

Methodology

The basic term of population statistics and at the same time the subject of its observation is 'population', which is sometimes replaced with the term 'inhabitants' or 'people'. In the practice of Czech and the former Czechoslovak demographic statistics, since 1950 not only citizens of the Czech Republic or former Czechoslovakia are considered to be inhabitants, but all persons, who were registered for permanent residence on the given territory on the given date, i.e. also foreigners.

Until 2000, the data concerned only residents with permanent residence in the Czech Republic (regardless of their citizenship), since 2001 in relation to the 2001 Population and Housing Census, the data include also foreigners with visa for stay over 90 days and foreigners with asylum granted.

Since 1 May 2004 (in connection with the accession of the Czech Republic to the European Union) all data relate to citizens of the Czech Republic and foreigners with permanent residence in the Czech Republic, third-country nationals with temporary residence in the Czech Republic or a long-term residence permit, and citizens of EU countries, Norway, Switzerland, Iceland, Liechtenstein and their family members with reported temporary residence in the Czech Republic and foreigners with valid asylum in the Czech Republic.

Synonyms for 'inhabitants registered for permanent stay' are '(permanent) residing inhabitants' or '**(permanent) residents**', '**(permanent) residing population**'. And that is where the current concept of population monitored by statistics differs from the concept applied for the last time in the 1950 Census, in which the subject of monitoring was **present population** defined by mere presence on the spot as at the date of the Census. Thus, from the concept of present population all time series result for population statistics until 1950, more recent time series result from the concept of residing inhabitants. Differences in data between the 'present' and 'residing' population, however, have never been substantial and the data based on the concept of present population are comparable with the data resulting from the concept of residing population.

Another concept of resident population is represented on data in 2011 Census (as at 26 March 2011), which are based on the place of usual residence of a person (for the first time in the Czech Census history). Place of usual residence refers to the place where a person usually resides daily (notwithstanding any temporary absences for the purpose of recreation, visiting, work-related travel, or time spent in a health facility) and where the person is a member of a household. Therefore it probably corresponds better with an actual place of residence of a person, unlike the registered place of permanent residence. The place of usual residence of a person is the defining factor for processing the geographical characteristics and classification of persons, as well as for processing households or determining the occupancy of dwellings and buildings. **All data from 2011 Census** in this handbook is published **for the usual resident population**. However, other population figures and other demographic data are still based on the permanent residence.

The basis of information on demographic structure of population and its changes lies in periodic **population and housing censuses**. Data found in censuses are followed by intercensal statistical **population balance** and annually processed **statistics on marriages, divorces, births, deaths, abortions and migration**. At present, they result from the processing of statistical reports on marriages, births, and deaths provided by Registry Offices and from processing of data taken over from other information systems. Since 2007 the Information System of the Ministry of Justice of the CR is the source of data on divorces (before 2007 the statistics was based on processing of reports on divorce). The data on abortions and since 2013 source data on statistics on deaths by causes of death are provided to the Czech Statistical Office by the Institute of Health Information and Statistics of the CR. The data on migration are received from information systems of the Directorate of Alien Police and the Ministry of the Interior of the CR since 2001 (migration of foreigners) and 2005 (before 2005 the statistics was based on processing of reports on migration). At ensuring inputs and their processing, statistical bodies are obliged to protect individual data.

The data contain also information on events (marriages, births, and deaths) of Czech citizens with the permanent residence in the Czech Republic registered by special Registry Office that occurred abroad.

The results of data processing for regions comply with the constitutional Act No 347/1997 Sb, on the establishment of higher self-governing territories, as amended, Act No 387/2004 Sb, on changes of regional boundaries, and the classification CZ-NUTS introduced by the CZSO provision from 27 April 1999. Since 1 January 2008, in accordance with the Eurostat system of classifications, the level of districts NUTS 4 is replaced by LAU classification (Local Administrative Units), namely by level LAU 1. All regional breakdowns refer to the situation on 1 January of the given year unless otherwise stated.

