# POPULATION DEVELOPMENT IN THE CZECH REPUBLIC IN 2015

**Roman Kurkin**[1] **– Michaela Němečková**[1] **– Terezie Štyglerová**[1]

ABSTRACT

The article describes the demographic situation in the Czech Republic in 2015 and sets it in the context of demographic trends in the past decade. The study analyses the development of individual components of population change and the effects they have on population size and the age and marital structure. A basic overview of the recent trends in cause-of-death statistics is also included. The population of the Czech Republic rose as a result of positive international migration in 2015, and total fertility rate and marriage rates increased as well. But life expectancy at birth for men stagnated and even decreased for women. The total intensity of the divorce rate remained at the 2014 level. The analysis of nuptiality was primarily based on the construction of nuptiality tables; the divorce rate was studied primarily by duration of marriage, and cause of death statistics was evaluated by standardised rates.

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

**Demografie,** 2016, **58: 299–319**

Since 2003 the population of the Czech Republic has been increasing (except in 2013). In 2015 it further increased by 15,568 to 10,553,843 (on 31 Dec.). The whole increase last year resulted from a positive balance of international migration (15,977), while the natural change was negative (–409). The decrease caused by natural change was due to a significant increase in the number of deaths (by 5,508), which could be considered the most important feature of population development in 2015. The large number of deaths interrupted the long-standing trend of increasing life expectancy at birth. In 2015 it stagnated for males (at 75.8 years) and decreased for females (by 0.2 to 81.4 years).

The number of live births increased in 2015 for the second year in a row but it remained almost 9,000 lower than in 2008, when the recent 'baby boom' peaked. The share of children born outside marriage has been going up every year since 1988, but in comparison with EU countries, it is still somewhere in the middle (*Eurostat*, 2016), though in some areas (e.g. districts in north-west Bohemia) the share of children born to unmarried women are on a level observed in EU countries with highest rates of extramarital births. The total fertility rate in the Czech Republic remained at a low level for a long period, from 1994 to 2013, and in 2014 and 2015 was above 1.5 children per woman – i.e. 1.53 and 1.57, respectively. In the last decade, fertility rates of women aged 35 and over in particular increased. The mean age of women at childbirth rose by 1.4 years from 2005 to 2015 to 30.0 years, but the increase per year has been diminishing.

Since 2008 there have been fewer abortions year on year thanks to a decrease in the number of induced abortions. Due to this decrease and the rise in the number of spontaneous abortions, the share of the spontaneous out of the total number of abor-

1) Czech Statistical Office.

tions has increased to 40%. The total spontaneous abortion rate increased as a result of the increasing mean age of women at pregnancy.

The number of marriages and the total marriage rates increased in the last two years and the number of weddings in 2013 remained the lowest in history. The drop in nuptiality resulted from the decrease in nuptiality among people of a young age, which was not fully offset by nuptiality among people at an older age. The timing of nuptiality became stable: the highest intensity of first marriage among men is around the age of 30 and among women around the age of 28.

**Table 1 Population and vital statistics and the main analytic indicators of demographic development, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| **Population and vital statistics** | | | | | | | |
| Live births | 102,211 | 117,153 | 108,673 | 108,576 | 106,751 | 109,860 | 110,764 |
| Deaths | 107,938 | 106,844 | 106,848 | 108,189 | 109,160 | 105,665 | 111,173 |
| under 1 year of age | 347 | 313 | 298 | 285 | 265 | 263 | 272 |
| Marriages | 51,829 | 46,746 | 45,137 | 45,206 | 43,499 | 45,575 | 48,191 |
| Divorces | 31,288 | 30,783 | 28,113 | 26,402 | 27,895 | 26,764 | 26,083 |
| Abortions | 40,023 | 39,273 | 38,864 | 37,733 | 37,687 | 36,956 | 35,761 |
| induced abortions | 26,453 | 23,998 | 24,055 | 23,032 | 22,714 | 21,893 | 20,403 |
| Immigrants | 60,294 | 30,515 | 22,590 | 30,298 | 29,579 | 41,625 | 34,922 |
| Emigrants | 24,065 | 14,867 | 5,701 | 20,005 | 30,876 | 19,964 | 18,945 |
| Natural increase | –5,727 | 10,309 | 1,825 | 387 | –2,409 | 4,195 | –409 |
| Net migration | 36,229 | 15,648 | 16,889 | 10,293 | –1,297 | 21,661 | 15,977 |
| Total increase | 30,502 | 25,957 | 18,714 | 10,680 | –3,706 | 25,856 | 15,568 |
| Mid-year population (thousands) | 10,234.1 | 10,517.2 | 10,496.7 | 10,509.3 | 10,510.7 | 10,524.8 | 10,542.9 |
| **Intensity indicators** | | | | | | | |
| Total first marriage rate – males (%) | 62.8 | 54.9 | 53.5 | 53.2 | 51.4 | 53.1 | 55.1 |
| – females (%) | 69.1 | 61.6 | 61.0 | 60.6 | 59.0 | 60.8 | 62.4 |
| Mean age at first marriage – males | 30.8 | 32.2 | 32.2 | 32.3 | 32.3 | 32.3 | 32.4 |
| – females | 28.1 | 29.4 | 29.6 | 29.6 | 29.8 | 29.8 | 29.8 |
| Total divorce rate (%) | 47.3 | 50.0 | 46.2 | 44.5 | 47.8 | 46.7 | 46.5 |
| Mean duration of marriage at divorce | 12.2 | 12.7 | 12.9 | 12.8 | 13.0 | 13.1 | 13.0 |
| Total fertility rate | 1.28 | 1.49 | 1.43 | 1.45 | 1.46 | 1.53 | 1.57 |
| Mean age of mothers at childbirth | 28.6 | 29.6 | 29.7 | 29.8 | 29.9 | 29.9 | 30.0 |
| Mean age of mothers at 1st birth | 26.6 | 27.6 | 27.8 | 27.9 | 28.1 | 28.1 | 28.2 |
| Percentage of live births outside marriage | 31.7 | 40.3 | 41.8 | 43.4 | 45.0 | 46.7 | 47.8 |
| Net reproduction rate | 0.62 | 0.72 | 0.69 | 0.70 | 0.71 | 0.74 | 0.76 |
| Total abortion rate | 0.53 | 0.51 | 0.52 | 0.51 | 0.52 | 0.51 | 0.51 |
| Total induced abortion rate | 0.35 | 0.32 | 0.32 | 0.31 | 0.32 | 0.31 | 0.29 |
| Life expectancy at birth – males | 72.9 | 74.4 | 74.7 | 75.0 | 75.2 | 75.8 | 75.8 |
| – females | 79.1 | 80.6 | 80.7 | 80.9 | 81.1 | 81.7 | 81.4 |
| Infant mortality rate (‰) | 3.4 | 2.7 | 2.7 | 2.6 | 2.5 | 2.4 | 2.5 |

**Note:** First marriage indicators are based on the nuptiality life tables for singles.
**Source:** Czech Statistical Office; authors' calculations.

The divorce rate also stabilised at the level of almost a half of marriages ending in divorce.

The population of the Czech Republic is ageing. Population ageing started back in the 1980s. This process is reflected in the increasing average age of the population, the median age, and the index of ageing. Since 2006 there have been more inhabitants aged 65 and over than those aged 0–14.

## POPULATION BY AGE AND MARITAL STATUS

At the end of 2015 there were 6,997,715 people in the population of the Czech Republic aged 15–64, 1,623,716 children aged 0–14, and 1,932,412 people aged 65 and over. Since 2009 only the categories of children and seniors have grown (Table 2). A decline has occurred in the population aged between 15 and 64. At the end of 2015 people of productive age (15–64) accounted for 66.3% of the population, whereas in 2005 it was 71.1% (this population group was largest in 2006 at 71.2%).

The extremely numerous generations born during or after World War II have been shifting into the age group over 65, and as a result the size of this main age group has experienced the most marked changes. In 2015 the number of seniors increased by 52,006 (by 3%) and for the first time they accounted for more than18% of the population (18.3% on 31 Dec. 2015). The biggest population increase occurred in the 65–69 age group (based on absolute figures) and the 75–79 age group (based on relative figures).

The number of children aged 0–14 years has continued to rise (since 2008) and gained another 22,671 people in 2015. The share of children in the population had increased to 15.4% by the end of 2015, a figure 0.8 percentage points higher than ten years ago.

**Table 2 Age distribution of population, 2005–2015 (31 Dec.)**

| Age group/Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| **Population (thousands)** | | | | | | | |
| Total | 10,251.1 | 10,532.8 | 10,505.4 | 10,516.1 | 10,512.4 | 10,538.3 | 10,553.8 |
| 0–14 | 1,501.3 | 1,518.1 | 1,541.2 | 1,560.3 | 1,577.5 | 1,601.0 | 1,623.7 |
| 15–64 | 7,293.4 | 7,378.8 | 7,262.8 | 7,188.2 | 7,109.4 | 7,056.8 | 6,997.7 |
| 65+ | 1,456.4 | 1,635.8 | 1,701.4 | 1,767.6 | 1,825.5 | 1,880.4 | 1,932.4 |
| in: 65–69 | 431.4 | 552.1 | 595.1 | 635.9 | 657.3 | 671.1 | 693.0 |
| 70–74 | 380.3 | 383.8 | 402.7 | 423.6 | 452.8 | 482.0 | 495.2 |
| 75–79 | 323.2 | 313.4 | 307.2 | 302.0 | 303.5 | 308.6 | 323.7 |
| 80–84 | 219.8 | 232.0 | 234.8 | 238.0 | 237.2 | 236.6 | 232.0 |
| 85+ | 101.7 | 154.5 | 161.6 | 168.1 | 174.9 | 182.1 | 188.5 |
| **Percentage of the total population** | | | | | | | |
| 0–14 | 14.6 | 14.4 | 14.7 | 14.8 | 15.0 | 15.2 | 15.4 |
| 15–64 | 71.1 | 70.1 | 69.1 | 68.4 | 67.6 | 67.0 | 66.3 |
| 65+ | 14.2 | 15.5 | 16.2 | 16.8 | 17.4 | 17.8 | 18.3 |
| **Characteristics of age distribution** | | | | | | | |
| Average age | 40.0 | 40.8 | 41.1 | 41.3 | 41.5 | 41.7 | 41.9 |
| Median age | 38.9 | 39.6 | 40.1 | 40.4 | 40.8 | 41.1 | 41.5 |
| Index of ageing[1)] | 97.0 | 107.8 | 110.4 | 113.3 | 115.7 | 117.4 | 119.0 |
| Total age dependency ratio[2)] | 54.4 | 55.0 | 56.3 | 57.5 | 58.6 | 59.8 | 61.4 |

**Note:** 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.
**Source:** Czech Statistical Office; authors' calculations.

