middle class in CEE countries from a demographic perspective have not been conducted for the middle class in CEE countries.

The remainder of the article is organised as follows. The introduction discusses the main aims, the novelty of the study, and the literature review addressing the issues of middle-class formation from the perspective of the systemic transformation in Central and Eastern European countries. The data and methodology are described in section two. The empirical research and discussion results are presented in sections three, four, and five. The last section presents the conclusions.

2. DATA AND METHODS

Our study applies micro-level cross-sectional data obtained from the European Statistics of Living Conditions (EU-SILC) conducted by Eurostat. EU-SILC consists of nationally representative surveys with private households as the target group. The units surveyed are households and all their current members. The surveys are conducted annually among all European Union Member States, as well as in some other countries. The samples are considered nationally representative of the population residing in private households within the country, irrespective of language, nationality, or legal residence status. The data used in our study were taken from the 2005 and 2021 surveys and extracted from the EU-SILC 2022 cross-sectional database.

Our study covers six Central and Eastern European countries: Czechia, Estonia, Hungary, Lithuania, Poland, and Slovakia. Detailed information on the sample sizes is presented in Table 1. In this study, the middle-income class is defined according to thresholds relating to the median equivalised disposable income per person in the household, following the OECD approach (*OECD*, 2019). We focus on the middle class and capture it in terms of three middle-income subgroups defined by the percentage of the median equivalised disposable income per person in the household (lower middle-income class = 75–100% of the median; core middle-income class = 101–150% of the median; and upper middle-income class = 151–200% of median) to reflect the substantial internal diversity of the middle class, which accounts for around 60% of the population in most Central and Eastern European countries. The approach used here follows that of the *OECD* (2019) and related comparative studies (*Pressman*, 2007; *Vaughan-Whitehead*, 2016; *Derndorfer – Kranzinger*, 2021), where the three central groups in a five-class income scheme of economic stratification correspond to the lower, core, and upper middle-income strata. This division allows for a more detailed analysis of the structural and demographic differences within the middle class.

In this study, we examine the distribution of household income (total gross income) and individual income (equivalised disposable income per household member). Economic stratification is assessed using the concept of annual equivalised household disposable income (hereinafter referred to as equivalised income) per household member. This measure accounts for differences in household composition and potential economies of scale within households. For each household, the equivalised income is calculated by dividing the household's total disposable income by its equivalised household size, as defined by the modified OECD scale. According to this scale, a weight of 1.0 is assigned to the first adult in the household, 0.5 to each additional member aged 14 or older, and 0.3 to each child under the age of 14. The sum of these weights yields the household-specific equivalence factor. The resulting equivalised income thus represents the income attributable to both the household and each of its members. Using equivalised household income enables the inclusion of economically inactive individuals, such as those fulfilling domestic tasks, students, or retirees, who may nonetheless belong to high-income households (*DiPrete*, 2003). This relational perspective is particularly important in CEE states, where intra-household resource pooling, informal support networks, and family-based income arrangements remain prevalent. Annual household disposable income was determined as the sum of all household members' annual gross cash income minus

Table 1: Sample size and average measures of income in CEE countries (mean and median expressed in PPS)

Country	2005				2021			
	Households number	Individuals number	National mean income	National median income	Households number	Individuals number	National mean income	National median income
CZ	4,351.0	10,333.0	8,725.8	7,639.9	8,677.0	18,595.0	15,654.6	13,815.3
EE	4,169.0	11,948.0	5,753.7	4,724.8	6,467.0	15,143.0	16,682.3	14,810.5
HU	6,927.0	17,969.0	6,308.1	5,555.5	7,805.0	17,031.0	11,064.8	9,981.9
LT	4,441.0	12,117.0	4,774.5	3,846.9	5,649.0	12,118.0	16,895.3	13,742.2
PL	16,263.0	49,044.0	5,711.0	4,758.9	17,004.0	42,077.0	15,315.1	13,870.3
SK	5,147.0	15,418.0	4,388.4	3,989.3	5,612.0	13,497.0	9,784.4	9,425.4

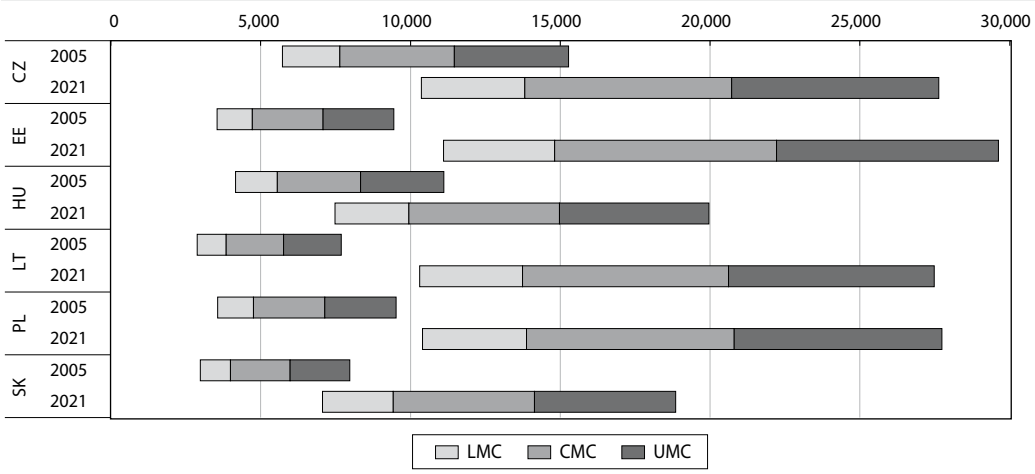
Source: Authors' calculation using EU-SILC data.

income tax, social security contributions, regular wealth tax, cash transfers to other households, and the balance of settlements with the tax authority. Thus, each household's income was divided by the sum of equivalent units attributable to each household, and then the equalised value was assigned to each household member. In order to obtain results that correspond to an extrapolation of the measures to the whole population, during the calculations we applied two kinds of weights that ensure the representativeness of the samples used: the personal cross-sectional weight (RB050) and the household cross-sectional weight (DB090). In addition to ensuring comparability and eliminating the effect of price level differences across countries, incomes were expressed in the purchasing power standard (PPS) of an artificial common currency.

According to the criteria used to identify the middle class, the median annual equivalised disposable household income per person was determined for each studied country for both years of study. The bottom and top cut-off points in the corresponding income class were identified on this basis. Figure 1 presents the income ranges in all the middle-income classes.

As Figure 1 shows, the increase in median income in 2021 compared to 2005 shifted the cut-off points and significantly widened the income ranges that define the middle class in each country.

Figure 1: Middle-income classes in CEE countries: ranges of annual equivalised disposable income per person in the household in PPS



Source: Authors' calculation using EU-SILC data.

3. RESULTS

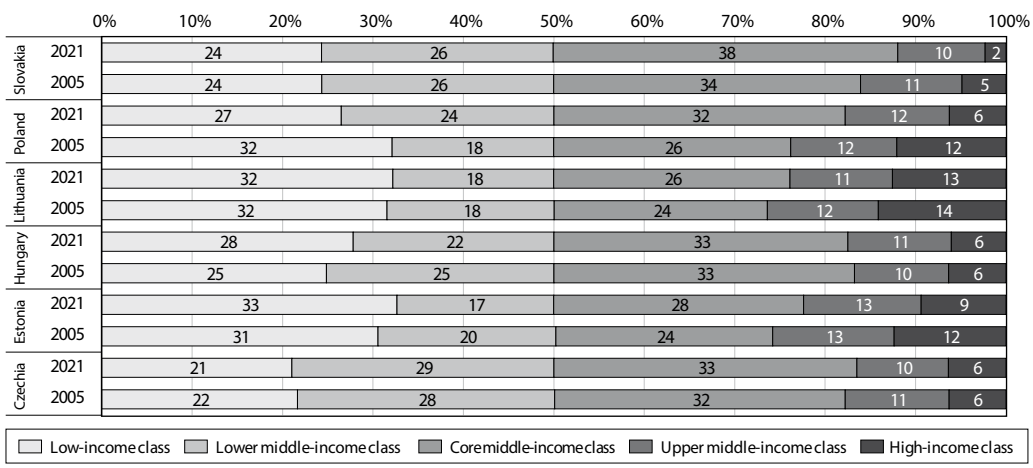
3.1 Middle-class demographics

At the outset of our analysis, we address the question: How did the size of the middle class change between 2005 and 2021 in Central and Eastern European countries (RQ1)?

In 2005, the proportion of the population that belonged to the middle class ranged from 54.3% in Lithuania to 72% in Czechia. The middle class also made up a high share of the population, around 70%, in Slovakia (70.8%) and Hungary (68.8%). In Poland, the middle class accounted for 55.8% of the population, and this was one of the lower shares among Central and Eastern European countries. In 2021, an increase in the share of the middle class in the population was observed in most of the countries studied. The only exception was Hungary, where the share decreased by 2.7 percentage points. Despite the observed decrease, the middle class still accounts for more than 66% of the Hungarian population and covers a larger share of the population than the middle class in Lithuania (55.2%) and Estonia (58%). The biggest increase in the share of the middle class was observed in Poland, with a rise of 11.4 percentage points. The share of the middle class in Slovakia increased by 2.6 percentage points. In contrast, in other countries, the increase in the share of the middle class did not exceed 1.0 percentage points. Figure 2 presents the share of all income classes in the country's population in CEE countries over the period studied.

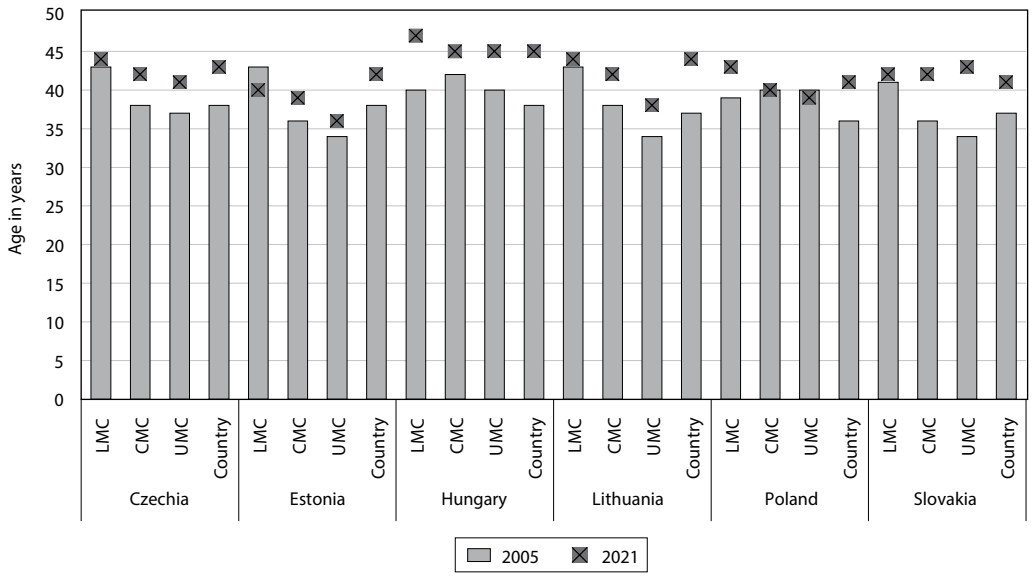
As mentioned above, the largest increase in the share of the middle class in the population was observed in Poland. This was mainly the result of people moving up the income ladder in the left tail of the distribution and a decrease in the share of the high-income class in the population. The middle class appears to be the most stable in Czechia, where it accounts for about 73% of the population. The slight increase in its share (by only 0.5 percentage points) is a result of the widening of the LMC (owing to the transfer of units from the low-income class) and the widening of the CMC, but at the expense of the UMC. Lithuania and Estonia saw an increase in the share of CMCs that was only due to the loss of income status of some units of HMCs and high-income classes and the transfer of units from LMCs to the low-income class. Although the share of the middle class in the income distribution grew in Slovakia, it should be noted that this was not the result of people moving up the income ladder. Slovakia's CMC widened as a result of the loss of income status among some people in the UMC and the high-income class. The decline in the share of the middle class in the Hungarian population may indicate income polarisation in the country. The lower-income class (with an increase in share of 3 percentage points) and the UMC are expanding, while the share of the high-income class remains stable.

Figure 2: The share of individual income classes in the country's population in CEE countries in 2005 and 2021



Source: Authors' calculation using EU-SILC data.

Figure 3: Median age (in years) of middle classes (LMC, CMC, UMC) and country population in 2005 and 2021



Source: Authors' calculation using EU-SILC data.

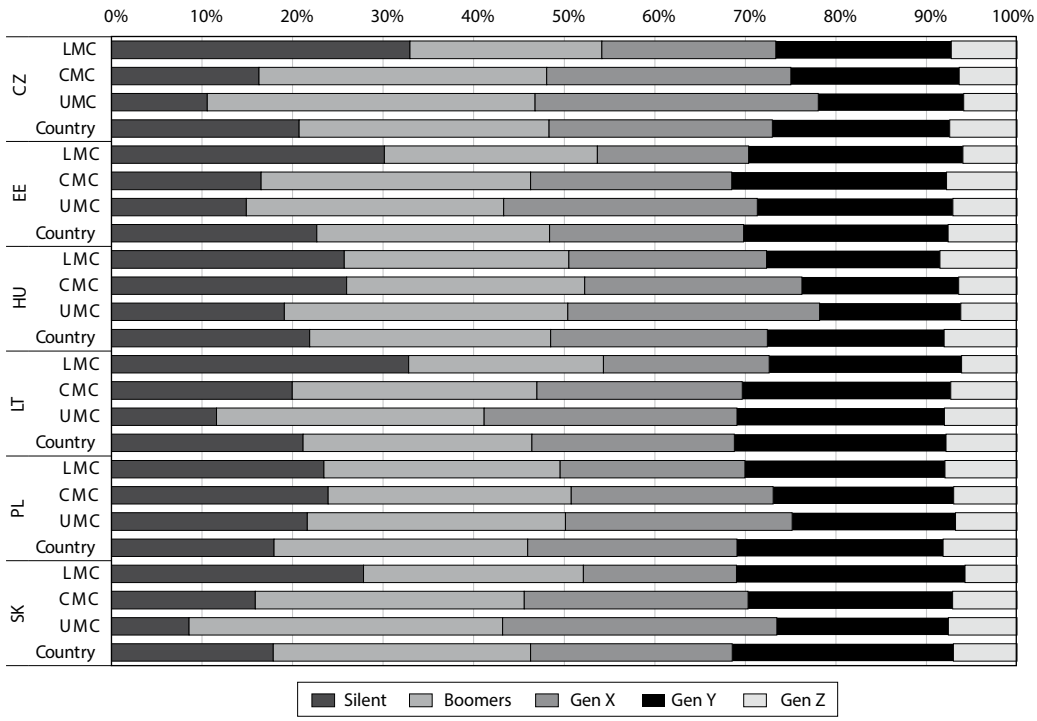
In the next step, we examine how the demographic profile of the middle class is shaping up in the face of negative demographic trends (RQ2, RQ3, RQ4). Our results indicate that the median age in the three income classes (LMC, CMC and UMC) decreased as equivalised income increased in both 2005 and 2021 (Figure 3). However, Poland and Hungary in 2005 and Slovakia in 2021 were exceptions. In both 2005 and 2021, individuals in the core middle-income class and upper middle-income class were, on average, younger than the general population in their respective countries, with the same exceptions. Between 2005 and 2021, the median age increased across all income classes in all countries, except in Estonia's LMC and Poland's UMC, where it decreased by 3 years and 1 year, respectively. In 2021, Estonia had the youngest median age across all the middle-income classes (40, 39, and 36 years, respectively), while Hungary had the oldest (47, 45, and 45 years, respectively). In two countries, Czechia and Lithuania, the middle aged more slowly than the overall population between 2005 and 2021. In Poland, the LMC aged more slowly than the population, while the CMC and UMC were, on average, younger in 2021 compared to 2005. In Estonia, the LMC grew younger between 2005 and 2021, while the CMC and UMC aged more slowly than the general population. In contrast, Hungary's LMC aged faster than the population, while the CMC and UMC aged more slowly. Slovakia exhibited a different pattern, with the CMC and UMC ageing much faster than the population, while the LMC aged more slowly.

The results suggest that some demographic groups made more progress than others. The middle-class demographic profile in the selected countries reveals that the younger generations were the primary beneficiaries. However, the exception was Slovakia, where the share of the middle class increased, but all the middle-income groups aged faster than the general population.

To better understand which demographic groups advanced up the income ladder, we categorised the population into six birth cohorts: the Silent Generation, the Baby Boomers, and Generations X, Y, Z, and Alfa.

In 2005, the largest age group within the LMC in every country was the Silent Generation, which did not align with their share of the population (Figure 4). In Poland and Hungary, people aged 60+ were also overrepresented in the CMC, and in Poland, they dominated in the UMC. In Poland, those born before 1946 had more opportunities to enter the UMC than younger generations. This disparity can be attributed

Figure 4: The share of different generations in the middle class (LMC, CMC, UMC) and country population in 2005



Source: Authors' calculation using EU-SILC data.

to Poland's high unemployment rate and the lowest employment and economic activity rates among EU Member States at the time, which made it harder for younger generations to enter the middle class. Older generations were often better protected from labour market changes and low-income risks than younger cohorts.

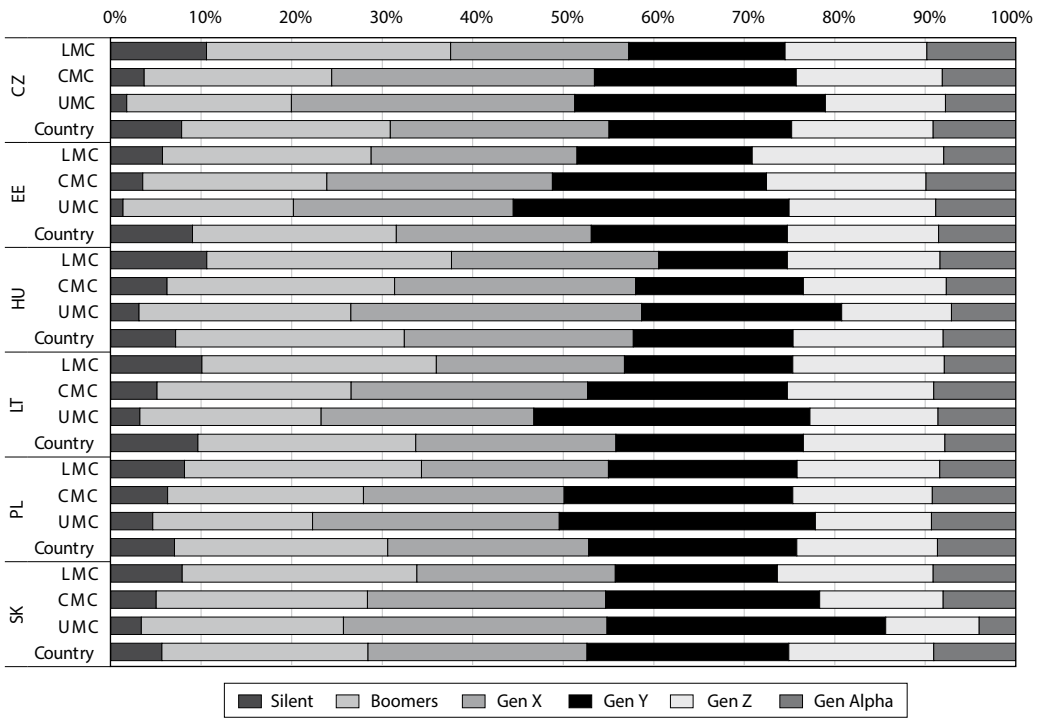
Meanwhile, in the CMC and UMC, the largest group was the Baby Boomers, reflecting their larger share of the overall population. Boomers were particularly overrepresented in these income classes in Czechia, Estonia, Slovakia, and Lithuania. This cohort, born during the post-war baby boom (those aged 41–59 in 2005), was not a 'sacrificed' generation; they benefited from longer labour market experience and did not face the diminishing returns to education that younger generations encountered.

Generation X, across all selected countries, was overrepresented in the UMC, especially in Slovakia, Czechia, Estonia, and Lithuania. Gen Xers were better educated than older cohorts, but in Poland and Hungary they faced significant challenges entering the labour market during the early post-communist period.

In 2005, Millennials were aged 9–24, and Zoomers were children under 9. Their position in the income distribution generally reflected their parents' income. In Estonia, however, the share of Millennials in the middle class exceeded their population share, while in Slovakia Zoomers were overrepresented in the middle class. In other countries, younger people and children were more likely to be located in the lower parts of the income distribution, reflecting the greater economic challenges faced by households with dependent children.

In 2021, compared to 2005, because of natural movement and migration, the age structure of the population of the selected CEE countries changed (Figure 5). We investigate whether some cohorts benefited from income growth while others – younger or older cohorts – faced stagnation or a decline in status.