Some of the terms used in the publication:

Mid-year population – *the number of inhabitants of a given territory at the moment, which was selected as the centre of the period monitored. Thus, number of inhabitants of the given territory at midnight from 30 June to 1 July of the year monitored published as ‘situation as at 1 July’ is considered to be the mid-year population in a calendar year. In some other countries the mid-year population is constructed in a different way – as an arithmetic mean of the start-period and end-period figures.*

End-period population – *the number of inhabitants of a given territory at the moment, by which the determined period is finished. The determined period is usually a calendar year. In that case, the end-of-year population (population as at 31 December) expresses the number of inhabitants at midnight on 31 December of the determined year.*

Population age structure *is an initial arrangement of demographic data for any demographic analysis. Population is classified by individual years of age (units of age), or abridged by five-year age group, or also by age categories defined in other way (e.g. children aged 0–14, seniors aged 65+, females in fertile (reproductive) age)¹. Age of an inhabitant is, in the Czech demographic statistics, the completed age, which a person reached at the moment of the survey, i.e. the age at the last birthday.*

Index of ageing – *a ratio of the number of inhabitants aged 65+ to the number of children aged 0–14.*

Average age – *an arithmetic mean of data on completed age for individual persons increased by a constant of 0.5 years. Average age expresses average age of living inhabitants. It did not relate or equal the average age at death or the life expectancy at birth, with which it is often interchanged.*

*Results from the Census and data on individual demographic events are classified also by **year of birth** of a person. Since age is defined as the age at the last birthday, the age of a person cannot be directly derived from the year of birth.*

Natural increase – *difference between the numbers of live births in the given period and the total number of deaths in the same period. When the number of live births is smaller than the number of deaths then the natural increase gains negative values (natural decrease).*

Total population increase – *the difference between the initial state of population of the given territory and the final state of population of the same territory. It consists of the sum of the natural increase and migration balance.*

Marriage *in the demographic statistics is an entering into a marriage, for which the relevant reporting unit*

¹ *Since 2004 Demographic Handbook revision, unlike previously issued versions, the term ‘productive age’, formerly usually determined as the age of 15–59 years for males and 15–54 years for females, has not been used.*

(Registry Office) sent a statistical report of marriage. To observe the definition of entering into a marriage from the point of view of family law and other legal provisions is what Registry Offices take care of and the Czech Statistical Office assumes that. Since relevant statistical reports are checked on the completeness of the record series of registry offices, it is guaranteed that the statistical records on marriages of inhabitants entered into in the territory of the Czech Republic and on registered marriages of citizens of the CR entered into abroad are exhaustive. The same applies to the statistics of births and deaths.

Since 2015 the nomenclature of educational attainment of groom/bride has been extended for an individual category for tertiary technical education.

Gross nuptiality rate – number of marriages per 1,000 mid-year population.

Nuptiality rate by age – number of marriages of males/females in the given age category per 1,000 mid-year males/females in the given age category.

Nuptiality rate of unmarried females by age – number of marriages of females in the given age category per 1,000 mid-year unmarried females in the given age category. Mid-year number of unmarried females is the average of two end-period figures (or the average of start-period and end-period figure in the census years).

Divorces are observed by the statistics on the basis of sets of data on divorces provided to the Czech Statistical Office by the relevant courts. Since 2007 Ministry of Justice of the CR has provided data only on granted requests for divorce petition (previously it provided data on all requests), and in electronic form, to the Czech Statistical Office. In retrospective overviews only separations of marriages, which correspond to the divorce in present meaning, are included (as they existed according to the legal norm valid before 1949). Since 1950 the only form of legal dissolution of marriage, which is divorce, existed. The last amendment, which had significant impact on the numbers of divorces and their structures, was Act No 91/1998 Sb, on the Family, which has come into effect on 1 August 1998.

Gross divorce rate – number of divorces per 1,000 mid-year population.

Divorce rate by duration of marriage – number of divorces in the given duration interval per 100 initial marriages (entered into before relevant number of year).

Total divorce rate – the proportion of marriages that would be terminated in divorce provided that divorce rates by duration of marriage recorded in a given year remain unchanged.

Number of births (live births, stillbirths) is obtained as a summarisation of individual statistical reports on birth. This number does not include births from undisclosed deliveries according to the Act No 20/1966 Sb, on Healthcare of People, as amended by the Act No 422/2004 Sb, and foundlings (mother is not identified).