All analytic indicators of the age structure show evidence of the ongoing population ageing (Table 2). The average age of the population of the Czech Republic increased by 0.2 to 41.9 years (in total) in 2015. The median age, which divides the population into equally numerous halves, shifted by 0.4 to 41.5 years. The index of ageing (the number of people aged 65+ per 100 children aged 0–14) grew from 117.4 to 119.0 between 2014 and 2015. The total age dependency ratio (defined here as the number of people aged 0–19 and 65+ per 100 people aged 20–64) rose above the level of 60 again (for the first time after 1998).

In 2015 there was also a change in the population structure by marital status, which has already been changing for several decades with the increasing share of single and divorced people and the decreasing share of married and widowed people. At the end of 2015, 47.4% of the population aged 15 and over were married, 31.0% were single, 13.2% were divorced, and 8.4% were widowed (Table 3). During the last decade the biggest change occurred in the share of married persons, which dropped by almost 6 percentage points for men and by almost 5 percentage points for women. The population distribution by marital status is in its basic structure similar for both men and women (the majority of them are married), but there are differences in the shares of various marital statuses by sex. While the shares of married or divorced people do not differ significantly, the share of single men is 10 percentage points higher (36.3% in 2015) than the share of single women (25.9%), and the reverse is true for widowed people (13.5% of women compared to 2.9% of men).

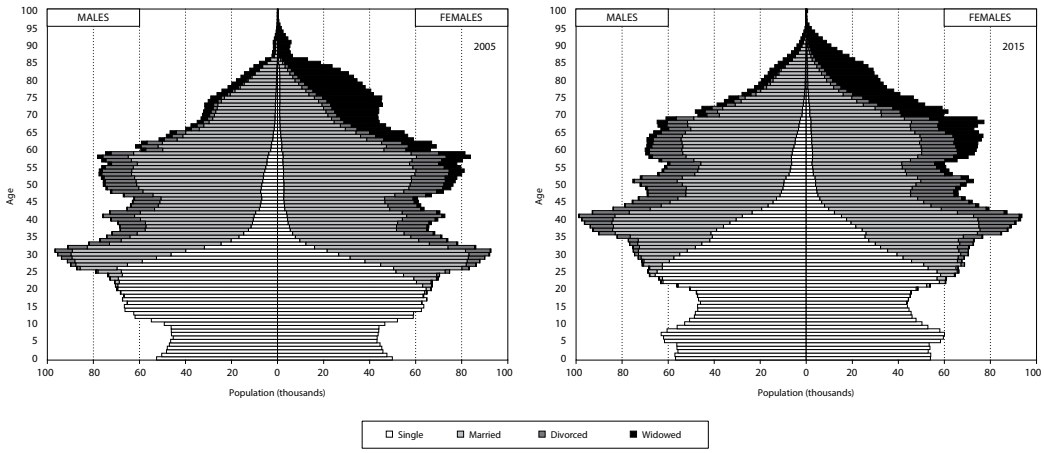
The population structure by marital status significantly differs by age and it gradually changes from year to year in every age group (Figure 1). Between 2005 and 2015 the most pronounced change was among people in their thirties. There are progressively more de iure single people and between 2005 and 2015 the age at which married people outnumber single persons shifted from 29 to 34 years. Breaking the population down into five-year age groups, there were more single than married men in the 30–34 age group in 2015 (unlike 2005). In the female population, the share of single and married women aged 30–34 was similar in 2015, while ten years ago the married population was three times larger than the population of single women. In older age groups the majority of the population was married but, due to lower nuptiality (and the high divorce rate), the highest proportion of married people is at present lower than in the past, and the age group in which the largest

**Table 3 Population 15+ years by marital status and sex, 2005–2015 (31 Dec.)**

| Marital status | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| | | | | Total population (thousands) | | | |
| Single | 2,429.1 | 2,696.4 | 2,685.0 | 2,706.5 | 2,725.3 | 2,748.5 | 2,765.9 |
| Married | 4,611.7 | 4,501.9 | 4,410.0 | 4,366.2 | 4,309.1 | 4,271.8 | 4,236.1 |
| Divorced | 949.5 | 1,070.2 | 1,106.6 | 1,123.8 | 1,144.8 | 1,164.6 | 1,180.6 |
| Widowed | 759.5 | 746.1 | 762.6 | 759.3 | 755.7 | 752.3 | 747.5 |
| | | | | Percentage in the male population | | | |
| Single | 32.8 | 35.0 | 35.2 | 35.5 | 35.8 | 36.0 | 36.3 |
| Married | 54.5 | 51.5 | 50.7 | 50.2 | 49.7 | 49.2 | 48.8 |
| Divorced | 9.9 | 10.8 | 11.2 | 11.4 | 11.6 | 11.8 | 12.0 |
| Widowed | 2.8 | 2.7 | 2.9 | 2.9 | 2.9 | 3.0 | 2.9 |
| | | | | Percentage in the female population | | | |
| Single | 23.0 | 25.1 | 25.0 | 25.2 | 25.5 | 25.7 | 26.0 |
| Married | 51.0 | 48.5 | 47.8 | 47.4 | 46.9 | 46.5 | 46.1 |
| Divorced | 11.8 | 12.9 | 13.4 | 13.7 | 13.9 | 14.2 | 14.4 |
| Widowed | 14.2 | 13.5 | 13.8 | 13.7 | 13.7 | 13.6 | 13.5 |

**Source:** Czech Statistical Office; authors' calculations.

**Figure 1 Population by age, sex and marital status, 2005 and 2015 (31 Dec.)**




**Source:** Czech Statistical Office.

share of the population were found to be married is older. In 2005 the largest share of married men (81.5%) was in the 65–69 age group, whereas in 2015 it was in the 70–74 age group at 76.4%. Among females the peak shifted even more: from 72.1% in the 45–49 age group to 64.8% in the 55–59 age group. The amount by which married people outnumber other marital statuses in middle age decreased slightly owing to an increased number of divorced people, and also decreased among the oldest age groups owing to an increased number of widowed people. Although the share of widowed people in the oldest age groups decreased thanks to the mortality decline, the most women were widowed in the 75–79 and 80+ age groups.

## NUPTIALITY

The trend of a decreasing number of marriages stopped in 2013, when the historically lowest figure (43,499) was recorded. In the following two years the number of marriages went up – by 2,076 in 2014 and by another 2,616 in 2015 to reach a total of 48,191. This was the highest figure in the last seven-year period.

**Table 4 Marriages by order, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Total marriages | 51,829 | 46,746 | 45,137 | 45,206 | 43,499 | 45,575 | 48,191 |
| Marriages of two singles | 33,446 | 30,095 | 29,045 | 29,684 | 28,877 | 30,785 | 32,689 |
| Remarriages (for both) | 8,323 | 7,693 | 7,368 | 6,899 | 6,604 | 6,514 | 6,975 |
| Male order of marriage – first | 38,347 | 34,414 | 33,371 | 33,816 | 32,743 | 34,691 | 36,884 |
| – higher | 13,482 | 12,332 | 11,766 | 11,390 | 10,756 | 10,884 | 11,307 |
| Female order of marriage – first | 38,605 | 34,734 | 33,443 | 34,175 | 33,029 | 35,155 | 37,021 |
| – higher | 13,224 | 12,012 | 11,694 | 11,031 | 10,470 | 10,420 | 11,170 |
| Protogamous marriages (%) | 64.5 | 64.4 | 64.3 | 65.7 | 66.4 | 67.5 | 67.8 |
| Remarriages (%) – males | 26.0 | 26.4 | 26.1 | 25.2 | 24.7 | 23.9 | 23.5 |
| – females | 25.5 | 25.7 | 25.9 | 24.4 | 24.1 | 22.9 | 23.2 |

**Source:** Czech Statistical Office; authors' calculations.

There were more marriages among people of all marital status in y-o-y comparison in 2015. A total of 32,689 marriages were entered into by both single grooms and brides; the share of protogamous marriages was almost 68%. Roughly three-quarters of brides (37,021) and grooms (36,884) entered into their first marriage in 2015. The share of higher-order marriages was slightly lower in 2015 than in 2005 (23% and 26%, respectively).

The changing number of marriages was not only the result of the changing size of the population at the most common age of marriage, but also reflected the development of nuptiality level (and its age diversification). The changes between 2005 and 2015 were driven mainly by men and women at the age of up to and around the nuptiality peak. During the last ten-year period the largest number of first marriages per 1,000 single men (based on the nuptiality life tables for singles) decreased from 73 to 54 and from 92 to 76 among women. The decline was recorded mainly in the 2005–2010 period. The age at which the highest first-marriage rate occurs did not change significantly: between 2005 and 2015 it shifted only from 29 to 30 years for men and from 27 to 28 for women. A slight increase in nuptiality at older ages was recorded in the last two years.

According to nuptiality life tables for 2015, 55.1% of men and 62.4% of women would enter into their first marriage by their 50th birthday. This is more than each of the years in the 2011–2014 period, but fewer (by almost 8 percentage points) than in 2005 (Table 5). Based on the 2015 first-marriage probabilities, the mean age at first marriage would be 32.4 years for males and 29.8 years for females, provided that the probabilities remained unchanged. These figures didn't change significantly in the last three years, but in comparison with 2005 they were higher by almost 1.5 years.

In 2015 the total remarriage rate of divorcees was 37.2% (males) and 36.3% (females). The development of this indicator was similar to the total first marriage rate: the minimum value was registered in 2013 and despite its rise in 2014–2015 it remained lower than in 2005. On average men would remarry after 8.2 years and women after 8.6 years from a divorce, provided that the remarriages rate remained stable in the future. The average time elapsed from divorce to new marriage has continued to increase slightly. The remarriage rate is the highest just in the first year after divorce and decrease with the time elapsed since the divorce. In short durations since divorce, the remarriage rates are slightly higher for men than for women and from the 10–14 year duration since divorce they don't significantly differ by sex.