Figure 5: The share of different generations in the middle class (LMC, CMC, UMC) and country population in 2021



Source: Authors' calculation using EU-SILC data.

In 2021, the cohorts born before 1965 (the Silent Generation and the Baby Boomers) experienced a significant decline in opportunities to access the core and upper middle-income classes. The Silent Generation was only slightly overrepresented in the LMC, while their share in the UMC was significantly lower than their share in each country's population. In 2021, Boomers were the dominant generation in the LMC in each country, while at the same time their share of the UMC was significantly smaller than their share of the population in each country (except for Slovakia). Boomers were often reaching the end of their careers, retiring, or already retired.

Gen Xers and Millennials made the most notable progress up the income ladder from 2005 to 2021. Their share increased in the upper-income tier while it decreased in the lower-income tier. Progress among these cohorts was likely driven by increased labour force participation and rising educational levels. Here it seems that the winners were the younger generations, especially Generation Y. The share of Millennials in the UMC increased significantly in 2021 compared to 2005 (an increase ranging between 6.5 percentage points in Hungary and 11.8 percentage points in Slovakia), while, at the same time, the share of this generation in the population remained similar or even decreased in each country. The better positioning of the younger generations was likely the result of the more dynamic economic development in Central and Eastern European countries. These changes opened up job opportunities for younger generations and created a demand for skills and knowledge that are more prevalent among younger people (ICT skills), resulting in an increase in their average wages (*Hammer et al.*, 2021). The slightly weaker position of Gen Xers compared to Millennials may have resulted from the unfavourable conditions on their entry into the labour market. If a cohort faces a difficult situation at the time they are entering the labour market, it seems that that cohort will have decreased earnings over their lifetime (*Chauvel et al.*, 2014).

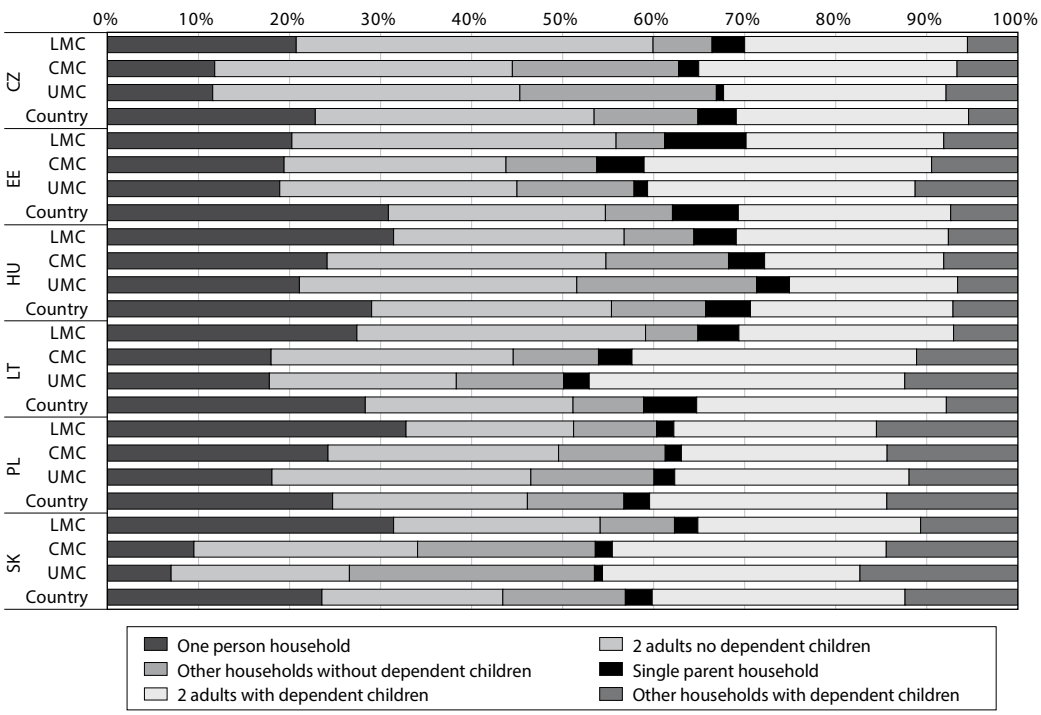
The youngest cohorts (Zoomers – aged 9–24 and Gen Alpha – children under age 9 in 2021) also made progress up the income ladder from 2005 to 2021. In contrast to 2005, Zoomers were overrepresented in the LMC and the CMC in Lithuania, Czechia, and Estonia and in the LMC in the other three countries. In turn, Gen Alpha was overrepresented in all middle classes in Lithuania, in the CMC and the UMC in Estonia and Poland, and in the LMC in the other three countries. This generally reflected the income of their parents (Generations X and Y), who were likely to be in their peak wage-earning years. Moreover, the increase in the monetary support of families with children resulted in an increase in households' income.

3.2 Types of households in the middle class in Central and Eastern European countries

Next, we examine whether different household types experienced substantial shifts in middle-class membership. One household group's movement up the income ladder does not necessarily reflect its economic standing relative to other household types at any given point in time. In all countries, single-person households and single-parent households were more likely to be concentrated in the lower parts of the income distribution in both 2005 and 2021. These two types of households were consistently underrepresented in the middle class, particularly in the core middle-income class and the upper middle-income class, as illustrated in Figures 6 and 7. Estonia and Lithuania had the highest proportion of single-person households among the selected countries. For instance, in Estonia, the share of single-person households rose from 30.9% in 2005 to 43.1% in 2021, while their share in the upper middle-income class increased from 18.9% in 2005 to 25.7% in 2021.

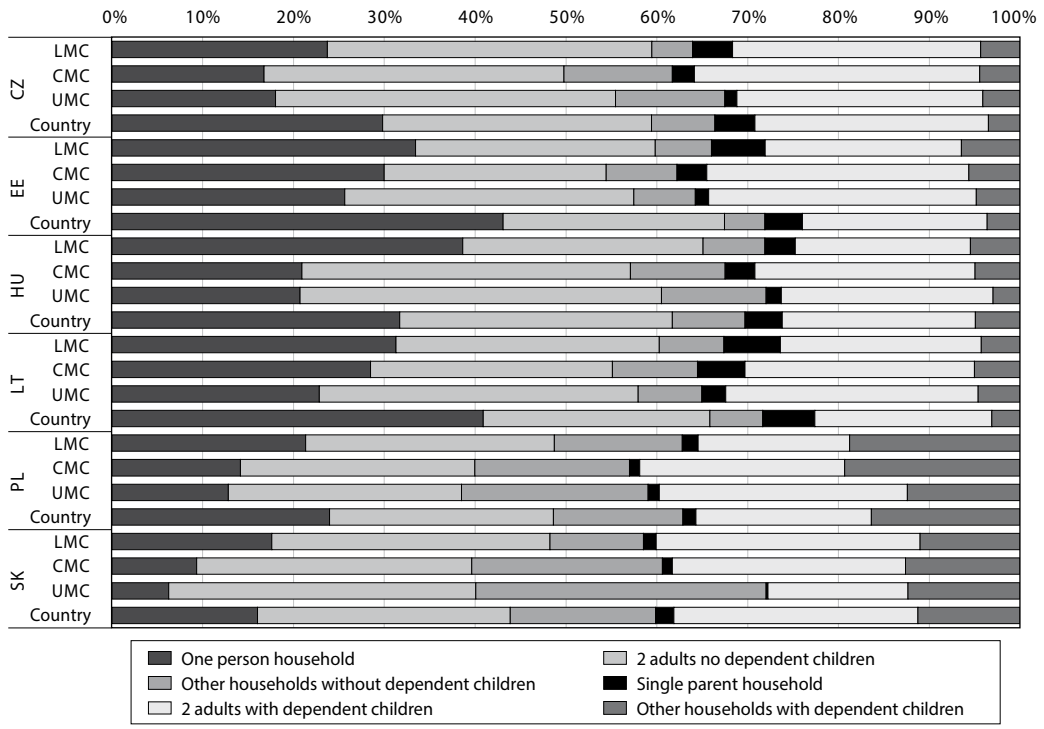
Single-person households, especially those composed of elderly individuals, and single-parent families are particularly vulnerable to poverty. Partnered adults tend to fare better across various economic indicators than their unpartnered counterparts.

Figure 6: The share of each household type in the middle class (LMC, CMC, UMC) and country population in 2005



Source: Authors' calculation using EU-SILC data.

Figure 7: The share of each household type in the middle class (LMC, CMC, UMC) and country population in 2021



Source: Authors' calculation using EU-SILC data.

In Czechia and Hungary in both 2005 and 2021, across household types, individuals in married or cohabiting households without dependent children had the highest incidence of being in the middle class, reflecting the highest share of the overall population. Also in the other four countries, households of two adults without dependent children were overrepresented in 2021 in each middle-income class. Meanwhile, in 2005 they were only underrepresented in Poland in the LMC and in Slovakia and Lithuania in the UMC. Only in Poland, the share of households with two adults without dependent children living in the UMC decreased from 28.4% in 2005 compared to 25.7% in 2021, when at the same time the share of these households in the household population increased (from 21.4% to 24.7%). In all selected countries, households with two adults with dependent children were much more likely than households with two adults without dependent children to be in the lower-income tier in 2005. Households of two adults with dependent children were overrepresented only in Czechia (in the CMC), Estonia, Lithuania, Slovakia (in the CMC and the UMC), and Hungary (in the LMC). Meanwhile, in Poland, this group of households was underrepresented in each middle-income class. Households with two adults with dependent children made more progress up the income ladder from 2005 to 2021 than their immediate counterparts without dependent children. According to Eurostat data, this is particularly true in Poland, Lithuania, and Estonia, where child and family allowances increased significantly in 2021 compared to 2005. In contrast, in Slovakia, the share of households of two adults with dependent children in the UMC declined significantly from 28.3% in 2005 to 15.4% in 2021 and in the CMC from 30.1% in 2005 to 25.7% in 2021.

3.3 Income situation of the middle class in Central and Eastern European countries

Finally, we analyse how diverse the middle class is in terms of income structure and distribution (RQ5). In the first year of the study, Czech households boasted

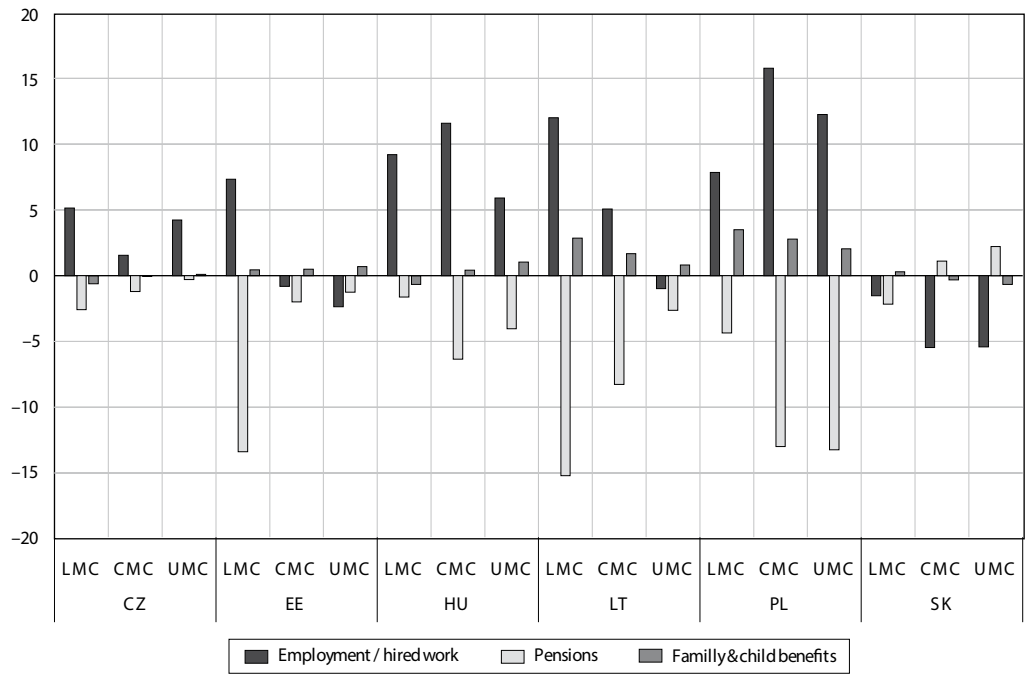
the highest income, while Slovak and Lithuanian households were at the bottom of the spectrum. Hungarian, Polish, and Estonian households exhibited similar income levels but were still significantly lower than Czech households. Fast forward to 2021, and the landscape has changed dramatically. Czechia, which once led the income rankings, has now been surpassed by Lithuania, which experienced a remarkable increase in mean income. Despite this, Estonia holds the highest median income among the studied countries. Poland has made significant progress, ultimately matching the income levels of Czechia. Meanwhile, Hungary and Slovakia continue to lag behind as the poorest countries among the studied group.

The analysis of middle-class incomes in Central and Eastern European countries confirms the relation between incomes in whole countries' populations and notable shifts in income levels between 2005 and 2021.

In 2005, the highest income levels were recorded across all sub-classes of the Czech middle class. Households in the lower middle-income class in Czechia achieved incomes comparable to those of the core middle-income class in Hungary and the upper middle-income class in Lithuania and Slovakia. The average income (both mean and median) of the Czech core middle-income class was at the level of the average income of the upper middle-income class in Hungary, exceeding that of the upper middle-income class in other countries.

Significant increases in middle-class incomes were observed across all CEE countries between 2005 and 2021. The differential growth rates, however, altered the relative income standings among these countries. The most notable change was the equalisation of middle-class incomes among the countries studied. In 2021, households in Estonia exhibited the best income situation across all middle-class subclasses, although the difference was not substantial. Comparable middle-class income levels were recorded in Czechia, Poland, and Lithuania. In contrast, the lowest income levels across all middle-class subclasses were found in Hungary and Slovakia.

Figure 8: Changes in the share of selected income sources in the middle-class income structure, 2005–2021 (percentage points)



Source: Authors' calculation using EU-SILC data.

The income structure of the middle class in Central and Eastern European countries is shown in Annex 1 in the annex. The analysis of gross household income in the studied countries highlights the dynamics of various income sources over time. The primary sources of household income were paid employment (wages and salaries), pensions, and self-employment, with paid work dominating in all countries. In 2005, wages and salaries accounted for between 45% of income in the LMC in Poland and 88% in the UMC in Estonia, while in 2021 this share ranged from 52% in the LMC in Czechia to 85% in the UMC in Estonia. As can be seen, the increase in the median income corresponded to a higher share of income from paid work. In most of the countries studied, the share of income from hired work increased in 2021 compared to 2005. The exceptions were Slovakia, where the share of income from paid employment decreased in all the subclasses of the middle-income class, and Estonia, where the share of income from this source decreased in the core and upper middle-income classes.

After paid employment, pensions were the second source of income for households in the countries studied. However, it should be emphasised that, unlike income from paid employment, the increase in the median disposable income was accompanied by a decrease in the share of income from pensions. Their share in the LMC in 2005 ranged from 33% in Czechia, Poland, and Lithuania to only a few percent in the UMC class. The exceptions are Poland and Hungary, where this proportion was 25% and 14%, respectively. In 2021, all countries except Slovakia saw a decrease in the share of household incomes from pensions. This decrease corresponded to an increase in the share of income from hired work. Conversely, in Slovakia a decrease in the share of income from hired work was offset by increased income from self-employment and pensions (the CMC and the UMC).

Another source of income for households in the middle class was self-employment, which in 2005 in most of the studied countries accounted for between 6–8% of income in the LMC and 7–10% in the UMC. Czechia was the only country in which the share of income from self-employment in this middle-income class was higher, at 19%. A surprisingly low share of income from this source was recorded in Estonia, ranging from 1.07% to 2.08%. In 2021, a decrease in the share of income from self-employment was observed in Czechia, Hungary, and Estonia (to less than 1%). A decrease in income from this source was also seen in Poland and Lithuania, but just in the LMC and the CMC. In both Poland and Lithuania, an increase in the share of income from self-employment was observed in the UMC and in Slovakia it was observed in all middle-income classes.

The share of other sources of household income was relatively small. Income from capital in the first year of the study ranged from 0.05% (the UMC in Slovakia) to 1.19% (the same class in Czechia). However, it should be stressed that the share of income from this source increased in most of the countries studied, i.e., in all middle-income classes in Estonia and Lithuania, in the core and upper middle-income classes in Czechia, and in the UMC in Hungary and Slovakia. Only in Poland did the share of income from capital decrease in the subsequent middle-income classes to 0.14%, 0.26%, and 0.47%, respectively.

Unemployment benefits also accounted for a small proportion of household income. The highest, in 2005, was in Poland, where the share of income from unemployment benefits ranged from 2.46% in the LMC to 0.95% in the UMC. Over the period studied, the share of income from this source fell in Hungary, Poland, and Slovakia, while it increased in Estonia, Lithuania, and Czechia. Their highest level, in 2021, was recorded in Lithuania (2.45%–1.13%).

In 2005, income from family allowances and child benefits represented between 0.42% of household income in the UMC in Poland and 6.12% in the LMC in Hungary. It is important to note that the increase in the median income corresponded to a higher share of income from this source. When comparing the two years studied, an increase in the share of income from family allowances and child benefits was recorded in most of the countries studied. The share of income from this source increased in all the middle-income classes in Poland, Lithuania, and Estonia, and in the core and upper-middle-income classes in Czechia and Hungary. The exception was Slovakia, where income from family and child benefits fell by 15% and 53% in the core and upper middle-income classes, respectively.

The analysis indicates a significant reliance on paid employment as a stable income source for the middle

class, with a shift away from pensions in several countries. The observed increases in family allowances and child benefits reflect the changing societal support structures in the countries studied. The results underscore the shifting landscape of income sources in the middle-income classes and highlight areas of vulnerability, such as reliance on pensions and self-employment, particularly in countries exhibiting declines in these areas.

4. DISCUSSION AND CONCLUSIONS

Even though the formation of the middle class after the systemic transformation that started in the early 1990s in Central and Eastern European countries has been thoroughly described in the sociological literature (*Domański*, 2012), class stratification from an economic perspective, considering disposable income per person in the household, is not well-explored. Moreover, it is unclear how the middle class changed in terms of such demographic characteristics as age (born cohorts) and type of households in the period after accession to the European Union, which our study aimed to fulfil.

The analysis we conducted enabled us to address all the research questions. The income situation of the middle class in Central and Eastern European countries has been improving, as reflected in the increases in annual equivalised household disposable income per household member (mean and median), both at the national level and within different income classes.

Concerning RQ1, most of the CEE countries studied experienced an increase in the share of the middle class within the population. The most notable changes were observed in Poland, where not only did the middle class undergo record growth but this occurred through upward mobility within the income distribution. Slovakia also saw a significant expansion of its middle class; however, this was primarily due to a decline in the income status of individuals who previously belonged to the high-income class. The middle class appears to be the most stable in Czechia, with movement occurring mainly between its subgroups. In contrast, Hungary is an exception, where income polarisation is evident. Here, the lower and core middle-income classes have contracted, with their shares shifting into both the low-income and high-income classes.

Regarding RQ2, overall, between 2005 and 2021, the middle-class population aged more slowly than the country's population in the selected countries (except Slovakia). This was particularly evident in the core and upper middle-income classes in Poland, which grew even younger in 2021 compared to 2005. Regarding RQ3 and RQ4, in 2005, the oldest cohorts (Silent Generation and Boomers) were not disadvantaged generations. They benefited from extensive experience in a dynamic labour market following the socioeconomic transformation, unlike Gen X and Gen Y. Boomers were significantly overrepresented in the core and upper middle-income classes in Czechia, Estonia, Slovakia, and Lithuania, while the Silent Generation was overrepresented in all middle-income classes in Poland. However, by 2021, cohorts born before 1965 experienced a marked decline in their access to the core and upper middle-income classes, suggesting that younger generations, particularly Generation Y, emerged as the economic winners. The youngest cohorts (Zoomers and Generation Alpha) also made notable progress up the income ladder between 2005 and 2021. By 2021, the core and upper middle-income classes were predominantly young – an under-recognised transformation that signals a generational relocation of economic power.

Across countries, single-person and single-parent households were more likely to be at the lower end of the income distribution and less likely to belong to the middle class in both 2005 and 2021. However, as a result of increased cash support for families with children (especially in Poland, Lithuania, and Estonia), households with dependent children made greater strides up the income ladder between 2005 and 2021 compared to their childless counterparts.

Regarding RQ5, the primary sources of income for middle-class households were employment (wages and salaries), pensions, and self-employment, with employment being the dominant source across all countries. In most of the countries studied, the share of income from employment increased in 2021 compared to 2005, while the share of pensions decreased. Slovakia was the exception, where a decline in income from employment was offset by increases in income from self-employment and pensions within the

core and upper middle-income classes. The analysis highlights a significant reliance on paid employment as a stable source of income for the middle class, along with a shift away from pensions in several countries. This trend aligns with the demographic analysis, which shows decreasing opportunities for older generations to remain within the middle class. Additionally, increases in family and child benefits reflect evolving social support structures across the countries studied. Households with two adults and dependent children experienced more upward mobility from 2005 to 2021 compared to their childless counterparts. This was especially evident in Poland, Lithuania, and Estonia, where child and family allowances saw substantial growth in 2021 compared to 2005.

