

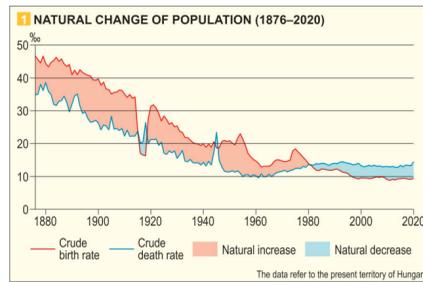
NATURAL CHANGE OF POPULATION

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The natural change of population represents the difference between the number of live births and the number of deaths, the two decisive factors of population development. Although in our modern and open society migration is an important factor in population change, the major contours of population development can still be traced by comparing births and deaths and by revealing the underlying processes. The difference between the number of births and the number of deaths gives the absolute value of natural increase or decrease, while the difference between the two ratios gives the rate of increase or decrease for the total population.

Natural change of population in the last century

A long-term trend can be observed in live births and deaths per thousand people in the present-day area of Hungary. Apart from some transitional periods, both values declined steadily from the last third of the 19th century to the mid-20th century. The number of births, however, exceeded the number of deaths. In consequence, save for the two world wars, popula-



tion growth was continuous until 1980. The death rate rose from the 1960s to the mid-1990s and then declined again. The birth rate varied significantly from the 1950s onwards. Since 1981, it has been consistently less than the death rate. As a result, the population of the country has been steadily declining.

We can discern, therefore, a long-term trend that lasted a century or so. This demographic transition continued until the mid-20th century, reflecting fundamental changes in the fertility behaviour and mortality conditions of the Hungarian population. The period was characterised by significant population growth with declining fertility and improved mortality. The

process was driven essentially by the economic, social and cultural transformation and modernisation of the country. For this reason, the phenomenon was not unique to Hungary but could be observed, with variations, in all developed countries. Fertility declined sharply: whereas around five children were born to females of the 1870s generation, among the generations born between the 1920s and the end of the 1960s the average number of children decreased to around two, with the two-child family model becoming dominant among mothers born in or after 1940. This was manifested in a drop in the birth rate from 45‰ to below 15‰ by the 1960s. Meanwhile, the decrease in the death rate from 35‰ to around 10‰ was the result of a dynamic increase in life expectancy at birth, rising from less than 40 years around the turn of the century. By 1960, average life expectancy reached almost 66 years for males and 70 years for females. The decrease in infant and early childhood mortality was particularly spectacular: whereas at the end of the 19th century, one in four infants died before their first birthday, the figure fell below 50‰ by the 1960s and below 10‰ in the late 1990s.

The demographic transition was thus marked by women giving birth to fewer and fewer children, with

2 MAIN DATA OF VITAL STATISTICS (1900–2020)

Year	Live births	Deaths	Natural increase, decrease	Marriages	Divorces	Infant deaths	Abortions	Deaths due to circulatory system diseases	Deaths due to cancer	Deaths due to suicide	Live births	Deaths	Natural increase, decrease	Marriages	Divorces	Infant deaths	Abortions	Total fertility rate	Average life expectancy at birth								
																			Male	Female	Male, female together						
	Total																		Per one thousand inhabitants			Per one hundred live births			Male	Female	Male, female together
1900	268,019	177,363	90,656	61,466	1,075	60,492	—	—	—	—	39.7	26.3	13.4	9.1	0.2	225.7	—	5.32	36.6	38.2	—						
1910	265,457	168,875	96,582	65,300	2,890	52,068	—	—	—	—	35.1	22.3	12.8	8.6	0.4	196.1	—	4.86	39.1	40.5	—						
1920	249,458	169,717	79,741	104,122	—	48,030	—	—	—	—	31.4	21.3	10.1	13.1	—	192.5	—	3.80	41.0	43.1	—						
1930	219,784	134,341	85,443	77,907	5,495	33,518	—	—	8,888	2,680	25.4	15.5	9.9	9.0	0.6	152.5	—	2.84	48.7	51.8	—						
1941	177,047	123,349	53,698	79,074	6,858	20,458	—	28,611	10,980	2,522	18.9	13.2	5.7	8.5	0.5	115.6	—	2.48	55.0	58.2	—						
1950	195,567	106,902	88,665	106,261	11,263	16,760	1,707	30,274	12,792	2,074	20.9	11.4	9.5	11.4	1.2	85.7	0.9	2.62	59.9	64.2	—						
1960	146,461	101,525	44,936	88,566	16,590	6,976	162,160	45,249	17,386	2,493	14.7	10.2	4.5	8.9	1.7	47.6	110.7	2.02	65.9	70.1	68.0						
1970	151,819	120,197	31,622	96,612	22,841	5,449	192,283	64,280	22,639	3,595	14.7	11.6	3.1	9.3	2.2	35.9	126.7	1.98	66.3	72.1	69.2						
1975	194,240	131,102	63,138	103,775	25,997	6,380	96,212	67,919	25,972	4,052	18.4	12.4	6.0	9.9	2.5	32.8	49.5	2.34	66.3	72.4	—						
1980	148,673	145,355	3,318	80,331	27,797	3,443	80,882	76,923	27,937	4,809	13.9	13.6	0.3	7.5	2.6	23.2	54.4	1.91	65.5	72.7	69.0						
1985	130,200	147,614	-17,414	73,238	29,309	2,651	81,970	79,725	28,893	4,725	12.3	14.0	-1.6	6.9	2.8	20.4	63.0	1.85	65.1	73.1	—						
1990	125,679	145,660	-19,981	66,405	24,888	1,863	90,394	76,369	31,221	4,133	12.1	14.0	-1.9	6.4	2.4	14.8	71.9	1.87	65.1	73.7	69.3						
1995	112,054	145,431	-33,377	53,463	24,857	1,195	76,957	73,797	33,265	3,369	10.8	14.1	-3.2	5.2	2.4	10.7	68.7	1.57	65.3	74.5	69.8						
2000	97,597	135,601	-38,004	48,110	23,987	900	59,249	68,873	33,679	3,269	9.6	13.3	-3.7	4.7	2.3	9.2	60.7	1.32	67.1	75.6	71.3						
2005	97,496	135,732	-38,236	44,234	24,804	607	48,689	70,938	32,057	2,621	9.7	13.5	-3.8	4.4	2.5	6.2	49.9	1.30	68.2	76.5	72.3						
2006	99,871	131,603	-31,732	44,528	24,869	571	46,324	66,561	32,396	2,461	9.9	13.1	-3.2	4.4	2.5	5.7	46.4	1.34	68.3	76.6	72.4						
2007	97,613	132,938	-35,325	40,842	25,160	577	46,324	66,547	32,747	2,450	9.7	13.2	-3.5	4.1	2.5	5.9	44.9	1.31	68.3	76.5	72.4						
2008	99,149	130,027	-30,878	40,105	25,155	553	44,089	64,749	32,776	2,477	9.9	13.0	-3.1	4.0	2.5	5.6	44.5	1.35	68.6	76.9	72.8						
2009	96,442	130,414	-33,972	36,730	23,820	495	43,181	64,921	33,174	2,461	9.6	13.0	-3.4	3.7	2.4	5.1	44.8	1.32	68.6	76.9	72.8						
2010	90,335	130,456	-40,121	35,520	23,873	481	40,449	65,819	33,076	2,492	9.0	13.0	-4.0	3.6	2.4	5.3	44.8	1.25	69.0	77.4	73.2						
2011	88,049	128,795	-40,746	35,812	23,335	433	38,443	64,250	33,274	2,422	8.8	12.9	-4.1	3.6	2.3	4.9	43.7	1.23	69.2	77.3	73.3						
2012	90,269	129,440	-39,171	36,161	21,830	438	36,118	64,178	33,790	2,350	9.1	13.0	-3.9	3.6	2.2	4.9	40.0	1.34	69.8	77.8	73.8						
2013	88,689	126,778	-38,089	36,986	20,209	454	34,891	62,979	33,274	2,093	9.0	12.8	-3.9	3.7	2.0	5.1	39.3	1.34	70.1	77.9	74.0						
2014	91,510	126,308	-34,798	38,780	19,576	421	32,663	62,786	33,292	1,927	9.3	12.8	-3.5	3.9	2.0	4.6	35.7	1.41	70.5	78.1	74.4						
2015	91,690	131,697	-40,007	46,137	20,315	383	31,176	65,493	33,321	1,870	9.3	13.4	-4.1	4.7	2.1	4.2	34.0	1.44	70.9	78.2	74.7						
2016	93,063	127,053	-33,990	51,805	19,552	368	30,439	62,846	33,618	1,763	9.5	12.9	-3.5	5.3	2.0	4.0	32.7	1.49	71.5	78.4	75.0						
2017	91,577	131,674	-40,097	50,572	18,495	332	28,496	65,598	33,548	1,634	9.4	13.5	-4.1	5.2	1.9	3.6	31.1	1.49	72.0	78.7	75.5						
2018	89,807	131,045	-41,238	50,828	16,952	304	26,941	64,695	33,250	1,656	9.2	13.4	-4.2	5.2	1.7	3.4	30.0	1.49	72.1	78.9	75.6						
2019	89,193	129,603	-40,410	65,268	17,600	335	25,783	63,609	32,638	1,550	9.1	13.3	-4.1	6.7	1.8	3.8	28.9	1.49	72.1	78.6	75.4						
2020	92,233	140,900	-48,667	67,301	15,200	317	23,900	67,000	33,000	1,600	9.5	14.5	-5.0	6.9	1.6	3.4	25.9	1.55	72.2	78.7	75.5						

Gyes. Childcare allowance (Hung. gyermekgondozást segítő ellátás, abbreviation: 'gyes'. Formerly: childcare aid, Hung. gyermekgondozási segély). In Hungary, within the framework of the family support system it is an individual, monthly entitlement. It was introduced in 1967 to address the problem of labour surpluses and an unfavourable demographic situation. **Gyed. Childcare fee** (Hung. gyermekgondozási díj, abbreviation: 'gyed') In Hungary it is a monthly income-related cash benefit, which is intended to compensate for the loss of income of the parent. Introduced in 1985, it was discontinued in 1996 but reinstated in 2000 within the context of health insurance benefits.

these children then living longer and longer. As they are among us for an increasing length of time, population growth will be sustained for a period. Even so, the difference between the number of births and deaths was relatively small and stable in Hungary. Consequently, when compared to other European countries (e.g. Sweden, Germany or Italy), the demographic transition in Hungary resulted in relatively low population growth. Overall, the population of Hungary calculated for the present-day area of the country doubled between 1870 and 1970. The number of inhabitants of the Carpathian Basin grew slightly slower, with a doubling of population between 1870 and 1990.

Nevertheless, in certain short periods, the number of births and deaths fluctuated strongly. Both rates were significantly influenced by political, economic and epidemiological crises up until World War II. World War I had a disastrous effect on the number of births. Indeed, even 70-80 years later, the population pyramid bore traces of that conflict, including some 'incomplete' generations. The Great Depression led to a sharp decline in the birth rate. Before World War I, the number of deaths was increased by epidemics affecting infant and child mortality, and the two world wars (especially the second one) were marked by a great loss of life (i.e. high mortality).

Population policy also had a significant impact on the number of births after World War II. The ban on abortion in the 1950s and the introduction of childcare allowances (e.g. 'Gyes' and 'Gyed') in the 1970s and 1980s brought about a temporary but significant increase in birth numbers. However, such policies affected only the timing of having children rather than the final number of children. Indeed, by the early 1960s, fertility in Hungary was already among the lowest in the world.

From the 1980s, however, the fluctuating but steady decline in fertility and in the number of births, as well as the increasing and then stagnant, slowly decreasing number of deaths, continued to maintain the natural population decrease. Moreover, this trend was not influenced significantly by international migration until the 1990s. When natural decrease became a constant feature, this indicated the end of the demographic transition and the emergence of a new demographic era.