## DIVORCE

The number of divorces exhibited a decreasing trend in the last ten-year period. In 2015 a total of 26,083 marriages ended in divorce. Roughly one-fifth of divorces were second- or higher-order divorce (Table 6). Divorces with minors accounted for more than one--half of all divorces. The share of divorces with minors gradually decreased from 61.4% to 56.3% be-

**Table 5 Nuptiality indicators, 2005–2015**

| Indicator | | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Total first marriage rate (%) | – males | 62.8 | 54.9 | 53.5 | 53.2 | 51.4 | 53.1 | 55.1 |
| | – females | 69.1 | 61.6 | 61.0 | 60.6 | 59.0 | 60.8 | 62.4 |
| Mean age at first marriage | – males | 30.8 | 32.2 | 32.2 | 32.3 | 32.3 | 32.3 | 32.4 |
| | – females | 28.1 | 29.4 | 29.6 | 29.6 | 29.8 | 29.8 | 29.8 |
| Total remarriage rate of divorcees (%) | – males | 41.7 | 38.4 | 36.9 | 36.4 | 34.7 | 35.4 | 37.2 |
| | – females | 40.7 | 37.2 | 36.6 | 34.9 | 33.5 | 33.6 | 36.3 |
| Average time elapsed from divorce | – males | 7.0 | 7.5 | 7.5 | 7.6 | 8.0 | 8.1 | 8.2 |
| | – females | 7.3 | 7.8 | 7.8 | 8.0 | 8.3 | 8.5 | 8.6 |

**Note:** First-marriage indicators are based on the nuptiality life tables for singles. The remarriage rates of divorcees are constructed from the distribution of remarriage rates by time elapsed from divorce.
**Source:** Czech Statistical Office; authors' calculations.

**Table 6 Divorce indicators, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Total divorces | 31,288 | 30,783 | 28,113 | 26,402 | 27,895 | 26,764 | 26,083 |
| Percentage of repeated divorces – males | 19.9 | 19.5 | 19.4 | 19.4 | 20.0 | 20.1 | 19.3 |
| – females | 19.1 | 18.8 | 19.1 | 19.1 | 19.1 | 19.4 | 18.8 |
| Divorces without minors | 12,078 | 13,143 | 12,282 | 11,213 | 11,974 | 11,557 | 11,090 |
| Divorces with minors | 19,210 | 17,640 | 15,831 | 15,189 | 15,921 | 15,207 | 14,993 |
| – percentage of total | 61.4 | 57.3 | 56.3 | 57.5 | 57.1 | 56.8 | 57.5 |
| Number of minors in divorced marriages | 28,732 | 26,483 | 23,716 | 22,982 | 24,335 | 23,119 | 23,187 |
| – average number of minors per divorce with minors | 1.50 | 1.50 | 1.50 | 1.51 | 1.53 | 1.52 | 1.55 |
| Total divorce rate (%) | 47.3 | 50.0 | 46.2 | 44.5 | 47.8 | 46.7 | 46.5 |
| Mean duration of marriage at divorce (years) | 12.2 | 12.7 | 12.9 | 12.8 | 13.0 | 13.1 | 13.0 |
| **Duration of marriage (years):** | **Divorce rates (per 100 marriages)** | | | | | | |
| 0–4 | 2.1 | 2.3 | 2.1 | 2.0 | 2.1 | 2.0 | 1.9 |
| 5–9 | 2.5 | 2.4 | 2.2 | 2.1 | 2.3 | 2.3 | 2.3 |
| 10–14 | 1.8 | 1.8 | 1.6 | 1.6 | 1.8 | 1.6 | 1.7 |
| 15–19 | 1.3 | 1.5 | 1.3 | 1.3 | 1.4 | 1.3 | 1.3 |
| 20–24 | 0.9 | 1.0 | 1.0 | 0.9 | 1.0 | 1.0 | 1.0 |
| 25–29 | 0.5 | 0.6 | 0.6 | 0.5 | 0.6 | 0.6 | 0.5 |
| 30+ | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

**Note:** Total divorce rate and mean duration of marriage at divorce resulted from the distribution of reduced divorce rates by time elapsed since entering into marriage.
**Source:** Czech Statistical Office; authors' calculations.

tween 2005 and 2011, after that it ranged from 57% to 58%. Divorce affected 23,187 minors in 2015, i.e. 1.5 children per divorced marriage. In most cases divorced marriages have only one minor, but the share of divorced marriages with one minor decreased from 56–58% in the 2005–2011 period to 52.2% in 2015. Conversely, the proportion of divorces with two or more minors was higher in 2015 than ten years ago. Since 2002 the total divorce rate has ranged between 45% and 50% (it was slightly below 45% only in 2012) in the Czech Republic. It was 45.5% in 2015. Since the beginning of the 1990s the mean duration of marriage at divorce gradually increased from 10 to 13 years; in the last three years it remained at this level (Table 6). In terms of the duration of a marriage until divorce, the highest divorce rates usually occur after 3–5 years of marriage. In 2015 the peak was 2.62 divorces per 100 marriages of 4-year duration.

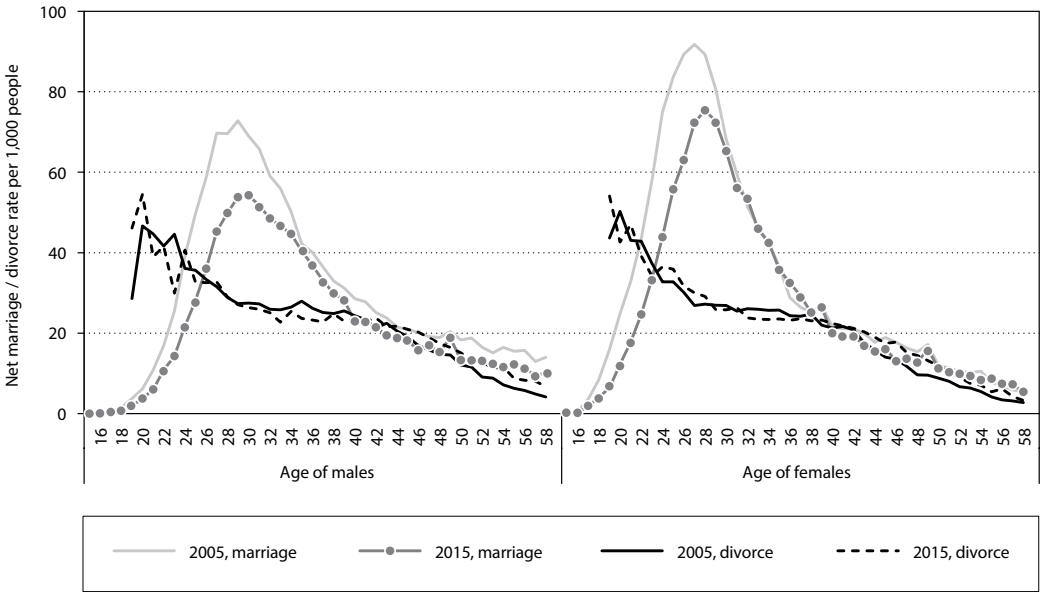
Age-specific net divorce rates did not change as significantly as the age-specific nuptiality rates in the 2005–2015 periods (Figure 2). They are the highest among young ages and are decreasing with age. However, nowadays the divorce rates for men and women aged 40 years and over are higher than in 2005.

## FERTILITY

A total of 110,764 live births were recorded in 2015 by the Czech Statistical Office, by 904 more than a year before. The number of newborns rose in the last two years (Table 7). In comparison with 2005 there was an 8.4% increase of live births. The largest number of live births in the last decade was 119,570, reached in 2008. But a substantial decline occurred between 2010 and 2011. Structure of live births by birth order did not change significantly in a ten-year perspective. First-order births accounted for 46–49% of live births, second-order births for 36–39%, and third- and higher-births for 14–15%. The number of first-order births slightly rose by 2% between 2014 and 2015, second-order births stagnated, and third- and higher-order births declined by 2%.

The number of live births to single mothers increased from 44,985 in 2014 to 46,887 in 2015.

**Figure 2 Net marriage and divorce rates*) by sex and age, 2005 and 2015**




**Note:** *) Number of marriages/divorces by year of birth per 1,000 people (on 1 January) of a given marital status (single, divorced and widowed for marriages, married for divorces). Age is defined as the age reached during the given year.
**Source:** Czech Statistical Office; authors' calculations.

The number almost doubled in comparison with 2005. In contrast, the number of children born to mothers with another marital status declined. The share of live births outside marriage (Table 7) increased from 31.7% in 2005 to 47.8% in 2015. The largest share was identified among first-order births (58.0% in 2015);

**Table 7 Live births by birth order and marital status of the mother, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Live births | 102,211 | 117,153 | 108,673 | 108,576 | 106,751 | 109,860 | 110,764 |
| – first order | 49,930 | 54,331 | 50,989 | 51,476 | 51,092 | 52,106 | 53,223 |
| – second order | 37,993 | 45,514 | 42,156 | 41,826 | 40,078 | 41,196 | 41,276 |
| – third and higher order | 14,288 | 17,308 | 15,528 | 15,274 | 15,581 | 16,558 | 16,265 |
| Marital status of mother | | | | | | | |
| Single | 25,753 | 39,529 | 38,666 | 40,581 | 41,655 | 44,985 | 46,887 |
| Married | 69,802 | 69,989 | 63,252 | 61,488 | 58,751 | 58,593 | 57,788 |
| Divorced | 6,354 | 7,389 | 6,514 | 6,299 | 6,134 | 6,089 | 5,911 |
| Widowed | 302 | 246 | 241 | 208 | 211 | 193 | 178 |
| Percentage of live births outside marriage | 31.7 | 40.3 | 41.8 | 43.4 | 45.0 | 46.7 | 47.8 |
| – first order | 40.0 | 51.1 | 53.1 | 54.5 | 55.7 | 57.3 | 58.0 |
| – second order | 20.8 | 28.8 | 29.9 | 31.6 | 33.4 | 35.6 | 37.5 |
| – third and higher order | 31.7 | 36.5 | 37.0 | 38.1 | 39.3 | 40.6 | 40.8 |

**Source:** Czech Statistical Office; authors' calculations.

among third- and higher-order births 40.8% were born outside marriage and among second-order births 37.5%. The share of births outside marriage increased from 2005 in all birth orders.