Until 1948, the international **definition of live birth** was in force in the Czech Republic, for which the foetus with recognized signs of respiration or heartbeat (regardless of the length of gestation) was considered and the **definition of stillbirth**, for which the stillborn foetus born after 28th week of gestation was considered. In the years 1949–1952 according to the national definition, a foetus considered to be a child had to weigh at least 400 g. Its vitality was determined depending whether the foetus showed signs of life at birth or not. In the period 1953–1964, a foetus measuring at least 35 cm and weighing at least 1,000 g, which gestational age was at least 28 weeks was registered to be a child (all three criteria had to be met). The criterion of life was at least one breath. The live birth was also the foetus, which was born alive and did not meet given criteria but survived 24 hours. In case of multiple births, only one foetus had to have all signs of child and all foetuses from the gestation were considered to be children. In the period from 1 January 1964 until 29

February 1988 the internationally recommended definitions were re-applied, according to them: birth of live foetus is expulsion or extraction from its mother (regardless of the length of gestation) provided the foetus after its birth breathes or shows other signs of life, such as heartbeat, pulsation of the umbilical cord or movement of voluntary muscles, although the umbilical cord has not been cut or the placenta has not been delivered; the birth of still foetus is the birth of foetus, whose death occurred prior its complete expulsion or extraction of its mother (regardless of the length of gestation). The death is proven that the foetus does not breathe or does not show any other sign of life such as heartbeat, pulsation of umbilical cord or movement of voluntary muscles (Decree No 194/1964 Sb of the Ministry of Health). A stillborn child is foetus born after 28th week of gestation or, if the length of gestation can not be determined, the foetus weighing at least 1,000 g. From 1 March 1988 until 31 March 2012 the Decree No 11/1988 Sb of the Ministry of Health, on mandatory notifications of terminated pregnancies, death of a child, and death of the mother, was in force. It defined a live birth as a child who shows at least one sign of life (respiration, heartbeat, pulsation of umbilical cord, movement of voluntary muscles) and whose birth weight is 500 g or more, or whose birth weight is lower than 500 g if it survives 24 hours after delivery. A stillborn child was understood as a child not showing any signs of life and whose birth weight is 1,000 g or more.

On 1 April 2012, a regulation No 11/1988 Sb was cancelled by Act No 372/2011 Sb and the national legislation currently does not contain general definitions of a live birth and a stillbirth. These definitions along with all cases of abortions are stated only in the guidelines for filling in the 'Death certificate (Report on examination of the deceased person)' (in the regulation No 297/2012 Sb), namely for the needs of filling in of it. A live birth is defined in the Regulation (EU) No 1260/2013 on European demographic statistics. A stillbirth is also defined in the Commission Regulation (EU) No 328/2011 implementing Regulation (EC) No 1338/2008 of the European Parliament and of the Council on Community statistics on public health and health and safety at work, as regards statistics on causes of death, namely for the purposes of the respective regulations. The methodology of reporting **birth order** was changed in accordance with the Regulation (EU) No 1260/2013 on European demographic statistics in 2014. The birth order newly examined only in live births, and of live births.

Since 2015 the nomenclature of educational attainment of mother/father has been extended for an individual category for tertiary technical education.

Gross birth rate – number of live births per 1,000 mid-year population. A less used indicator is total birth rate expressing the number of births in total (i.e. live births and stillbirths) per 1,000 mid-year population.

Fertility rate by age – the number of live-born children delivered by females in a certain age category (e.g. by individual years of age or five-year age group) per 1,000 mid-year females in the given age category.

Total fertility rate – the number of children (live births) that would be delivered by each female during all her reproductive age (which is considered to be at the age of 15–49), should the fertility rate of females by age during this reproductive age not change and remain on the level of the year for which the total fertility rate is calculated. Zero mortality of females during reproductive age is assumed. If the total fertility rate reaches the value of about 2.1 (at the present level of mortality) it indicates that the fertility ensures mere reproduction of population without major natural increase or decrease. If it falls below this level, the fertility does not ensure mere reproduction of population and the population tends to decrease in the long-term.

Gross reproduction rate – a derived indicator giving the number of girls that would be in average live-delivered to one female in the given population throughout her reproductive age, provided that the fertility rate level remains the same in individual age groups as in a given calendar year. Zero mortality of females during reproductive age is assumed.

