

# Cancer screening in the Czech Republic

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## ABSTRACT

The study aimed to summarize basic information on cancer screening in the Czech Republic. The study presents a list of screening programs for the early detection of selected cancers performed in the Czech Republic. It draws attention to the importance of systematic examination of asymptomatic patients to detect malignant diseases in their preclinical phase when the chance of complete healing is high. The role of general practitioners is pivotal in the implementation of the programs.

## KEYWORDS

screening – general practitioner – cancer – case report

## SOUHRN

**Ševčíková J., Kollárová H., Entrová A., Gregorová Durdáková R., Štěpánek L., Horáková D.:  
Nádorový screening v České republice**

Cílem studie bylo shrnout základní informace o screeningu rakoviny v České republice. Studie uvádí seznam screeningových programů pro časnou detekci vybraných nádorových onemocnění prováděných v České republice. Upozorňuje na důležitost systematického vyšetřování asymptomatických pacientů k detekci maligních onemocnění v jejich preklinické fázi, kdy je šance na úplné vyléčení vysoká. Role praktických lékařů je při realizaci programů stěžejní.

## KLÍČOVÁ SLOVA

screening – praktický lékař – rakovina – kazuistika

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## INTRODUCTION

Cancers are the second most common cause of death in the world and also in the Czech Republic in both sexes and are responsible for 1/4 of all deaths [1]. In 2020, 19,3 million new cases of cancer were reported worldwide. In the same year, 10 million people died of cancer. Breast, lung and colon cancer are among the most common cancers worldwide, while the most common cancers ending in death are lung, colon, liver and stomach cancers [2]. In the Czech Republic, the situation is also unfavourable, in some oncological diagnoses we are among the most burdened populations worldwide. In 2022, 100,925 cases of malignant tumours were newly reported to the National Oncology Registry, including neoplasms in situ (ICD 10 dg. C00–C97 and D00–D09), of these, 52,404 cases were in men and 48,521 in women [1].

## EPIDEMIOLOGY IN THE CZECH REPUBLIC

The most common cancer, with a share of 30% in 2022, was non-melanoma skin cancer (dg. C44), which is a diagnosis with a low fatality rate [1]. In 2022, the second most frequently diagnosed malignant neoplasm with a significant share of mortality in men was prostate cancer (dg. C61), which accounted for 20% of all newly diagnosed malignant neoplasms in men, with an absolute incidence of 9,839. In women, breast cancer (dg. C50) accounted for 18% of all newly diagnosed malignant neoplasms of malignant neoplasms in women (incidence 7.918). In both sexes, colon and rectal cancer (dg. C18–C20) ranked third, accounting for 7.7% of all new diseases (incidence was 7,107, of which 4,151 were men and 2,956 were women). On the fourth rank were trachea, bronchus and lungs (dg. C33, C34) with a share of 7.4% of all new malignant

diseases (absolute incidence 6,808, of which 4,117 in men and 2,691 in women). Mortality due to cancer accounted for 25% of all deaths in the Czech Republic in 2022. Each year, approximately 5,000 people die from malignancy of the trachea, bronchi and lungs, 3,200 people from colon and rectum cancers, over 2,300 people from pancreatic cancer, 1,700 women from breast cancer and approximately 1,500 men from prostate cancer. These tumors, accounting for 50.1%, represent the most common cause of death from neoplasms excluding non-melanoma skin cancers.

## ETIOPATHOGENESIS

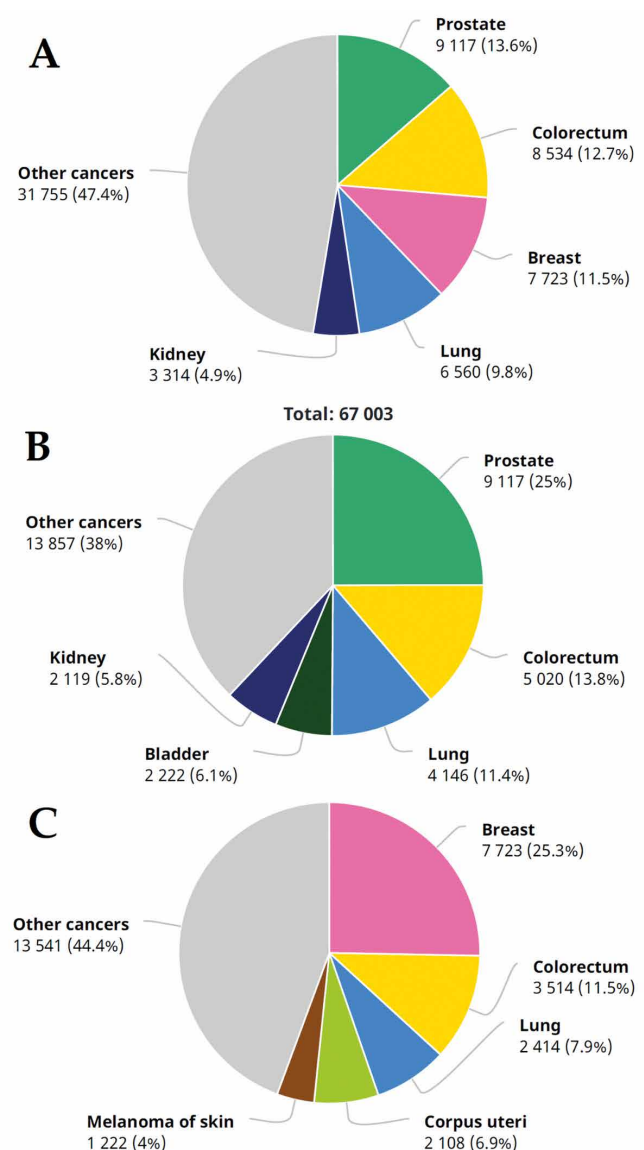
The increasing trend in the reporting of neoplasms can be explained by the ageing of the population when the cumulative effect of risk factors is more applied as life expectancy increases. Lifestyle factors, especially inappropriate diet, smoking and lack of physical activity, have the greatest share in the development of cancer.