Besides birth order, other important differential characteristics of extramarital births are the age and educational attainment of the mothers. Unmarried motherhood is much more common at a young age: between 15 and 19 years (94.7% in 2015) and between 20 and 24 years (75.3% in 2015). In contrast it is least common among mothers in the 30–39 age group (39.7% in 2015). The share of live births outside marriage was higher in all age groups between 2005 and 2015. Extramarital births are less common among women with higher levels of education. In 2015, 80.5% of births to women with basic education were extramarital. Among tertiary-educated women the figure was only 29.1%. However, in a long-term perspective the share of births outside marriage has increased relatively most among the highest educated group of women. In 2005 only 13.7% of this subpopulation gave birth outside marriage, and the figure then was 67.6% for women with basic education.

The intensity of fertility measured by total fertility rate (TFR) increased from 1.53 children per woman in 2014 to 1.57 one year later. It was the highest level since 1993, and was more than one-fifth higher than in 2005 when it was 1.28 children (Table 8). The last year-on-year increase was mainly the result of the increase in the first-order fertility rate, the increase in the age-specific fertility rates among almost all age groups, except for those aged 15–19, and the higher intensity of both marital and non-marital fertility. The total first-order fertility rate increased by 0.03 children per woman, second-order fertility increased by 0.01, and third- and higher-order intensity stagnated. The net reproduction rate increased from 0.62 in 2005 to 0.76 in 2015, but not only because of the rise in the level of fertility, but also due to the decrease in the mortality intensity of women of reproductive age.

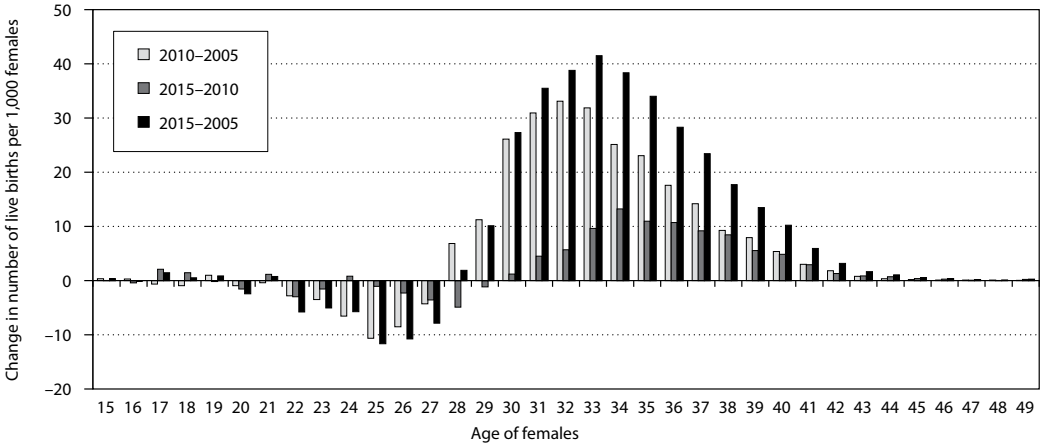
The mean age of mothers at childbirth increased by less than 0.1 year to 30.0 years between 2014 and 2015. The slow-down trend of postponing having children to a later age has already been apparent for the last five years. In comparison with 2010 the rise was 0.4 years, while in comparison with 2005 it was

**Table 8 Fertility indicators, 2005–2015**

| Indicator/Age group | | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|
| Total fertility rate | – total | 1.28 | 1.49 | 1.43 | 1.45 | 1.46 | 1.53 | 1.57 |
| | – first order | 0.63 | 0.72 | 0.70 | 0.72 | 0.73 | 0.76 | 0.79 |
| | – second order | 0.46 | 0.56 | 0.54 | 0.54 | 0.53 | 0.56 | 0.57 |
| | – third and higher order | 0.19 | 0.21 | 0.19 | 0.19 | 0.20 | 0.21 | 0.21 |
| Net reproduction rate | | 0.62 | 0.72 | 0.69 | 0.70 | 0.71 | 0.74 | 0.76 |
| Mean age of mother at childbirth – total | | 28.6 | 29.6 | 29.7 | 29.8 | 29.9 | 29.9 | 30.0 |
| | – first order | 26.6 | 27.6 | 27.8 | 27.9 | 28.1 | 28.1 | 28.2 |
| | – second order | 29.6 | 30.7 | 30.9 | 31.0 | 31.0 | 31.1 | 31.2 |
| | – third and higher order | 32.8 | 33.2 | 33.3 | 33.3 | 33.2 | 33.3 | 33.4 |
| **Age group:** | | **Age-specific fertility rates (per 1,000 females)** | | | | | | |
| 15–19 | | 10.9 | 11.5 | 11.3 | 12.0 | 11.7 | 11.9 | 11.7 |
| 20–24 | | 48.7 | 45.7 | 42.4 | 42.5 | 41.9 | 43.0 | 45.5 |
| 25–29 | | 100.9 | 99.7 | 93.6 | 93.4 | 92.4 | 95.6 | 97.0 |
| 30–34 | | 72.1 | 99.0 | 95.7 | 98.1 | 98.2 | 104.4 | 106.3 |
| 35–39 | | 22.8 | 38.4 | 37.2 | 38.4 | 40.0 | 43.2 | 45.3 |
| 40–44 | | 3.7 | 5.9 | 6.1 | 6.6 | 7.1 | 7.4 | 8.4 |
| 45–49 | | 0.1 | 0.3 | 0.3 | 0.3 | 0.3 | 0.4 | 0.4 |

**Source:** Czech Statistical Office; authors' calculations.

**Figure 3 Changes in age-specific fertility rates, 2005–2015**



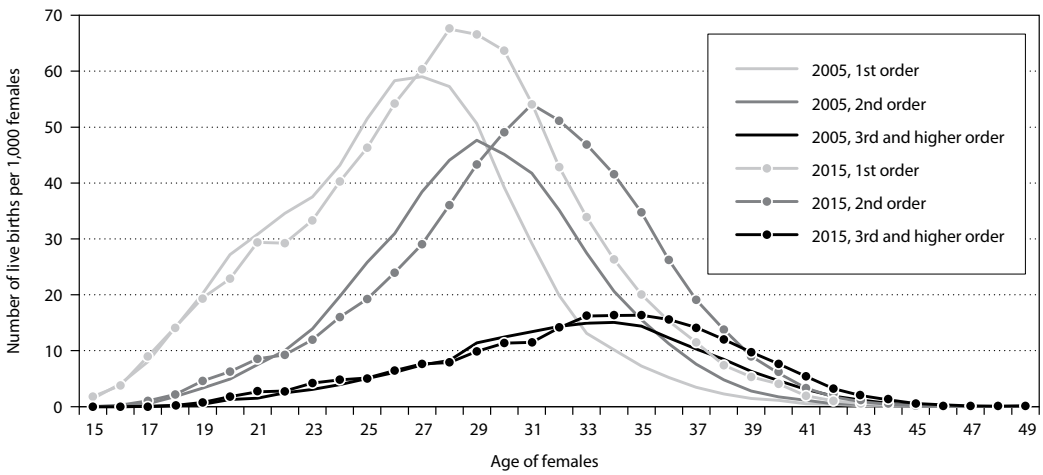

**Source:** Czech Statistical Office; authors' calculations.

1.4 years. A slight increase in the mean age was identified among all birth orders in the last year on year comparison (Table 8). Between 2005 and 2015 the mean age of mothers at first-order birth increased the most, by 1.6 years, while for second-order births it increased by 1.5 years and for third- and higher-order births by only 0.6 years.

The highest intensity of fertility was in the 30–34 age group of women from 2011 onwards. The average age-specific fertility rate was 106.3 children per 1,000 females at this age in 2015. In a ten-year perspective the highest increases were in the 30–34 and 35–39 age groups, with a slight increase in the 40–44 age group and a slight decrease in the 20–24 and 25–29 age groups (Figure 3).

The top of curves of the fertility rates by age of females have been shifting towards an older

**Figure 4 Age-specific fertility rates of women by age and by birth order,*) 2005 and 2015**




**Note:** *) The number of live births of given birth order per 1,000 women of the given age.
In 2005 birth order was surveyed for all births, in 2015 only for live births.
**Source:** Czech Statistical Office; authors' calculations.

age and also towards a higher intensity of fertility in the last decade, which is especially evident among women aged 28 and older. On the other hand, a decrease was recorded in the 22–27 age group of women. Most of the changes occurred in the first half of the decade.

The highest intensity of fertility moved to an older age in every birth order between 2005 and 2015 (Figure 4). Younger age groups (before the peaks of the curves in 2005) had lower fertility rates in 2015, but not significantly enough to eliminate the higher intensity in the older age groups in the same year, which led to a higher intensity in each birth order.

## ABORTION

The number of registered abortions[2] was 35,761 in 2015. This was 1,195 fewer than in the previous year and by 4,262 fewer than in 2005. The number of abortions has declined annually since 2008. The main reason for this development was the decrease in induced abortions[3] (*ČSÚ*, 2015e). There were 20,403 abortions of this type in 2015, which was 1,490 fewer than in 2014 and 6,050 fewer than in 2005 (Table 9). In contrast, the number of spontaneous abortions[4] increased from 12,245 in 2005 to 13,857 in 2014 and to 14,082 in the last year. The share of spontaneous abortions rose from 30.6% to 39.4% in the last decade, while the share of induced abortions decreased from 66.1% to 57.1%. Ectopic pregnancies were counted in about 3% of cases during the last decade.

There were more abortions to single women in 2015 than in 2005. The figure rose from 14,942 to 17,852, however it declined by 147 in the last year. The number of abortions to married women declined markedly from 19,548 in 2005 to 13,368 in 2015; from this the decline was by 846 in 2015. Divorced women also had fewer abortions – there were 4,823 abortions among divorced women ten years ago and 3,505 in the last recorded year.