Net reproduction rate – it differs from the gross reproduction rate as it respects mortality conditions in the given population; it expresses the number of girls that would be delivered in average to one female

according to the gross reproduction rate and would live to see their mother's age in the years they were born. Provided the net reproduction rate is equal to 1.0 the stationary population would be maintained into the future.

Pregnancy rate by age – number of all terminated pregnancies (by a live-born or a stillborn child or by abortion) per 1,000 mid-year females in the given age category.

Total pregnancy rate – the average number of terminated pregnancies per a female throughout her reproductive age (age of 15–49) provided that age-specific pregnancy rates of a given year remain unchanged at the level of the year for which the total pregnancy rate is calculated throughout all her reproductive age.

An **abortion** in the demographic statistics is a premature termination of a pregnancy classified by a doctor as a termination of a pregnancy by abortion. The Czech Statistical Office receives data on abortions from the Institute of Health Information and Statistics of the CR (IHIS CR). Abortion statistics has been kept in the Czechoslovakia since 1953², more detailed statistics (specific by every category: induced, spontaneous, others) has been kept from 1958 in relation to coming into force of Act No 68/1957 Sb, on induced abortions. Before 1964 an abortion was a foetus which could not be considered as a live birth by in those days effective law. In the period from 1 January 1964 until 29 February 1988, according to the internationally recommended child definition, an abortion was a stillbirth born up to 28th week of gestation or (provided that the week of gestation cannot be defined) whose birth weight was below 1,000 g.

Since 1 March 1988 the definition of abortion were determined by the Regulation No 11/1988 Sb of the Ministry of Health of the CR. The Regulation defined the abortion as the termination of a pregnancy in which:

- a. the foetus does not show any sign of life and its birth weight is below 1,000 g or cannot be measured, if the pregnancy takes less than 28 weeks;
- b. the foetus shows at least one of the signs of life and its birth weight is below 500 g, but it does not live longer than 24 hours after delivery;
- c. the foetal egg without a foetus or gestational deciduas is removed out of the female's uterus.

The Regulation was cancelled by Act No 372/2011 Sb as of 1 April 2012. This existing legal regulation defines **foetus after abortion** as a foetus, which after the complete expulsion or extraction from its mother shows none of the signs of life and at the same time its birth weight is lower than 500 g and provided that the weight cannot be measured, if the pregnancy lasted less than 22 weeks.

Abortion is also termination of an ectopic pregnancy or an induced abortion made according to special regulations.

Categories of abortion³:

1. spontaneous;
2. ectopic pregnancies (termination of ectopic pregnancy);
3. induced abortion;
4. illegal abortion (those performed or initiated by the woman or by other unauthorized person).

² The penal code No 86/1950 Sb (§218, chapter 4) allowed to perform 'a killing of human foetus by a doctor in in-patient facility by the approval of a pregnant female' on given conditions (in danger of pregnant female's or her foetus' life). In 1953–1958 the statistics covered only these abortions.

³ Code list and nomenclature according to currently valid instructions for the content of the data structure: Závazné pokyny NZIS – National Register of Reproductive Health – Abortions (version 005_20160101_1, (valid from of 2016).

In the period of 1958–1986 the ectopic pregnancies were not registered. From 1987 ectopic pregnancies have been included, from 1988 to 1991 in the numbers of induced abortions, since 1992 in the category of other abortions. Unlike some other European countries, in the Czech Republic also menstrual extraction made by vacuum aspiration is included in induced abortions. Induced abortions also include RU-486 abortions (available in the CR since mid-2014).

The obligation of notification all kinds of abortions performed in (or treated after) in-patient medical facilities in the CR follow from legislative rules.

Gross abortion rate – number of abortions per 1,000 mid-year population.

Abortion rate by age – number of abortions at females in certain age category per 1,000 mid-year females in given age category. Similarly induced abortion rate or spontaneous abortion rate are defined.

Total abortion rate – an indicator, which is analogous to the total fertility rate. It expresses the number of abortions in average per one female in the population throughout her reproductive age (15–49 years), provided that the abortion rate of females by age does not change and remains the same as in the given year for which the total abortion rate is calculated. Zero mortality of females during reproductive age is assumed. In the same way also the total induced abortion rate is constructed as well as the total spontaneous abortion rate.

