

3 Results

3.0 Overview of incident cancer cases and cancer deaths

Figure 3.o.1
Most frequent tumour sites as percent of all incident cancer cases in Germany 2020
not including non-melanoma skin cancer (C44)

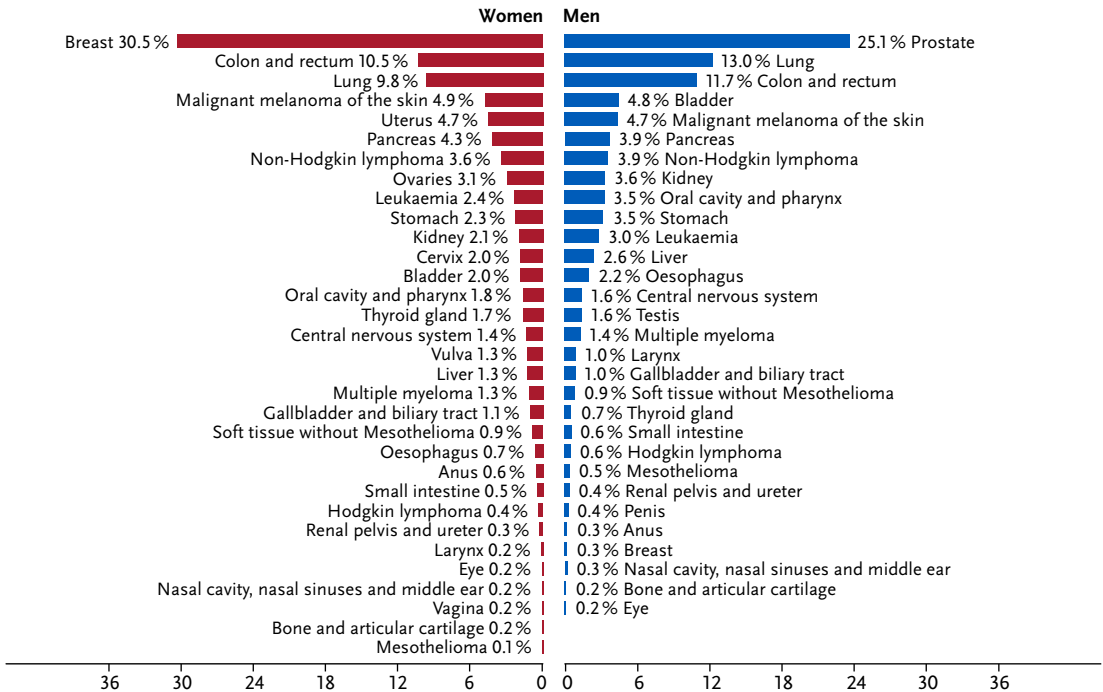


Figure 3.o.2
Most frequent tumour sites when cancer was cause of death in Germany 2020

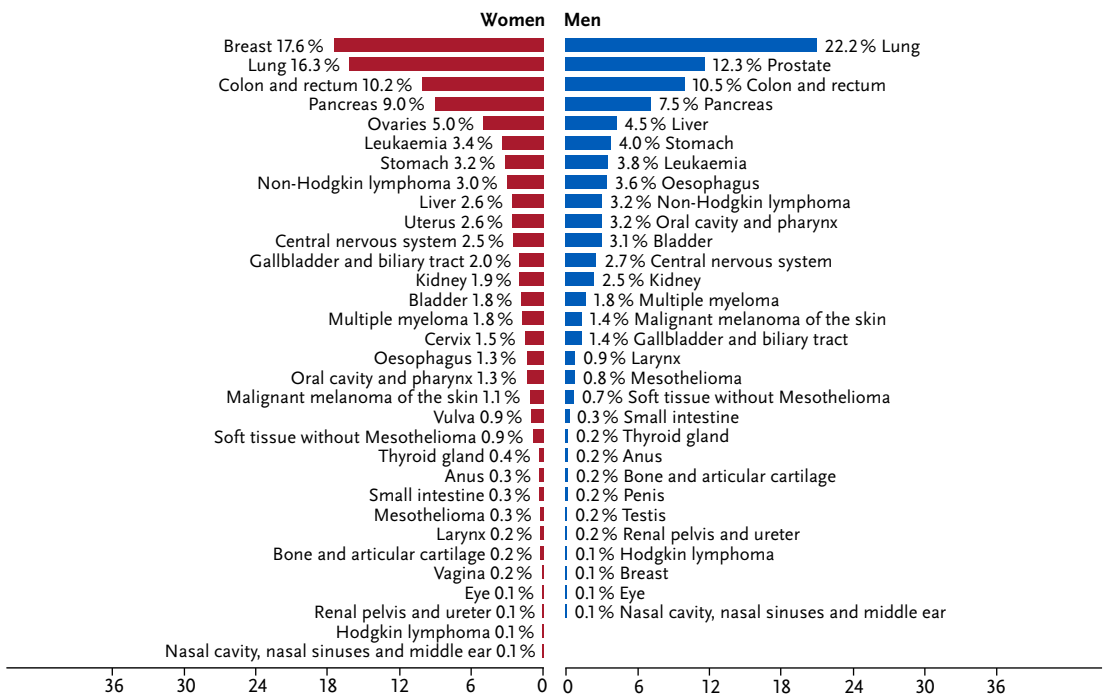


Table 3.o.1

Estimated numbers of incident cancer cases and numbers of deaths from cancer in Germany 2020

Source for numbers of deaths from cancer: Official cause of death statistics, Federal Statistical Office, Wiesbaden

