Czech National Cancer Control Plan 2030

SUMMARY OF ANALYTICAL STUDY

Czech National Cancer Control Plan 2030

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

Czech National Cancer Control Plan 2030:
Summary of analytical study

Data and information background of Czech oncology

Czech National Cancer Control Plan 2030

ÚZIS ČR

Ústav zdravotnických informací a statistiky České republiky
Institute of Health Information and Statistics of the Czech Republic

Data background for evaluation of cancer care in the Czech Republic: National Health Information System (NHIS)

The Czech Society for Oncology has been building a comprehensive information system, which relies mainly on data from the National Health Information System (NHIS) and its components (national registries maintained according to applicable laws). These comprehensive registries are complemented in selected areas by detailed clinical registries and data collections from standardised data warehouses of hospitals forming the network of comprehensive cancer centres.

The NHIS is a unified national public administration information system, which collects and processes data from the basic registers of public administration bodies, ministries, health service providers, or other persons submitting data to the NHIS. The procedure and conditions for the management of and access to these data are comprehensively regulated in Sections 70–78 of Act No. 372/2011 Coll. (on health services and conditions of their provision), as amended, and its implementing regulations, in particular Decree No. 116/2012 Coll. of the Ministry of Health on the transmission of data to the National Health Information System, or Decree No. 373/2016 Coll. on the transmission of data to the National Health Information System (with effect from 1 January 2017).

The following data sources were used for the analytical study of the Czech National Cencer Control Plan 2030 (national registries – components of the NHIS):

- **Czech National Cancer Registry (CNCR):** The purpose of the Czech National Cancer Registry is to register cancers and periodically monitor their further development. The CNCR provides aggregate data for statistical surveys at both national and international level, as well as for epidemiological studies and medical research. CNCR as a population-based registry of individual neoplasms has been operated by the Institute of Health Information and Statistics since 1976, and data are available until 2020 (continuous closure and validation is ongoing for 2021).

- **National Registry of Reimbursed Health Services (NRRHS)** contains inpatient and outpatient data from health insurers, including complete data on reported diagnoses, procedures, and treatments; data are currently available from 2010-2021.

- **Death Certificate System (DCS)** is the primary source of information about each death. It is completed by the examining physician without delay after the examination of the deceased, and in addition to basic socio-demographic characteristics, it also records the sequence of causes leading to death (since 1994 coded using ICD-10), with data available until 2020.

Main sources of demographic data and population health indicators

Sources of demographic population data

- As part of monitoring the development of the Czech population, the Czech Statistical Office (CSO) processes data on the demographic structure of the Czech population, which are available on the CSO website. These data cover the main demographic characteristics of the Czech population, in particular the total number of inhabitants, detailed age structure, life expectancy characteristics and, for example, projections of the age structure of the Czech population up to 2050.

European Health Surveys in the Czech Republic

❑ **European Health Interview Survey (EHIS)**
  - The European Health Interview Survey (EHIS) is an important component of health statistics internationally. The implementation of this survey is mandatory for EU countries according to Regulation (EC) No 1338/2008 of the European Parliament and of the Council of 16 December 2008 on Community statistics on public health and health and safety at work. The first wave of the EHIS was carried out according to a uniform methodology on a voluntary basis between 2006 and 2009, and the second wave of the EHIS was carried out between 2013 and 2015 in all EU28 countries. The implementation of the sample surveys is methodologically coordinated within the Technical Group TG HIS of Eurostat, composed of representatives of the Member States; the last meeting of the TG HIS took place on 21 March 2019 in Luxembourg.

❑ **European Health Examination Survey (EHES)**
  - The European Health Examination Survey (EHES), involving a medical examination, focuses mainly on cardiovascular diseases; the monitoring of selected indicators is among the indicators proposed by WHO to meet the goal of reducing premature mortality from chronic diseases through appropriate preventive activities. Thus, the EHES aims to monitor the situation in the population and provide the information needed to improve health status, to reduce the costs of treating diseases and their complications, and to increase the productivity of the population of economically active age.
  - The main methodologist in the implementation of medical examinations with venous blood sampling within Europe is the coordinating centre for the implementation of the EHES, the Institute for Health and Social Care (THL) in Helsinki. It is helping to build the EHES network in EU countries and aims to ensure standardised and high quality data collection through national medical examination surveys. This is implemented in about 15 European countries.

Classification system CZ-DRG for acute inpatient care (AIC) in the Czech Republic

The assessment of the burden, performance, outcomes and real costs of acute inpatient care provided to cancer patients in the Czech Republic is based on a legally anchored and fully sustainable DRG system. A major contribution of the Czech concept in this area is the long-standing reference network of hospitals that generate an annual reference database of all inpatient cases with a high resolution of care content and cost items.

- **The CZ-DRG hospital case classification system** is a tool for classifying (sorting) patients into a limited number of groups in which individual hospital cases are **clinically and economically similar** to each other. The CZ-DRG system for AIC is an interdependent **set of classification rules, methodological procedures and algorithms, codebooks, information systems and software tools** that are necessary for its correct functioning and that also influence the processes and behaviour of providers not only in AIC but also in other health segments.

- Main benefits of the CZ-DRG system with regard to the AIC reimbursement process:

  1. **Reflection of the real AIC provision:** development of a classification system structure with an adequate clinical detail that corresponds to 21st century treatment modalities.

  2. **Reflection of the real cost of AIC:** calculation of the cost of hospitalisation cases according to internationally recognised methodological procedures implemented in the network of reference hospitals (representative set of AIC providers in the Czech Republic), which regularly submit data on the production and economics of AIC to the CZ-DRG.

Authorisation of the IHIS CR on the basis of **§ 41a** of Act No. 48/1997 Coll., on Public Health Insurance and on Amendments to Some Related Acts:

(1) For the purpose of rationalising the functioning of the public health insurance system in the field of acute inpatient care, the **Institute of Health Information and Statistics of the Czech Republic** (IHIS CR) **shall establish and annually update** a list of groups of hospitalisations in acute inpatient care related to the diagnosis (hereinafter referred to as "groups"), their relative costliness, rules for classifying hospitalisations into groups and methodologies related to reporting of reimbursed services provided in acute inpatient care.

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Data basis of the CZ-DRG system – network of reference hospitals (RH): coverage of cancer centres and regional hospitals

1	ChCC of UH Brno
2	ChCC of UH in Motol
3	HOC of UH Brno
4	HOC ofUH Hradec Králové
5	HOC of UH Král. Vinohrady
6	HOC of UN Olomouc
7	HOC of UN Plzeň
8	HOC of Inst. of Haemat. and Blood Transf.
9	CCC of UH Královské Vinohrady
10	CCC of UH Hradec Králové
11	CCC of UH Olomouc
12	CCC of UH Plzeň
13	CCC of UH Ostrava
14	CCC of UN Motol, CMH, Hosp. na Homolce
15	CCC RH Liberec
16	CCC RH Zlín
17	CCC of MMCI in Brno
18	CCC of City Hospital in Ústí nad Labem
19	CCC of Hospital České Budějovice
20	CCC of Hospital Jihlava
21	CCC of Hospital na Bulovce, GUH, UTN
22	CCC Nový Jičín
23	CCC of the Pardubice Region

The centres are summarised according to https://www.linkos.cz.

ZDRAVÍ2030

Abbreviations:
CCC = Comprehensive Cancer Centre
HOC = Haemato-Oncology Centre
ChCC = Children's Cancer Centre
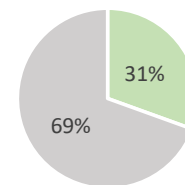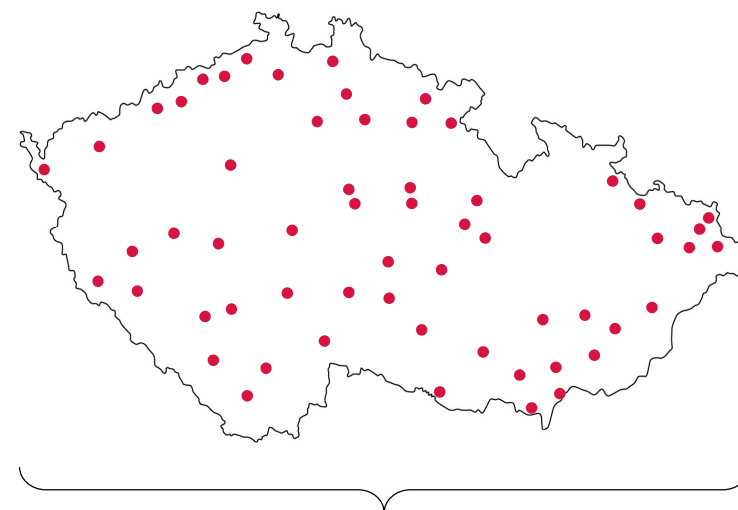UH = University Hospital
RH = Regional Hospital

Cancer centres in the Czech Republic
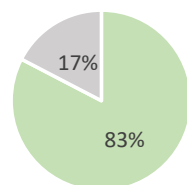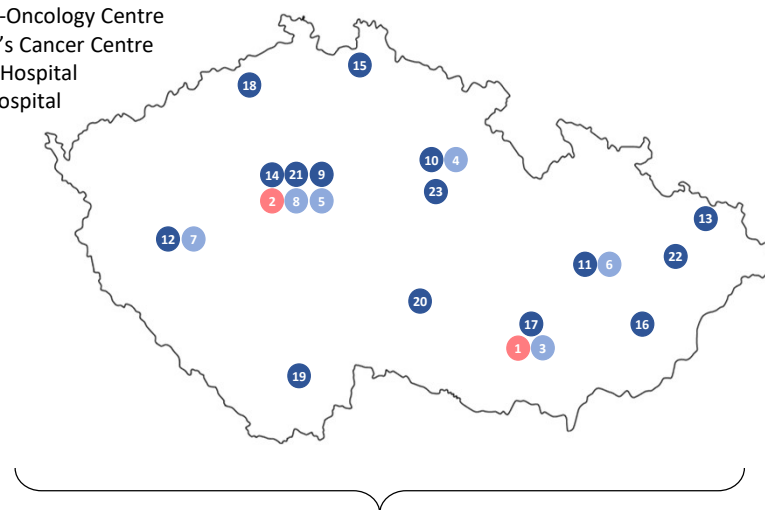
N=23

- Cancer centre is part of the network of RH.
- Cancer centre is not part of the network of RH.

17%
83%

Regional hospitals in the Czech Republic

N=59

- Regional hospital is part of the network of RH.
- Regional hospital is not part of the network of RH.

31%
69%

The network of reference hospitals covers more than 80% of highly specialised centres in providing care in the fields of oncology and haemato-oncology. Within the AIC providers established by regional authorities, the network of reference hospitals covers approximately one third of them.

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Transparent publication of the CZ-DRG classification system on a web portal

The portal (in Czech langugage) is available at **https://drg.uzis.cz/klasifikace-pripadu/web/**

- Structure and units of the system

- Classification rules at the level of DRG groups

- Interactive web-based classifier

- Search

- Cost data

- Difference documentation compared to the previous version of the system

Infrastructure of cancer care providers available on-line

The principal aim of this information gateway is to provide centralized and guaranteed scientific information about the fulfilment of the National Cancer Control Programme in the Czech Republic. This website provides a clearly arranged and comprehensive presentation of the Czech cancer centres network, involving basic information about each healthcare facility.

Main aspects and challenges for objectives of the Czech National Cancer Control Plan 2030 in the area of building the data and information base for the Czech cancer care

Czech oncology has a functional information system that covers all necessary dimensions of evaluation with almost 100% population representativeness. A number of sub-components are already interconnected and derived from administrative data, thus reducing the administrative complexity of data collection and validation.

In particular, the main objectives and challenges in this area involve:
- ❏ Strengthening the computerisation and interoperability of partial collections of data, introduction of standardised e-recording of cancer diagnosis and treatment, standardisation of hospital information system exports.
- ❏ Full computerisation of data collection for the Czech National Cancer Registry, including real-time linking of reports from the laboratory segment
- ❏ Completion of the predictive superstructure above the area-based sub-registries to strengthen predictions in the areas of economic and staffing needs, impact of new technologies and drugs
- ❏ Completion of a comprehensive information system for mapping patient trajectories in the healthcare system, identifying desirable and undesirable trajectories and evaluating measures for improvement
- ❏ Development of a comprehensive information system for planning and evaluating end-of-life care for patients
- ❏ Strengthening the publication of comprehensive indicators of access to and quality of care
- ❏ Implementing the concept of open data in cancer care

The goal of the Czech National Cancer Plan 2030 is a fully computerised Czech National Cancer Information System
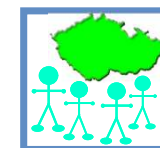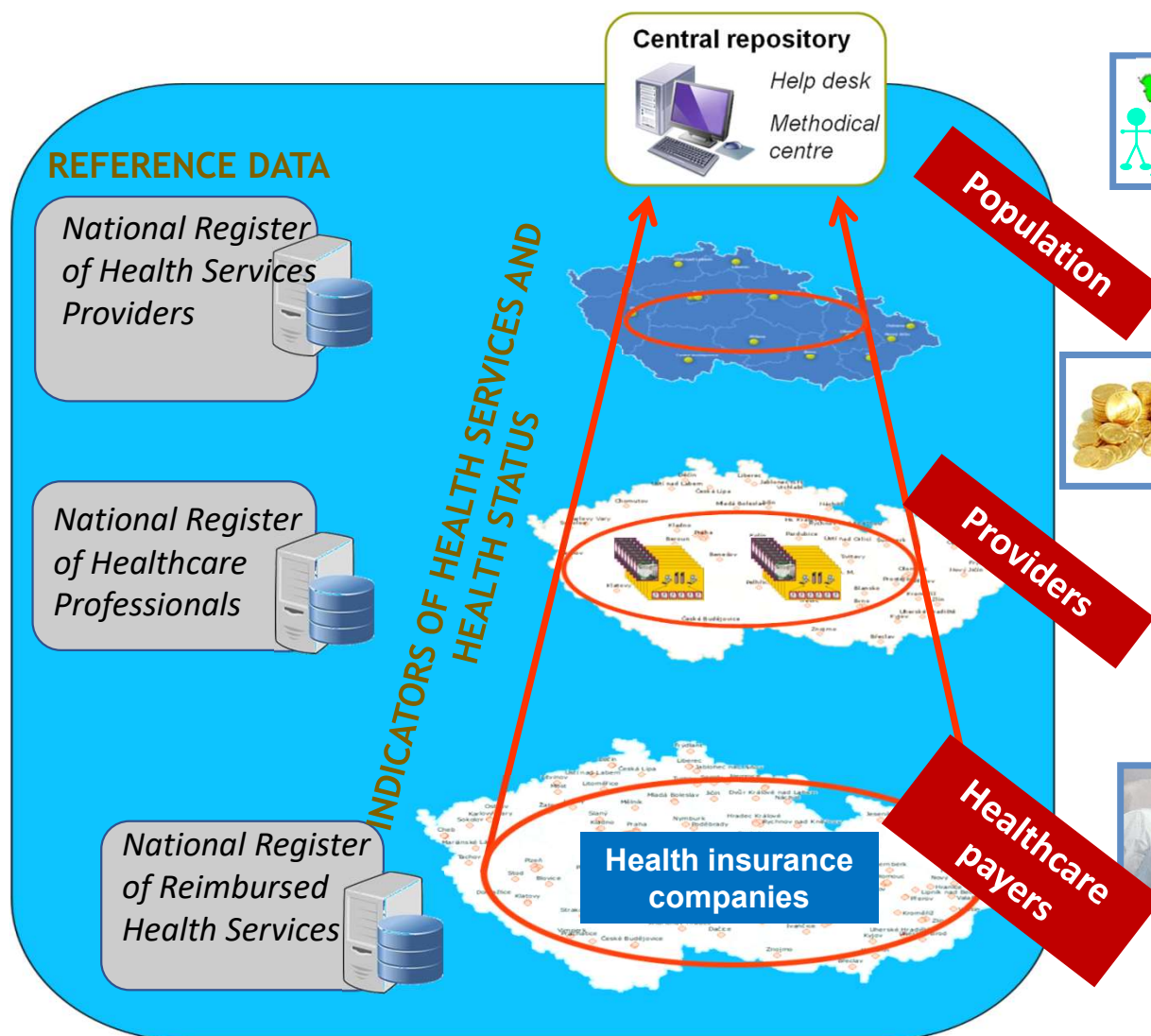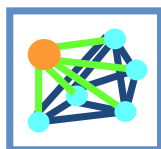
Czech National Cancer Registry: filling the database in the transition to full computerisation
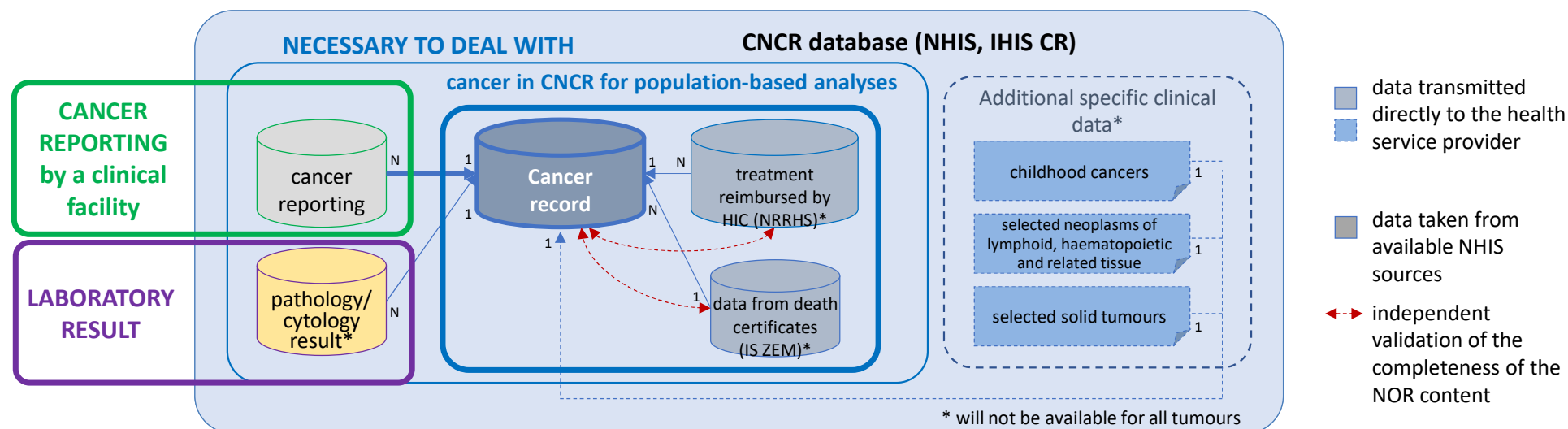
Basic CNCR record:

- reporting to CNCR – "Incidence of neoplasm" form
- result/report from examination done by a pathologist/cytologist
- reported treatment of cancer, reimbursed by HIC (NRRHS)
- data on deaths from death certificates – date, causes, place (IS ZEM)

validation of records reported by health service providers

completion of necessary data from the NHIS

Resulting cancer record

Additional specific clinical data

tumour markers, specific diagnostic classification and risk data, results of clinical and laboratory tests, treatment regimens and protocols, treatment outcomes, patient follow-up, etc. for selected specific groups of neoplasms:

- childhood cancers
- selected neoplasms of lymphoid, haematopoietic and related tissue
- selected solid tumours – e.g. rare diseases

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Main aspects and challenges for objectives of the Czech National Cancer Control Plan 2030 in the area of building the data and information base for the Czech cancer care

Due to the expected growth of the epidemiological, clinical and financial burden of cancer, strategic modelling of predictions in all these areas is essential in the objectives of the Czech National Cancer Control Plan 2030. For this purpose, a wide integration of available data sources will be carried out and integrated databases will be opened for secondary data use after modifications to protect personal and sensitive data. A modern basis for automating the computation of predictive model scenarios will be strengthened, including the integration of AI-based technologies.

Key data inputs for the mutual integration and strengthening of predictive models

I. Data from the National Register of Reimbursed Health Services, CZ-DRG reference database, cost of care models

- Essential basis of administrative data for assessing care content, costs and outcomes.

II. Population-based data, epidemiological and clinical probability models

- In important segments of care, with sufficient background in population and clinical registries, predictive models have been built assessing the incidence and prevalence of patients treated. These models serve as a correction factor in clinical burden predictions; their input data and results are an essential component of a new prediction system.

III. Horizon scanning, assessing new drug indications and implementation of new technologies

- Correction of predictions for 2018, 2019 and partly 2020, including prediction of the impact on reimbursement in case of new indications for existing therapies or in case of new therapies.

IV. Operational and staffing data sources, internal hospital data sources

- In particular, the National Register of Health Services Providers and the National Register of Healthcare Professionals.

An important goal of the Czech National Cancer Control Plan 2030 is the widespread integration of partial data sources and the development of a new generation of predictive models supporting cancer care management

Prediction

Correction of prevalence of treated patients

Correction of incidence of treated patients

Epidemiology – new inputs

Incidence of treated patients derived from the incidence of a given disease [+ treatments and standards]

Epidemiology – trends

Prevalence of treated patients derived with adjustment for survival patterns [+ treatments and standards]

Real data with reimbursements

Exports of administrative data from health insurance companies (production data + reimbursements)

Horizon scanning

Broadening the spectrum of indications. Emerging indications for existing therapies and new therapies.

Correction of current unit prices of therapies

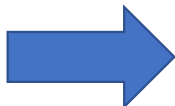All available demographic and epidemiological predictions point to a significant increase in the number of cancer cases and the number of "person-years" of treatment consumed. Together with the development of new technologies, these are major challenges for predictive modelling of cancer care needs.

ZDRAVÍ 2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

The Czech National Cancer Control Plan 2030 will develop and implement a new generation of predictive models in response to the social and demographic determinants of cancer care

Demografic ageing of the population
Rising old-age dependency ratio

Projections of the development of the number of person-years

High variant	
Medium variant	
Low variant	

34 077
27 450
20 079

?
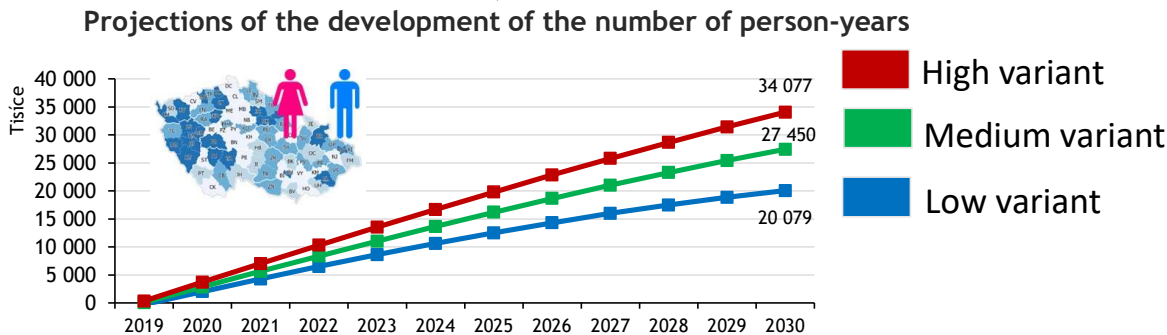
"Price of success"

Rising prevalence of patients

"Secondary" morbidity

Increasing life expectancy, improving treatment outcomes, increasing survival of cancer patients

Partial objectives of the Czech National Cancer Control Plan 2030 are aimed at the creation and implementation of completely new complex information systems strengthening important components of the organisation of cancer care

Prevention and screening programmes

- ❑ Information support for primary prevention programmes and population health surveys

- ❑ Developing the information base of screening programmes towards personalised risk assessment

- ❑ Development of the National Screening Centre

Early access to specialised care

- ❑ Planned development of infrastructure for different types of centres and clinics

- ❑ Planning of needs and systematic provision of financial resources for innovative and centre-based care

- ❑ Effective cooperation within regional networks of centres

- ❑ Provision of specialised and general follow-up care

Palliative and end-of-life care for patients

- ❑ Integrated assessment of inpatient, outpatient and home care

- ❑ Development of an information base for the evaluation of care in the health and social care interface, linking with health service providers

- ❑ Mapping patient trajectories at the end of life

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

The Czech National Cancer Control Plan 2030 aims to build a comprehensive information system to assess the availability and quality of care at the end of life

Diagram of the structure of palliative care in the Czech Republic

Palliative care

General

Part of clinical care provided to patients at advanced stages of disease. It is provided by physicians of various specialties.

Children's "hospices"

Children's hospices represent a significantly different type of care. It is more of a relief service. The term hospice is therefore partly misleading. Palliative care for paediatric patients is a separate issue.

Specialised

Home palliative care

The so-called "mobile hospice" provides specialised palliative care in a home environment through visits by nurses and physicians.

Palliative care unit (PCU)

A department within a healthcare facility providing specialised palliative care to patients while making hospital care available. There are two PCUs in the Czech Republic.

Inpatient hospice

A standalone inpatient facility providing specialised palliative care. There are currently 17 hospices in the Czech Republic.

Consultant team

An interdisciplinary team operating within a healthcare facility.

The predicted demographic development of the Czech population, ageing and associated morbidity will require a change in the concept of palliative care. New models of integrated care must be based on multidisciplinary hospital consultative teams and on close cooperation of outpatient health and social services, e.g. mobile specialised palliative care, home care, etc. Strengthening the capacity of mobile teams and teams capable of providing care in the patients' home environment is a highly effective measure that saves staff capacity and financial resources, especially in acute inpatient care in hospitals. Multilevel models of palliative care organisation and models that allow its early integration in the care processes provided by different segments of providers should be sought.

The Czech National Cancer Control Plan 2030 aims to develop the data basis for prevention and screening programmes in oncology

GUARANTOR: NATIONAL SCREENING CENTRE

NSC NÁRODNÍ SCREENINGOVÉ CENTRUM

Monitoring the cancer burden

- cancer epidemiology in the target population
- long-term impact indicators

Data source: Czech National Cancer Registry

Monitoring the screening process using clinical data

- early quality indicators in screening centres
- detection of cancers and precancerous lesions in screening

Data source: screening centres, specialised registries

Monitoring the screening process using administrative data

- population-based early quality indicators
- monitoring of screening availability for the target population

Data source: National Health Information System

The combination of all three levels creates a comprehensive information system that enables a comprehensive assessment of all aspects of the performance, quality and cost of the screening process.

The Czech National Cancer Control Plan 2030 aims to develop the data basis for prevention and screening programmes in oncology

The Czech screening programmes are equipped with a unique system for direct invitation of citizens to the screening. This information system is implemented in a standardised way in all health insurance companies and allows full control over all processes. The strategic challenge is to move the evaluation towards individualised risk analysis and personalised management of prevention programmes.

Evaluation of participant's pathway in the programme
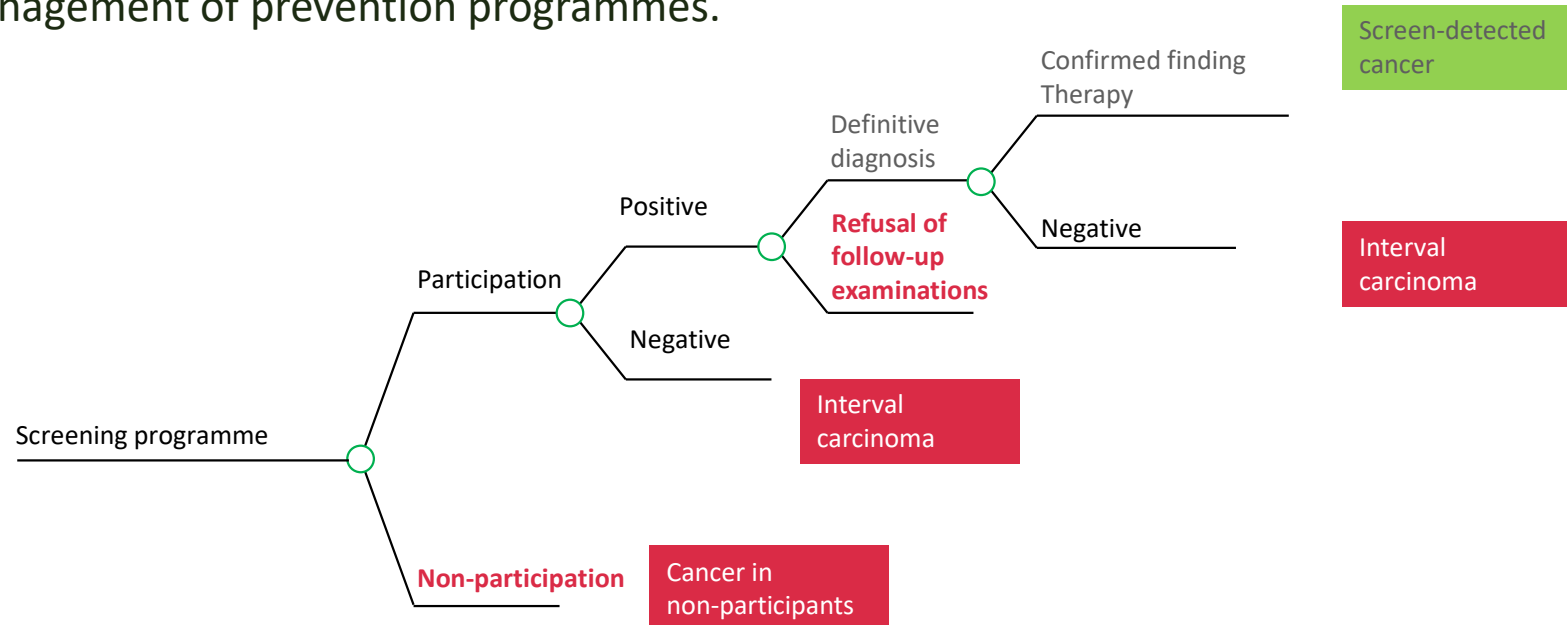
MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

Czech National Cancer Control Plan 2030:
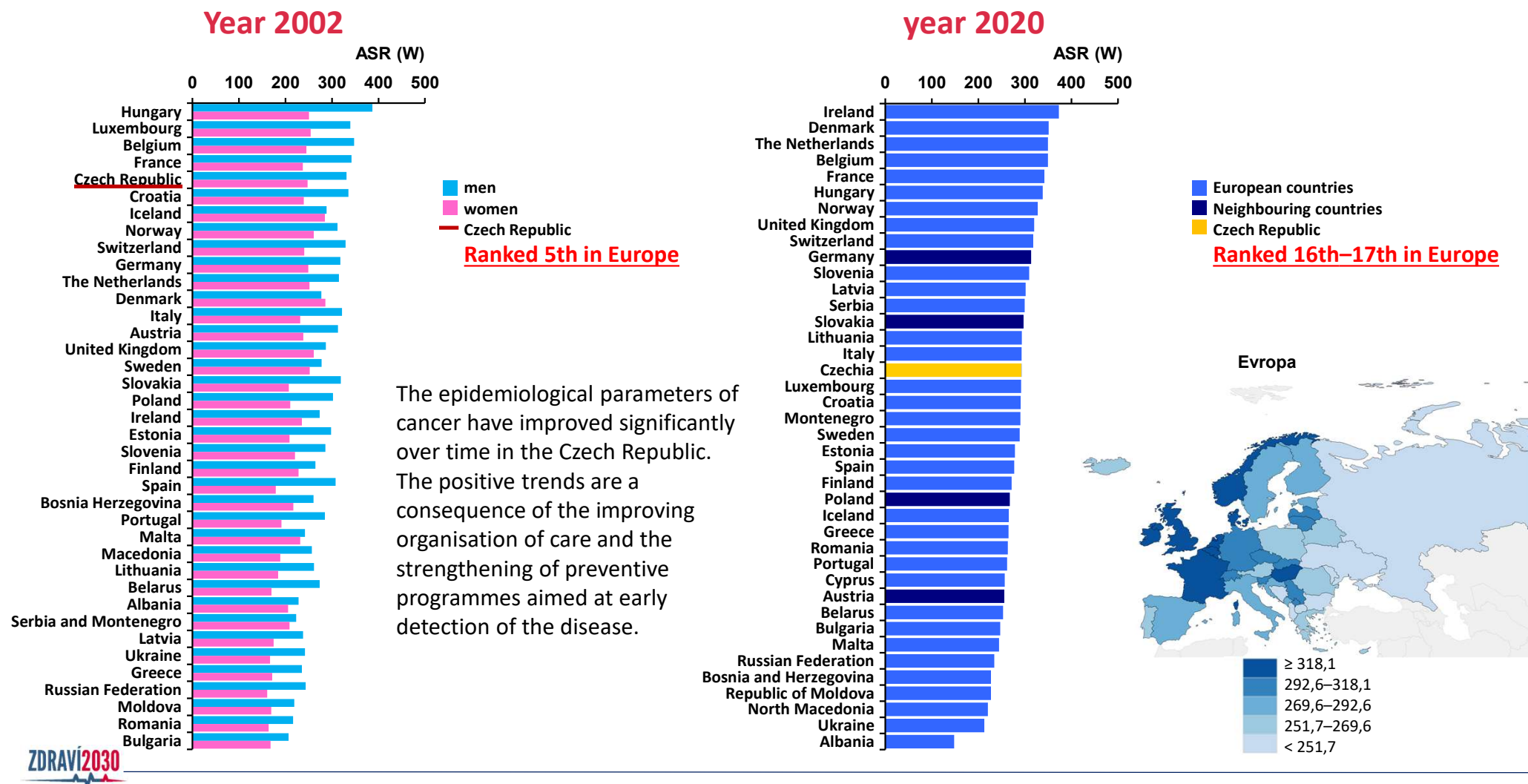# Summary of analytical study

Cancer epidemiology

Czech National Cancer Control Plan 2030

ÚZIS ČR

Ústav zdravotnických informací a statistiky České republiky
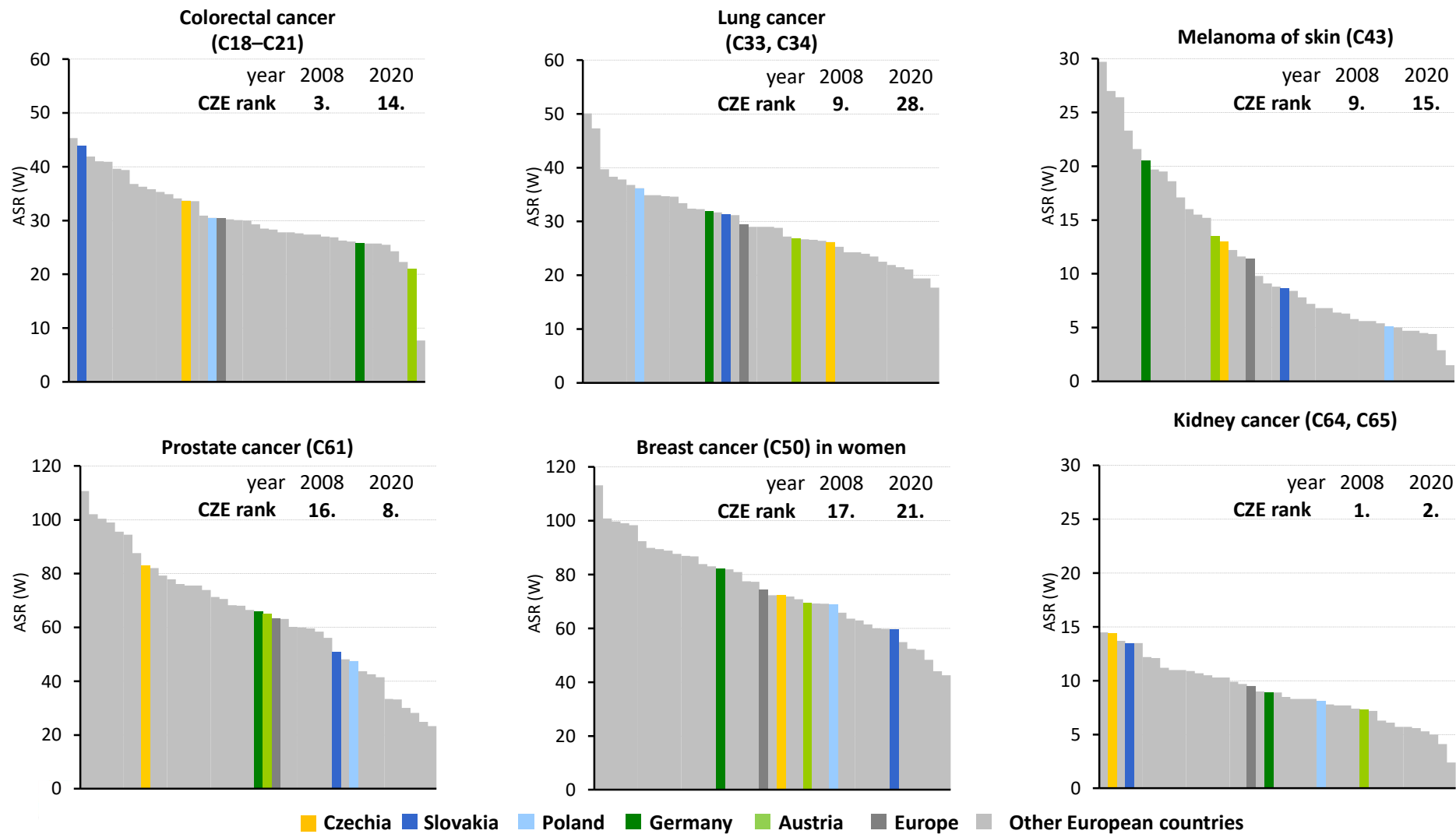*Institute of Health Information and Statistics of the Czech Republic*

Cancer incidence (C00–C97) in international comparison

Source: Globocan 2020; ASR (W): world age-standardised rates

Year 2002

ASR (W)

Ranked 5th in Europe

- men
- women
- Czech Republic

The epidemiological parameters of cancer have improved significantly over time in the Czech Republic. The positive trends are a consequence of the improving organisation of care and the strengthening of preventive programmes aimed at early detection of the disease.

year 2020

ASR (W)

Ranked 16th–17th in Europe

- European countries
- Neighbouring countries
- Czech Republic

Evropa

- ≥ 318,1
- 292,6–318,1
- 269,6–292,6
- 251,7–269,6
- < 251,7

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Incidence of selected cancers in 2020 compared with European countries

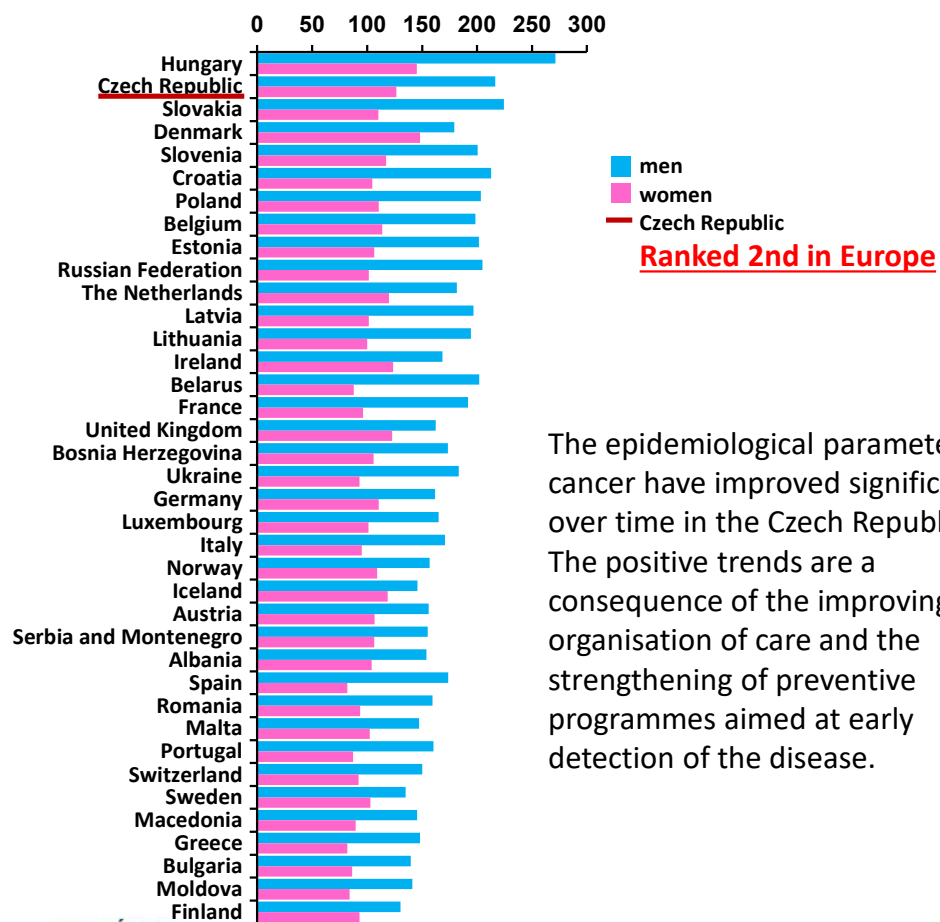Source: Globocan 2008, 2020; ASR (W): world age-standardised rates

Colorectal cancer (C18–C21) — CZE rank: 2008 = 3., 2020 = 14.

Lung cancer (C33, C34) — CZE rank: 2008 = 9., 2020 = 28.

Melanoma of skin (C43) — CZE rank: 2008 = 9., 2020 = 15.

Prostate cancer (C61) — CZE rank: 2008 = 16., 2020 = 8.

Breast cancer (C50) in women — CZE rank: 2008 = 17., 2020 = 21.

Kidney cancer (C64, C65) — CZE rank: 2008 = 1., 2020 = 2.