The present study is not without limitations. Its methodological framework is based exclusively on economic stratification using equivalised household disposable income. While this approach ensures comparability and highlights income-related mobility, it does not capture other dimensions of social differentiation, such as occupation, education, or labour market status (*Hugree et al*., 2020). Future research could combine income-based and sociological classifications and incorporate demographic factors, such as age, household type, or generation, to better reflect the multidimensional nature of stratification in post-communist societies.

Another future direction of research will focus on exploring the relationship between income class stratification in post-communist and Western European states and life satisfaction across different demographic groups. This study would provide a deeper understanding of whether the processes identified in post-communist Central and Eastern European countries are homogenous owing to their shared historical background or if they diverge from those in European Union countries with longer capitalist, market-oriented traditions. Furthermore, the findings would offer valuable insights for policymakers in tailoring policies to the demographic and economic conditions of specific age and generational groups, ultimately aiming to enhance individuals' life satisfaction.

The changes observed in the size and demographic structure of the middle class in Central and Eastern European countries have significant implications for policymakers. It is essential to focus on the most vulnerable households within the middle class, particularly those who experienced downward mobility in the period following EU accession. In this regard, policies should prioritise support for older generations, particularly the Silent Generation, whose position in the middle-class income hierarchy has deteriorated the most.

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SUMMARY

The article examines the diversity of demographic characteristics in the middle class in six Central and Eastern European (CEE) countries: Poland, Czechia, Slovakia, Hungary, Estonia, and Lithuania. Using EU-SILC data from 2005 and 2021 and aking the equivalised disposable income per person in the household as the criterion for membership in the middle class (in economic terms), the article explores how income levels and class composition evolved over time, with a particular focus on structure by age and household type. The findings show that the middle class expanded in most countries. The income thresholds defining the middle class rose, indicating improvements in income levels. Younger generations improved their economic position the most. In contrast, older generations, particularly those living alone, were more likely to fall below the middle-income threshold. Households with children generally advanced economically, while single-person and elderly households showed signs of stagnation or decline in their share of the middle class. Educational attainment emerged as a key factor: individuals with higher education were more likely to enter and remain in the middle class. Cross-country comparisons revealed that Poland experienced the most robust middle-class growth, while Hungary showed more modest progress and still maintained higher shares of population below the middle-income line. Although the middle class is becoming more demographically diverse, it remains exposed to risks such as inequality and economic volatility. Demographic shifts within the middle class reveal emerging social divisions and new vulnerabilities. Structural factors such as age, education, and household composition increasingly determine opportunities for upward mobility. These findings contribute to understanding class restructuring and social change in post-communist Europe and suggest the need for targeted policies to strengthen and protect vulnerable segments of the middle-income population.

Annex

Annex 1: Structure of gross income of households in the middle class by source of income

Country	Middle class	Employment / hired work	Self-employment	Income from capital	Pensions	Unemployment	Family and child benefits	Other
Czechia	**2005**							
	LMC	46.7%	7.4%	0.5%	32.8%	0.7%	3.3%	8.6%
	CMC	69.9%	10.5%	0.7%	11.7%	0.3%	1.5%	5.3%
	UMC	70.8%	19.5%	1.2%	4.7%	0.2%	0.7%	3.1%
	2021							
	LMC	51.9%	6.8%	0.4%	30.2%	0.5%	2.7%	7.6%
	CMC	71.5%	10.1%	1.0%	10.5%	0.4%	1.4%	5.1%
	UMC	75.0%	15.3%	1.4%	4.4%	0.3%	0.8%	2.8%
Estonia	**2005**							
	LMC	61.7%	1.1%	0.1%	27.5%	0.4%	4.3%	5.0%
	CMC	81.5%	1.7%	0.4%	10.0%	0.4%	3.5%	2.5%
	UMC	87.8%	2.1%	0.3%	6.2%	0.2%	2.4%	1.0%
	2021							
	LMC	69.0%	1.0%	0.8%	14.0%	1.7%	4.8%	8.6%
	CMC	80.7%	0.8%	0.8%	8.0%	1.5%	4.0%	4.3%
	UMC	85.4%	0.8%	1.2%	4.9%	1.3%	3.1%	3.3%
Hungary	**2005**							
	LMC	46.4%	7.4%	0.4%	28.4%	1.3%	6.1%	10.0%
	CMC	57.3%	7.9%	0.2%	24.1%	0.7%	3.1%	6.7%
	UMC	70.2%	8.7%	0.2%	14.0%	0.5%	1.8%	4.5%
	2021							
	LMC	55.7%	5.0%	0.2%	26.8%	0.6%	5.4%	6.3%
	CMC	69.0%	6.0%	0.2%	17.7%	0.2%	3.5%	3.4%
	UMC	76.2%	7.6%	1.1%	9.9%	0.3%	2.9%	2.0%

Annex 1: (continuation)

Country	Middle class	Employment / hired work	Self-employment	Income from capital	Pensions	Unemployment	Family and child benefits	Other
Lithuania	**2005**							
	LMC	50.5%	6.4%	0.1%	32.6%	0.4%	1.6%	8.3%
	CMC	71.3%	6.2%	0.2%	15.7%	0.1%	1.7%	4.8%
	UMC	80.7%	6.8%	0.2%	7.1%	0.2%	1.3%	3.7%
	2021							
	LMC	62.6%	5.8%	1.0%	17.3%	2.4%	4.5%	6.3%
	CMC	76.4%	5.9%	0.9%	7.4%	1.6%	3.4%	4.4%
	UMC	79.7%	8.1%	1.0%	4.5%	1.1%	2.1%	3.5%
Poland	**2005**							
	LMC	45.3%	8.1%	0.3%	32.7%	2.5%	2.0%	9.3%
	CMC	52.1%	7.3%	0.3%	31.2%	1.8%	1.1%	6.2%
	UMC	62.3%	8.1%	0.5%	24.6%	0.9%	0.4%	3.1%
	2021							
	LMC	53.2%	7.6%	0.1%	28.3%	0.3%	5.5%	4.9%
	CMC	68.0%	6.9%	0.3%	18.1%	0.1%	3.9%	2.7%
	UMC	74.6%	9.7%	0.5%	11.3%	0.1%	2.5%	1.4%
Slovakia	**2005**							
	LMC	54.1%	2.8%	0.2%	29.7%	0.8%	3.3%	9.2%
	CMC	74.2%	2.6%	0.1%	15.0%	0.6%	2.5%	4.9%
	UMC	85.6%	3.7%	0.1%	6.4%	0.4%	1.9%	1.9%
	2021							
	LMC	52.5%	8.3%	0.2%	27.5%	0.5%	3.6%	7.4%
	CMC	68.7%	7.6%	0.1%	16.1%	0.4%	2.2%	4.9%
	UMC	80.2%	6.5%	0.1%	8.6%	0.1%	1.3%	3.3%

Source: Authors' calculation using EU-SILC data.

NADĚJE DOŽITÍ BEZ BOLESTI VE VĚKU 25, 50 A 65 LET V EVROPĚ

Markéta Míšková[1] – Michala Lustigová[2]

PAIN-FREE LIFE EXPECTANCY AT AGES 25, 50, AND 65 IN EUROPE

Abstract

With increasing life expectancy and population ageing across Europe, attention is shifting from how long people live to how many of those years are spent in good health. Life without pain has become an important indicator of quality of life and functional health. The aim of this study is to compare pain-free life expectancy at ages 25, 50, and 65 across 23 European countries and to analyse the differences between men and women. Data were obtained from the European Health Interview Survey (2019) and the Human Mortality Database. Pain-free life expectancy was calculated using the Sullivan method, which combines life table data with the age-specific prevalence of pain. The results reveal significant differences between countries and sexes. The prevalence of pain in Europe reaches 22% among men and 31% among women. Women live longer but spend a larger proportion of their lives with pain. Among men aged 65, the proportion of life spent with pain ranges from 16% to 44% of total life expectancy, while among women the figure is 24% to 58%. Western European populations show higher pain-free life expectancy than those in Eastern Europe, particularly among men. These findings highlight persistent regional and gender disparities in health across Europe and provide valuable insights for developing targeted public health policies aimed at reducing the burden of pain throughout the life course.

Keywords: life expectancy, pain, health inequalities, Europe
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ÚVOD

V posledních desetiletích dochází v evropském regionu ke zvyšování střední délky života u mužů a žen (*Țarcă et al.*, 2024), současně však lze pozorovat proces demografického stárnutí populace (*Cai et al.*, 2023). Prevalence bolesti se v evropských populacích pohybuje okolo 20–40 % (*Rometsch et al.*, 2025; *Todd et al.*, 2019), u osob starších 50 let se bolest vyskytuje až u 60 % populace (*Zimmer et al.*, 2020). Stáří klade zvýšené nároky nejen na sociální a ekonomické systémy (*Nielsen et al.*, 2021), ale také na zdravotnický sektor, a to zejména v souvislosti s vyšší prevalencí chronických onemocnění a bolestivých stavů (*Gianfredi et al.*, 2025). Bolest přitom nemusí být vždy spojena s život ohrožujícím onemocněním (například v případě osteoporózy) (*Zimmer – Rubin*, 2016). Lze tedy předpokládat, že výskyt zdravotních obtíží spojených s bolestí bude v důsledku populačního stárnutí nadále v populaci narůstat (*Zimmer et al.*, 2020). Zvyšující se naděje dožití mimo jiné odráží rostoucí úroveň zdravotnictví (*Cao et al.*, 2020) a pokroky v oblasti medicíny

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(*Cai et al.*, 2023). Otázkou však zůstává, zda jsou přidané roky života prožívány v neomezujícím zdravotním stavu a při zachování dobré kvality života *(Zimmer – Rubin*, 2016).

Výskyt bolesti je ovlivňován širokou škálou biologických, sociálních a behaviorálních faktorů. U žen je dlouhodobě pozorována vyšší prevalence bolesti v porovnání s muži (*Rometsch et al.*, 2025), což může být přičítáno rozdílné genetice (*Nascimento et al.*, 2020), různým hormonálním hladinám, imunitnímu systému (*Keogh – Boerner*, 2024), rozdílnému spektru prevalence nejčastějších onemocnění (*Osborne – Davis*, 2022), ale i vyšší míře zdravotního uvědomění a častějšímu vyhledávání lékařské péče u žen (*Cao et al.*, 2020). Je známo, že ženy se sice dožívají vyššího věku než muži, ale větší část svého života stráví se zdravotními obtížemi, včetně chronické bolesti (*Zimmer – Rubin*, 2016). Vyšší prevalence bolesti je dále asociována s nezdravým životním stylem (*Mills et al.*, 2019), nízkým socioekonomickým statusem, psychickými obtížemi (*Şentürk et al.*, 2023) atd. Tyto faktory ovlivňují nejen samotný výskyt bolesti, ale mají také dopad na celkovou délku i kvalitu života (*Foster et al.*, 2023).

Důležitým faktorem ovlivňujícím výskyt bolesti je samozřejmě věk. S vyšším věkem prevalence bolesti obecně narůstá (*Şentürk et al.*, 2023), nicméně některé studie poukazují na nejvyšší výskyt ve středním věku (45–64 let), po němž může docházet k mírnému poklesu. Etiologie bolesti se v průběhu života mění – zatímco v mladší dospělosti převládají úrazy a akutní stavy, ve vyšším věku jsou hlavními příčinami bolesti degenerativní a muskuloskeletální onemocnění (*Rustøen et al.*, 2005). Období mladé dospělosti je charakteristické zásadními životními přechody, jako je vstup na trh práce, budování partnerství či zakládání rodiny (*Bültmann et al.*, 2020). Výskyt bolesti v tomto věku může negativně ovlivnit duševní zdraví a zvyšovat riziko depresivních a úzkostných poruch *(Harte et al.*, 2024), užívání návykových látek (*Murray et al.*, 2022) či sociální izolace (*Carter et al.*, 2023). Ve věku kolem 50 let je většina jedinců stále ekonomicky aktivní, avšak současně se začínají manifestovat první chronické zdravotní potíže (*Komolsuradej et al.*, 2025). V tomto období bývá reportovaná prevalence bolesti zvláště vysoká (*Rustøen et al.*, 2005), jelikož jedinci bolest vnímají jako výrazně omezující faktor (*Glei – Weinstein*, 2023), přičemž ji ještě nespojují s běžnými projevy stáří (*Chireh – D'Arcy*, 2018). Věk 65 let je v mnoha zemích spojován s odchodem do důchodu, přestože se stále častěji diskutuje o nutnosti posunu této hranice směrem k vyššímu věku (*Weber – Loichinger*, 2022). Přítomnost bolesti v tomto věku může významně snižovat kvalitu života (*Denche-Zamorano et al.*, 2025), zvyšovat riziko dalších zdravotních komplikací (*Mookerjee et al.*, 2024), omezovat úroveň fyzické aktivity (*Balicki et al.*, 2025) a představovat omezující faktor pro setrvání na pracovním trhu (*Skovlund et al.*, 2023).

Mezi evropskými zeměmi existují významné rozdíly ve střední délce života i v počtu let prožitých ve zdraví (*Jagger et al.*, 2008). Některé studie uvádí, že populace jižní Evropy tráví větší část života ve zhoršeném zdravotním stavu než populace ze severní a střední Evropy (*Nielsen et al.*, 2021). Naproti tomu jiné výzkumy poukazují na nejnižší hodnoty naděje dožití v populacích střední a východní Evropy, které zároveň častěji vykazují vyšší zátěž dlouhodobých zdravotních obtíží (*Stonkute et al.*, 2023).

Většina existujících studií se zaměřuje na ukazatele naděje dožití ve zdraví (nejčastěji měřeno na základě subjektivního hodnocení zdraví či prevalence dlouhodobé nemocnosti), případně bez funkčních omezení. Chybí však celoevropský výzkum zaměřený na naději dožití bez bolesti – indikátor, který může komplexně odrážet nejen fyzický stav jedince, ale také jeho psychické rozpoložení. Současně je běžné, že se analýzy omezují na jednu konkrétní věkovou skupinu, čímž ztrácí možnost věkového srovnání v rámci životního cyklu. Cílem této studie je proto porovnat naději dožití bez bolesti ve třech věkových momentech (25, 50 a 65 let), které reprezentují mladou dospělost, střední věk a počátek seniorského věku. Výsledky přispějí k hlubšímu pochopení geografických rozdílů mezi evropskými zeměmi a pomohou objasnit genderové nerovnosti v oblasti zdraví.

DATA A METODIKA

Tento článek hodnotí rozdíly v naději dožití bez bolesti u mužů a žen ve vybraných evropských populacích. Ukazatel naděje dožití bez bolesti vyjadřuje průměrný počet let, kterých se dožije osoba v určitém věku při zachování aktuálních úmrtnostních poměrů

a prevalence bolesti v populaci dle věku. K určení naděje dožití bez bolesti je využita Sullivanova metoda, která kombinuje funkce z úmrtnostních tabulek v tomto případě věkově specifickou prevalencí bolesti. V každém věku je délka života bez bolesti převážena prevalencí bez zdravotního omezení a konkrétně spočítána jako součin tabulkového počtu žijících v dokončeném věku (L_x) a podílu osob bez bolesti v daném věku (π_x). Tyto hodnoty se následně sčítají od daného věku až do nejvyššího věku, a výsledek je vydělen tabulkovým počtem dožívajících se přesného věku (l_x) (*Jagger et al*., 2007):

$$PFLE_x = \frac{1}{l_x}\sum_{i=x}^{\omega}(1-\pi_i)L_i$$

kde:

$PFLE_x$ (pain-free life expectancy) je naděje dožití bez bolesti ve věku x,

L_i je tabulkový počet žijících v dokončeném věku i,

π_i je podíl osob bez bolesti ve věku i,

l_x je tabulkový počet dožívajících se přesného věku x,

ω je nejvyšší věk v tabulce.

Tato metoda je nejrozšířenější metodou pro odhad naděje dožití bez zdravotního omezení, jelikož má nízké nároky na vstupní data (úmrtnostní tabulky a prevalence zdravotního stavu) (*Muszyńska-Spielauer et al*., 2024). Naděje dožití bez bolesti je v následující kapitole hodnocena jednak v absolutních hodnotách, ale i relativních hodnotách, jako podíl naděje dožití s bolestí na celkové naději dožití.

Nejprve byly vypočítány zkrácené úmrtnostní tabulky pomocí specifických měr úmrtnosti zvlášť pro muže a ženy. Data o počtu zemřelých a středním stavu obyvatel za rok 2019 byla získána z Human mortality database (HMD). Výpočet úmrtnostní tabulky za evropské země celkem byl spočítán tak, že byly sečteny počty zemřelých a střední stavy obyvatel za všechny zkoumané evropské země. Počáteční věkovou skupinou jsou osoby ve věku 25–29 let a poslední věková skupina končí otevřeným intervalem 80+ let.

Údaje o prevalenci bolesti pochází z individuálních dat Evropského výběrového šetření o zdraví (EHIS) za rok 2019, která byla získána na základě žádosti od EUROSTATu. Za osoby s přítomností bolesti byli označeni respondenti, kteří na otázku: „Jak velké fyzické bolesti jste pociťoval/a v posledních 4 týdnech?“, odpověděli, že pociťují střední, silné nebo velmi silné bolesti. V rámci této otázky mohl respondent odpovědět i že pociťuje velmi mírné a mírné bolesti. V tomto případě byl respondent zařazen do kategorie bez bolesti, jelikož bolest tyto osoby nemusí významně ovlivňovat ve vykonávání každodenních aktivit *(Zimmer et al*., 2022) a kvalita života nebývá významně ovlivněna (*Ekediegwu et al.*, 2024). Z datového soboru byli vyřazeni respondenti, za které vyplňoval dotazník někdo jiný (tzv. proxy respondenti), protože bolest je vnímána subjektivně. Prevalence bolesti podle věku byla využita ve výpočtu podle Sullivanovy metody, v níž se tabulkový počet žijících v dokončeném věku L_x z úmrtnostní tabulky váží podílem osob bez bolesti v daném věku. Absolutní počty respondentů v jednotlivých věkových kategoriích jsou k dispozici v příloze číslo 1 a 2. Výsledné hodnoty vyjadřují očekávaný počet let života bez bolesti při zachování současných podmínek úmrtnosti a zdravotního stavu. Pro uvedení do problematiky byla ještě vypočítána věkově standardizovaná míra prevalence bolesti u osob starších 25 let. Za standard byla zvolena Evropská standardní populace z roku 2013 (*Eurostat*, 2013).

Jelikož jsou data o prevalenci bolesti přebírána ze studie EHIS, byly do výzkumu zahrnuty pouze ty populace zemí, za které jsou k dispozici data v HMD a zároveň se účastnily šetření EHIS. Individuální anonymizovaná data EHIS z roku 2019 pro vědecké účely dále neposkytuje Francie. Jednotlivé země mohou v některých případech odevzdávat data do EUROSTATu v rozdílném formátu, v tomto případě se to týká věkových skupin, kdy poslední věkový interval je rozdílný. Z tohoto důvodu byly vyřazeny země, které mají poslední věkový interval nižší než 80 let (Itálie, Island). Celkem tedy do analýz vstupuje 23 zemí.

Pro tuto studii byly vybrány tři věky, pro které byla vypočítána naděje dožití bez bolesti, které reprezentují různé životní etapy. Osoby ve věku 25 let (mladá dospělost) mají zpravidla dokončené vzdělávání a vstupují na trh práce. Tato populace většinou není zatížena závažnými zdravotními problémy. Ve věku 50 let (střední věk) se zvyšuje riziko chronických zdravotních obtíží včetně bolesti, ale zároveň jde o populaci, která je většinou stále součástí pracovního trhu. V tomto věku hraje důležitou roli také prevence bolestivých stavů v budoucnosti. Věk 65 let je

ve většině evropských zemí spjat s odchodem do důchodu. Život bez bolesti je velmi důležitý z hlediska udržení dobré kvality života.

VÝSLEDKY

Výskyt bolesti se významně liší u jednotlivých populací, a dosahuje rozdílných hodnot také v závislosti na pohlaví (Tab. 1). Prevalence bolesti se ve zkoumaných evropských zemích pohybuje okolo 21,9 % u mužů a 31,4 % u žen. Nejvyšších hodnot prevalence bolesti dosahují muži (30,4 %) a ženy (40,0 %) z Estonska. Naopak nejnižší prevalence bolesti je pozorována u mužů z Řecka (12,5 %) a u žen z Bulharska (12,8 %). V Česku dosahuje prevalence bolesti 16,7 % u mužů a 19,4 % u žen.