The greater occurrence of carcinogens in a polluted environment, genetic predisposition and, last but not least, a higher level of medical care and improved diagnosis of cancer are indisputable. On the contrary, we can observe a downward trend in mortality since the second half of the 1990s, which means that the goal of secondary prevention, including screening programs, has been fulfilled. The epidemiological situation of cancer in the Czech Republic is illustrated by graphs derived from the international Globocan database (Figure 1), which provides estimates of key epidemiological indicators. The subsequent table (Figure 2) presents not only incidence and mortality rates but also five-year survival data for selected cancer types. These data are available through the IARC Global Cancer Observatory website.

Screening means general testing of the population to find the disease in its early, asymptomatic stage. The gist is to prevent further development of the disease. The benefit is an improvement in the prognosis and the possibility of using a less radical and usually cheaper therapy. A screening method does not burden the patient, is easy to perform, is not expensive, and is sensitive, i.e. it reliably captures all the changes sought, but at the same time does not give false positive results. Sufficient professional capacity to implement the program, permanent continuity of the entire process and continuity in further investigation and treatment must be ensured. The population at risk for screening must be clearly defined. Conditions for the introduction of screening were already established in 1968 by the WHO. We distinguish between population screening, when we examine entire population groups, and selective screening programs, when we examine only a selected part of

the population at high risk, always according to the recommended procedure. The methodology and legislative anchoring of cancer screening are among the key priorities of the Ministry of Health of the Czech Republic [5].

Oncology treatment is one of the most expensive types of therapy, and even the most developed countries cannot ensure the availability of the most modern oncology treatment for all necessary patients. It is proven that finding the disease in its early, still asymptomatic stage usually prevents the further development of the disease and its complications, brings the possibility of using less radical and usually also cheaper therapy and improves the prognosis [5, 6].