Legend: Czechia, Slovakia, Poland, Germany, Austria, Europe, Other European countries

Cancer mortality (C00–C97) in international comparison

Source: Globocan 2020; ASR (W): world age-standardised rates

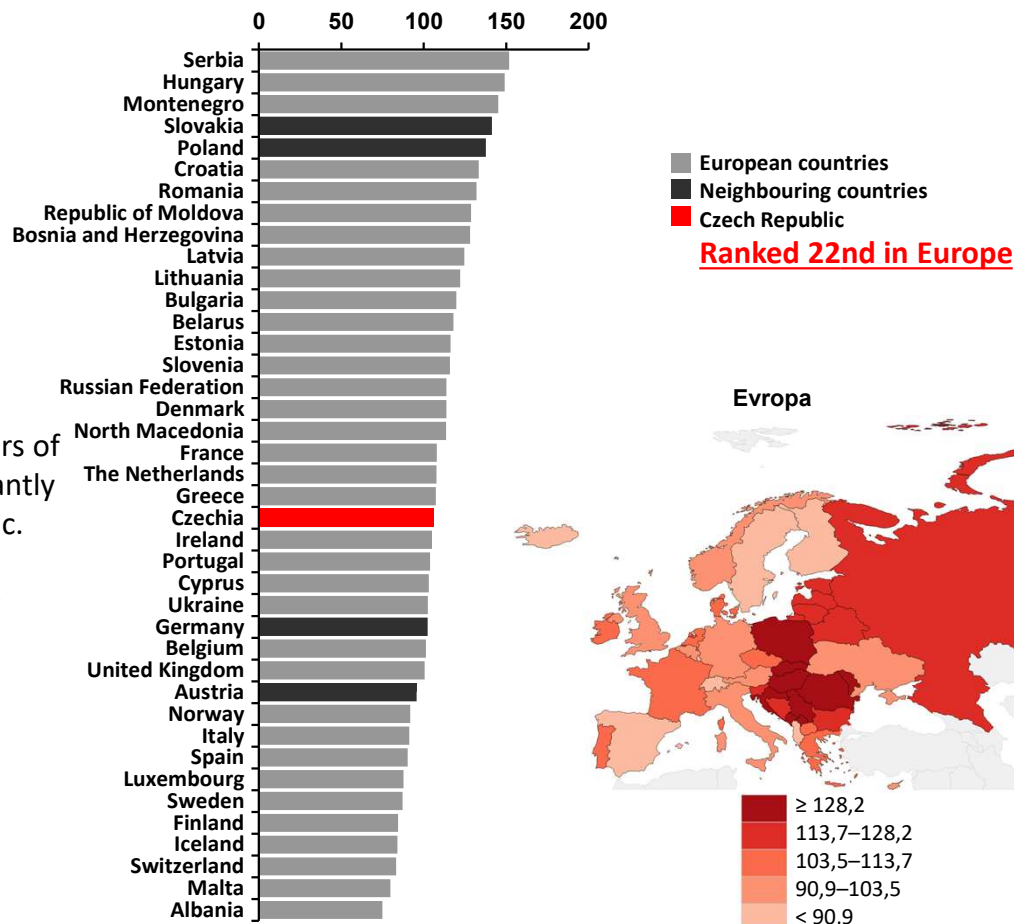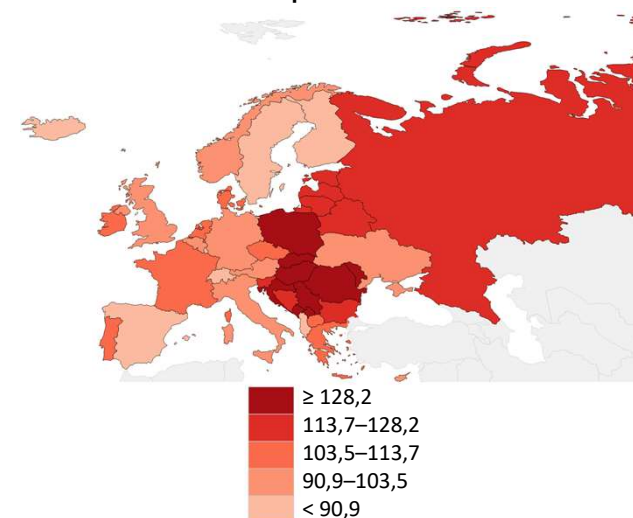

Year 2002

ASR (W)

Year 2020

ASR (W)

The epidemiological parameters of cancer have improved significantly over time in the Czech Republic. The positive trends are a consequence of the improving organisation of care and the strengthening of preventive programmes aimed at early detection of the disease.

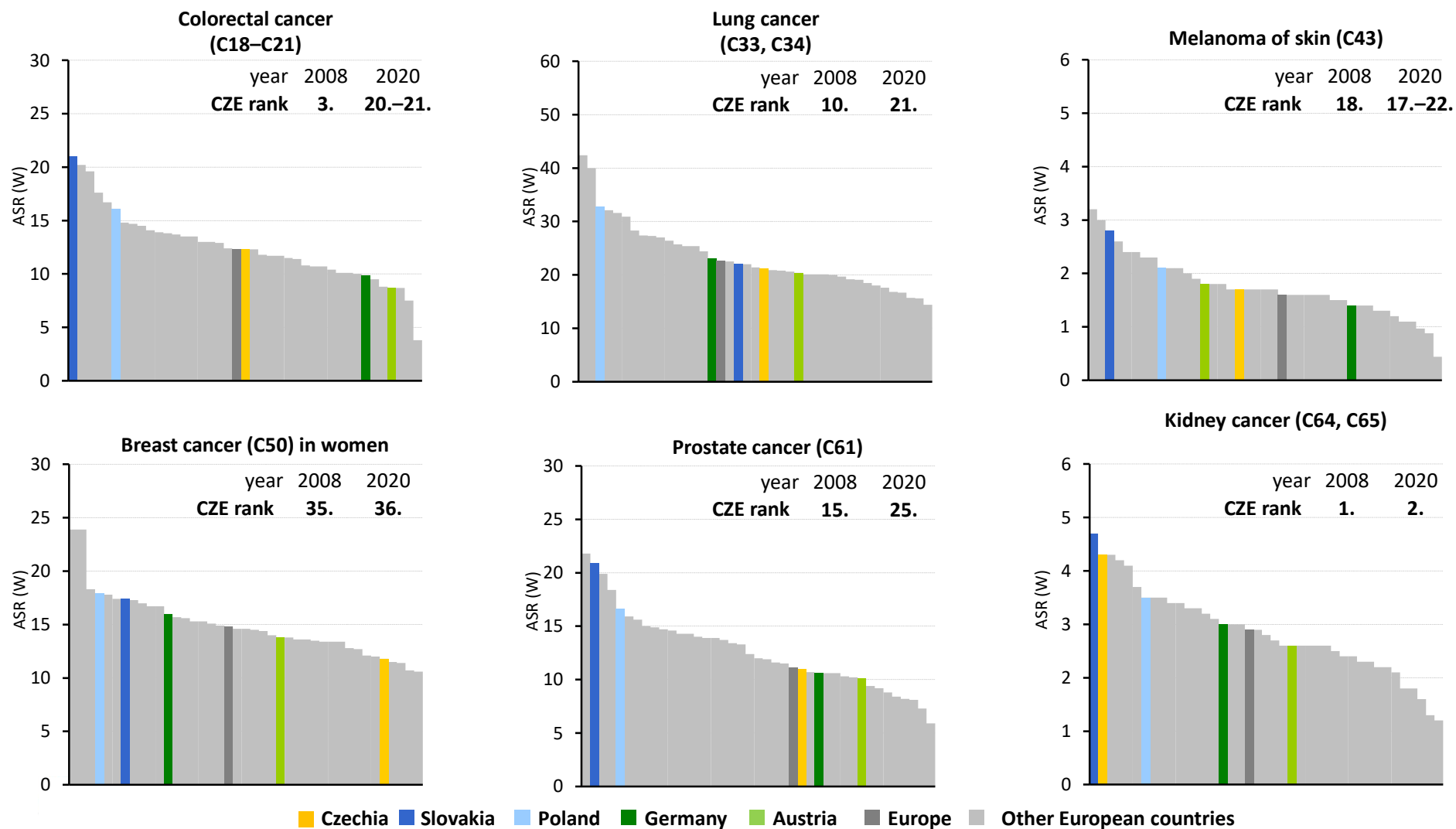Ranked 2nd in Europe

Ranked 22nd in Europe

Evropa

Mortality of selected cancers in 2020 compared with European countries

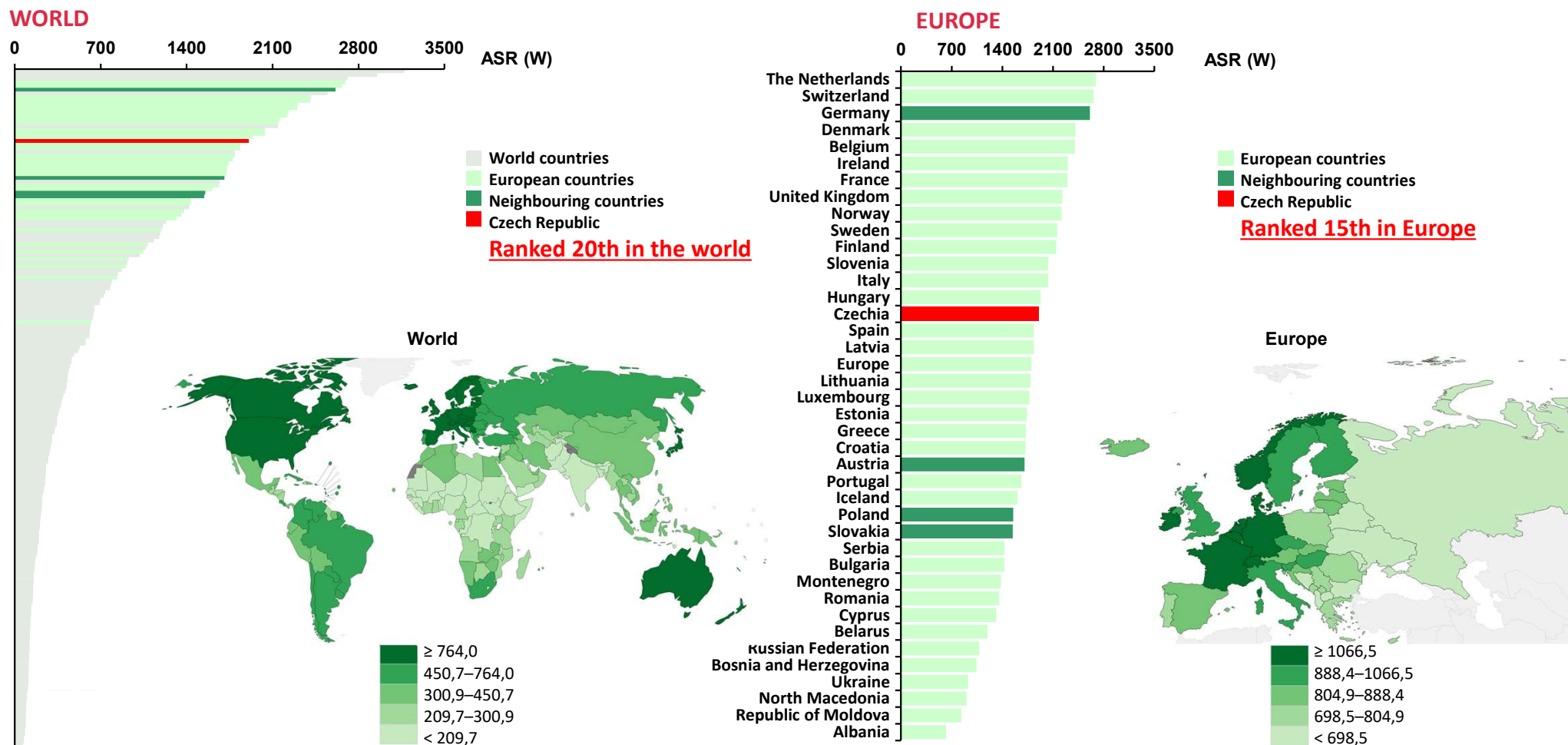Source: Globocan 2008, 2020; ASR (W): world age-standardised rates

Colorectal cancer (C18–C21)

year	2008	2020
CZE rank	3.	20.–21.

Lung cancer (C33, C34)

year	2008	2020
CZE rank	10.	21.

Melanoma of skin (C43)

year	2008	2020
CZE rank	18.	17.–22.

Breast cancer (C50) in women

year	2008	2020
CZE rank	35.	36.

Prostate cancer (C61)

year	2008	2020
CZE rank	15.	25.

Kidney cancer (C64, C65)

year	2008	2020
CZE rank	1.	2.

Legend: ■ Czechia ■ Slovakia ■ Poland ■ Germany ■ Austria ■ Europe ■ Other European countries

Prevalence (survivors 5 years from diagnosis) ZN (C00–C97) in 2020 in international comparison
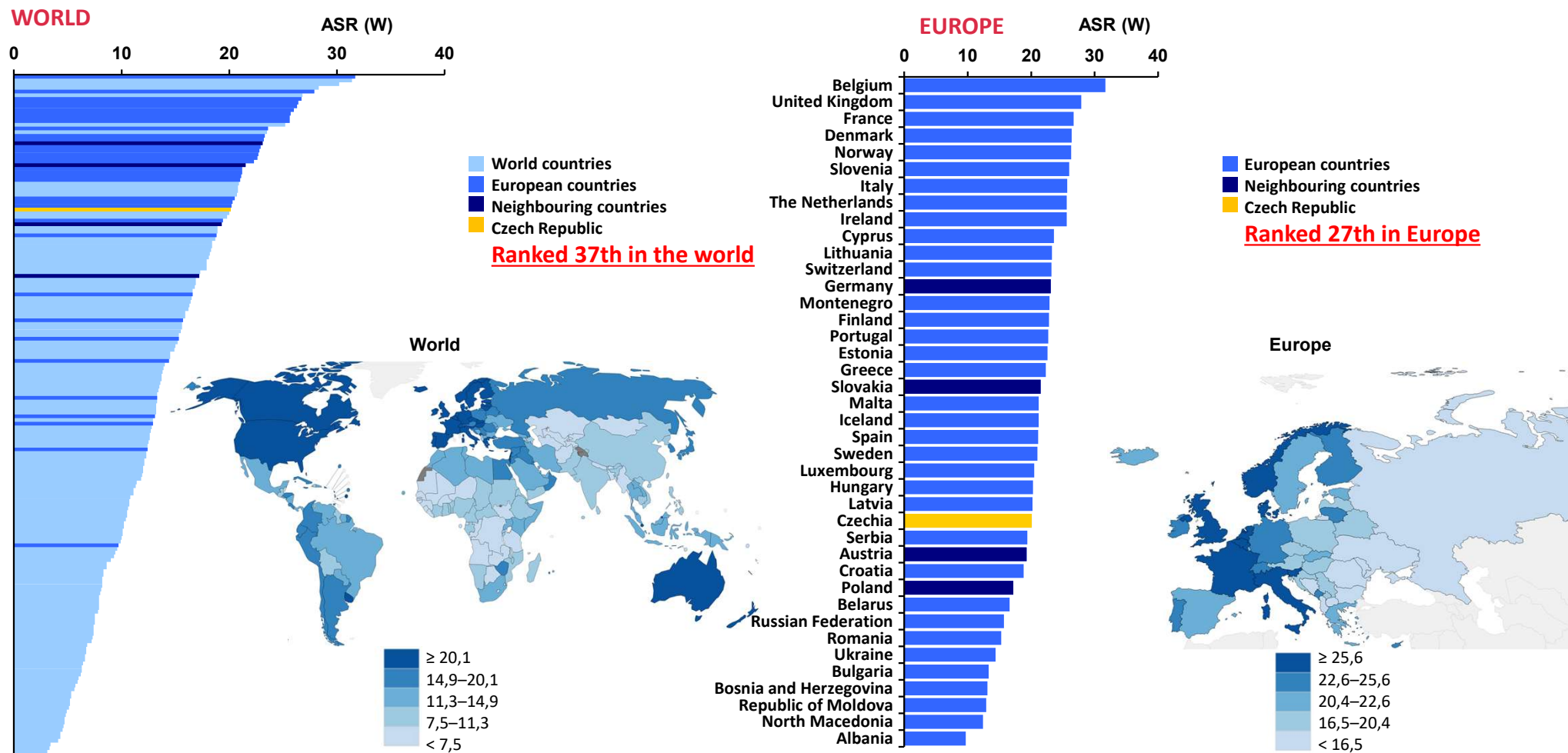
Source: Globocan 2020; ASR (W): world age-standardised rates

The epidemiological parameters of cancer have improved significantly over time in the Czech Republic. The positive trends are a consequence of the improving organisation of care and the strengthening of preventive programmes aimed at early detection of the disease. Incidence rates for some preventable diagnoses have been stabilising or decreasing, survival of cancer patients has generally been increasing and mortality is has been decreasing.

WORLD

ASR (W)

World countries
European countries
Neighbouring countries
Czech Republic

Ranked 20th in the world

World

≥ 764,0
450,7–764,0
300,9–450,7
209,7–300,9
< 209,7

EUROPE

ASR (W)

The Netherlands
Switzerland
Germany
Denmark
Belgium
Ireland
France
United Kingdom
Norway
Sweden
Finland
Slovenia
Italy
Hungary
Czechia
Spain
Latvia
Europe
Lithuania
Luxembourg
Estonia
Greece
Croatia
Austria
Portugal
Iceland
Poland
Slovakia
Serbia
Bulgaria
Montenegro
Romania
Cyprus
Belarus
Russian Federation
Bosnia and Herzegovina
Ukraine
North Macedonia
Republic of Moldova
Albania

European countries
Neighbouring countries
Czech Republic

Ranked 15th in Europe

Europe

≥ 1066,5
888,4–1066,5
804,9–888,4
698,5–804,9
< 698,5

Incidence of selected blood cancers* in 2020 in international comparison

Source: Globocan 2020

WORLD

ASR (W)
0 10 20 30 40

- World countries
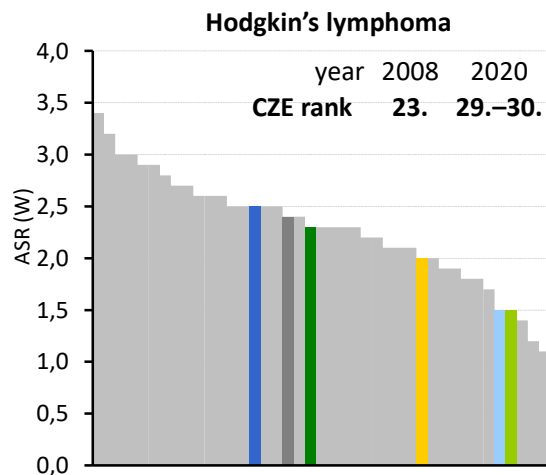- European countries
- Neighbouring countries
- Czech Republic

Ranked 37th in the world

World

≥ 20,1
14,9–20,1
11,3–14,9
7,5–11,3
< 7,5

EUROPE

ASR (W)
0 10 20 30 40

Belgium
United Kingdom
France
Denmark
Norway
Slovenia
Italy
The Netherlands
Ireland
Cyprus
Lithuania
Switzerland
Germany
Montenegro
Finland
Portugal
Estonia
Greece
Slovakia
Malta
Iceland
Spain
Sweden
Luxembourg
Hungary
Latvia
Czechia
Serbia
Austria
Croatia
Poland
Belarus
Russian Federation
Romania
Ukraine
Bulgaria
Bosnia and Herzegovina
Republic of Moldova
North Macedonia
Albania

- European countries
- Neighbouring countries
- Czech Republic

Ranked 27th in Europe

Europe

≥ 25,6
22,6–25,6
20,4–22,6
16,5–20,4
< 16,5

ASR (W): world age-standardised incidence rates
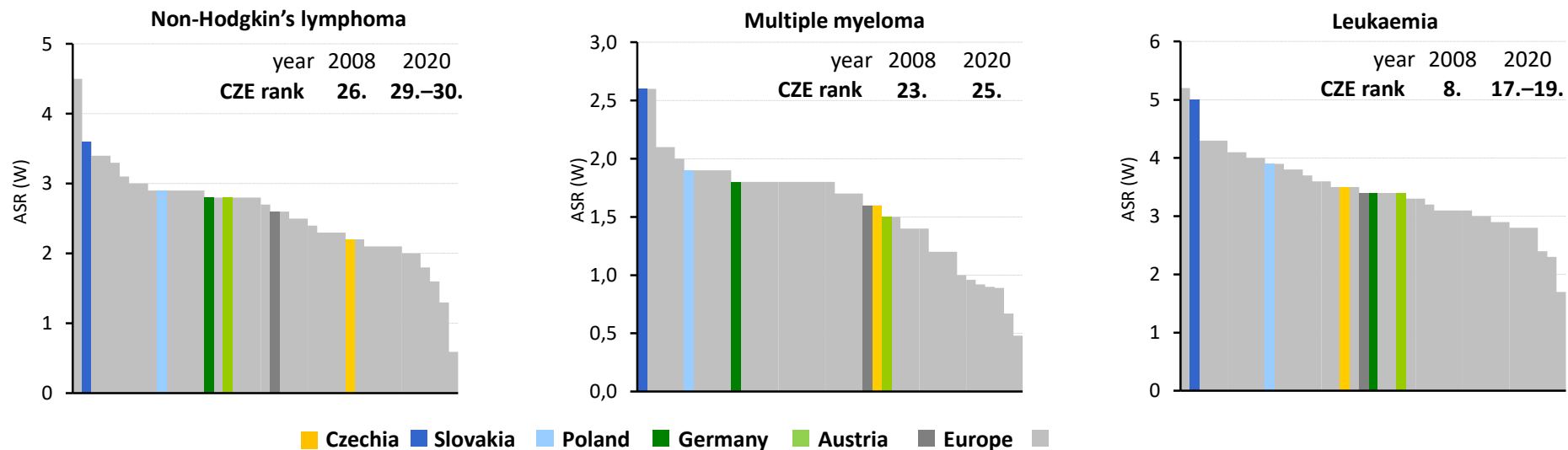*Hodgkin's lymphoma (C81), non-Hodgkin's lymphoma (C82–86, C96), multiple myeloma (C88 and C90), leukaemia (C91–95)

Incidence of selected blood cancers* in comparison with European countries

Source: Globocan 2008, 2020; ASR (W): world age-standardised rates

Hodgkin's lymphoma

year	2008	2020
CZE rank	23.	29.–30.

Non-Hodgkin's lymphoma

year	2008	2020
CZE rank	21.	23.

Multiple myeloma

year	2008	2020
CZE rank	22.	29.

Leukaemia

year	2008	2020
CZE rank	25.	23.–24.
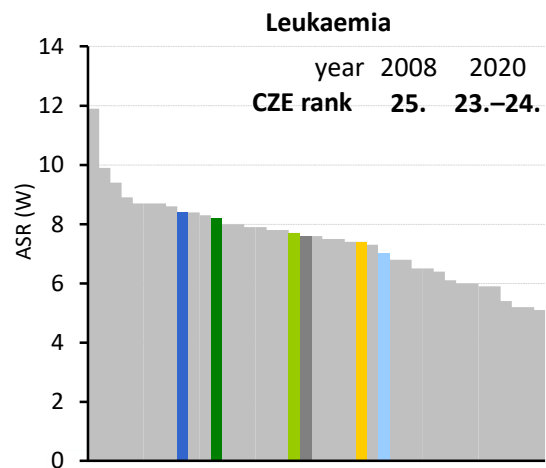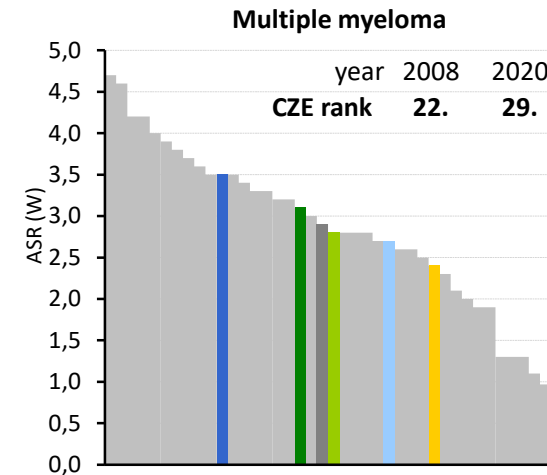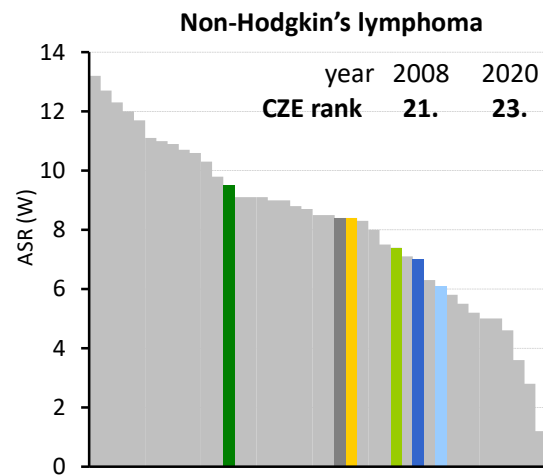
Legend: ■ Czechia ■ Slovakia ■ Poland ■ Germany ■ Austria ■ Europe ■ Other European countries

* Hodgkin's lymphoma (C81), non-Hodgkin's lymphoma (C82–86, C96), multiple myeloma (C88 a C90), leukaemia (C91–95)

Stabilised or decreasing mortality with stable or increasing incidence rates increases the prevalence of patients on long-term treatment, especially in haemato-oncology, where this trend is one of the main reasons for increasing overall treatment costs. The system of haematological care in the Czech Republic is highly functional from the point of view of the organisation of healthcare; with a slightly increasing incidence of haematological malignancies, the mortality rate from these diseases is decreasing and the number of patients in the population who survive with this disease (prevalence) is increasing dramatically over the years. For some diagnoses, prolonged survival has changed the nature of the disease from acute high-risk to chronic, lifelong (e.g. chronic myeloid leukaemia).

Mortality of selected blood cancers* in 2020 in international comparison

Source: Globocan 2020

WORLD

ASR (W)

0   5   10   15   20

World countries
European countries
Neighbouring countries
Czech Republic

Ranked 86th in the world

World

≥ 8,8
7,8–8,8
6,9–7,8
5,3–6,9
< 5,3

EUROPE

ASR (W)

0   5   10   15

Slovakia
Cyprus
Slovenia
Serbia
Latvia
Croatia
Montenegro
Poland
Portugal
Estonia
Ireland
France
The Netherlands
Belgium
Italy
Greece
Hungary
Germany
Belarus
Lithuania
United Kingdom
Austria
Denmark
Norway
Czechia
Sweden
Switzerland
Finland
Republic of Moldova
Russian Federation
Romania
Spain
Ukraine
Bulgaria
Luxembourg
Bosnia and Herzegovina
Iceland
North Macedonia
Malta
Albania

European countries
Neighbouring countries
Czech Republic

Ranked 25th in Europe

Europe

≥ 8,9
8,3–8,9
7,5–8,3
6,8–7,5
< 6,8

ASR (W): world age-standardised incidence rates
* Hodgkin's lymphoma (C81), non-Hodgkin's lymphoma (C82–86, C96), multiple myeloma (C88 a C90), leukaemia (C91–95)

Mortality of selected blood cancers* in comparison with European countries

Source: Globocan 2008, 2020; ASR (W): world age-standardised rates

Non-Hodgkin's lymphoma

year	2008	2020
CZE rank	26.	29.–30.

Multiple myeloma

year	2008	2020
CZE rank	23.	25.

Leukaemia

year	2008	2020
CZE rank	8.	17.–19.

Legend: Czechia, Slovakia, Poland, Germany, Austria, Europe

*Non-Hodgkin's lymphoma (C82–86, C96), multiple myeloma (C88 a C90), leukaemia (C91–95)

Stabilised or decreasing mortality with stable or increasing incidence rates increase the prevalence of patients on long-term treatment, especially in haemato-oncology, where this trend is one of the main reasons for increasing overall treatment costs. The system of haematological care in the Czech Republic is highly functional from the point of view of the organisation of healthcare; with a slightly increasing incidence of haematological malignancies, the mortality rates from these diseases have been decreasing and the number of patients in the population who survive with this disease (prevalence) has increasing dramatically over the years. For some diagnoses, prolonged survival has changed the nature of the disease from acute high-risk to chronic, lifelong (e.g. chronic myeloid leukaemia).

Overall cancer burden excl. non-melanoma skin cancer (C00–C97 excl. C44) in the Czech Republic

Source: [1]Czech National Cancer Registry, [2]Czech Statistical Office

Absolute counts	2013	2014	2015	2016	2017	2018	2019	2020	Average annual change 2016–2019
Incidence[1]	58 734	58 903	59 528	60 186	60 035	59 325	62 568	57 157*	+1,3 %
Mortality[1,2]	26 958	26 910	26 681	27 109	27 183	27 521	28 025	27 841	+1,1 %
Prevalence[1]	367 075	381 528	395 891	410 168	423 369	434 966	449 405	457 455	+3,1 %

The decline in 2020 is mainly attributable to the COVID-19 epidemic, with some cancer groups under-diagnosed.

Incidence and mortality
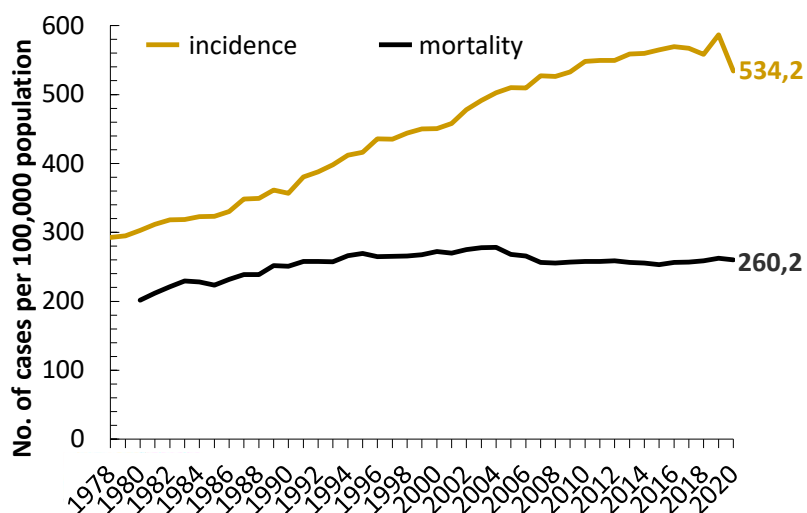
Prevalence
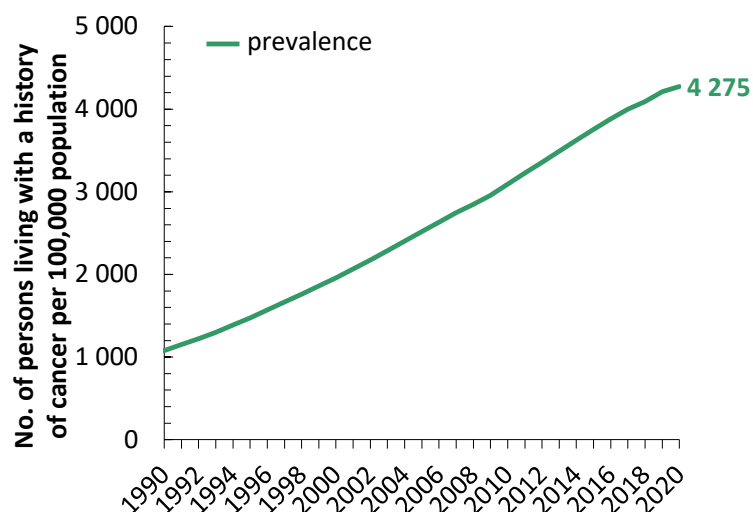
In the Czech Republic, an average of about **60,000** patients with malignant neoplasms (excluding non-melanoma skin malignancies) are newly diagnosed annually, which is more than **560 per 100,000 population**. In 2020, **27,841** persons died related to malignant neoplasm, which is **260.2 per 100,000 population**.

As of 31 December 2020, there were a total of **457,455** people living with a history of cancer in the Czech Republic, which is **4,275 per 100,000 population**.

Over the past 10 years, the incidence has increased significantly with stable mortality, which inevitably translates into an increasing prevalence of treated patients and patients under long-term follow-up.

Cancer incidence in the Czech Republic in 2016–2020

Source: Czech National Cancer Registry

Annual number of new cases

Diagnosis	Annual number of new cases
Non-melanoma skin cancer (C44)	25 742
Prostate cancer (C61)	7 647
Breast cancer (C50) in women	7 310
Colorectal cancer (C18–C20)	7 283
Lung cancer (C33, C34)	6 631
Kidney cancer (C64)	3 120
Melanoma of skin (C43)	2 610
Pancreatic cancer (C25)	2 401
Bladder cancer (C67)	2 204
Uterine cancer (C54, C55)	1 970
Head and neck cancer (C00–C14, C30–C31)	1 902
Non-Hodgkin's lymphoma (C82–C86)	1 732
Leukaemia (C91–C95)	1 381
Gastric cancer (C16)	1 364
Thyroid cancer (C73)	1 211
Ovarian cancer (C56)	974
Liver cancer (C22)	967
Brain and spinal cord cancer (C70–C72)	915
Gallbladder cancer (C23, C24)	807
Cervical cancer (C53)	786
Oesophagal cancer (C15)	666
Multiple myeloma (C90)	630
Testicular cancer (C62)	510
Laryngeal cancer (C32)	487
Connective and soft tissues cancer (C47, C49)	350
Hodgkin's lymphoma (C81)	289
Other malignant neoplasms	3 708
Neoplasms in situ (D00–D09)	8 765
Neoplasms non-malignant and unknown behaviour (D10–D36, D37–D48)	2 919

■ men
■ women

Annual numbers of new cases	men	women	total
All cancers (C00–C97, D00–D09, selected D10–D36, D37–D48)	50 033	47 246	97 280
Malignant neoplasms (C00–C97)	45 634	39 962	85 596
Malignant neoplasms excl. non-melanoma skin cancer (C00–C97 excl. C44)	**32 084**	**27 770**	**59 854**

The most common neoplasms in the Czech Republic in 2016–2020 were non-melanoma skin cancer (C44), prostate cancer (C61), breast cancer (C50) in women, colorectal cancer (C18–C20) and lung cancer (C33, C34).

Cancer mortality in the Czech Republic in 2016–2020

Source: Czech Statistical Office

Annual number of deaths

Cancer type	Annual number of deaths
Lung cancer (C33, C34)	5 342
Colorectal cancer (C18–C20)	3 386
Pancreatic cancer (C25)	2 183
Breast cancer (C50) in women	1 675
Prostate cancer (C61)	1 426
Gastric cancer (C16)	989
Kidney cancer (C64)	977
Leukaemia (C91–C95)	931
Liver cancer (C22)	886
Bladder cancer (C67)	868
Head and neck cancer (C00–C14, C30–C31)	824
Brain and spinal cord cancer (C70–C72)	757
Gallbladder cancer (C23, C24)	688
Ovarian cancer (C56)	626
Non-Hodgkin's lymphoma (C82–C86)	571
Oesophagal cancer (C15)	552
Uterine cancer (C54, C55)	417
Melanoma of skin (C43)	415
Multiple myeloma (C90)	400
Cervical cancer (C53)	304
Laryngeal cancer (C32)	230
Non-melanoma skin cancer (C44)	168
Connective and soft tissues cancer a perif. nervů (C47, C49)	132
Thyroid cancer (C73)	72
Hodgkin's lymphoma (C81)	54
Testicular cancer (C62)	33
Other malignant neoplasms	2 799
Neoplasms in situ , non-malignant, and unknown behaviour (D00–D09, D10–D36, D37–D48)	598

■ men
■ women

Annual numbers of deaths	men	women	total
All cancers (C00–C97, D00–D09, selected D10–D36, D37–D48)	15 652	12 650	28 302
Proportion of all deaths	*26,8 %*	*22,5 %*	*24,7 %*
Malignant neoplasms excl. non-melanoma skin cancer (C00–C97 excl. C44)	**15 248**	**12 287**	**27 536**
Proportion of all deaths	*26,1 %*	*21,8 %*	*24,0 %*

The most common causes of death from cancer were lung cancer (C33, C34), colorectal cancer (C18–C20), pancreatic cancer (C25), breast cancer (C50) in women and prostate cancer (C61), which accounted for 50% of all cancer deaths (excluding non-melanoma skin cancer).

Cancer prevalence* in the Czech Republic as of 31/12/2020

Source: Czech National Cancer Registry

*People with a history of cancer (diagnosed in last 5 years) who were alive on 31 Dec 2020

Number of persons living with cancer or a history of cancer

Cancer type	Value
Non-melanoma skin cancer (C44)	67 709
Prostate cancer (C61)	32 426
Breast cancer (C50) in women	29 570
Colorectal cancer (C18–C20)	21 892
Kidney cancer (C64)	10 798
Melanoma of skin (C43)	10 359
Lung cancer (C33, C34)	8 616
Uterine cancer (C54, C55)	7 948
Bladder cancer (C67)	7 239
Non-Hodgkin's lymphoma (C82–C86)	5 821
Head and neck cancer (C00–C14, C30–C31)	5 470
Thyroid cancer (C73)	5 208
Leukaemia (C91–C95)	3 975
Cervical cancer (C53)	2 810
Ovarian cancer (C56)	2 771
Pancreatic cancer (C25)	2 443
Gastric cancer (C16)	2 400
Testicular cancer (C62)	2 324
Multiple myeloma (C90)	1 845
Brain and spinal cord cancer (C70–C72)	1 512
Laryngeal cancer (C32)	1 495
Hodgkin's lymphoma (C81)	1 241
Connective and soft tissues cancer (C47, C49)	1 112
Liver cancer (C22)	953
Oesophagal cancer (C15)	943
Gallbladder cancer (C23, C24)	917
Other malignant neoplasms	7 967
Neoplasms in situ (D00–D09)	37 325
Neoplasms non-malignant and unknown behaviour (D10–D36, D37–D48)	9 563

Legend: ■ men ■ women

Cancer prevalence as of 31/12/2020	men	women	total
All cancers (C00–C97, D00–D09, selected D10–D36, D37–D48)	112 424	127 627	240 051
Malignant neoplasms (C00–C97)	104 594	105 080	209 674
Malignant neoplasms excl. non-melanoma skin cancer (C00–C97 excl. C44)	**81 895**	**78 189**	**160 084**

The **most common cancers** (present or with a history in the last five years) in people living in the Czech Republic as of 31 December 2020 were non-melanoma skin cancer (C44), followed by prostate cancer (C61), Breast cancer (C50) in women and colorectal cancer (C18-C20). A total of 160,084 people in the Czech Republic were living with a malignant neoplasm regardless of diagnosis (excluding non-melanoma skin cancer) in the present or history of cancer in the last five years as of 31 December 2020.

Cancer prevalence* in the Czech Republic as of 31/12/2020

Source: Czech National Cancer Registry

*People with a history of cancer (diagnosed at any time) who were alive on 31 Dec 2020

Number of persons living with cancer or a history of cancer

Bar chart values:

Cancer	Value
Non-melanoma skin cancer (C44)	196 570
Breast cancer (C50) in women	93 132
Prostate cancer (C61)	71 592
Colorectal cancer (C18–C20)	60 088
Melanoma of skin (C43)	32 205
Kidney cancer (C64)	28 692
Uterine cancer (C54, C55)	27 979
Bladder cancer (C67)	19 177
Thyroid cancer (C73)	18 298
Cervical cancer (C53)	17 730
non-Hodgkin's lymphoma (C82–C86)	14 950
Lung cancer (C33, C34)	13 632
Testicular cancer (C62)	11 746
Head and neck cancer (C00–C14, C30–C31)	11 617
leukémie (C91–C95)	10 561
Ovarian cancer (C56)	9 382
Hodgkin's lymphoma (C81)	6 396
Gastric cancer (C16)	5 348
Laryngeal cancer (C32)	3 875
Brain and spinal cord cancer (C70–C72)	3 870
Connective and soft tissues cancer (C47, C49)	3 514
Pancreatic cancer (C25)	3 216
Multiple myeloma (C90)	3 107
Gallbladder cancer (C23, C24)	1 697
Oesophagal cancer (C15)	1 354
Liver cancer (C22)	1 305
Other malignant neoplasms	17 835
Neoplasms in situ (D00–D09)	110 586
Neoplasms non-malignant and unknown behaviour (D10–D36, D37–D48)	23 609

Legend: ■ men ■ women

Cancer prevalence as of 31/12/2020	men	women	total
All cancers (C00–C97, D00–D09, selected D10–D36, D37–D48)	295 630	428 294	723 924
Malignant neoplasms (C00–C97)	276 623	342 704	619 327
Malignant neoplasms excl. non-melanoma skin cancer (C00–C97 excl. C44)	**204 789**	**252 666**	**457 455**

The **most common cancers** (present or with a history at any time in the past) in people living in the Czech Republic as of 31 December 2020 were non-melanoma skin cancer (C44), followed by breast cancer (C50) in women, prostate cancer (C61) and colorectal cancer (C18-C20). A total of 457,455 people were living with a malignant neoplasm, regardless of diagnosis (excluding non-melanoma skin cancer), either in the present or with a history of cancer, in the Czech Republic as of 31 December 2020.

Overall blood cancers burden in the Czech Republic

Source: [1]Czech National Cancer Registry, [2]Czech Statistical Office

Absolute counts	2013	2014	2015	2016	2017	2018	2019	2020	Average annual change 2016–2019**
Incidence[1]	4 490	4 614	4 811	4 674	4 989	4 865	5 566	4 937*	+6,2%
Mortality[1,2]	1 930	1 930	1 901	2 088	2 027	2 065	2 026	2 053	-1,0 %
Prevalence[1]	30 387	31 780	33 311	34 581	36 077	37 301	39 347	40 570	+4,4 %

The decline in 2020 is mainly attributable to the COVID-19 epidemic, with some cancer groups under-diagnosed.
**The year-on-year change is assessed on the basis of a linear trend*

Incidence and mortality

Prevalence

In the Czech Republic, an average of **5,000** patients with blood cancers are newly diagnosed annually, which is more than **46.0 per 100,000 population**. In 2020, **2,053** persons died in connection with blood cancers, which is **19.2 per 100,000 population**.

As of 31 December 2020, there were a total of **40,570** people in the Czech Republic with blood cancers or a history of this disease, which is **379 per 100,000 population**.