Fertility trends, a change in the fertility model

Profound changes in fertility behaviour, the decisive factor influencing the number of births, have been observed over the past 30-40 years. By the end of the communist period, the family model of having children early had stabilised, and families with two children

were common. Young people's careers were characterised by a clearly visible rhythm: after finishing school, everyone started work, got married and soon had the first child. The average age of women at the time of the birth of the first child was 23 years, while at the birth of the second child it was around 25 years. The total fertility rate (TFR) was around 1.8 in the 1980s, but the completed fertility of women at the end of their fertility cycle exceeded this and approached 2.0. Then, for women born around 1960, it exceeded 2.0. Doubtless this was the result of a system where the expanding sphere of family support was decisive, and even essential. A wide range and expanding system of childcare allowances (including 'Gyes' and 'Gyed'), housing support and price subsidies of childcare products helped to normalise the dual-earner and two-child family model.

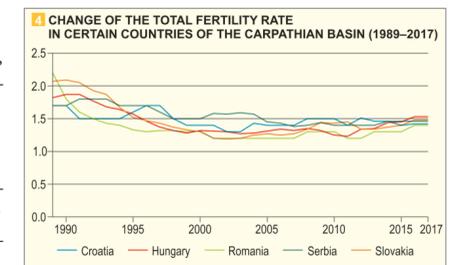
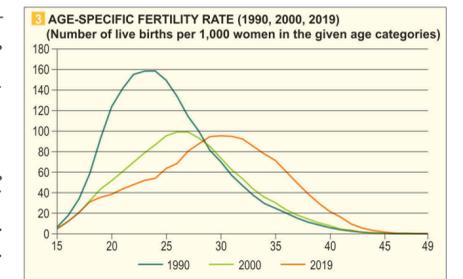
Economic and institutional changes following the collapse of communism radically altered the established reproductive system. As in the other former communist countries, there were changes in the circumstances of coming of age and starting a family. The number of years spent studying increased, and the age at which people entered employment became less certain. In general, life became more unpredictable, and the cost of having children increased. Many postponed their plans to have children, resulting in a total fertility rate of 1.3. For a decade or so, the number of live births was consistently less than 100,000 a year.

The total fertility rate (TFR) is the average number of children who would be born per woman if her cohort were to experience, throughout their child-bearing years, the current age-specific fertility rates. The TFR is the sum of age-specific fertility rates of women in age categories from 15 to 49 years. It changes and fluctuates from year to year. The TFR is one of the most useful indicators of fertility, because it shows how many children women are presently having.

The fact that a TFR of 1.3 was sustained for more than a decade was essentially the consequence of the postponement of childbearing, which affected young people until 2011. The age of having the first child for women increased on average to 28 years. After the period of postponement – although somewhat delayed by the economic crisis – the 'replacement' of postponed children began. Yet the data also suggest childbearing behaviour also changed during the period of the postponement. Not only was the first child born later, but fewer children were born, which is clearly reflected in the age-specific fertility rates. The popularity of the two-child family has been declining, and although the chances of the birth of a third child have



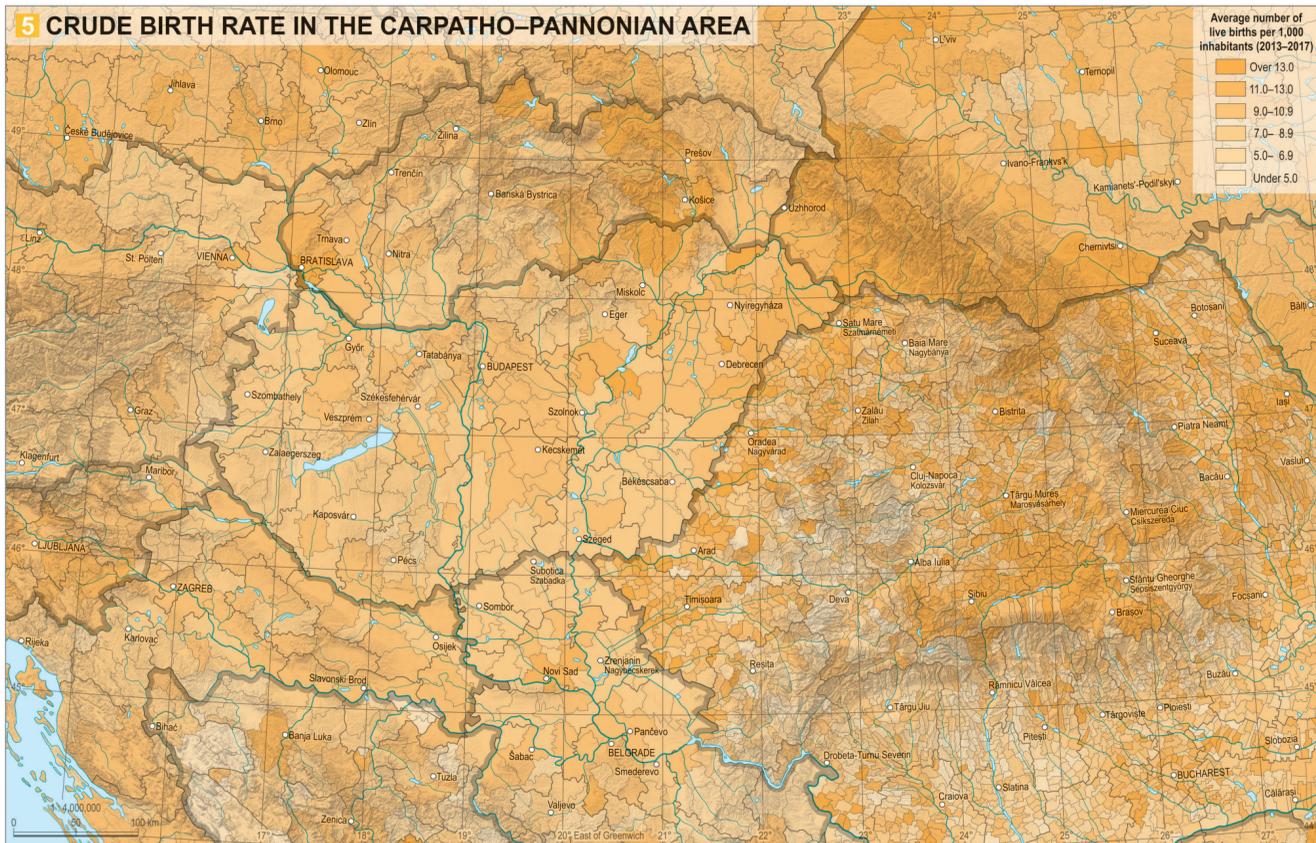
1 On average, 90 thousand children were born annually in Hungary in the last decade



increased, fertility has been declining overall due to childlessness and an increase in the share of those having only one child.

These processes were also observed in Western Europe, but started earlier and lasted longer (i.e. the processes took place more slowly). A comparison with the countries in the Carpathian Basin shows that the change described above is also typical of these countries; the differences pertain only to the level of fertility in a given country prior to the collapse of communism, to the duration of the fertility ebb (i.e. how long having children was delayed), and to the extent of fertility growth. The speciality of the situation in Hungary is that the postponement occurred when a large generation, the 'Ratkó grandchildren', were at the peak of their childbearing age. In consequence, the decrease in the number of births was more pronounced.

In the Carpathian Basin, regional differences in fertility are significant. Such discrepancies reflect differences in the historical demographic heritage and structural characteristics of a given society (e.g. age, gender, ethnic, religious and educational characteristics). They also depend on the stage of the change of fertility model that has been reached by the given region and the extent to which it has recovered from the 2008 Global Economic Crisis, which reduced childbearing throughout Europe. If live births in recent years are compared to the total population (or more precisely, calculated per one thousand inhabitants), the crude live birth rate is obtained. When comparing the number of live births to the total female population of childbearing age (15-49 years), the general fertility rate is of assistance in identifying the regional characteristics of this phenomenon. Although fertility behaviour can be inferred mainly by the latter, both maps show a similar spatial pattern. In general, it can be concluded that fertility is much higher than average in areas inhabited by peripheral, disadvantaged, poorly educated and low-skilled populations with modest incomes. Some of these areas are defined by a specific historical demographic heritage (e.g. areas inhabited by religious Slovak and Rusyn populations in the Northeastern Carpathians between the High Tatra and Maramureş or the Greek Catholic areas of Szabolcs in Hungary) (cf. 8 and 5). In other cases (e.g. East Slovakia, Partium, the areas formerly inhabited by Germans in Banat and Transylvania, in Baranya and Mureş counties), the growing proportion of the unskilled Roma population may be behind the high



fertility rates **VI.3.8.** In some major cities (e.g. Novi Sad, Belgrade, Zagreb, Bratislava, Graz, Vienna) there is also a high number of live births, which is mainly due to the influx of youth population (for political, war-related or economic reasons, mainly from abroad). In general, however, fertility is lower in major cities, especially in relation to their agglomerations (e.g. Budapest, Pécs, Szeged, Miskolc, Győr, Cluj-Napoca/Kolozsvár, Braşov, Sibiu, Timişoara, Arad, Košice), where young people of reproductive age have moved en masse as part of suburbanisation and peri-urban development.

To identify spatial differences in Hungary, we can turn to the regional values of the *total fertility rate* (TFR), the most sensitive indicator of fertility behaviour **7.** Based on the figures, it can be concluded that in areas with the highest fertility (TFR is greater than 2.0) there is a high population ratio of social groups with multiple disadvantages, low education and skills, and poor employment prospects (e.g. the districts of Enns, Szikszó, Cigánd, Edelény, Ózd, Heves, Kunhegyes and Tiszavasvári).

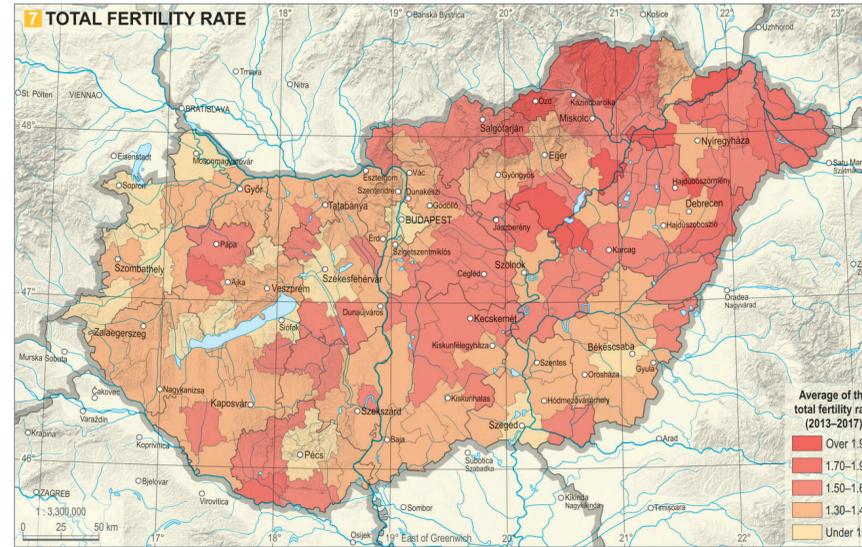
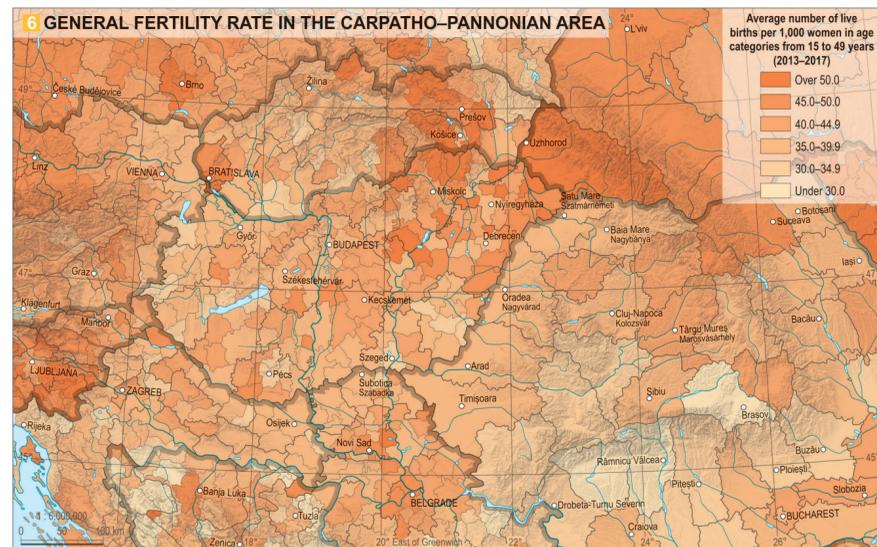
The average age of mothers **8** is lowest in these areas, not least because the first child is born before the mother reaches the age of 20, who often drops out of education. In contrast to them, in the western border areas of the country with high levels of economic development, where significant numbers commute to jobs abroad (e.g. the Szentgotthárd, Körmend, Sopron, Kőszeg, Mosonmagyaróvár, Sárvár, Celldömölk districts) and where the proportion of Roma people is also small, the total fertility rate is astonishingly low, between 1.1 and 1.3. The indicator is similarly low in the capital and in the major university cities (e.g. Szeged, Pécs, Debrecen), which can be explained largely by the presence of university students, who are of fertile age but less likely to have children due to their studies.