Největší rozdíly mezi pohlavími jsou zaznamenány v Belgii, Portugalsku, Norsku a Španělsku, kde rozdíl v prevalenci bolesti u mužů a žen přesahuje 10 procentních bodů (p. b.). Naopak nejnižší rozdíly (do 6 p. b.) ve výskytu bolesti u obou pohlaví jsou pozorovány v populacích Bulharska, Česka, Dánska, Irska a Lotyšska.

Při zkoumání vztahu mezi nadějí dožití a nadějí dožití bez bolesti je na první pohled patrné, že vyšší naděje dožití automaticky neznamená vyšší naději dožití bez bolesti (Grafy 1–6). V případě mužů lze pozorovat poměrně zřejmé rozdělení evropských zemí na dvě skupiny, přičemž tyto shluky jsou nejvýraznější ve věku 65 let (Graf 5). V tomto věku první skupina populací dosahuje vyšší celkové naděje dožití i vyššího počtu let prožitých bez bolesti a spadají do ní zejména populace západní Evropy. Druhá skupina shlukuje zejména populace z východní Evropy a vyznačuje se jak nižší nadějí dožití, tak i nižší nadějí dožití bez bolesti. Rozdělení zemí do těchto dvou skupin je patrné ve všech třech sledovaných věcích. Mezi muži se populace Česka a Slovinska z hlediska naděje dožití bez bolesti nejvýrazněji odlišují od ostatních populací. Ve věku 25 let vykazují muži z Česka hodnoty naděje dožití bez bolesti, které se nacházejí na pomezí mezi skupinou zemí s nižšími a vyššími hodnotami. S rostoucím věkem se však jejich pozice posouvá směrem k populacím s nižší nadějí dožití bez bolesti. Naopak muži ze Slovinska mají ve všech sledovaných věcích relativně vysokou celkovou naději dožití, avšak počet let prožitých bez bolesti zůstává v rámci této skupiny nízký.

U žen není rozdělení populací na skupiny natolik výrazné a rozložení je více různorodé (Graf 2, 4, 6). Všeobecně lze říci, že ženy v západní Evropě mají

Tab. 1: Věkově standardizovaná míra prevalence bolesti v Evropě, 2019, populace 25+ (%)
Age-standardised prevalence of pain in Europe, 2019, population aged 25+(%)

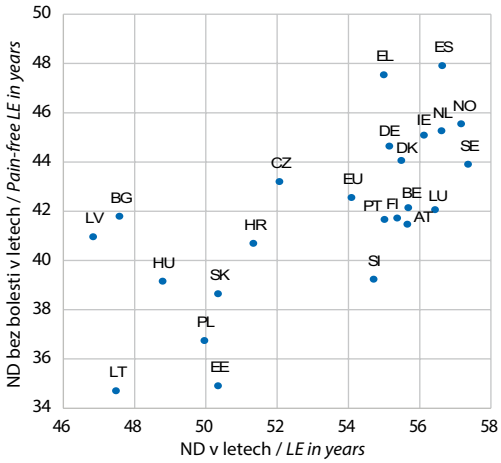
Země / *Country*	Muži / *Males*	Ženy / *Females*	Země / *Country*	Muži / *Males*	Ženy / *Females*
Evropa / *Europe*	21,9	31,4	Maďarsko / *Hungary*	19,9	26,1
Belgie / *Belgium*	23,5	33,6	Německo / *Germany*	18,5	27,5
Bulharsko / *Bulgaria*	13,2	15,8	Nizozemsko / *Netherlands*	19,3	28,7
Česko / *Czechia*	16,7	19,4	Norsko / *Norway*	20,5	33,1
Dánsko / *Denmark*	20,2	25,4	Polsko / *Poland*	26,4	33,9
Estonsko / *Estonia*	30,4	40,0	Portugalsko / *Portugal*	23,1	36,9
Finsko / *Finland*	24,1	30,9	Rakousko / *Austria*	24,4	33,1
Chorvatsko / *Croatia*	20,6	28,1	Řecko / *Greece*	12,5	20,8
Irsko / *Ireland*	19,2	24,7	Slovensko / *Slovakia*	24,1	33,5
Litva / *Lithuania*	27,5	36,0	Slovinsko / *Slovenia*	27,2	34,6
Lotyšsko / *Latvia*	12,8	17,0	Španělsko / *Spain*	14,4	24,9
Lucembursko / *Luxembourg*	24,2	31,4	Švédsko / *Sweden*	22,7	31,2

Zdroj dat: EHIS, 2019; vlastní výpočet.
***Data source:** EHIS, 2019; authors' calculation.*

vyšší naději dožití, zatímco ženy ve východní Evropě dosahují nižší naděje dožití. V porovnání s muži se však významně liší naděje dožití bez bolesti uvnitř jednotlivých shluků. Ve všech sledovaných věcích představuje populace Španělských žen odlehlý případ s vyšší nadějí dožití při zachování vysokého počtu let prožitých bez bolesti. Ženy v Portugalsku mají sice také poměrně vysokou naději dožití, avšak mnoho let prožijí s bolestivými stavy. V porovnání s ostatními zeměmi mají ženy v Lotyšsku nízkou naději dožití, ale velmi vysokou naději dožití bez bolesti, což významně přispívá k lepší kvalitě života ve stáří. Podobný trend je ve věku 25 let pozorován také u žen z Bulharska či Česka, ale s přibývajícím věkem se dostávají na úroveň ostatních zemí s nízkou nadějí dožití a nízkou nadějí dožití bez bolesti.

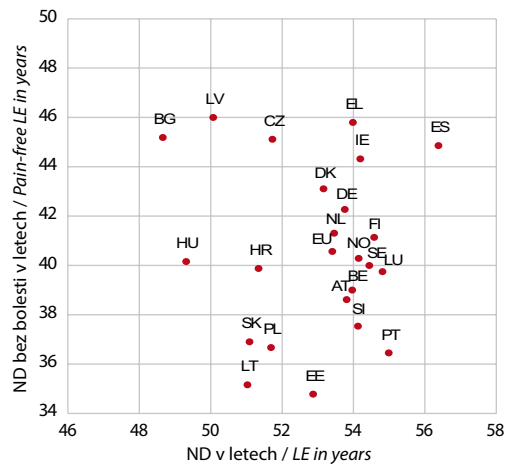
Graf 1: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 25 let, 2019, muži

Association between life expectancy and pain-free life expectancy at age 25, 2019, males



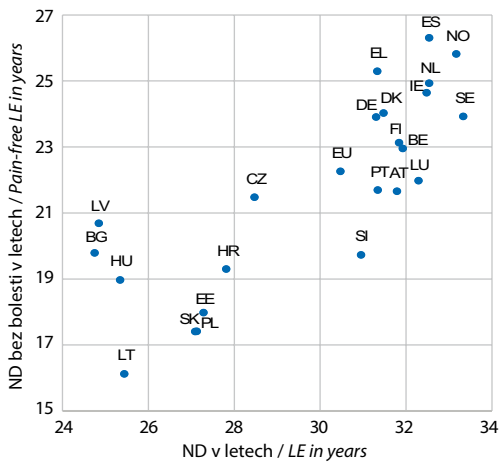
Graf 2: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 25 let, 2019, ženy

Association between life expectancy and pain-free life expectancy at age 25, 2019, females



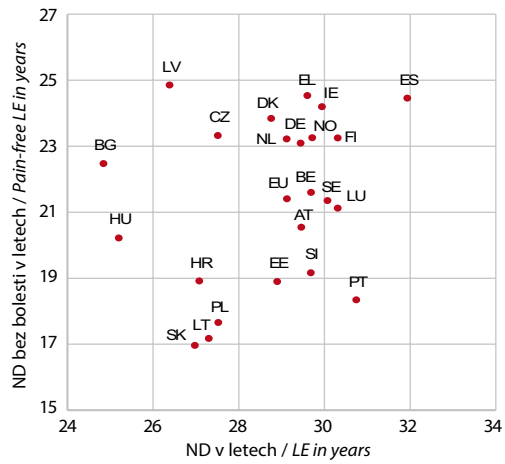
Graf 3: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 50 let, 2019, muži

Association between life expectancy and pain-free life expectancy at age 50, 2019, males

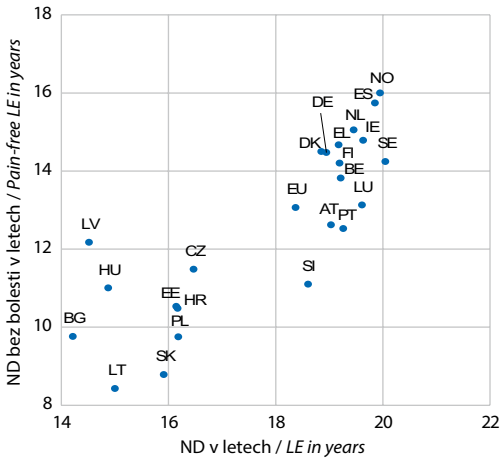


Graf 4: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 50 let, 2019, ženy

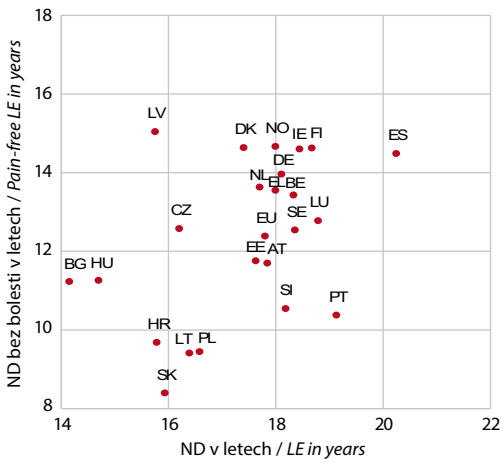
Association between life expectancy and pain-free life expectancy at age 50, 2019, females



Graf 5: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 65 let, 2019, muži
Association between life expectancy and pain-free life expectancy at age 65, 2019, males



Graf 6: Vztah mezi nadějí dožití a nadějí dožití bez bolesti ve věku 65 let, 2019, ženy
Association between life expectancy and pain-free life expectancy at age 65, 2019, females



Pozn .: ND – naděje dožití, AT – Rakousko, BE – Belgie, BG – Bulharsko, CZ – Česko, DE – Německo, DK – Dánsko, EE – Estonsko, EL – Řecko, ES – Španělsko, EU – vybrané evropské země, FI – Finsko, HR – Chorvatsko, HU – Maďarsko, IE – Irsko, LT – Litva, LU – Lucembursko, LV – Lotyšsko, NL – Nizozemsko, NO – Norsko, PL – Polsko, PT – Portugalsko, SE – Švédsko, SI – Slovinsko, SK – Slovensko.

Note: *LE – life expectancy, AT – Austria, BE – Belgium, BG – Bulgaria, CZ – Czechia, DE – Germany, DK – Denmark, EE – Estonia, EL – Greece, ES – Spain, EU – selected European countries, FI – Finland, HR – Croatia, HU – Hungary, IE – Ireland, LT – Lithuania, LU – Luxembourg, LV – Latvia, NL – Netherlands, NO – Norway, PL – Poland, PT – Portugal, SE – Sweden, SI – Slovenia, SK – Slovakia.*

Zdroj dat: EHIS, 2019; HMD, 2019; vlastní výpočet.
Data source: *EHIS, 2019; HMD, 2019; authors' calculation.*

Podíl naděje dožití s bolestí na celkové naději dožití vykazuje v evropských zemích i mezi pohlavími značné rozdíly (Tab. 2). Ve všech sledovaných věcích je odhadováno, že ženy stráví větší část života s bolestmi než muži. Tento genderový rozdíl je konzistentní napříč všemi zeměmi a s věkem se zpravidla prohlubuje. Zatímco u mužů se podíl života s bolestí ve věku 25 let pohybuje mezi 12 a 31 % celkové délky života, u žen dosahuje 17 až 41 %.

Všeobecně by se dalo říci, že s přibývajícím věkem také stoupá podíl života s bolestí, avšak existují výjimky. V některých zemích je zaznamenán nejvyšší podíl ve věku 50 let (muži z Lotyšska, muži z Dánska, muži z Finska, muži a ženy z Norska). Rostoucí podíl života s bolestí s věkem je výrazný zejména u populace Slovenska nebo Bulharska, naopak k mírnému nárůstu dochází například v populacích Norska či Finska.

Mezi jednotlivými zeměmi jsou patrné významné rozdíly. Nejnižší podíl života s bolestí vykazují muži a ženy z Lotyšska, kromě věku 25 let, kde nejnižších hodnot dosahují muži a ženy z Bulharska. Naopak země s nejvyšším podílem života s bolestí závisí na věku. Ve věku 25 let dosahují nejvyšších hodnot muži a ženy z Estonska, ve věku 50 let jsou to muži z Litvy a ženy z Portugalska, a nakonec ve věku 65 let nejvyšší podíl vykazují muži a ženy ze Slovenska.

Vyšší podíl života s bolestí je pozorován spíše v zemích východní Evropy a v Portugalsku, a to napříč věkovými kategoriemi. Z této skupiny se významně vymykají populace Lotyšska a zejména v nižších věcích také populace Bulharska, které mají naopak jednu z nejnižších hodnot ve všech zkoumaných zemích. Podíl života s bolestí je však napříč Evropou různorodý.

Tab. 2: Podíl naděje dožití s bolestí na naději dožití v Evropě, 2019 (%)
Proportion of life expectancy spent with pain in Europe, 2019 (%)

Země / *Country*	25 Let / *Age 25*		50 Let / *Age 50*		65 Let / *Age 65*	
	Muži / *Males*	Ženy / Females	Muži / *Males*	Ženy / Females	Muži / *Males*	Ženy / Females
Evropa / *Europe*	21,3	31,7	27,0	39,1	28,9	43,2
Belgie / *Belgium*	24,3	35,0	28,1	39,5	28,1	39,9
Bulharsko / *Bulgaria*	12,2	17,3	20,0	27,2	31,3	38,2
Česko / *Czechia*	17,0	21,9	24,6	30,4	30,3	37,8
Dánsko / *Denmark*	20,6	27,1	23,7	31,4	23,1	31,6
Estonsko / *Estonia*	30,6	40,9	34,1	45,9	34,8	45,6
Finsko / *Finland*	24,6	32,1	27,4	36,0	26,0	35,5
Chorvatsko / *Croatia*	20,7	30,5	30,6	42,8	35,2	51,1
Irsko / *Ireland*	19,7	26,4	24,1	32,7	24,7	35,0
Litva / *Lithuania*	26,9	38,4	36,6	48,4	43,8	53,9
Lotyšsko / *Latvia*	12,5	18,0	16,7	23,3	16,2	23,8
Lucembursko / *Luxembourg*	25,5	34,6	31,9	41,8	33,1	43,9
Maďarsko / *Hungary*	19,7	27,4	25,1	35,2	26,0	39,8
Německo / Germany	19,1	29,3	23,6	34,9	23,6	36,9
Nizozemsko / *Netherlands*	20,0	30,5	23,4	33,9	22,6	37,2
Norsko / Norway	20,3	33,0	22,2	34,9	19,8	33,3
Polsko / Poland	26,4	36,4	35,8	47,3	39,7	54,1
Portugalsko / Portugal	24,3	40,2	30,8	50,1	35,0	55,2
Rakousko / Austria	25,5	35,5	31,9	42,1	33,7	46,5
Řecko / Greece	13,6	23,7	19,3	31,1	23,5	38,4
Slovensko / Slovakia	23,2	35,4	35,7	48,6	44,8	57,9
Slovinsko / Slovenia	28,3	37,6	36,3	46,3	40,3	52,5
Španělsko / Spain	15,4	28,1	19,2	35,5	20,7	40,3
Švédsko / Sweden	23,4	33,8	28,2	40,8	29,0	43,9

Zdroj dat: EHIS, 2019; HMD, 2019; vlastní výpočet.
Data source: *EHIS, 2019; HMD, 2019; authors' calculation.*

DISKUZE

Tato studie se zabývá srovnáním naděje dožití bez bolesti ve třech vybraných věcích se zaměřením na populace Evropy. Bylo zjištěno, že mezi evropskými zeměmi existují výrazné rozdíly nejen v celkové naději dožití, ale také v počtu let prožitých bez bolesti. Ve všech hodnocených věcích ženy dosahují vyšší celkové naděje dožití oproti mužům, avšak větší část života stráví s výskytem bolestivých stavů. U mužů je patrné rozdělení populací na západní a východní Evropu, přičemž toto rozdělení je výraznější ve vyšším věku.

Výsledky této studie potvrzují poznatky popisované v předchozích výzkumech, podle nichž ženy sice žijí déle, avšak větší část života prožívají se zdravotními obtížemi, včetně bolesti (*Zimmer – Rubin*, 2016; *Jagger et al.*, 2008). Pozorované rozdíly mezi pohlavími lze vysvětlit jak biologickými faktory, tak behaviorálními aspekty, včetně vyšší ochoty žen řešit a přiznat zdravotní problémy a vyhledávat lékařskou péči (*Nascimento et al.*, 2020; *Cao et al.*, 2020).

V této studii byly potvrzeny regionální rozdíly mezi evropskými zeměmi z hlediska naděje dožití bez bolesti. Vzhledem k nedostatku výzkumů přímo

zaměřených na tento ukazatel v evropském kontextu jsme se pokusili naše výsledky porovnat alespoň se studiemi, které se věnují podobným oblastem nebo souvisejícím zdravotním ukazatelům. Například *Cao et al.* (2020) analyzovali naději dožití ve zdraví na globální úrovni. V jejich výsledcích lze nalézt určitou shodu s našimi zjištěními – například populace Litvy vykazuje nízkou naději dožití i naději dožití ve zdraví, což odpovídá i našim výsledkům o nízké naději dožití bez bolesti. Podobně se i populace Španělska v obou studiích vyznačuje vysokými hodnotami sledovaných ukazatelů.

Také J*agger et al.* (2008), kteří zkoumali naději dožití ve zdraví v evropských zemích, identifikovali vzorce odpovídající našim závěrům, a to, že u mužů je patrné rozdělení mezi západoevropské a východoevropské země, zatímco u žen je pozorována větší variabilita. Je pozoruhodné, že se ve studii J*agger et al.* (2008) populace žen z Lotyšska výrazně nevymyká ostatním evropským populacím, zatímco v naší analýze vykazuje velmi vysokou naději dožití bez bolesti v kontrastu s poměrně nízkou celkovou nadějí dožití. Tento rozdíl může být způsoben nižší prevalencí bolestivých stavů, jejich nižší intenzitou, rozdíly v ochotě bolest hlásit nebo limitacemi spojenými s výběrovými šetřeními.

Další srovnání nabízí studie *Stonkute et al.* (2023), která analyzuje naději dožití bez zdravotního omezení ve vztahu ke vzdělání. V některých zemích, například v populaci Estonska, byl zaznamenán vysoký podíl zdravotních omezení, což odpovídá našim zjištěním o vysokém podílu let života s bolestí. Ačkoli se jedná o odlišné ukazatele, obě studie poukazují na znevýhodněné postavení estonské populace z hlediska zdravotního stavu. Naproti tomu v případě populace Česka se výsledky liší – zatímco studie *Stonkute et al.* (2023) uvádí, že jedinci tráví větší část zbývajícího života se zdravotními omezeními, naše analýza ukazuje spíše nižší podíl života s bolestí, zejména u žen. To může naznačovat, že zdravotní omezení v této populaci souvisejí s jinými typy obtíží než bolestí.

Autoři *Zimmer a Rubin* (2016) zkoumali naději dožití bez bolesti na populaci Spojených států amerických. Z našich výsledků vyplývá, že evropská populace má oproti té americké vyšší celkovou naději dožití i naději dožití bez bolesti. Tito výzkumníci však využívají jinou studii a zaměřují se i na zkoumání různých intenzit bolesti, což může být příčinnou rozdílných výsledků.

Tato studie rovněž poukazuje na specifický vývoj výskytu bolesti v průběhu života. Výsledky ukazují, že v některých populacích je podíl života s bolestí relativně vysoký již ve věku 25 let, což naznačuje přítomnost bolestivých stavů i v mladé dospělosti. Například v Estonsku nebo Polsku je tento jev patrný u mužů i žen a může souviset se socioekonomickými faktory (*Foster et al.*, 2023), životním stylem (*Mills et al.*, 2019) nebo s časným výskytem chronických onemocnění (*Şentürk et al.*, 2023). V některých zemích dosahuje podíl života s bolestí maxima již ve věku 50 let, což je v souladu s poznatky o vlivu pracovní zátěže, stresu a kumulace zdravotních rizik v produktivním věku (*Komolsuradej et al.*, 2025). Ve věku 65 let je ve většině zemí patrný další nárůst podílu života s bolestí, i když v některých populacích dochází k určitému zmírnění tohoto trendu, což může být způsobeno selektivním přežitím zdravějších jedinců (*Bokermann et al.*, 2024), změnou životního stylu po odchodu do důchodu (*Loichinger – Weber*, 2016) nebo lepší kompenzací chronických stavů prostřednictvím dostupné zdravotní péče a léčby bolesti (*Mookerjee et al.*, 2024).