Over the past 10 years, the incidence has increased significantly with stable mortality, which inevitably translates into an increasing prevalence of treated and long-term follow-up patients.
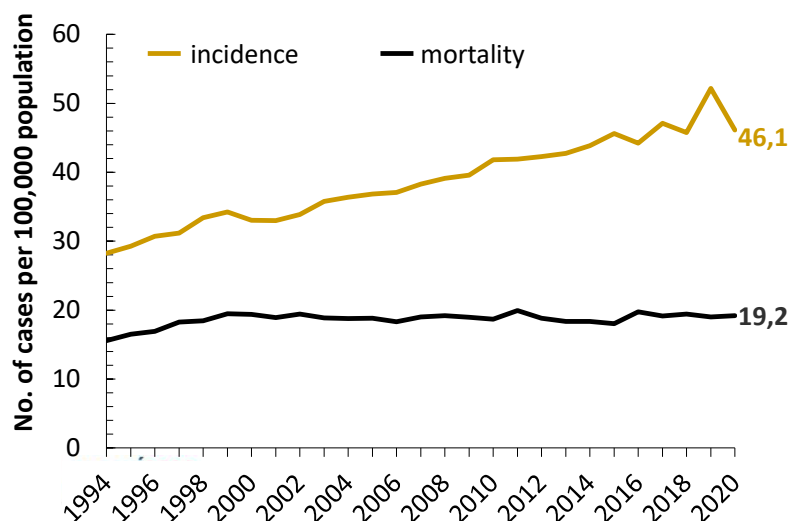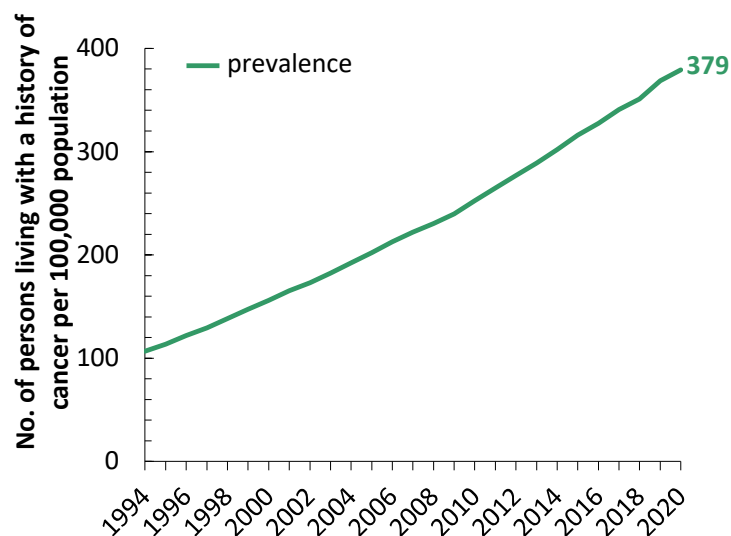
Blood cancers incidence in the Czech Republic in 2016–2020

Source: Czech National Cancer Registry

Annual number of new cases

Annual number of new cases	men	women	total
Blood cancers total	**2 681**	**2 325**	**5 006**
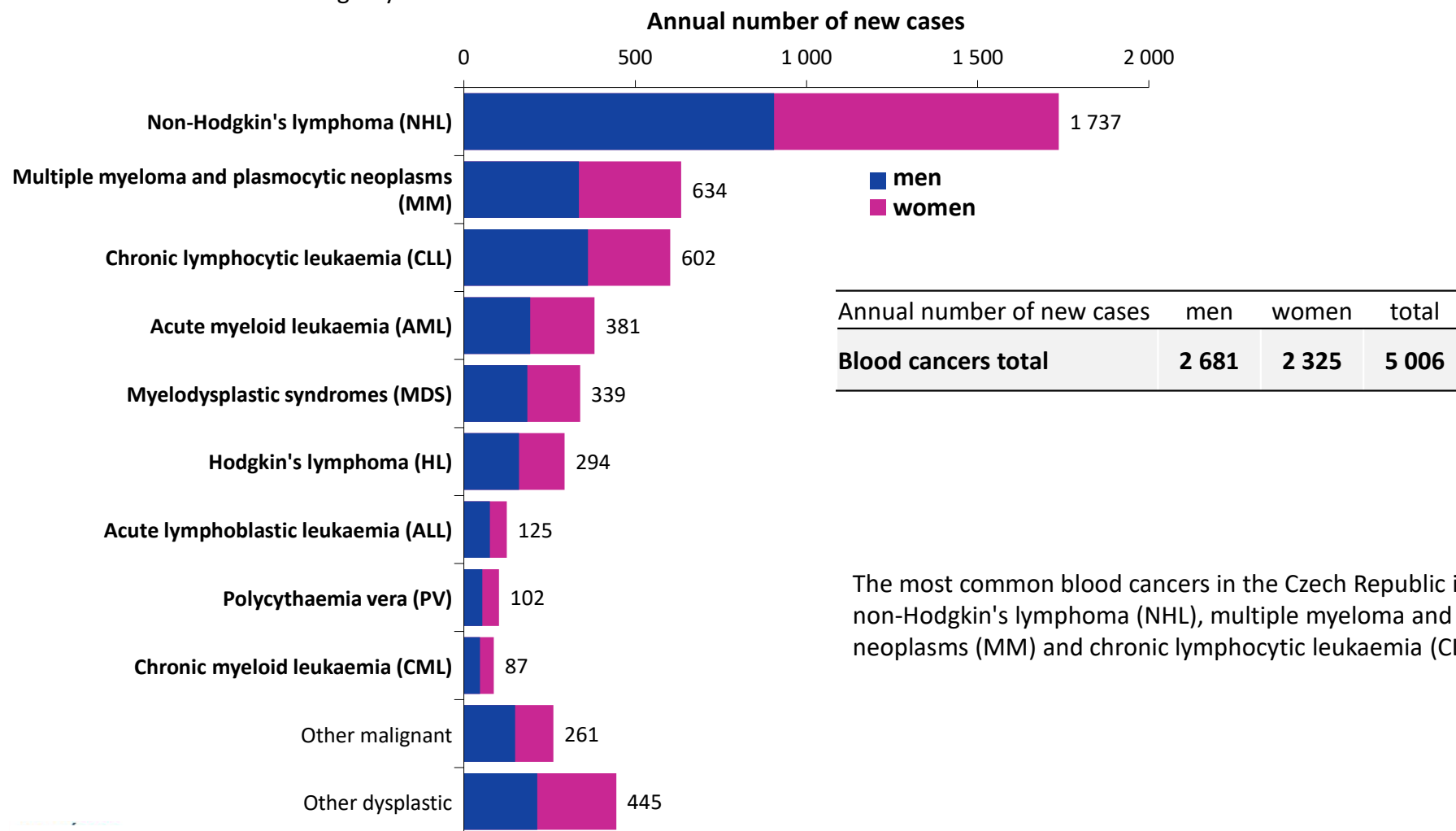
The most common blood cancers in the Czech Republic in 2016-2020 were non-Hodgkin's lymphoma (NHL), multiple myeloma and plasmocytic neoplasms (MM) and chronic lymphocytic leukaemia (CLL).

Cancer incidence (C00–C97) in children 0–19 years in 2020 in international comparison

Source: Globocan 2020

WORLD

ASR (W)

World countries
European countries
Neighbouring countries
Czech Republic

Ranked 56th–57th in the world

World

≥ 15,4
12,3–15,4
9,8–12,3
7,4–9,8
< 7,4

EUROPE

ASR (W)

Country
Belgium
Italy
Croatia
Serbia
Slovakia
Germany
France
United Kingdom
Portugal
Hungary
Greece
Denmark
Switzerland
The Netherlands
Austria
Ireland
Norway
Spain
Poland
Finland
Belarus
Ukraine
Bulgaria
Russian Federation
Montenegro
Latvia
North Macedonia
Lithuania
Sweden
Cyprus
Czechia
Albania
Slovenia
Estonia
Republic of Moldova
Romania
Malta
Luxembourg
Iceland
Bosnia and Herzegovina

European countries
Neighbouring countries
Czech Republic

Ranked 31st in Europe

Europe

≥ 18,3
16,4–18,3
15,1–16,4
13,5–15,1
< 13,5

ASR (W): world age-standardised incidence rates

Overall cancer burden in children 0–19 years in the Czech Republic

Source: [1]Czech National Cancer Registry, [2]Czech Statistical Office

Absolute counts	2013	2014	2015	2016	2017	2018	2019	2020
Incidence[1]	408	412	379	378	385	376	429	398
Mortality[2]	47	47	44	45	49	44	53	47
Prevalence[1]	7 777	7 929	8 048	8 187	8 486	8 783	9 091	9 395

In 2020, **398** children were newly diagnosed with cancer in the Czech Republic, which is **181.0 per 1,000,000 children**; in the same year, **47** children died due to malignant neoplasms, which is **21.4 per 1,000,000 children**.

As of 31 December 2020, there were a total of **9, 395** children with a malignant neoplasm or a history of this disease in the Czech Republic, which is **4 272 per 1,000,000 children**.

Incidence and mortality

Prevalence

Cancer incidence in children 0–19 years in the Czech Republic in 2016–2020

Source: Czech National Cancer Registry

Annual number of new cases

Annual number of new cases	boys	girls	total
Malignant neoplasms in children (0–19 years)	**210**	**183**	**393**

The **most common neoplasms in children** in the Czech Republic in 2016–2020 were leukaemia, CNS tumours, other malignant epithelial neoplasms and malignant melanomas and lymphomas.
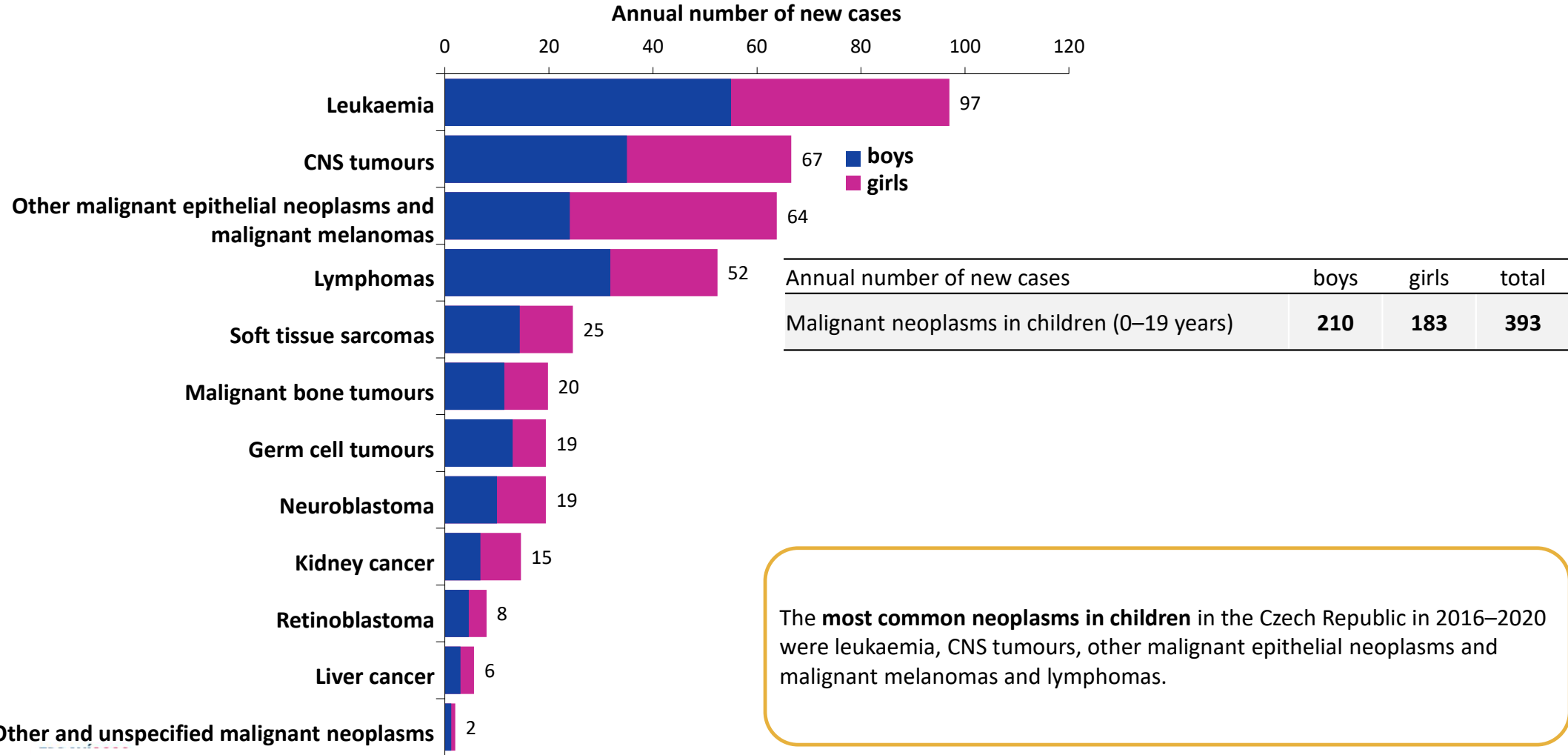
Czech National Cancer Control Plan 2030: Summary of analytical study

Survival of cancer patients and increase in the prevalence of treated patients

Czech National Cancer Control Plan 2030

ÚZIS ČR

Ústav zdravotnických informací a statistiky České republiky
Institute of Health Information and Statistics of the Czech Republic

In its objectives, the CNCCP 2030 emphasizes the strengthening of all factors that have the potential to prolong and improve the quality of life of cancer patients
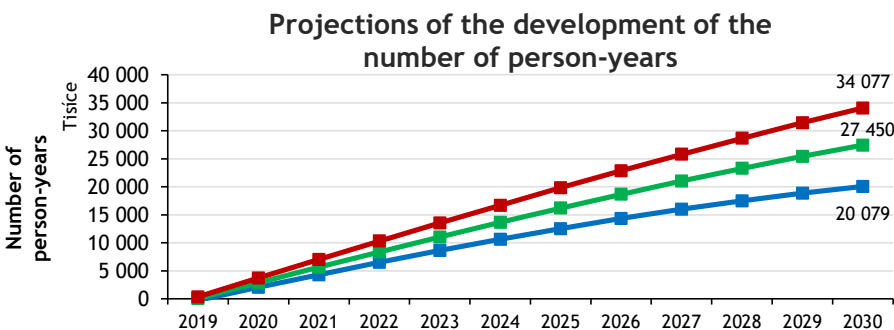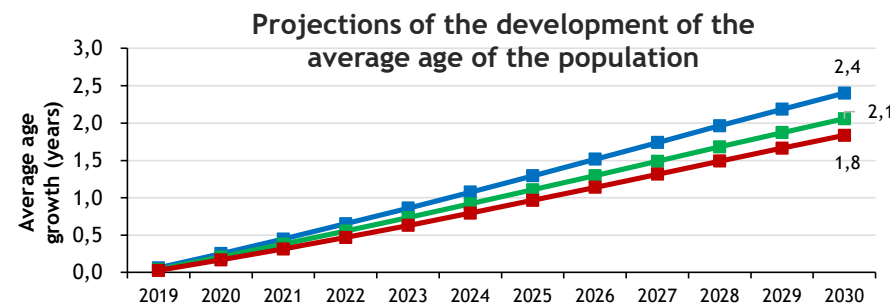
✓ **Early detection of cancer**   ✓ **Effective organisation of care**   ✓ **Patient centredness**

It is evident from all recent international comparisons that the Czech healthcare system has undergone significant development in the last two decades in terms of the organisation of cancer care and in increasing the availability of highly specialised anti-cancer therapy. Great progress has also been made in strengthening organised screening programmes. The results of care are comparable to the EU average, with Czech oncology achieving the best results in Central and Eastern Europe in most indicators.

The 5-year survival rates of Czech cancer patients are close to the EU average
Source: State of Health in the EU Czechia Country Health Profile 2021

Prostate cancer
Czechia: 85 %
EU23: 87 %

Childhood leukaemia
Czechia: 85 %
EU23: 85 %

Breast cancer
Czechia: 81 %
EU23: 82 %

Cervical cancer
Czechia: 61 %
EU23: 63 %

Colon cancer
Czechia: 56 %
EU23: 60 %

Lung cancer
Czechia: 11 %
EU23: 15 %

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS

In its objectives, the CNCCP 2030 emphasizes the strengthening of all factors that have the potential to prolong and improve the quality of life of cancer patients

✓ **Early detection of cancer**   ✓ **Effective organisation of care**   ✓ **Patient centredness**

In a number of key indicators, such as 5-year relative survival or early detection of cancer, the rates are still lower compared to Western and Northern European countries. This is mainly due to the high proportion of advanced disease detected at later stages, for which the chance of long-term survival and cure is significantly reduced. Organised cancer screening programmes also show some gaps in population coverage, and there is significant room for improvement in primary prevention programmes and the elimination of major risk factors for cancer related to unhealthy lifestyles.

Therefore, the strategic goal of the CNCCP 2030 must be to strengthen prevention and early detection of diseases in all forms of programmes and population-based interventions.

Survival rates of cancer patients (the CONCORD study): selected diagnoses

Source: The CONCORD study, Allemani et al. Lancet 2018; 391: 1023–75

Lung cancer

5-year relative survival (%)

Country	2000–2004	2010–2014
Latvia	17,3	20,4
Switzerland	14,7	20,4
Iceland	14,1	20,2
Austria	15,4	19,7
Sweden	13,9	19,5
Norway	12,3	19,0
Germany	14,9	18,3
Belgium	15,4	18,2
Ireland	10,1	17,5
France	14,1	17,3
Netherlands	12,4	17,3
Estonia	10,8	16,9
Denmark	9,5	16,6
Italy	14,0	15,9
Portugal	10,6	15,7
Malta	9,2	14,9
Slovenia	9,9	14,8
Poland	12,1	14,4
Spain	10,8	13,5
United Kingdom	8,3	13,3
Finland	11,9	13,0
Slovakia	9,5	11,2
Czech Republic	8,6	10,6
Croatia	11,2	10,0
Lithuania	8,8	9,9
Bulgaria	5,8	7,7

Colon cancer

5-year relative survival (%)

Country	2000–2004	2010–2014
Iceland	61,4	68,2
Belgium	64,3	67,9
Switzerland	62,8	67,3
Norway	58,4	66,7
Sweden	61,3	64,9
Finland	60,2	64,9
Germany	62,0	64,8
Italy	59,0	64,2
Austria	60,7	63,7
France	60,2	63,7
Spain	56,5	63,2
Netherlands	58,1	63,1
Slovenia	53,6	61,9
Denmark	51,5	61,6
Portugal	56,5	60,9
Ireland	53,3	60,5
United Kingdom	52,0	60,0
Estonia	48,9	58,4
Malta	57,0	57,5
Lithuania	44,5	56,9
Latvia	40,5	56,5
Czech Republic	48,0	56,1
Poland	45,3	52,9
Bulgaria	43,9	52,4
Slovakia	50,4	51,8
Croatia	47,3	51,1

Breast cancer in women

5-year relative survival (%)

Country	2000–2004	2010–2014
Iceland	87,4	89,1
Sweden	85,6	88,8
Finland	86,5	88,5
Norway	84,2	87,7
Portugal	81,6	87,6
Malta	79,7	86,9
France	86,9	86,7
Netherlands	83,9	86,6
Belgium	84,8	86,4
Switzerland	84,4	86,2
Denmark	80,3	86,1
Germany	83,9	86,0
Italy	84,2	86,0
United Kingdom	79,8	85,6
Spain	82,9	85,2
Austria	81,4	84,8
Slovenia	78,7	83,5
Latvia	69,3	82,2
Ireland	77,2	82,0
Czech Republic	75,7	81,4
Croatia	73,6	78,6
Bulgaria	70,9	78,3
Estonia	70,9	76,6
Poland	71,3	76,5
Slovakia	78,7	75,5
Lithuania	64,6	73,5

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Survival rates of cancer patients (the CONCORD study): selected diagnoses

Source: The CONCORD study, Allemani et al. Lancet 2018; 391: 1023–75

Malignant melanoma of skin
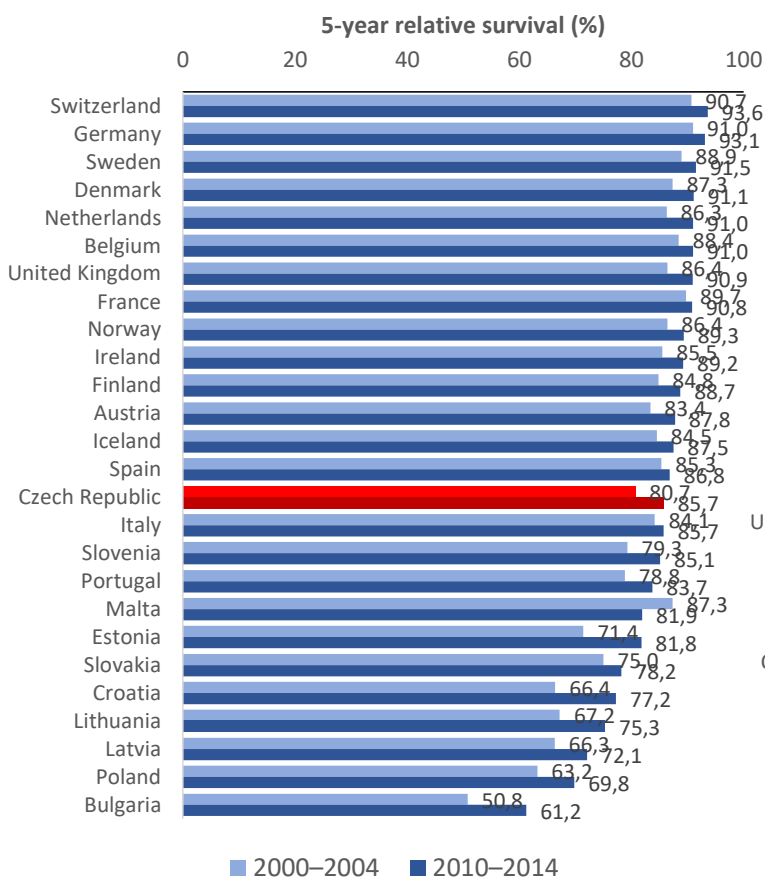
Prostate cancer
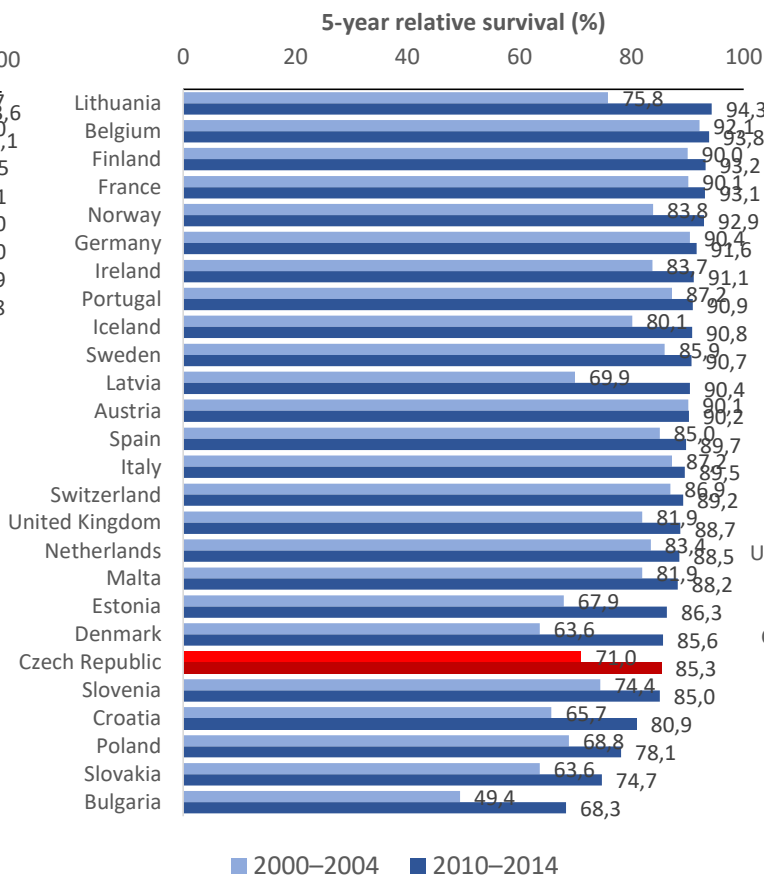
Cervical cancer
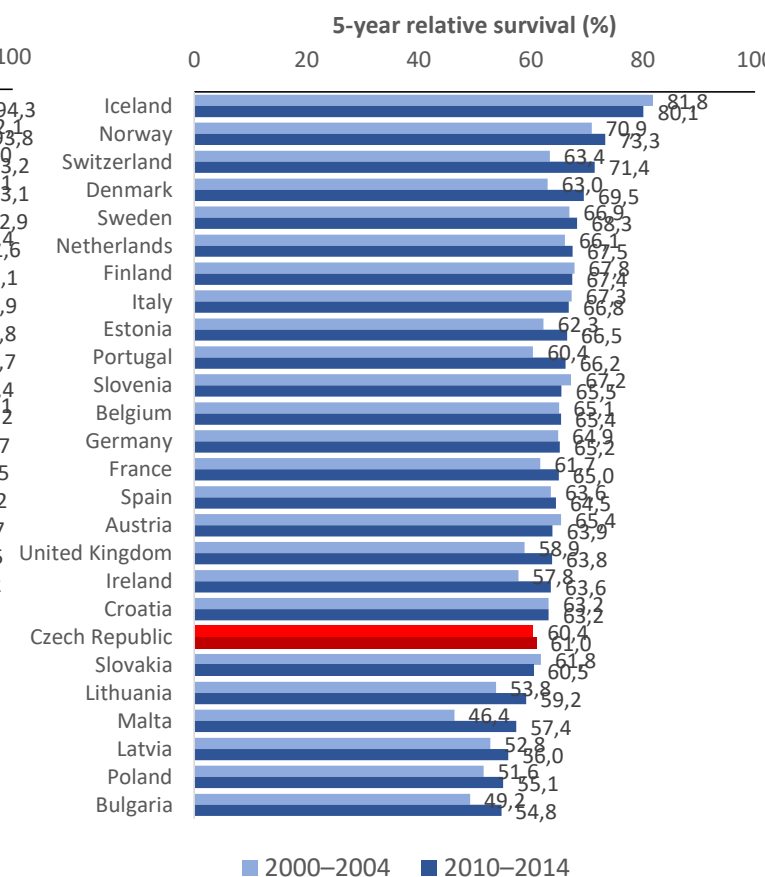
International comparison: Breast cancer mortality, ASR(W), women

Source: International Agency for Research on Cancer – The Global Cancer Observatory
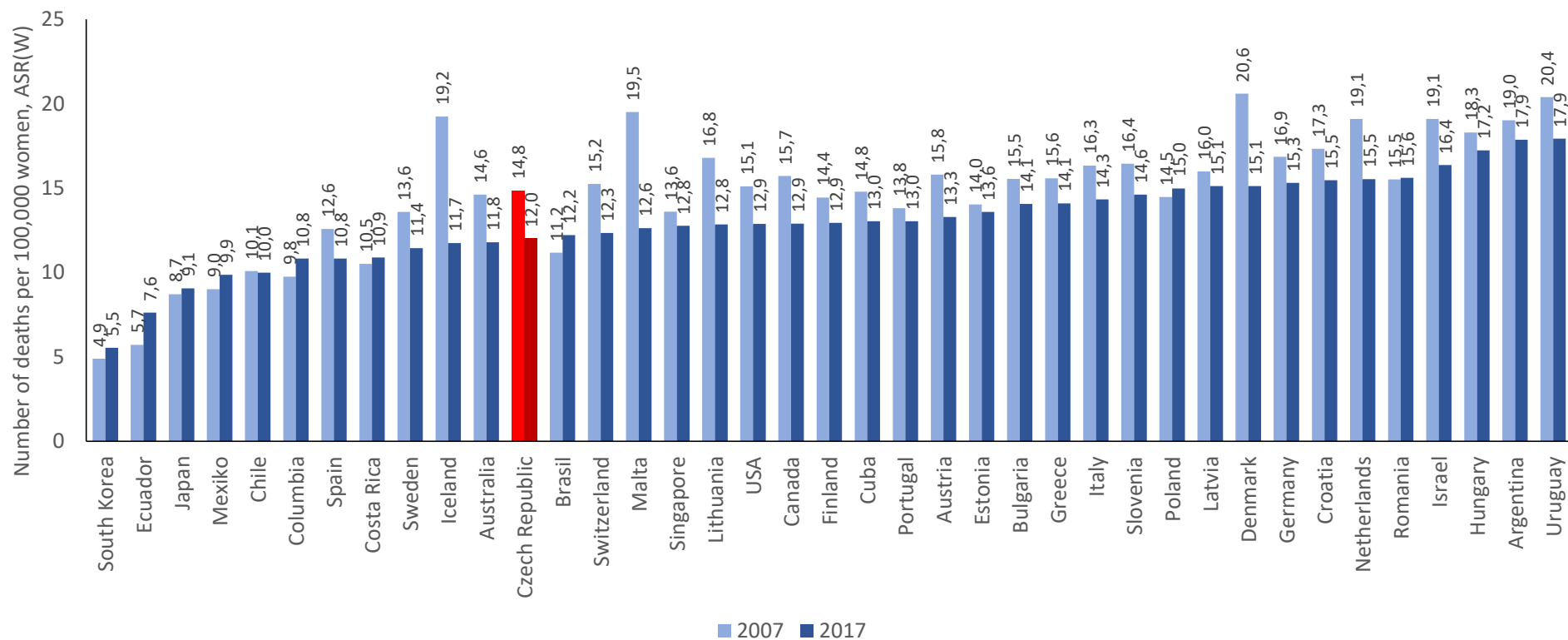
International comparison: Colorectal cancer mortality, ASR(W), men

Source: International Agency for Research on Cancer – The Global Cancer Observatory
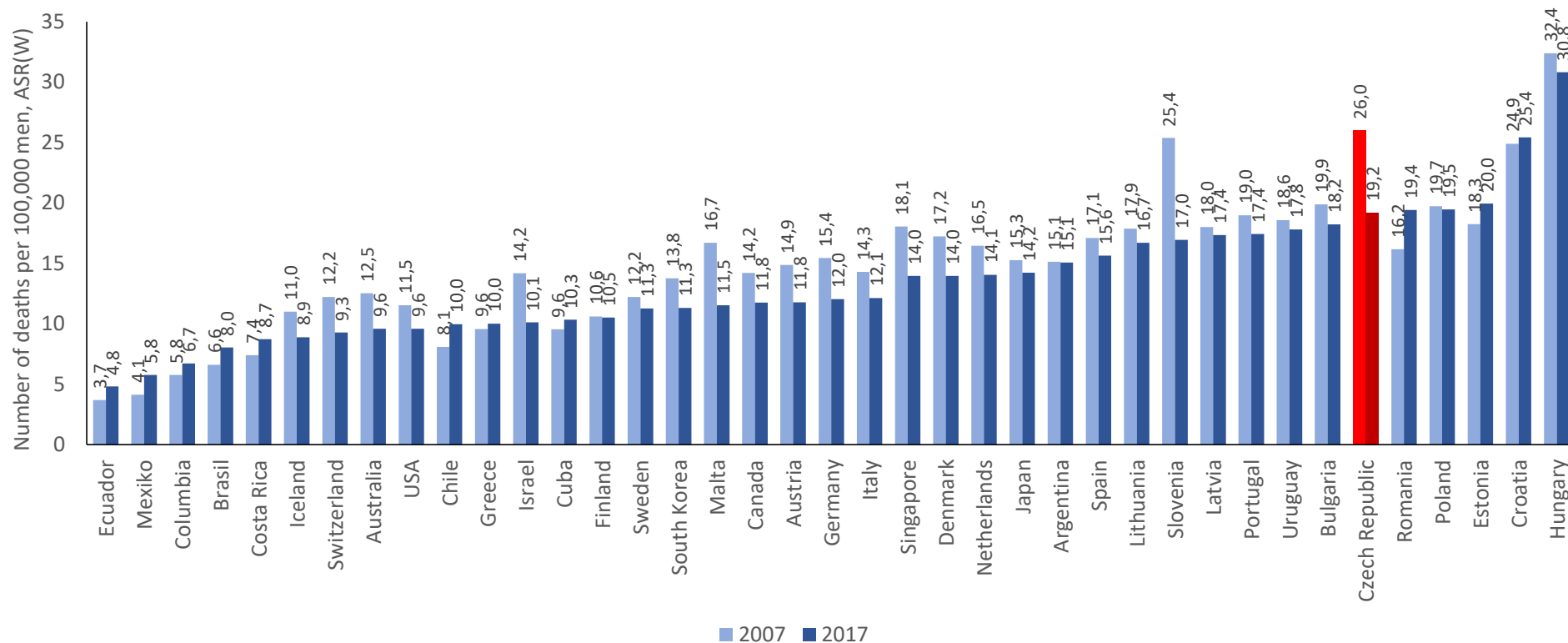
ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS

International comparison: Colorectal cancer mortality, ASR(W), women

Source: International Agency for Research on Cancer – The Global Cancer Observatory
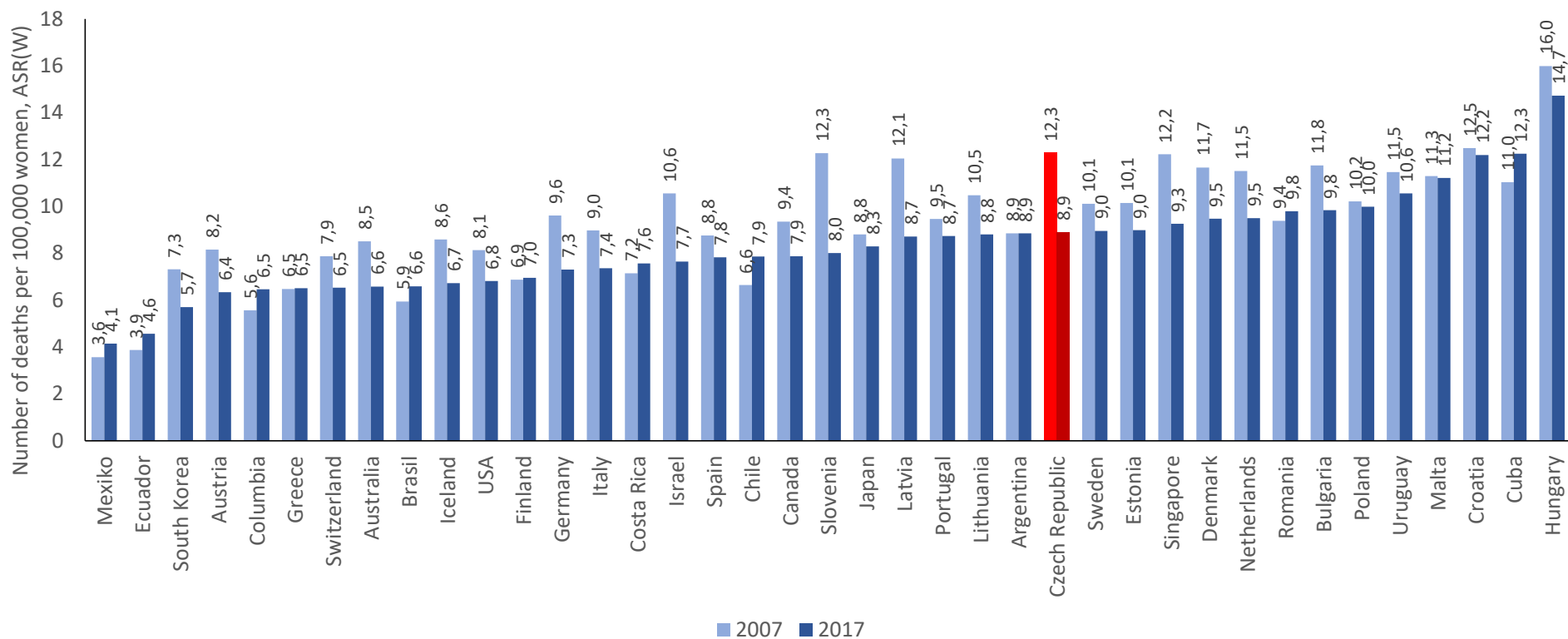
Time trends of 5-year relative survival of cancer patients in the Czech Republic

All patients with diagnosed cancer

Diagnoses are ranked in descending order of 5-year survival for the 2015-2019 period analysis.

5-year relative survival (%)

Legend:
- ▣ Period analysis 2015–2019 (with 95% CI)
- ● Cohort analysis 2010–2014

Diagnosis	Number of patients (cohort 2010–2014)	Number of patients (period 2015–2019)	Relative survival (%, cohort 2010–2014)	Relative survival (%, period 2015–2019)	Difference in survival
Thyroid cancer (C73)	5 093	10 259	95.97	96.90	+0.93 %
Testicular cancer (C62)	2 239	4 523	94.90	96.30	+1.40 %
Prostate cancer (C61)	34 013	65 886	91.20	92.76	+1.56 %
Breast cancer (C50) in women	32 673	61 753	85.77	87.57	+1.80 %
Melanoma of skin (C43)	10 565	20 599	84.55	87.26	+2.71 %
Uterine cancer (C54. C55)	9 616	17 486	79.26	81.08	+1.82 %
Kidney cancer (C64)	14 112	24 348	68.38	71.47	+3.09 %
Cervical cancer (C53)	4 617	7 279	63.62	63.41	−0.21 %
Bladder cancer (C67)	10 790	17 453	63.43	61.78	−1.65 %
Colorectal cancer (C18–C20)	38 224	58 914	57.68	59.45	+1.77 %
Laryngeal cancer (C32)	2 630	4 042	49.34	51.06	+1.72 %
Head and neck cancer (C00–C14. C30–C31)	7 597	12 993	47.86	50.16	+2.30 %
Ovarian cancer (C56)	5 134	7 662	40.37	42.35	+1.98 %
Gastric cancer (C16)	7 354	8 842	21.17	23.08	+1.91 %
Lung cancer (C33. C34)	29 896	37 739	11.12	12.54	+1.42 %
Oesophagal cancer (C15)	2 958	3 865	9.65	12.44	+2.79 %
Gallbladder cancer (C23. C24)	3 881	4 425	11.07	11.81	+0.74 %
Liver cancer (C22)	3 769	4 739	6.22	7.80	+1.58 %
Pancreatic cancer (C25)	9 785	12 037	5.56	6.90	+1.34 %

Overall survival of cancer patients varies significantly between diagnoses. These differences are due to several factors, the main ones being the biological nature of the tumour and the stage at which the tumour is detected.

Time trends of 5-year relative survival according to stages – selected diagnoses

All diagnosed patients

*The 5-year survival rates for individual diagnoses/stages are **age-standardised**.*

Colorectal cancer (C18–C20)

Lung cancer(C33, C34)

Legend:
- ◇ Period analysis 2015–2019
- ○ Cohort analysis 2010–2014
- △ Cohort analysis 2005–2009
- □ Cohort analysis 2000–2004
- + Cohort analysis 1995–1999
- × Cohort analysis 1990–1994

Time trends of 5-year relative survival according to stages – selected diagnoses

All diagnosed patients

*The 5-year survival rates for individual diagnoses/stages are **age-standardised**.*

Melanoma of skin (C43)

Prostate cancer (C61)

◇ Period analysis 2015–2019   ◉ Cohort analysis 2010–2014
△ Cohort analysis 2005–2009   □ Cohort analysis 2000–2004
+ Cohort analysis 1995–1999   × Cohort analysis 1990–1994

Time trends of 5-year relative survival according to stages – selected diagnoses

All diagnosed patients

The 5-year survival rates for individual diagnoses/stages are __age-standardised__.

Breast cancer (C50) in women — **Cervical cancer (C53)**

Legend:
◇ Period analysis 2015–2019
● Cohort analysis 2010–2014
△ Cohort analysis 2005–2009
□ Cohort analysis 2000–2004
+ Cohort analysis 1995–1999
× Cohort analysis 1990–1994

The objectives of the Czech National Cancer Control Plan 2030 respond to the expected increase in the cancer burden of the population and other demographic risk factors

Population projections for the Czech Republic

Source: Czech Statistical Office – Population projections for the Czech Republic: 2018 to 2100

- **Low variant** (blue)
- **Medium variant** (green)
- **High variant** (red)

In 2030, according to the model projection, a population growth of approximately +134 thousand can be expected, with a decrease of -116 thousand and an increase of up to +341 thousand in the limit values. According to the projected development of the number and structure of the population, the average age of the population should increase by 2.1 years (by +1.8 years and +2.4 years in the limit values). The higher average age is due to an increase in the population aged 65+ and a decrease in the 0–14 and 15–64 age groups. The structure of the population can also be characterised by means of person-years, i.e. the product of the age of the population and its numerical representation. In the medium variant, this number is expected to increase by +27 million person-years, due to a larger population and its higher age.
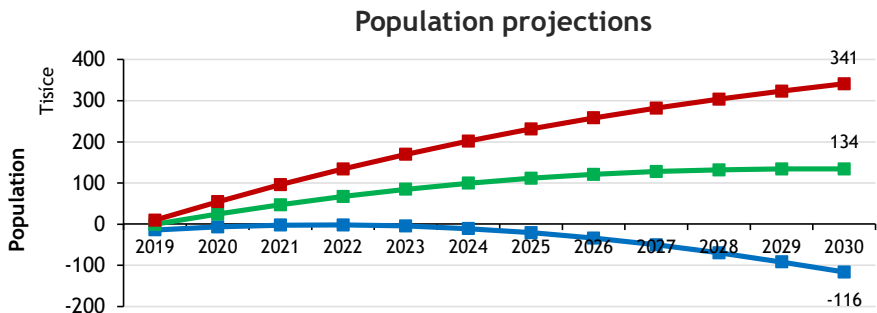
Population projections

Projections of the development of the average age of the population

Projections of the development of the number of person-years

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

The objectives of the Czech National Cancer Control Plan 2030 respond to the expected increase in the cancer burden of the population and other demographic risk factors

Age structure of the population and its expected development

Source: Czech Statistical Office
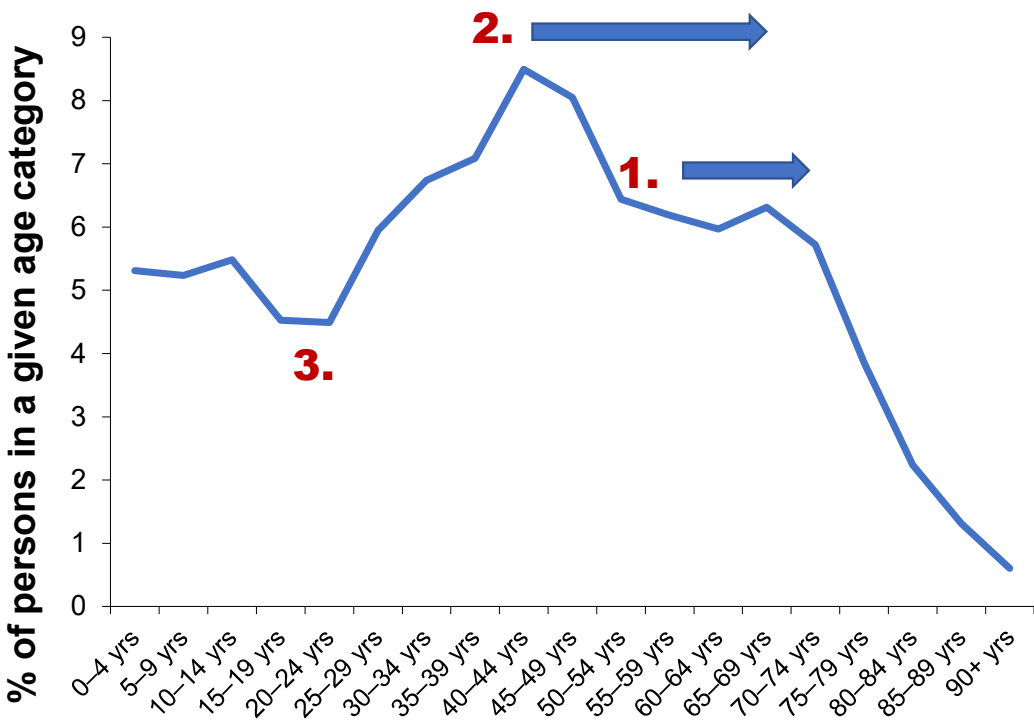
The relative structure of the population clearly shows three major age classes whose further shift over time will have a significant impact on the health system. These are the very large class of people aged 40–50 and, in particular, those aged 30–40. These population categories will age to the age of 60 and over in the next 15 and 20–25 years respectively, and will inevitably increase the need for health and social services significantly. The decline in the population aged 10–25 is also very significant and, together with the postponement of the age of motherhood for the first child, creates a demographic risk of a shortage of people of working age in the next 15–30 years.