Relationship changes: marriages, registered partnerships, births outside marriage

Marriage plays a prominent role in understanding the pattern of changing fertility, as for a long time it was the only legitimate basis for childbirth. Marriage and having children were intricately linked. Moreover, in Western European practice, marriage ‘regulated’ fertility for a long time: the number of children depended on the late/early age at which young people married and the proportion of people remaining unmarried. Evidently, births outside marriage (illegitimate births) were seen in society in the past and at a measurable rate, but their recent significant increase reflects the

rapid spread of registered partnerships. Today, a registered partnership is often regarded as a form of cohabitation before marriage (a ‘trial marriage’ or a ‘prelude’ to marriage). Even so, some registered partnerships become long-term alternatives to marriage. Civil partnerships are defined and perceived differently in each society, and there are also significant differences in the extent to which marriage has declined in popularity. Many people now have children in registered partnerships, so the link between marriage and having children has been weakened. However, marriages continue to play a decisive role in the development of fertility, since having children is more likely in marriage than in cohabitation.

Looking back over the last hundred years, the number of marriages was highest in Hungary in the after-



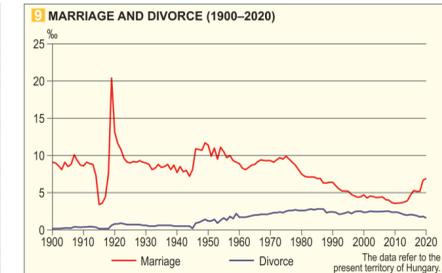
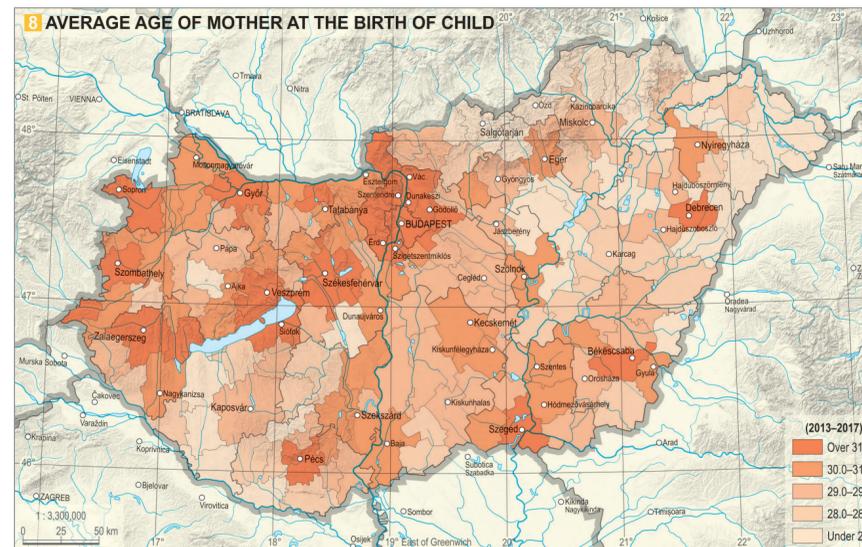
The total first marriage rate (TFMR) for women shows the proportion of women aged 15-49 who would marry by their fiftieth birthday if the current age-specific marriage rates were to remain unchanged in the future. The TFMR is calculated for females and males. The female/male TFMR is the sum of all the age-specific female/male first marriage rates.

math of World War I, in the first half of the 1950s and in the mid-1970s (over 100,000 per year, or more than 10 marriages per 1,000 inhabitants **9.** The propensity for marriage declined continuously after 1975 – save for a stagnation period lasting a few years after the turn of the millennium – and reached its lowest point in 2010. The number of marriages began to rise again after 2010, and a relatively large number of marriages (about 50-52 thousand) have been registered each year on the present-day territory of Hungary since 2016. As a result, the propensity for marriage has now returned to the level of the mid-1990s, and the decades-old trend of the declining popularity of marriage has seemingly been halted.

Despite the increase in recent years, the *total first-marriage ratio* (TFMR) for women in Hungary (0.65) is rather low compared to the surrounding countries. Among the neighbouring countries, only Slovenia

(0.47) and Austria (0.61) recorded a lower ratio in 2017. The chances of marriage – partly reflecting greater religiosity among the population – are highest in Romania (1.05) and Ukraine (0.81 in 2015), followed by Serbia (0.73), Croatia (0.72) and Slovakia (0.72).

The Carpathian Basin has seen a declining propensity for marriage for decades, but there are significant differences between the various areas **10.** The differences are the result of several factors, such as differences in the perception of marriage, the prevalence of registered partnerships, and the level of economic development. Some social policy measures and changes in the economic situation or the legal environment may also temporarily affect the number of marriages. In Romania, for example, in 2007, due to the introduction of state aid for newlyweds, the number of marriages was exceptionally high. During the 2008–2009 global economic crisis and in the following years, the decline was general, but the growing propensity to marry, which has been observed in Hungary over the last decade (in which the replacement of marriages postponed during the crisis plays an important role) is, to some extent, typical for the region as a whole. Connectedly, the *crude marriage rate* (the number of marriages per thousand inhabitants) reached its highest level in recent years in rural areas inhabited by people who are more religious than average and who thus regard marriage as the legitimate form

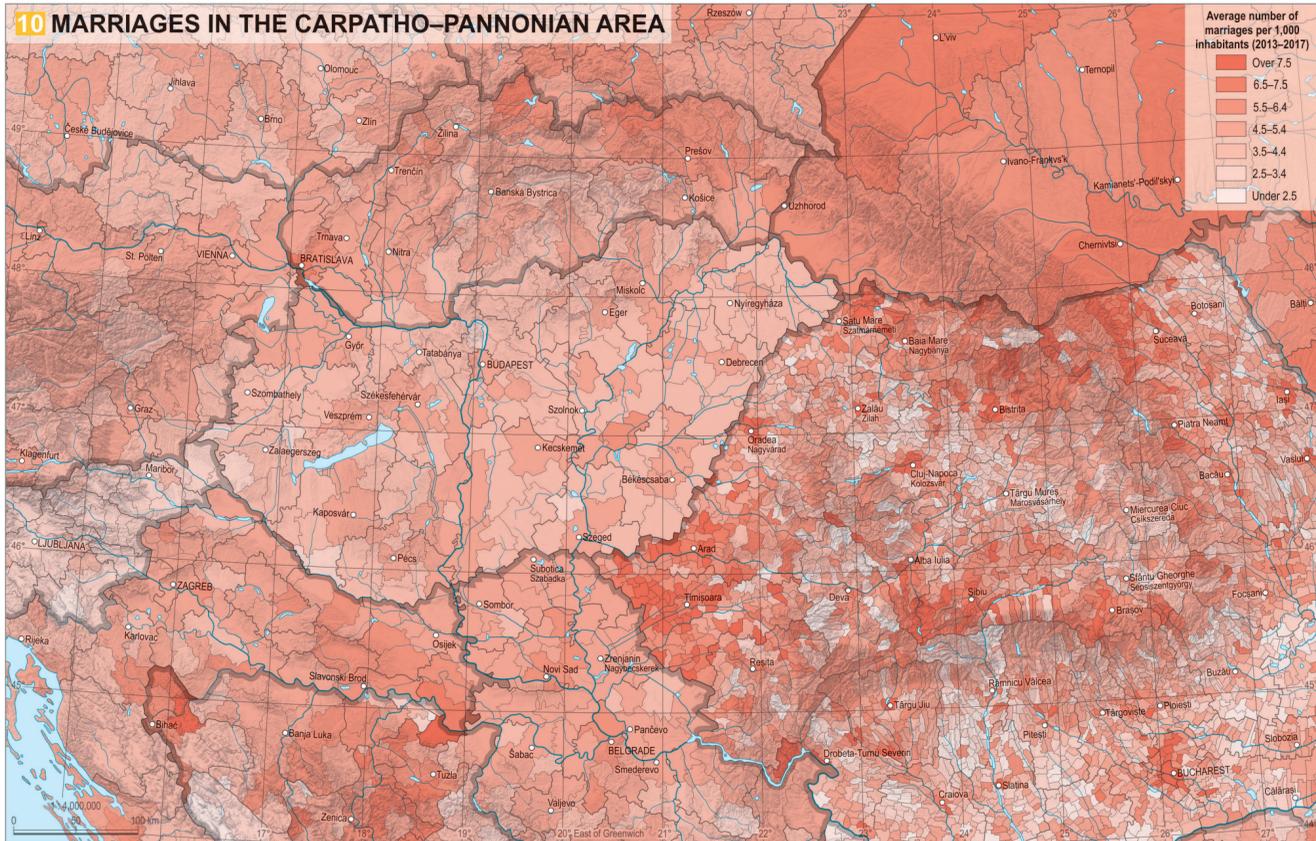


of relationship and the social framework for having children. These are the regions where the youthful age structure of the population already favoured a higher number of marriages due to higher fertility (e.g. in the northern and northeastern parts of the Carpathians from the High Tatras to Bistrița-Năsăud County in Transylvania inhabited by Slovaks, Rusyns and Romanians; in some rural areas in southern Transylvania and Banat with Romanian inhabitants; and the Slavonian areas inhabited by Croats). This marriage rate is also high (over 7.0) in Transylvania (in the wider sense), which is inhabited by a particularly religious population, and in the major cities with the highest levels of economic development. In the target areas for internal migration, which lack an advantageous age structure (e.g. Cluj-Napoca/Kolozsvár, Oradea/Nagyvárad, Timişoara, Arad, Sibiu and Braşov), this marriage rate is also high **10.**

The *total first marriage rate for women* also shows significant regional differences within Hungary (ranging between 0.5 and 0.8), but there are no regions with uniformly high or low marriage rates **11.** It is not possible to clearly recognise economic, religious or ethnic reasons for the regional differences in the marriage indicators for women. In some of the regions with the most religious populations (e.g. Rábaköz, Baranya and the eastern half of Tolna, the surroundings of Kalocsa, central Nógrád, northern Heves, southern Borsod) the marriage rate for women is relatively high, while in other areas with similarly strong ecclesiastical ties (e.g. regions in Vas, Zala, Somogy or in Abauj and Szabolcs) it is below average. In the economically most developed northwestern areas of Hungary, both high and low marriage rates can be found. It is a fact, however, that in Budapest and its agglomeration, the propensity for marriage dropped below the national average everywhere in the last five years (0.65).