**Figure 1.** Number of new cases of cancers in 2020 in both sexes (A), males (B), and females (C) [4]

Cancer	New cases				Deaths				5-year prevalence	
	Number	Rank	(%)	Cum.risk	Number	Rank	(%)	Cum.risk	Number	Prop. (per 100 000)
Prostate	7 956	1	12.1	9.1	1 622	5	5.8	1.1	33 201	627.7
Breast	7 732	2	11.8	7.8	1 709	4	6.1	1.3	32 229	591.7
Colorectum	7 568	3	11.5	3.7	3 504	2	12.5	1.4	24 655	229.6
Lung	6 192	4	9.4	3.1	5 006	1	17.8	2.5	7 737	72.1
Bladder	3 145	5	4.8	1.5	1 082	6	3.9	0.32	10 740	100.0
Kidney	3 087	6	4.7	1.7	992	8	3.5	0.42	10 187	94.9
Melanoma	2 932	7	4.5	1.6	441	15	1.6	0.19	11 469	106.8
Pancreas	2 479	8	3.8	1.1	2 309	3	8.2	1.0	2 138	19.9
NHL	1 765	9	2.7	0.92	648	12	2.3	0.26	6 027	56.1
Corpus uteri	1 707	10	2.6	1.8	369	18	1.3	0.27	6 867	126.1
Leukaemia	1 663	11	2.5	0.78	1 010	7	3.6	0.38	5 091	47.4
Thyroid	1 360	12	2.1	0.88	76	25	0.27	0.03	5 385	50.2
Stomach	1 242	13	1.9	0.58	930	10	3.3	0.38	1 725	16.1
Liver	1 053	14	1.6	0.48	933	9	3.3	0.41	1 181	11.0
Lip, oral cavity	955	15	1.5	0.54	400	17	1.4	0.22	3 207	29.9
Ovary	920	16	1.4	0.95	602	13	2.1	0.56	2 792	51.3
Brain CNS	906	17	1.4	0.51	732	11	2.6	0.39	3 764	35.1
Oesophagus	668	18	1.0	0.39	596	14	2.1	0.33	941	8.8
Cervix uteri	658	19	1.0	0.79	369	18	1.3	0.36	2 398	44.0
Multiple myeloma	624	20	0.95	0.31	416	16	1.5	0.17	1 938	18.1
Oropharynx	582	21	0.89	0.36	243	21	0.87	0.15	1 870	17.4
Testis	509	22	0.78	0.71	35	30	0.13	0.04	2 303	43.5
Larynx	465	23	0.71	0.28	220	22	0.78	0.13	1 657	15.4
Gallbladder	354	24	0.54	0.14	259	20	0.92	0.10	423	3.9
Hodgkin lymphoma	290	25	0.44	0.19	59	27	0.21	0.03	1 169	10.9
Vulva	272	26	0.41	0.21	103	24	0.37	0.05	872	16.0
Salivary glands	151	27	0.23	0.07	74	26	0.26	0.03	516	4.8
Hypopharynx	150	28	0.23	0.10	131	23	0.47	0.08	338	3.2
Penis	139	29	0.21	0.15	43	29	0.15	0.04	485	9.2
Mesothelioma	64	30	0.10	0.03	51	28	0.18	0.03	77	0.72
Vagina	61	31	0.09	0.05	30	32	0.11	0.02	166	3.1
Nasopharynx	51	32	0.08	0.03	35	30	0.13	0.02	177	1.7
All cancers	65 676	-	-	28.3	28 071	-	-	11.4	207 021	-
All cancers excl. NMSC	61 107	-	-	27.4	27 882	-	-	11.4	191 182	-

**Figure 2.** Incidence, mortality and prevalence by cancer site [4]

## POPULATION SCREENING PROGRAMS IN THE CZECH REPUBLIC

Almost every fourth death in the Czech Republic (23%) was caused by an oncological disease in 2019, which is a 10% higher mortality for this group of diagnoses than the average of the European Union (EU). It is necessary to focus especially on preventable and treatable oncological diseases [7]. Figures 3 and 4 show the distribution of incidence and mortality from oncological diseases in the Czech Republic and EU countries and illustrate the necessity of oncological screening programs.

In the Czech Republic, we have established population screening programs for the early detection of colorectal cancer, breast cancer and cervical cancer, a pilot project is screening for bronchogenic carcinoma, and screening for prostate cancer is being prepared [5, 8].

According to Decree No. 70/2012 of the Collection, the recommendation of screening programs for the early detection of tumour growth is an integral part of a preventive examination by a general practitioner (GP) as part of oncology prevention [9]. Czech GPs participate in prevention at all levels. They are world leaders in the implementation of colorectal cancer screening and have a major influence on the implementation of other