1. **An increase in morbidity related to diseases of old age is expected within the next 15 years.**

2. **Within 20–25 years, a sharp increase in morbidity related to diseases of old age is expected.**

3. **A lower representation of younger age groups as a risk of declining fertility in the next 10–15 years is expected.**

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

The objectives of the Czech National Cancer Control Plan 2030 respond to the expected increase in the cancer burden of the population and other demographic risk factors

Demographic ageing of the population

	as of 31 Dec 2020	as of 31 Dec 2021	as of 1 Jan 2030	as of 1 Jan 2040	as of 1 Jan 2050
People aged 65+	2,158,322	2,169,109	2,403,273	2,698,767	3,075,587
People aged 75+	864,727	894,236	1,246,717	1,372,410	1,591,668
People aged 85+	203,389	198,475	293,687	470,469	505,383

Development of the percentage of people aged 65+
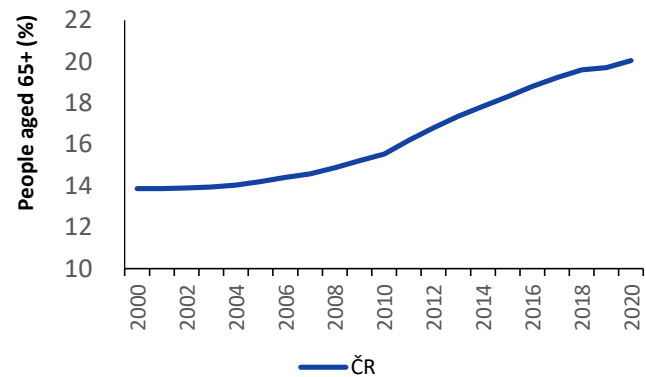
The development of the morbidity of the Czech population, including the cancer burden, will be determined in the coming years by the very rapid demographic ageing.

The objectives of the Czech National Cancer Control Plan 2030 respond to the expected increase in the cancer burden of the population and other demographic risk factors

Ageing of the Czech population and projections of the old-age dependency ratio

Percentage of people aged:	as of 1 Jan 2010	as of 1 Jan 2020	as of 1 Jan 2030	as of 1 Jan 2040	as of 1 Jan 2050
0–14 yrs	14.2%	16.0%	14.9%	13.9%	14.8%
15–64 yrs	70.6%	64.1%	62.9%	61.0%	56.6%
65+ yrs	15.2%	19.9%	22.3%	25.1%	28.6%
Old-age dependency ratio	**21.6**	**31.1**	**35.4**	**41.1**	**50.5**

The number of people aged 65+ per 100 people of working age (i.e. those 15–64 years old) will almost double between 2010 and 2040

The old-age dependency ratio is calculated as the number of people at an age when they are generally economically inactive (i.e. aged 65 and over) per 100 persons of working age (i.e. 15-64 years old). **The old-age dependency ratio is increasing significantly and will reach an average value of over 50 by 2050.**

The current old-age dependency ratio – and especially projections for the next few years – shows that an increase in morbidity is to be expected as the percentage of economically active population will decline. There will also be a significant burden on the economically active population, which will have to provide care to ageing family members.

Long-term prediction of incidence: malignant neoplasms (C00-C97 excluding C44)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed incidence	Predicted incidence (including 90% confidence intervals)			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	60,756	61,689 (57,580 – 65,797)	63,515 (59,272 – 67,757)	66,800 (62,303 – 71,299)	72,081 (67,272 – 76,889)
Optimistic scenario		62,983 (60,571 – 65,393)	63,591 (61,028 – 66,153)	64,737 (61,830 – 67,644)	65,864 (62,214 – 69,513)

In 2019, more than 60,000 patients with malignant neoplasms (excluding non-melanoma skin cancer) were newly diagnosed in the Czech Republic. Due to the demographic development of the Czech population, it is necessary to expect a substantial increase in cancer incidence for the next period: up to +10% every 10 years.

In 2020, there was a distinctive decrease in the number of newly diagnosed cancer patients due to the COVID-19 epidemic. Therefore, an increase in the number of patients beyond the earlier prediction can be expected in the coming years due to delayed diagnosis of some of these patients.
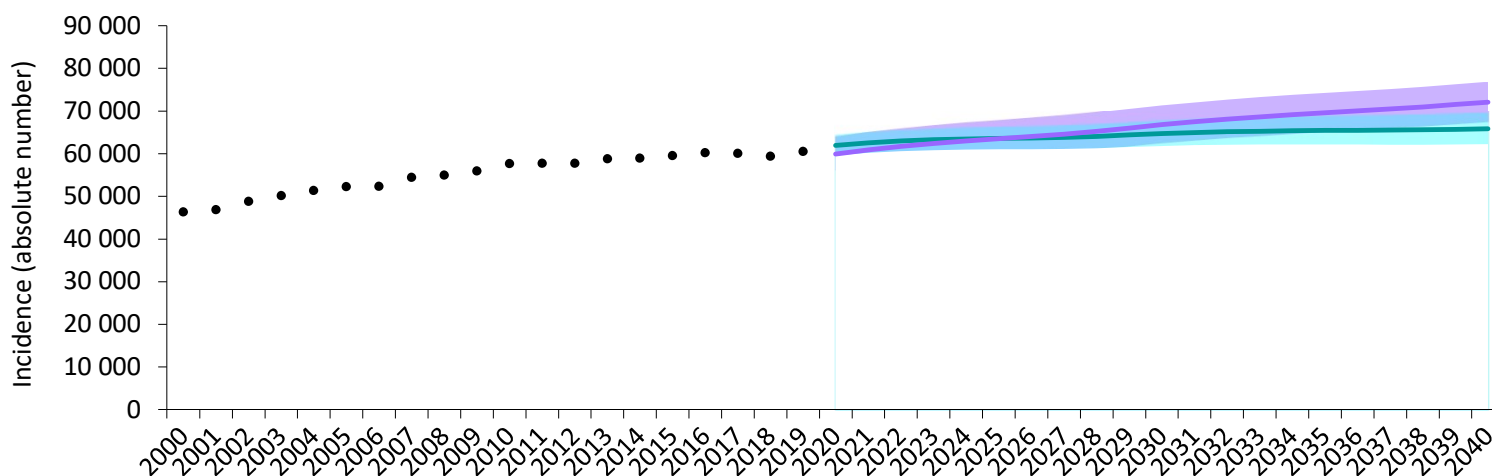
The 90% confidence interval is represented by a band in the chart. The confidence interval is due to the statistical uncertainty in the estimate of the recent incidence trend and does not include other sources of uncertainty.

Long-term prediction of prevalence: malignant neoplasms (C00-C97 excluding C44)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed interval prevalence	Predicted interval prevalence			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	448,783	524 thousand	564 thousand	627 thousand	776 thousand
Optimistic scenario		496 thousand	507 thousand	523 thousand	540 thousand

In 2019, there were almost 450 000 people in the Czech Republic with a history of cancer (excluding non-melanoma skin cancer). In 2040, the model predicts up to 800,000 people with a history of cancer.

Due to the demographic development of the Czech population, it is necessary to expect a substantial increase in cancer prevalence for the next period: up to +30% every 10 years.

The value of interval prevalence is shown, i.e. the number of all patients living with the disease (or its history) at any given time during a given year.
The high-prevalence scenario represents the highest of the scenarios considered (high incidence, favourable survival trend), whereas the low-prevalence scenario represents the lowest of the scenarios considered (low incidence, same trend as the recent survival).

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Long-term prediction of incidence: example of breast cancer (C50)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed incidence	Predicted incidence (including 90% confidence intervals)			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	7,397	7,546 (7,099 – 7,998)	7,735 (7,276 – 8,194)	7,968 (7,499 – 8,438)	8,262 (7,773 – 8,751)
Optimistic scenario		7,499 (6,966 – 8,038)	7,574 (6,977 – 8,174)	7,652 (6,941 – 8,365)	7,895 (6,908 – 8,885)

In 2019, over 7,000 patients were newly diagnosed with breast cancer in the Czech Republic.

In 2040, the model predicts between 7 and 9 thousand new patients in the two proposed scenarios.

Given the partial decrease in the number of patients diagnosed in 2020 due to the epidemic situation, an increase in the number of patients beyond the earlier prediction can be expected in the following years due to delayed diagnosis of some of these patients. The available data also show a decrease in the uptake of mammography screening in 2020.

The 90% confidence interval is represented by a band in the chart. The confidence interval is due to the statistical uncertainty in the estimate of the recent incidence trend and does not include other sources of uncertainty.
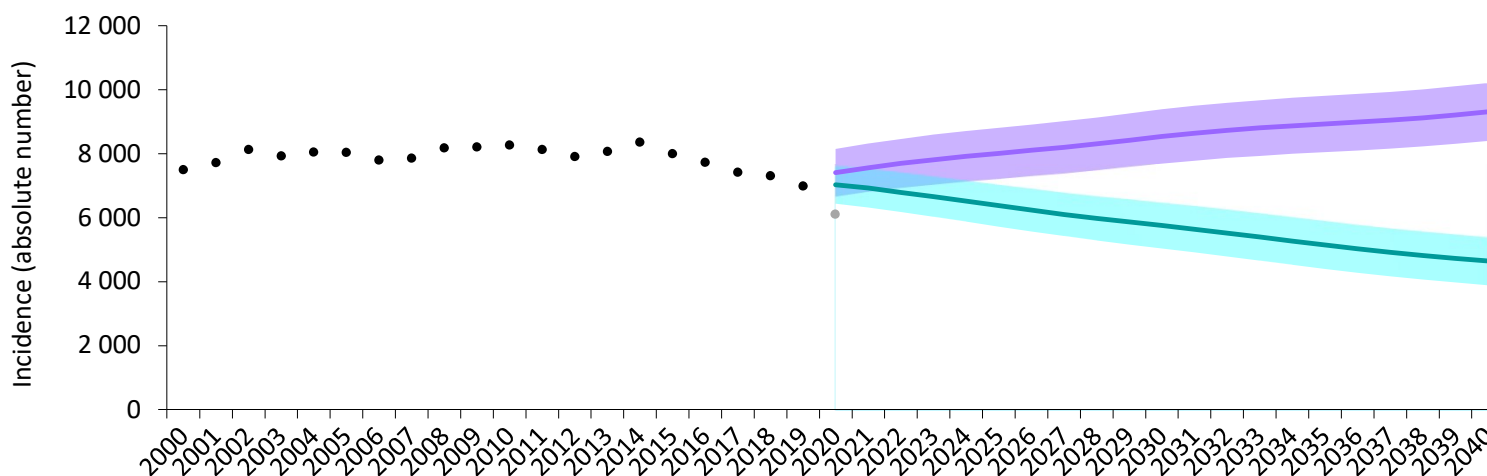
Long-term prediction of prevalence: example of breast cancer (C50)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed interval prevalence	Predicted interval prevalence			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	94,655	102 thousand	109 thousand	119 thousand	135 thousand
Optimistic scenario		100 thousand	105 thousand	111 thousand	119 thousand
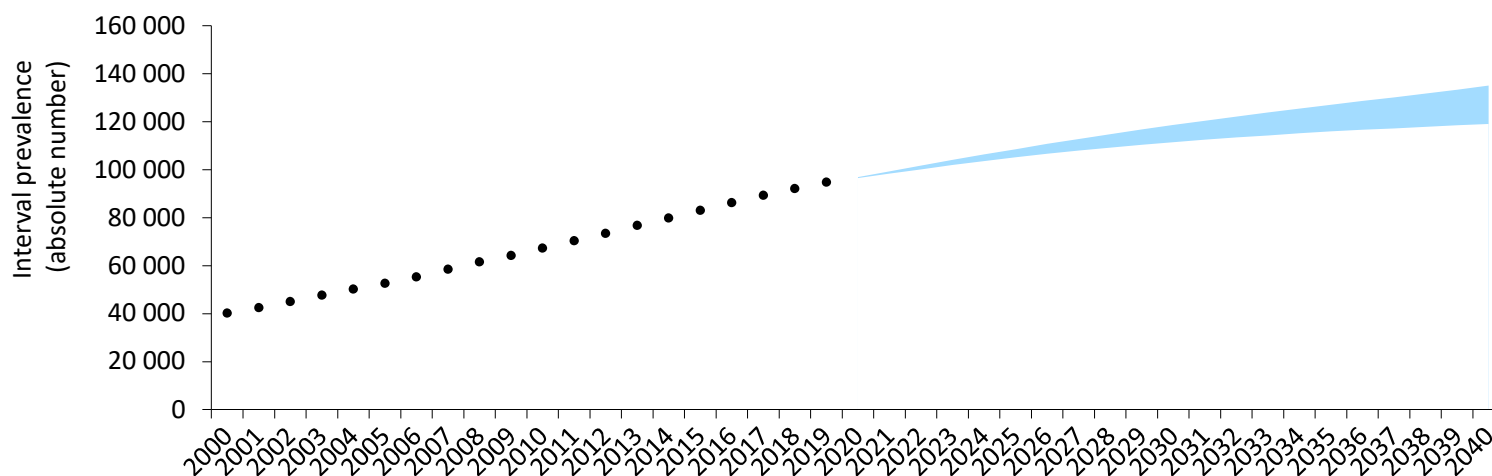
In the period 2019–2020, there were nearly 100,000 women in the Czech Republic living with a history of breast cancer. In 2040, the model predicts up to 135 thousand women living with a history of breast cancer.

The value of interval prevalence is shown, i.e. the number of all patients living with the disease (or its history) at any given time during a given year.
The high-prevalence scenario represents the highest of the scenarios considered (high incidence, favourable survival trend), whereas the low-prevalence scenario represents the lowest of the scenarios considered (low incidence, same trend as the recent survival).

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Incidence and prevalence predictions for 2022: example of breast cancer (C50)

Incidence trend continuation scenario, survival improvement scenario

Breast cancer (C50)	Predicted values for the year 2022	
	Incidence[1]	(90% confidence interval)
Stage I	3,876	(3,603; 4,149)
Stage II	2,096	(1,986; 2,207)
Stage III	579	(519; 640)
Stage IV	424	(381; 469)
Clinical stage unknown[2]	524	(477; 573)
TOTAL	7,499	(6,966; 8,038)

[1] The number includes the total incidence of cancer, including new cancers diagnosed in cancer patients.

Breast cancer (C50)	Predicted values for the year 2022	
	Prevalence[2]	(90% confidence interval)
Stage I	52,479	(52,102; 52,856)
Stage II	35,440	(35,130; 35,750)
Stage III	7,511	(7,368; 7,654)
Stage IV	2,876	(2,788; 2,964)
Clinical stage unknown	3,434	(3,338; 3,530)
TOTAL	101,740	(101,215; 102,265)

[2] The value of interval prevalence is shown, i.e. the number of all patients living with the disease (or its history) at any given time during a given year. The resulting estimates have been adjusted to disease progression to disseminated stages. Patients who were previously diagnosed at stage I, II or III but who are likely to relapse or to progress to disseminated stage in a given year are already included in the predicted stage IV prevalence.

Breast cancer in women was chosen as an example because it is a diagnosis whose health and financial impact in the Czech Republic is significantly reduced by a functional screening programme. Unfortunately, despite this programme's performance, nearly 1000 of breast cancer cases are still newly diagnosed at an advanced stage (III or IV) each year, which is negatively reflected in the risk prevalence structure (predicted to be more than 10,000 patients with late diagnosis).

The high proportion of advanced clinical stages of breast cancer increases treatment requirements and reduces the overall achievable population-based survival.

Predicted numbers of patients likely to be treated in 2022: example of breast cancer (C50)

Incidence trend continuation scenario, survival improvement scenario

Breast cancer C50	Newly diagnosed and treated patients in 2022 (Clinical stage I–III)	Numbers of stage IV patients treated in 2022	
		Newly diagnosed and treated stage IV patients	Relapses and progressions treated in patients diagnosed in previous years
	Stage I **3,833** (3,563; 4,103)		
	Stage II **2,060** (1,952; 2,170)	**370** (332; 409)	**1,170** (1,114; 1,226)
	Stage III **556** (499; 615)		
TOTAL	**6,449** (6,014; 6,888)	**1,540** (1,446; 1,635)	
	7,989 (7,460; 8,523)		

The tables show numbers of people likely to be treated with cancer therapy, with respect to clinical stage (information on provided treatment according to CNCR/NRRHS records, 2015–2019) – either newly diagnosed or treated in the terminal stage of cancer (terminal relapses and progressions). Thus, the estimates do not include patients diagnosed in previous years treated in non-terminal stages of cancer and patients in follow-up care only.

Breast cancer in women was chosen as an example because it is a diagnosis whose health and financial impact in the Czech Republic is significantly reduced by a functional screening programme. Unfortunately, despite this programme's performance, nearly 1000 of breast cancer cases are still newly diagnosed at an advanced stage (III or IV) each year, which is negatively reflected in the risk prevalence structure (predicted to be more than 10,000 patients with late diagnosis).

The high proportion of advanced clinical stages of breast cancer increases treatment requirements and reduces the overall achievable population-based survival.

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY   ÚZIS

Long-term prediction of incidence: example of colorectal cancer (C18–C20)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed incidence	Predicted incidence (including 90% confidence intervals)			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	6,977	7,696 (6,926 – 8,465)	8,013 (7,211 – 8,808)	8,538 (7,691 – 9,386)	9,303 (8,394 – 10,207)
Optimistic scenario		6,793 (6,178 – 7,415)	6,376 (5,719 – 7,031)	5,756 (5,041 – 6,473)	4,642 (3,888 – 5,393)

The 90% confidence interval is represented by a band in the chart. The confidence interval is due to the statistical uncertainty in the estimate of the recent incidence trend and does not include other sources of uncertainty.

In 2019, almost 7,000 patients were newly diagnosed with colorectal cancer in the Czech Republic. Colorectal cancer is a diagnosis for which a significant decrease in incidence has been observed in the recent period in connection with the colorectal cancer screening programme, which has already been running for many years.

If the scope and quality of the programme are further developed in the coming period, a continuation of this trend and a possible further decline can be expected. However, if the trend does not continue and the current burden (age-specific incidence) is maintained, up to 9,500 new cases can be expected in 2040 due to the ageing population. Given the clear decline in the number of patients diagnosed in 2020 due to the epidemic situation, an increase in the number of patients beyond the earlier prediction can be expected in the following years due to delayed diagnosis of some of these patients.

Long-term prediction of prevalence: example of colorectal cancer (C18–C20)

Data source: IHIS CR: CNCR, NRRHS; Czech Statistical Office: demography, population projections for the Czech Republic

Predicted development in two scenarios	Observed interval prevalence	Predicted interval prevalence			
	Year 2019	Year 2022	Year 2025	Year 2030	Year 2040
Realistic scenario	65,263	68 thousand	70 thousand	76 thousand	89 thousand
Optimistic scenario		64 thousand	61 thousand	56 thousand	45 thousand
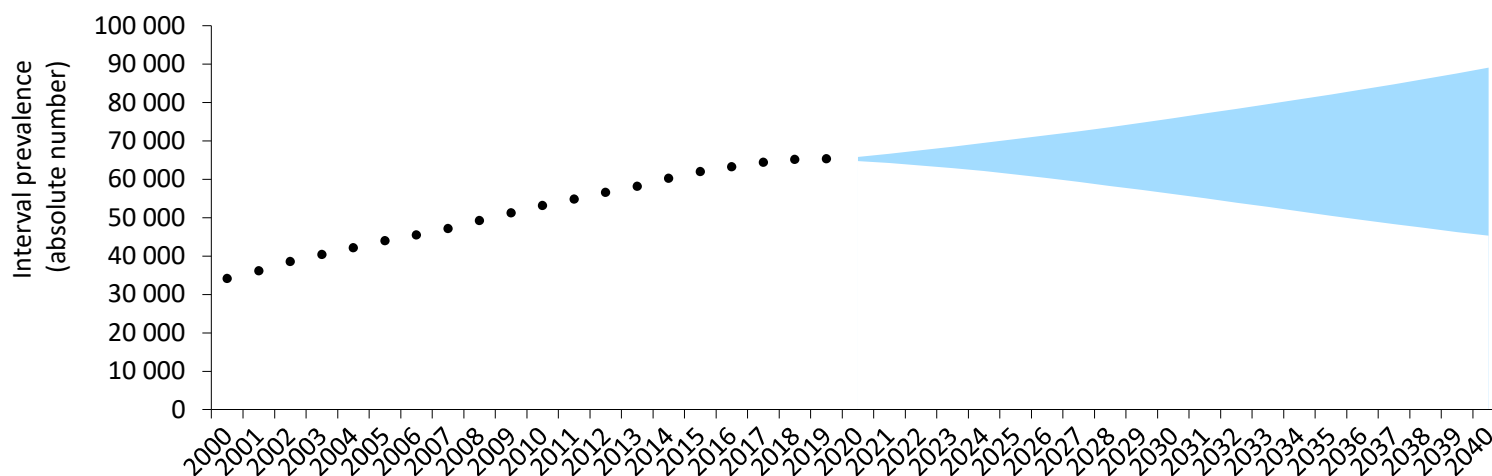
In 2019, there were over 65,000 people living with a history of colorectal cancer in the Czech Republic. In 2040, the model predicts up to 90 thousand people living with a history of colorectal cancer. The value will be highly dependent on future trends in incidence and survival.

Colorectal cancer is a diagnosis for which a significant decrease in incidence has been observed in the recent period in connection with the colorectal cancer screening programme, which has already been running for many years.

If the scope and quality of the programme are further developed in the coming period, a continuation of this trend and a possible further decline can be expected. However, if the trend does not continue and the current burden (age-specific incidence) is maintained, up to 9,500 new cases can be expected in 2040 due to the ageing population. Given the clear decline in the number of patients diagnosed in 2020 due to the epidemic situation, an increase in the number of patients beyond the earlier prediction can be expected in the following years due to delayed diagnosis of some of these patients.

The value of interval prevalence is shown, i.e. the number of all patients living with the disease (or its history) at any given time during a given year.
The high-prevalence scenario represents the highest of the scenarios considered (high incidence, favourable survival trend), whereas the low-prevalence scenario represents the lowest of the scenarios considered (low incidence, same trend as the recent survival).

Incidence and prevalence predictions for 2022: example of colorectal cancer (C18–C20)

Incidence trend continuation scenario, survival improvement scenario

Colorectal cancer (C18-C20)	Predicted values for the year 2022	
	Incidence[1]	(90% confidence interval)
Stage I	1,384	(1,216; 1,553)
Stage II	1,420	(1,304; 1,537)
Stage III	1,728	(1,621; 1,837)
Stage IV	1,308	(1,160; 1,458)
Clinical stage unknown[2]	953	(877; 1,030)
TOTAL	6,793	(6,178; 7,415)

[1] The number includes the total incidence of cancer, including new cancers diagnosed in cancer patients.

Colorectal cancer (C18-C20)	Predicted values for the year 2022	
	Prevalence[2]	(90% confidence interval)
Stage I	21,979	(21,735; 22,223)
Stage II	18,653	(18,428; 18,878)
Stage III	15,772	(15,565; 15,979)
Stage IV	5,662	(5,538; 5,786)
Clinical stage unknown	3,906	(3,803; 4,009)
TOTAL	65,972	(65,550; 66,394)

[2] The value of interval prevalence is shown, i.e. the number of all patients living with the disease (or its history) at any given time during a given year. The resulting estimates have been adjusted to disease progression to disseminated stages. Patients who were previously diagnosed at stage I, II or III but who are likely to relapse or to progress to disseminated stage in a given year are already included in the predicted stage IV prevalence.

Colorectal cancer was chosen as an example because it is a diagnosis whose health and financial impact in the Czech Republic is significantly reduced by a functional screening programme. Unfortunately, despite this programme's performance, more than 3000 of colorectal cancer cases are still newly diagnosed at an advanced stage (III or IV) each year, which is negatively reflected in the risk prevalence structure (predicted to be more than 21,000 patients with late diagnosis).
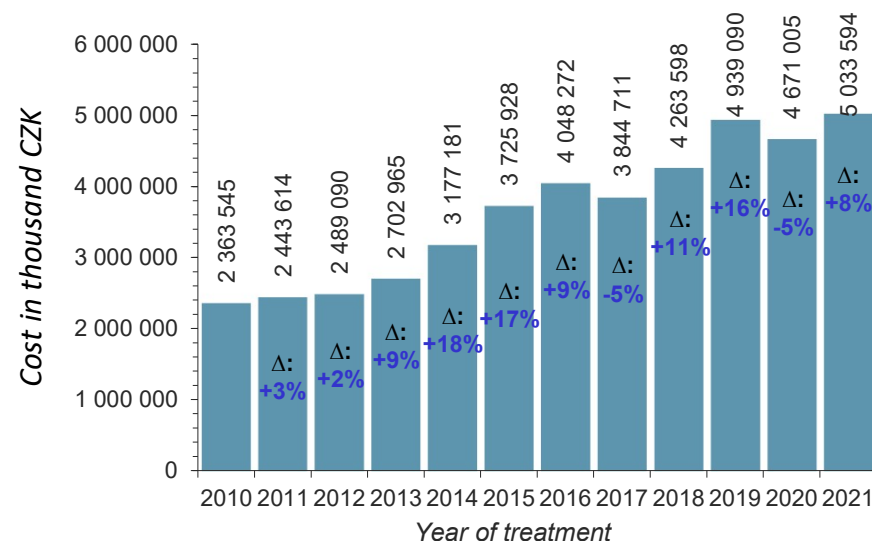
The high proportion of advanced clinical stages of colorectal cancer increases treatment requirements and reduces the overall achievable population-based survival.

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Predicted numbers of patients likely to be treated in 2022: example of colorectal cancer (C18–C20)

Incidence trend continuation scenario, survival improvement scenario

Colorectal cancer C18-C20	Newly diagnosed and treated patients in 2022 (Clinical stage I–III)		Numbers of stage IV patients treated in 2022	
			Newly diagnosed and treated stage IV patients	Relapses and progressions treated in patients diagnosed in previous years
	Stage I	**1,285** (1,129; 1,442)	**1,188** (1,054; 1,324)	**1,743** (1,674; 1,812)
	Stage II	**1,372** (1,260; 1,485)		
	Stage III	**1,677** (1,573; 1,782)		
TOTAL	**4,334** (3,962; 4,709)		**2,931** (2,728; 3,136)	
	7,265 (6,690; 7,845)			

The tables show numbers of people likely to be treated with cancer therapy, with respect to clinical stage (information on provided treatment according to CNCR/NRRHS records, 2015–2019) – either newly diagnosed or treated in the terminal stage of cancer (terminal relapses and progressions). Thus, the estimates do not include patients diagnosed in previous years treated in non-terminal stages of cancer and patients in follow-up care only.

Colorectal cancer was chosen as an example because it is a diagnosis whose health and financial impact in the Czech Republic is significantly reduced by a functional screening programme. Unfortunately, despite this programme's performance, more than 3000 of colorectal cancer cases are still newly diagnosed at an advanced stage (III or IV) each year, which is negatively reflected in the risk prevalence structure (predicted to be more than 21,000 patients with late diagnosis).

The high proportion of advanced clinical stages of colorectal cancer increases treatment requirements and reduces the overall achievable population-based survival.

Development of prevalence and costs in the segment of centre-based (innovative) treatment

Prevalence of treated patients
Oncology – solid tumours

Number of treated patients:
- 2010: 6 821
- 2011: 7 066 (Δ: +4%)
- 2012: 7 267 (Δ: +3%)
- 2013: 7 690 (Δ: +6%)
- 2014: 8 481 (Δ: +10%)
- 2015: 9 498 (Δ: +12%)
- 2016: 10 095 (Δ: +6%)
- 2017: 10 734 (Δ: +6%)
- 2018: 11 336 (Δ: +6%)
- 2019: 12 518 (Δ: +10%)
- 2020: 12 647 (Δ: +1%)
- 2021: 14 088 (Δ: +11%)

Year of treatment

Costs incurred for treated patients
Oncology – solid tumours

Cost in thousand CZK:
- 2010: 2 363 545
- 2011: 2 443 614 (Δ: +3%)
- 2012: 2 489 090 (Δ: +2%)
- 2013: 2 702 965 (Δ: +9%)
- 2014: 3 177 181 (Δ: +18%)
- 2015: 3 725 928 (Δ: +17%)
- 2016: 4 048 272 (Δ: +9%)
- 2017: 3 844 711 (Δ: -5%)
- 2018: 4 263 598 (Δ: +11%)
- 2019: 4 939 090 (Δ: +16%)
- 2020: 4 671 005 (Δ: -5%)
- 2021: 5 033 594 (Δ: +8%)

Year of treatment
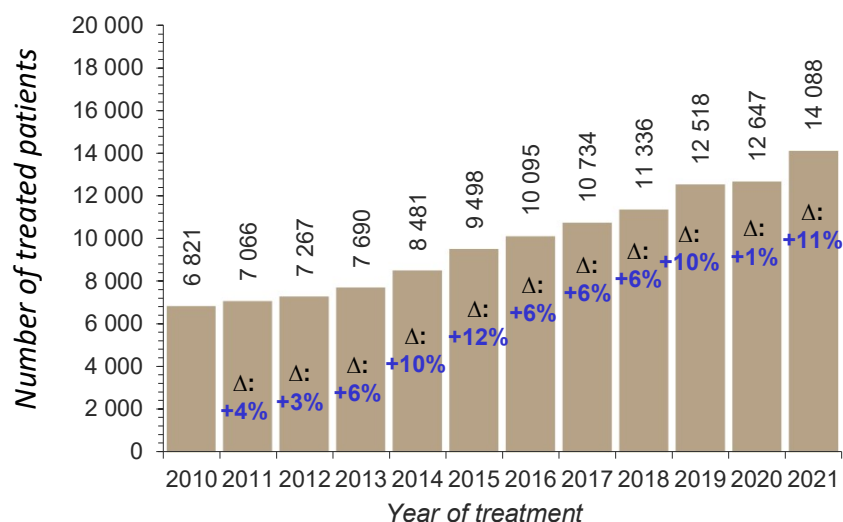
The segment of centre-based treatment is a very important modality that nowadays has long-term and completely new indications in many cancer types. It is often a multi-year treatment, the costs of which increase with the rising prevalence of a given cancer type. The total cost of this treatment for solid tumours in adults exceeded 5 billion CZK in 2021, and it is necessary to expect an annual cost increase of approximately 10% for the next period.

Development of prevalence and costs in the segment of centre-based (innovative) treatment
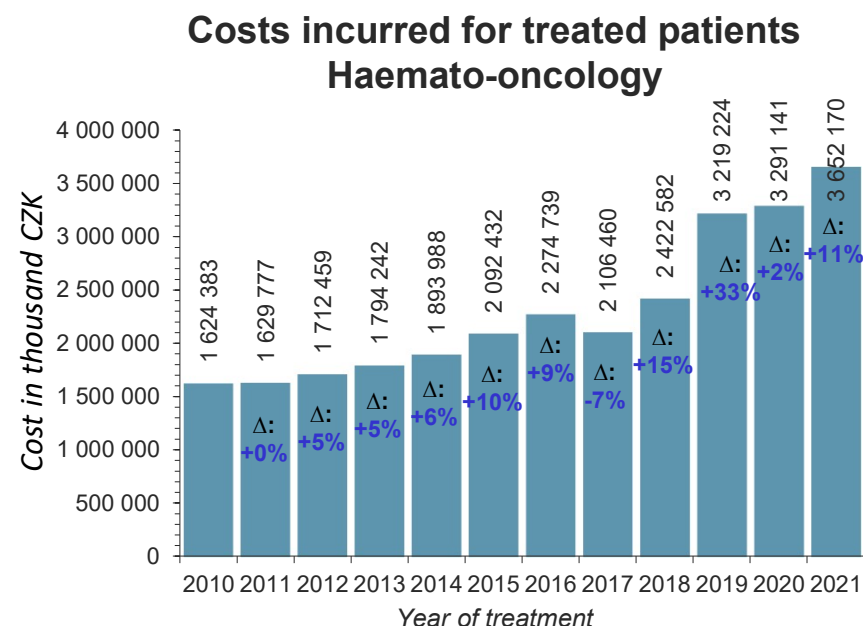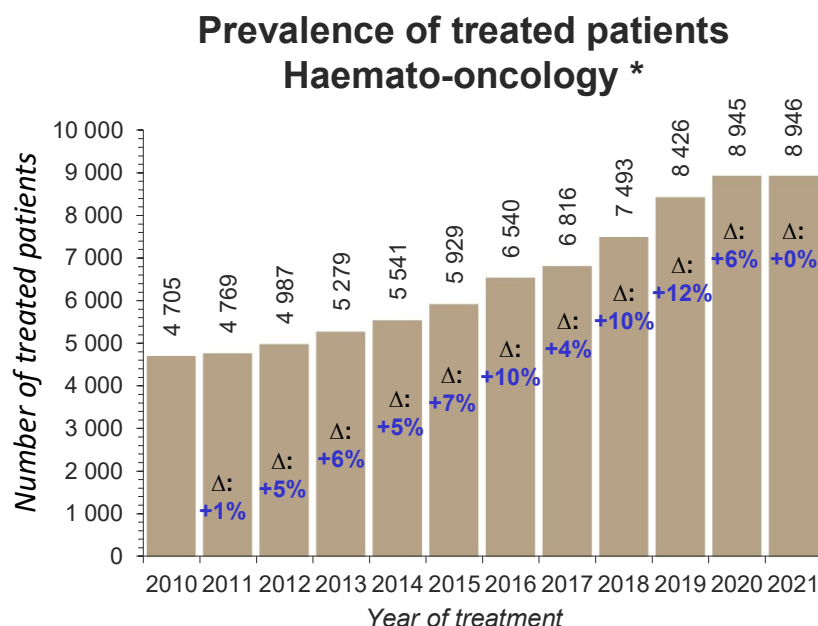
Prevalence of treated patients
Haemato-oncology *

Costs incurred for treated patients
Haemato-oncology

The segment of centre-based treatment is a very important modality that nowadays has long-term and completely new indications in many cancer types. It is often a multi-year treatment, the costs of which increase with the rising prevalence of a given cancer type. The total cost of this treatment for haemato-oncological malignancies in adults exceeded 3.6 billion CZK in 2021, and it is necessary to expect an annual cost increase of approximately 10% for the next period.

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Centre-based treatment in the segments of oncology and haemato-oncology

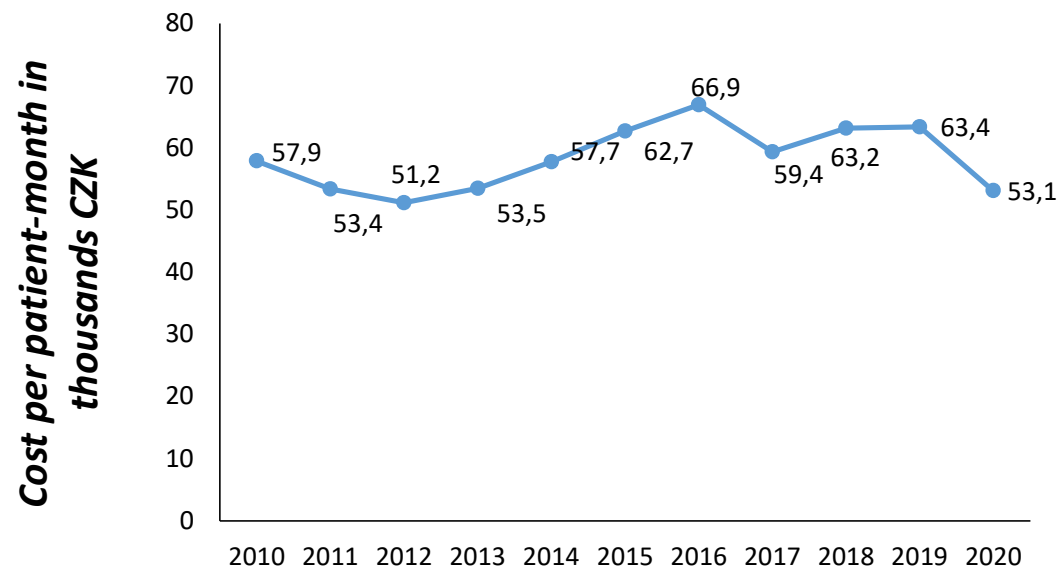| Diagnosis	ATC groups with at least one therapy included in a given indication	Total costs incurred for patients treated between 2010 and 2021 (thousand CZK)	Total costs incurred for patients treated in 2020	Number of patients treated in 2020	Total costs incurred for patients treated in 2021 (thousand CZK)	Number of patients treated in 2021
ONCOLOGY						
Breast cancer L01		11,590,821	949,947	2,405	1,333,235	3,457
Colorectal cancer L01		10,633,243	984,083	2,343	992,980	2,500
Prostate cancer L01, L02, V10		3,099,810	607,892	1,740	644,060	2,011
Kidney cancer L01		7,059,488	671,701	1,379	602,958	1,403
Lung cancer L01		3,424,900	315,262	1,364	301,180	1,335
Thyroid cancer H01, L01, V04, V10		416,090	68,741	1,065	68,140	887
Malignant melanoma L01		2,671,910	448,810	655	396,229	670
Ovarian cancer L01		1,109,970	256,954	518	296,459	553
GIST L01		576,668	64,987	384	73,772	388
Others L01, L03, V10, A16		3,119,692	302,628	794	324,581	884
Solid tumours in total A16, H01, L01, L02, L03, V04, V10		43,702,593	4,671,005	12,647	5,033,594	14,088
HAEMATO-ONCOLOGY						
Lymphomas L01, L04, V10		5,866,386	557,266	2,635	630,245	2,565
Multiple myeloma L01, L04		6,559,192	860,973	1,865	984,448	1,986
Chronic myeloid leukaemia L01		1,685,576	377,827	1,360	342,809	1,276
Chronic lymphocytic leukaemia L01		2,418,997	689,659	1,243	789,412	1,221
Others L01, L03, L04, B02, C07, V03		11,183,446	805,416	1,842	905,256	1,898
Haemato-oncology in total B02, C07, L01, L03, L04, V03, V10		27,713,597	3,291,141	8,945	3,652,170	8,946

Development in the segment of centre-based treatment: solid tumours in adults

Data source: NRRHS

Index of decline/increase 2016 -> 2021: 0.89

Cost per patient in thousands CZK

346,5
345,8
342,5
351,5
374,6
392,3
401,0
358,2
376,1
394,6
369,3
357,3

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

Index of decline/increase 2016 -> 2020: 0.79

Cost per patient-month in thousands CZK

57,9
53,4
51,2
53,5
57,7
62,7
66,9
59,4
63,2
63,4
53,1

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
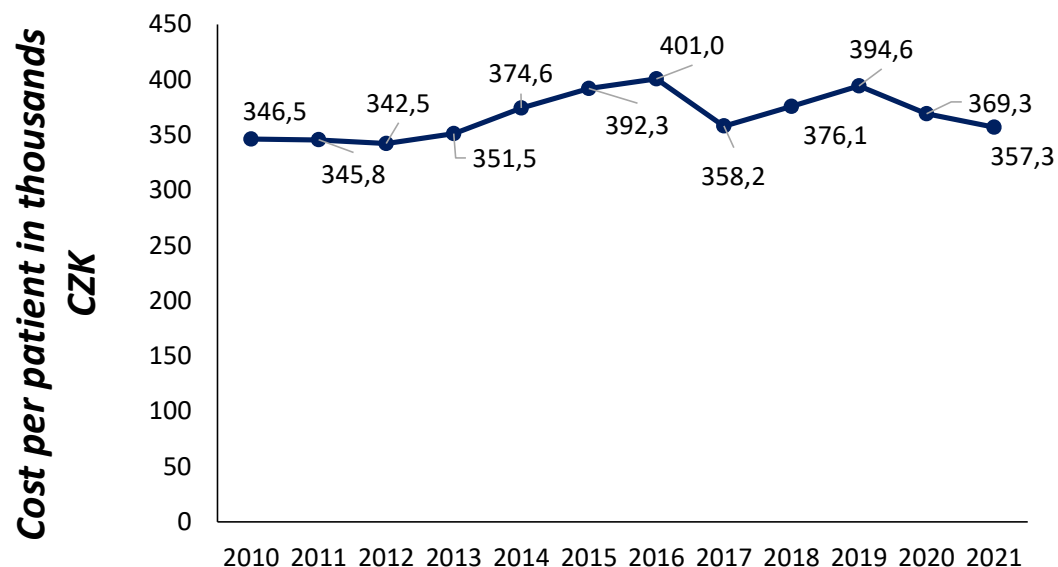
Patient-months for 2021 are not available (for their calculation, it is necessary to have data from a part of the following year, which are not yet available).