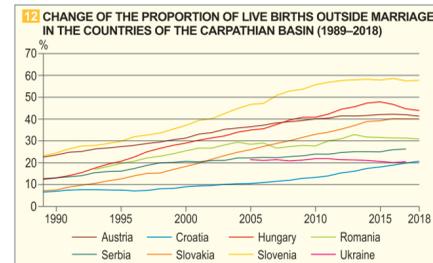
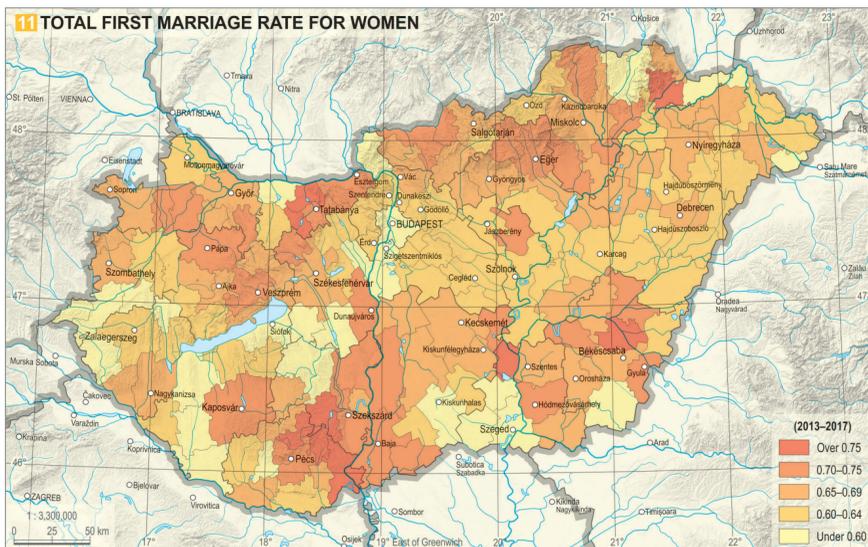
By comparing data from 2010 and 2017, we can discern regional fluctuations in the propensity to marry. Békés County, which had one of the lowest values in 2010, was at the forefront by 2017, but the number of marriages decreased sharply in Western Transdanubia and Budapest, where in 2010 the propensity to marry was average or above average. In areas with high marriage rates in 2017, women were generally more likely to marry at a young age. In north-eastern Hungary, the marriage rates of teenage women were notably high, while in the Alföld (Great Hungarian Plain) this was true of women aged 20–34. In contrast, where there are fewer marriages, the propensity to marry is generally low among women aged under 25 years and high among women aged 30–49 years.

Although economic fluctuations and certain social policy measures have also played a major role in the pattern of marriages, the basic trend has been the spread of registered partnerships and the postponement of marriages to a later age. The latter account for the increase in the rate of births outside marriage as well as regional differences. The shifts in relationship behaviour and the spread of registered partnerships and sin-



gle-person households after the fall of communism, accelerated in relation to the transformation processes mentioned above, although these changes have roots in the communist period. The decline in marriages in recent decades has mainly been a result of the spread of registered partnerships as first relationships. The 'questioning' of the institution of lifelong marriage is strongly linked to divorces, the rapid spread of which began in the 1960s in some Western European and Eastern Bloc countries. After a divorce, those involved tend not to be single, as in many cases the marriage relationship was undermined by the appearance of a new partner. The new relationships forged by divorcees often become registered partnerships, although in this regard there are differences between countries. Thus, divorce not only questions the institution of marriage

but also increases the frequency of registered partnerships. Civil partnerships have become far more common in countless places, including Hungary, not as an alternative to marriage, but as an alternative to 'remarriage'. In the 1980s, however, registered partnerships began to take on the function of a 'trial marriage', subsequently becoming a possible alternative to marriage. The initial differences in *births outside marriage* between countries and the increases in these differences are clearly related to changes in the popularity of marriage as a lifestyle in relationships. The proportion of births outside marriage started to increase in the countries of the Carpathian Basin in the first half of the 1990s. At that time, around 23% of children in Austria and Slovenia were born to unmarried parents, compared with 13% in Hungary and in Serbia (in 1990).



In other countries in the region, this was the case for 7-8% of children in 1990, after which the share started to increase everywhere. In Slovenia, the proportion of births outside marriage increased rapidly to nearly 60% by 2015. In Hungary, 48% of children were born outside marriage in 2015, since which time there has been stagnation and a slight decrease. The phenomenon is less common in Ukraine, Romania and Croatia whose populations are more religious. Indeed, in the latter, only a fifth of newborns fall in this category.

Regarding the rate of births outside marriage (as a percentage of total live births), regional differences in the Carpathian Basin are even more pronounced than in the case of the marriage pattern. Evidently, those areas where the vast majority of newborns have married parents are the same as those with the highest marriage rates (e.g. the Northern and Northeastern Carpathians, the aforementioned urban areas in Transylvania and the Croatian-Slavonian areas). At the same time, the proportion of children born outside marriage is highest where the Roma population (with low and moderate marriage rates) constitutes a particularly high proportion of the total population (e.g. in the southeastern third of Slovakia, the northern and northeastern margins of Hungary, Southern Transdanubia, the Central Tisza Region, the Partium and the Transylvanian Basin, cf. 13 and VI.3.7.).

Indicators on mortality can be divided into three groups. The first group includes the *absolute mortality numbers and distributions*. The second group comprises the *death rates, which can be crude (relating to the total population) or standardised (e.g. crude death rate, age-specific death rate, infant mortality rate, standardised death rate)*. The latter eliminate differences arising from the different age compositions of specific populations. Finally, there are the *derived indicators, including life expectancy or years of life lost, which are important tools for measuring premature deaths. Life expectancy at birth shows how long, on average, a newborn could live, if current death rates would not change. Life expectancy at 65 is also a common indicator, which is the average number of years that a person at the age 65 can be expected to live.*

Life prospects

Life prospects improved in all European countries after World War II. Life expectancy increased at different rates from country to country. The rate of increase was smaller in those countries with higher life expectancy (the northwestern European countries and some of the Mediterranean countries) and more significant in countries with initially lower life expectancy (including the former communist countries). The improvement was due to a reduction in infant mortality. Ultimately, the trend led to a levelling of mortality differences within Europe. The overall improvement in mortality occurred independently of changes in the socio-political structure and level of development of the various countries. In the mid-1960s, however, the trend of levelling was disrupted. In the Eastern Bloc countries, the improvement in

mortality was interrupted. Indeed, in some countries the level of mortality started to rise. Surprisingly, the deterioration in mortality took place in peacetime, during the period of 'socialist prosperity'. The crisis particularly affected middle-aged, less educated male workers. The deteriorating health of people in the eastern half of Europe was reflected in differences between the mortality trends observed in the communist countries and those seen in the developed Western and Mediterranean countries. The increase in mortality caused by diseases of the circulatory system was the main explanation for the deterioration in the region. In addition to human-made diseases (e.g. smoking), 'social pathologies' (suicide, alcoholism) and environmental factors also contributed to the division of Europe in terms of mortality. The relative deterioration in the Eastern Bloc countries was caused by an accumulation of disadvantages. Unhealthy behaviours became widely accepted and were a part of everyday life. The conditions for maintaining health were limited and a lack of economic resources hindered the introduction of modern (and costly) treatment methods. The centralised social system failed to encourage individuals to take responsibility for their own health and by altering behaviours and lifestyles. The social environment and unhealthy working conditions also contributed to early deaths in the population. The mortality crisis in Hungary peaked in 1993. The further east we look, the more severe this crisis grew, and the longer it took to overcome it.

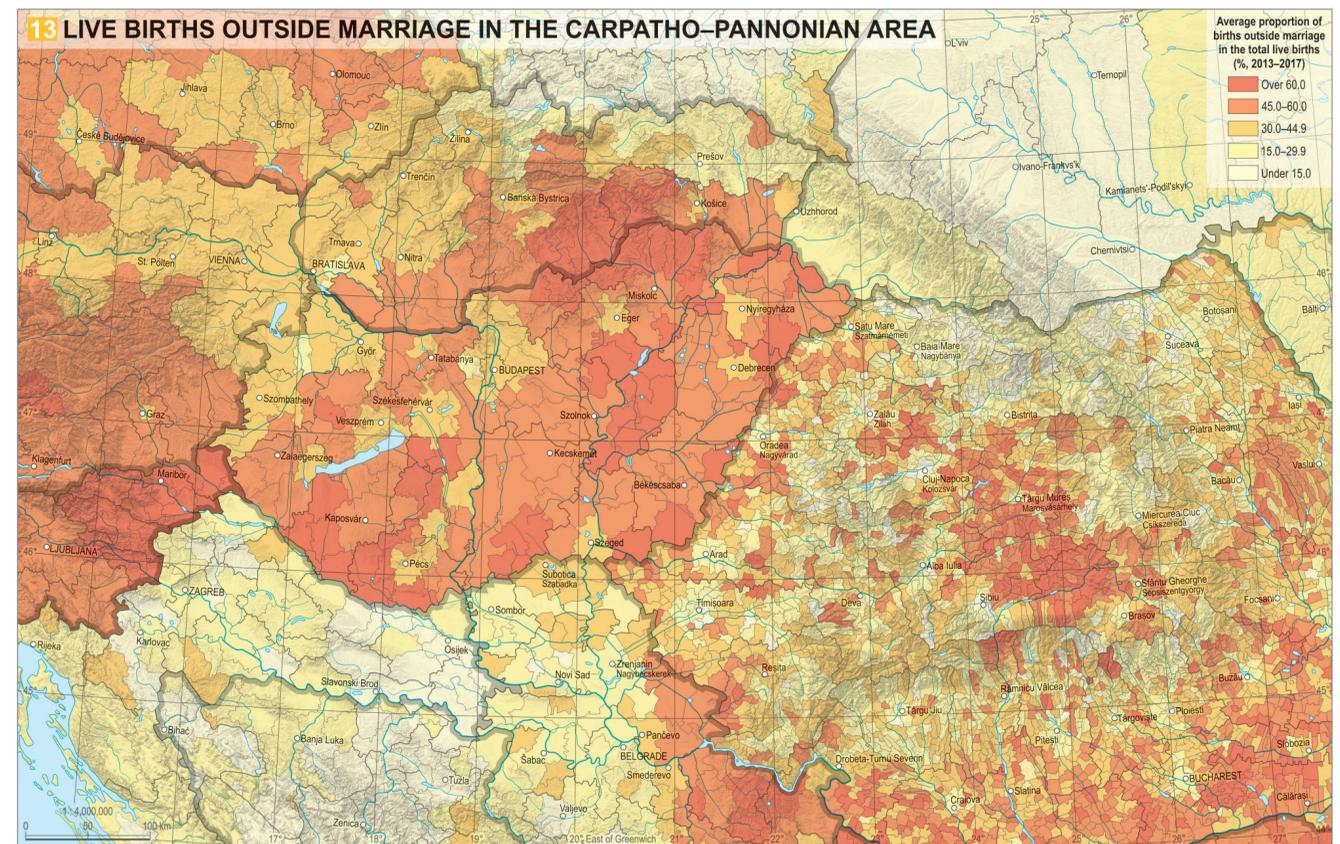
The number of deaths per thousand inhabitants (i.e. the *crude mortality rate*) expresses mortality's effect on the natural increase or decrease of population. Caution should be exercised when interpreting this indicator, as it is calculated for the population as a whole. This means that in populations with a significant proportion of older age groups with high mortality, the crude mortality rate will naturally be higher. In contrast,