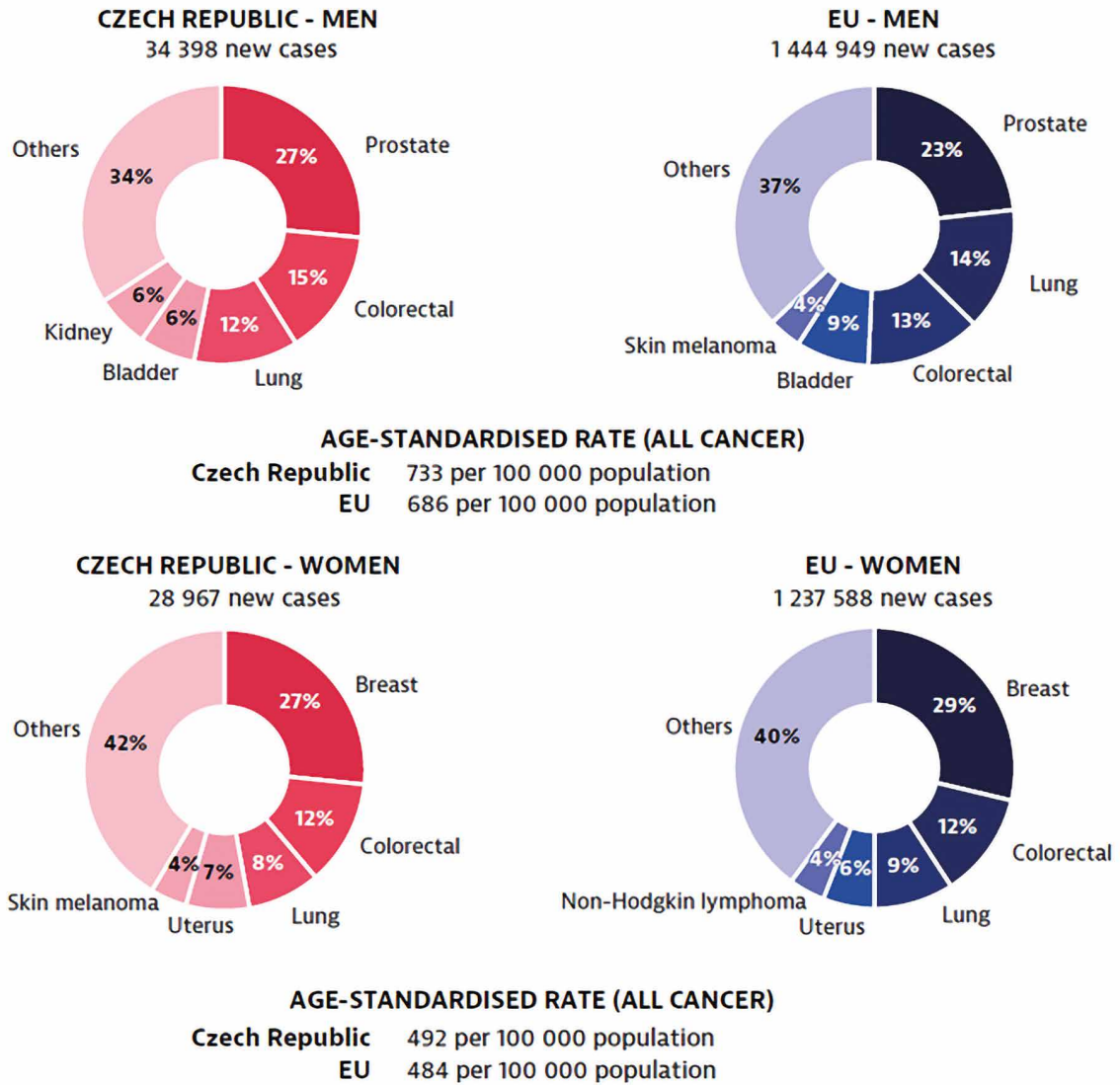


Figure 3. Distribution of cancer incidence by sex in the Czech Republic and the European Union [7]

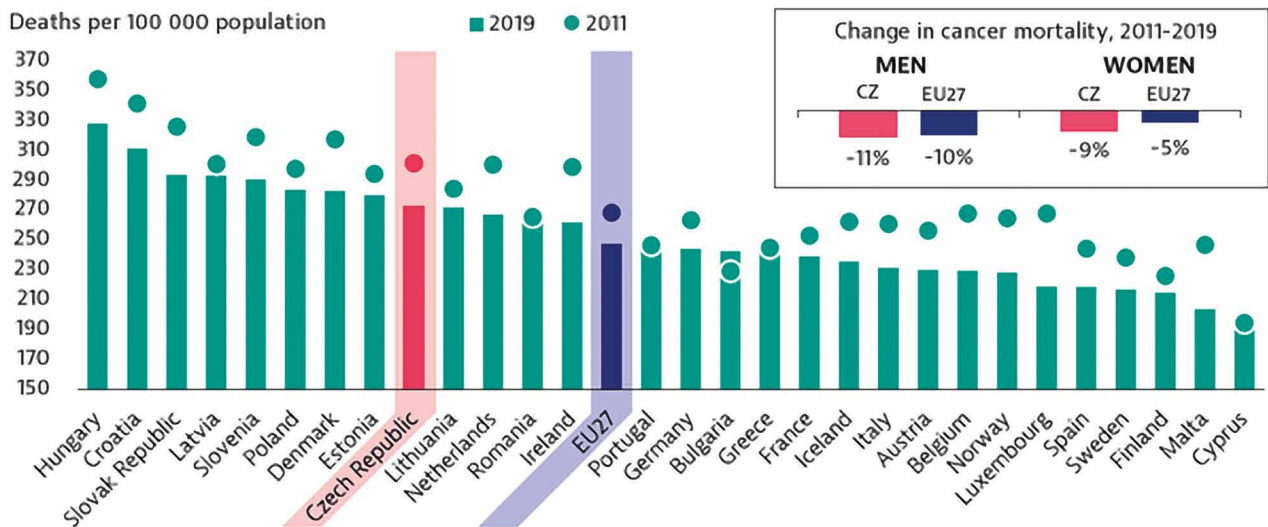


Figure 4. Mortality from oncological diseases in the European Union [7]

screening programs. A GP selects suitable patients, approaches them and recommends examinations.