Tato studie přináší nový pohled na rozdíly mezi evropskými populacemi v naději dožití bez bolesti. Na rozdíl od dřívějších prací zaměřených na obecné ukazatele zdraví nebo na život bez funkčního omezení, zde prezentujeme komplexní srovnání naděje dožití bez bolesti v různých věcích. Bolest představuje významný ukazatel zdraví a kvality života v evropských populacích. Na základě zjištěných rozdílů mezi pohlavími, zeměmi a věky je žádoucí, aby byla cíleně podporována prevence a zvládání bolestivých stavů zejména ve skupinách s vyšším rizikem.

LIMITACE

Tato studie má několik omezení. Prvním z nich je průřezový charakter dat a subjektivní povaha měření bolesti, která může být ovlivněna kulturními odlišnostmi a zvyklostmi v projevování a hlášení zdravotních obtíží. Dále Sullivanova metoda neumožňuje zohlednit změny zdravotního stavu v průběhu života, a výsledky tak představují odhad pro hypotetickou populaci. Z hlediska celoevropského

srovnání představuje určitou limitaci absence dat u některých evropských zemí. Toto omezení však bylo vědomě zvoleno ve prospěch zajištění jednotné metodiky a srovnatelnosti dat. Další limitací je skutečnost, že byť analýza vychází pouze z jednoho šetření (*EHIS*, 2019), je jen obtížně porovnatelná s výsledky jiných studií. Jak například uvádí *Vrabcová et al.* (2017), prevalence omezení v denních aktivitách se může lišit v závislosti na kontextu šetření. Výsledky mohou být ovlivněny například tím, v jaké části dotazníku je daná otázka umístěna nebo jaké otázky jí předcházejí, což může ovlivnit způsob, jakým respondenti svou situaci hodnotí. Odlišné výsledky u jednotlivých šetření tak mohou vznikat i tehdy, když je otázka formulována identickým způsobem.

ZÁVĚR

Výsledky této studie ukazují, že bolest představuje významný ukazatel zdraví a kvality života, přičemž mezi evropskými zeměmi, pohlavími a věky existují výrazné rozdíly. Ženy sice žijí déle než muži, ale větší část svého života tráví s bolestí. Mezi evropskými zeměmi je patrné rozdělení východních a západních zemí, zejména u mužů, přičemž západoevropské země vykazují vyšší naději dožití bez bolesti v porovnání s východoevropskými zeměmi. Tyto rozdíly naznačují, že výskyt bolesti může být ovlivněn řadou faktorů souvisejících s životními podmínkami, zdravotní politikou i kulturními zvyklostmi jednotlivých zemí. Studie rovněž upozorňuje na vysoký výskyt bolesti již ve středním věku, který může být spojen s pracovní zátěží a kumulací zdravotních rizik. Tyto poznatky mohou sloužit jako podklad pro tvorbu zdravotní politiky zaměřené na prevenci a zvládání bolestivých stavů v celé Evropě, s důrazem na rizikové skupiny podle věku a pohlaví. Přestože je hodnocení bolesti subjektivní, představuje cenný ukazatel celkového zdravotního stavu a kvality života jednotlivce.

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DOSTUPNOST DAT / DATA AVAILABILITY

Tento článek vychází z údajů Eurostatu, EHIS, 2019. Odpovědnost za všechny závěry vyvozené z údajů nesou výhradně autorky. / This paper is based on data from Eurostat, EHIS, 2019. The responsibility for all conclusions drawn from the data lies entirely with the authors.

MARKÉTA MÍŠKOVÁ

vystudovala veřejné zdravotnictví a sociální epidemiologii. V rámci doktorského studia na Katedře demografie a geodemografie Přírodovědecké fakulty Univerzity Karlovy se věnuje prevalenci bolesti v evropské populaci. Konkrétně se zabývá souvislostmi mezi výskytem bolesti a faktory životního stylu, kvalitou života, volnočasovými či společenskými aktivitami.

MICHALA LUSTIGOVÁ

působí jako odborná asistentka na Katedře sociální geografie a regionálního rozvoje Přírodovědecké fakulty Univerzity Karlovy se zaměřením na demografii, geografii zdraví a sociální epidemiologii. Dlouhodobě se věnuje hodnocení populačního zdraví s důrazem na kardiometabolické rizikové faktory. Ve svém výzkumu se dále zaměřuje na kvantifikaci vlivu životního stylu, zdravotně-rizikového chování a životního prostředí na zdraví populace a také na sociální nerovnosti ve zdraví. Metodicky se podílela na přípravě řady studií zdravotního stavu české populace jako např. EHIS/EHES či VŠPO.

Poděkování

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SUMMARY

This study provides a comparative analysis of pain-free life expectancy (PFLE) at ages 25, 50, and 65 in 23 European countries, using data from the European Health Interview Survey (EHIS) and applying the Sullivan method. The results reveal significant differences in PFLE between countries, sexes, and age groups. Across all examined age groups, women have higher overall life expectancy but spend a larger proportion of their lives with pain. A clear East-West divide was observed, particularly among men, with Western European countries showing higher PFLE compared to Eastern European countries.

The study also highlights a notable prevalence of pain already at age 25 in some populations, and a peak in pain-related life burden during middle age (around age 50) in certain countries, which may be linked to work-related stress and the accumulation of health risks. In many countries, a further increase in the proportion of life with pain is seen at older ages, although in some populations this trend may level off as a result of selective survival or improved management of chronic conditions.

These findings suggest that pain is a key indicator of health and quality of life and should be addressed in public health strategies. The results support the development of targeted policies aimed at preventing and managing pain across the life course, with particular attention to age- and gender-specific needs.

PŘÍLOHY / APPENDIX

Příloha 1: Absolutní počty respondentů studie EHIS dle věkových kategorií v Evropě, 2019, muži
Absolute numbers of EHIS study respondents by age groups in Europe, 2019, males

Země / *Country*	**25–29 let** ***25–29 years***	**30–34 let** ***30–34 years***	**35–39 let** ***35–39 years***	**40–44 let** ***40–44 years***	**45–49 let** ***45–49 years***	**50–54 let** ***50–54 years***
Evropa / *Europe*	5 192	6 017	6 920	7 750	7 838	8 419
Belgie / *Belgium*	253	276	317	395	394	385
Bulharsko / *Bulgaria*	175	187	219	270	326	266
Česko / *Czechia*	173	218	205	264	289	244
Dánsko / *Denmark*	111	128	135	163	177	248
Estonsko / *Estonia*	128	163	159	167	173	153
Finsko / *Finland*	109	118	157	146	141	154
Chorvatsko / *Croatia*	103	141	143	156	149	194
Irsko / *Ireland*	134	244	368	332	270	221
Litva / *Lithuania*	148	171	122	141	157	171
Lotyšsko / *Latvia*	189	224	190	201	207	163
Lucembursko / *Luxembourg*	110	137	203	180	213	253
Maďarsko / *Hungary*	168	171	191	250	243	203
Německo / *Germany*	535	597	647	632	726	1 045
Nizozemsko / *Netherlands*	278	270	284	291	304	339
Norsko / *Norway*	266	294	272	302	352	361
Polsko / *Poland*	345	436	500	581	500	495
Portugalsko / *Portugal*	231	244	380	504	506	527
Rakousko / *Austria*	466	461	506	498	561	695
Řecko / *Greece*	132	171	246	315	289	319
Slovensko / *Slovakia*	160	161	205	193	171	209
Slovinsko / *Slovenia*	226	255	364	353	351	398
Španělsko / *Spain*	365	480	764	1 048	981	974
Švédsko / *Sweden*	387	470	343	368	358	402

Zdroj dat: EHIS, 2019.
Data source: *EHIS, 2019.*

Příloha 1: Absolutní počty respondentů studie EHIS dle věkových kategorií v Evropě, 2019, muži (pokračování)
Absolute numbers of EHIS study respondents by age groups in Europe, 2019, males (continued)

Země / *Country*	**55–59 let** ***55–59 years***	**60–64 let** ***60–64 years***	**65–69 let** ***65–69 years***	**70–74 let** ***70–74 years***	**75–79 let** ***75–79 years***	**80+ let** ***80+ years***
Evropa / *Europe*	9 031	9 126	8 857	7 364	5 356	5 858
Belgie / *Belgium*	381	380	315	266	174	247
Bulharsko / *Bulgaria*	283	303	312	266	188	197
Česko / *Czechia*	266	305	366	349	218	184
Dánsko / *Denmark*	312	277	280	314	185	200
Estonsko / *Estonia*	180	179	168	118	93	103
Finsko / *Finland*	235	261	311	307	174	137
Chorvatsko / *Croatia*	202	257	239	158	154	199
Irsko / *Ireland*	331	336	322	266	147	153
Litva / *Lithuania*	199	163	132	85	103	118
Lotyšsko / *Latvia*	217	189	160	106	98	127
Lucembursko / *Luxembourg*	222	162	157	118	68	55
Maďarsko / *Hungary*	170	216	243	195	115	106
Německo / *Germany*	1 187	1 177	1 144	858	749	779
Nizozemsko / *Netherlands*	366	329	320	338	204	168
Norsko / *Norway*	340	309	319	254	180	156
Polsko / *Poland*	658	779	826	548	309	338
Portugalsko / *Portugal*	635	600	653	549	409	552
Rakousko / *Austria*	685	628	512	434	433	368
Řecko / *Greece*	288	301	342	306	244	410
Slovensko / *Slovakia*	204	267	233	147	63	75
Slovinsko / *Slovenia*	389	428	382	306	210	187
Španělsko / *Spain*	949	925	781	731	576	713
Švédsko / *Sweden*	332	355	340	345	262	286

Zdroj dat: EHIS, 2019.
***Data source:** EHIS, 2019.*

Příloha 2: Absolutní počty respondentů studie EHIS dle věkových kategorií v Evropě, 2019, ženy
Absolute numbers of EHIS study respondents by age groups in Europe, 2019, females

Země / *Country*	**25–29 let** ***25–29 years***	**30–34 let** ***30–34 years***	**35–39 let** ***35–39 years***	**40–44 let** ***40–44 years***	**45–49 let** ***45–49 years***	**50–54 let** ***50–54 years***
Evropa / *Europe*	5 829	7 000	7 972	8 835	8 998	9 959
Belgie / *Belgium*	302	356	373	374	396	440
Bulharsko / *Bulgaria*	163	184	213	289	337	305
Česko / *Czechia*	198	239	250	321	326	307
Dánsko / *Denmark*	193	195	224	249	317	359
Estonsko / *Estonia*	161	189	197	201	193	216
Finsko / *Finland*	171	195	184	214	218	261
Chorvatsko / *Croatia*	148	150	174	153	161	250
Irsko / *Ireland*	222	311	416	423	344	218
Litva / *Lithuania*	132	185	179	178	220	234
Lotyšsko / *Latvia*	184	309	262	245	235	257
Lucembursko / *Luxembourg*	174	230	242	236	237	243
Maďarsko / *Hungary*	144	180	187	253	228	244
Německo / *Germany*	392	523	648	721	806	1 274
Nizozemsko / *Netherlands*	282	319	278	293	316	385
Norsko / *Norway*	290	285	336	312	330	356
Polsko / *Poland*	525	615	755	768	711	721
Portugalsko / *Portugal*	269	350	469	631	637	680
Rakousko / *Austria*	553	548	572	587	663	765
Řecko / *Greece*	125	181	297	303	300	337
Slovensko / *Slovakia*	155	183	232	271	249	286
Slovinsko / *Slovenia*	290	337	408	459	443	496
Španělsko / *Spain*	420	537	788	1 000	988	940
Švédsko / *Sweden*	336	399	288	354	343	385

Zdroj dat: EHIS, 2019.
Data source: *EHIS, 2019.*

Příloha 2: Absolutní počty respondentů studie EHIS dle věkových kategorií v Evropě, 2019, ženy (pokračování)
Absolute numbers of EHIS study respondents by age groups in Europe, 2019, females (continued)

Země / *Country*	**55–59 let** ***55–59 years***	**60–64 let** ***60–64 years***	**65–69 let** ***65–69 years***	**70–74 let** ***70–74 years***	**75–79 let** ***75–79 years***	**80+ let** ***80+ years***
Evropa / *Europe*	10 488	10 969	10 563	9 320	7 488	9 655
Belgie / *Belgium*	408	386	339	294	217	296
Bulharsko / *Bulgaria*	292	363	380	401	326	368
Česko / *Czechia*	313	384	490	502	359	443
Dánsko / *Denmark*	330	335	329	330	232	228
Estonsko / *Estonia*	245	248	255	218	179	299
Finsko / *Finland*	307	318	373	412	219	220
Chorvatsko / *Croatia*	285	308	253	229	237	362
Irsko / *Ireland*	383	348	386	290	202	240
Litva / *Lithuania*	262	298	222	210	216	289
Lotyšsko / *Latvia*	302	310	255	189	193	296
Lucembursko / *Luxembourg*	195	188	154	103	55	44
Maďarsko / *Hungary*	215	283	307	239	194	223
Německo / *Germany*	1 431	1 326	1 329	974	989	1 026
Nizozemsko / *Netherlands*	402	345	309	301	190	235
Norsko / *Norway*	318	299	287	251	163	214
Polsko / *Poland*	862	1 158	1 149	821	523	686
Portugalsko / *Portugal*	714	814	730	783	683	966
Rakousko / *Austria*	780	700	582	491	508	522
Řecko / *Greece*	329	362	375	406	313	531
Slovensko / *Slovakia*	273	386	378	287	155	163
Slovinsko / *Slovenia*	461	478	417	308	289	390
Španělsko / *Spain*	1 009	974	903	899	739	1 255
Švédsko / *Sweden*	372	358	361	382	307	359

Zdroj dat: EHIS, 2019.
Data source: *EHIS, 2019.*

Příloha 3: Naděje dožití a naděje dožití bez bolesti v Evropě, 2019, muži (v letech)
Life expectancy and pain-free life expectancy in Europe, 2019, males (in years)

Země / *Country*	25 let / *age 25*		50 let / *age 50*		65 let / *age 65*	
	ND / *LE*	NDBB / *PFLE*	ND / *LE*	NDBB / *PFLE*	ND / *LE*	NDBB / *PFLE*
Evropa / *Europe*	54,1	42,6	30,5	22,3	18,4	13,1
Belgie / *Belgium*	55,7	42,1	31,9	23,0	19,2	13,8
Bulharsko / *Bulgaria*	47,6	41,8	24,7	19,8	14,2	9,8
Česko / *Czechia*	52,1	43,2	28,5	21,5	16,5	11,5
Dánsko / *Denmark*	55,5	44,1	31,5	24,0	18,9	14,5
Estonsko / *Estonia*	50,3	34,9	27,3	18,0	16,1	10,5
Finsko / *Finland*	55,4	41,7	31,8	23,1	19,2	14,2
Chorvatsko / *Croatia*	51,3	40,7	27,8	19,3	16,2	10,5
Irsko / *Ireland*	56,1	45,1	32,5	24,6	19,6	14,8
Litva / *Lithuania*	47,5	34,7	25,4	16,1	15,0	8,4
Lotyšsko / *Latvia*	46,8	41,0	24,8	20,7	14,5	12,2
Lucembursko / *Luxembourg*	56,4	42,1	32,3	22,0	19,6	13,1
Maďarsko / *Hungary*	48,8	39,2	25,3	19,0	14,9	11,0
Německo / *Germany*	55,2	44,6	31,3	23,9	18,9	14,5
Nizozemsko / *Netherlands*	56,6	45,3	32,5	24,9	19,5	15,1
Norsko / *Norway*	57,2	45,6	33,2	25,8	19,9	16,0
Polsko / *Poland*	50,0	36,8	27,1	17,4	16,2	9,8
Portugalsko / *Portugal*	55,0	41,7	31,3	21,7	19,3	12,5
Rakousko / *Austria*	55,7	41,5	31,8	21,7	19,0	12,6
Řecko / *Greece*	55,0	47,5	31,3	25,3	19,2	14,7
Slovensko / *Slovakia*	50,3	38,7	27,1	17,4	15,9	8,8
Slovinsko / *Slovenia*	54,7	39,2	31,0	19,7	18,6	11,1
Španělsko / *Spain*	56,6	47,9	32,5	26,3	19,9	15,7
Švédsko / *Sweden*	57,4	43,9	33,3	23,9	20,0	14,2

Pozn.: ND – naděje dožití, NDBB – naděje dožití bez bolesti.
Note: *LE – life expectancy, PFLE – pain-free life expectancy.*

Zdroj dat: EHIS, 2019.
Data source: *EHIS, 2019.*

Příloha 4: Naděje dožití a naděje dožití bez bolesti v Evropě, 2019, ženy (v letech)
Life expectancy and pain-free life expectancy in Europe, 2019, females (in years)

Země / *Country*	**25 let / *age 25***		**50 let / *age 50***		**65 let / *age 65***	
	ND / *LE*	**NDBB / *PFLE***	**ND / *LE***	**NDBB / *PFLE***	**ND / *LE***	**NDBB / *PFLE***
Evropa / *Europe*	59,4	40,6	35,1	21,4	21,8	12,4
Belgie / *Belgium*	60,0	39,0	35,7	21,6	22,3	13,4
Bulharsko / *Bulgaria*	54,7	45,2	30,8	22,5	18,2	11,2
Česko / *Czechia*	57,7	45,1	33,5	23,3	20,2	12,6
Dánsko / *Denmark*	59,2	43,1	34,8	23,8	21,4	14,6
Estonsko / *Estonia*	58,9	34,8	34,9	18,9	21,6	11,8
Finsko / *Finland*	60,6	41,1	36,3	23,2	22,7	14,6
Chorvatsko / *Croatia*	57,3	39,9	33,1	18,9	19,8	9,7
Irsko / *Ireland*	60,2	44,3	35,9	24,2	22,4	14,6
Litva / *Lithuania*	57,0	35,2	33,3	17,2	20,4	9,4
Lotyšsko / *Latvia*	56,1	46,0	32,4	24,9	19,8	15,0
Lucembursko / *Luxembourg*	60,8	39,7	36,3	21,1	22,8	12,8
Maďarsko / *Hungary*	55,3	40,2	31,2	20,2	18,7	11,3
Německo / *Germany*	59,8	42,3	35,4	23,1	22,1	14,0
Nizozemsko / *Netherlands*	59,5	41,3	35,1	23,2	21,7	13,6
Norsko / *Norway*	60,1	40,3	35,7	23,2	22,0	14,7
Polsko / *Poland*	57,7	36,7	33,5	17,7	20,6	9,4
Portugalsko / *Portugal*	61,0	36,4	36,7	18,3	23,1	10,4
Rakousko / *Austria*	59,8	38,6	35,5	20,5	21,8	11,7
Řecko / *Greece*	60,0	45,8	35,6	24,5	22,0	13,5
Slovensko / *Slovakia*	57,1	36,9	33,0	17,0	19,9	8,4
Slovinsko / *Slovenia*	60,1	37,5	35,7	19,2	22,2	10,5
Španělsko / *Spain*	62,4	44,9	37,9	24,5	24,2	14,5
Švédsko / *Sweden*	60,4	40,0	36,1	21,3	22,4	12,5

Pozn.: ND – naděje dožití, NDBB – naděje dožití bez bolesti.
Note: *LE – life expectancy, PFLE – pain-free life expectancy.*
Zdroj dat: EHIS, 2019; HMD, 2019; vlastní výpočet.
Data source: *EHIS, 2019; HMD, 2019; authors' calculation.*

POPULATION DEVELOPMENT IN THE CZECH REPUBLIC IN 2024

Jana Koukalová[1)]

Abstract

The article analyses the demographic development of the Czech Republic in 2024 and sets it in the context of the previous five years. The study focuses on the main demographic processes, namely fertility, mortality, nuptiality, the divorce rate, and migration. In 2024, the population of the Czech Republic grew as a result of the positive balance of international migration. The population continued to age. The number of live births was the lowest ever in the history of statistical surveys and remained lower than the number of deaths. Life expectancy at birth has increased for both sexes and is the highest it has ever been. The number of marriages was the lowest since 2013, while the number of divorces increased slightly year-on-year. The volume of international migration remained at a high level in 2024.

Keywords: demographic development, population, age structure, nuptiality, divorce, fertility, mortality, migration, Czech Republic

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POPULATION BY AGE AND MARITAL STATUS

At the end of 2024, the Czech Republic had a population of 10,909.5 thousand inhabitants. Compared to 31 December 2023, the population grew only slightly during 2024, by less than 9 thousand inhabitants. The population grew year-on-year in the last five years, including in 2021, when the population increased by 21.9 thousand people (or 0.2%) between what it was on 1 January 2021 and the end of the year. The change in the numerical size of the population between 2020 and 2021 reflects the use of a new population count (the number of inhabitants by sex, age, and marital status) as of 1 January 2021 based on the 2021 census (*Koukalová*, 2022). In 2022, the population increased by 3.0% as a result of a massive wave of immigration from war-torn Ukraine, an increase in absolute terms of 310.8 thousand people, the biggest in history.