Although the number of induced abortions went down significantly in the last decade, it didn't decrease among single women (Table 9). The figure was 10,646 in 2005 and 11,067 in 2015; the peak was 11,883 in 2013. A profound drop was recorded among married women (from 11,901 to 6,687) and divorced women (from 3,469 to 2,203). Since 2007 the number of single women who had an induced abortion has been higher than the number of married women. However, these trends resulted mainly from the changing structure of women of reproduction age by marital status, as the share of single women has been growing and the share of married women diminishing. A larger share of women in this subpopulation are staying single.

The share of induced abortions out of all abortions decreased in all categories of women's marital status in the last decade. The lowest figure was among married women (50.0% in 2015), while single (62.0%), divorced (62.9%) and widowed women (71.0%) recorded higher shares. The share of induced abortions decreases as education level rises. The figure ranged from 42.8% among tertiary-educated women to 74.5% among women with basic education. The share of induced abortions has decreased in all categories in the last ten years.

2) Data on abortions are provided by the Institute of Health Information and Statistics of the Czech Republic (IHIS CR).

3) Induced abortions: legally induced abortion by means of vacuum aspiration can be performed in the early stages of gestation (i.e. up to the 7th week in the case of a first pregnancy and to the 8th week in other cases) and by a method other than vacuum aspiration up to the 12th week of gestation, or for health reasons to the 24th week of gestation.

4) Spontaneous abortions up to 31 March 2012 refer to: the spontaneous expulsion of a foetus from the uterus, where:
a) the foetus shows no signs of life and its birth weight is less than 1,000 g, or the weight cannot be measured, and the gestation period was shorter than 28 weeks,
b) the foetus shows one or more signs of life but its birth weight is less than 500 g and it does not survive for more than 24 hours after birth,
c) only the ovum without the foetus or only the decidua was extracted.
Spontaneous abortions since 1 April 2012 refer to: spontaneous expulsion of a foetus from the uterus where the foetus shows no signs of life and its birth weight is lower than 500 g, or, the weight cannot be measured, and the gestation period was shorter than 22 weeks.

**Table 9 Abortions, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Abortions | 40,023 | 39,273 | 38,864 | 37,733 | 37,687 | 36,956 | 35,761 |
| – induced abortions | 26,453 | 23,998 | 24,055 | 23,032 | 22,714 | 21,893 | 20,403 |
| – spontaneous abortions | 12,245 | 13,981 | 13,637 | 13,515 | 13,708 | 13,857 | 14,082 |
| – ectopic pregnancies | 1,324 | 1,287 | 1,172 | 1,186 | 1,265 | 1,206 | 1,276 |
| Abortions – single females | 14,942 | 16,706 | 17,269 | 17,373 | 18,050 | 17,999 | 17,852 |
| – married females | 19,548 | 17,274 | 16,347 | 15,393 | 14,705 | 14,214 | 13,368 |
| – divorced females | 4,823 | 4,410 | 4,264 | 3,949 | 3,928 | 3,766 | 3,505 |
| Induced abortions – single females | 10,646 | 11,283 | 11,693 | 11,566 | 11,883 | 11,604 | 11,067 |
| – married females | 11,901 | 9,296 | 8,993 | 8,385 | 7,774 | 7,459 | 6,687 |
| – divorced females | 3,469 | 2,991 | 2,915 | 2,622 | 2,620 | 2,433 | 2,203 |

**Source:** Czech Statistical Office.

**Table 10 Abortion indicators, 2005–2015**

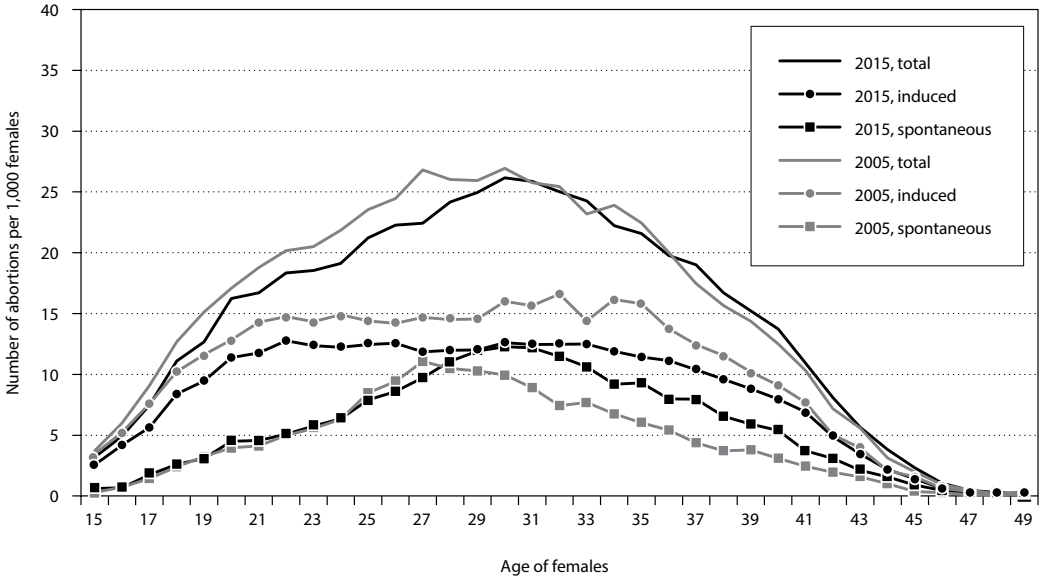
| Indicator/Age group | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Total abortion rate | 0.53 | 0.51 | 0.52 | 0.51 | 0.52 | 0.51 | 0.51 |
| Total induced abortion rate | 0.35 | 0.32 | 0.32 | 0.31 | 0.32 | 0.31 | 0.29 |
| Total spontaneous abortion rate | 0.16 | 0.18 | 0.18 | 0.18 | 0.18 | 0.19 | 0.20 |
| Mean age at abortion | 29.8 | 30.2 | 30.1 | 30.2 | 30.1 | 30.3 | 30.3 |
| Mean age at induced abortion | 29.6 | 29.7 | 29.7 | 29.7 | 29.5 | 29.7 | 29.7 |
| Mean age at spontaneous abortion | 30.0 | 31.0 | 30.9 | 31.0 | 31.1 | 31.2 | 31.1 |
| **Age group:** | **Age-specific induced abortion rates (per 1,000 females)** | | | | | | |
| 15–19 | 7.7 | 7.0 | 7.1 | 6.8 | 7.2 | 6.6 | 6.1 |
| 20–24 | 14.2 | 12.7 | 13.3 | 12.9 | 12.9 | 12.4 | 12.1 |
| 25–29 | 14.5 | 13.1 | 13.5 | 13.3 | 13.5 | 13.0 | 12.2 |
| 30–34 | 15.8 | 13.2 | 13.6 | 13.3 | 13.0 | 13.0 | 12.4 |
| 35–39 | 12.8 | 12.0 | 11.8 | 11.3 | 11.3 | 11.0 | 10.2 |
| 40–49 | 3.1 | 2.9 | 3.0 | 2.9 | 2.9 | 3.2 | 3.1 |

**Source:** Czech Statistical Office; authors' calculations.

The total abortion rate ranged from 0.54 to 0.51 abortions per woman in the last decade (Table 10). The figure stagnated between 2010 and 2015, when the total abortion rate ranged from 0.51 to 0.52. The total induced abortion rate declined from 0.35 to 0.29 in the last ten years (by 0.02 in 2015). In contrast, the total spontaneous abortion rate increased from 0.16 to 0.20 in the same period (by 0.01 in 2015). The mean age at abortion stagnated in 2015 at 30.3 years. In the long term, it increased in relation to the rising age at pregnancy. The trend differed according to the type of abortion: the mean age of women at the time of an induced abortion stagnated over the last ten years between 29.5 years and 29.7 years, while the mean age of women at the time of a spontaneous abortion increased from 30.0 years to 31.1 years.

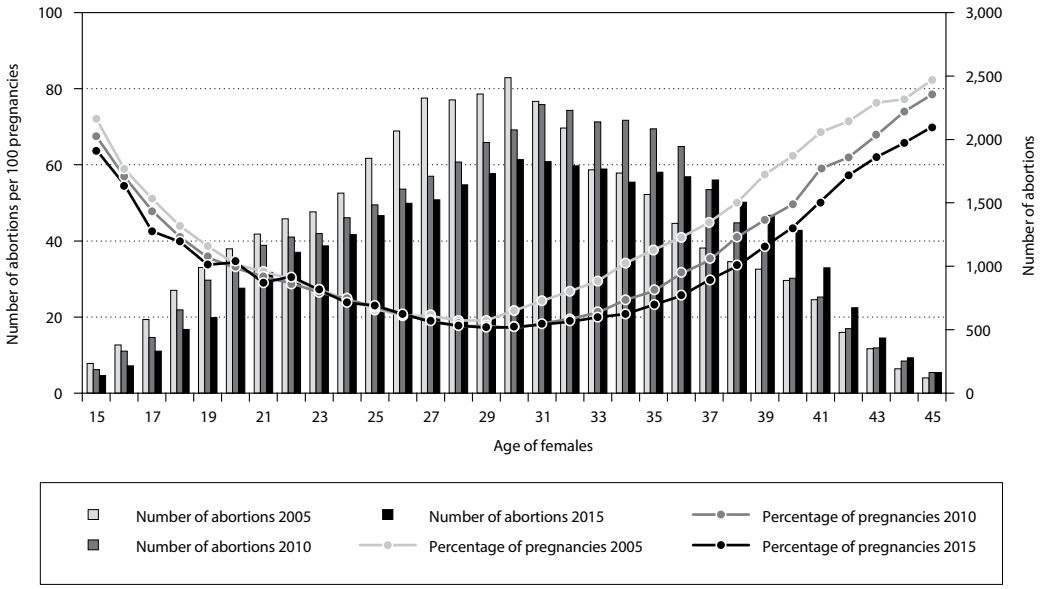
Induced abortion rates declined in the last decade at every age, while the most profound drop was in the 30–34 age group (Figure 5). In contrast, spontaneous abortion rates rose at almost every age (except for age 19 and ages 25–27), and most significantly among women aged 30–39. As a result, total abortion rates stagnated among women aged 30 and over, while the rates decreased among younger women. The spontaneous abortion rates curve was more similar to the age-specific fertility curve. It peaked at age 30 in 2015, three years later than in 2005.