Colorectal cancer screening was launched in the Czech Republic thanks to Dagmar and Václav Havel VIZE 97 Foundation as early as 2000, and its conditions were gradually adjusted. Implementation was put in the hands of GPs with a frequency of examination once every 2 years in connection with a preventive examination. The frequency of examinations was changed in 2009 for the age category of 50–54 to once a year and from 55 to once every 2 years. At the same time, the possibility of using a screening colonoscopy from the age of 55 onwards in the event of a negative finding was introduced once every 10 years. For practical reasons, in the same year, the necessity to carry out an examination only in connection with a preventive examination was abolished. To increase the number of examinations performed, outpatient gynaecologists were also invited to screen for colorectal cancer.

Originally, quajac faecal occult blood tests (q-FOBT) based on the pseudoperoxidase reaction of haemoglobin with quajac resin were used for testing. Although these tests were very beneficial at the time, their negatives had several disadvantages (false positive or possibly negative results, UV influence, the need for quick reading, the number of samples, etc.).

In 2014, q-FOBTs were replaced by immunochemical tests (i-FOBT) or FIT from the English faecal immunochemical test. I-FOBT is based on the detection of human haemoglobin in the stool by reacting with a monoclonal antibody against human haemoglobin in the test. Immunochemical tests do not require dietary precautions or medication restrictions. It is also simpler to carry out the test by taking a sample from a single stool by sticking and inserting it into the collection container and then applying a drop of the extract to the test. The absence of a necessary diet change, simple handling and the method of evaluating the immunochemical test increased the willingness of the target population and health professionals to perform it. I-FOBTs are characterised by higher sensitivity and the same specificity during a single examination. However, subjective visual evaluation of the test carried out many false positives and unnecessary colonoscopies [10].

For that reason, starting in 2020, POCT devices have been used in GPs' offices for quantitative evaluation. If a GP does not own the device, they can send the test to the laboratory for analysis. The cutoff concentration of haemoglobin was set at 15 µg/g stool. Another change was the shift of the age limit for screening colonoscopy from 55 to 50 years of age.

The average waiting time for a follow-up colonoscopy after a positive FOBT in the Czech Republic is approximately three months [11]. In light of the continuous increase in waiting times for colonoscopies following a positive FOBT, the Committee of the Czech Society of Gastrointestinal Oncology has recommend-

ed initiating measures to address this issue. These include adjusting the screening interval, modifying the age range for screening, and optimising colonoscopy indications. As of January 2025, the FOBT screening interval has been standardised to every two years starting at the age of 50. Furthermore, beginning in 2026, considerations include setting an upper age limit for screening at 74 years and 364 days, lowering the starting age to 45 years, and increasing the cut-off value for test positivity [12].

In 2014, a direct invitation to colorectal cancer screening was introduced, which helped improve the participation of those addressed in the program and, at the same time, increased people's awareness of their responsibility for their health. Despite all the changes and simplifications, only about 30% of Czech citizens over 50 years participate in colorectal cancer screening at the recommended interval. Nevertheless, in the last decade, there has been a decrease in the incidence of colorectal cancer by more than 25% and a decrease in mortality by almost 25%. Since the introduction of screening in 2000 to 2020, the mortality rate of colorectal cancer decreased by almost 47 per cent [12].

Breast cancer screening was launched in the Czech Republic in September 2002. More than 7,000 new cases of breast cancer are diagnosed in the Czech Republic every year, and approximately 1,600 women die of the disease every year [1]. Women over the age of 45 are sent for preventive mammography with a frequency of examination once every 2 years. The upper age limit was first set at 69 years, but in 2010 it was abolished, and the examination is now fully covered by public health insurance for all women from the age of 45 until the end of life. It is thus an organised nationwide program with the widest age spectrum in the world. After 20 years of existence, around 60% of the target group of women now participate in the program. For women with an increased risk of the disease, the program is individually adapted and, depending on the level of risk, they can be sent for a preventive examination even before the age of 45. A GP or a gynaecologist sends the woman for examination. The incidence of breast cancer increased by 37% during the duration of organised screening; a certain share of this fact is due to better detection of the disease, but mortality decreased by almost 18% (comparison between 2002 and 2018). There was a significant increase in the proportion of early stages of the disease at the time of diagnosis. The chance of five-year survival of breast cancer patients in clinical stage I is close to 100%. Participation in breast cancer screening is also high. Since 2014, it has been stable at around 77% for women aged 50 to 69. The European Union average is only 65.9% [13].

Cervical screening was officially launched in the Czech Republic at the beginning of 2008. Approximately 750 cases of cervical cancer are diagnosed annually in the Czech Republic, and 300 women die of this disease each

year [1]. As a preventive measure, women are examined by their gynaecologist once a year. A cervical smear is part of the preventive examination. The sample, together with a standardised guide, is sent for screening cytological examination to an accredited cytological laboratory. The result of the examination is sent back to the gynaecologist on the original application form. According to the Decree of the Ministry of Health of the Czech Republic No. 70/2012 Coll., every woman over the age of 15 has the right to a preventive gynaecological examination. There is no upper age limit. Active invitation within the national program is implemented in the age category of 25–70 years [14]. The incidence in the Czech Republic has been around 19 per 100,000 women for a long time. After the introduction of screening, we observed a decrease to 13 per 100,000 women (comparison between 2008 and 2022) [1]. The significant differences in incidence in post-communist countries versus Western European countries can be explained, among other things, by the time delay in the introduction of cervical screening. According to data from 2018, the Czech Republic is 23<sup>rd</sup> in the European incidence ranking. Currently, the cervical cancer screening rate in the Czech Republic is the highest among the member countries of the EU. In 2019, 83% of women reported having had a cervical exam in the past three years. At the same time, the EU average is only 60% [13].