All population growth in the Czech Republic in the last five-year period 2020–2024 was driven by international migration (Table 1), as the natural change in the total population was regularly negative. In 2024, the number of deaths exceeded the number of live births by 27.9 thousand, and in the previous four years it was by 18.9 to 28.1 thousand.

At the end of 2024 the population was divided by the main age groups of 0–14, 15–64, and 65+ years into a ratio of 15.5% to 63.8% to 20.7% (Table 2).

The number of children aged 0–14 years in the population of the Czech Republic increased continuously from 2008 to 2022 but has been decreasing since 2023. In 2024, there was a decrease of 37.0 thousand (by 2.1%) to 1.691 million. The decrease was caused both by a lower increase in international

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Table 1: Population development of the Czech Republic, 2020–2024

Indicator	2020	2021	2022	2023	2024
Natural increase	–19,089	–28,098	–18,920	–21,646	–27,900
Net migration	26,927	49,969	329,742	94,672	36,845
Total increase	7,838	21,871	310,822	73,026	8,945
	Per 1,000 population				
Natural increase	–1.8	–2.7	–1.8	–2.0	–2.6
Net migration	2.5	4.8	30.6	8.7	3.4
Total increase	0.7	2.1	28.9	6.7	0.8

Source: Czech Statistical Office (CZSO).

migration and by a further decrease in the number of live births to a historical low (84.3 thousand live births). In 2020–2023, the most numerous five-year age group was made up of 10–14-year-olds, as the strongest birth cohorts gradually moved to older ages. In 2024, children aged 5–9 became the most numerous age group. At the end of 2024, the population of the Czech Republic included 511.1 thousand children aged 0–4 years, 591.2 thousand children aged 5–9 years, and 588.6 thousand children aged 10–14 years. The largest year-on-year decrease, of 28.7 thousand children, was in the age category of 0–4-year-olds, while 10–14-year-old children decreased by 7.6 thousand and children aged 5–9 by 0.7 thousand.

The number of people in the 15–64 age group steadily decreased from 2009 to 2021, but in the last three years this age group has been growing in number. In 2022, this age group increased by almost 215 thousand people, which was due to a wave of immigration from war-torn Ukraine. By the end of 2024, the number of people aged 15–64 years had increased by another 94.0 thousand, to 6.963 million. Viewed from the perspective of five-year age groups, in 2024 the largest (not only within the 15–64 age group but in the entire population) was the 45–49 age group, which by the end of the year included 929.0 thousand people. The second most numerous group was made up of people aged 50–54, with 840.5 thousand people, with this group increasing for the fifth year in a row. The third highest number of people in 2024 was in the age group 40–44, with a total number of 774.8 thousand, and their number has been decreasing since 2019. The main reason was the shift of the numerically large cohort of people born in the 1970s from the 40–44 to the 45–49 age group and their entry in the last two years into the 50–54 age group.

The senior age group (aged 65 and over) underwent the most dynamic changes of all three main age groups over the past decade. At the end of 2024, there were 2.256 million people aged 65 and over in the Czech Republic, i.e. 18.6 thousand (0.8%) more year-on-year. In 2020 and 2021, the increase in the number of people aged 65 and over was smaller than the increases in the previous two years (of 1.3% and 0.8%, respectively), which was a result of the Covid-19 epidemic and its negative impact on mortality. In 2022, the number of people aged 65 and over increased by 1.8%, in 2023 by 1.3%, and in 2024 by only 0.8%, as the numerically weaker cohorts of the late 1950s began to move into the senior age group. Viewed from the perspective of five-year age groups, the senior group aged 65–69 remains numerically the largest group, but in 2024 it exceeded the group aged 70–74 by only 106 people. In 2024, there were 613.6 thousand people aged 65–69 years. In 2024, the number of people in all five-year groups of the senior population increased, with the exception of the youngest senior age group (65–69 years old). The most significant increase was in the number of people aged 80–84 years, which rose by 7.0% or 20.2 thousand, as people from the strong 1944 cohort entered this group, replacing people from the weaker generation born in 1939.

Table 2: Age distribution of the population, 2020–2024 (31 Dec.)

Age group / Indicator	2020	2021	2022	2023	2024
	Population (thousands)				
Total	10,701.8	10,516.7	10,827.5	10 900.6	10,909.5
0–14	1,719.7	1,693.4	1,750.8	1,727.8	1,690.8
15–64	6,823.7	6,654.2	6,868.9	6,935.5	6,962.8
65+	2,158.3	2,169.1	2,207.8	2,237.3	2,255.9
	Percentage of the total population				
0–14	16.1	16.1	16.2	15.9	15.5
15–64	63.8	63.3	63.4	63.6	63.8
65+	20.2	20.6	20.4	20.5	20.7
	Characteristics of age distribution				
Average age	42.6	42.8	42.6	42.8	43.1
Median age	43.3	43.8	43.7	44.0	44.3
Ageing index[1)]	125.5	128.1	126.1	129.5	133.4
Total age dependency ratio[2)]	69.0	71.0	71.5	71.9	72.0

Note: The number and structure of the population from 2021 is based on the results of the 2021 Population and Housing Census, while the data for previous years follow the results of the 2011 census.
1) The number of people aged 65 and over per 100 children aged 0–14.
2) The number of children aged 0–19 and people aged 65 and over per 100 people aged 20–64.
Year-on-year differences stated in the text may vary due to rounding.
Source: Czech Statistical Office; author's calculations.

Trends in all the analytic indicators of the age structure indicate the ageing of the Czech population. This process was only slightly and temporarily slowed by the large migration wave of refugees from Ukraine in 2022 (Table 2). In 2023, the average age of the population of the Czech Republic increased again, and in 2024 this trend continued, reaching 43.1 years. The median age increased by 0.3 to 44.3 years in 2024, the highest it has ever been. After a slight decrease in the ageing index in 2022 caused by an increase in the number of children as a result of the immigration of refugees from Ukraine, it returned to an increasing trend in 2023, which continued in 2024, when there were 133 seniors aged 65 and over per 100 children aged 0–14. The number of people aged 0–19 or 65 and over per 100 people aged 20–64 (the total age dependency ratio) has been growing continuously over the past five years, though only slightly in the past three years. In 2024, there were 72 dependent persons per 100 people of working age.

Despite the significant events that have occurred in recent years – the Covid-19 pandemic and the wave of immigration from war-torn Ukraine – the age distribution of the population by marital status continued to change in 2024 in the direction of long-term trends. While the share (absolute and relative) of single and divorced people in the population is increasing, the share of married, including widowed, people is decreasing. At the end of 2024, 33.9% of people aged 15 and over were single (Table 3); 39.4% of men were single and 28.7% of women. During 2024, the share of single people increased by 0.6 p.p. (for women by 0.5 p.p.), which is similar to the previous three years. Married men and married women form the majority, but their share has been decreasing since the early 1980s. At the end of 2024, 44.5% of the population aged 15 years and over were married (i.e. 4.105 million people: 45.6% of men and 43.5% of women). In the latest year-on-year comparison, the shares of married people decreased by 0.4 p.p. in total

Table 3: Population 15+ years by marital status, 2020–2024 (31 Dec.)

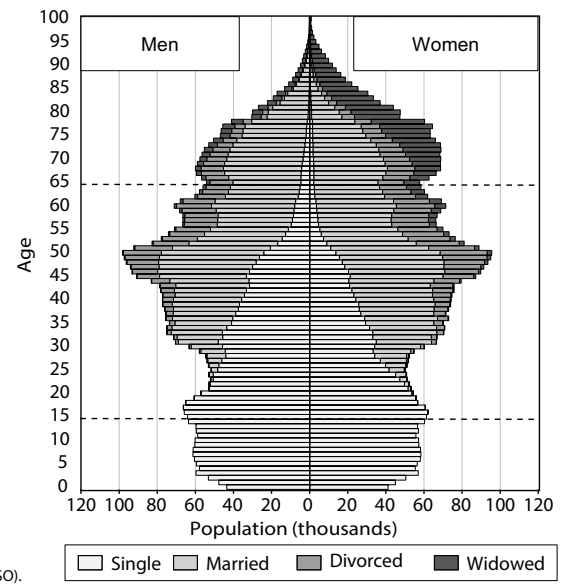
Marital status	2020	2021	2022	2023	2024
	Population (thousands)				
Single	2,887.4	2,852.3	2,980.6	3,060.1	3,127.5
Married	4,136.3	4,013.7	4,111.5	4,124.5	4,104.6
Divorced	1,229.3	1,234.0	1,254.5	1,257.9	1,259.4
Widowed	729.0	723.3	730.1	730.3	727.2
	Percentage of the population 15+ years				
Single	32.15	32.33	32.84	33.40	33.90
Married	46.05	45.49	45.30	45.00	44.50
Divorced	13.69	13.99	13.82	13.70	13.70
Widowed	8.12	8.20	8.04	8.00	7.90

Note: The number and structure of the population from 2021 is based on the results of the 2021 Population and Housing Census, while the data for previous years follow the results of the 2011 census.
Year-on-year differences stated in the text may vary due to rounding.
Source: Czech Statistical Office; author's calculations.

and for women and by 0.5 p.p. for men. The share of divorced persons in the population shows a long-term increasing trend (since the 1960s), but according to data from the last three years, it seems that the trend has reversed – their proportion has been decreasing slightly since 2022. At the end of 2024, divorced people made up 13.7% of the population aged 15 and older, 12.1% of men and 15.1% of women. The share of widowed persons in the population aged 15 and over has changed the least. Between 2020 and 2024, their share decreased from 8.1% to 7.9%, with the decline in the proportion of widowed women (from 13.2% to 12.7%) resulting from the faster improvement in male mortality. The proportion of widows among men has long been significantly lower than among women; over the past five years it has been at the level of 2.9%.

The structure of the population by marital status and age differs and changes over time. Among the

Figure 1: Population by age, sex, and marital status, 2024 (31 Dec.)



Source: Czech Statistical Office (CZSO).

youngest people, single people dominate, who then gradually give way to married people among older people (Figure 1). In 2024, married people formed the majority for the first time among 35–39-year-old women and 40–44-year-old men. However, the highest relative number of married people was among 60–64-year-old women (58.9%) and 75–79-year-old men (71.2%). Married people maintained their dominance over other marital status categories even at the age of 85–89 (men) and 70–74 (women). In the oldest age categories, widowed people predominate, with a much higher proportion among women than among men (among those aged 95+, 89% of women and 67% of men were widowed). Divorced people do not make up the majority in any five-year age group. At the end of 2024, divorcees had the highest relative representation among the population aged 55–59 (26.1% of men, 29.3% of women).

NUPTIALITY

After the peak of the long-term downward trend in the number of marriages in 2013, when it reached a historical low of 43.5 thousand, there was a six-year period of growth, with an average year-on-year increase of 4%. There was a significant decrease in the number of marriages in 2020 and 2021, caused mainly by epidemiological measures (*Slabá*, 2022), namely the pandemic-era regulations restricting wedding ceremonies and the number of attendees at these ceremonies. A large part of the year 2022 was no longer affected by pandemic restrictions, and the total number of marriages rose to 54.8 thousand (a year-on-year increase of 17.2%) and almost returned to the pre-pandemic level of 2019. However, in 2023 there was another significant decrease (by 12% to 48.3 thousand), and in 2024 the number of marriages fell by another 8% to 44.5 thousand, the lowest number since 2013 (Table 4).

In 2024, the number of marriages of single, divorced, and widowed persons decreased. A total of 80% of marriages were concluded between engaged partners with the same marital status, and in 65% of cases it was the first marriage for both (the share of these so-called protogamous marriages has been in the range of 63–68% since the mid-1990s). Three-quarters of grooms and three-quarters of brides entered into their first marriage in 2024: 33.1 thousand men (74.5% of the total number of grooms) and 33.2 thousand women (74.7% of the total number of brides).

In 2024, 64.0% of marriages were registered in the period of June–September, and the largest number of marriages took place in June (8.9 thousand). Conversely, the least popular month for marriages was January, as is traditionally the case, when only 772 couples got married. The most popular date in 2024 was Saturday, 24 August, when 1.7 thousand couples said their 'I do's'.

In line with the annual total number of marriages, the intensity of marriage among singles also rose. In 2024, there was a year-on-year decrease in the total first marriage rate to 53.0% for men (2.6 p.p. less

Table 4: Marriages by order, 2020–2024

Indicator	2020	2021	2022	2023	2024
Total marriages	45,415	46,778	54,820	48,268	44,486
in: – marriages of singles	29,694	30,519	35,869	31,439	29,010
Men: order of marriage – first	33,814	34,930	40,847	35,827	33,148
– higher	11,601	11,848	13,973	13,417	11,338
Women: order of marriage – first	33,974	34,856	41,138	36,028	33,228
– higher	11,441	11,922	13,682	13,136	11,258
Protogamous marriages (%)	65.4	65.2	65.4	65.1	65.2
First marriages (%) – men	74.5	74.7	74.5	74.2	74.5
– women	74.8	74.5	75.0	74.6	74.7

Note: Protogamous marriages = both the groom and the bride are single.
Source: Czech Statistical Office; author's calculations.

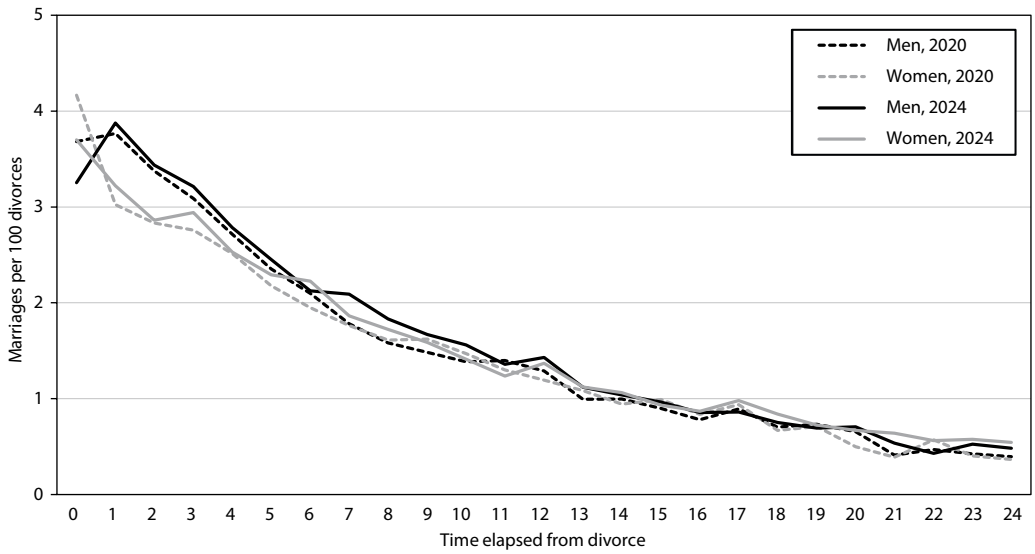
Table 5: Nuptiality indicators, 2020–2024

Indicator	2020	2021	2022	2023	2024
Total first marriage rate (%) – men	51.9	54.4	60.4	55.6	53.0
– women	60.8	63.7	70.2	65.2	62.4
Mean age at first marriage – men	32.6	32.6	32.5	32.7	32.9
– women	30.4	30.3	30.3	30.6	30.8
Total remarriage rate of divorcees (%) – men	40.8	42.5	51.3	46.6	43.2
– women	39.4	42.0	48.9	44.7	41.9
Average elapsed time from divorce – men	9.3	9.3	9.7	9.8	9.8
– women	9.6	9.7	10.1	10.2	10.3

Note: First marriage indicators are based on single decrement primo-nuptiality tables. The remarriage rates of divorcees are constructed from the distribution of remarriage rates by time elapsed from divorce.
Source: Czech Statistical Office; author's calculations.

year-on-year) and 62.4% for women (a decrease of 2.8 p.p.), returning to levels similar to those in 2014 and 2015, respectively. During the period 2020–2024, the age at which the marriage rate of singles peaked alternated between the ages of 29 and 30 for men and between 27 and 29 for women. In 2024, the highest rate of first marriages was among men aged 30 (49 out of 1,000 single men) and women aged 27 (66 out of 1,000 single women). With a few exceptions (a slight increase in men aged 17–19, 46, and 49 and women aged 16, 18, and 45), a year-on-year decline was observed at all ages in 2024, with the least pronounced decline among the youngest ages and most noticeable one around the maximum. Based on the first-marriage probabilities for 2024, the mean age of men and women at first marriage increased by 0.2 years to 32.9 years for men and by 0.1 year to 30.8 years for women (Table 5). In both cases, these are the highest values recorded

Figure 2: The remarriage rates of divorcees by sex and time elapsed since divorce, 2020 and 2024



Source: Czech Statistical Office (CZSO).

so far. Compared to 2020, the mean age at first marriage in 2024 increased by 0.3 years for men and by 0.4 years for women (in 2020 and 2021 it remained almost unchanged).

Assuming that the remarriage rates of divorced people by time since divorce remained the same, 43.2% of divorced men and 41.9% of divorced women would remarry in 2024 (Table 5). The remarriage rate decreased by 3.4 p.p. year-on-year for men and 2.9 p.p. for women. In general, divorced persons most often enter into a new marriage in the first years after divorce (divorced men more often than women). The remarriage rate decreases with the time elapsed since divorce and the gender gap in remarriage gradually disappears (Figure 2). In 2024, men remarried on average 9.8 years after divorce and women after 10.3 years and these were record values for this indicator (though with only a very slight year-on-year increase). The average elapsed time since divorce has been increasing regularly in recent years, mainly due to the increase in the number of divorced people marrying at a longer interval after divorce. Between 2020 and 2024, the average elapsed time since divorce increased by 0.6 years for men and by 0.7 years for women.

DIVORCE

According to data obtained from the Ministry of Justice of the Czech Republic, a total of 20.8 marriages ended in divorce in 2024, which was 7% more than in the previous year (Table 6). Between 2020 and 2024, the number of divorces decreased every year except for the last year. In a long-term perspective, over 80% of divorces involve men and women who are ending a marriage for the first time. In 2024, this involved 17.0 thousand men and 17.1 thousand women. The remaining one-fifth (3.8 thousand men and 3.7 thousand women) had already been divorced before (meaning that these were second- or higher-order divorces). The year-on-year increase in divorces in 2024 was particularly evident in first divorces (8% for both men and women) and slightly evident in higher-order divorces (1% for men, 4% for women).

In 2024, 12.0 thousand marriages with minor children and 8.8 thousand without minor children were divorced (which in both cases was 7% more than in 2023). The share of divorces of marriages with minor children out of the total number of divorces decreased slightly by 0.1 p.p. year-on-year to 57.8% and did not deviate significantly from previous years (Table 6). In total, 19.3 thousand minor children were affected by divorce in 2024, which was 7% more than in the previous year. The number of divorces of marriages with minor children has been below 20.0 thousand for the past three years. In most divorced families with minor children in 2024, one child (47.7% of cases) or two children (45.4%) were living at the time of divorce. In 2024, there were 1.60 children per divorced marriage with children.

Table 6: Divorces, 2020–2024

Indicator	2020	2021	2022	2023	2024
Total divorces	21,734	21,107	19,846	19,453	20,796
Percentage of repeated divorces – men	19.0	18.9	19.5	19.2	18.1
– women	18.6	18.4	19.2	18.5	18.0
Divorces without minor children	9,015	8,253	8,378	8,190	8,766
Divorces with minor children	12,719	12,854	11,468	11,263	12,030
– percentage of total	58.5	60.9	57.8	57.9	57.8
Number of minor children in divorced marriages	20,187	20,444	18,369	17,961	19,294
– average number of minor children per divorce with minor children	1.6	1.6	1.6	1.6	1.6

Source: Czech Statistical Office (CZSO).

Table 7: Divorce indicators, 2020–2024

Indicator / Time elapsed	2020	2021	2022	2023	2024
Total divorce rate (%)	40.6	39.7	37.7	37.1	40.0
Mean duration of marriage at divorce (years)	13.7	13.6	13.5	13.5	13.5
	Divorce rates (per 100 marriages)				
0–4	1.5	1.5	1.5	1.5	1.6
5–9	1.9	1.9	1.8	1.8	1.9
10–14	1.6	1.6	1.5	1.4	1.5
15–19	1.2	1.2	1.1	1.0	1.1
20–24	0.9	0.8	0.8	0.7	0.8
25–29	0.5	0.5	0.5	0.5	0.5
30+	0.3	0.2	0.2	0.2	0.2

Note: The total divorce rate and mean duration of marriage at divorce are based on the distribution of reduced divorce rates by time elapsed since entering into marriage.
Source: Czech Statistical Office; author's calculations.