Although the prevalence of patients treated with innovative drugs is increasing significantly (up to 10% per year on average), financial costs are not growing at the same rate. The unit cost calculated per month of treatment has been gradually decreasing over time (impact of discounts, genericisation), which has led to a decrease of more than 20% between 2016 and 2021.

Development in the segment of centre-based treatment: haemato-oncology

Data source: NRRHS
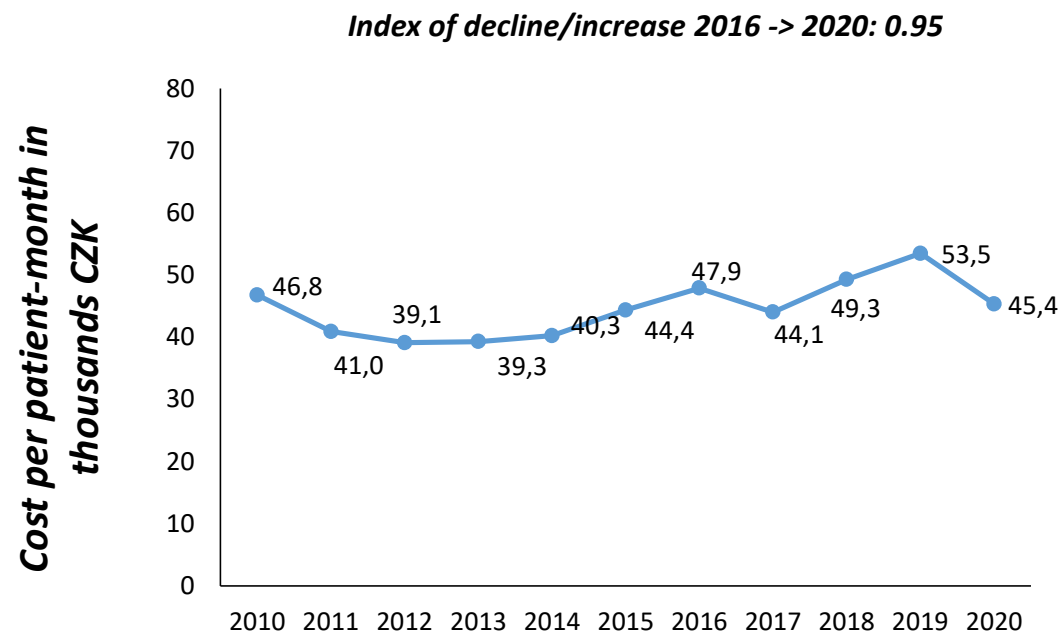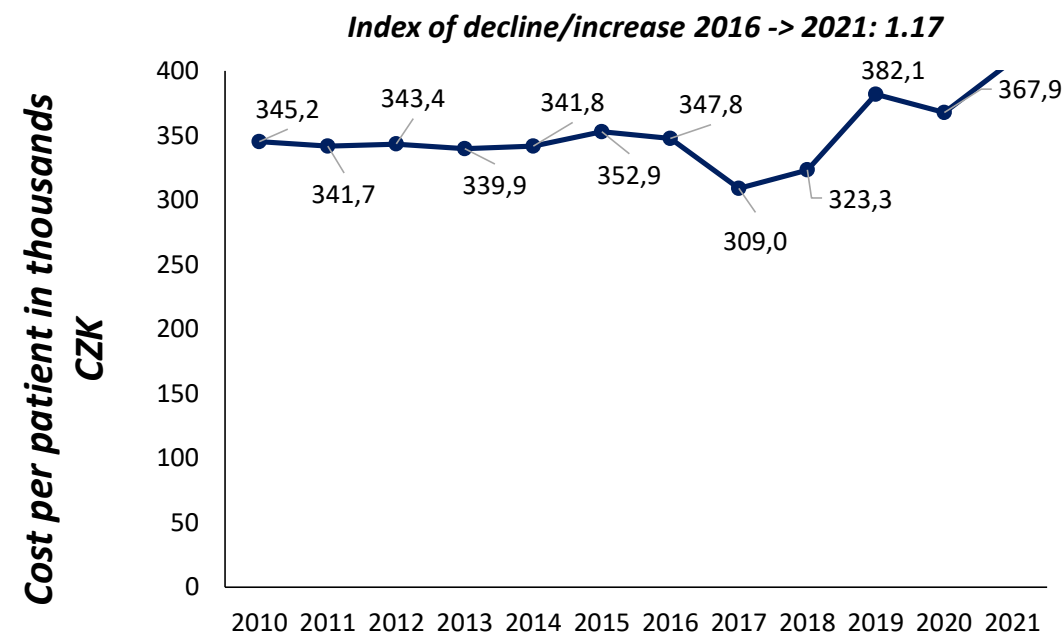
Index of decline/increase 2016 -> 2021: 1.17

Cost per patient in thousands CZK

- 345,2
- 341,7
- 343,4
- 339,9
- 341,8
- 352,9
- 347,8
- 309,0
- 323,3
- 382,1
- 367,9

(years: 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021)

Index of decline/increase 2016 -> 2020: 0.95

Cost per patient-month in thousands CZK

- 46,8
- 41,0
- 39,1
- 39,3
- 40,3
- 44,4
- 47,9
- 44,1
- 49,3
- 53,5
- 45,4

(years: 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020)

Although the prevalence of patients treated with innovative drugs is increasing significantly (on average by more than 10% per year), financial costs are not growing at the same rate. The unit cost calculated per month of treatment has been gradually decreasing over time (impact of discounts, genericisation): which has led to a decrease of about 5% between 2016 and 2021. The total cost of treatment per patient, on the other hand, is increasing over time, as it reflects the significant extension of patients' lives: for haemato-oncology indications, it is a long-term to life-long treatment.

Czech National Cancer Control Plan 2030:
Summary of analytical study

Detection according to clinical stages
A problem of second cancers

Czech National Cancer Control Plan 2030

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS ČR
Ústav zdravotnických informací a statistiky České republiky
Institute of Health Information and Statistics of the Czech Republic

Cancer detection in the Czech Republic according to clinical stage in years 2016–2020

Source: Czech National Cancer Registry

Cancer type	Stage 1	Stage 2	Stage 3	Stage 4	unknown – objective reason	unknown – incomplete record	N
Cervical cancer (C53, D06)	79	9	3	4	4	12	N = 18 286
Other skin cancer (C44, D04)	8 / 72	6	0	5		8	N = 139 456
Testicular cancer (C62)	68	12	11	1		7	N = 2 548
Bladder cancer (C67, D09.0)	29 / 39	12	5	7	2	6	N = 15 502
Melanoma of skin (C43, D03)	24 / 44	12	5	3	5	7	N = 17 084
Breast cancer (C50, D05) in women	8 / 44	28	9	6	1	5	N = 39 679
Uterine cancer (C54, C55, D07.0)	4 / 62	8	8	6	3	9	N = 10 251
Prostate cancer (C61, D07.5)	0 / 40	27	10	11	4	8	N = 38 359
Kidney cancer (C64)	52	7	13	16	5	8	N = 15 601
Colorectal cancer (C18–C20, D01.0–D01.2)	11 / 19	19	22	18	5	6	N = 40 733
Laryngeal cancer (C32, D02.0)	5 / 25	13	15	32	4	7	N = 2 555
Anal cancer (C21, D01.3)	8 / 10	20	26	8	8	20	N = 1 042
Gastric cancer (C16, D00.2)	2 / 14	15	16	36	9	8	N = 6 941
Lip, oral cav. and pharyngeal cancer (C00–C14, C30–C31, D00.0, D02.3)	2 / 16	11	14	46	4	8	N = 9 188
Oesophagal cancer (C15, D00.1)	2 / 9	13	24	34	9	10	N = 3 384
Ovarian cancer (C56)	17	6	32	30	6	10	N = 4 869
Pancreatic cancer (C25)	6	13	9	44	14	13	N = 12 004
Lung cancer (C33, C34, D02.1, D02.2)	0 / 11	7	19	48	7	8	N = 33 222
Liver cancer (C22–C24)	1 / 6	9	13	34	20	18	N = 8 950

Stage: 1 / 2 / 3 / 4 / unknown – objective reason / unknown – incomplete record

The available data show that, in addition to the growing overall epidemiological burden of cancer in the population, the biggest problem in the Czech Republic is the late detection of these diseases. Still a **high percentage of cancers** (even in diagnoses with organised screening) are **detected at an advanced stage**, when treatment is very expensive and the probability of cure is significantly reduced. This is a major challenge to strengthen comprehensive prevention programmes targeting at risk populations. The high proportion of diseases diagnosed at an advanced stage reduces overall, population-based survival rates.

„Secondary" incidence: first and subsequent cancers in the same patient

Source: Czech National Cancer Registry

Diagnoses ranked in descending order of the proportion of subsequent cancers in the period 2011–2020.

Diagnosis	Order of neoplasm in a patient	Period 1981–1990 N annually (% of newly diagnosed*)	Period 1991–2000 N annually (% of newly diagnosed*)	Period 2001–2010 N annually (% of newly diagnosed*)	Period 2011–2020 N annually (% of newly diagnosed*)
Bladder cancer (C67)	First neoplasm	1 073 (94,5 %)	1 580 (89,6 %)	1 828 (83,3 %)	1 655 (75,1 %)
	Subsequent neoplasm	63 (5,5 %)	183 (10,4 %)	366 (16,7 %)	548 (24,9 %)
Kidney cancer (C64)	First neoplasm	1 041 (93,6 %)	1 939 (89,8 %)	2 297 (83,3 %)	2 409 (77,1 %)
	Subsequent neoplasm	71 (6,4 %)	221 (10,2 %)	460 (16,7 %)	715 (22,9 %)
Lung cancer (C33, C34)	First neoplasm	5 544 (95,8 %)	5 563 (92,0 %)	5 448 (85,8 %)	5 204 (78,9 %)
	Subsequent neoplasm	244 (4,2 %)	481 (8,0 %)	901 (14,2 %)	1 394 (21,1 %)
Colorectal cancer (C18–C20)	First neoplasm	4 658 (94,6 %)	6 157 (90,6 %)	6 782 (84,6 %)	6 074 (79,0 %)
	Subsequent neoplasm	267 (5,4 %)	640 (9,4 %)	1 230 (15,4 %)	1 611 (21,0 %)
Pancreatic cancer (C25)	First neoplasm	1 192 (95,4 %)	1 392 (91,5 %)	1 586 (85,5 %)	1 824 (79,6 %)
	Subsequent neoplasm	58 (4,6 %)	129 (8,5 %)	269 (14,5 %)	469 (20,4 %)
Breat cancer (C50) in women	First neoplasms	3 089 (94,8 %)	4 143 (91,1 %)	5 273 (87,1 %)	5 899 (82,0 %)
	Subsequent neoplasm	170 (5,2 %)	403 (8,9 %)	782 (12,9 %)	1 292 (18,0 %)
Ovarian cancer (C56)	First neoplasm	892 (94,5 %)	1 013 (91,3 %)	993 (86,0 %)	840 (82,8 %)
	Subsequent neoplasm	52 (5,5 %)	97 (8,7 %)	162 (14,0 %)	174 (17,2 %)
Prostate cancer (C61)	First neoplasm	1 373 (93,7 %)	2 164 (89,1 %)	4 199 (85,6 %)	6 113 (83,5 %)
	Subsequent neoplasm	92 (6,3 %)	266 (10,9 %)	707 (14,4 %)	1 212 (16,5 %)
Uterine cancer (C54, C55)	First neoplasm	1 290 (96,5 %)	1 493 (93,0 %)	1 620 (89,1 %)	1 706 (86,4 %)
	Subsequent neoplasm	47 (3,5 %)	113 (7,0 %)	198 (10,9 %)	269 (13,6 %)
All malignant neplasms excl. non-melanoma skin (C00–C97 excl. C44)	First neoplasm	32 933 (95,3 %)	39 702 (91,5 %)	44 928 (85,7 %)	47 361 (80,0 %)
	Subsequent neoplasm	1 608 (4,7 %)	3 698 (8,5 %)	7 501 (14,3 %)	11 825 (20,0 %)

* Calculated from the total number of cases for the period.

Secondary" incidence: first and subsequent cancers in the same patient

Source: Czech National Cancer Registry

Diagnoses ranked in descending order of the proportion of subsequent cancers in the period 2011–2020.

Diagnosis	Order of neoplasm in a patient	Period 1981–1990 N annually (% of newly diagnosed*)	Period 1991–2000 N annually (% of newly diagnosed*)	Period 2001–2010 N annually (% of newly diagnosed*)	Period 2011–2020 N annually (% of newly diagnosed*)
Myelodysplastic syndromes (MDS)	First neoplasm	158 (82,7 %)	211 (78,4 %)	260 (79,1 %)	244 (72,0 %)
	Subsequent neoplasm	33 (17,3 %)	58 (21,6 %)	69 (20,9 %)	95 (28,0 %)
Acute myeloid leukaemia (AML)	First neoplasm	266 (86,1 %)	278 (80,7 %)	280 (79,3 %)	284 (74,5 %)
	Subsequent neoplasm	43 (13,9 %)	67 (19,3 %)	73 (20,7 %)	97 (25,5 %)
Chronic lymfocytic leukaemia (CLL)	First neoplasm	480 (86,1 %)	532 (82,5 %)	553 (79,8 %)	455 (75,5 %)
	Subsequent neoplasm	77 (13,9 %)	113 (17,5 %)	140 (20,2 %)	147 (24,5 %)
Non-Hodgkin's lymphoma (NHL)	First neoplasm	996 (86,4 %)	1 071 (83,7 %)	1 224 (81,9 %)	1 331 (76,7 %)
	Subsequent neoplasm	157 (13,6 %)	208 (16,3 %)	271 (18,1 %)	405 (23,3 %)
Multiple myeloma and plasmocytic neoplasms (MM)	First neoplasms	412 (89,4 %)	441 (85,8 %)	478 (83,2 %)	511 (80,6 %)
	Subsequent neoplasm	49 (10,6 %)	73 (14,2 %)	97 (16,8 %)	123 (19,4 %)
Chronic myeloid leukaemia (CML)	First neoplasm	100 (88,1 %)	82 (86,7 %)	84 (85,2 %)	72 (82,9 %)
	Subsequent neoplasm	14 (11,9 %)	13 (13,3 %)	15 (14,8 %)	15 (17,1 %)
Polycythaemia vera (PV)	First neoplasms	57 (89,8 %)	62 (85,6 %)	68 (84,8 %)	86 (84,1 %)
	Subsequent neoplasm	6 (10,2 %)	10 (14,4 %)	12 (15,2 %)	16 (15,9 %)
Hodgkin's lymphoma (HL)	First neoplasm	255 (95,0 %)	263 (93,9 %)	257 (91,0 %)	260 (88,6 %)
	Subsequent neoplasm	13 (5,0 %)	17 (6,1 %)	25 (9,0 %)	34 (11,4 %)
Acute lymphoblastic leukaemia (ALL)	First neoplasm	89 (94,3 %)	100 (93,3 %)	75 (90,8 %)	116 (92,8 %)
	Subsequent neoplasm	5 (5,7 %)	7 (6,7 %)	8 (9,2 %)	9 (7,2 %)
Blood cancers total	**First neoplasm**	**3 148 (87,7 %)**	**3 436 (84,3 %)**	**3 734 (82,0 %)**	**3 886 (77,6 %)**
	Subsequent neoplasm	**443 (12,3 %)**	**642 (15,7 %)**	**817 (18,0 %)**	**1 120 (22,4 %)**

* Calculated from the total number of cases for the period.

First and subsequent cancers vs clinical stages in colorectal and lung cancer

Source: Czech National Cancer Registry
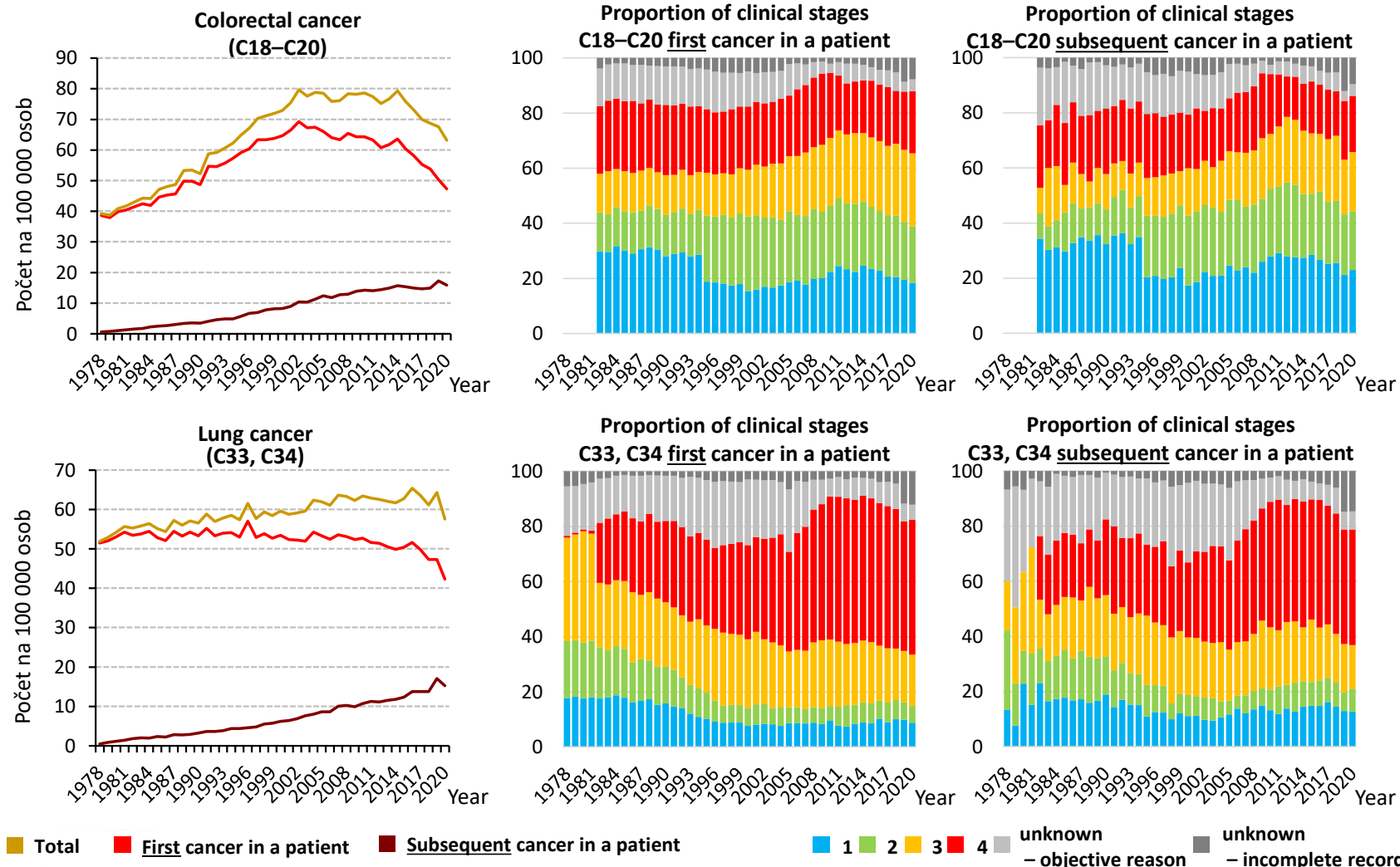
The increasing incidence of subsequent malignant neoplasms in patients already treated for other cancers applies to all cancer groups. The prolonged survival of cancer patients provides a significant time window for the development of subsequent malignancies.

A very important finding is that a significantly high proportion of subsequent malignancies in cancer patients are still detected at advanced stages, even with sufficient time for early detection. This situation calls for changes in the organisation of cancer care and for strengthening screening and prevention programmes for cancer patients.

Legend: Total; First cancer in a patient; Subsequent cancer in a patient; 1; 2; 3; 4; unknown – objective reason; unknown – incomplete record

First and subsequent cancers vs clinical stages in breast (women) and prostate cancer

Source: Czech National Cancer Registry
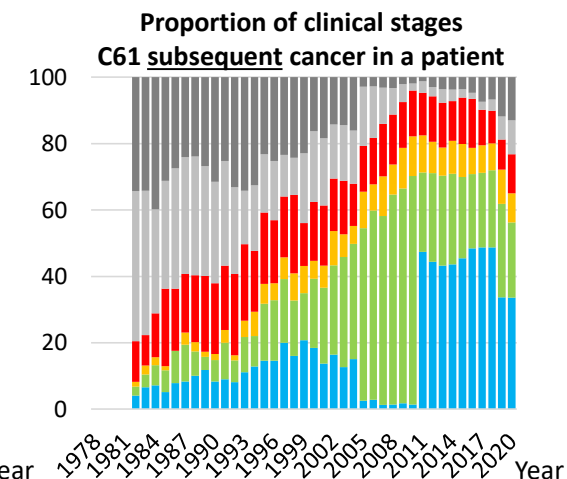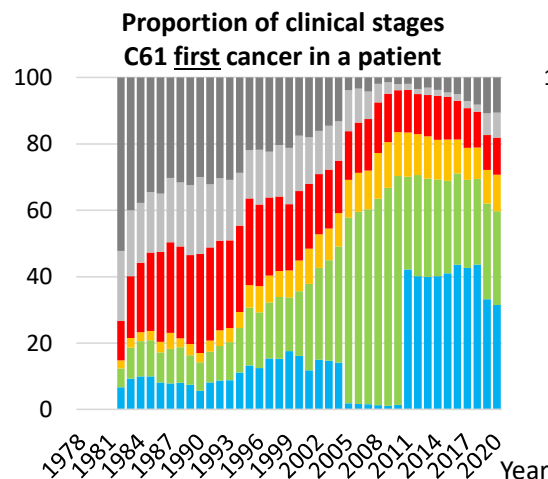
Breast cancer (C50) in women

Proportion of clinical stages C50 u žen first cancer in a patient

Proportion of clinical stages C50 in women subsequent cancer in a patient

Prostate cancer (C61)

Proportion of clinical stages C61 first cancer in a patient

Proportion of clinical stages C61 subsequent cancer in a patient

Legend: Total | First cancer in a patient | Subsequent cancer in a patient | 1 | 2 | 3 | 4 | unknown – objective reason | unknown – incomplete record
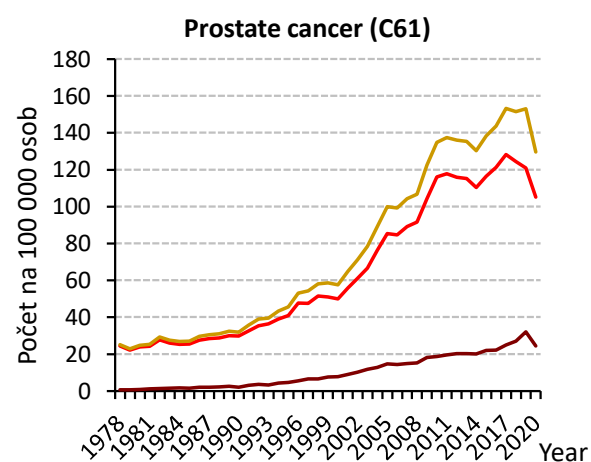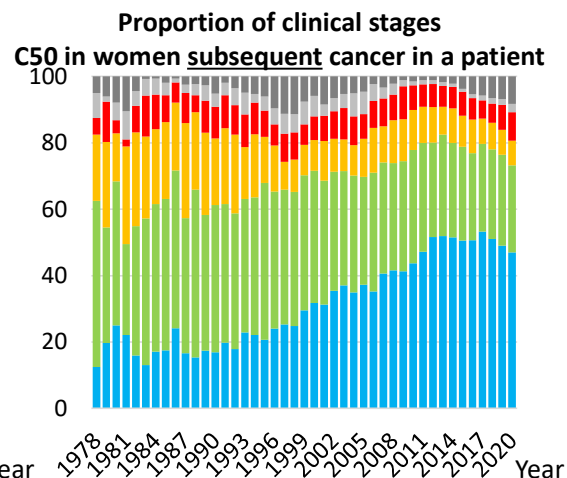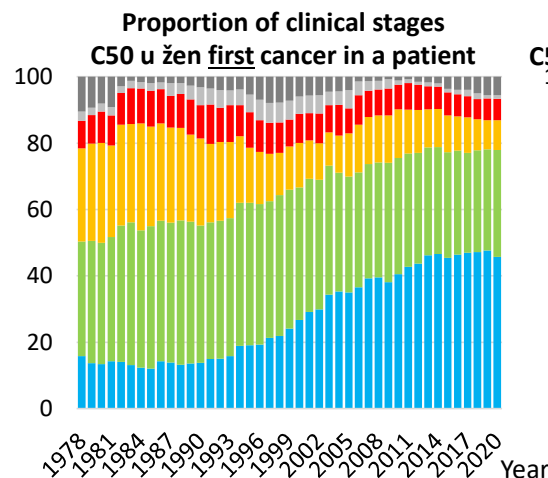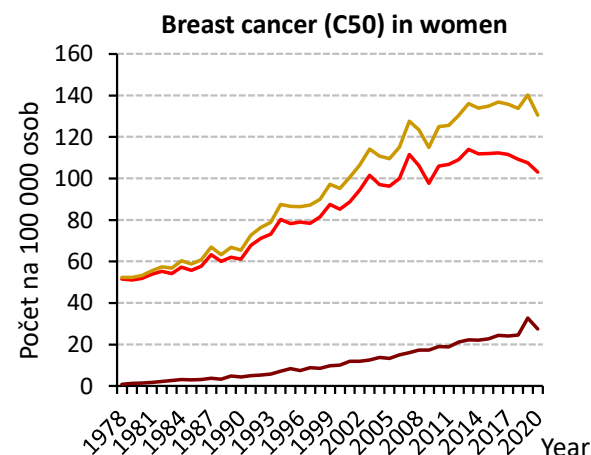
The increasing incidence of subsequent malignant neoplasms in patients already treated for other cancers applies to all cancer groups. The prolonged survival of cancer patients provides a significant time window for the development of subsequent malignancies.

A very important finding is that a significantly high proportion of subsequent malignancies in cancer patients are still detected at advanced stages, even with sufficient time for early detection. This situation calls for changes in the organisation of cancer care and for strengthening screening and prevention programmes for cancer patients.

One of the principal objectives of the NOP CR 2030 is to strengthen the organisation of care, especially in terms of its timely availability.

In particular, the developing network of highly specialised centres represents an important fulcrum for the organisation of cancer care in the regions of the Czech Republic. The proportion of cancer patients treated in comprehensive cancer centres (CCCs) has been increasing significantly over time, currently exceeding 70%. A significant degree of centralisation of care is also being achieved by centres of specialised haemato-oncological care (e.g. up to 83 % for chronic myeloid leukaemia, 70 % for acute myeloid leukaemia). Over time, the coverage of the Czech population with highly specialised care has thus been improving, as is the geographical and temporal availability of modern therapies. One of the indirect indicators of this progression is the reporting of multidisciplinary diagnostic team (MDT) activities; in 2015, approximately 51,000 MDT consultations were reported, in 2019–2020 it will be over 91,000 per year. The conditions for follow-up of cancer patients are also improving, including cooperation between cancer departments and GPs. In 2019, the PL network took over 4,600 cancer patients into follow-up care, and in 2020 it was more than 6,550.

Despite the positive trends mentioned above, a number of very serious challenges remain for the organisation of cancer care in the Czech Republic. It is necessary to further strengthen the organisational role of the centres in their catchment areas. Reserves exist in the cooperation between regional hospitals and CCCs. There are still significant differences between regions of the Czech Republic in the availability of treatment in comprehensive centres. The Karlovy Vary Region (KVK) deserves the most attention in this respect, where only 43 % of cancer patients receive treatment in a CCC of another region (KVK does not have its own CCC). There are also significant differences between regions in the early detection of cancer and in the coverage of the population by ongoing screening programmes.

List of highly specialised cancer care centres in the Czech Republic

Updated according to
https://www.linkos.cz
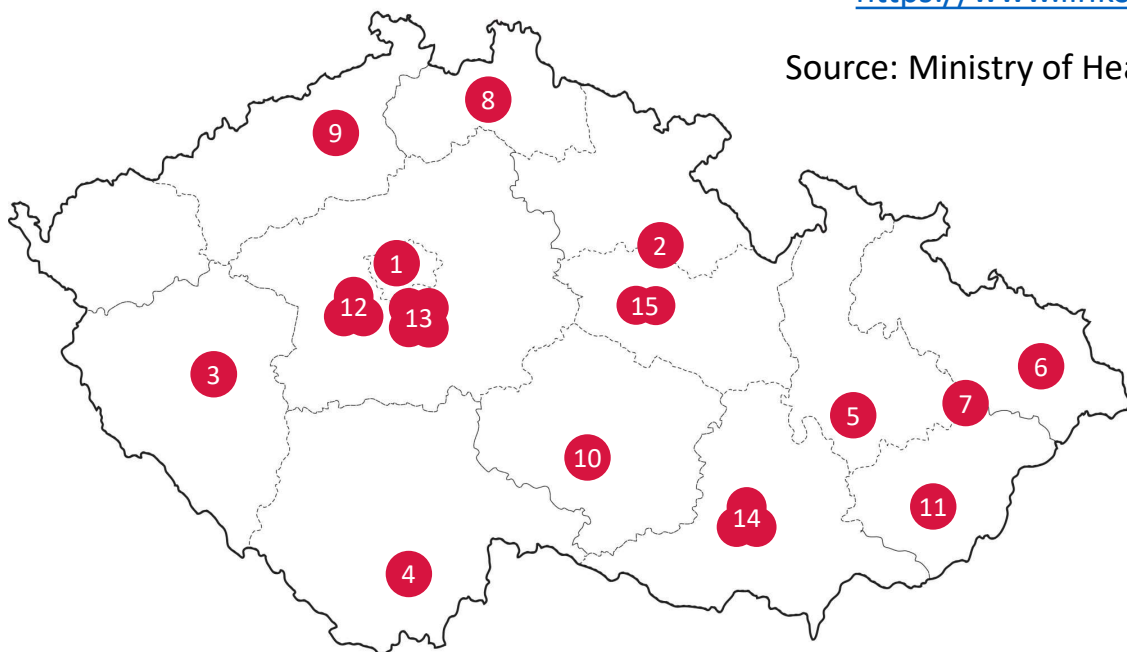
Source: Ministry of Health

1. University Hospital Královské Vinohrady
2. University Hospital Hradec Králové
3. University Hospital Plzeň
4. Hospital České Budějovice, a.s.
5. University Hospital Olomouc
6. University Hospital Ostrava
7. Hospital Nový Jičín, a.s.
8. Regional Hospital Liberec, a.s.
9. Krajská zdravotní, a.s.
10. Hospital Jihlava, p. o.
11. Regional Hospital of T. Baťa, a.s.
12. Hospital Na Bulovce + General University Hopital in Prague + Thomayer University Hospital
13. University Hospital in Motol + Central Military Hospital + Hospital Na Homolce + Proton Therapy Center
14. Masaryk Memorial Cancer Institute + University Hospital Brno + St. Ann's University Hospital in Brno
15. Hospitals of Pardubice Region, a.s. + Radiology Centre Multiscan, s.r.o.

The distribution of the centres and their regional accessibility are even in the vast majority of regions. An exception and a problem is the absence of a highly specialised care centre in the Karlovy Vary Region. Providing highly specialised care in this region is one of the objectives of the NOP 2030.

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

List of highly specialised cancer care centres in the Czech Republic (comprehensive cancer centres, CCC, haemato-onkology centres, HOC, childhood cancer centres, ChCC)

Updated according to
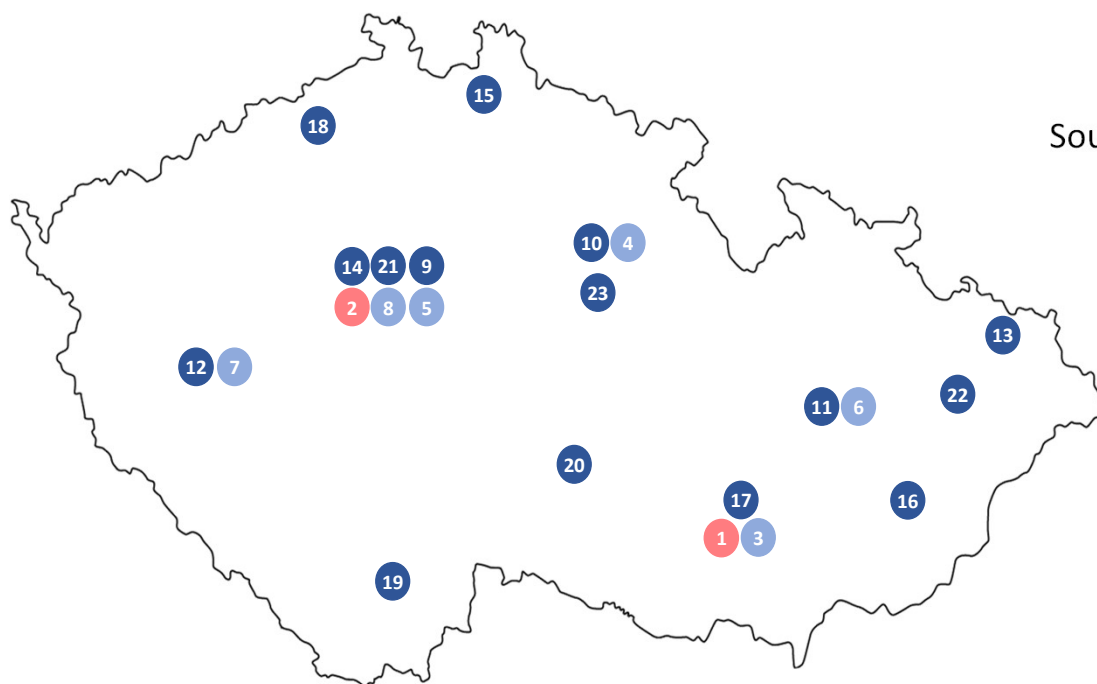https://www.linkos.cz

Source: Ministry of Health

The distribution of the centres and their regional accessibility are even in the vast majority of regions. An exception and a problem is the absence of a highly specialised care centre in the Karlovy Vary Region. Providing highly specialised care in this region is one of the objectives of the NOP 2030.

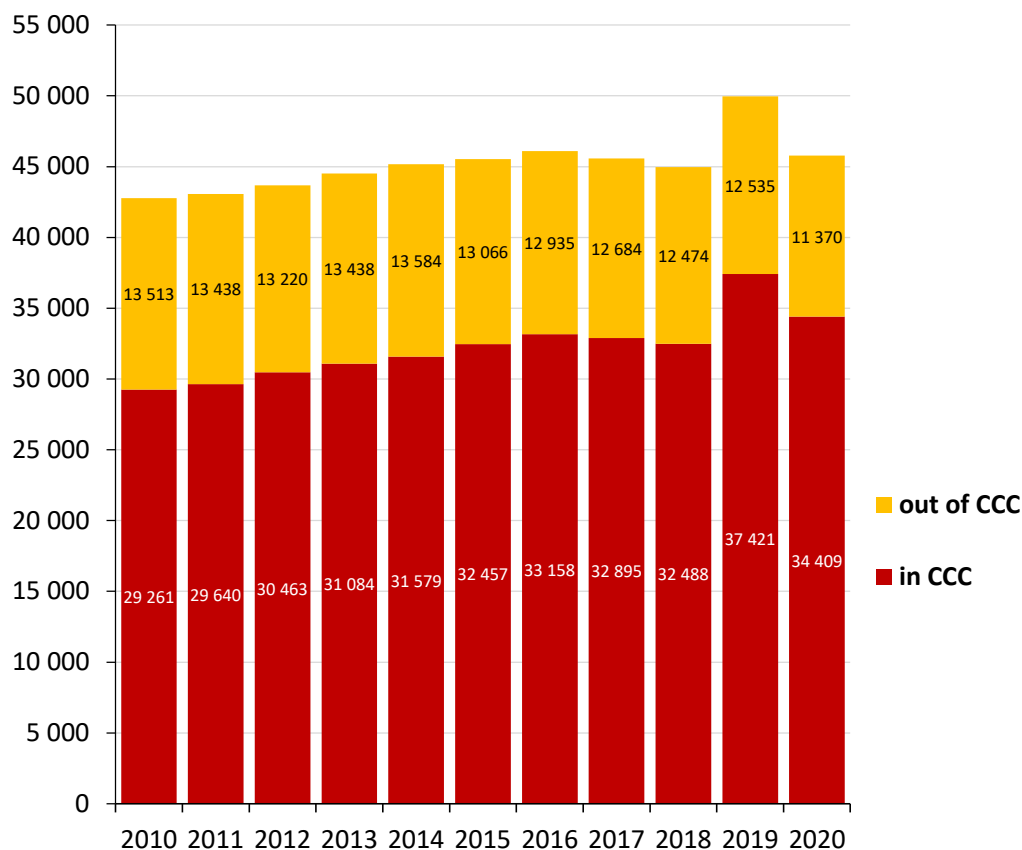| #	Centre
1	ChCC UH Brno
2	ChCC UH in Motol
3	HOC UH Brno
4	HOC UH Hradec Králové
5	HOC UH Královské Vinohrady
6	HOC UH Olomouc
7	HOC UH Plzeň
8	HOC IHBT
9	CCC UH Královské Vinohrady
10	CCC UH Hradec Králové
11	CCC UH Olomouc
12	CCC UH Plzeň
13	CCC UH Ostrava
14	CCC UH in Motol, GUH, Na Homolce
15	CCC RH Liberec
16	CCC RH Zlín
17	CCC MMCI v Brně
18	CCC MN in Ústí nad Labem
19	CCC Hospital České Budějovice
20	CCC Hospital Jihlava
21	CCC Hospital na Bulovce, CMH, FTN
22	CCC Nový Jičín
23	CCC Pardubice Region

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Number and proportion of patients treated in and out of CCCs: time trends

Source: CNCR 1977–2020 + NRRHS 2010–2020; treatment of solid malignant neoplasms reported in NRRHS data for diagnosis C00–C97 (excluding haemato-oncological diagnoses C81–C96 and dg. C44); diagnosis reported in CNCR

Number of newly diagnosed cases

Year	out of CCC	in CCC
2010	13 513	29 261
2011	13 438	29 640
2012	13 220	30 463
2013	13 438	31 084
2014	13 584	31 579
2015	13 066	32 457
2016	12 935	33 158
2017	12 684	32 895
2018	12 474	32 488
2019	12 535	37 421
2020	11 370	34 409

Proportion of newly diagnosed and treated patients according to place of treatment

Year	out of CCC	in CCC
2010	31,6%	68,4%
2011	31,2%	68,8%
2012	30,3%	69,7%
2013	30,2%	69,8%
2014	30,1%	69,9%
2015	28,7%	71,3%
2016	28,1%	71,9%
2017	27,8%	72,2%
2018	27,7%	72,3%
2019	25,1%	74,9%
2020	24,8%	75,2%

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS
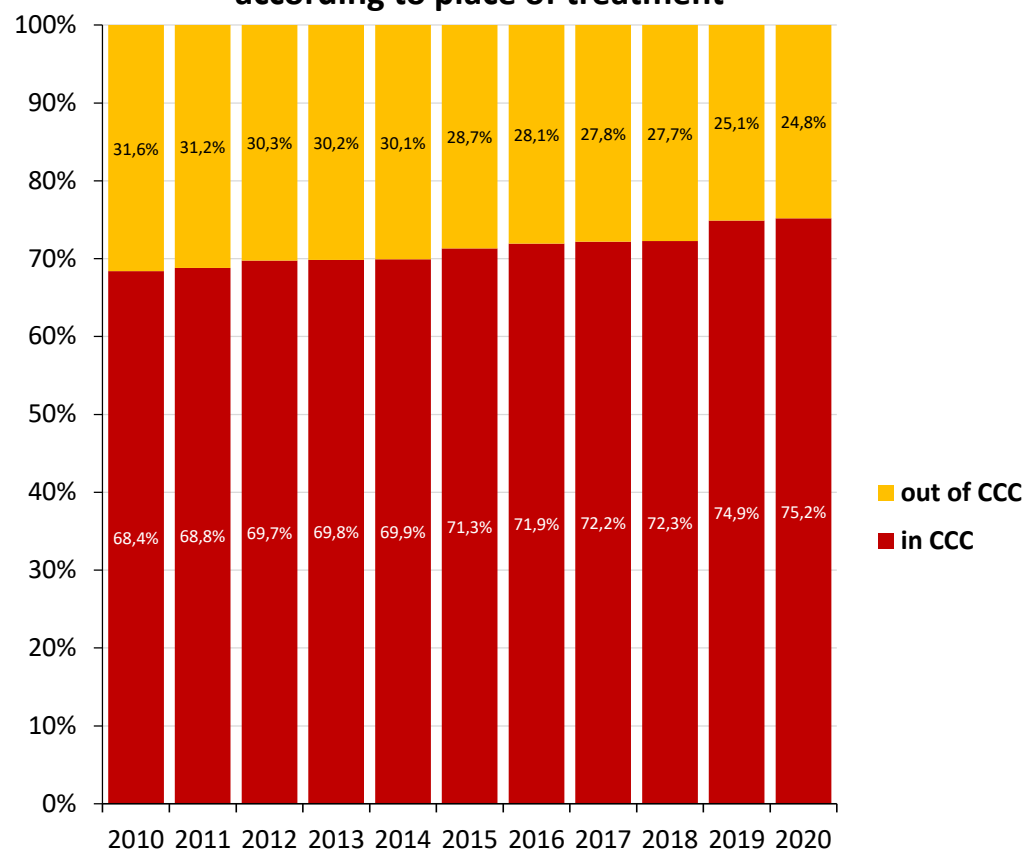
Number and proportion of patients treated in and out of CCCs: region of residence (period 2016–2020)