Mortality is together with birth rate one of the constituents of natural demographic reproduction. The basis for monitoring of mortality is individual statistical report on death, which is sent to the Czech Statistical Office by the relevant Registry Office.

Crude death rate – number of deaths per 1,000 mid-year population.

Death rate by age group – number of deaths per 1,000 mid-year population in the given age group. Since there is a big difference between the mortality of males and females, this indicator is usually given for both sexes separately.

Infant mortality – the number of deaths of infants (i.e. children under 1 year of age) per 1,000 live-born children in the same time interval.

Neonatal mortality – a similar indicator resulting from the number of children who died within 28 days of age (i.e. at the age of 0 to 27 completed days of life) per 1,000 live births.

Indicator of intensity of stillbirths occurrence is foetal mortality index, which is in practice defined as **stillbirth rate** – the number of stillbirths per 1,000 births in total in the given time interval.

The number of stillbirths and deaths under 7 days of age (i. e. at the age of 0 to 6 completed days of life) per 1,000 total births represents the indicator of **perinatal mortality**.

For characterization of the survivorship function of a certain population life tables are used, which with the help of life table functions, all of which are mathematically related, provide the most precise expression of mortality intensity of the population monitored. The result of the calculation of life tables is, besides others, indicator of life expectancy (expectation of life).

In 2018, the Czech Statistical Office modified the methodology for constructing mortality tables, with the main change being the use of the Kannisto function (instead of Gompertz-Makeham) for modeling mortality in the highest ages⁴. All data in this publication are based on mortality tables prepared by this new methodology.

Life expectancy (expectation of life) – shows the number of years probably live by an x-year-old person, providing that the survivorship function established by the life table remains unchanged throughout the x-year-old person's remaining life. The indicator is usually used in the form of the life expectancy (expectation of life) at birth, in which it expresses the average expected length of life of a person just born.

To analyse mortality it is necessary to know also the share of individual causes of death in population. For classification of causes of death there is an internationally recommended taxonomy, which is released by World Health Organization (WHO). In the Czech Republic it has been used since 1919, the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) with its further updates (since 2009) nowadays. The Institute of Health Information and Statistics of the Czech Republic is responsible for the use of ICD-10 in practice (including the implementation of its updates in the Czech Republic). Since 2011, selection of underlying cause of death is made by a programme for automated coding (IRIS).

The revision of ICD and its period of legal force in the CR:

Revision	WHO approved in	Legal force in the CR
ICD-3*	1920**	1919–1930
ICD-4	1929**	1931–1940
ICD-5	1938**	1941–1948
ICD-6	1948	1949–1957
ICD-7	1955	1958–1967
ICD-8	1965	1968–1978
ICD-9	1975	1979–1993
ICD-10	1990	1994–

*) International Classification of Causes of Deaths

**) Approved by International Statistical Institute, resp. by Health Organisation of League of Nations.

There is no full comparability between revisions.

Class/chapter of causes of death classification stated in Demographic Handbook:

Class/Chapter	ICD-6	ICD-7
I	Infective and parasitic diseases	Infectious and parasitic diseases
II	Neoplasms	Neoplasms
III	Allergic, endocrine, metabolic and nutritional diseases	Allergic, endocrine, metabolic and nutritional diseases
IV	Diseases of the blood and blood-forming organs	Diseases of the blood and blood-forming organs
V	Mental disorders, psychoneuroses and personality disorders	Mental disorders, psychoneuroses and personality disorders
VI	Diseases of the nervous system and sense organs	Diseases of the nervous system and sense organs
VII	Diseases of the circulatory system	Diseases of the circulatory system
VIII	Diseases of the respiratory system	Diseases of the respiratory system
IX	Diseases of the digestive system	Diseases of the digestive system
X	Diseases of the genitourinary system	Diseases of the genitourinary system
XI	Deliveries, complications of pregnancy, childbirth, and the puerperium	Deliveries, complications of pregnancy, childbirth, and the puerperium
XII	Diseases of the skin	Diseases of the skin
XIII	Diseases of the bones and musculoskeletal system	Diseases of the bones and musculoskeletal system
XIV	Congenital malformations	Congenital malformations
XV	Certain diseases of early infancy	Certain diseases of early infancy
XVI	Symptoms, senility, and ill-defined conditions	Symptoms, senility, and ill-defined conditions

⁴ For more information, see <https://www.czso.cz/csu/czso/life-tables-methodology>.