The bronchogenic cancer screening pilot project was launched in the Czech Republic in January 2022. In 2019, 6,965 malignant neoplasms of the trachea, bronchus and lungs were newly diagnosed, and about 5,300 people die of this disease in our country every year. It is the most common cause of death among all malignant neoplasms in the Czech Republic. Most cancers are detected at a late stage, only approximately 20% of cancers found are in stage I or II [15]. A registering GP, pulmonologist and radiologist work together to implement the screening. The program is intended for smokers aged 55–74 years with a lifetime smoking load of 20 pack-years, who are no longer being monitored by a pulmonologist and who have a negative history of other comorbidities limiting the chance of five-year survival [16]. The registering GP sends a selected patient to the pulmonology clinic for further examination, and after the examination by the pulmonologist, a low-dose CT (LDCT) examination is performed. In case of unavailability of a pulmonology ambulance, whether capacity or geography, the practitioner can send the patient to the LDCT directly. As of September 19, 2022, 891 patients were included in the program. Based on the initial examination, 68% of patients had a negative LDCT result, 27% of patients had an indeterminate result, and 5% had a positive result. 42 patients (4.7%) with an indeterminate result were subsequently referred to a follow-up examination. Based on the last examination, 71% of patients already had a negative result [17].

The prostate cancer early detection program is now in the preparatory phase. The aim is to launch it from 1. 1. 2024. Prostate cancer is the most common malignancy in men; about 8,000 men fall ill each year, and 1,500 men die of prostate cancer [1]. The increase in incidence can be caused, among other things, by overdiagnosing through widespread, unorganised examination of prostate-specific antigen (PSA) at an irrational frequency. 50% of men sometimes have their PSA determined as part of a “grey screening”; the majority of those examined in this way are aged 65–70, which is late. The PSA test is so sensitive that it can detect even very early stages of prostate cancer, including dormant ones that do not threaten the patient’s life. The PSA value, which will be considered as the threshold for indicating further examinations, has been discussed in professional circles and working groups for many years [18, 19]. The program aims to prepare and implement a pilot project for the early detection of prostate cancer in men aged 50 and over. Risk-adjusted PSA screening can reduce unnecessary diagnostic and therapeutic interventions and associated morbidities without reducing sensitivity [20].

The case studies below show the importance of general practitioners in secondary prevention:

Female, 55 years, married, university-educated, non-smoker, does not consume alcohol or other addictive substances, works as an accountant. From the family history: the patient’s father died at the age of 50 during a heart defect surgery, the mother is alive, being treated for diabetes and hypertension, the patient’s brother is being treated for diabetes, and the patient has two healthy children. From her personal history: she has been treated for allergy with bronchial asthma and chronic allergic rhinitis since childhood and is being monitored for mild LDL hypercholesterolemia that does not require pharmacotherapy, at the age of 53 she underwent a vaginal hysterectomy with bilateral salpingectomy and extirpation of a left ovarian fibroma. She is allergic to dust mites and wormwood. She does not take any medication regularly. As part of the screening for colorectal cancer at the GP, a stool examination for occult bleeding was performed on July 16, 2020, with a positive result. Despite the strong recommendation, the patient refused a colonoscopy and signed the reverse. As part of a preventive examination at the general practitioner on October 18, 2021, a stool examination for hidden bleeding was performed again, with a positive result. On November 26, 2021, she underwent a colonoscopy examination, where an infiltration of the sigmoid colon 20 cm from the anus was found. On February 28, 2022, rectosigmoid resection with appendectomy and end-to-end anastomosis was performed. Histological examination showed moderately differentiated adenocarcinoma. No distant metastases were found. The patient remains under regular follow-up by a gastroenterologist.