Source: CNCR + NRRHS **2016–2020**; treatment of solid malignant neoplasms reported in NRRHS data for diagnosis C00–C97 (excluding haemato-oncological dg. C81–C96 and dg. C44); diagnosis reported in CNCR

Number of new cases

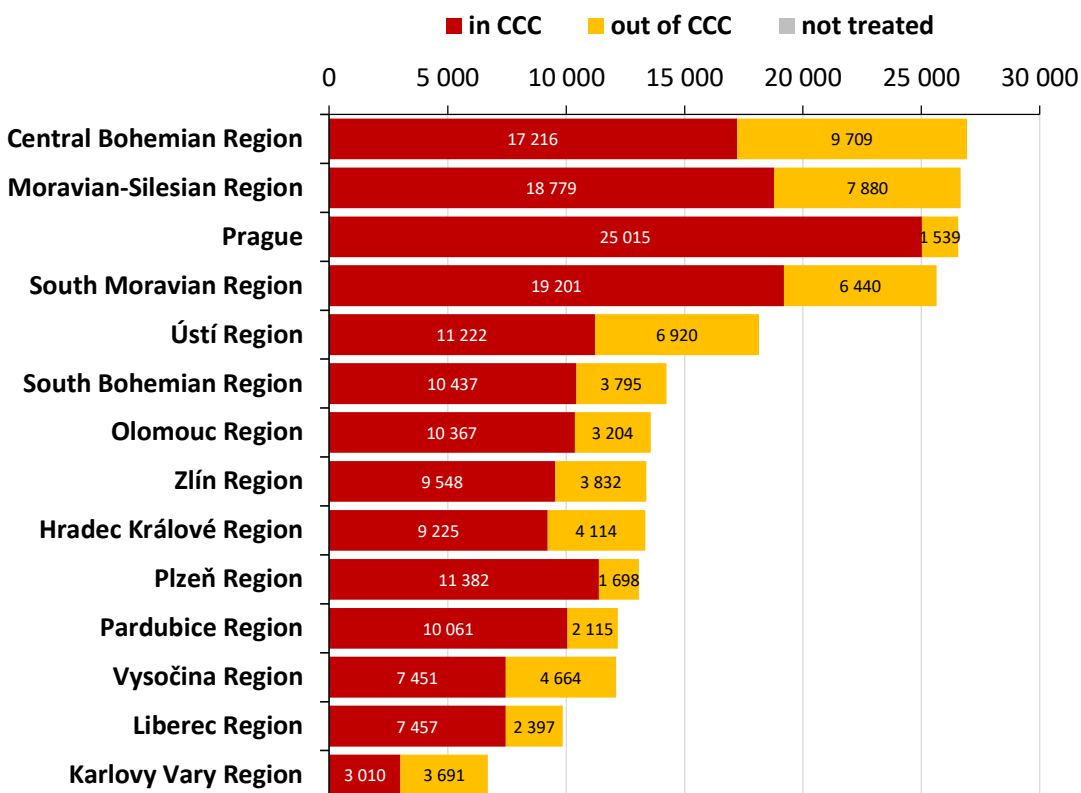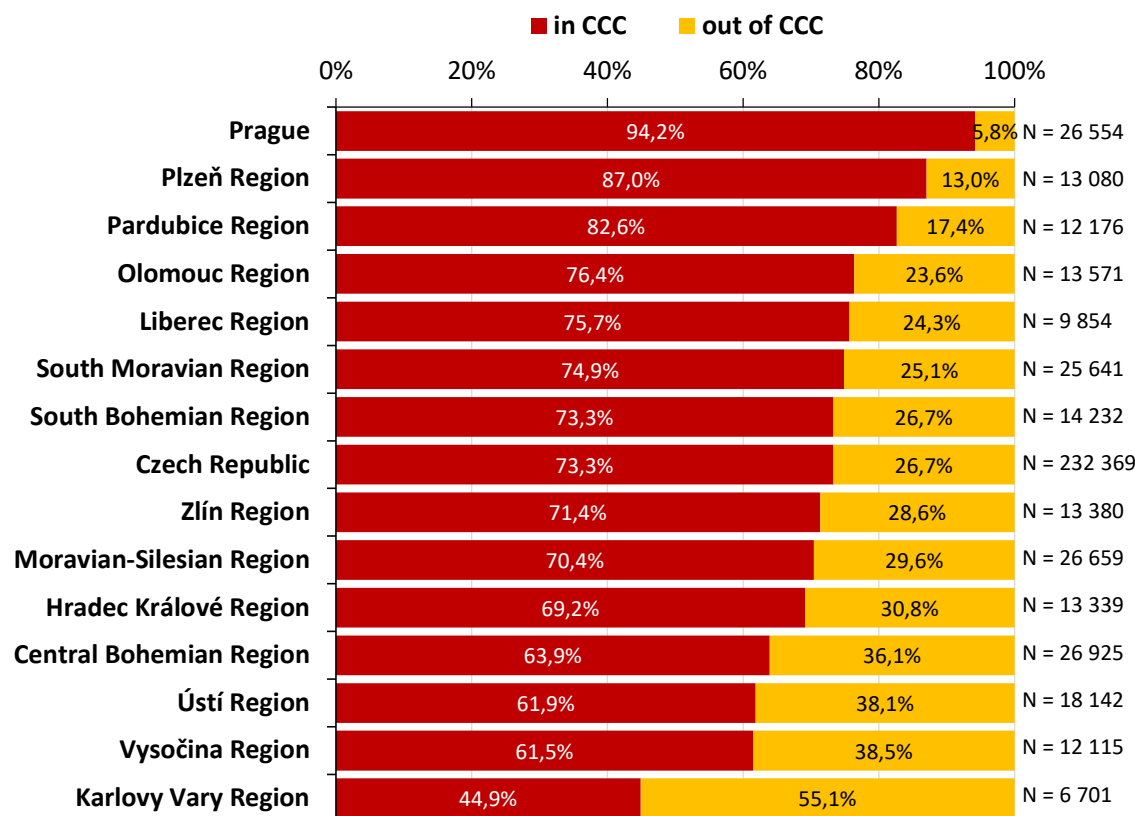Legend: ■ in CCC ■ out of CCC ■ not treated

Region	in CCC	out of CCC
Central Bohemian Region	17 216	9 709
Moravian-Silesian Region	18 779	7 880
Prague	25 015	1 539
South Moravian Region	19 201	6 440
Ústí Region	11 222	6 920
South Bohemian Region	10 437	3 795
Olomouc Region	10 367	3 204
Zlín Region	9 548	3 832
Hradec Králové Region	9 225	4 114
Plzeň Region	11 382	1 698
Pardubice Region	10 061	2 115
Vysočina Region	7 451	4 664
Liberec Region	7 457	2 397
Karlovy Vary Region	3 010	3 691

Proportion of newly diagnosed and treated patients according to place of treatment

Legend: ■ in CCC ■ out of CCC

Region	in CCC	out of CCC	N
Prague	94,2%	5,8%	N = 26 554
Plzeň Region	87,0%	13,0%	N = 13 080
Pardubice Region	82,6%	17,4%	N = 12 176
Olomouc Region	76,4%	23,6%	N = 13 571
Liberec Region	75,7%	24,3%	N = 9 854
South Moravian Region	74,9%	25,1%	N = 25 641
South Bohemian Region	73,3%	26,7%	N = 14 232
Czech Republic	73,3%	26,7%	N = 232 369
Zlín Region	71,4%	28,6%	N = 13 380
Moravian-Silesian Region	70,4%	29,6%	N = 26 659
Hradec Králové Region	69,2%	30,8%	N = 13 339
Central Bohemian Region	63,9%	36,1%	N = 26 925
Ústí Region	61,9%	38,1%	N = 18 142
Vysočina Region	61,5%	38,5%	N = 12 115
Karlovy Vary Region	44,9%	55,1%	N = 6 701

List of centres of highly specialised haemato-oncological care for adults and centres of highly specialised oncological and haemato-oncological care for children
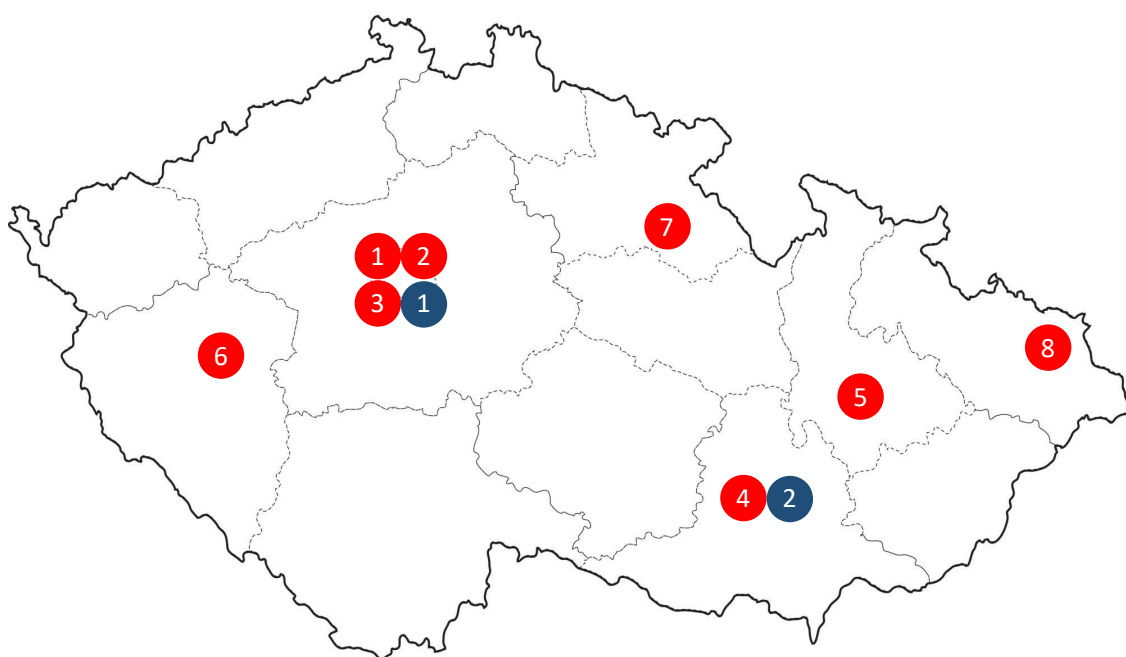
● Centres of highly specialised haemato-oncological care for adults :
1. Institute of Haematology and Blood Transfusion
2. General University Hospital in Prague
3. University Hospital Královské Vinohrady
4. University Hospital Brno
5. University Hospital Olomouc
6. University Hospital Plzeň
7. University Hospital Hradec Králové
8. University Hospital Ostrava

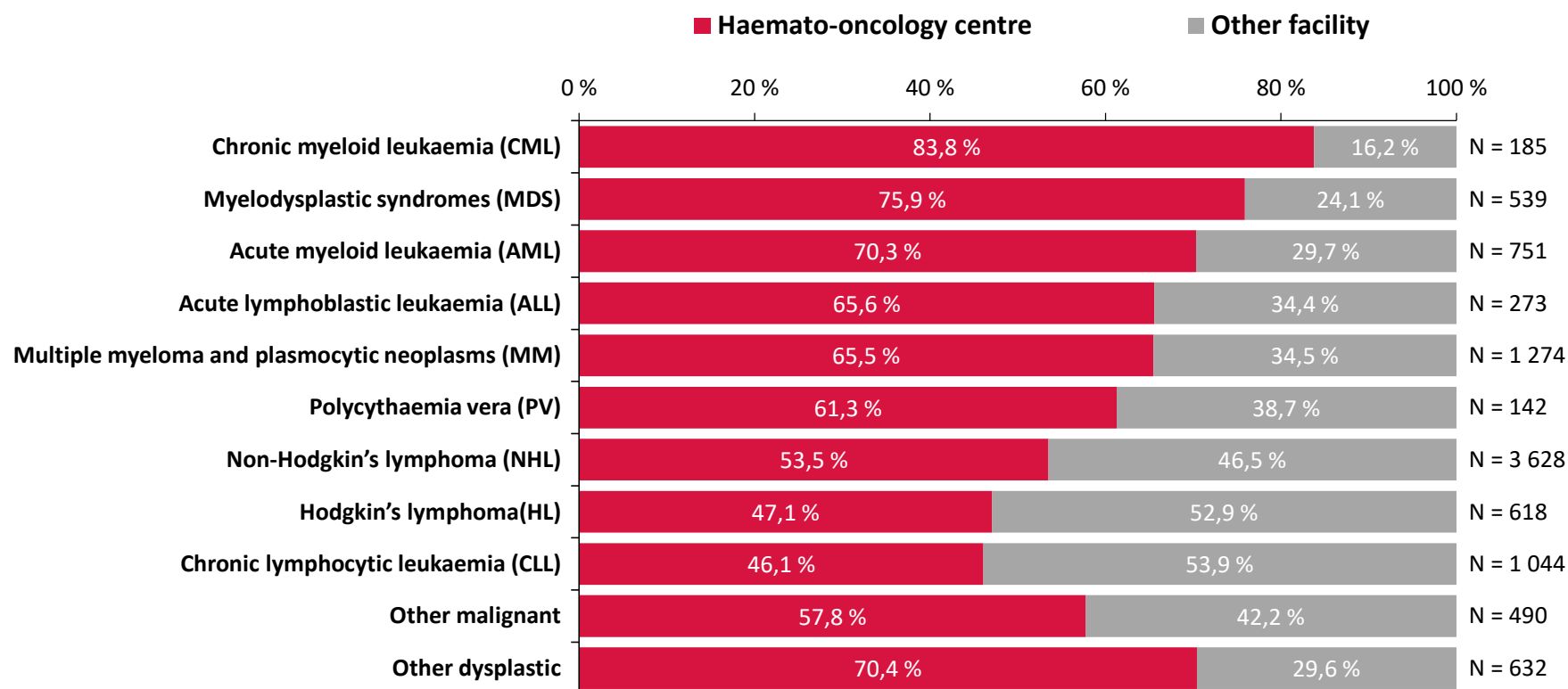**●** Centres of highly specialised oncological and haemato-oncological care for children:
1. University Hospital in Motol
2. University Hospital Brno

Source: Ministry of Health

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS

Healthcare facilities in the treatment of blood cancers, 2019–2020

Source: CNCR 1977–2020, newly diagnosed patients

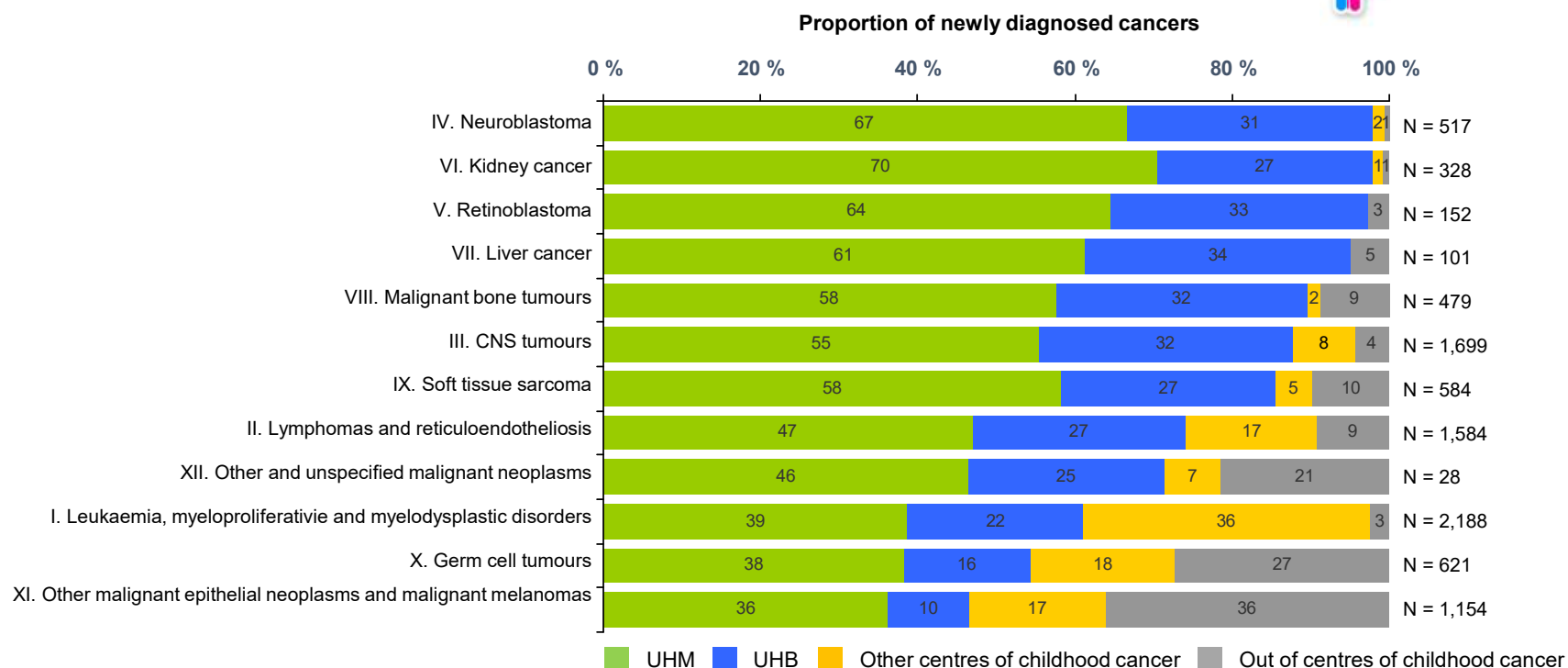**Proportion of patients according to the place of diagnosis (according to CNCR)**

■ **Haemato-oncology centre**   ■ **Other facility**

Diagnosis	Haemato-oncology centre	Other facility	N
Chronic myeloid leukaemia (CML)	83,8 %	16,2 %	N = 185
Myelodysplastic syndromes (MDS)	75,9 %	24,1 %	N = 539
Acute myeloid leukaemia (AML)	70,3 %	29,7 %	N = 751
Acute lymphoblastic leukaemia (ALL)	65,6 %	34,4 %	N = 273
Multiple myeloma and plasmocytic neoplasms (MM)	65,5 %	34,5 %	N = 1 274
Polycythaemia vera (PV)	61,3 %	38,7 %	N = 142
Non-Hodgkin's lymphoma (NHL)	53,5 %	46,5 %	N = 3 628
Hodgkin's lymphoma(HL)	47,1 %	52,9 %	N = 618
Chronic lymphocytic leukaemia (CLL)	46,1 %	53,9 %	N = 1 044
Other malignant	57,8 %	42,2 %	N = 490
Other dysplastic	70,4 %	29,6 %	N = 632

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Healthcare facilities according to ICCC diagnoses in children, 1994–2016

Total
(N = 9,435)

Proportion of newly diagnosed cancers

Diagnosis	UHM	UHB	Other centres	Out of centres	N
IV. Neuroblastoma	67	31	2	1	N = 517
VI. Kidney cancer	70	27	1	1	N = 328
V. Retinoblastoma	64	33		3	N = 152
VII. Liver cancer	61	34		5	N = 101
VIII. Malignant bone tumours	58	32	2	9	N = 479
III. CNS tumours	55	32	8	4	N = 1,699
IX. Soft tissue sarcoma	58	27	5	10	N = 584
II. Lymphomas and reticuloendotheliosis	47	27	17	9	N = 1,584
XII. Other and unspecified malignant neoplasms	46	25	7	21	N = 28
I. Leukaemia, myeloproliferativie and myelodysplastic disorders	39	22	36	3	N = 2,188
X. Germ cell tumours	38	16	18	27	N = 621
XI. Other malignant epithelial neoplasms and malignant melanomas	36	10	17	36	N = 1,154

Legend: UHM (green), UHB (blue), Other centres of childhood cancer (yellow), Out of centres of childhood cancer (grey)

University Hospital in Motol and University Hospital Brno are the main centres involved in the treatment of all groups of diagnoses of childhood cancer patients. The high degree of centralisation of care stands out especially in the care of patients with kidney tumours, neuroblastoma, retinoblastoma, liver tumours, malignant bone tumours and sarcomas. Patients with leukaemia and related diseases are also represented to a somewhat greater extent in other childhood cancer centres.

Newly treated patients with multidisciplinary team (MDT) consultation

Source: NRRHS; code 51881 = MULTIDISCIPLINARY INDICATION SEMINAR TO DETERMINE THE OPTIMAL TREATMENT FOR PATIENTS WITH CANCER

Proportion of patients who were <u>treated for the first time</u> in a given year for a solid tumour <u>in a CCC</u> and also had a reported MDT consultation:
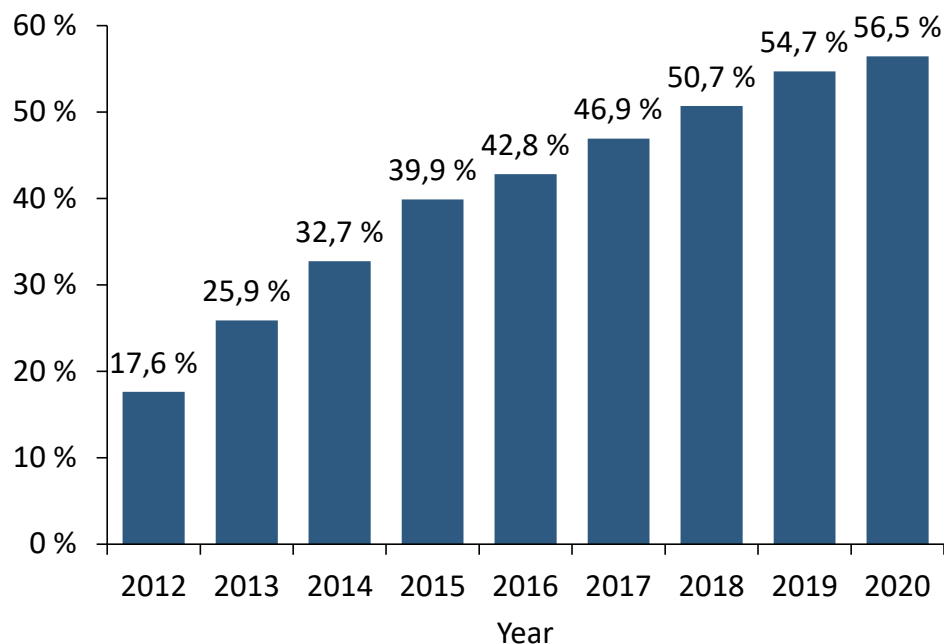
Legend:
- Number of reported MDT consultations (total)
- Number of patients with MDT consultation in a given year
- Proportion of MDT consultations in CCC (% from total)

Left chart (Proportion):
- 2012: 17,6 %
- 2013: 25,9 %
- 2014: 32,7 %
- 2015: 39,9 %
- 2016: 42,8 %
- 2017: 46,9 %
- 2018: 50,7 %
- 2019: 54,7 %
- 2020: 56,5 %

Right chart:
Year	Reported MDT consultations (total)	Patients with MDT consultation	Proportion in CCC
2012	22 316	10 794	95 %
2013	37 695	17 503	90 %
2014	47 657	23 210	88 %
2015	57 828	28 842	89 %
2016	64 998	32 321	88 %
2017	82 350	37 469	90 %
2018	90 085	40 649	89 %
2019	103 321	45 555	89 %
2020	103 048	44 844	89 %
2021	114 178	47 253	88 %

ZDRAVÍ2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Follow-up of cancer patients by general practitioners

Source: NRRHS 01/2019–03/2022;
code 01186 = taking a patient into care by GP after cancer treatment, **code 01188** = subsequent check-up of a cancer patient

Number of procedures in individual months:
(reported from 2019)

	Procedure 01186	Procedure 01188	Total
Year 2019	3 441	1 241	4 682
Year 2020	3 205	3 460	6 665
Year 2021	2 084	3 427	5 511

Number of procedures

Code 01186   Code 01188

Month	Code 01186	Code 01188
2019-01	215	55
2019-02	283	64
2019-03	250	90
2019-04	272	71
2019-05	314	76
2019-06	308	71
2019-07	234	63
2019-08	190	81
2019-09	272	117
2019-10	389	163
2019-11	416	211
2019-12	298	179
2020-01	355	331
2020-02	320	295
2020-03	175	174
2020-04	165	169
2020-05	306	313
2020-06	433	455
2020-07	271	297
2020-08	213	260
2020-09	346	348
2020-10	233	286
2020-11	221	279
2020-12	167	253
2021-01	150	238
2021-02	174	236
2021-03	194	280
2021-04	177	248
2021-05	191	360
2021-06	206	392
2021-07	135	209
2021-08	117	218
2021-09	183	306
2021-10	218	353
2021-11	205	346
2021-12	134	241
2022-01	164	258
2022-02	147	257
2022-03	170	342

ZDRAVÍ 2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY   ÚZIS

A major task of the CNCCP 2030: strengthening the organisation of end-of-life care

Structure of palliative care in the Czech Republic

Palliative care

General

Part of the clinical care of patients in advanced stages of the disease. Provided by physicians of various specialties

Children's "hospices"

Children's hospices represent a significantly different type of care. They are more like respite services. The term hospice is therefore partly misleading.
Palliative care for paediatric patients is a separate issue.

Specialised

Palliative care at home

So-called "mobile hospice". Provides specialised palliative care in the home environment through visits by nurses and doctors

Palliative care department (PCD)

A department within a health care facility providing patients with specialized palliative care while making hospital care available. There are 2 PCDs in the Czech Republic.

Inpatient hospice

A separate inpatient facility providing specialized palliative care. There are currently 17 hospices in the Czech Republic.

Consiliary team

An interdisciplinary team established within a healthcare facility

The predicted demographic development of the Czech population, ageing and associated morbidity will require a change in the concept of palliative care. New models of integrated care must be based on multidisciplinary hospital consiliary teams and on close cooperation of outpatient health and social services, e.g. mobile specialised palliative care, home care, etc. Strengthening the capacities of mobile teams and teams capable of providing care in the patients' home environment is a highly effective measure that saves staff capacity and financial resources, especially in acute inpatient care in hospitals.
Multi-level models of palliative care organisation and models that allow its early integration in the care processes provided by different segments of providers should be sought.

ZDRAVÍ2030

NSC NÁRODNÍ SCREENINGOVÉ CENTRUM

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Number of acute, aftercare and long-term care beds in regions of CR (2018–2021)

Zdroj: NRRHS

Acute beds

Number of beds per 1,000 population

Region	2021 value
Prague	6,2
South Moravian Region	5,1
Hradec Králové Region	5,0
Ústí Region	4,7
Vysočina Region	4,5
Moravian-Silesian Region	4,5
Plzeň Region	4,5
Czech Republic	4,4
Olomouc Region	4,4
South Bohemian Region	4,4
Liberec Region	4,3
Pardubice Region	3,8
Zlín Region	3,7
Karlovy Vary Region	3,6
Central Bohemian Region	2,8

Legend:
- 2021
- 2020
- 2019
- 2018
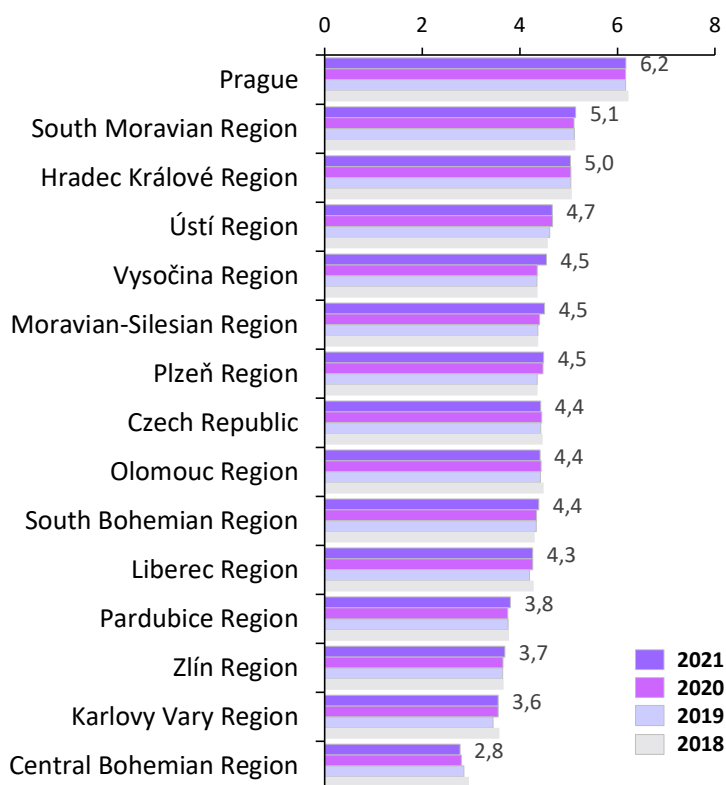
Aftercare and long-term care beds

Number of beds per 1,000 population

Region	value
Vysočina Region	4,0
Plzeň Region	3,5
Pardubice Region	3,4
Olomouc Region	3,0
Moravian-Silesian Region	3,0
Zlín Region	2,9
Prague	2,8
Hradec Králové Region	2,7
Czech Republic	2,7
Central Bohemian Region	2,5
South Moravian Region	2,5
Ústí Region	2,5
Karlovy Vary Region	2,3
Liberec Region	1,7
South Bohemian Region	1,6
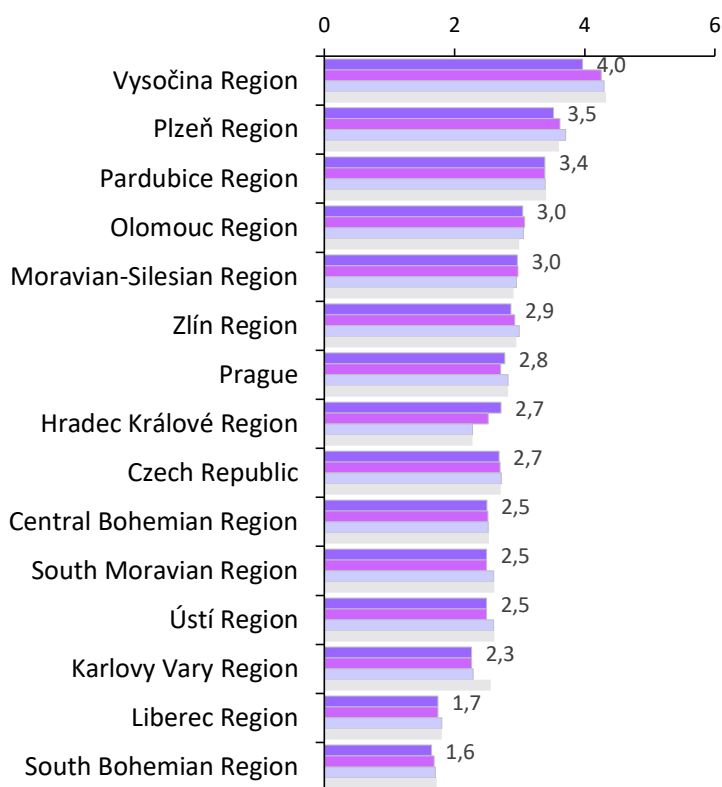
The proportion of the number of acute beds and beds for aftercare and long-term care is uneven in the South Moravian Region. There are twice as many acute beds as beds for follow-up and long-term care.

ZDRAVÍ2030

NSC NÁRODNÍ SCREENINGOVÉ CENTRUM

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Mobile specialised palliative care in the Czech Republic

REGION	Number of patients to whom specialty 926 healthcare was reported					
	2016	2017	2018	2019	2020	2021
Prague	121	128	224	380	518	528
Central Bohemian Region	13	18	68	95	231	286
South Bohemian Region	3		13	81	289	415
Plzeň Region	1	2	8	14	5	7
Karlovy Vary Region			25	64	142	155
Ústí Region		17	44	54	55	59
Liberec Region			3	2	5	82
Hradec Králové Region	33	70	98	127	160	185
Pardubice Region	2	37	75	130	174	226
Vysočina Region	62	90	177	565	856	940
South Moravian Region	75	98	144	368	639	887
Olomouc Region	1	10	63	160	305	350
Zlín Region	64	21	133	359	548	659
Moravian-Silesian Region	24	31	208	417	548	541

Mobile specialised palliative care (MSPC) has gradually been becoming established in the Czech healthcare system as one of the full-fledged alternatives to health care for the dying. MSPC was initially operated completely outside the health insurance system. In 2015 and 2016, part of this care was covered by the VZP pilot project. Since 2017, this form of health care has been part of the reimbursement decree.

It is not possible to identify all care provided by MSPC providers in administrative data related to the reporting of health services (as it is still quite often paid for directly or through donations), but nevertheless a significant increase in this service provided under services covered by health insurance can be observed.

Increase in the number of MSPC patients whose care is covered by health insurance

2016 2017 2018 2019 2020 2021

CENTRUM CESKE REPUBLIKY ÚZIS

Mobile specialised palliative care in the Czech Republic
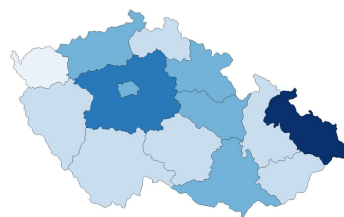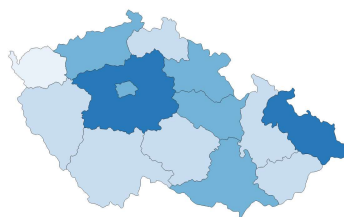
REGION	Number of patients per 100,000 population to whom specialty 926 healthcare was reported					
	2016	**2017**	**2018**	**2019**	**2020**	**2021**
Prague	10	10	17	29	39	40
Central Bohemian Region	1	1	5	7	17	20
Jihočeský kraj			2	13	45	64
Plzeň Region			1	2	1	1
Karlovy Vary Region			8	22	48	53
Ústí Region		2	5	7	7	7
Liberec Region			1		1	19
Hradec Králové Region	6	13	18	23	29	34
Pardubice Region		7	14	25	33	43
Vysočina Region	12	18	35	111	168	185
South Moravian Region	6	8	12	31	54	74
Olomouc Region		2	10	25	48	56
Zlín Region	11	4	23	62	94	114
Moravian-Silesian Region	2	3	17	35	46	45

Mobile specialised palliative care (MSPC) has gradually been becoming established in the Czech healthcare system as one of the full-fledged alternatives to health care for the dying. MSPC was initially operated completely outside the health insurance system. In 2015 and 2016, part of this care was covered by the VZP pilot project. Since 2017, this form of health care has been part of the reimbursement decree.

It is not possible to identify all care provided by MSPC providers in administrative data related to the reporting of health services (as it is still quite often paid for directly or through donations), but nevertheless a significant increase in this service provided under services covered by health insurance can be observed.

Increase in the number of MSPC patients whose care is covered by health insurance

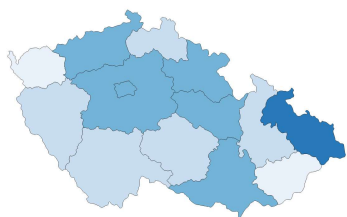2016   2017   2018   2019   2020   2021

Home care in the Czech Republic

REGION	Number of patients to whom specialty 925 healthcare was reported					
	2016	2017	2018	2019	2020	2021
Prague	13 012	13 458	13 566	13 728	13 997	14 840
Central Bohemian Region	14 086	15 420	16 303	17 280	18 557	19 638
Jihočeský kraj	8 774	8 890	9 350	9 703	9 830	9 671
Plzeň Region	6 708	6 803	7 009	7 211	7 241	7 089
Karlovy Vary Region	4 148	4 262	4 171	4 050	4 066	3 971
Ústí Region	12 012	12 290	12 911	13 641	14 407	14 966
Liberec Region	6 455	6 638	6 663	6 721	6 641	6 988
Hradec Králové Region	12 271	12 574	12 802	13 110	13 445	13 580
Pardubice Region	10 338	10 713	10 954	11 300	11 291	11 460
Vysočina Region	6 038	6 355	6 681	7 140	7 559	7 618
South Moravian Region	13 599	14 058	14 375	14 409	14 260	14 375
Olomouc Region	7 127	7 317	7 455	7 859	8 039	7 963
Zlín Region	4 931	5 220	5 482	5 841	6 347	6 537
Moravian-Silesian Region	19 269	19 598	20 386	20 311	20 360	19 972

Increase in the number of MSPC patients whose care is covered by health insurance
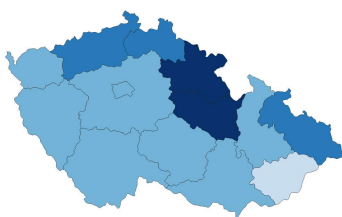
2016   2017   2018   2019   2020   2021
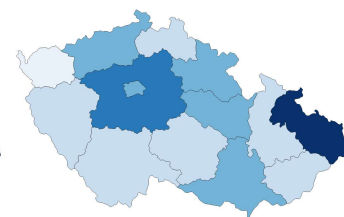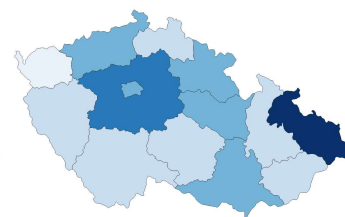
Home care in the Czech Republic

REGION	Number of patients per 100,000 population to whom specialty 925 healthcare was reported					
	2016	2017	2018	2019	2020	2021
Prague	1 022	1 046	1 043	1 044	1 055	1 112
Central Bohemian Region	1 057	1 146	1 198	1 254	1 333	1 405
Jihočeský kraj	1 375	1 391	1 459	1 509	1 527	1 503
Plzeň Region	1 161	1 174	1 203	1 227	1 225	1 199
Karlovy Vary Region	1 395	1 439	1 413	1 374	1 382	1 354
Ústí Region	1 461	1 497	1 573	1 662	1 758	1 832
Liberec Region	1 466	1 505	1 509	1 517	1 499	1 579
Hradec Králové Region	2 226	2 283	2 325	2 378	2 437	2 465
Pardubice Region	2 001	2 071	2 110	2 168	2 157	2 192
Vysočina Region	1 186	1 249	1 313	1 402	1 483	1 497
South Moravian Region	1 155	1 191	1 213	1 211	1 194	1 203
Olomouc Region	1 124	1 156	1 179	1 243	1 272	1 263
Zlín Region	844	895	941	1 002	1 092	1 127
Moravian-Silesian Region	1 591	1 623	1 693	1 691	1 701	1 674

Increase in the number of MSPC patients whose care is covered by health insurance

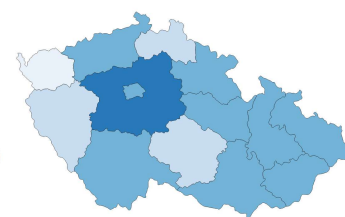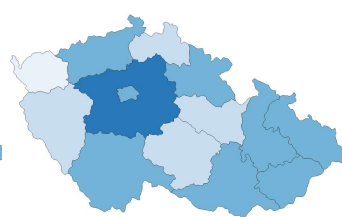2016   2017   2018   2019   2020   2021
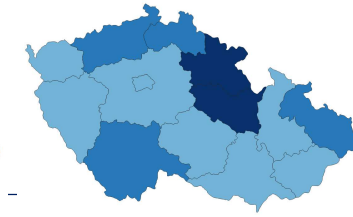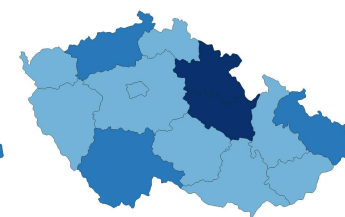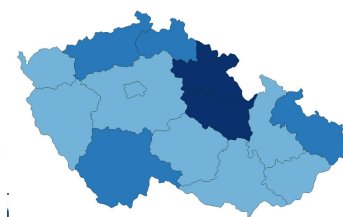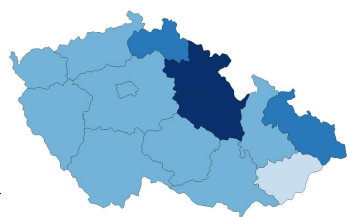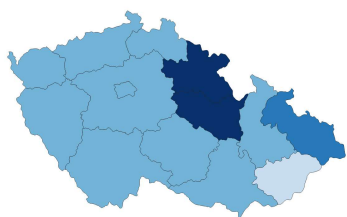
CENTRUM   ČESKÉ REPUBLIKY   UZIS

Nurse at health and social service providers in the Czech Republic

REGION	Number of patients to whom specialty 913 healthcare was reported					
	2016	2017	2018	2019	2020	2021
Prague	5 430	5 774	6 329	6 678	6 580	6 521
Central Bohemian Region	7 716	8 017	8 527	8 863	8 751	8 726
Jihočeský kraj	4 735	4 880	5 082	5 257	5 302	5 451
Plzeň Region	3 210	3 601	3 717	3 907	3 720	3 781
Karlovy Vary Region	1 874	1 862	1 952	1 998	1 972	2 060
Ústí Region	6 135	6 380	6 742	6 967	6 693	6 837
Liberec Region	1 919	2 050	2 175	2 274	2 229	2 632
Hradec Králové Region	3 750	3 941	4 199	4 218	4 037	4 237
Pardubice Region	3 556	3 703	3 805	4 010	3 879	4 096
Vysočina Region	3 318	3 492	3 561	3 864	4 019	4 062
South Moravian Region	5 449	5 583	5 861	6 301	6 144	6 176
Olomouc Region	4 033	4 284	4 308	4 440	4 429	4 465
Zlín Region	4 602	4 614	4 712	4 857	4 779	4 803
Moravian-Silesian Region	7 137	7 519	7 746	7 962	8 073	8 154

Increase in the number of MSPC patients whose care is covered by health insurance

2016   2017   2018   2019   2020   2021

CENTRUM   ČESKÉ REPUBLIKY   ZIS
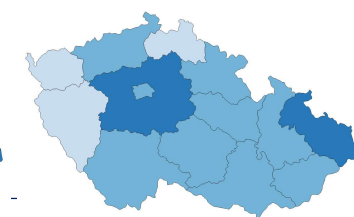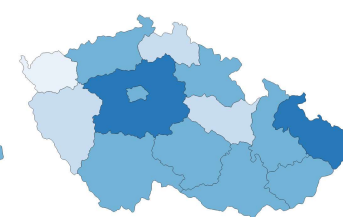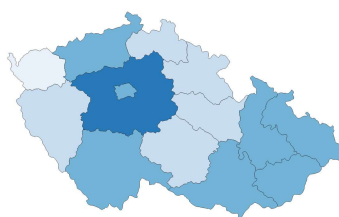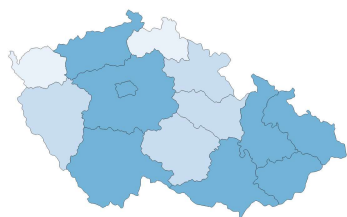
Nurse at health and social service providers in the Czech Republic

REGION	Number of patients per 100,000 population to whom specialty 913 healthcare was reported					
	2016	2017	2018	2019	2020	2021
Prague	427	449	486	508	496	488
Central Bohemian Region	579	596	627	643	628	624
Jihočeský kraj	742	763	793	817	824	847
Plzeň Region	556	622	638	665	630	640
Karlovy Vary Region	630	629	661	678	670	702
Ústí Region	746	777	822	849	817	837
Liberec Region	436	465	493	513	503	595
Hradec Králové Region	680	715	763	765	732	769
Pardubice Region	688	716	733	769	741	783
Vysočina Region	652	687	700	759	788	798
South Moravian Region	463	473	495	530	515	517
Olomouc Region	636	677	681	702	701	708
Zlín Region	788	791	808	834	822	828
Moravian-Silesian Region	589	623	643	663	674	684

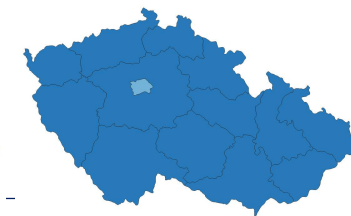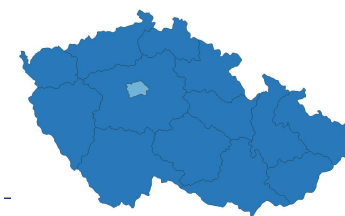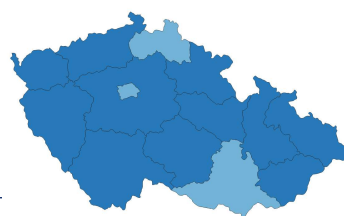**Increase in the number of MSPC patients whose care is covered by health insurance**
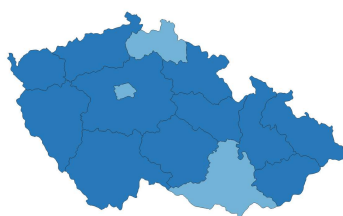
2016	2017	2018	2019	2020	2021
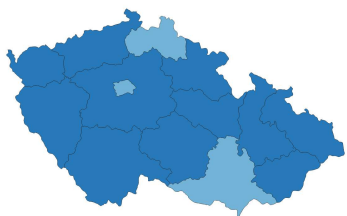
ČESKÉ REPUBLIKY

Czech National Cancer Control Plan 2030: Summary of analytical study

Strategic objective: strengthening screening programmes

National Cancer Plan of the Czech Republic

Ústav zdravotnických informací a statistiky České republiky
Institute of Health Information and Statistics of the Czech Republic

National organised screening programmes in the Czech Republic

All three internationally recommended cancer screening programmes are implemented in the Czech Republic. All three programmes have a safety and quality control system, data facilities and data auditing in place. The programmes are fully covered by public health insurance and health insurance companies also invite citizens to be screened on the basis of a single standardised system. The unified information system for screening programmes is based on the infrastructure of the National Health Information System.

