

## 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 “number of inhabitants”. 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. Since 2001, the figures also include (in accordance with the Population and Housing Census 2001) foreigners with long-term stay (i.e. the stay based on visa over 90 days, as stipulated by Act No. 326/1999 Coll.) and foreigners with granted asylum status (in compliance with Act No. 325/1999 Coll.). Since 1st May 2004, in accordance with amendment No. 326/1999 Coll., the figures include also citizens of the European Union with temporary stay on the territory of the Czech Republic, and citizens of third countries with long-term stay. The data contain also information on events (marriages, births and deaths) of Czech citizens with permanent residence of CR that occurred abroad.

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 26th 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 demographic data, resulting from the processing of statistical reports, data taken over from other information systems and statistical population balance 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.

### **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 30th June to 1st 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 initial and final status.

**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 age). Age of an inhabitant is, in the demographic statistics, the completed age, which a person reached at the moment of the survey, i.e. the age at the last birthday.

Another often used indicator of population age structure is **index of ageing**, which is constructed as a ratio of the number of inhabitants aged 65+ to the number of children aged 0–14. The demographic handbook (since 2004 revision), unlike older publications, does not use the term “productive age”, which was formerly usually determined as the age of 15–59 years for males and 15–54 years for females.

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.

**Average age of population** is 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 has nothing in common with average age at death or with the life expectancy (expectation of life), with which it is often interchanged.

**Natural increase of population** – 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.

**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 (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 complete series of records of registry offices, it is guaranteed that the statistical records on marriages of inhabitants entered into in the territory of the Czech Republic and those registered by special Registry Office in Brno (marriages of citizens of the CR concluded abroad) are exhaustive. The same applies to the statistics of births and deaths.

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

**Nuptiality rate by age** – number of marriages of males or females in the given age category per 1,000 mid-year males or 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 females in the given age category. Mid-year number of females is the average of two end-period figures.

**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 Czech Statistical Office obtains from Ministry of Justice CR data in electronic form only on granted requests for divorce petition. 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 Coll., on the Family, which has come into effect on 1st August 1998.

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

**Divorce rate by age** – number of divorces of males or females in the given age category per 1,000 mid-year males or females in the given age category.

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

As at 1 April 2012, a regulation No. 11/1988 of the Ministry of Health of the CR was cancelled by Act No. 372/2011 Coll, which defined a **live birth** as a child who gives at least one sign of life (respiration, heartbeat, umbilicus pulsation, active movement of muscles) and whose birth weight is 500 g or more, or whose birth weight is below 500 g if it survives 24 hours after delivery. A **stillborn child** was understood as a child not showing any signs of life, whose birth weight is 1,000 g or more.

General definitions of terms live birth and stillbirth are not contained in the currently valid legislation (at time of the release of this handbook). 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 relevant regulation), namely for the needs of filling in of the Death certificate (Report on examination of the deceased person). A stillbirth is also defined in the Commission Regulation (EU) implementing Regulation (EC) 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 regulation.

**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 that would be delivered by each female (live births) 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 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 1 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.

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. Basic data on abortions are obtained by health authorities, which provide them through the Institute of Health Information and Statistics of the CR to the Czech Statistical Office. Abortion statistics has been kept in the Czechoslovakia since 1953, a detailed statistics has been kept from 1958 in relation to coming into force of Act No. 68/1957 on induced abortions.

Regulation No. 11/1988 of the Ministry of Health of the CR, cancelled by Act No. 372/2011 Coll., 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.

Existing legal regulations (Act No. 372/2011 Coll.) define only **foetus after abortion**, which is 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. In the period of 1958–1986 ectopic pregnancies were not included in abortions. From 1987 ectopic pregnancies have been included, from 1988 to 1991 in the numbers of spontaneous abortions, otherwise in the category of other abortions. Unlike some other European countries, in the Czech Republic also menstrual regulation made by vacuum aspiration is included in induced abortions.

Categories of abortion:

- a. *spontaneous abortion: spontaneous expulsion of a foetus from uterus before the end of 28th week of gestation;*
- b. *induced abortions: legally induced abortion by means of vacuum aspiration, which can be performed in early stages of gestation (i.e. till 7th week in case of first pregnancy and till 8th week in other cases) and by other methods till 12th week of gestation, for health reasons till 24th week of gestation;*
- c. *other abortions: as a result of an injury or criminal acts;*
- d. *ectopic: termination of ectopic pregnancy.*

**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.

**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 (according to the number of induced abortions) as well as the total spontaneous abortion rate (according to the number of spontaneous abortions).

Possibilities of international comparison of abortion indicators are limited. Some European countries do not show abortions at all (abortions are there considered to be a private issue of a female and no information can be provided about them); some countries do not show spontaneous abortions or induced abortions performed by private doctors. The Czech Republic belongs to several countries that show abortions in full.

**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.

**Mortality** is together with birth rate one of the constituents of 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, who died within 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 **foetal mortality rate** – the number of stillbirths per 1,000 births in total in the given time interval and territory.

The number of stillbirths and deaths under 7 days of age 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).

**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). The 9th International Classification of Diseases (ICD-9) was in the CR used at 1979–1994, since 1994, causes of death have been classified according to the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) with its further updates issued by WHO (since 2009). There is no full comparability between the ICD-9 and ICD-10. The Institute of Health Information and Statistics of the Czech Republic is responsible for the use of ICD-10 in practice. Since 2011, selection of underlying cause of death is made by a programme for automated coding (IRIS).

### **ICD-9 International Classification of Diseases**

- I. Infectious and parasitic diseases
- II. Neoplasms
- III. Endocrine, nutritional and metabolic diseases, and immunity disorders
- IV. Diseases of the blood and blood-forming organs
- V. Mental disorders
- VI. Diseases of the nervous system and sense organs
- VII. Diseases of the circulatory system
- VIII. Diseases of the respiratory system
- IX. Diseases of the digestive system
- X. Diseases of the genitourinary system
- XI. Complications of pregnancy, childbirth and the puerperium
- XII. Diseases of the skin and subcutaneous tissue
- XIII. Diseases of the musculoskeletal system and connective tissue
- XIV. Congenital malformations
- XV. Certain conditions originating in the perinatal period
- XVI. Symptoms, signs, and ill-defined conditions
- XVII. Injury and poisoning
- E XVII. External causes of injury and poisoning

### **ICD-10 International Statistical Classification of Diseases and Related Health Problems**

- I. Certain infectious and parasitic diseases
- II. Neoplasms
- III. Diseases of the blood and blood-forming organs and some disorders concerning 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
- XIX. Injury, poisoning and some other consequences of external causes
- XX. External causes of sickness and mortality rates

**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 city-planning district) 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.

**Internal migration** – Time comparability of data on internal migration is rather limited by changes of the scope of migration within the City of Prague and territorial restructurings (in detail see explanatory notes tab. 9-1). Before 1992 also migration between the Czech Republic and Slovak Republic was considered to be internal migration. Statistics of internal migration was introduced in the Czechoslovakia in 1950.

**External migration** – change of the permanent or long term stay of a person from the CR to abroad or from abroad to the Czech Republic.

**Migration balance** – the 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.

Data in the chapter 11 “International comparison” were drawn from Eurostat database.