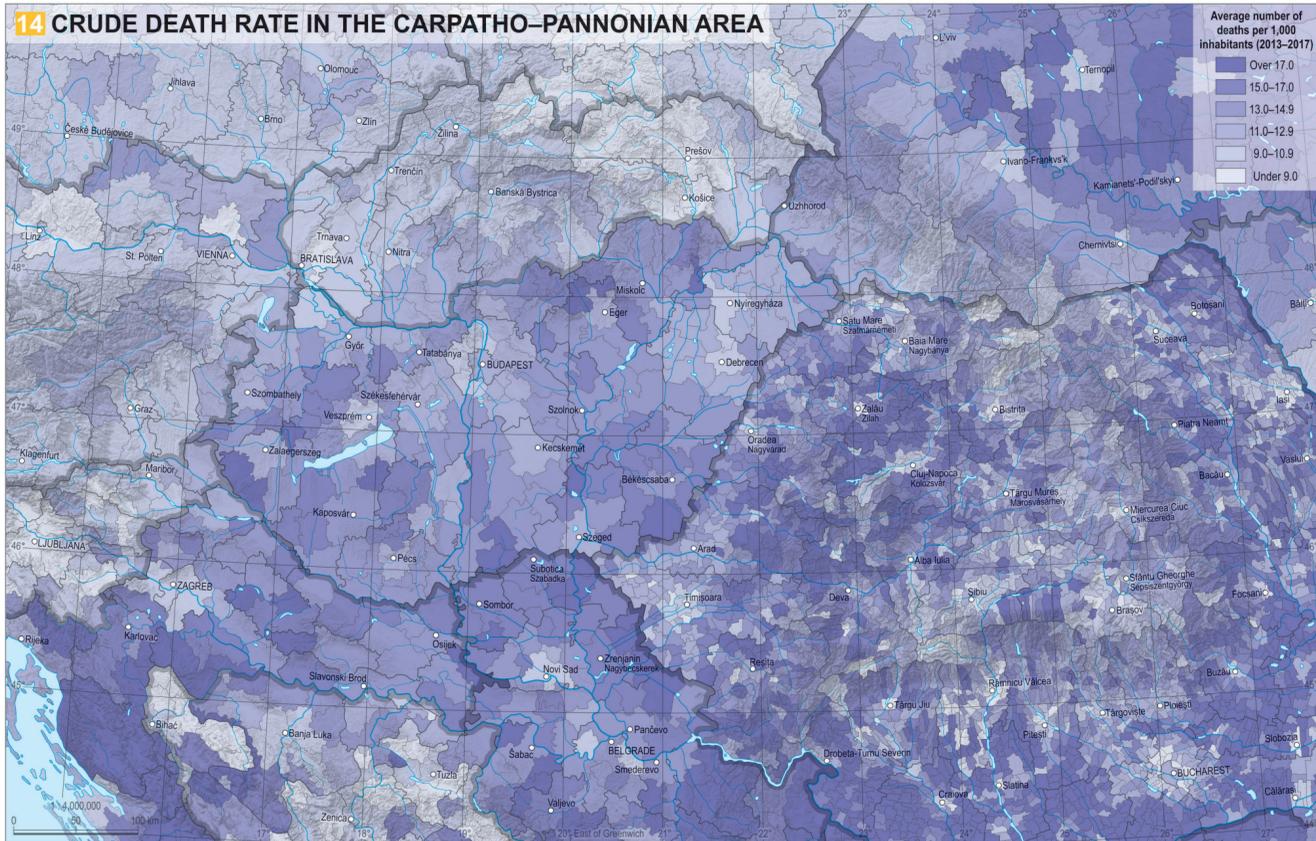


2 Almost 130 thousand people died each year in Hungary over the last twenty years

it will be lower among those populations with higher fertility levels (with a younger age structure). Regional differences in mortality may reflect the impact of several factors, including the standard of living, the health behaviour of the population (smoking, alcohol consumption habits), the magnitude of income-financial inequalities, the quality and accessibility of health care, psychosocial stress (unemployment) and environmental risk factors. Large-scale differences are primarily determined by differences in financial well-being and economic development.

Based on the crude mortality rate, the Carpathian Basin can be divided into two parts. The number of deaths per one thousand people is below average in the more developed western areas with higher standards of living and in the northern and northeastern areas with more productive populations and a more favourable age composition. The same applies to Budapest and its agglomeration, the Hajdú and Szabolcs regions, the dynamically developing Novi Sad region in Serbia, and the major cities in Transylvania. A high mortality rate is fundamentally typical for regions with aged populations that have also been affected by emigration and net negative internal migration (the





areas most affected by war migration between 1991 and 1995, the Dinarides and Slavonia, the rural areas of Vojvodina, the Apuseni Mountains, the mountains of Banat and the villages of the Transylvanian Plain).

In mortality studies, *infant mortality* (i.e. deaths under one year of age) is always of particular importance. Indeed, the infant mortality rate is an important indicator of the overall development of each country, of the health and social care system, of prenatal and neonatal care. Infant mortality has a significant impact on life expectancy at birth.

In Hungary only 0.22% of all deaths were accounted for by infant mortality in 2020 (compared with 30.8% in 1910). The infant mortality rate relative to 1,000 inhabitants has reached historic lows in recent years (3.4%, 2), mainly due to the hospitalisation of newborns requiring treatment (including premature babies), advances in medical equipment and the preparedness of specialists.

Infant mortality is closely related to the socio-economic conditions and health behaviour of the mother. There is a close relationship between a mother's level of education and the infant mortality of her children. As the level of education rises, the neonatal mortality rate decreases. For this reason, too, the social composition of the population and the level of economic development largely explain regional differences in infant mortality. The infant mortality map of the Carpathian Basin 15 exhibits east-west oriented spatial divisions. In Hungary, areas with higher infant mortality – associated with the low social status of the local population – occur mostly in the northeastern and southwestern areas of the country and in Kiskunság. In Slovakia, however, a high rate of infant mortality is seen in the eastern areas, where Roma account for a high proportion of the population.

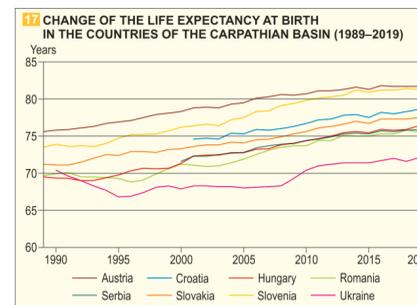
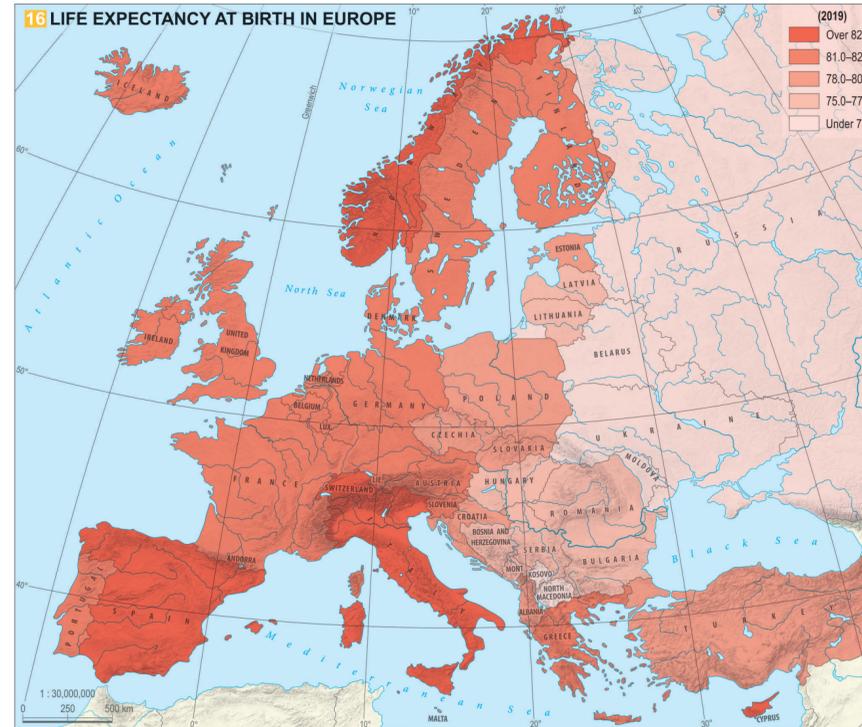
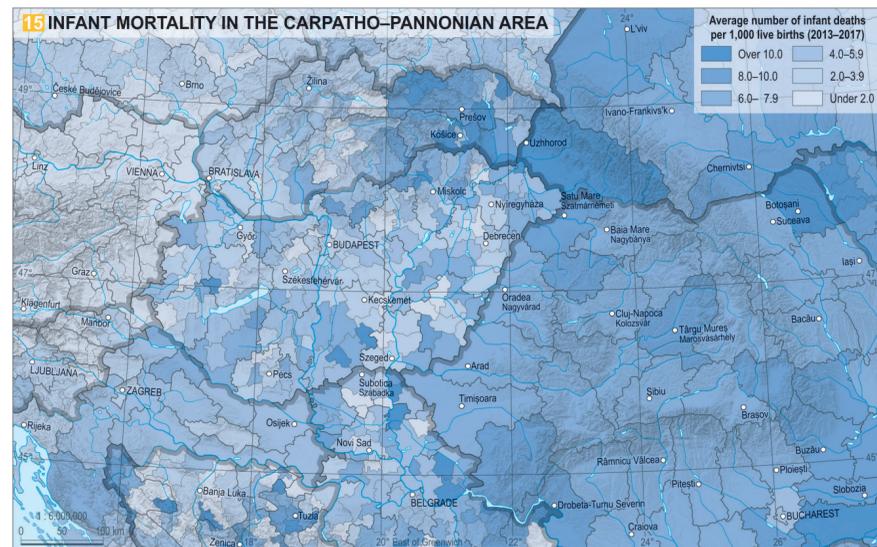
Mortality differences are most accurately manifested by *life expectancy*. Commonly used in demographic

analyses, this indicator condenses the mortality conditions of a particular year into a single number, expressing the average amount of years that people of a certain age can still hope to live.

According to the data for 2019, the highest *life expectancy at birth* can be expected by inhabitants of the most developed European countries in the northwest and in the Mediterranean region (81–84 years, 16). Meanwhile, life expectancy in Central and Eastern Europe remains less favourable. The differences are mostly due to the health-related causes of death (smoking, excessive alcohol consumption, violent deaths), as well as deaths from diseases of the circulatory system and from cancer.

In recent decades, mortality decreased in all countries in the Carpathian Basin, with life expectancy

reaching unprecedented levels 17. The timing of the improvement, which occurred several years after the collapse of communism, varied from country to country. In the early 1990s, the mortality crisis peaked in the majority of central and eastern European countries, with a decrease or stagnation in average life expectancy at birth. Only from the mid-1990s was an improvement registered in Hungary, with life expectancy at birth rising from 69.3 years to 75.5 years in the space of almost a quarter of a century 2. The trends of the countries in the region vary greatly. In Ukraine, as in the other Soviet successor states, the mortality rate reflected an extremely profound socio-economic shock: between 1990 and 1995, life expectancy at birth decreased by 3 years, and after a moderate increase, it remained stagnant until 2007. Only in the last ten



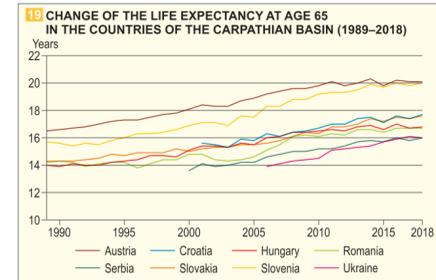
years has there been an improvement in mortality in that country. The timelines show similar trends in two other groups of countries. Austria and Slovenia (the latter is rapidly catching up with the former) are among the frontliners, with life expectancy for the population as a whole being 81.7 and 81.2 years, respectively. The third and more populous group includes slightly diverging countries (e.g. Romania, Serbia, Hungary, Slovakia), where life expectancy currently ranges from 76 to 78 years.

The major cities of the Carpathian Basin and its western and northwestern areas are characterised by relatively low mortality and high life expectancy. Towards the east, deteriorating mortality conditions, increasing life expectancy differences, and accentuated regional inequalities can be seen. The fundamental reason for this is that in countries with high standards of living and correspondingly high life expectancy, people's life prospects are closer to the biological limits of life expectancy. Above a certain income level, incremental increases in lifespan tend to be more modest, resulting in the regional convergence of such values. Spatial differences in life expectancy at birth are determined within each country by the composition of the local society (mainly by the education of the people living there and the labour market and income conditions). Accordingly, in addition to the major cities of Hungary, Transylvania, Slovakia and the Vojvodina region, people living in the agglomeration of Budapest, the Balaton region, the most developed north-

western third of Slovakia and certain areas of western Croatia can expect the longest lifespans 18.