Mamo.cz

Breast Cancer Screening Programme
- Since 2002
- Women aged over 45 years
- Mammography every 2 years

www.mamo.cz

kolorektum

Colorectal Cancer Screening Programme
- Since 2000
- Men and women aged over 50 years
  - 50–54 years – FOBT every year
    OR screening colonoscopy every 10 years
  - over 55 years – FOBT every 2 years
    OR screening colonoscopy every 10 years

www.kolorektum.cz

CERVIX

Cervical Cancer Screening Programme
- Since 2008
- All adult women
- Annual pap smear
- Women aged 35 and 45 years with negative cytology:
  HPV-DNA detection (since 2021)

www.cervix.cz

Data sources for monitoring of cancer screening programmes

Monitoring of cancer burden

- Epidemiology of cancer in the target population
- Long-term impact indicators

SOURCE: CZECH NATIONAL CANCER REGISTRY, ÚZIS ČR

Monitoring of screening process using clinical data

- Early performance indicators at screening centres
- Detection of cancer and precancerous lesions in screening

SOURCE: CANCER SCREENING PROVIDERS

Monitoring of screening process using administrative data

- Population-based early performance indicators
- Monitoring of programmes' accessibility by target population

SOURCE: DATA FROM HEALTH INSURANCE COMPANIES

The National Screening Centre, ÚZIS ČR is the guarantor of the data and information basis of cancer screening programmes

https://nsc.uzis.cz

The combination of all three components creates a comprehensive information system that enables a comprehensive evaluation of all aspects of the performance, quality and cost of the screening process.

The objectives of the CNCCP2030 are aimed at strengthening the participation of citizens in established prevention programmes and further development of these programmes

✓ **Health literacy**   ✓ **Motivation to participate**   ✓ **Personalised approach**

Despite the very significant successes of fully functional Czech cancer screening programmes, we cannot overlook the reserves, especially in the coverage of the population. For this reason, it is necessary to upgrade the information system supporting screening in order to enable more individualised risk assessment and more targeted invitation of citizens to screening. Information and education outputs must be directed towards strengthening health literacy in these areas. In addition to universal screening programmes, it is essential to introduce and develop sub-programmes for early detection of cancer in high-risk populations.

An important objective is also to re-strengthen screening programmes after the decline caused by the COVID-19 epidemic

The objectives of the CNCCP2030 are aimed at strengthening the participation of citizens in established prevention programmes and further development of these programmes

Significant sub-objectives of the given area in the CNCCP 2030

❑ Improving the effectiveness of existing population-based screening, including the use of innovative approaches

❑ Gradual introduction of new proven screening and early detection programmes for cancer

❑ Successful introduction of lung cancer screening

❑ Establishment of special cancer prevention programmes for patients at risk (autoimmune diseases, HIV patients, congenital and acquired diseases/conditions with higher risk of haemato-oncological disease)

❑ Strengthening of regular systematic monitoring of patients with the aim of early detection or relapse

❑ Ensuring continuous and long-term follow-up of the consequences of anticancer treatment

❑ Establish and implement care programmes for groups of patients at high risk of developing further primary cancers after completion of treatment for malignancies

❑ Setting up a widely available dispensary system including the involvement of primary care physicians (including prevention of subsequent cancer in already treated or cured cancer patients)
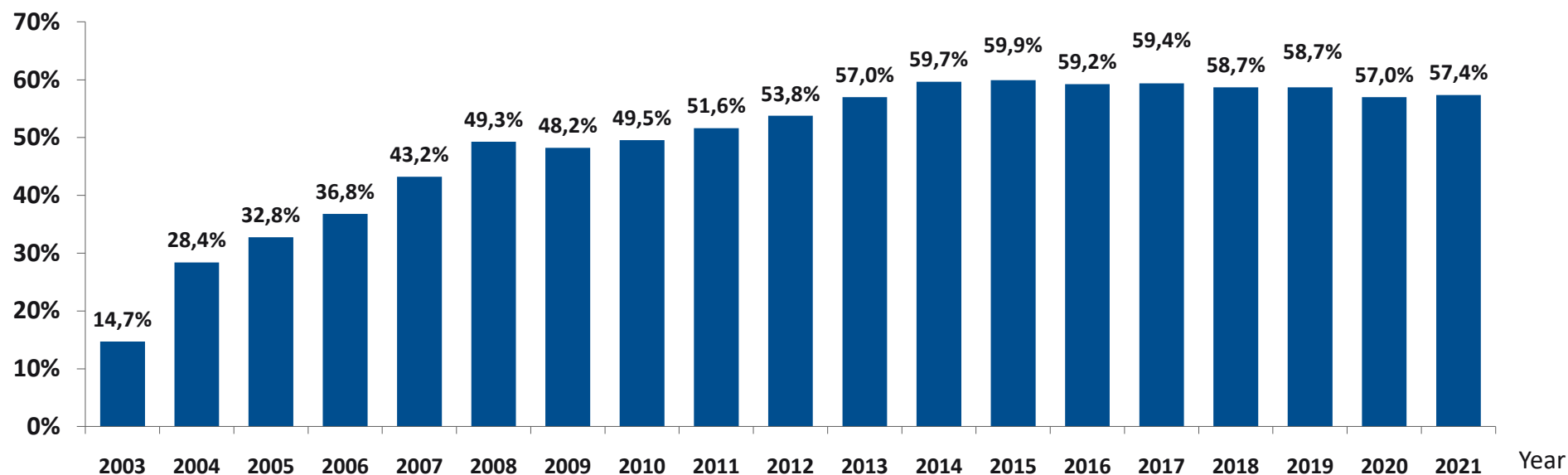
Coverage by breast cancer screening examinations in 2003–2021 at two-year interval

Screening mammography
Women aged 45–69 years
Data source: National Registry of Reimbursed Health Services, ÚZIS

Coverage by examinations

Year	Coverage
2003	14,7%
2004	28,4%
2005	32,8%
2006	36,8%
2007	43,2%
2008	49,3%
2009	48,2%
2010	49,5%
2011	51,6%
2012	53,8%
2013	57,0%
2014	59,7%
2015	59,9%
2016	59,2%
2017	59,4%
2018	58,7%
2019	58,7%
2020	57,0%
2021	57,4%

Coverage by breast cancer screening examinations at two-year interval reaches almost **60%**.
In 2020—2021, the coverage **decreased** to around **57%** mainly due to the COVID-19 pandemic.
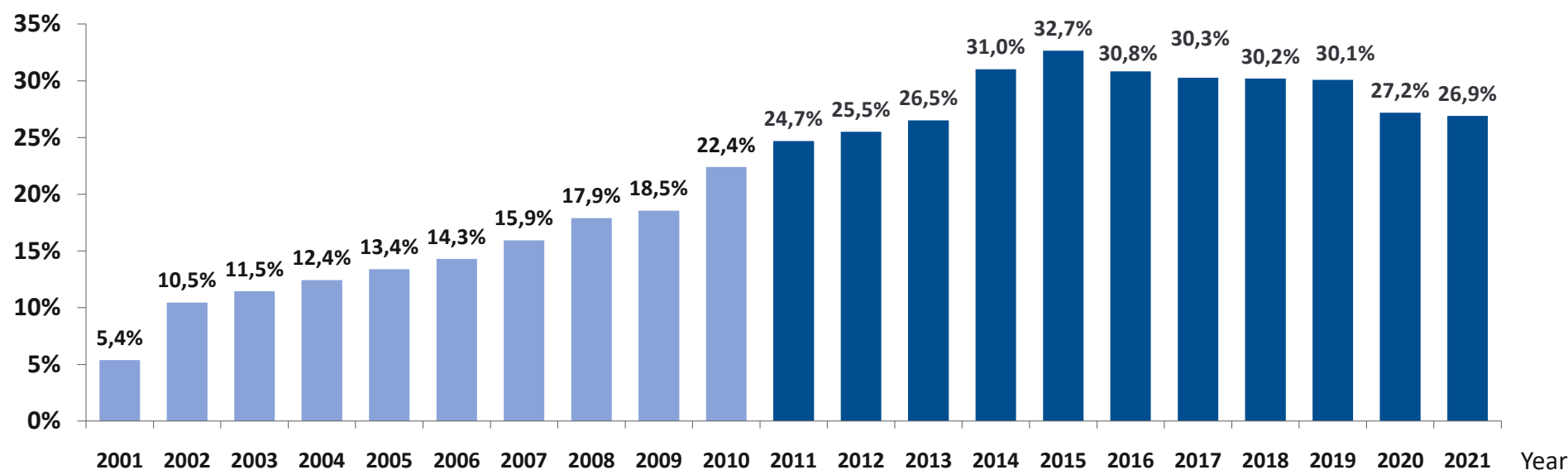
Coverage by colorectal cancer screening examinations in 2001–2021 at two-year interval

Screening colonoscopy, screening FOBT
Men and women aged 50+
Data source: National Registry of Reimbursed Health Services, ÚZIS
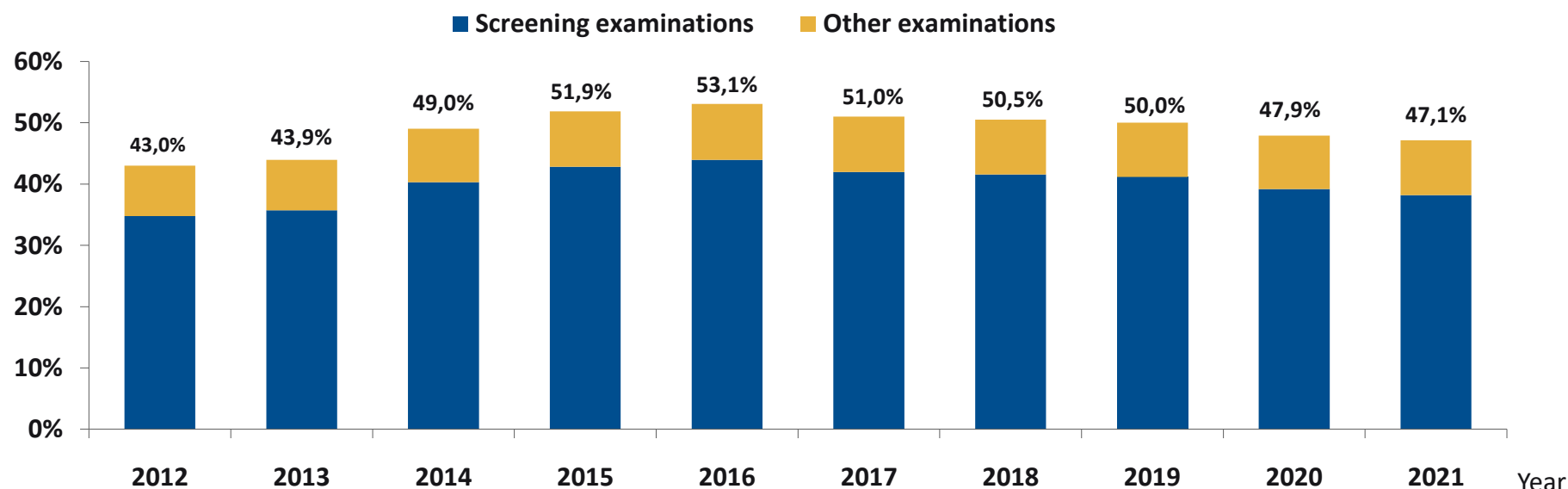
Coverage by examinations

Coverage by colorectal cancer screening examinations at the two-year interval has been around **30% in 2014—2019**.
In 2020—2021, the coverage **decreased** to around **27%** mainly due to the COVID-19 pandemic.

Complete coverage of the target population by colorectal screening in 2002–2021 at three-year interval by type of procedure

Coverage by examinations

Screening colonoscopy, screening FOBT
Diagnostic colonoscopy, diagnostic FOBT
Men and women aged 50+
Data source: National Registry of Reimbursed Health Services, ÚZIS

- ■ Screening examinations
- ■ Other examinations

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Total	43,0%	43,9%	49,0%	51,9%	53,1%	51,0%	50,5%	50,0%	47,9%	47,1%

Complete coverage of the target population by colorectal screening at the three-year interval was above **50%** in 2015–2019. Due to the COVID-19 pandemic, complete coverage decreased below 50%. The **contribution of other examinations** to coverage is in the range of **8-9 percentage points**.
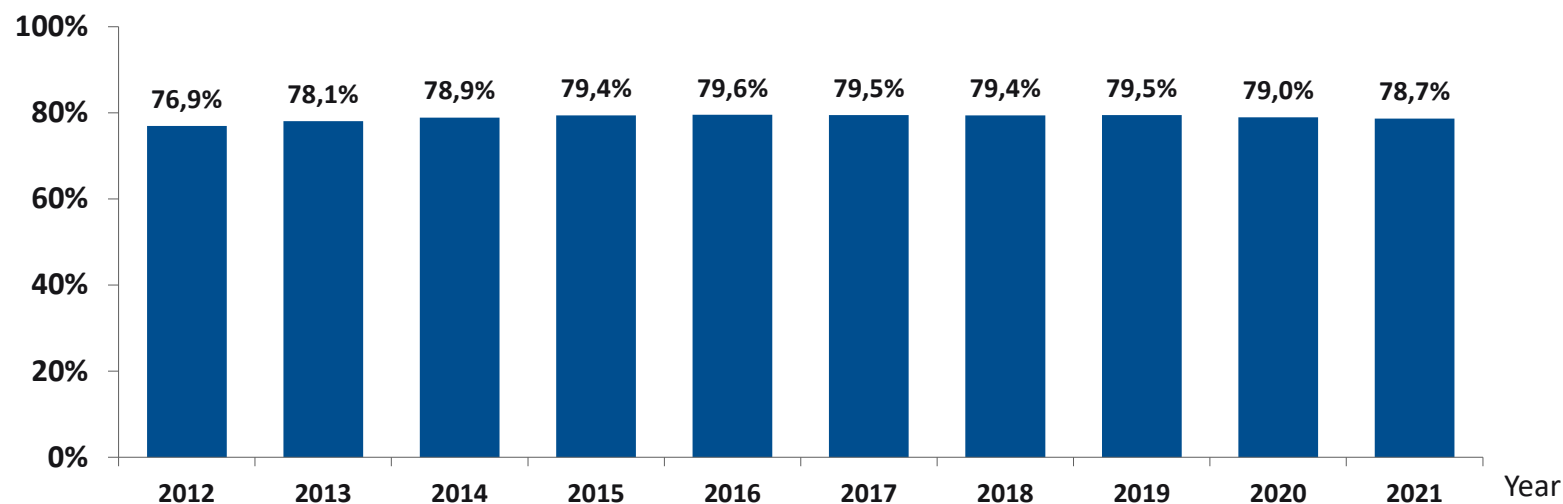
Coverage by cervical cancer screening examinations in 2012–2021 at three-year interval
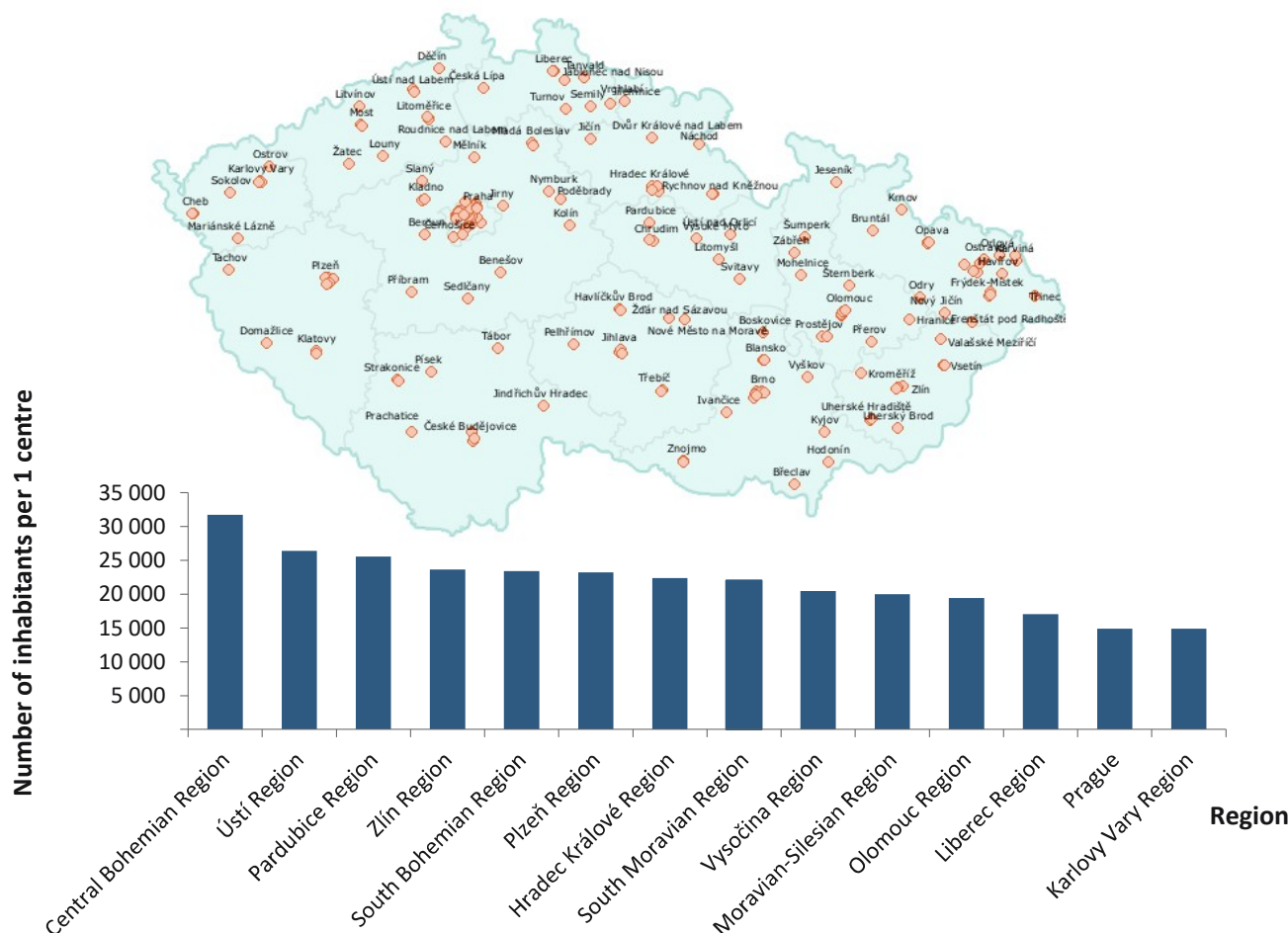
Coverage by examinations

Coverage by cervical cancer screening examinations at the three-year interval reached almost **80 % in 2015—2019**.
In 2020—2021, the coverage **decreased** to around **79 %** mainly due to the COVID-19 pandemic.

Specialised centres cover the Czech population across regions: the example of colorectal cancer screening

In the Czech Republic, a total of 195 centres for screening colonoscopy were accredited for 2021.

The network of centres for screening colonoscopy is sufficient in the Czech Republic, and the situation is similar for mammography and cervical screening.

Note: This is a list of workplaces for the year 2021. Applications for the status of a screening workplace in the colorectal cancer screening programme of the Ministry of Health of the Czech Republic for the year 2022 are currently being assessed.

A prerequisite for effective screening is further improvement of its quality

- **The European Commission has issued European recommendations for individual cancer screening programmes, including recommendations for quality monitoring through quality indicators**
- **The published quality indicators have gradually been implemented in the Czech Republic**

European Guidelines for QA in breast cancer screening and diagnosis

European Guidelines for QA in colorectal cancer screening and diagnosis

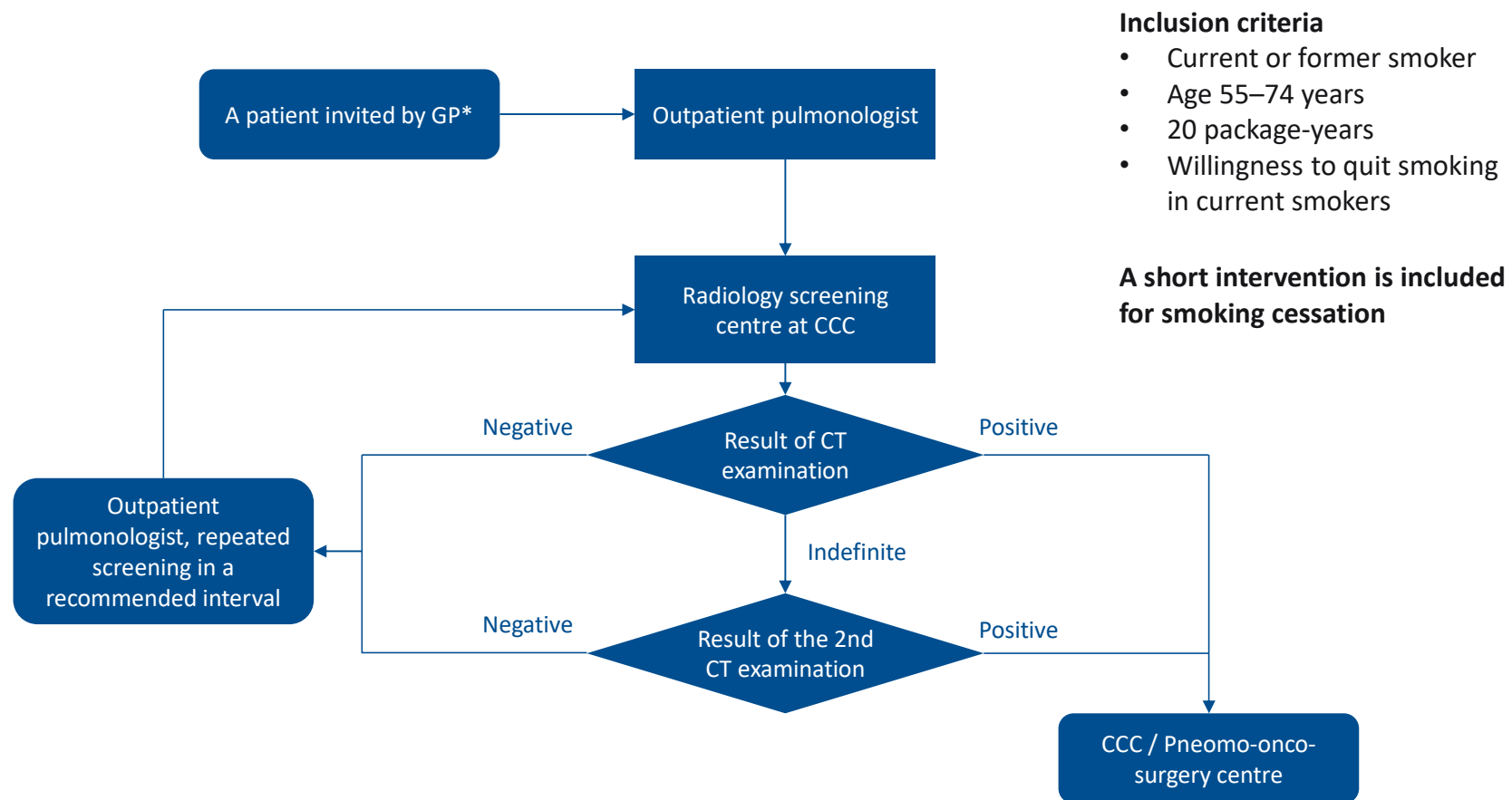European Guidelines for QA in cervical cancer screening

- **Regular monitoring and evaluation of cancer screening programmes is essential to ensure their maximum effectiveness**
- **Through quality monitoring, program weaknesses can be identified and eliminated, with the subsequent benefit of increased program health benefits and health care cost savings**

Population-based pilot programme for lung cancer early detection

- **Launch of the programme**
  - Since 2022 (5-year population pilot programme)
- **Target population**
  - Men and women aged 55–74 years with smoking history (at least 20 pack-years), former of current smokers
- **Test**
  - low-dose CT (LDCT), initially repeated after one year, then after 2 years
- **Process**
  - GPs offer the programme and refer patients to a pneumologist
  - Pneumologists perform complex pulmonary examinations, refer patients for LDCT and navigate them in the healthcare system
  - LDCT is provided at certified radiological departments only
- **Governance and coordination**
  - Committee for Preparation of the Lung Cancer Early Detection Programme of the Ministry of Health
  - Certification Committee for Lung Cancer LDCT Centres of the Ministry of Health
- **Monitoring and evaluation**
  - National Screening Centre, Institute of Health Information and Statistics of the Czech Republic
- **Information for professionals and the general public**
  - https://prevenceproplice.cz/

KARCINOM PLIC
PROGRAM ČASNÉHO ZÁCHYTU

Algorithm of an early detection programme for lung cancer

Inclusion criteria
- Current or former smoker
- Age 55–74 years
- 20 package-years
- Willingness to quit smoking in current smokers

A short intervention is included for smoking cessation

A patient invited by GP* → Outpatient pulmonologist

↓

Radiology screening centre at CCC

↓

Result of CT examination
- Negative → Outpatient pulmonologist, repeated screening in a recommended interval
- Positive → CCC / Pneomo-onco-surgery centre
- Indefinite ↓

Result of the 2nd CT examination
- Negative → Outpatient pulmonologist, repeated screening in a recommended interval
- Positive → CCC / Pneomo-onco-surgery centre

* In specific cases, direct referral of persons meeting the inclusion criteria by a general practitioner to the radiology centre is possible, and follow-up care is then coordinated

The pathway towards an individualised early detection programme for prostate cancer

- PSA screening for prostate cancer may reduce prostate cancer mortality, but screening is generally not currently provided at the population level due to concerns about adverse effects (in particular overdiagnosis of less aggressive tumours)

- PSA screening is available in primary and secondary care in the Czech Republic, the current situation may lead to widespread "grey" screening

- Current international recommendations lean towards the view that individualised screening can be beneficial for a group of informed men, whereas grey screening may lead to lower efficiency and safety of the process; this represents a potential for optimising investment in this type of care

- The Ministry of Health of the Czech Republic, representatives of professional societies, health insurance companies and the NSC launched a discussion on a possible way to prepare a pilot population-based program of individualised prostate cancer screening

- The parameters of the programme and its quality assurance at all levels (recruitment of men, parameters of the screening test, navigation through the screening process, diagnostics using 'state of the art' methods) will be the subject of further discussions, which will include the preparation of appropriate methodological documents

- A strong monitoring and evaluation component must be part of the potential program, for final decisions and optimization of the program setup in the long term

New consensus approaches for individualized early detection of prostate cancer are proposed to minimise adverse effects
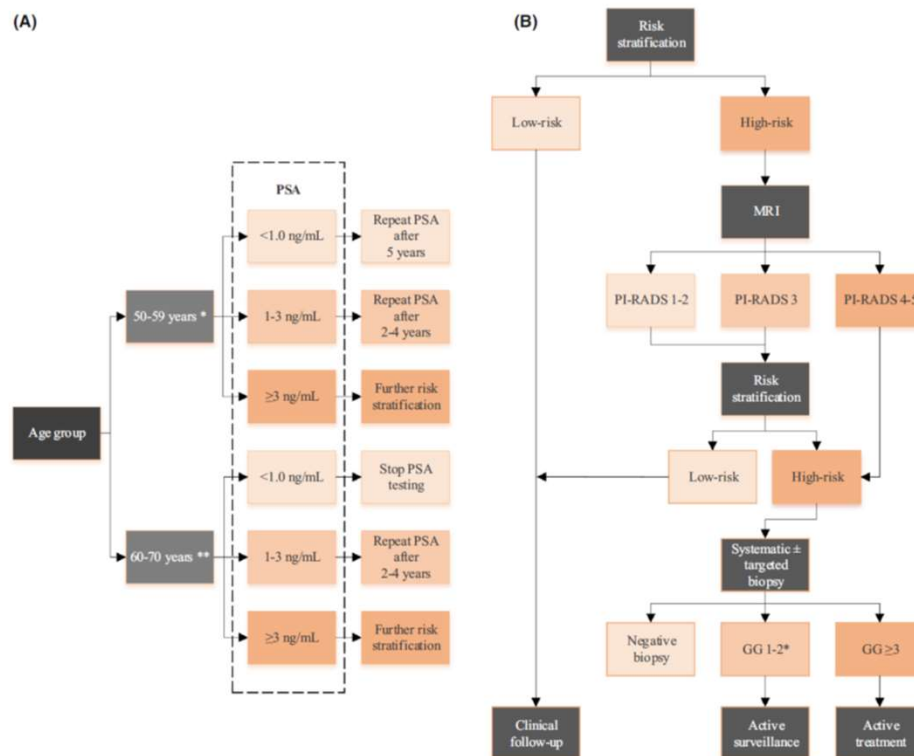

Fig. 1 – (A) Flow chart for PSA interval testing in different age groups. PSA = prostate-specific antigen. *Follow the same schedule for men aged >45 yr with a family history of prostate cancer or African descent and for men aged >40 yr who carry *BRCA2* mutations [11]. **Follow the same schedule for men aged >70 yr with good performance status and life expectancy of at least 10–15 yr [11]. (B) Algorithm for a risk-stratified early detection strategy for prostate cancer in men with elevated PSA. MRI = magnetic resonance imaging; PI-RADS = Prostate Imaging-Reporting and Data System; GG = Gleason grade group. *Only favorable intermediate-risk prostate cancer.

Part of the current initiative is the assessment and possible adaptation of these practices to the health system in the Czech Republic

Van Poppel H, Hogenhout R, Albers P, van den Bergh RC, Barentsz JO, Roobol MJ. Early detection of prostate cancer in 2020 and beyond: facts and recommendations for the European Union and the European Commission. Screening. 2021 Mar 1;73:56.

Important objectives of the NOP CR 2030 in the field of prevention are aimed at strengthening the activities of the already established National Screening Centre, ÚZIS ČR

NATIONAL SCREENING CENTRE, ÚZIS ČR

Cancer screening and early detection programmes in the Czech Republic

National Screening Centre
Ústav zdravotnických informací a statistiky České republiky
Kounicova 688/26
P. O. Box č. 19
611 00 Brno

Telephone contact to the secretariat NSC: 778 529 202

E-mail: nsc@uzis.cz

NSC NATIONAL SCREENING CENTRE

ÚZIS ČR
Ústav zdravotnických informací a statistiky České republiky
Institute of Health Information and Statistics of the Czech Republic

https://nsc.uzis.cz

National Screening Centre

General information

- **Part of the Institute of Health Information and Statistics of the Czech Republic (ÚZIS)**
- **20 regular employees within 2 departments**
  - Screening Project Management Department
  - Screening Project Data Management and Analysis Department
- **Financing from Operational Programme Employment (2017–2020)**
- **Supervised by the National Council for the Implementation and Steering of Early Detection Programmes, established by the Minister of Health**
- **NSC closely cooperates with the Ministry of Health, universities, professional societies, health insurance companies, healthcare providers, etc.**
- **Activities are anchored in strategic tools**
  - National Strategy for Health Protection and Promotion and Disease Prevention – Health 2020 - Action Plan: Development of health screening programs in the Czech Republic
  - Strategic Framework for Health Care Development in the Czech Republic by 2030 – Health 2030 – Specific Objective: Disease prevention, promotion and health protection and increasing health literacy
  - Recovery and Resilience Facility – through Increasing the resilience of healthcare services: strengthening cancer screening programmes
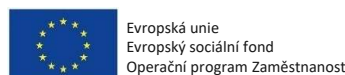
Key activities

- **Knowledge translation: bridging the gap between evidence and practice**
- **Methodological and personnel background to support early detection of the disease**
- **Education in cancer screening implementation**
- **Data warehouse for implementation of screening programmes**
- **Implementation research pilot projects**
- **Support of newly developed screening programs (early detection of lung cancer, SMA/SCID newborn screening)**

NSC activities in population-based cancer screening programmes

- **Comprehensive evaluation of existing screening programmes**
  - breast cancer
  - colorectal cancer
  - cervical cancer
- **Methodological and analytical support for newly considered or introduced screening programmes and setting up their monitoring**
  - Population-based pilot programme for early detection of lung cancer in at-risk populations
  - Potential population-based pilot programme for individualised prostate cancer screening
- **Implementation of projects aimed at optimising existing screening programmes**
  - Increasing the effectiveness of personalised invitations to citizens for colorectal, breast and cervical cancer screening (completed 30/11/2021)
  - Optimisation of the cervical cancer screening programme by introducing detection of the human papillomavirus genome using self-sampling kits in women who are long-term non-participants in the current screening programme (completed 31/12/2021)
  - Optimisation of the colorectal cancer screening programme (completed 30/6/2021)
- **Preparation of new potential pilot projects for early detection of cancer (starting in 2023)**

Czech National Cancer Control Plan 2030: Summary of analytical study

Strategic objective: strengthening primary prevention

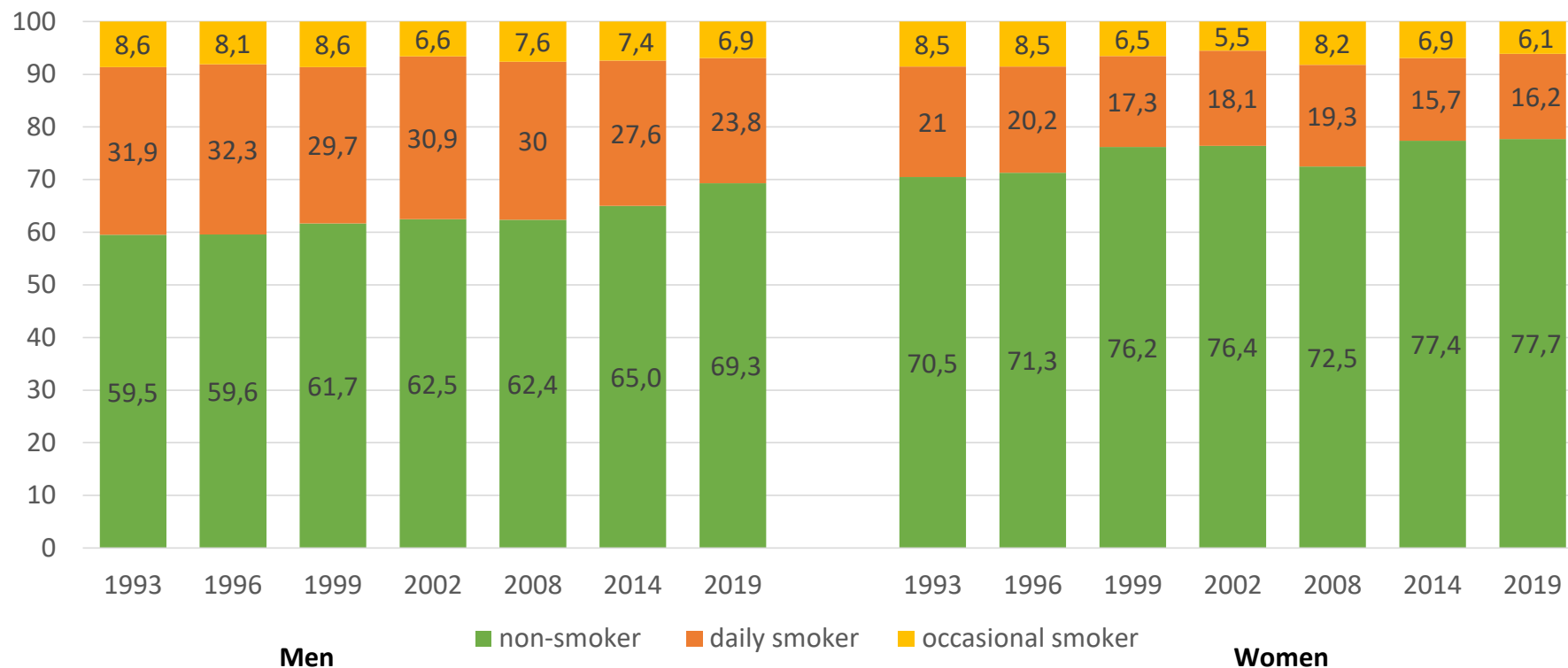*Czech National Cancer Control Plan 2030*

Tobacco consumption – time trends, structure (%), population 15+

Men

	1993	1996	1999	2002	2008	2014	2019
occasional smoker	8,6	8,1	8,6	6,6	7,6	7,4	6,9
daily smoker	31,9	32,3	29,7	30,9	30	27,6	23,8
non-smoker	59,5	59,6	61,7	62,5	62,4	65,0	69,3

Women

|	1993	1996	1999	2002	2008	2014	2019
occasional smoker	8,5	8,5	6,5	5,5	8,2	6,9	6,1
daily smoker	21	20,2	17,3	18,1	19,3	15,7	16,2
non-smoker	70,5	71,3	76,2	76,4	72,5	77,4	77,7

Legend: ■ non-smoker ■ daily smoker ■ occasional smoker

- In 2019, in the population aged 15 years and older in the Czech Republic, 24% of men and 16% of women were daily smokers. The proportion of smokers has decreased in time for both sexes. Since 1993, the proportion of non-smokers has increased by 10 p.p. for men and 7 p.p. for women.

# Exposure to tobacco smoke in EU countries, structure (%), population 15+, 2014

Source : EHIS 2019

Legend: ■ Exceptionally or never ■ less than 1 hour per day ■ 1 hour or more per day
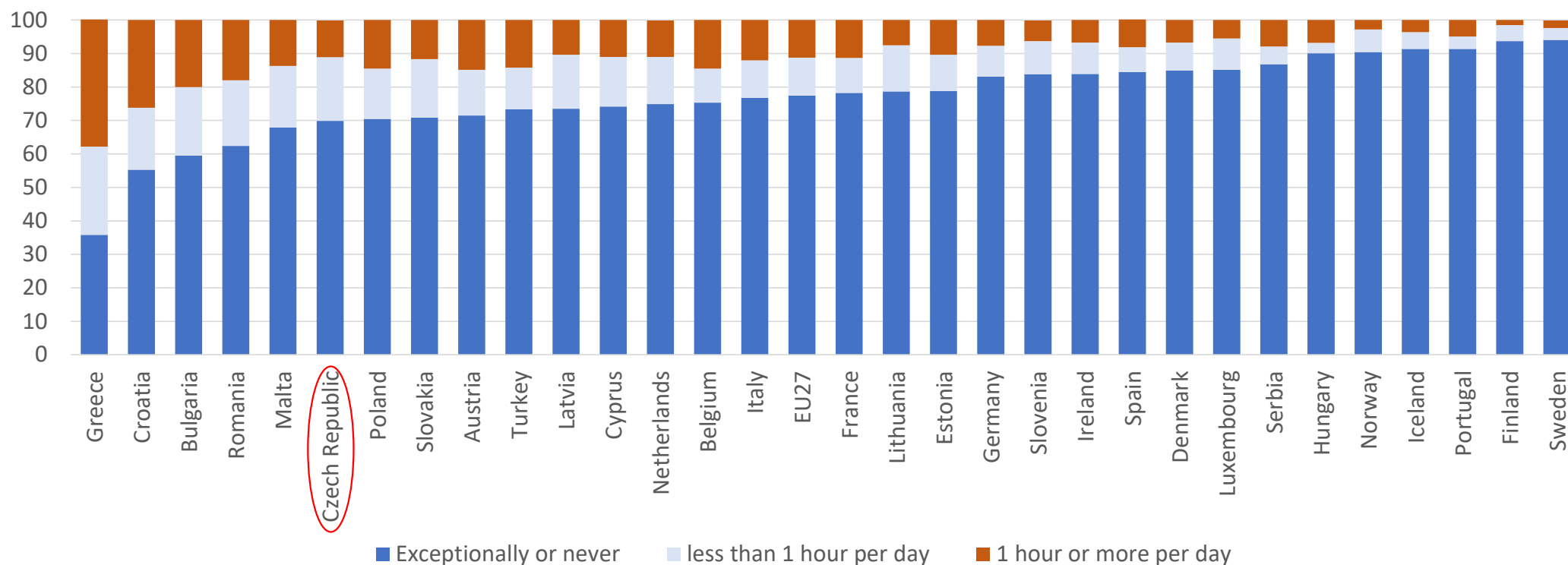
- The proportion of people exposed to tobacco smoke in the Czech Republic is among the highest in the EU, especially in terms of the proportion of people who are exposed less than daily.