**Figure 5 Age-specific abortion rates by type of abortion, 2005 and 2015**




**Source:** Czech Statistical Office; authors' calculations.

**Figure 6 Share of pregnancies ended in abortion and number of abortions by age of women, 2005–2015**




**Source:** Czech Statistical Office; authors' calculations.

The share of pregnancies ended in abortion was the highest in the youngest and the oldest age groups (Figure 6). There were 40% or more abortions out of the total number of pregnancies in the 15–17 and 40 and over age groups, but the absolute numbers of abortions at these ages were not high (they accounted for 13.0% of all abortions in 2015). Between 2005 and 2015 the share of pregnancies ended in abortion markedly declined among women aged 30 and over and to a lesser extent also in the 15–19 age group. It didn't change significantly in the 20–29 age group. There were more abortions among women aged 35 and over, but also even more pregnancies in 2015 compared to 2005.

## MORTALITY

The number of deaths increased by 5,508 in comparison with 2014 and reached 111,173 in 2015, which was the highest figure since 2004. The number of deceased by sex was almost even in the last recorded year (55,934 males and 55,239 females). The number of deaths under 1 year of age increased only by 9 to 272 in 2015. The infant mortality rate also increased to 2.5 deaths per 1,000 live births, which was a quarter less than in 2005 (Table 11).

The share of deaths at the age 80 and over increased in the long term among both men and women. The figure was 26.1% for men and 50.3% for women in 2005 and it shifted to 33.2% and 58.8%, respectively, in 2015. This development is a result of the changes in age structure and the mortality decrease. The mean age at death for men was 69.4 years in 2005 and 72.2 years a decade later. It was 77.2 and 79.4 years for women in the same calendar years.

The life expectancy at birth for men stagnated at 75.8 years in 2015. It increased in the last ten years from 72.9 years (by 4%). In the case of women the rise was from 79.1 years in 2005 to 81.4 years ten years later (by 3%); however, in the last year there was a decline in life expectancy at birth among women. It went down from 81.7 in 2014. This change was mainly caused by a higher intensity of mortality among women aged 70 and over. A year-on-year decline was last registered in 2003. The overall rise in life expectancy at birth between 2005 and 2015 was caused by the lower mortality of men aged 50–64 and women aged 70 and over. The difference between women and men in life expectancy at birth decreased from 6.22 years in 2005 to 5.62 years in 2015. Trends in mortality by sex in the age groups between 45 and 59 years are what most influenced this decrease.

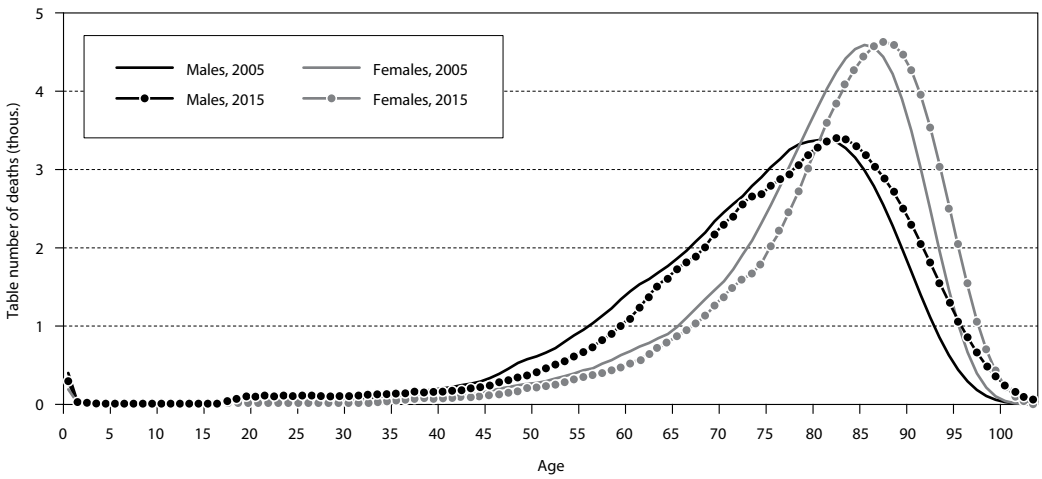
The indicator of the table number of deaths is derived from life tables and is not affected by the changing age structure of the population (Figure 7). The most common age at the time of death for women was 87 years in 2015, two years higher

**Table 11 Deaths, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Deaths | 107,938 | 106,844 | 106,848 | 108,189 | 109,160 | 105,665 | 111,173 |
| – males | 54,072 | 54,150 | 54,141 | 54,550 | 55,098 | 53,740 | 55,934 |
| – females | 53,866 | 52,694 | 52,707 | 53,639 | 54,062 | 51,925 | 55,239 |
| Deaths under 1 year of age | 347 | 313 | 298 | 285 | 265 | 263 | 272 |
| Infant mortality rate (‰) | 3.4 | 2.7 | 2.7 | 2.6 | 2.5 | 2.4 | 2.5 |
| Percentage of deaths at the age 80 and over – males | 26.1 | 30.0 | 30.5 | 31.5 | 32.0 | 32.5 | 33.2 |
| – females | 50.3 | 55.5 | 56.2 | 57.2 | 57.6 | 57.9 | 58.8 |
| Life expectancy of males at age: 0 | 72.9 | 74.4 | 74.7 | 75.0 | 75.2 | 75.8 | 75.8 |
| 65 | 14.4 | 15.3 | 15.5 | 15.6 | 15.7 | 16.0 | 16.0 |
| 80 | 6.1 | 6.6 | 6.8 | 7.0 | 7.2 | 7.3 | 7.5 |
| Life expectancy of females at age: 0 | 79.1 | 80.6 | 80.7 | 80.9 | 81.1 | 81.7 | 81.4 |
| 65 | 17.6 | 18.7 | 18.8 | 18.9 | 19.1 | 19.5 | 19.3 |
| 80 | 7.1 | 7.9 | 7.9 | 8.0 | 8.2 | 8.5 | 8.2 |

**Source:** Czech Statistical Office; authors' calculations.

**Figure 7 Life-table deaths by sex and age, 2005 and 2015**




**Source:** Czech Statistical Office.

than a decade ago. The most common age at the time of death for men was 81 years in 2005 and 82 years in 2015. Among women deaths were concentrated more around the peak age, while among men deaths occurred within a longer age interval.

***Causes of death***

There have been important methodological changes that have affected the trend in mortality by cause of death during the period evaluated in this article (2005–2015). Since 2011 IRIS, the automated coding system for selection of the underlying cause of death, has been used in the Czech Republic, which was preceded by the introduction of ACME decision tables into coding practice in 2007; since 2013 a new death certificate with 4 lines in Part I (instead of 3 lines) has been used and the system of data collection was changed. Since 2009 the updates of the ICD-10 are regularly implemented. The last updates valid in the Czech Republic since 1 January 2014 were only minor and did not affect mortality by cause of death, unlike the adoption of the 2nd edition of the ICD-10, including 2009 updates or updates valid from 1 January 2013. Mortality trends by cause of death must be evaluated with caution and an awareness of these changes, because in some cases it is difficult to clearly distinguish between the effects of changes in methodology and the real trend in mortality from a given cause of death. However, in other cases a sudden change in the trend over time has appeared, in which case the 'external influence' is rather clear (see below).

The majority of deaths – though since 2011 already less than half – are from diseases of the circulatory system (45.8% in 2015). In 2015 this figure was less than half not only in the case of men (41.9%) but also, for the first time, in the case of women (49.9%). But the absolute number of deaths from these diseases increased from 48,627 to 50,969 between 2014 and 2015. Deaths from neoplasms in 2015 accounted for 27,407, which is two hundred fewer than in 2014, and these accounted for a quarter of all causes of death in 2015 (24.7%). The share was also a bit lower than a year ago. Unlike diseases of the circulatory system, neoplasms represented a higher share of causes of death among men (27.0% vs 22.3% in 2015) than among women. In 2015, the third most common cause of death for both men and women was a disease of the respiratory system (7.4% and 6.1% of all deaths). This is not usual among men for whom injuries and poisonings are typically the third most frequent cause of death (except in 2013 and 2015, when this was not the third most frequent cause). Deaths from diseases of the respiratory system significantly rose year-on-year both absolutely and relatively, but the rise was bigger due

to the decrease in 2014, when there were exceptionally favourable epidemiological conditions (CZSO, 2015b). External causes of death were the fourth most common cause among men and the sixth among women, in the latter case coming even after endocrine diseases and diseases of the digestive system (Table 12).

In the long-term view, a rare and slight increase (by 2% for men and 3% for women) occurred in the standardised mortality rate from diseases of the circulatory system in 2015. However, the level in 2015 represented 73% (in the case of men) and 71% (women) of the level in 2005. Between 2014 and 2015 mortality rates from a subcategory of this ICD-10 chapter – ischaemic heart diseases (I20–I25) – very slightly increased, but within it the mortality from acute myocardial infarction (I21–I22) decreased by 11%. The mortality rate from another frequent subcategory – cerebrovascular diseases (I60–I69) – decreased only among men, while among women it stagnated. The last year-on-year increase in overall mortality from circulatory diseases was thus caused by other diseases from this ICD-10 chapter. Mortality from ischaemic heart diseases and cerebrovascular diseases was affected most by the methodological changes in 2007 following the introduction of the ACME decision table into coding practice (Figure 8), which corrected some incorrect coding when both causes were present on the death certificate. ACME tables and the implementation of IRIS and updates led to a substantial reduction of mortality from atherosclerosis, a reduction of 85% between 2005 and 2015, which in 2005 was still higher than, for instance, the level of mortality from acute myocardial infarction (in the case of women this was true even until 2010).

The standardised mortality rate from neoplasms decreased between 2014 and 2015 by 2% and the overall average decrease for both sexes between 2005 and 2015 was by almost 20%. This positive trend was for men driven by the decline in mortality from the most frequent neoplasms as causes of death, such as lung cancer (C33–C34), colorectal cancer (C18–C21; but in 2015 no further decrease was registered), and prostate cancer (C61). In the case of women the most significant decrease was recorded for mortality from colorectal neoplasms during the last decade (by 31%), followed by breast cancer (C50; by 28%), and cancer of the genital organs (C51–C58; by 18%). The mortality level from all of these categories is comparable (Figure 8), similarly to the standardised mortality rate from cancer of trachea, bronchus and lung. But for the latter an increasing trend was apparent until 2012, after which it stagnated. Among other more common neoplasms as causes of death, a longer-term decrease in mortality has been observed among both sexes for stomach cancer, while cancer of the pancreas has been characterised by an overall stagnation of the mortality trend with year-on-year oscillation.