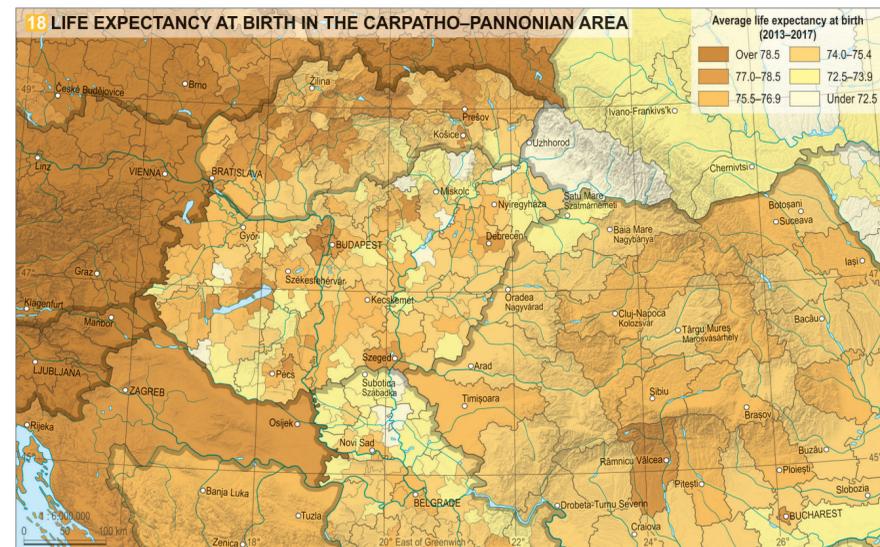
As far as Hungary is concerned, the lowest life expectancy occurs in areas where the level of education is low, the ratio of poor people is high, and the employment conditions of the population are unfavourable (e.g. along the northeastern and southwestern border and in the Central Tisza Region). In these areas, social disadvantages are cumulative, and catching up requires the application of special programmes.

The evolution of *life prospects in old age* (manifested by life expectancy at the age of 65) is increasingly important for the pension system and the institutional system of health and social care for the elderly. Life prospects among the elderly population are similar in several respects to life expectancy at birth, which characterises general mortality. Yet, the differences between countries are smaller. In the post-communist countries, the trend generally started with stagnation and a minor halt in the early 1990s. Then – except for Romania – life expectancy in old age steadily improved



everywhere 19. For the period as a whole, life expectancy at the age of 65 was highest in Austria (20.1 years in 2017), and the Slovenians are now only slightly behind (20.0 years). In terms of life expectancy at 65, Slovakia and Croatia (17.4 years) are followed by Hungary and Romania (both 16.4 years). In Hungary, therefore, the improvement has been somewhat ambiguous, as the gains in life expectancy have been greater in all other Visegrád countries. The Hungarian values are lowered primarily by a more modest improvement in the life expectancy of elderly men. The spatial pattern of life expectancy at the age of 65 in Hungary closely resembles that of life expectancy at birth (cf. 18 and 20). At this age, people living in Budapest and along the northern shore of Lake Balaton have a life expectancy of at least 18 years, reflecting the significant proportion of high-status Hungarian and foreign elderly people. In some of the elite Buda districts (I, II and XII), life expectancy at 65 is 20 years (i.e. today's Austrian level).

The collapse of communism occurred three decades ago. The subsequent period is long enough to ascertain spatial changes in lifespans and to evaluate how evenly or unevenly the improvements in expectancy have been and which areas were able to benefit from the improvement in mortality that has characterised society as a whole. In the period between 1985 and 1989, the maximum life expectancy at birth was 71.5 years at district level. Over the past three decades, this indicator improved in all districts, but the rate of improvement was not even 21. Spatial mortality inequalities among districts decreased moderately. There has been a modest improvement in the regions of Borsod, Gömör, Abauj and the Central Tisza Region, where life prospects have improved by only 3-4 years. Similarly, this indicator has increased only modestly in the western Hungarian border area with traditionally high life expectancy and in most districts



in the Alföld. In contrast, there has been an improvement of more than 8 years along the northern shore of Lake Balaton and in some parts of the Budapest agglomeration. Overall, it can be concluded that the extent of the improvement in lifespan was influenced by the initial level of mortality, the success of the market economy transition, the prosperity of the given region, and the evolution of the standard of living after the collapse of communism.

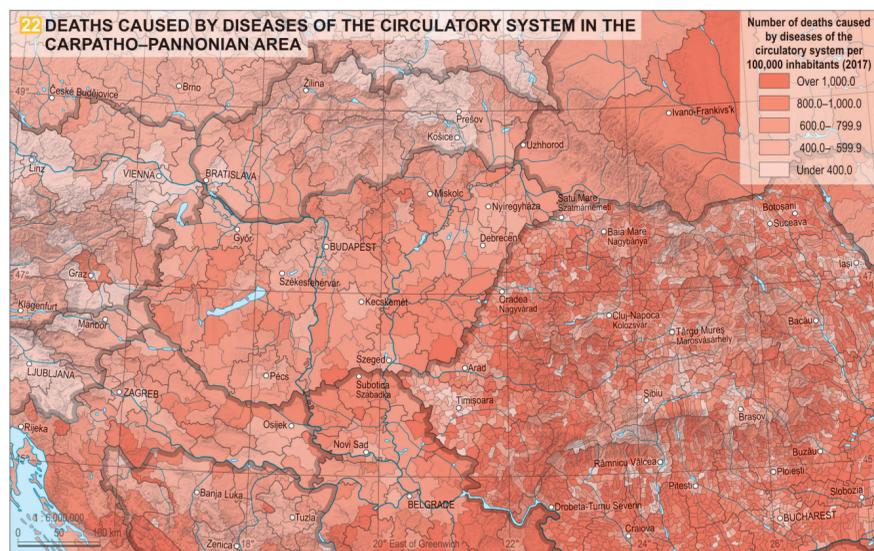
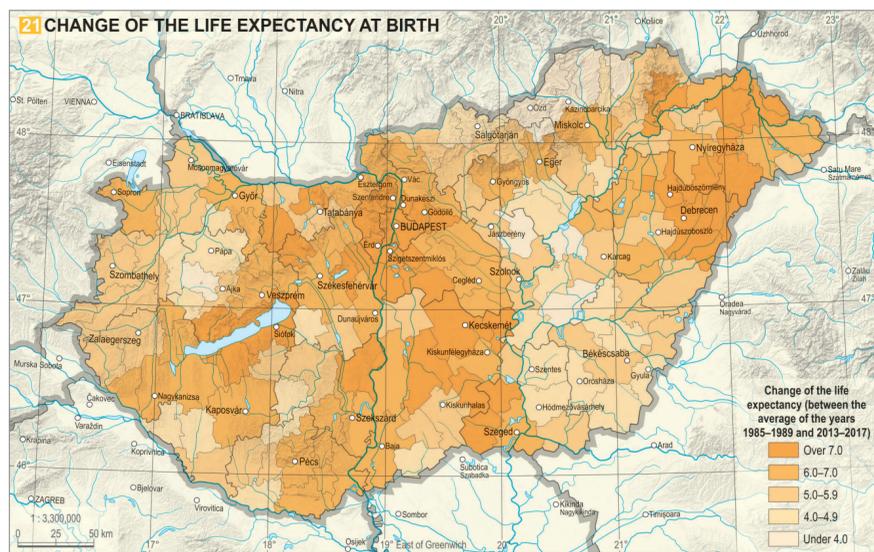
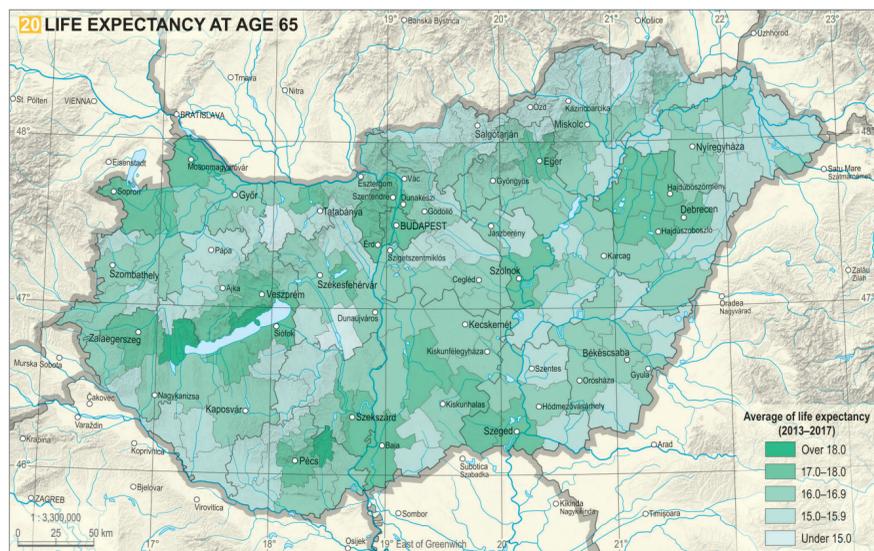
Causes of death

In recent decades, the cause-of-death structure in the European countries with their developed health systems has remained largely unchanged. Half of deaths are caused by cardiovascular diseases, a quarter by cancer in the West, just like in the East. Even so, in the former communist countries, mortality levels are higher, and deaths occur at younger ages. This justifies a detailed spatial examination of the mortality caused by the two main disease types.

Regional inequalities in mortality caused by the circulatory system have determinants that resemble those of general mortality (standard of living, health behaviour, healthcare, psychosocial stress). Based on an examination of the rate of deaths caused by the circulatory system per 100,000 inhabitants, it can be concluded that this type of mortality is high in much of the Carpathian Basin (especially in peripheral rural areas such as the Dinarides, the Serbian-Romanian border zone of Banat, the Banat Mountains and the Apuseni Mountains) [22]. In contrast, cardiovascular diseases in areas with higher standards of living and good healthcare (mostly in the major cities) are less likely to lead to death.

Regional inequalities in deaths caused by diseases of the circulatory system in Hungary can be illustrated by the so-called standardised mortality ratio (SMR) [23], which expresses differences in mortality in particular areas compared to the national average. If mortality in a region is higher than the national value, its standardised mortality ratio is greater than 100%. It can be observed at district level also that the frequency of cardiac death is significantly lower than the national average in the economically more developed areas, primarily in the central and western areas, in regional centres, county centres and in their immediate vicinity. In contrast, in peripheral regions (e.g. the border region from Ipoly to Maros rivers, the central areas of Tiszántúl, Jászság, Tapióság, the northwestern foreland of the Bakony and Vértes mountains), the value of the indicator exceeds the national average by as much as 20%. Inequalities are clearly indicated by the fact that, while the SMR is the lowest (67%) in District II of Budapest with a population of high social status, it is the highest in Ózd District (157%). These outstanding inequalities can be explained by differences in accessibility to the health system, by changing standards of care, and by social differences.

In countries with an advanced mortality profile (high life expectancy), approximately a quarter of deaths can be attributed to cancer. Particular attention should be given to this cause of death in Hungary, as the country has had the highest standardised rate of cancer deaths in Europe for decades. There are several different causes of, and risk factors for, cancer. The root causes of cancer include certain infections (Hepatitis C, Human papillomavirus), smoking, excessive alcohol consumption, a sedentary lifestyle and overnutrition, but environmental factors (including UV and ionising radiation exposure, asbestos contamination, the



inhalation of chemicals, etc.) also play a significant role in its development.

Mortality caused by cancer is much more homogeneous than that caused by the circulatory diseases [24]. Indeed, high rates of cancer mortality can be observed among the population of the entire Carpathian Basin.

The risk of cancer is, however, much lower in the north-eastern part of Slovakia, the Northeastern Carpathians, southern Transylvania and the Romanian lowland regions of Partium and Banat.