## SOUHRNNÉ SDĚLENÍ

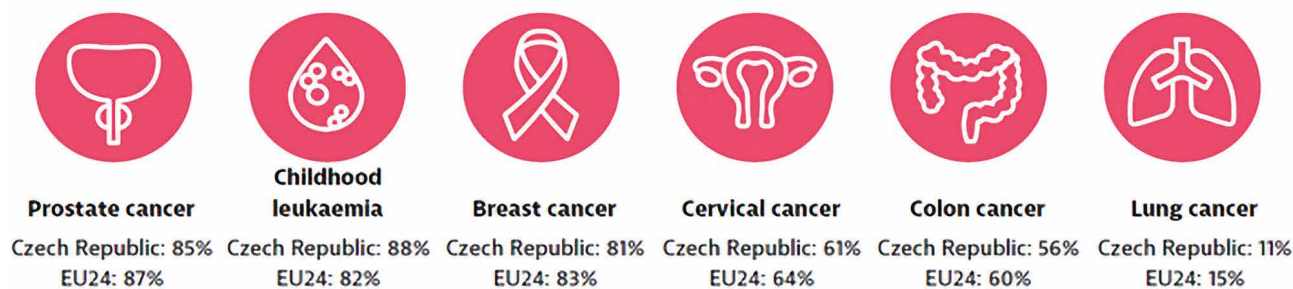
A 54-year-old woman, married, a non-smoker, consumes alcohol occasionally, does not use other addictive substances, is trained as a carpenter, and works as a healthcare worker. From family history: the patient's father is being treated for arterial hypertension, the mother has gallstones, the patient's brother is being monitored for epilepsy, and the patient has 1 healthy sister and 2 healthy children. From a personal history: she gave birth by caesarean section for a non-progressing birth, she underwent a carpal tunnel syndrome surgery, she has had Lyme disease, infectious mononucleosis and COVID-19, she is being treated for arterial hypertension and type 2 diabetes, she is being monitored for hyperlipoproteinemia not requiring pharmacotherapy, severe obesity with a BMI of 45 kg/m<sup>2</sup>, polyamorous eufunctional goitre, gallstones, has varicose veins of the lower limbs, experienced deep thrombosis of the veins of the right lower leg. She is allergic to penicillin, and after taking amlodipine, she has swelling of her lower limbs. On November 10, 2015, as part of a preventive check-up at the GP, the patient was sent for a mammographic examination, which was performed after the emergency on May 30, 2016, when the patient was 47 years old. Suspicious microcalcifications were found on the image in the left breast at the border of the outer quadrants. On 15 June 2016, she underwent a stereotactic vacuum biopsy, histological examination showed intraductal carcinoma. On July 27, 2016, a left lower outer quadrant quadrantectomy was performed with sentinel node sampling. Between September 26 and November 1, 2016, she was administered adjuvant radiotherapy in a total dose of 50.0 Gy and boost bed brachytherapy of 10 Gy. Due to the severe varicose involvement of the lower limbs, anti-estrogen therapy with Tamoxifen (Tamoxifen nitros) was contraindicated. On November 20, 2016, the patient underwent a laparoscopic bilateral adnexectomy on the indication of the oncologist. A molecular-genetic examination did not find a mutation in a panel of 22 genes for hereditary tumour syndromes, including the BRCA1 and BRCA2 genes. Distant metastases are not present. The patient remains under regular follow-up by an oncologist.

A 43-year-old woman, married, a stop-smoker for a year (used to smoke 10 cigarettes a day for 20 years), consumes alcohol occasionally, does not use other addictive substances, has a high school education, and works as a store manager. From family history: the patient does not know her father, the mother is being treated for arterial hypertension and insulin-dependent diabetes, and the patient has 2 healthy children. From her personal history: she suffered from atopic eczema in childhood, suffered concussion, and does not take any medication permanently. She is allergic to pollen and iodine. On December 17, 2014, she came for an examination by a general gynaecologist for bleeding from genital tract after a constipated stool. She had

not had a preventive gynaecological examination for several years. According to the description, there was an exophytic tumour growing on the exocervix in the entire range of the upper and lower lips, bleeding on contact. The colposcopy showed numerous atypical vessels. Biopsies were taken from several places by the gynaecologist. Histology showed poorly differentiated squamous cell carcinoma. PET CT examination from 23/12/2014 confirmed a tumour of the cone with infiltration of the left parameters, without signs of generalisation. The gynaecological council recommended radical surgery to the patient, but she repeatedly postponed it. Only after an interview with a GP did she finally undergo a radical abdominal hysterectomy with bilateral salpingectomy and pelvic lymphadenectomy. The surgery was carried out on May 13, 2015. A total of 24 lymph nodes were described, and 1 metastasis in the common iliac nodes on the right was demonstrated. Adjuvant radiochemotherapy followed. The patient is still free of clinical problems and signs of disease recurrence. The patient remains under regular follow-up by an oncologist.