The last year-on-year increase in the mortality rate from diseases of the respiratory system was more significant than in the case of diseases of the circulatory system, namely by 12% for men and even 18% for women. Almost 40% of the mortality level from this ICD-10 chapter is made up of mortality from pneumonia (J12–J18), which increased between 2014 and 2015 to a similar extent as mortality from all respiratory diseases. But in the case of pneumonia a more profound decrease since 2005 was recorded. However, the majority of the decrease occurred between 2010 and 2011, in connection with the implementation of an automated coding system. As a consequence of this, male mortality from chronic lower respiratory diseases (J40–J47) has been higher than mortality from pneumonia since 2011, and an overall increasing trend in mortality from this subgroup of diseases has been apparent since that year, and this has also been true for women.

The mortality rate from external causes of death (injuries and poisonings) had a stagnating trend for the last three years in the case of men and for seven years already in the case of women (Figure 8). Before that a decreasing trend was observed for both sexes. The mortality trend from traffic accidents (V01–V99) and suicides (X60–X84) for women has been stable for the last five years, while the male suicide rate has, since the last peak in 2012, been slightly decreasing. Until 2011, an unstable trend was observed in mortality from accidental falls (W00–W19), but in the years since then the implementation of the automated coding system has corrected and harmonised coding practice.

The introduction of IRIS also resulted in a change in the level of mortality from endocrine diseases, and from diabetes mellitus in particular (E10–E14),

**Table 12 Deaths by cause of death, selected chapters of ICD-10, 2005–2015**

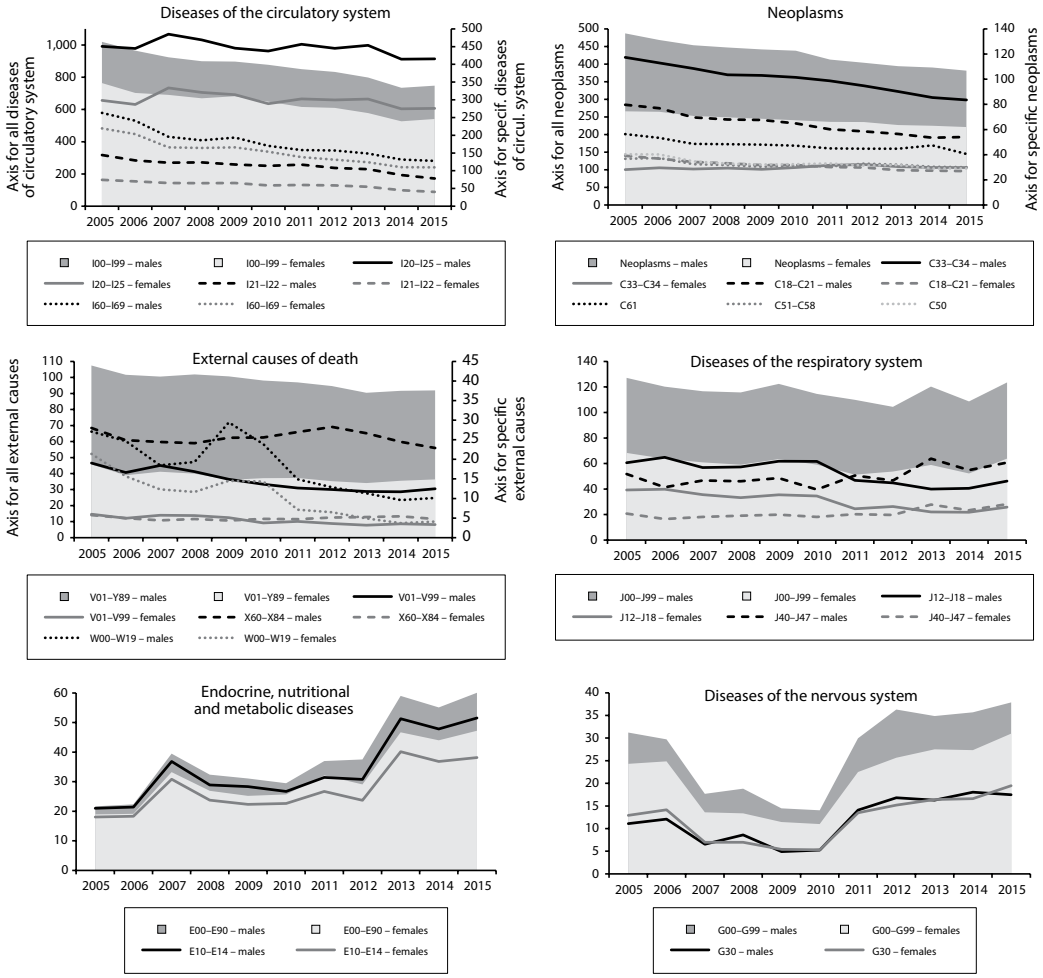
| Chapter of ICD-10 | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| | Percentage of the given cause of death out of total deaths | | | | | | |
| Neoplasms (C00–D48) | 25.9 | 26.2 | 25.5 | 25.6 | 25.1 | 26.1 | 24.7 |
| Endocrine, nutritional and metabolic diseases (E00–E90) | 1.4 | 2.0 | 2.6 | 2.5 | 3.9 | 3.9 | 4.0 |
| Mental and behavioural disorders (F00–F99) | 0.3 | 0.2 | 0.9 | 0.9 | 1.1 | 1.1 | 1.3 |
| Diseases of the nervous system (G00–G99) | 1.9 | 1.0 | 2.0 | 2.3 | 2.4 | 2.5 | 2.7 |
| Diseases of the circulatory system (I00–I99) | 51.1 | 50.2 | 49.3 | 49.0 | 47.4 | 46.0 | 45.8 |
| Diseases of the respiratory system (J00–J99) | 5.6 | 5.8 | 5.3 | 5.4 | 6.3 | 5.9 | 6.7 |
| Diseases of the digestive system (K00–K99) | 4.5 | 4.4 | 4.2 | 4.2 | 4.2 | 4.2 | 4.2 |
| Diseases of the genitourinary system (N00–N99) | 1.5 | 1.4 | 1.1 | 1.3 | 1.1 | 1.2 | 1.3 |
| Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99) | 0.9 | 1.5 | 1.1 | 1.1 | 1.2 | 1.2 | 1.3 |
| External causes (V00–Y89) | 5.9 | 5.6 | 5.6 | 5.4 | 5.1 | 5.4 | 5.2 |
| | Percentage of the given cause of death out of total male deaths | | | | | | |
| Neoplasms (C00–D48) | 28.5 | 28.9 | 27.6 | 27.8 | 27.6 | 28.4 | 27.0 |
| Endocrine, nutritional and metabolic diseases (E00–E90) | 1.2 | 1.8 | 2.2 | 2.2 | 3.5 | 3.4 | 3.5 |
| Mental and behavioural disorders (F00–F99) | 0.4 | 0.3 | 0.8 | 0.8 | 0.9 | 1.0 | 1.1 |
| Diseases of the nervous system (G00–G99) | 1.8 | 0.9 | 1.8 | 2.2 | 2.1 | 2.3 | 2.4 |
| Diseases of the circulatory system (I00–I99) | 45.4 | 44.6 | 44.6 | 44.3 | 43.0 | 41.8 | 41.9 |
| Diseases of the respiratory system (J00–J99) | 6.0 | 6.2 | 6.0 | 5.9 | 7.0 | 6.6 | 7.4 |
| Diseases of the digestive system (K00–K99) | 5.1 | 4.9 | 4.7 | 4.6 | 4.7 | 4.7 | 4.7 |
| Diseases of the genitourinary system (N00–N99) | 1.3 | 1.2 | 1.0 | 1.2 | 0.9 | 1.0 | 1.1 |
| Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99) | 1.0 | 1.8 | 1.3 | 1.3 | 1.3 | 1.3 | 1.5 |
| External causes (V00–Y89) | 8.0 | 7.7 | 7.7 | 7.4 | 7.0 | 7.2 | 7.0 |
| | Percentage of the given cause of death out of total female deaths | | | | | | |
| Neoplasms (C00–D48) | 23.3 | 23.5 | 23.4 | 23.3 | 22.6 | 23.8 | 22.3 |
| Endocrine, nutritional and metabolic diseases (E00–E90) | 1.6 | 2.3 | 3.0 | 2.7 | 4.4 | 4.4 | 4.6 |
| Mental and behavioural disorders (F00–F99) | 0.1 | 0.2 | 1.0 | 1.0 | 1.3 | 1.3 | 1.6 |
| Diseases of the nervous system (G00–G99) | 2.0 | 1.1 | 2.2 | 2.5 | 2.7 | 2.8 | 3.0 |
| Diseases of the circulatory system (I00–I99) | 56.8 | 55.9 | 54.3 | 53.8 | 51.8 | 50.3 | 49.9 |
| Diseases of the respiratory system (J00–J99) | 5.2 | 5.3 | 4.6 | 4.9 | 5.5 | 5.2 | 6.1 |
| Diseases of the digestive system (K00–K99) | 3.8 | 3.8 | 3.7 | 3.7 | 3.7 | 3.7 | 3.7 |
| Diseases of the genitourinary system (N00–N99) | 1.7 | 1.5 | 1.3 | 1.3 | 1.2 | 1.3 | 1.4 |
| Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99) | 0.8 | 1.3 | 0.8 | 0.8 | 1.1 | 1.0 | 1.1 |
| External causes (V00–Y89) | 3.8 | 3.4 | 3.5 | 3.3 | 3.2 | 3.6 | 3.5 |

**Source:** Czech Statistical Office; authors' calculations.

which has come to be more frequently selected as the underlying cause of death. This began in 2007, when the ACME decision tables were introduced into coding practice. The next change – a rise – was registered in 2013 and was caused by the introduction of a fourth line in Part I of the death certificate and the introduction of the ICD-10 updates (*Štyglerová*, 2014a). The use of IRIS is also connected with the very significant rise in mortality from diseases of the nervous system and mental and behavioural

disorders (*ČSÚ*, 2012d). The latter case is linked mainly to the selection of vascular dementia as the underlying cause of death, which was not applied before. The opposite trend was registered in the case of mortality from ill-defined causes of death (R00–R99); however, since 2013, in connection with the establishment of the modified data collection system, a certain increase has been recorded. A relatively stable mortality level has been observed for the last five years for diseases of the digestive system, including one of the most common diseases of this system – chronic liver diseases, which had stagnated over the long-term among women and, after a short slight decrease in 2008–2010, also among men. The mortality rates from other ICD-10 chapters of causes of death are from the view of overall mortality level marginal, including causes related to infant mortality.[5)]

**Figure 8 Standardised mortality rates (per 100,000 inhabitants), selected causes of death, 2005–2015**




**Note:** The new European population standard issued by Eurostat in 2013 was used for standardisation.
**Source:** Czech Statistical Office; authors' calculations.