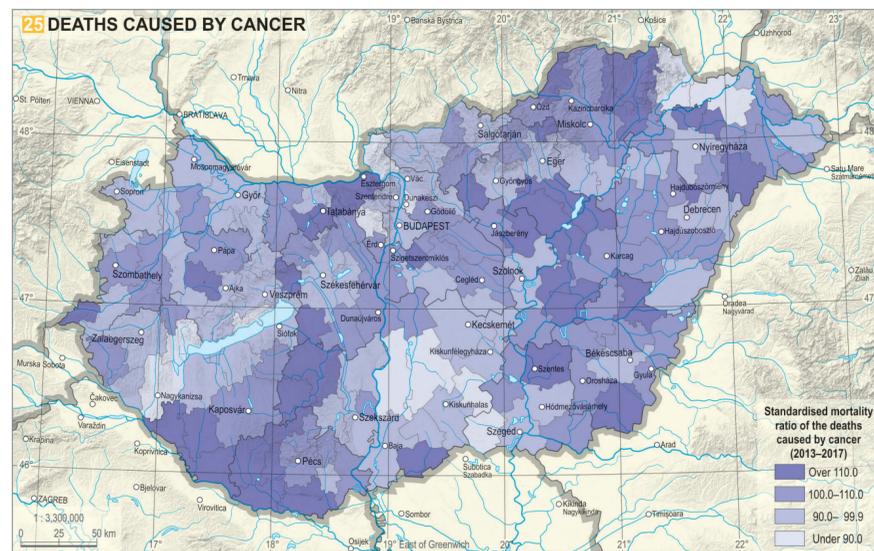
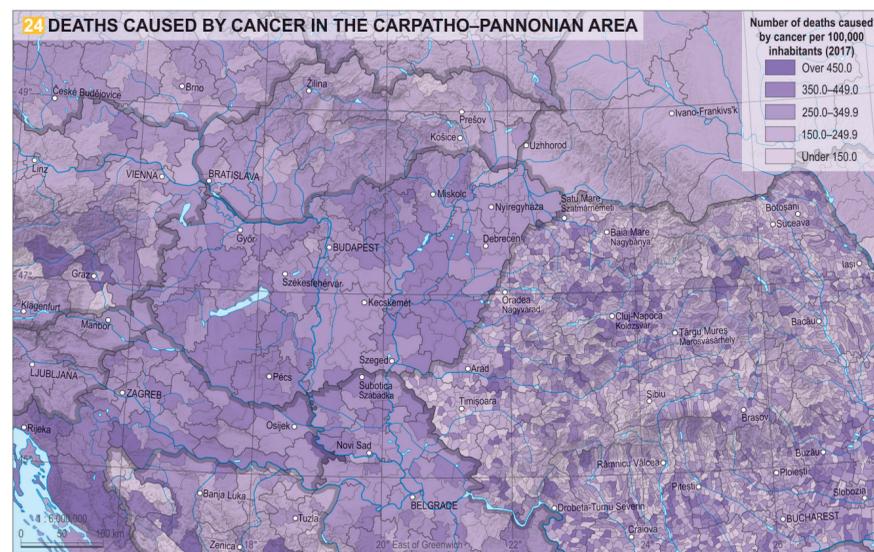
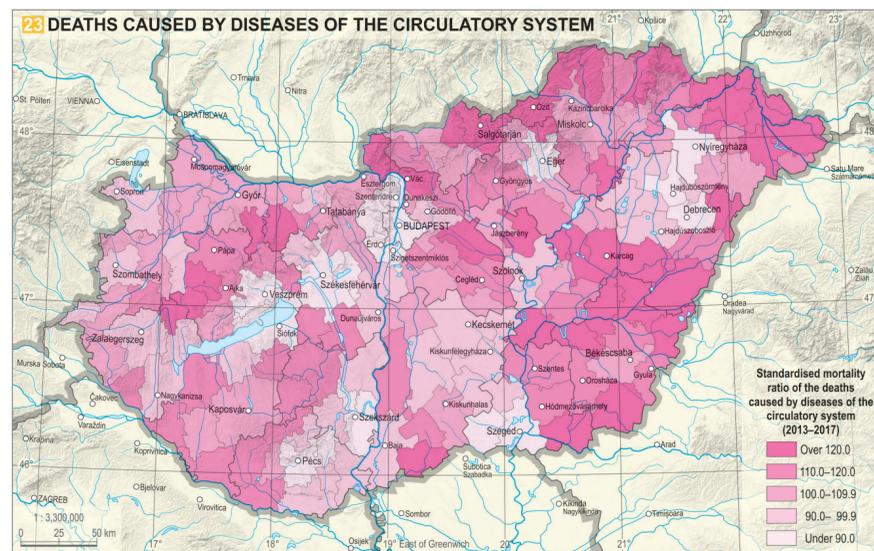
Reflecting the above situation, cancer mortality in Hungary is more homogeneous [25] than mortality

caused by diseases of the circulatory system. This reflects the fact that socio-economic differences play a somewhat less significant role in this respect than in the case of general mortality or mortality caused by diseases of the circulatory system. In recent decades, the standardised ratio was the most favourable in Sárospatak District (71% of the national average) and the highest in Kunhegyes District (129%). Despite the more moderate regional differences, areas that are particularly vulnerable can be clearly identified: for example, regions with a high Roma population ratio with multiple disadvantages in Southern Transdanubia, in the Central Tisza Region, in the regions of Abaúj and Szabolcs in northeastern Hungary, and in the districts of the Transdanubian Range particularly affected by industrialisation and de-industrialisation (e.g. Tatabánya, Oroszlány, Esztergom, Vecser, Várpalota), where the value of the indicator exceeds the national average by more than 10%. Meanwhile, cancer mortality is much lower than average in the county centres and in certain regions (in Széplén, in the Buda Mountains – including certain districts of the capital – and on the northern shore of Lake Balaton). This can be explained by, among other factors, the composition and health behaviour of society, disease prevention, the frequency of screening tests and a higher quality care system.

The suicide rate in Hungary was the highest in the world from the mid-1960s to the late 1980s [2]. In 1980, there were 44.9 suicide deaths per 100,000 inhabitants. This rate decreased to an average of 27.6 between 2001 and 2005 and to 18 between 2015 and 2018 (thus equalling the rate observed in Vojvodina, Serbia). Nevertheless, Hungary's rate was still higher than both Slovakia's traditionally lower suicide rate (10.1) and the rate observed in Transylvania, which has also declined in recent years. A well-known and long-standing feature of the phenomenon of suicide is the strongly regional variation in incidence. Areas multiply hit by suicide in the Carpathian Basin include the region of scattered and isolated farmsteads (*tanyas*) in the Danube-Tisza Midland and the southern and central parts of Tiszántúl in Hungary (cf. [26 and 27]), northern Bačka (mainly around Subotica/Szabadka) in Vojvodina in Serbia, and – in Romania – the Partium region (mainly Satu Mare/Szatmár), and Székely Land (today mainly Harghita County). Despite significant socio-economic and political changes, the spatial pattern has not changed substantially in 100 years [27]. In the early 20th century, the areas most affected by suicide were some areas of the Alföld (with scattered *tanya* settlements) inhabited mostly by Hungarians, Székely Land (then mostly Háromszék), and the major cities. A high suicide rate was recorded in both urban and rural areas, including the Reformed (Calvinist) Tiszántúl and Ormánság regions, the Catholic Kiskun-ság and Bácska regions, the religiously diverse Székely Land, and in parts of Transylvania and the Spiš region inhabited by Lutheran Saxons. Suicide was a rarer occurrence in mountainous areas with fervently religious and less educated Slovak, Rusyn, Romanian, Croatian and Serbian populations. Regional disparities today reflect a specific culture of deviance, permissive attitudes towards self-destructive behaviour, and ideas mediated by the social environment.

Natural increase, decrease

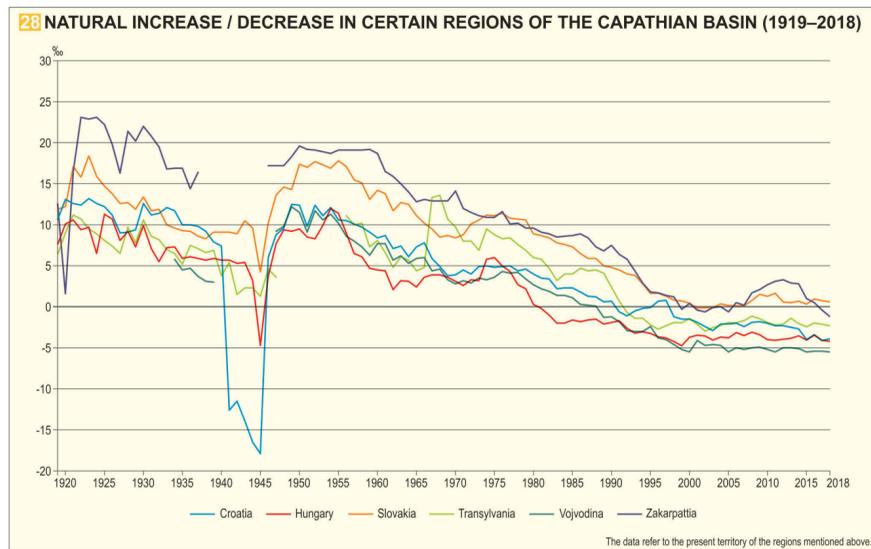
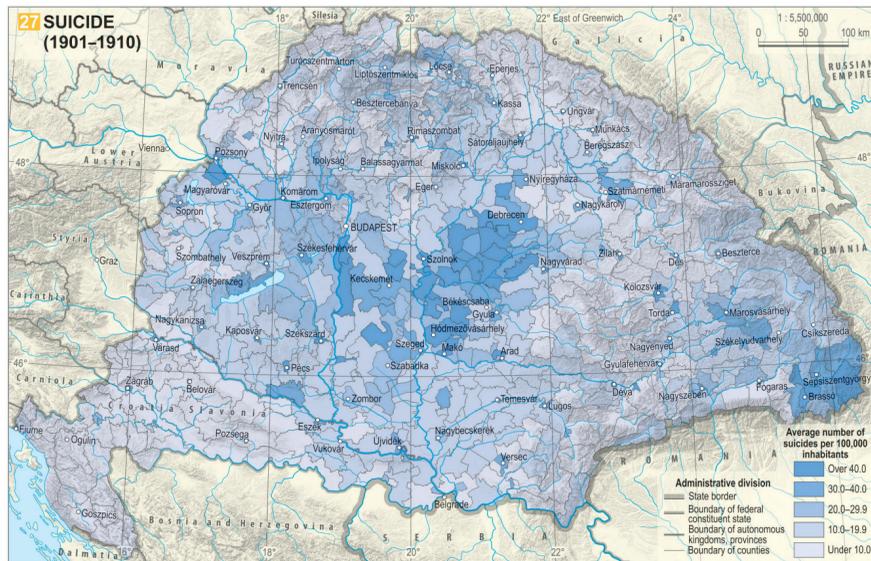
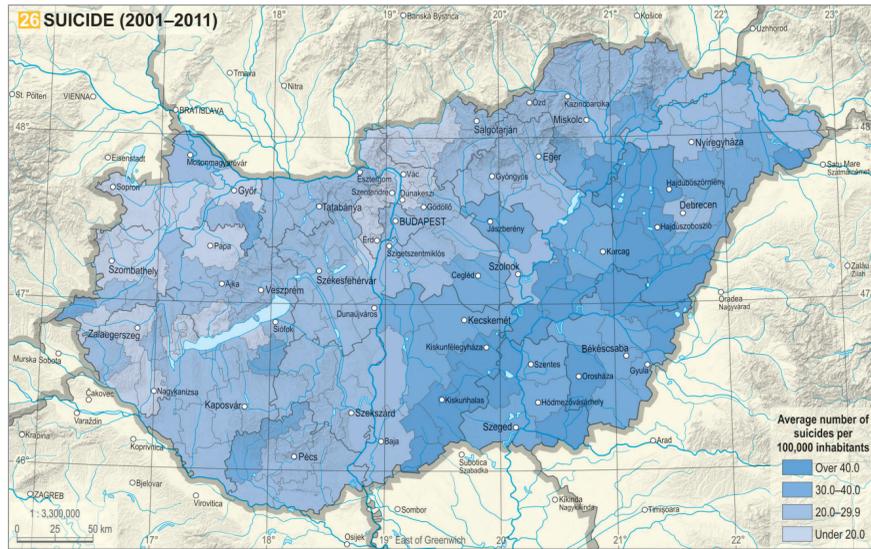
In the period between the two world wars, as live births decreased at a faster rate than deaths, natural increase significantly declined in all regions of the



Carpathian Basin [28]. Following the devastation of World War II, natural increase generally peaked around 10‰ in the 1950s due to a high fertility rate. The outliers in this regard were Slovakia and Zakarpattia, where, for historical reasons, this indicator returned to the 17-20‰ level in the mid-20th century.