In terms of the duration of marriages until divorce, most divorces occur after 5–9 years of marriage. In 2024, the absolute number of divorces after this duration of marriage was 5.0 thousand, and their share (24%) slightly increased from their 20–23% share from the previous period 2020–2023. The intensity of divorce also peaks in the interval of 5–9 years of marriage duration (on average, there were 1.9 divorces in 2024 per hundred marriages of each length) and then decreases with the increasing length of marriage (Table 7). Year-on-year, the divorce rate in 2024 increased in all five-year intervals studied. The highest increase was recorded in the 25–29 year period of marriage duration (from 0.48 to 0.53; a relative increase of 11%), the lowest was in the 30+ years of marriage duration (by 3%), and in other periods the increase ranged between 8% and 9%.

Assuming that the intensity of divorce in individual lengths of marriage duration remained at the level of 2024, 40.0% of marriages would end in divorce, which is 2.9 p.p. more than the year before, but 0.6 p.p. less than in 2020 (Table 7). The mean duration of marriage at divorce has been increasing for three decades, with small fluctuations, and the longest mean duration was recorded in 2020, when it reached 13.7 years. After that it decreased slightly and has remained at 13.5 years for the past three years.

FERTILITY

The Czech Statistical Office recorded a total of 84.3 thousand live births in 2024, which was the lowest number ever (Table 8). Year-on-year, the number of live births decreased by 6.8 thousand, which was the third consecutive decline in the number of live births. The decreasing number of live births is related, among other things, to the weak birth cohorts from the 1990s entering their reproductive period. There were 291 stillbirths in 2024, 15 fewer than in 2023. However, the stillbirth rate (the share of stillbirths among all births) increased slightly year-on-year, to 3.4‰.

From the perspective of the mother's marital status, the majority of children have long been born to married women. In 2020–2022, the share of live births in marriage did not change much, ranging between 51.5% and 51.8%, while in 2023 it increased to 52.9%, and in 2024, when it was 53.0%, it remained at a similar level in 2024, when it was 53.0%. The latest decline in the number of live births was slightly more pronounced in children born outside marriage (−8%) than in those born into marriage (−7%). In absolute numbers, in 2024, 44.7 thousand children were born to married women, 36.4 thousand (43.2%) to single women, 3.1 thousand children (3.7%) to divorced mothers, and 102 children (0.1%) to widowed mothers

Table 8: Live births by birth order and by marital status of the mother, 2020–2024

Indicator	2020	2021	2022	2023	2024
Live births	110,200	111,793	101,299	91,149	84,311
– first order	52,414	51,900	46,905	42,165	38,522
– second order	41,432	43,623	39,130	35,658	33,177
– third and higher order	16,354	16,270	15,264	13,326	12,612
Marital status of mother					
Single	48,799	49,950	45,091	39,473	36,413
Married	56,792	57,590	52,427	48,224	44,712
Divorced	4,482	4,140	3,678	3,353	3,084
Widowed	127	113	103	99	102
Percentage of live births outside marriage	48.5	48.5	48.2	47.1	47.0
– first order	58.1	58.5	57.6	55.3	54.9
– second order	38.9	39.7	39.7	38.8	39.0
– third and higher order	41.9	40.2	41.5	43.4	43.7

Source: Czech Statistical Office (CZSO).

(Table 8). The share of children born outside marriage decreased from 48.5% in 2020 to 47.0% in 2024.

The structure of live births by birth order was relatively stable in 2020–2024 (Table 8). First-born children made up the highest share throughout this period (45.7–47.6%; the lowest share was in 2024. The share of second-born children was about 10 p.p. less (37.6–39.4%; the highest share was in 2024), while third- and higher-order births formed the lowest share (14.6–15.1%; the highest share was in 2022). In 2024, there was a year-on-year decrease in the absolute number of live births out of all births – the decrease was most pronounced for first-born children (by 9%), followed by second-born children (by 7%), and the decrease was 5% for third- and higher-order births. Compared to 2021, after which there was the first significant decrease (by 10.5 thousand) in the number of live births, in 2024 there were a quarter fewer live births – 26% fewer first-order children, 24% fewer second-order children, and 22% fewer third- and higher-order children.

Between 2020 and 2024, the total fertility rate in the Czech Republic changed significantly. While in 2020 the total fertility rate remained at 1.71 children per woman, in 2021 it temporarily increased to 1.83. This was followed by a significant decline in 2022 and 2023 (by 11% and 10%, respectively), which continued to a slightly lesser extent (by 6%) in 2024 (Table 9). The total fertility rate in 2024 was 1.37 children per woman, which was a quarter lower than the fertility level in 2021. A similar trend to the total fertility rate was shown by the net reproduction rate, which decreased from 0.83 girls per woman to 0.66 between 2020 and 2024. Compared to 2020, the total fertility rates of all birth orders decreased in 2024. The first-order total fertility rate reached 0.65 children per woman, while the second-order fertility rate reached 0.53 and the third- and higher-order rates were 0.19 children per woman in 2024. Compared to the peak value in 2021, the total first-order fertility rate was 26% lower in 2024, the second-order fertility rate was 24% lower, and the third- and higher-order rates were down by 23%.

The mean age of mothers at childbirth in 2020 was 30.2 years and, after an annual increase of 0.2 years in 2021, remained at 30.4 years for the next three years. In 2024 there was a slight annual increase to 30.5 years (Table 9). A similar development (with

Table 9: Fertility indicators, 2020–2024

Indicator	2020	2021	2022	2023	2024
Total fertility rate – total	1.71	1.83	1.62	1.45	1.37
– first order	0.85	0.88	0.78	0.70	0.65
– second order	0.62	0.69	0.61	0.55	0.53
– third and higher order	0.24	0.25	0.23	0.20	0.19
Net reproduction rate	0.83	0.89	0.78	0.70	0.66
Mean age of mother at childbirth – total	30.2	30.4	30.4	30.4	30.5
– first order	28.5	28.8	28.8	28.9	29.0
– second order	31.3	31.4	31.4	31.4	31.4
– third and higher order	33.3	33.4	33.4	33.2	33.1
Fertility rates in the five-year age groups (‰)					
15–19	9.3	8.1	7.2	6.2	5.7
20–24	49.7	47.6	42.7	37.7	34.5
25–29	108.8	117.6	105.0	94.7	87.5
30–34	110.4	122.5	106.2	95.4	90.8
35–39	53.3	58.7	51.5	45.9	43.8
40–44	10.2	10.9	10.7	9.7	9.8
45–49	0.7	0.8	0.8	0.8	0.8

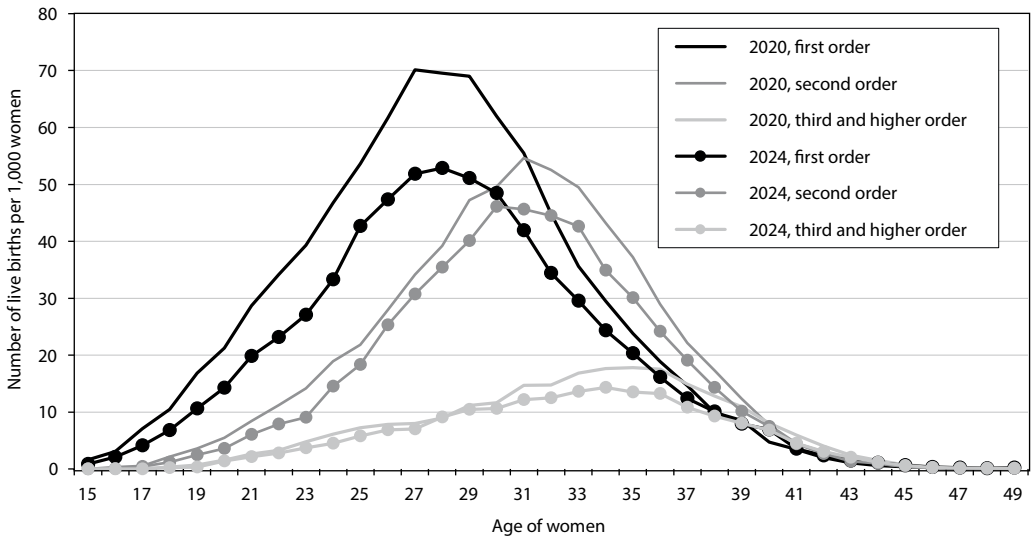
Note: Total fertility rates by birth order are calculated as rates of the second category, where women are not distinguished in the denominator by the number of live births.
Source: Czech Statistical Office; author's calculations.

a more significant annual change in 2021) could also be observed in the mean age of mothers at childbirth in the case of first- and second-order children. The mean age of first-time mothers, the biggest increase in which was observed in the past five years, increased by a total of 0.5 years from 28.5 years in 2020 to 29.0 years in 2024. The mean age of mothers at the birth of their second child was 31.3 years in 2020 and it remained at 31.4 years in 2021–2024. In the case of mothers of third- and higher-order children, their mean age fluctuated between 33.1 and 33.4 years (it was the lowest in 2024).

A comparison of the fertility rates for five-year age groups of women of reproductive age over time shows that the largest changes in absolute numbers (the number of births per thousand women of a given age) concerned the age groups 25–29 and 30–34, where fertility is the highest, whether this was the increase in total fertility in 2021 or the decrease in total fertility rates in 2022–2024. With the exception of the two youngest age groups (15–19 and 20–24), the peak of fertility was reached in 2021. Over the next three years, fertility rates decreased in all age groups. The two youngest age groups (15–19 and 20–24) recorded the biggest decrease, by 29% and 28%, respectively. The fertility of women aged 25–29, 30–34, and 35–39 decreased by a quarter. The oldest age groups, 40–44 years, 45–49 years, saw a decrease of one-tenth and 4%, respectively, but in the last monitored year, a slight increase was recorded in these groups. In terms of one-year fertility rates, the highest fertility intensity belonged to women aged 29 (2020, 2022, 2023) and 30 (2021 and 2024). In 2020 and 2022, it reached 124–129 children per thousand women and in 2021 as high as 142, while in 2023 it dropped to just under 112 children and in 2024 to 105 children per thousand women.

Between 2020 and 2024, the first-order fertility rate was highest among women aged 28 or 29 (in 2024, there were 53 first-born children per thousand women

Figure 3: Age-specific fertility rates of women by birth order, 2020 and 2024



Source: Czech Statistical Office (CZSO).

aged 28), except in 2020, when it was highest among women aged 27. A comparison of fertility rates by age between 2020 and 2024 (Figure 3) shows a decrease in fertility rates among first-time mothers at all ages up to 39. Despite the overall decline in fertility in the last three years, mothers aged 40 and older maintained slightly higher fertility rates in 2024 than in 2020. The highest level of second-order fertility was recorded at the age of 31 or 32, except in the last two years, when it was highest at age 30 (there were 47 or 46 second-order births per 100 women of this age in 2023 and 2024, respectively), and for third- or higher-order fertility it was highest at the age of 34 or 35 (14 births per 100 women aged 34 in 2024). Compared to 2020, fertility decreased at all ages up to the age of 43 (for second-order births) and to the age of 47 (for third- and higher-order births).

MORTALITY

In 2024, 112.2 thousand inhabitants of the Czech Republic died, which was a similar number of deaths as in the previous year (the number of deaths decreased by 584, which is a relative decrease of 0.5%) and a similar number to the years before the outbreak of the Covid-19 epidemic (2018 and 2019). Since 2007, the number of deaths in the Czech Republic has had an increasing trend, with certain annual fluctuations, mainly due to changes in the age composition of the population (in 2020–2022, Covid-19 also significantly contributed to the higher number of deaths). In 2024, the month with the highest number of deaths was January, followed by February, when, respectively, 1.1 thousand and 1.0 thousand more people died than the average monthly standardised number of this year (Table 10). The months of October and December were also above the average monthly standardised number, while all the other months were below average.

The share of men out of all deaths is slightly more than half: the figure usually ranges between 50% and 51%. This was also the case in 2024 with men accounting for 51.4% of deaths, i.e. 57.7 thousand deceased men compared to 54.5 thousand women (Table 11). The share of the three basic age groups (0–14 years, 15–64 years, and 65 years and over) among the deceased in 2024 did not change year-on-year. More than four-fifths of the deceased are seniors aged 65 and over, and in 2024 the figure was 84.2%. Seniors aged 80 and over accounted for almost half of all deaths, and in the past five years they have accounted for between 31.9% and 34.7% of deaths among men and between 54.8% and 58.4% of deaths among women. People aged 90 and older make up a substantial share of total deaths and that share rose

Table 10: Standardised deaths by month of death, 2020–2024

Year	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2020	9,896	10,140	9,889	9,279	8,511	8,847	8,882	9,076	9,459	13,731	15,751	13,708
2021	15,688	14,805	16,248	11,700	9,249	8,628	8,531	8,431	8,931	9,776	12,816	13,365
2022	10,678	11,130	10,350	9,963	8,938	8,748	8,922	9,171	9,564	9,902	9,491	11,779
2023	11,071	9,841	9,605	9,122	8,532	8,509	8,303	8,641	8,362	9,203	9,594	10,474
2024	10,268	10,201	8,925	8,688	8,434	8,678	8,679	8,804	9,058	9,640	9,175	9,849

Note: Standardised to the same number of days (30) in a month. Standardised deaths in the month = real deaths in the month / number of days in the month * 30. The highest number of deaths by month in the given year in bold.
Source: Czech Statistical Office.

slightly between 2020 and 2024 by 0.3 p.p. to 8.3% for men and by 0.1 p.p. to 21.4% for women, while the development was not smooth and, in addition to the intensity of mortality, it is also shaped by the age structure of the living population. In 2024, deaths aged 15–64 accounted for 15.5% of the total (abs. 17.4 thousand people). Deaths aged 15–64 are significantly more frequent among men than women: in 2024 a total of 20.8% men and only 9.8% of women died at this age. Deaths under 14 years of age occur minimally in the Czech Republic, representing less than 0.5% of all deaths. Only 196 children under 1 year of age died in 2024, 4 fewer than in the previous year. This historical minimum was partly the result of a significant decrease in the number of live births. In the last five years, infant mortality reached alternating values of 2.2 and 2.3 ‰ – the latter value was also reached in 2024.

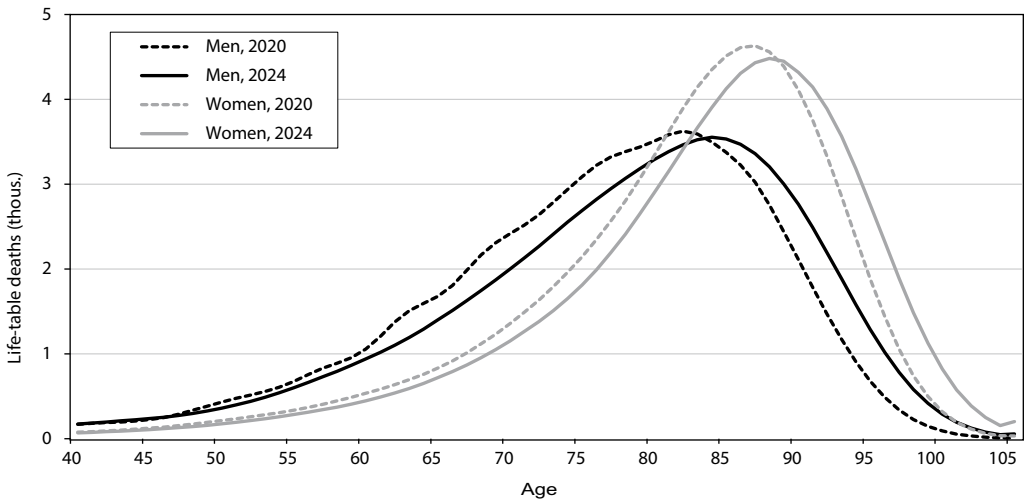
The effect of the age structure of the population on the number of deaths is eliminated (for example) by the mortality table indicators. Between 2020 and 2024, there was a shift in the curve of life table deaths towards an increase in life table deaths in old and very

Table 11: Deaths, 2020–2024

Indicator	2020	2021	2022	2023	2024
Deaths	129,289	139,891	120,219	112,795	112,211
– men	66,599	73,522	61,404	58,030	57,670
– women	62,690	66,369	58,815	54,765	54,541
Deaths at age: 0–14	397	406	397	360	362
15–64	19,648	22,493	18,567	17,560	17,370
65 and over	109,244	116,992	101,255	94,875	94,479
Percentage of deaths at the age 80 and over – men	34.6	31.9	34.0	34.3	34.7
– women	58.4	54.8	57.4	57.0	58.1
Percentage of deaths at the age 90 and over – men	8.0	7.4	8.2	8.2	8.3
– women	21.3	19.5	21.5	21.4	21.4
Deaths under 1 year of age	249	246	230	200	196
Infant mortality rate (‰)	2.3	2.2	2.3	2.2	2.3

Source: Czech Statistical Office; author's calculations.

Figure 4: Life-table deaths by sex and age, 2020 and 2024



Source: Czech Statistical Office. Based on life tables.

old age and a decrease in earlier and middle senior age (Figure 4). Compared to 2020, more men died from the age of 84 in 2024, while more women died regularly from the age of 89 in 2024. The modal age at death for both men and women in 2024 shifted from 82 to 84 years for men and from 87 to 88 years for women compared to 2020.

Life expectancy at birth in 2024 reached 77.2 years for men (i.e. 0.3 years more than in 2023 and 1.9 years more than in 2020) and 83.1 years for women (an increase of 0.4 years year-on-year and 1.8 years compared to 2020). Compared to 2019, the last pre-pandemic year, life expectancy at birth in 2024 increased by 0.8 years for men and 1.0 years for women. The slightly faster rate of increase in life expectancy at birth among women than men brings a widening gap between the sexes. However, the years 2020 and 2021 deviated from this stable situation (a difference of 6.1 and 6.4 years, respectively), and in 2024 the difference was 6.0 years in favour of women. In 2024, not only life expectancy at birth but also the life expectancy of people living also increased. For example, men and women who reached the senior age of 65 in 2024 had the hope of living another 17.0 years if they were men and 20.8 years if they were women, i.e. they could expect to live to 82.0 years and 85.8 years, respectively. This means an increase in life expectancy at age 65 between 2020 and 2024 of 1.8 years for men and 1.6 years for women (Table 12).

Table 12: Life expectancy by sex and age, 2020–2024

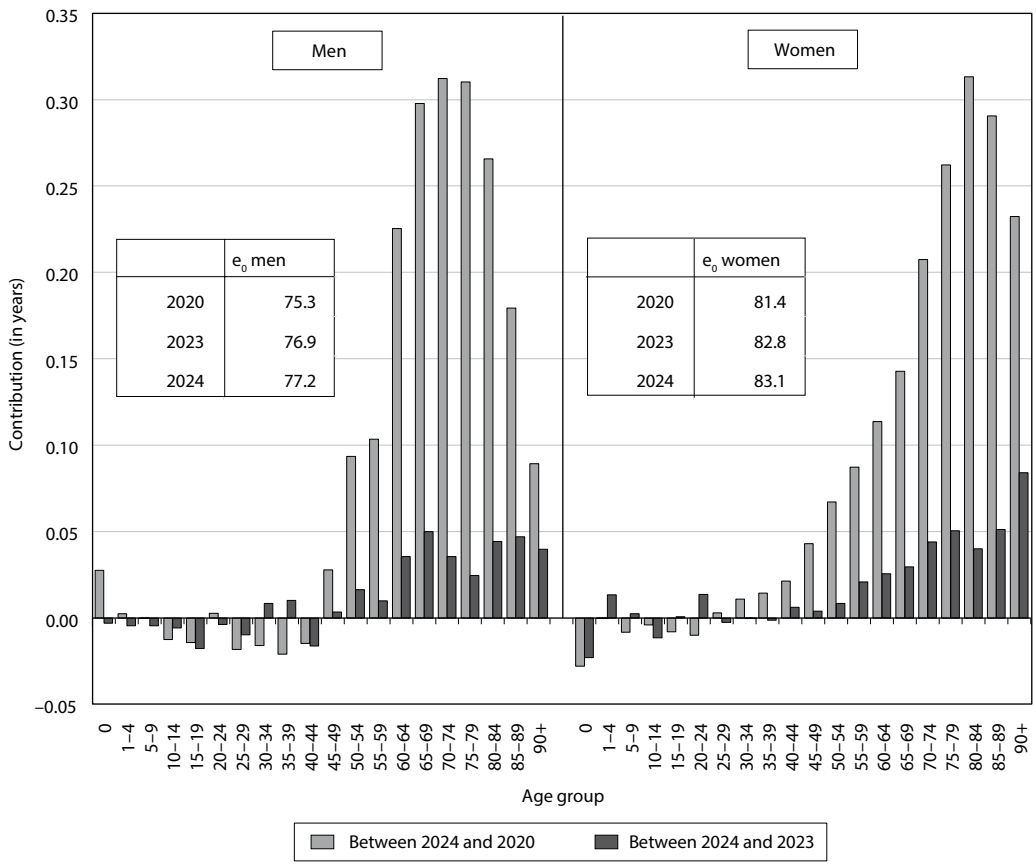
Indicator	2020	2021	2022	2023	2024
Life expectancy of men at age: 0	75.3	74.1	76.1	76.9	77.2
65	15.2	14.5	16.1	16.7	17.0
80	6.6	6.5	7.2	7.5	7.8
Life expectancy of women at age: 0	81.4	80.5	82.0	82.8	83.1
65	19.2	18.6	19.8	20.4	20.8
80	8.2	8.2	8.7	9.2	9.5

Note: The indicator is based on life tables calculated according to the uniform methodology that has been used by the CZSO since 2018.
Year-on-year differences stated in the text may vary due to rounding.
Source: Czech Statistical Office.