5) Also mortality levels from other causes of death were affected by methodological changes and implementation of ICD-10 updates but due to their less important influence on overall mortality they are not discussed here.

## INTERNATIONAL MIGRATION

The number of immigrants (34,922) exceeded the number of emigrants (18,945) by 15,977 in 2015.[6] Positive net migration was lower by 5,684 in comparison with 2014. In 2013 the figure was even negative (the only year this was so in the last decade). The volume of migration declined by 7,722 to 53,867 in the last year. Males made up 54.5% of immigrants and 55.4% of emigrants in 2015. Ten years ago the figure was 62.9% for immigrants and 60.4% for emigrants.

Migrants aged 15–34 contributed most to positive net migration in 2015 and also in the long term (Table 13). There were 11,023 more immigrants than emigrants in this age group in 2015 (and they accounted for 69% of net migration). According to the five-year age group the highest net migration was until 2012 among people in the 20–24 age group and in the last two years among those aged 25–29. The net migration of children aged 0–14 was positive in all observed years but nonetheless markedly lower than in the 15–34 age group (3,406 in 2015). Net migration was also lower among people between the ages of 35 and 64 (1,420 in 2015). Older migrants aged 65 and over contributed only minimally, but positively, to net migration (by 128).

Net migration rates by age were higher at the beginning of life (migration with parents), among migrants aged 17–18 (movements related to the end of secondary school), and among migrants aged 23–28 (entering the labour market) than among other ages in 2015.

The positive net migration in 2005–2015 period was mainly made up of citizens from Ukraine, Slovakia, Vietnam, and Russia (Figure 9), which together accounted for 62% of total net migration. In 2015 Slovaks (5,202), Ukrainians (2,246) and Romanians (1,238) made the biggest contributions to net migration, while migrants with Czech and Vietnamese citizenship contributed to net migration negatively (–588 and –229, respectively).

The largest number of immigrants were citizens of Slovakia (6,682), followed by Ukraine (5,454), and the Czech Republic (3,333) in 2015. Emigrants were most commonly Czechs (3,921), Ukrainians (3,208) and Russians (2,061) in the same year. Romania, Bulgaria and Germany accounted for the smallest numbers of emigrants and roughly one thousand immigrants (each), which resulted in high positive net migration rates for these countries.

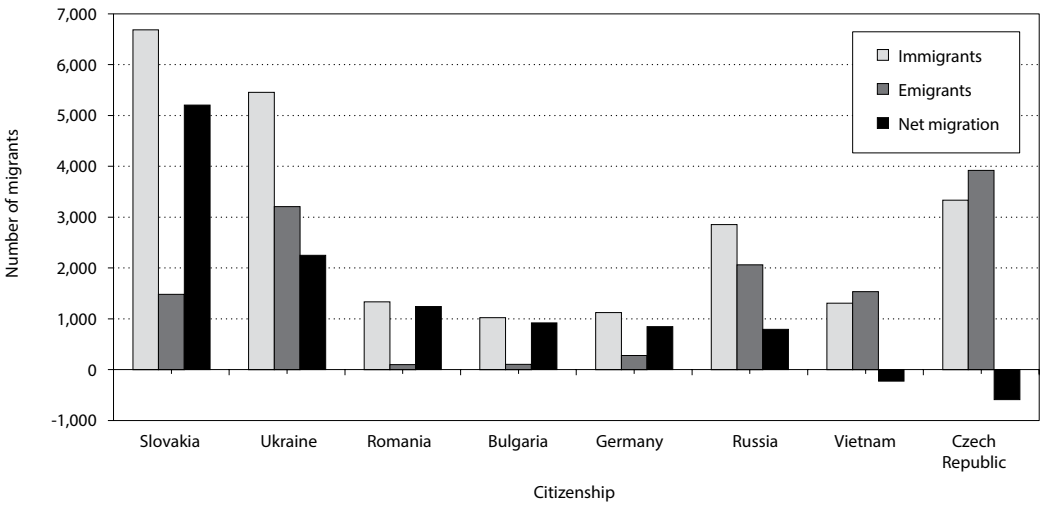
**Table 13 International migration, 2005–2015**

| Indicator | 2005 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|
| Immigrants | 60,294 | 30,515 | 22,590 | 30,298 | 29,579 | 41,625 | 34,922 |
| – males | 37,900 | 16,561 | 12,440 | 17,054 | 16,467 | 23,115 | 19,022 |
| Emigrants | 24,065 | 14,867 | 5,701 | 20,005 | 30,876 | 19,964 | 18,945 |
| – males | 14,546 | 11,029 | 3,109 | 11,901 | 18,040 | 11,238 | 10,502 |
| Volume of migration | 84,359 | 45,382 | 28,291 | 50,303 | 60,455 | 61,589 | 53,867 |
| Net migration | 36,229 | 15,648 | 16,889 | 10,293 | –1,297 | 21,661 | 15,977 |
| aged: 0–14 | 2,808 | 3,992 | 2,214 | 1,754 | 1,190 | 3,685 | 3,406 |
| 15–34 | 21,346 | 11,889 | 11,166 | 7,932 | 3,036 | 13,197 | 11,023 |
| 35–64 | 11,823 | –403 | 3,191 | 420 | –5,528 | 4,571 | 1,420 |
| 65+ | 252 | 170 | 318 | 187 | 5 | 208 | 128 |

**Source:** Czech Statistical Office.

6) Data was provided from the Central Population Register Record (ISEO), administered by the Ministry of the Interior of the CR, and the Foreigners' Information System (CIS), administered by the Directorate of the Alien Police Service of the CR.

**Figure 9 International migration by selected citizenship,*) 2015**




**Note:** *) Citizenships whose number of immigrants, emigrants or net migration was among the top five in 2015.
**Source:** Czech Statistical Office.

## *References*


- Czech Statistical Office. 2006a…2015a. *Demografická ročenka České republiky v roce 2005*…2014 (Demographic Yearbook of the Czech Republic in 2005…2014). Prague: CZSO.
- Czech Statistical Office. 2015b. *Population change – year 2014* (press release). Prague: CZSO.
- Czech Statistical Office. 2016. *Stav a pohyb obyvatelstva v České republice v roce 2015.* (Population of the Czech Republic in 2015). Prague: CZSO.
- Czech Statistical Office. 2006c…2016c. *Úmrtnostní tabulky za ČR, regiony soudržnosti a kraje – 2004–2005…2014–2015* (Life Tables for the Czech Republic, Cohesion Regions and Regions – 2004–2005…2014–2015). Prague: CZSO. Available at: <https://www.czso.cz/csu/czso/life_tables>.
- Český statistický úřad (Czech Statistical Office). 2006d…2015d. *Vývoj obyvatelstva České republiky v roce 2005...2014* (Population trends in the Czech Republic in 2005…2014). Prague: CZSO.
- Český statistický úřad (Czech Statistical Office). 2015e. *Vývoj potratovosti v České republice – 2003–2014* (Trends in abortion rates in the Czech Republic – 2003–2014). Prague: CZSO.
- Eurostat. Statistics Explained: Marriage and divorce statistics (cit. 6 Sept 2016). Available at: <http://ec.europa.eu/eurostat/statistics-explained/index.php/Marriage_and_divorce_statistics>.
- Eurostat. The European short list of 86 causes of death. 2012. Available at: <http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=COD_2012&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC>.
- Kurkin, R. – Němečková, M. – Štyglerová, T. 2014. Population Development in the Czech Republic in 2013. *Demografie*, 2014, 56, pp. 287–306. ISSN 0011-8265.
- Poppová, M. 2012. Changes in coding practice between 2010 and 2011 in the Czech Republic. *Demografie*, 54, pp. 427–433. ISSN 0011-8265.
- Poppová, M. 2011. IRIS Language Independent Coding Software – Implementation in the Czech Republic. *Demografie*, 53, pp. 392–396. ISSN 0011-8265.
- Poppová, M. – Štyglerová, T. 2012. Statistika zemřelých podle příčin smrti se změnila. *Statistiky&My*, no. 5, pp. 24–25. ISSN 1804-7149.

- Štyglerová, T. 2014a. Zlom v datech o zemřelých. *Statistiky&My*, no. 11–12, pp. 32. ISSN 1804-7149.
- Štyglerová, T. 2014b. Na co umíráme. *Statistiky&My*, no. 11–12, pp. 32. ISSN 1804-7149.
- Ústav zdravotnických informací a statistiky ČR. *Potraty 2005…2013* (Abortions 2005…2013). 2006…2015. Prague: ÚZIS ČR.



## ROMAN KURKIN

earned his PhD degree in Demography at the Faculty of Science, Charles University, in 2015. He participated in coordinating and processing the 2011 Population and Housing Census at the Czech Statistical Office between 2009 and 2013 and since 2014 he has been working in the Department of Demographic Statistics at the same institution. He specialises in the analysis of fertility, abortion, regional differentiation of demographic processes, and applied demography.

## MICHAELA NĚMEČKOVÁ

studied demography at the Faculty of Science, Charles University. Since 2007 she has been working in the Department of Demographic Statistics at the Czech Statistical Office. She specialises in the analysis of demographic development, population projections, and methodology.

## TEREZIE ŠTYGLEROVÁ

studied demography at the Faculty of Science, Charles University. She completed her studies in 1999 and has been working since then in the Department of Demographic Statistics at the Czech Statistical Office, which she has headed since 2009. She specialises in the analysis of demographic development, population projections, and issues concerning mortality statistics by cause of death.