From the mid-1950s, in addition to the now slightly decreasing or even stagnant mortality levels, the number of live births began to fall almost uniformly in all areas of the Carpathian Basin, resulting in a general decline in natural increase.

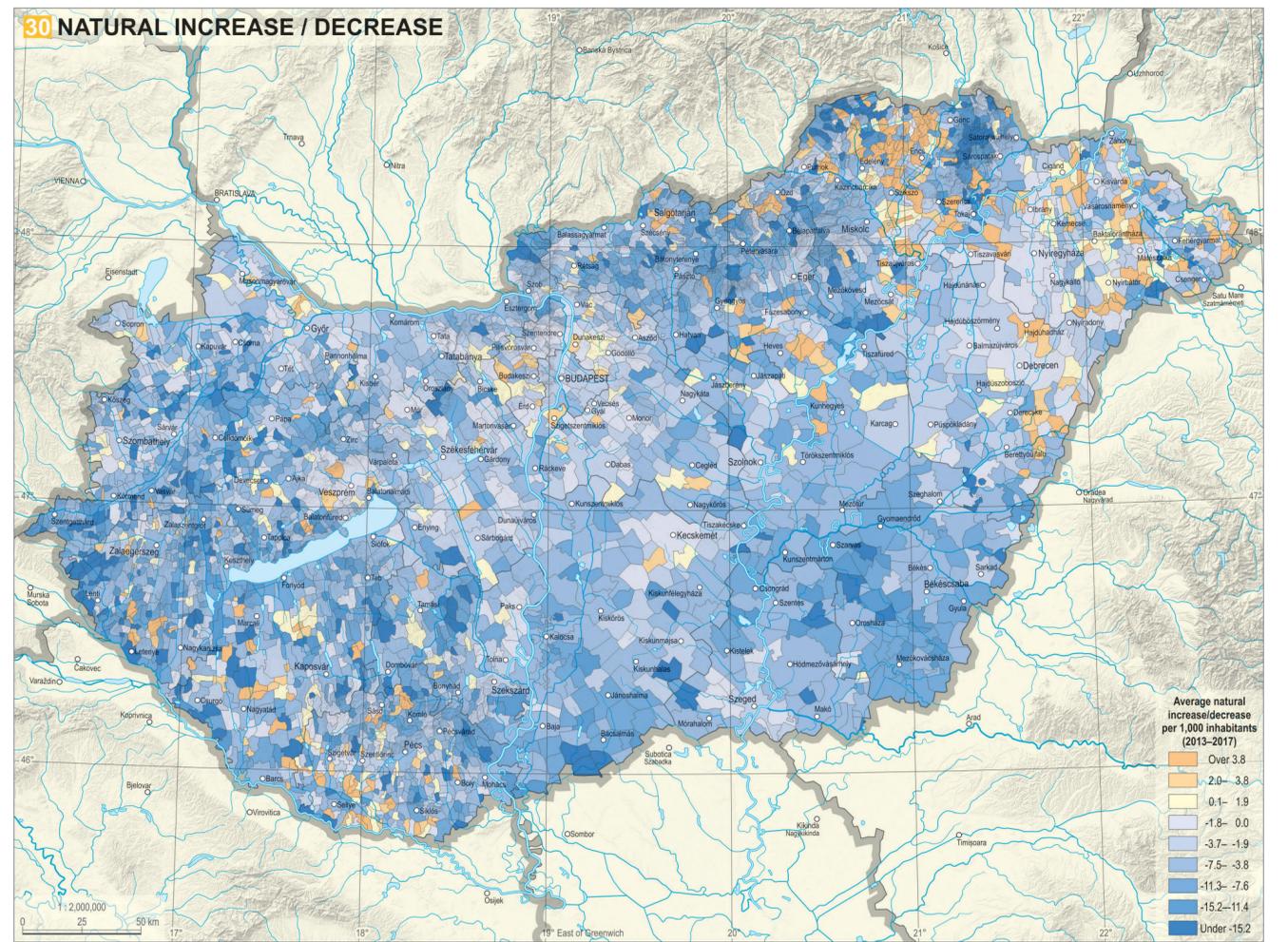
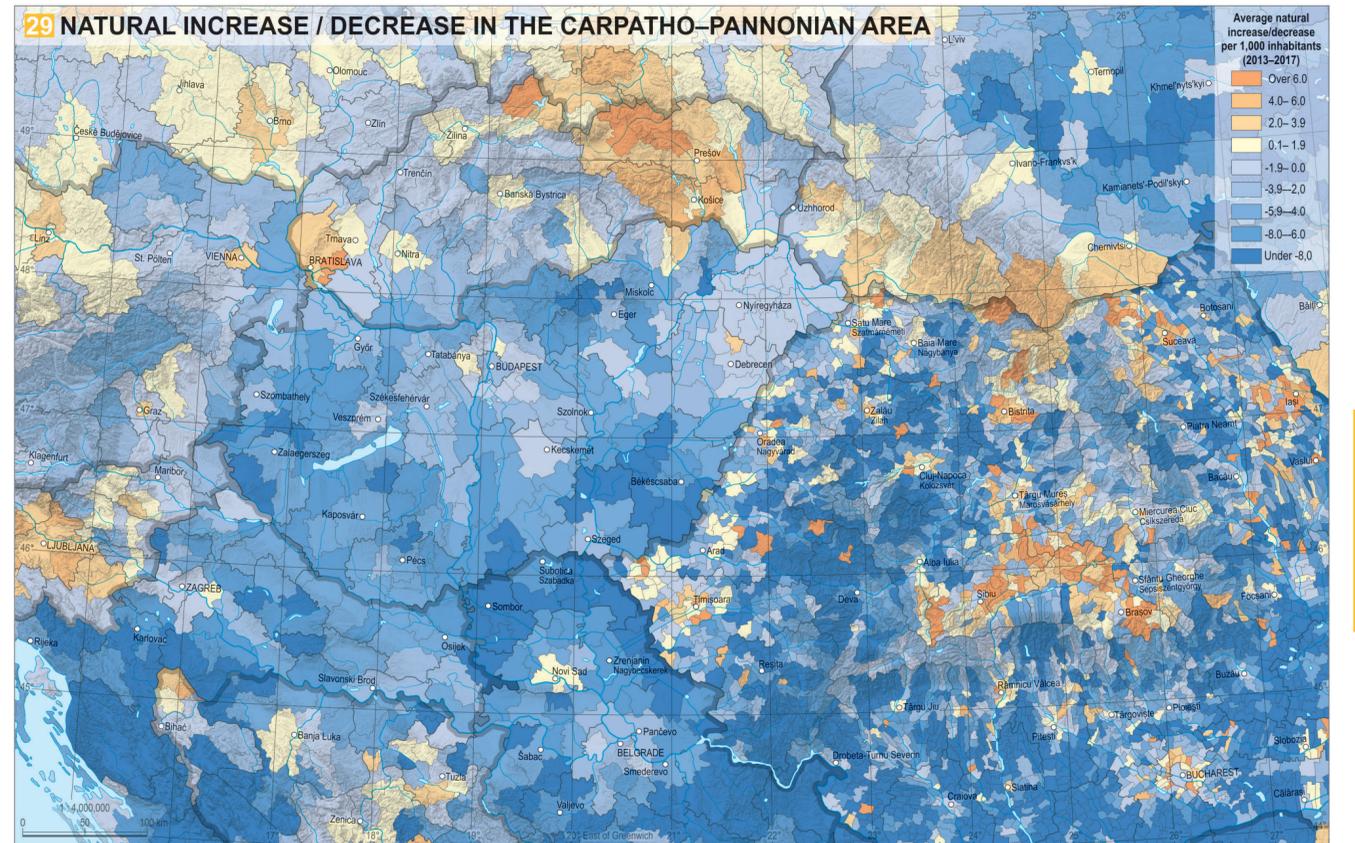
In the communist countries of the region, especially



more fertile populations, the figures hovered between natural increase and decrease in the years after the turn of the millennium, but the population of the latter area has been in permanent natural decrease since 2017 due to emigration, which particularly affects child-bearing age groups. Natural decrease was largely stabilised in some regions over the past decade through measures to support fertility (e.g. -5‰ in Vojvodina, -4‰ in Hungary, and -2‰ in Transylvania).

Although the vast majority of the population of the Carpathian Basin has been affected by natural decrease over the past three decades, there are still significant areas today where the number of births exceeds the number of deaths ²⁹. These include traditionally high fertility regions (e.g. the Orava, Spiš and Šariš regions in the Northern Carpathians of Slovakia and eastern half of Zakarpattia), the major urban areas with a youthful age composition and higher fertility as a result of internal migration (e.g. Bratislava, Košice, Žilina, Cluj-Napoca/Kolozsvár, Timișoara, Bistrița, and Novi Sad and its surroundings) and rural areas where the Roma population with its higher than average fertility constitutes a significant proportion of the total population (e.g. the southern Gemer/Gömör, Spiš, Šariš and Abaúj/Abov regions, areas in southern Transylvania formerly inhabited by Saxons, the area around Bistrița in northern Transylvania, and some of the eastern periphery regions of the Alföld belonging to Romania).

The spatial pattern of natural increase and decrease on the present-day territory of Hungary between 2013 and 2017 is much more diverse at municipality level than at district level (cf. Figures ²⁹ and ³⁰). According to data for the last five years, more people were born than died in no more than five of the Hungarian districts (Hajdúhadház, Encs, Szikszó and the districts of Dunakeszi and Budakeszi in the vicinity of the capital). Although the number of deaths exceeded the number of live births in 84% of municipalities in a country that has been affected by natural decrease since 1981, there were nevertheless 452 villages where births exceeded deaths. In addition, there were 52 municipalities where the numbers of births and deaths were roughly equal. Almost all settlements with significant natural increase are inhabited predominantly or to a significant extent by Roma people; these are essentially located in the northeastern peripheries (e.g. certain parts of Abaúj, Szabolcs, Szatmár and Bihar), in the Central Tisza Region and in the southwestern parts of Transdanubia (cf. ³⁰ and ^{VI.3.9.}). Against the backdrop of current demographic conditions in Hungary, areas where births and deaths are roughly equal or where natural decrease is small are already considered relatively advantageous; this includes the vast majority of the settlements in the agglomeration of Budapest, certain towns in northern Transdanubia with a demographically favourable population composition according to their economic development (e.g. Veszprém, Székesfehérvár, Tata, Győr and Mosonmagyaróvár) and the two major cities in the northern part of Tiszántúl (Debrecen and Nyíregyháza and their surroundings). Negative examples are areas affected by a particularly high natural decrease, including areas with a fragmented settlement structure dominated by tiny villages in the northern, southwestern and southeastern peripheries of the Alföld, characterised by adverse living conditions, migration and ageing. In the latter multiply disadvantaged areas, many villages register an average natural population change, as the favourable demographics of the high-fertility Roma local population and the unfavourable demographics of the aged non-Roma local population with low fertility almost balance each other.



in the 1960s and 1970s, various attempts were made to reverse demographic decline, sometimes affecting the intimate spheres of family life (e.g. the Ceaușescu regime's draconian abortion ban of 1966, which, in Transylvania, tripled the natural population increase between 1965 and 1967). The beneficial effect of these

measures could only halt or reverse the decline in natural increase for a few years. The dramatic change, when the number of deaths exceeded the number of live births, occurred first in Hungary (in 1981) and then in Vojvodina (1989), Croatia (1991), and Transylvania (1992). In Slovakia and Zakarpattia, with their

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