XVII	Accidents and poisonings	Accidents and poisonings, and violence
Class/Chapter	ICD-8	ICD-9
I	Infectious and parasitic diseases	Infectious and parasitic diseases
II	Neoplasms	Neoplasms
III	Endocrine, metabolic and nutritional diseases	Endocrine, nutritional and metabolic diseases, and immunity disorders
IV	Diseases of the blood and blood-forming organs	Diseases of the blood and blood-forming organs
V	Mental disorders	Mental disorders
VI	Diseases of the nervous system and sense organs	Diseases of the nervous system and sense organs
VII	Diseases of the circulatory system	Diseases of the circulatory system
VIII	Diseases of the respiratory system	Diseases of the respiratory system
IX	Diseases of the digestive system	Diseases of the digestive system
X	Diseases of the genitourinary system	Diseases of the genitourinary system
XI	Deliveries, complications of pregnancy, childbirth, and the puerperium	Complications of pregnancy, childbirth and the puerperium
XII	Diseases of the skin and subcutaneous tissue	Diseases of the skin and subcutaneous tissue
XIII	Diseases of the bones and musculoskeletal system	Diseases of the musculoskeletal system and connective tissue
XIV	Congenital malformations	Congenital malformations
XV	Certain causes of perinatal morbidity and mortality	Certain conditions originating in the perinatal period
XVI	Symptoms and conditions etiologically not defined	Symptoms, signs, and ill-defined conditions
XVII	Injury, poisoning and violence	Injury and poisoning
Chapter	ICD-10	
I	Certain infectious and parasitic diseases	
II	Neoplasms	
III	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	
IV	Endocrine, nutritional and metabolic diseases	
V	Mental and behavioural disorders	
VI	Diseases of the nervous system	
VII	Diseases of the eye and adnexa	
VIII	Diseases of the ear and mastoid process	
IX	Diseases of the circulatory system	
X	Diseases of the respiratory system	
XI	Diseases of the digestive system	
XII	Diseases of the skin and subcutaneous tissue	
XIII	Diseases of the musculoskeletal system and connective tissue	
XIV	Diseases of the genitourinary system	
XV	Pregnancy, childbirth and the puerperium	
XVI	Certain conditions originating in the perinatal period	
XVII	Congenital malformations, deformations and chromosomal abnormalities	
XVIII	Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	
XIX	Injury, poisoning and certain other consequences of external causes	
XX	External causes of morbidity and mortality	

Migration – moving of persons between two territorial units related to the change of place of residence. A synonym for ‘moving’ is ‘migration’. To distinguish between migration inside or outside a certain territorial unit, the terms immigrants (immigration) and emigrants (emigration) are used.

In demographic statistics of the Czech Republic migration is change of a municipality (in Prague of a basic settlement unit) of the permanent place of residence of a person on the territory of the CR or across the borders of the CR. Since 2001 moving of foreigners with long term stay in CR is also included into statistics of internal and external migration. Number of cases of migrations is a summarisation of individual data on migration mentioned in statistical notifications of migration provided to statistical authorities by stay registration offices and aliens’ registration office.

*Time comparability of data on **internal migration** is rather limited by changes of the scope of migration within the City of Prague (in detail see explanatory notes tab. 9-1) and territorial restructurings.*

External migration – *change of the permanent or long term stay of a person (as well as temporary in case of citizens) from the CR to abroad or from abroad to the Czech Republic.*

Migration balance (net migration) – *difference between the number of immigrants and emigrants. Together with natural increase it is a basic data for balance of population of a territory monitored. If the number of those moving in a territorial unit exceeds the number of those moving out, it is a positive migration balance, i.e. migration increase. When the opposite is true, i.e. the number of emigrants is higher than the number of immigrants, it is a negative migration balance, i.e. migration decrease.*