# Obesity, 1993–2019, structure (%), population 15+

Source: EHIS 2019
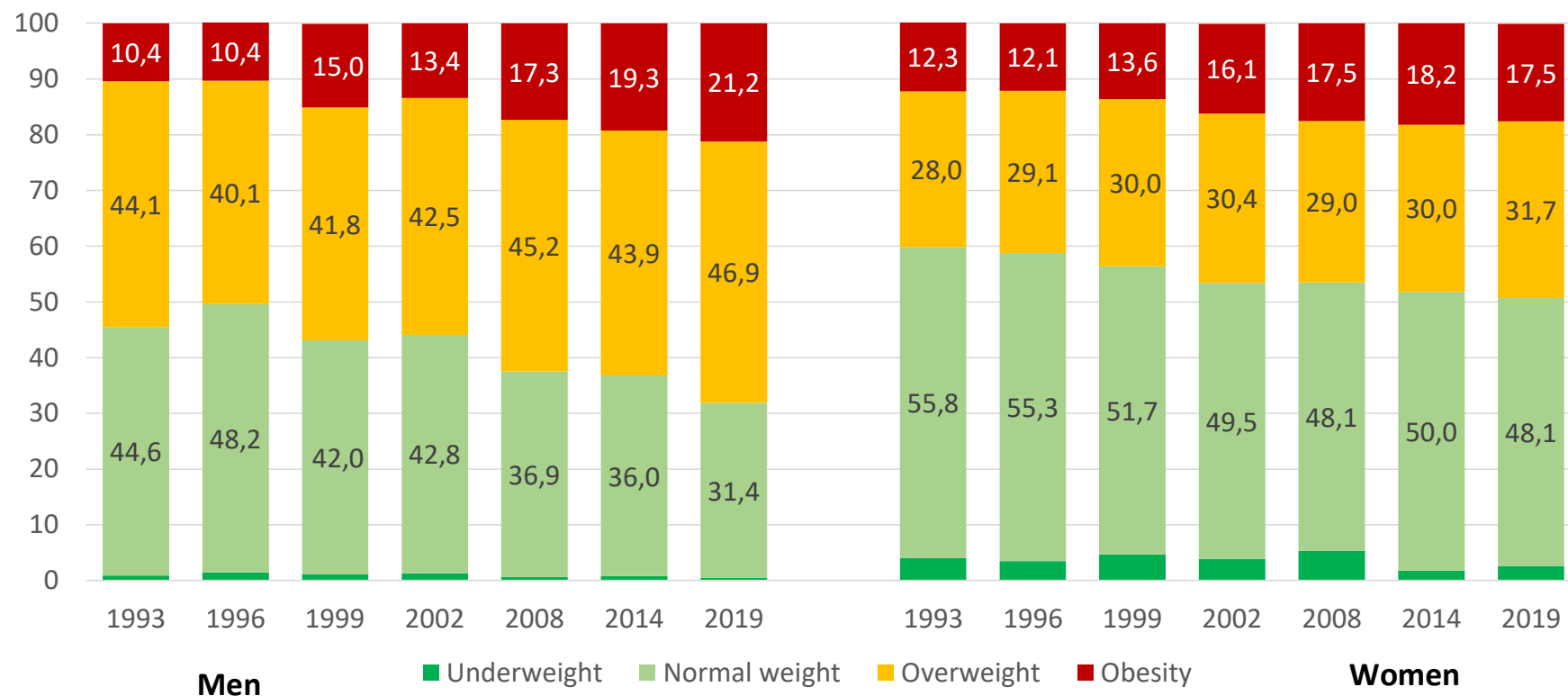
- More than 2/3 of men and about half of women were overweight or obese in 2019. The proportion of people with obesity has been rising for a long time, while in 1993 about 10% of people aged 15 and over were obese, in 2019 it was already about double.

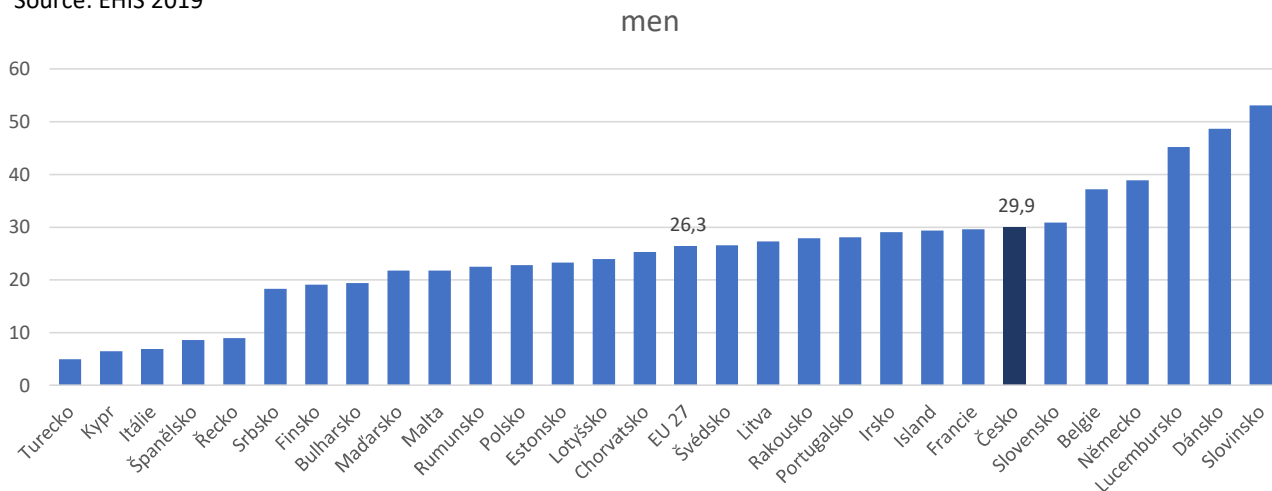# Proportion of obese in EU countries (%), population 15+, 2019
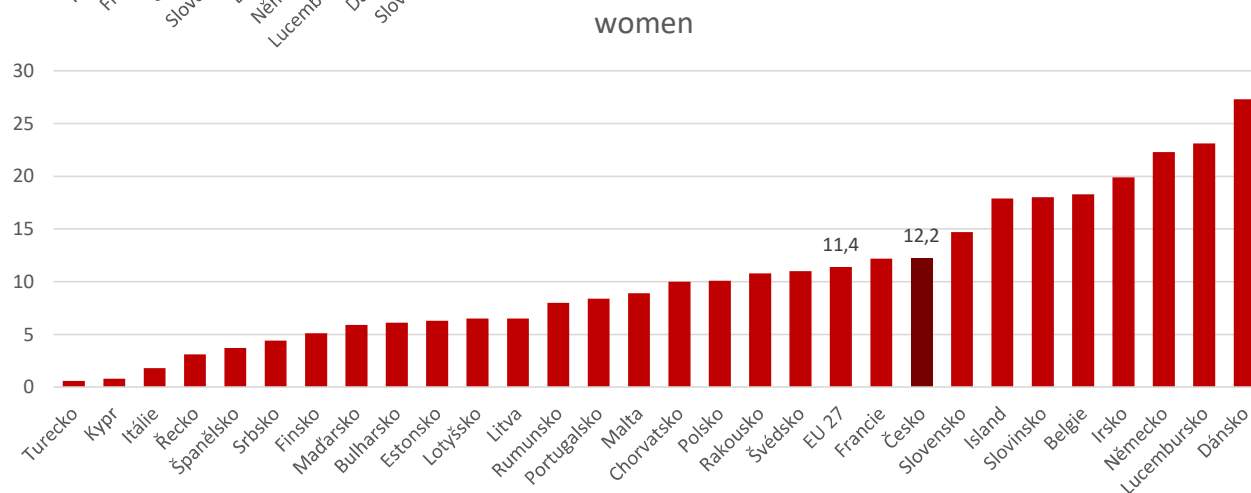
Source: EHIS 2019

men

women
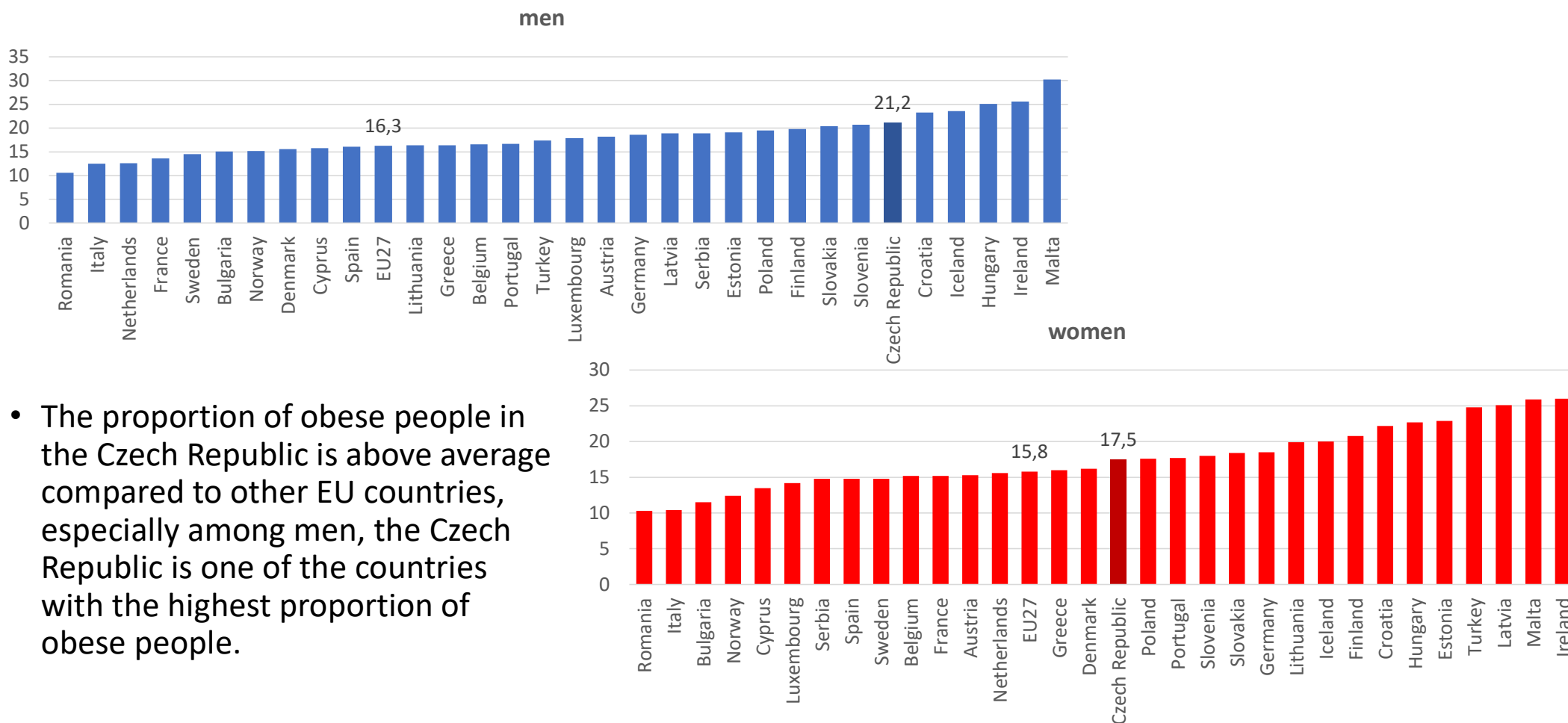
- The proportion of obese people in the Czech Republic is above average compared to other EU countries, especially among men, the Czech Republic is one of the countries with the highest proportion of obese people.

Proportion of people with heavy binge drinking at least once a month (%), population 15+, 2019
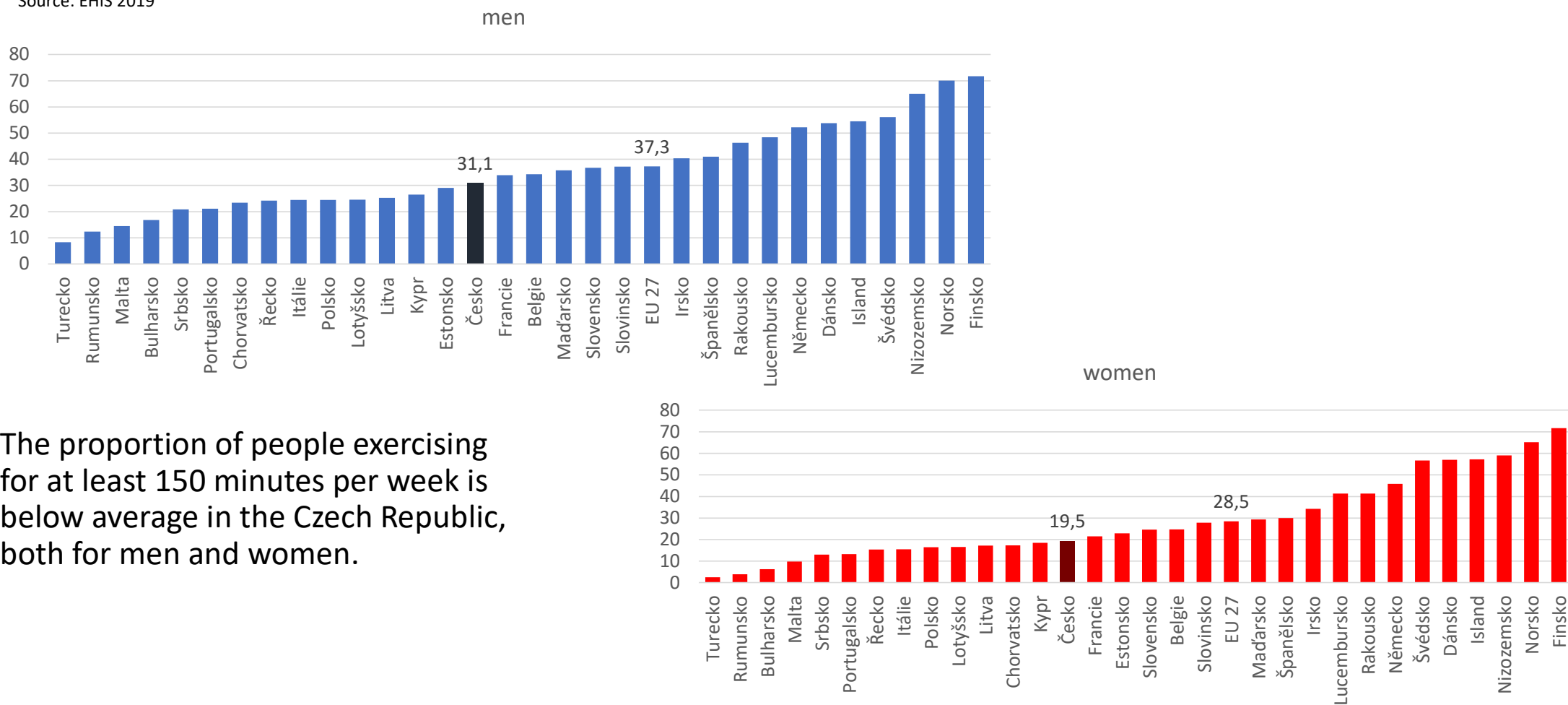
Source: EHIS 2019

men

women

- The proportion of people with excessive alcohol consumption in the Czech Republic is above average compared to EU countries, especially among men.

Proportion of people exercising at least 150 minutes per week (%), population 15+, 2019
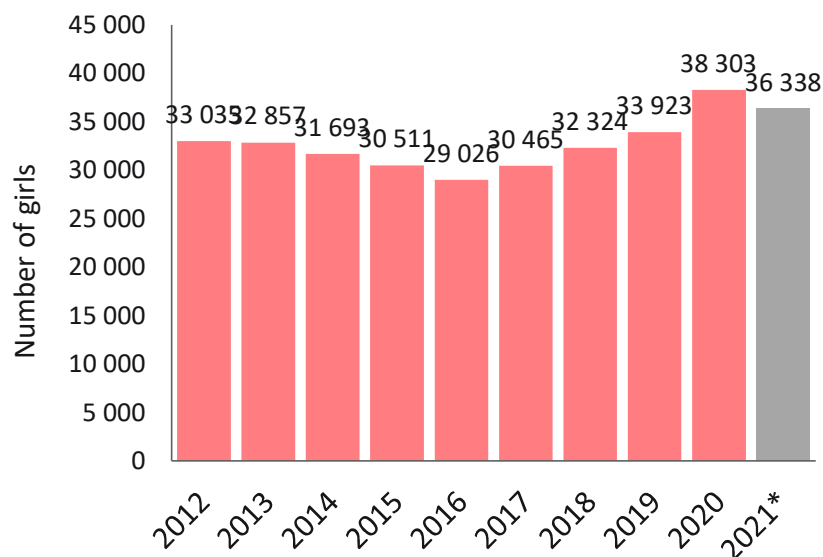
Source: EHIS 2019

men

women

The proportion of people exercising for at least 150 minutes per week is below average in the Czech Republic, both for men and women.
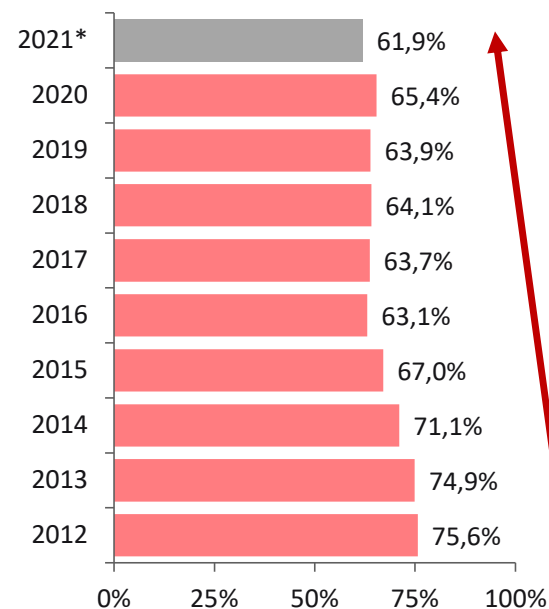
Girls (cohort 13 years of age in a given year) with primary HPV vaccination

Number of girls

Proportion of girls who received primary vaccination in the population 13 years of age (%)

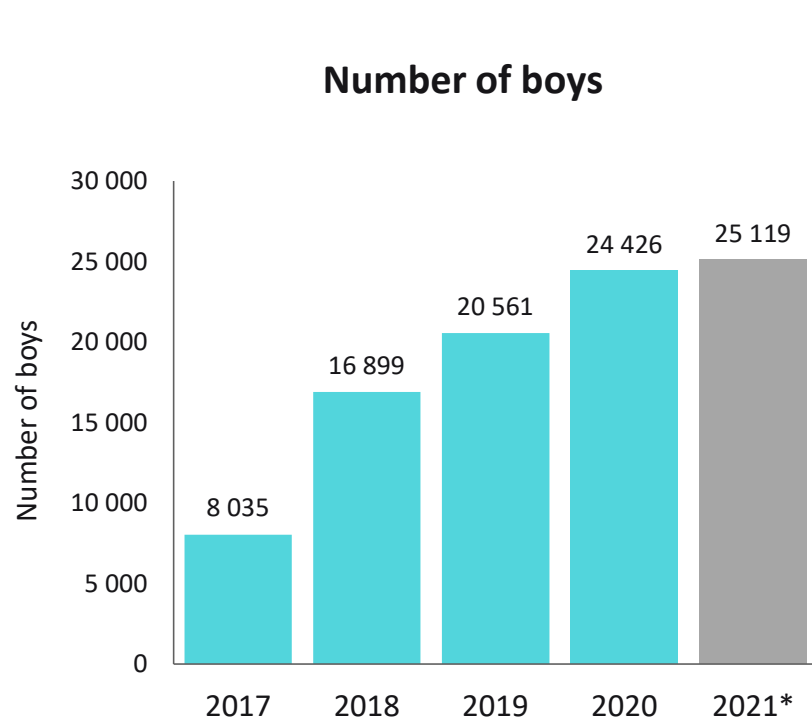| Year	%
2021*	61,9%
2020	65,4%
2019	63,9%
2018	64,1%
2017	63,7%
2016	63,1%
2015	67,0%
2014	71,1%
2013	74,9%
2012	75,6%

Note: Relates to girls aged 13 in a given year.

The statistical prediction is 36,338 girls vaccinated in 2021.
Of the number of girls who reached the age of 13 in 2021 (58,721), 61.9% can be predicted to be vaccinated in 2022.

The number vaccinated in a given year corresponds to girls who reached the age of 13 in that year and were vaccinated in that or the following calendar year.

* The year 2021 is not closed - girls from a given calendar cohort will be vaccinated in the following year.

ZDRAVÍ2030

NSC NÁRODNÍ SCREENINGOVÉ CENTRUM

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Boys (cohort 13 years of age in a given year) with primary HPV vaccination

Number of boys

Proportion of boys who received primary vaccination in the population 13 years of age (%)

Note: Relates to boys aged 13 in a given year.

The statistical prediction is 16 054 boys vaccinated in 2021.
Of the number of boys who will reach the age of 13 in 2021 (61,510), 40.8% can be predicted to be vaccinated in 2021.
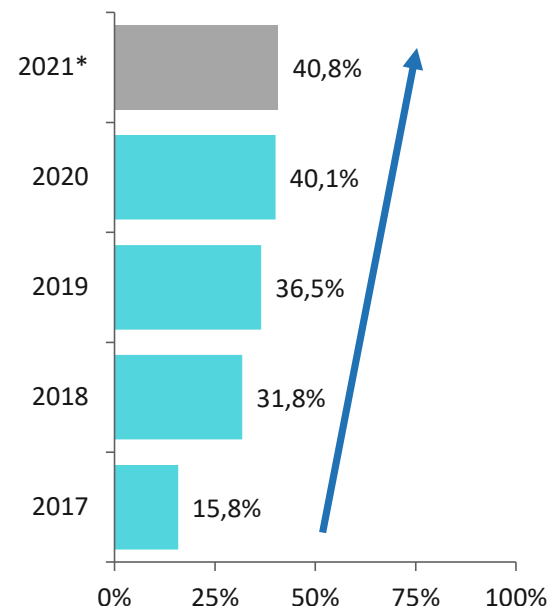
The number vaccinated in a given year corresponds to boys who reached the age of 13 in that year and were vaccinated in that or the following calendar year.

* The year 2021 is not closed - boys from a given calendar cohort will be vaccinated in the following year.
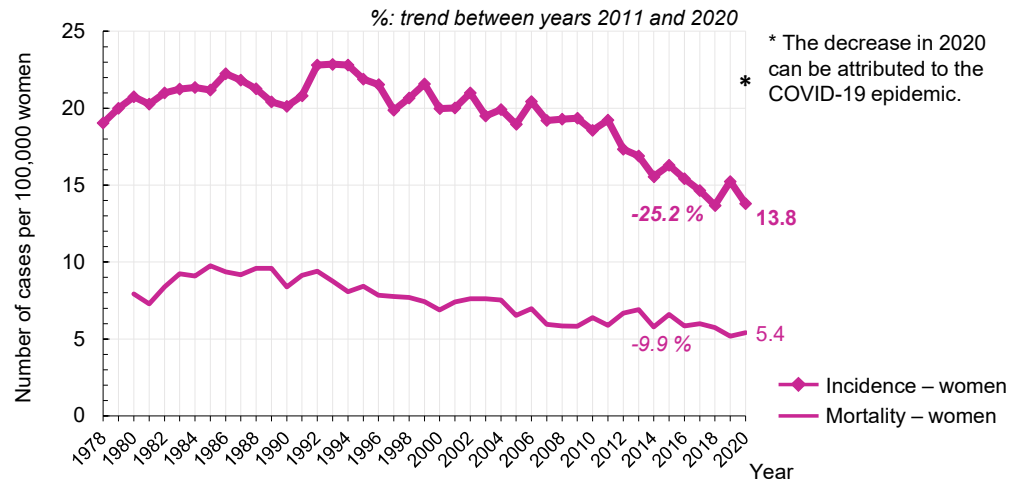
A review of the epidemiology of cancer in relation to human papillomavirus (HPV) infections
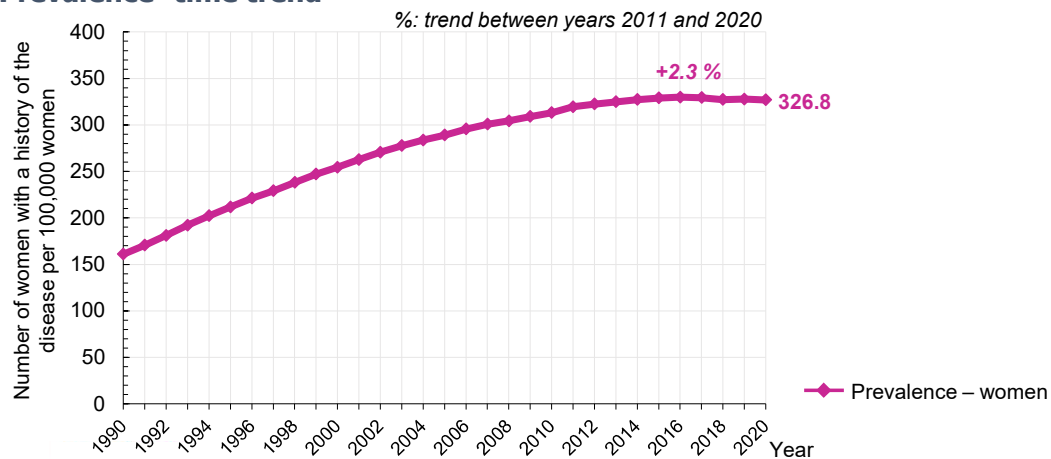
Absolute numbers

	Incidence Average annual number of newly diagnosed patients in the period 2016–2020			Prevalence Number of living persons with a history of cancer as of 31/12/2020		
	Total	Men	Women	Total	Men	Women
Cervical cancer (C53)	786	-	786	17 730	-	17 730
Vulval nad vaginal cancer (C51, C52)	303	-	303	2 424	-	2 424
Anal cancer (C21)	192	59	133	1 353	339	1 014
Penile cancer (C60)	118	118	-	941	941	-
Tongue and oropharynx cancer (C01, C02, C04–C06, C09)	1 123	801	322	7 003	4 647	2 356
Total	2 523	978	1 545	29 451	5 927	23 524

NSC NÁRODNÍ SCREENINGOVÉ CENTRUM

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY ÚZIS

Epidemiology of cervical cancer (C53)

Incidence[1] and mortality[1,2] time trend

%: trend between years 2011 and 2020

* The decrease in 2020 can be attributed to the COVID-19 epidemic.

-25.2 %   13.8

-9.9 %   5.4

Incidence – women
Mortality – women

Prevalence[1] time trend

%: trend between years 2011 and 2020

+2.3 %   326.8
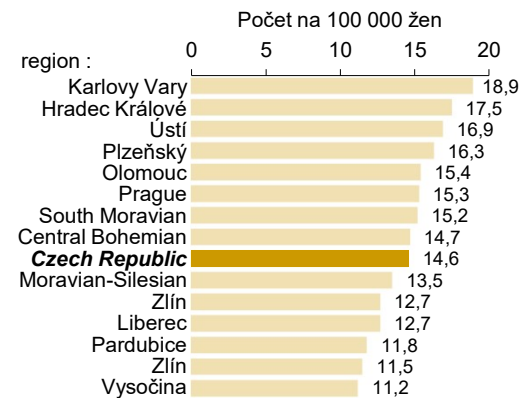
Prevalence – women

Incidence, mortality and prevalence in regions

INCIDENCE (annual average in 2016–2020)

Počet na 100 000 žen

region :	
Karlovy Vary	18,9
Hradec Králové	17,5
Ústí	16,9
Plzeňský	16,3
Olomouc	15,4
Prague	15,3
South Moravian	15,2
Central Bohemian	14,7
Czech Republic	14,6
Moravian-Silesian	13,5
Zlín	12,7
Liberec	12,7
Pardubice	11,8
Zlín	11,5
Vysočina	11,2

MORTALITY[2] (annual average in 2016–2020)

Počet na 100 000 žen

region :	
Karlovy Vary	10,0
Ústí	7,5
Plzeňský	6,3
Liberec	6,2
Czech Republic	5,6
Prague	5,6
Moravian-Silesian	5,4
South Bohemian	5,4
Vysočina	5,4
Central Bohemian	5,3
Hradec Králové	5,3
Zlín	5,2
South Moravian	5,1
Pardubice	4,5
Olomouc	4,1

RATIO MORTALITY[2]/INCIDENCE
(number of cases per na 100,000 women in 2016–2020)

Poměr M/I

region:	
Karlovy Vary	0,53
Liberec	0,49
Vysočina	0,48
Zlín	0,45
Ústí	0,45
South Bohemian	0,43
Moravian-Silesian	0,40
Plzeňský	0,39
Czech Republic	0,39
Pardubice	0,38
Prague	0,37
Central Bohemian	0,36
South Moravian	0,34
Hradec Králové	0,30
Olomouc	0,27

PREVALENCE** (as of 31/12/2020)

Number of women with a history of the disease per 100,000 women

region :	
Karlovy Vary	510,0
Ústí	425,3
Plzeňský	375,1
Prague	355,6
South Bohemian	337,2
South Moravian	328,2
Czech Republic	326,8
Hradec Králové	323,1
Moravian-Silesian	315,1
Liberec	306,4
Zlín	298,2
Olomouc	287,9
Pardubice	282,2
Central Bohemian	279,9
Vysočina	218,2

**Patients alive as of 31/12/2020 who had a given type of cancer diagnosed at any time in the past
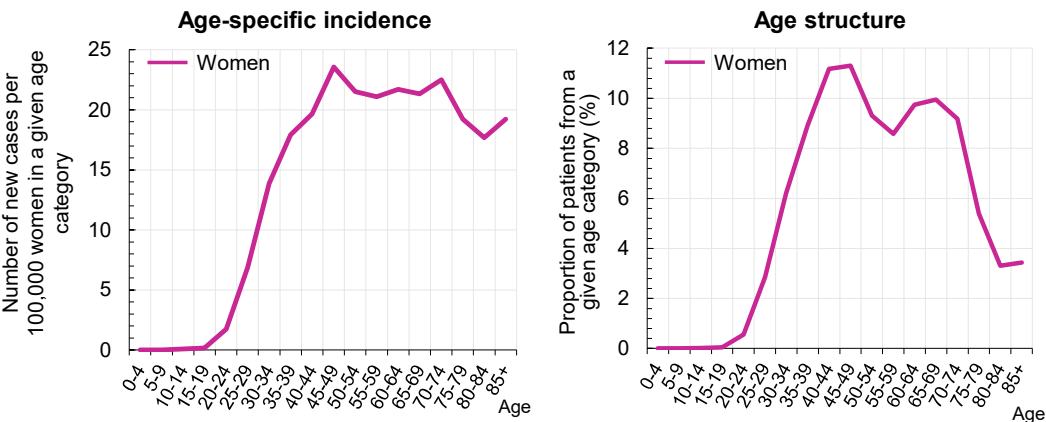
Source: [1]Czech National Cancer Registry, [2]Czech Statistical Office

Epidemiology of cervical cancer (C53)

Proportion and occurrence of clinical stages in newly diagnosed patients

Patients' age (annual average in 2016–2020)

Souhrn epidemiologie

Incidence[1] (annual average in 2016–2020)		Mortality[2] (annual average in 2016–2020)	
Cases per 100,000 women	14,6	Cases per 100,000 women	5,6
Annual average number of cases	786	Annual average number of cases	304
Proportion of all cancers (C00–C97 excl. C44)	Women: 2,8 %	Proportion of all cancers (C00–C97 excl. C44)	Women: 2,5 %
Patients' age Median (25th–75th percentilel) Proportion of women under 60 years of age	54 (42–67) let 59,0 %	**Prevalence[1] (as of 31/12/2020)**	
		Cases per 100,000 women	326,8
		Absolute number	17 730

* Objective reasons for not indicating the stage of the disease are findings only from the death certificate or autopsy, very early death of the patient, patients not treated for contraindications to cancer treatment, refusal of treatment by the patient. If the failure to indicate the stage is not explained, the record is considered erroneously incomplete.

Source: [1]Czech National Cancer Registry, [2]Czech Statistical Office

Czech National Cancer Control Plan 2030: Summary of analytical study

Conclusion: SWOT analysis

Czech National Cancer Control Plan 2030

The Czech National Cancer Control Plan 2030 is a strategic concept for further development of cancer care in the Czech Republic, including a comprehensive approach from primary prevention to end-of-life care

According to a number of international recommendations, cancer care in the Czech Republic is facing a number of significant organisational changes that must respond to the development of treatment options, the need to ensure equal access to care for all residents – but at the same time manage a reasonable degree of centralisation as a basic way of increasing the cost-effectiveness of diagnostic and treatment procedures and addressing the growing shortage of specialist staff.

In addition to the necessary primary prevention, organised screening programmes need to be further strengthened, and the proportion of cancers caught in early stages must be substantially increased. For patients in the final stages of life, a new national concept for palliative and end-of-life care should be launched, setting standards for the work of hospital palliative teams and subsequently strengthening not only mobile specialist palliative care, but also all forms of home care, as well as care at the health-social interface.

All these areas need to be standardised through comprehensive diagnostic and treatment guidelines and recommendations based on evidence-based medicine. Last but not least, further development of the National Health Information System and the follow-up processes of digitisation and computerisation of the management of health services as well as health-social services will play a strategic role in all of the above-mentioned tasks.

Starting point the Czech National Cancer Control Plan 2030: strengths

➢ The level of cancer prevention and treatment measures and cancer care infrastructure rank high in international comparison.

➢ Visible population-wide results of effective cancer control, e.g. the mortality/incidence ratio (M:I) in the Czech Republic is below the average of the ten European countries assessed in the ICP index and is at a similar level to France, Germany and Spain.

➢ The Czech Republic shows only a small difference in five-year survival rates compared to richer European countries (smallest for breast cancer, larger for prostate and colon cancer); moreover, cancer patients' survival rates are continuously improving over time.

➢ The mainstay of cancer care is a highly functional network of Comprehensive Cancer Centres (CCCs), highly specialised Haemato-Oncology Centres (HOCs) for adults, and highly specialised Children's Cancer (ChCCs). The principles of collaboration in patient care within regions, centres and regional cancer groups have been set. A concept for the organisation of cancer care in individual regions of the Czech Republic has been approved.

➢ The Czech Republic has an excellent level of cancer data evaluation and research (the Czech National Cancer Registry has been in operation since 1976, a completely new concept of the National Health Information System is being developed, and a new law on e-Health has been adopted).

➢ The Czech Republic is a leader in immunisation, screening and early detection in the field of oncology (existence of the National Screening Centre; three widely available population-based screening programmes – for cervical cancer, breast cancer and colorectal cancer – are fully operational; a fourth population-based screening for lung cancer is being introduced from 2022). Thanks to public health insurance, a range of cancer detection and treatment services are widely available in the Czech Republic, including HPV DNA tests, testing for mutations in the BRCA1 or BRCA2 gene, etc.

➢ The Czech Republic has a high availability of cancer therapies, with needs planning taking place annually in this area. In recent years, there has been an improvement in pricing and reimbursement; new, expensive therapies have been introduced; and the time it takes for these therapies to reach patients has been reduced.

➢ There is a high-quality and qualified staff capacity in the Czech Republic. The infrastructure of health services is robust and widely available. Concentration of specialised care in Comprehensive Cancer Centres (CCCs) and Haemato-Oncology Centres (HOCs) ensures high quality of care for cancer patients.

➢ The Czech Republic supports cancer research, including preclinical research and involvement in international clinical trials, especially in centres operating also as university centres in collaboration with medical faculties and some institutes of the Czech Academy of Sciences. The infrastructure and expertise for development and production in the field of biotechnology is available in the Czech Republic.

Starting point the Czech National Cancer Control Plan 2030: weaknesses

- Cancer is the second leading cause of the so-called premature mortality (after cardiovascular disease). Lower rates of participation in population-based screening programmes compared to the usual rates in developed EU countries, despite the introduction of targeted invitations. Low level of health literacy of the population. Existing regional disparities in the local and temporal availability of screening centres. Low visibility and weak impact of primary prevention programmes. Limited offer of specialist services in tobacco and alcohol treatment, obesity treatment, lack of significant support (positive incentives - bonuses) from healthcare payers.

- Regional differences in access to care, reduced availability of specialised care in some regions. Regional differences in the availability of health and social services related to cancer treatment itself (including palliative care in some regions, for example). Development of palliative care services is still ongoing; there are also regional differences in the scale of long-term follow-up supportive care that is needed.

- Disinformation about vaccines reduces the effectiveness of relevant vaccination programmes, e.g. declining vaccination rates of girls against human papillomavirus (HPV) and low awareness of the possibility of vaccinating boys against HPV.

- Inconsistent implementation of patient-centred approaches within the healthcare system. Low involvement of patients, their families and patient organisations in decision-making mechanisms. Services such as supportive therapy, nutritional counselling, physiotherapy, psychological care, etc. are not available in each facility.

- No uniform standard has been set across all institutions in terms of throughput across the system, inconsistent transfer of patients from primary care to specialised care, which can mean a delay of months before patients reach the care of specialised centres. Unclear system of lifelong care for cured paediatric patients after they reach the age of 18, e.g. in terms of monitoring the long-term toxicity of chemotherapy or other treatments.

- Planning and collaboration across actors and regions has so far been limited by the lack of policies and planning, especially the shielding of the plan at government level (ranked 15th in the ICP index). There is no medium-term plan for investment in cancer care, which makes it impossible to plan treatment in view of the expenditure that will result, in particular, from the introduction of new technologies. Hospitals are not in good condition in many regions, and there is a growing need for significant investment.

- Human capacities in cancer care are ageing and there is a local shortage, where, in addition to the financial remuneration of workers, the psychological impact of the consequences of working in this field is not systematically addressed (measures to improve psychological well-being, to maintain motivation and to prevent the burnout syndrome).

- Low representation of Czech partners in relevant EU community programmes.

ZDRAVI2030

MINISTERSTVO ZDRAVOTNICTVÍ
ČESKÉ REPUBLIKY

ÚZIS

Starting point the Czech National Cancer Control Plan 2030: opportunities

- Creation of a consensus strategy for 2030 approved by the government for intensive cooperation and better coordination of all stakeholders and available resources in the implementation of the Czech National Control Plan 2030 (Ministry of Health, Czech Society for Oncology, Ministry of Labour and Social Affairs, health insurance companies, regional authorities, patient organisations, etc.). Formulation of a clear strategic vision, goals and activities to be achieved in a predefined period, including specifications of tools, resources, responsibilities, measurement of progress, etc. – conceptual work, source of motivation and stability, elimination of chaotic procedures and regional disparities across related areas with the involvement of all stakeholders.

- Strengthening the position and role of centres of highly specialised care in all regions, in particular by standardising recommended procedures for referring patients at different stages of treatment. Introducing new incentive schemes for reimbursement of healthcare, payment according to real costs based on quality indicators. Strengthening the position of centres in health insurance plans. Introducing clinical guidelines and other mechanisms to standardise prevention and care.

- Intensification of international cooperation, including involvement in the implementation of Europe's Beating Cancer Plan. Effective use of EU funds (Integrated Regional Operational Programme 2021–2027 for investment projects, Operational Programme Employment + for systemic projects and National Recovery Plan – Component 6.2).

- Systematic promotion of health literacy and health promotion (in cooperation with stakeholders from outside the healthcare sector). There is also room for improvement in the area of inter-ministerial cooperation in healthcare between educational and health institutions in the promotion of healthy lifestyles. Further strengthening the availability of screening programmes for the target population and improving the quality of the whole screening process, introducing new early detection programmes in line with scientific knowledge.

- There is also room for improvement in the area of health financing to accommodate the increasing demanding needs of the population (e.g. extending HTA to medical devices and medicines used in healthcare facilities).

- There is also an opportunity to improve cancer diagnosis and treatment by levelling geographical disparities across the country.

- Improved efficiency of the organisation of care through the introduction of digitisation and technological advances (possibility of better patient care, assessment of the scope of care provided, identification of drug interaction, etc.).

- Effective use of new research findings. There is a persistent belief in the population that "the state will take care of me"; personal responsibility needs to be emphasised.

ZDRAVI2030

MINISTERSTVO ZDRAVOTNICTVÍ ČESKÉ REPUBLIKY

ÚZIS

Starting point the Czech National Cancer Control Plan 2030: risks & threats

- Poor lifestyle compared to developed EU countries, high prevalence of risk factors: tobacco use (34.4% of adults), high-risk alcohol consumption (12% women, 30% men), obesity (28.5% of adults) and lack of exercise (31.1% of adults). These are lifestyle characteristics highly resistant to educational and awareness-raising interventions. In the ICP index, the Czech Republic is the second worst among the ten European countries assessed in terms of obesity (after the UK) and the second worst in terms of tobacco consumption (after Russia).

- Demographic ageing of the population and a proportionally increasing cancer burden.

- Lack of resources for healthcare due to unforeseen events (e.g. economic crisis, acute need to redistribute resources to other health areas, etc.).

- Lack of resources to pay for innovative cancer care

- Consequences of the COVID-19 pandemic

- Ageing human resources in the field of cancer care (physicians, health workers, social workers, etc.).

- Political reluctance to address strategic issues of financing cancer care.