The increase in life expectancy at birth was mainly due to a decrease in mortality in older age groups (Figure 5). For men, the most significant contributors to the 0.3-year increase in life expectancy were the age groups 65–69 and 85–89, both of which saw an increase of 0.10 years. The 65–79 age group contributed most to the increase between 2020 and 2024 (by 0.93 years out of a total of 1.9 years). Even older age categories were responsible for the main part of the increase in life expectancy at birth for women: the age groups between 70 and 89 contributed an increase of 0.19 years out of a total of 0.4 years year-on-year, and between 2020 and 2024 an increase of 1.08 years out of a total of 1.8 years.

In 2024, the most common causes of death were, as is traditionally the case, diseases of the circulatory system, which were the cause of 42.6 thousand deaths (38.0% of all deaths). Of these, most inhabitants died from chronic ischemic heart disease (17.1 thousand), followed by heart failure (7.3 thousand), and cerebrovascular disease (5.9 thousand). The second most common cause of death was neoplasms (28.1 thousand or 25.0% of all deaths). The third most common cause of death was diseases of the respiratory system (8.7 thousand deaths, 7.7%). The above order of the first three cause-of-death categories has been stable in the long term, the only exception being in 2020 and 2021, when Covid-19 occupied third place.

Figure 5: The contributions of age groups to the difference in life expectancy at birth by sex, 2020, 2023, and 2024



Note: Calculation method according to Pressat (1985).
Source: Czech Statistical Office.

Table 13: Standardised mortality rates*) by selected causes of death (per 100,000), 2020, 2023, and 2024

Underlying cause of death (code according ICD-10)	Men			Women		
	2020	2023	2024	2020	2023	2024
Total	1,718.8	1,441.8	1,391.5	1,084.3	907.5	880.5
Neoplasms (C00–D48)	363.8	337.0	331.3	213.2	202.9	200.1
Malignant neoplasm of colon, rectum and anus (C18–C21)	47.2	43.4	43.8	23.8	22.2	22.2
Malignant neoplasm of pancreas (C25)	25.6	25.0	24.9	18.8	19.6	17.8
Malignant neoplasm of trachea, bronchus and lung (C33–C34)	73.4	63.0	60.5	30.7	29.8	30.4
Malignant neoplasm of prostate (C61) / Malignant neoplasm of breast (C50)	40.0	38.6	38.0	29.0	27.4	25.8
Endocrine, nutritional and metabolic diseases (E00–E90)	70.5	70.2	66.9	55.3	49.8	49.7
Diabetes mellitus (E10–E14)	60.3	60.2	56.6	45.7	41.7	41.5
Mental and behavioural disorders (F00–F99)	24.0	21.0	20.8	21.6	18.6	18.3
Diseases of the nervous system (G00–G99)	46.7	44.4	47.9	41.5	37.7	41.3
Alzheimer disease (G30)	26.3	23.2	25.4	29.4	26.3	28.1
Diseases of the circulatory system (I00–I99)	682.5	572.3	541.0	476.6	384.1	364.6
Ischaemic heart diseases (I20–I25)	336.8	260.0	239.2	204.7	147.7	134.0
Acute myocardial infarction (I21-I22)	54.1	39.8	36.4	23.5	15.4	14.3
Heart failure (I50)	87.6	88.9	89.5	64.5	66.7	67.0
Cerebrovascular diseases (I60–I69)	93.7	78.0	66.5	72.9	59.3	53.0
Atherosclerosis (I70)	21.0	16.6	16.4	15.9	11.6	11.4
Diseases of the respiratory system (J00–J99)	123.6	117.0	114.8	61.7	65.9	63.5
Diseases of the digestive system (K00–K93)	64.0	64.3	65.5	36.3	36.4	37.2
External causes of morbidity and mortality (V01–Y98)	83.9	79.7	80.7	32.4	27.9	27.7
Transport accidents (V01–V99, Y85)	9.9	8.9	7.8	2.9	2.5	2.1
Intentional self-harm (X60–X84, Y870)	20.4	20.2	24.7	3.9	4.1	5.2
COVID-19 (U07)	160.8	25.8	11.2	78.5	13.2	5.3
Other	99.0	110.1	111.3	67.2	71.1	72.8

Note: *) The European population standard issued by Eurostat (2013) was used for standardisation.
Source: Czech Statistical Office; author's calculations.

Based on standardised mortality rates (Table 13), the order of the most frequent cause-of-death categories in 2024 was the same, or very similar, as the order in absolute numbers (Table 13). This was true for women without any exceptions, while for men the only difference was one that has been occurring regularly since 2018 and reoccurred in 2024, when endocrine, nutritional, and metabolic diseases moved into fifth place according to standardised rates, ahead of diseases of the digestive system in sixth place. The standardised mortality rate for both men and women decreased slightly year-on-year, by 3.5% for men and 3.0% for women. Diseases of the circulatory system made the most significant contribution to the decrease in total

mortality: by 5.5% year-on-year for men and by 5.1% for women.[2)] Mortality from neoplasms decreased only slightly between 2023 and 2024 (by 1.7% and 1.4%, respectively). On the other hand, there are cause-of-death categories in which mortality is increasing. The most significant increase year-on-year was in mortality from diseases of the nervous system (8.1% for men, 9.7% for women).

INTERNATIONAL MIGRATION

Since 2022, migration statistics have been strongly influenced by the ongoing war in Ukraine, as the Czech Republic is one of the countries that received the most Ukrainian refugees (*Koukalová*, 2023). In 2022, net migration increased sharply to almost 330 thousand, and a year later it reached 94.7 thousand (Table 14). In 2024, the number of immigrants exceeded emigrants by 36.8 thousand people, which is a year-on-year decrease of 57.8 thousand (61%). The significant decrease in the balance, below the average of the past five years before the outbreak of the war in Ukraine (37.6 thousand), was primarily a reflection of the high number of emigrants. The number of immigrants from abroad in 2024 was the third highest in post-war history (the highest figures were 349.5 thousand in 2022 and 141.3 thousand in 2023), when a total of 121.8 thousand immigrants were recorded. The majority of immigrants (65%) were persons granted temporary protection. In 2024, there were almost 85.0 thousand emigrants from the Czech Republic abroad, the highest number since the deportation of the German population after the Second World War and almost double the number in 2023 (46.6 thousand). Three-quarters of emigrants were persons with temporary protection.

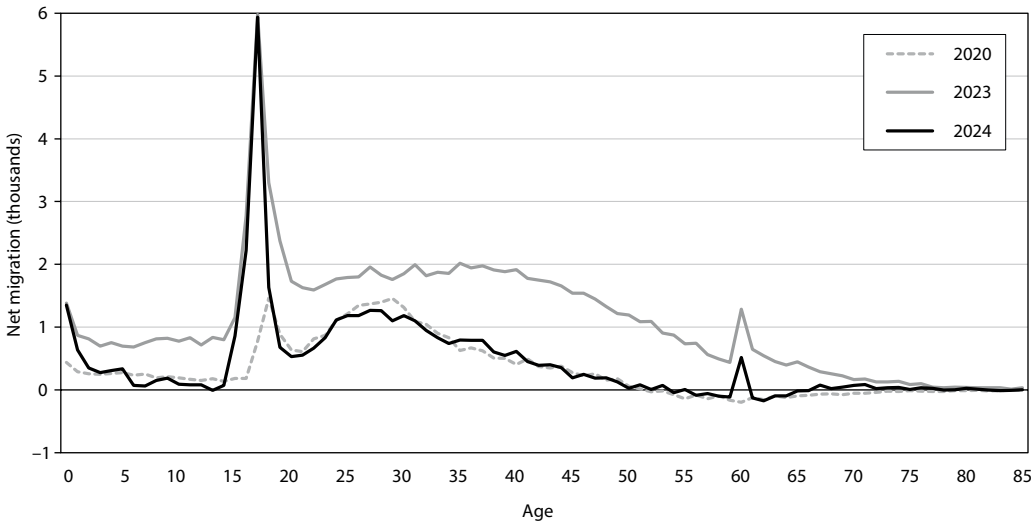
The structure of migration flows by gender and age in 2024 remained different from the years before the outbreak of the war in Ukraine. While until 2021, men typically predominated in both directions of international migration, in 2022 and 2023 there were more women among immigrants and in 2023 and 2024 also among emigrants (Table 14). In 2024, the ratio of men to women among immigrants to the Czech Republic from abroad was relatively balanced. Women accounted for a record 59.2% of emigrants in 2024. The share of men in the migration balance in 2024 reached a record 71.2%. Their predominance in the last five years was recorded as 58.5% in 2021, but in 2020, 2022, and 2023 it was only 40.7–49.9%, while, conversely, there were more women in the migration balance.

Table 14: International migration by sex and age, 2020–2024

Indicator	2020	2021	2022	2023	2024
Immigrants	55,661	69,201	349,548	141,263	121,823
– percentage of men	59.1	59.8	41.9	48.2	50.0
Emigrants	28,734	19,232	19,806	46,591	84,978
– percentage of men	67.8	63.4	62.2	49.2	40.8
Volume of migration	84,395	88,433	369,354	187,854	206,801
Net migration	26,927	49,969	329,742	94,672	36,845
by sex: men	13,430	29,216	134,165	45,207	26,248
women	13,497	20,753	195,577	49,465	10,597
aged: 0–14	3,498	4,547	75,862	12,251	4,052
15–64	24,166	45,036	243,340	79,575	32,348
65+	–737	386	10,540	2,846	445

Source: Czech Statistical Office (CZSO).

Figure 6: Net migration by age, 2020, 2023, and 2024



Source: Czech Statistical Office.

The positive balance of international migration for 2024, a total of 36.8 thousand, was largely (31%) made up of persons aged 15–19. In this age group, immigrants outweighed emigrants by 11.3 thousand, while the second highest migration balance, which belonged to the age group 25–29, was only 6.0 thousand. In third place was the migration balance of persons aged 30–34, which amounted to 4.8 thousand. Together, these three five-year age groups accounted for 60% of total net migration. In the previous two years, 2022 and 2023, the three age groups with the highest migration balance were the groups 15–19, 35–39, and 30–34, and in 2023 young people aged 15–19 had a relatively significantly predominated. In contrast, in 2020 and 2021, the highest gains from international migration were in the age group 25–29, followed by the age groups 30–34 and 20–24. A more detailed look at individual ages (Figure 6) shows that the age profile of net migration in 2024 remained similar to 2023 and, at most ages, the values for 2024 approached those from 2020.

In terms of the citizenship of migrants, net migration was again dominated by Ukrainian citizens in 2024, as it was in 2020–2023 (17.0 thousand; or 46% of the total balance). The number in 2024 decreased year-on-year by 58.1 thousand and was also lower than in 2021. This was primarily due to the record number of emigrants. The second largest group in net migration was made up of citizens of Slovakia (4.7 thousand; or 13% of the balance), and the third highest balance, for the second year in a row, comprised citizens of the Philippines (3.0 thousand). The net migration balance of Russian citizens, who used to make up the third largest group, has been negative in the last two years (−0.6 thousand in 2024) because of the low number of immigrants.

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SUMMARY

In 2024, the population of the Czech Republic reached 10.9 million inhabitants, which is a year-on-year increase of fewer than 9 thousand people. This growth was entirely the result of international migration, as the natural increase remained negative – the number of deaths exceeded the number of live births by almost 28 thousand. The age structure of the population confirms an ongoing process of population ageing. The senior age group (aged 65 and over) made up 20.7% of the population and the average age of the population reached 43.1 years. The number of marriages fell to 44.5 thousand, the lowest number since 2013. In 2024, there was a year-on-year decrease in the total first marriage rate to 53.0% for men and 62.4% for women, thus returning to levels similar to those observed in 2014 and 2015, respectively. The mean age at first marriage reached a record 32.9 years for men and 30.8 years for women. There were 20.8 thousand divorces, 7% more than in the previous year, and 40.0% of marriages ended in divorce. Fertility reached a historic low. The Czech Statistical Office recorded a total of 84.3 thousand live births in 2024, which was the lowest number ever. The total fertility rate fell to 1.37 children per woman and decreased most significantly in the case of first- and second-born children. The mean age of mothers at childbirth increased to 30.5 years and almost half of children (47%) were born outside of marriage. Mortality stabilised at the pre-pandemic level, with 112 thousand deaths. Life expectancy increased to 77.2 years for men and 83.1 years for women. The most common causes of death remained diseases of the circulatory system, neoplasms, and respiratory diseases. Migration dynamics changed significantly after 2022. While 121.8 thousand people immigrated to the Czech Republic in 2024, the number of emigrants reached a record 85 thousand, which led to a decrease in net migration to 36.8 thousand. The largest group of migrants was made up of citizens of Ukraine, followed by citizens of Slovakia and the Philippines.

Overall, the analysis of demographic development in 2024 confirmed the continuation of demographic ageing, historically low fertility. and declining marriage rates. Migration continues to compensate for natural population decline, but its importance is weakening. These trends represent a fundamental structural change in the Czech population, which will have long-term social and economic consequences – especially for the labour market, the pension system, and family policy.

Abstracts of Articles Published in the Journal *Demografie* in 2025 (Nos. 1–3)

Jolana Pavlátová – Klára Hulíková Tesárková

SENIORS IN THE SOUTH KOREAN WORKFORCE: THE CHALLENGES OF AN AGEING POPULATION

Population ageing is associated with many challenges, one of those most frequently discussed is the sustainability of social and pension systems. In the context of increasing life expectancy, a common issue, for example, is the age of entitlement to retirement pensions and the possibility of motivating people to stay longer in the labour market. The population of South Korea, one of the fastest ageing populations in the world, which also has a high level of senior participation in the labour market, can serve as an important inspiration and source of information for European populations. The aim of this paper is to provide a brief description of the labour market position of the elderly in South Korea, along with identifying key factors that can influence the economic activity of older people. Using data from the Korean Longitudinal Study of Ageing sample survey and applying binary logistic regression analysis, the research this article is based on, confirms that the high labour market participation of Korean seniors is likely associated more with their need to improve their financial security than with a personal interest or need for self-fulfilment. This can be seen as a reflection of the pension and welfare systems' inadequate preparedness for a fundamental change in the age structure. The chances of participating in the labour market are lower for women, people with poor health, and, logically, older people. It is these groups of the population that are at increased risk of poverty. European countries can take advantage of the lower pace of population ageing to prepare more effectively for the challenges that this process is likely to bring in terms of financial security once the workforce is no longer economically active.

Keywords: South Korea, population ageing, economic activity, pension systém
https://doi.org/10.54694/dem.0349 **Demografie,** 2025, **67(1): 3–23**

Monika Šmeringaiová

FERTILITY FACTORS FROM THE PERSPECTIVE OF MOTHERS OF LARGE FAMILIES

This study investigates the perceptions of fertility factors among highly educated and Catholic mothers living in Slovak cities who have large families, which are defined as families with three or more children. While considerable research has focused on the determinants of fertility, particularly in relation to the first and second child, the factors influencing the decision to have a larger family remain underexplored. I seek to fill this gap in part by examining how Slovak mothers of large families perceive various fertility factors that have contradictory effects on reproductive behaviour. Using in-depth interviews, the study reveals several heterogenous perceptions within my homogenous population, especially in the case of factors such as financial costs and institutional childcare. However, the perceived benefits of having children, rooted in religious beliefs, clearly outweighed concerns about career impacts or family budget constraints.

Keywords: large family, fertility, religiosity, female education, family policy
https://doi.org/10.54694/dem.0355 **Demografie,** 2025, **67(1): 24–37**

Jan Cvrček – Šárka Nekvapil Jirásková

RELIABILITY OF CAUSES OF DEATH RECORDED BETWEEN 1842 AND 2006: A COMPARISON OF ANTHROPOLOGICAL AND WRITTEN SOURCES FROM CENTRAL BOHEMIA

Determining the causes of death in the past on the basis of historical-demographic research encounters the problem of the credibility of extant sources. However, interdisciplinary collaboration between historical demographers and physical anthropologists presents a unique opportunity to verify their informative value. The aim of this study is to verify to what extent the cause of death stated in historical written records corresponds with the finding on the skeleton. The studied sample consists of skeletal remains of 97individuals from Bohemia, Czech Republic, died between 1842 and 2006 from the genealogically documented collection of the Department of Anthropology in the National Museum in Prague. The results showed a significant disproportion between the information recorded in vital records and the results of anthropological analysis. These were mainly unrecognized ethnic diseases that left clear marks on the skeleton as a result of osteolytic metastases. The disparities found illustrate the need for interdisciplinary cooperation in researching past mortality.

Keywords: cause of death, credibility, historical-demography, paleopathology, vital records
https://doi.org/10.54694/dem.0358 **Demografie,** 2025, **67(2): 61–75**

Hana Třísková

MATERNAL EMPLOYMENT PREFERENCES IN POLAND AND SLOVAKIA

This study examines the preferences of men and women towards maternal employment, focusing on mothers with pre-school-age and school-age children in Poland and Slovakia and utilising data from the Family and Changing Gender Roles V module (2022) in the International Social Survey Programme. Despite progress in achieving gender-equal access to paid leave and the increasing number of pre-school facilities, maternal employment has remained low in these countries, especially among mothers with children aged 0–2. The results indicate that Poles exhibit a stronger preference for mothers with a child under school age staying at home, while Slovaks are more supportive of maternal employment, particularly on a part-time basis. For mothers with school-age children, full-time employment is broadly supported in both countries. These findings highlight persistent cultural barriers in Poland and the positive impact of policy measures implemented in Slovakia to increase and support maternal employment.

Keywords: maternal employment, gender roles, traditional and egalitarian attitudes, parental leave, pre-school facilities, family policy, work-life balance
https://doi.org/10.54694/dem.0367 **Demografie,** 2025, **67(3): 107–123**

David A. Swanson – Jeff Tayman

PROBABILISTIC INTERVALS AROUND POPULATION FORECASTS: A NEW APPROACH WITH A SUBNATIONAL EXAMPLE USING WASHINGTON STATE COUNTIES

Population forecasts produced by governments at all levels are used in the public sector, the private sector, and by researchers. They have been primarily produced using deterministic methods. This paper shows how a method for producing measures of uncertainty can be applied to existing subnational population forecasts while meeting several important criteria, including the concept of utility. The paper includes an assessment of the efficacy of the method by: (1) examining the change in uncertainty intervals it produces by population size and population growth rate; and (2) comparing the width and temporal change of the uncertainty intervals it produces to the width and temporal change of uncertainty intervals produced by a Bayesian approach. The approach follows the logic of the Espenshade-Tayman method for producing confidence intervals in conjunction with ARIMA equations to construct a probabilistic interval around the total populations forecasted from the Cohort Component Method, the typical approach used by demographers. The paper finds that population size and population growth rate are related to the width of the forecast intervals, with size being the stronger predictor, and the intervals from the proposed method are not dissimilar to those produced by a Bayesian approach. This approach appears to be well-suited for generating probabilistic population forecasts in the United States and elsewhere where these forecasts are routinely produced. It has a higher level of utility, is simpler, and is more accessible to those tasked with producing measures of uncertainty around population forecasts.

Keywords: ARIMA, Bayesian Methods, Cohort Forecasting Methods, Espenshade-Tayman Method, Forecast Uncertainty, Utility
https://doi.org/10.54694/dem.0365 **Demografie,** 2025, **67(3): 124–147**

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Roubíček, V. 1997. *Úvod do demografie.* Praha: Codex Bohemia. (U publikace s více než třemi autory se uvádí jen příjmení prvního autora, za ním následuje zkratka a kol., u zahraničních publikací et al.)

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Daly, M. 2004. Rodinná politika v evropských zemích. In *Perspektivy rodinné politiky v ČR*, s. 62–71. Praha: MPSV ČR.

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Syrovátka, A. 1962b. Úmrtnost dětí v českých zemích na dopravní úrazy. *Časopis lékařů českých,* 101, s. 1513–1517.

Odkazy v textu na seznam literatury

(Srb, 2004*)*; *(Srb,* 2004: 36–37*)*; *(Syrovátka a kol.,* 1984*)*. (*Dudová – Vohlídalová*, 2018)

Popisky tabulek a grafů (dodat v češtině a angličtině)

Tab. 1: Pohyb obyvatelstva, 1990–2010; Population and vital statistics, 1990–2010

Graf 1: Relativní věková struktura cizinců a obyvatelstva ČR celkem, 31. 12. 2009; Relative age distribution of foreigners and total population of CR, 31 Dec 2009

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