A 69-year-old woman, married, has smoked 10 cigarettes a day for the last 5 years (previously smoked 20 cigarettes a day for a total of 44 years), consumes alcohol occasionally, does not use other addictive substances, has high school education, old-age pensioner, worked all her life as a postal clerk. From the family history: the patient's father died at the age of 52 from pancreatic cancer, the mother is being treated for hypertension, the patient's brother died at the age of 66 from a myocardial infarction, the other brother is not being treated for anything, the patient has 2 children, the daughter is being monitored for juvenile arthritis. From personal history: the patient is being treated for arterial hypertension and hyperlipidemia and is being monitored for hyperuricemia. She underwent surgery for a right-sided disc herniation at the L5/S1 level, as well as microdiscectomy at the C4/5, C5/6 levels and C6/C7 foraminotomy for spinal canal stenosis in the respective locations and arthroscopic meniscectomy of the right knee. The patient's allergy history is negative. As part of a preventive check-up with a GP on May 24, 2022, she was included in the screening for bronchogenic carcinoma and sent for a pulmonology examination. The pulmonologist completed an LDCT examination of the lungs with the finding of a tumorous-looking mass in the upper lobe of the left lung. PET CT examination did not show any other tumour foci. On November 30, 2022, she underwent a video-assisted thoracoscopic tumour enucleation. Histopathological examination showed chondrohamartoma. The patient was referred to further examination by a pulmonologist, who regularly follows her up.

A 53-year-old man, married, smoked 20 cigarettes a day for 28 years, consumes alcohol occasionally, does not use other addictive substances, trained locksmith, and works



**Figure 5.** The five-year survival rates for adults in the Czech Republic versus the European Union [7]

as a maintenance worker. From family history: the father is treated with ischemic heart disease, the mother with arterial hypertension, the patient has 2 children, and the daughter is treated with bronchial asthma. From the personal history: the patient is obese, and is being treated for arterial hypertension, hyperlipidemia, psoriasis, varicose veins of the lower extremities and haemorrhoids. He is allergic to Oramelox (Meloxicam). On July 23, 2018, as part of a preventive examination at the GP, asymptomatic microscopic hematuria was detected, for which he was referred by the practitioner to a specialist urological examination. During the examination, the urologist palpated a hard nodule in the left lobe of the prostate; only a slightly enlarged prostate was detectable sonographically. A PSA examination was completed with an elevation of 7.1 ng/mL of blood (norm for the age category 50–59 years up to 3.5 ng/mL). Subsequently, a biopsy was performed with evidence of adenocarcinoma of the prostate. Skeletal scintigraphy on January 11, 2019, did not show a generalisation of the cancer. On January 28, 2019, the patient underwent a robot-assisted radical prostatectomy with lymphadenectomy. On April 4, 2019, adjuvant radiotherapy of the pelvis 46.0 Gy, 70 Gy per bed, 35 fractions of 2 Gy and complete antiandrogen blockade with LH-RH analogues (degarelix acetate) were started. From May 28, 2020, there was a change to Eligard 45 mg (leuprorelin acetate). Androgen deprivation therapy has been followed since January 2021. The patient remains without signs of generalisation of the disease in the dispensary care of the urology clinic.

## CONCLUSIONS

The presented case studies document that early detection of the disease can lead to a complete recovery. It points to the importance of interdisciplinary cooperation between individual medical specialities and to the fact that the systematic examination of asymptomatic patients saves human lives and thus affects the destinies not only of the patients themselves but also of their families. GPs participate in cancer prevention

at all levels. As part of primary prevention, thanks to knowledge of the patient's lifestyle, the practitioner can draw attention to risk factors and the possibilities of influencing them, as part of secondary prevention, recommend targeted examinations and explain the meaning of preventive examinations and screening examinations for the early detection of cancer. Figure 5 confirms the importance of screening programs for influencing the survival of people diagnosed with cancer. As part of tertiary prevention, the GP accepts stabilised oncology patients for dispensary, and as part of quaternary prevention, he provides terminal patients with medical care, psychological support, coordination of social services and, in the event of death, an examination. It thus becomes a guide to the patient's illness and sometimes also to dying.

Despite significant progress in the therapy of malignant diseases, they remain the second most common cause of death in the world and the Czech Republic. At the same time, early detection of the disease can lead to a complete recovery of the patient. The introduction of screening programs for the early detection of malignant diseases brought a decrease in mortality from these diseases. Screening does not typically reduce incidence; on the contrary, improved detection may initially lead to an apparent increase. However, in the case of cervical and colorectal cancer screening, a decline in incidence has been observed due to the detection of preinvasive stages. Vaccination against human papillomavirus (HPV) also contributes to this downward trend. The quality of oncology care in the Czech Republic has increased, as evidenced by the better five-year survival rate, even though we are still below the average EU level in these values. GPs play a major role in early detection and further care [13]. The role of the general practitioner in cancer screening is essential. GPs' work is long-term and continuous, always in the same place, and they have the most contact with the patient. Thanks to the knowledge of personal, family, work and social anamnesis, practitioners gain insight that enables them to understand the patient's difficulties in a wider context. They can thus help to convince hesitant patients to undergo screening.

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## Conflicts of Interest

The authors have no conflict of interest to declare.

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