Cancer site	ICD-10	No. of incident cases		Incidence rate ¹		No. of deaths		Mortality rate ¹	
		Women	Men	Women	Men	Women	Men	Women	Men
Oral cavity and pharynx	C00 – C14	4,050	9,140	5.8	15.3	1,397	3,955	1.7	6.3
Oesophagus	C15	1,720	5,660	2.2	9.0	1,398	4,556	1.7	6.9
Stomach	C16	5,370	9,120	6.7	13.8	3,321	5,032	3.6	7.2
Small intestine	C17	1,210	1,540	1.7	2.4	330	417	0.4	0.6
Colon and rectum	C18 – C20	24,240	30,530	29.6	46.2	10,667	13,120	10.7	18.1
Anus	C21	1,500	810	2.3	1.3	355	261	0.4	0.4
Liver	C22	3,030	6,740	3.7	10.0	2,781	5,676	3.1	8.0
Gallbladder and biliary tract	C23, C24	2,600	2,530	2.9	3.6	2,102	1,738	2.1	2.3
Pancreas	C25	9,960	10,270	11.4	15.1	9,474	9,448	10.0	13.4
Nasal cavity, nasal sinuses and middle ear	C30, C31	440	680	0.7	1.2	86	139	0.1	0.2
Larynx	C32	510	2,690	0.8	4.3	198	1,070	0.2	1.6
Lung	C33, C34	22,590	34,100	31.4	51.8	17,066	27,751	21.9	40.5
Bone and articular cartilage	C40, C41	360	510	0.7	1.1	183	257	0.3	0.5
Malignant melanoma of the skin	C43	11,320	12,240	19.1	19.9	1,162	1,778	1.4	2.5
Non-melanoma skin cancer	C44	96,490	112,300	123.5	157.6	431	617	0.3	0.7
Mesothelioma	C45	290	1,190	0.3	1.5	263	1,054	0.3	1.3
Soft tissue without Mesothelioma	C46 – C49	2,190	2,420	3.4	4.0	908	927	1.2	1.4
Breast	C50	70,550	740	112.7	1.1	18,425	166	21.8	0.2
Vulva	C51	3,090		4.0		973		0.9	
Vagina	C52	390		0.5		164		0.2	
Cervix	C53	4,640		9.5		1,546		2.4	
Uterus	C54, C55	10,860		15.8		2,758		3.1	
Ovaries	C56	7,180		10.7		5,265		6.4	
Penis	C60		960		1.4		252		0.3
Prostate	C61		65,820		97.4		15,403		18.6
Testis	C62		4,060		10.1		197		0.4
Kidney	C64	4,830	9,330	6.6	15.2	2,034	3,121	1.9	4.2
Renal pelvis and ureter	C65, C66	770	1,130	0.9	1.6	143	189	0.1	0.2
Bladder	C67	4,630	12,500	5.2	17.6	1,935	3,942	1.7	4.9
Eye	C69	450	440	0.7	0.8	156	158	0.2	0.2
Central nervous system	C70 – C72	3,250	4,080	5.5	7.5	2,585	3,427	3.7	5.8
Thyroid gland	C73	3,980	1,780	8.6	3.6	396	295	0.4	0.4
Without specification of site	C80	5,080	5,470	5.5	7.8	5,204	5,434	5.2	7.6
Hodgkin lymphoma	C81	990	1,460	2.3	3.3	132	185	0.1	0.3
Non-Hodgkin lymphoma	C82 – C88	8,230	10,090	11.0	15.9	3,180	4,012	2.9	5.4
Multiple myeloma	C90	3,010	3,700	3.7	5.5	1,881	2,213	1.8	2.9
Leukaemia	C91 – C95	5,640	7,920	8.0	12.9	3,573	4,784	3.5	6.4
Other cancer sites		2,450	2,220	3.4	3.5	2,908	4,317	3.3	5.9
All cancers	C00 – C97	327,890	374,150	460.9	563.6	105,380	125,891	119.0	175.6
All cancers²	C00 – C97o.C44	231,400	261,850	337.4	406.0	104,949	125,274	118.7	174.9

¹ per 100,000 persons, age-standardised (old European Standard)² not including non-melanoma skin cancer (C44)

3.1 All cancers

Table 3.1.1

Overview of key epidemiological parameters for Germany, ICD-10 Coo-C97 without C44

Incidence	2019		2020			
	Women	Men	Women	Men		
Incident cases	244,000	279,700	231,400	261,800		
Crude incidence rate ¹	579.7	682.1	549.3	638.2		
Age-standardised incidence rate ^{1,2}	356.5	437.6	337.4	406.0		
Median age at diagnosis	69	70	69	70		
Mortality	2019		2020		2021	
	Women	Men	Women	Men	Women	Men
Deaths	105,682	124,560	104,949	125,274	104,598	123,292
Crude mortality rate ¹	251.0	303.8	249.1	305.3	248.2	300.4
Age-standardised mortality rate ^{1,2}	121.3	177.1	118.7	174.9	117.2	169.8
Median age at death	77	75	77	75	78	75
Prevalence and survival rates	5 years		10 years		25 years	
	Women	Men	Women	Men	Women	Men
Prevalence	801,700	835,000	1,384.600	1,379.200	2,365.800	2,172.100
Absolute survival rate (2019–2020) ³	58	52	47	39		
Relative survival rate (2019–2020) ³	66	62	61	57		

¹ per 100,000 persons ² age-standardised (old European Standard) ³ in percent

Epidemiology

The term “all cancers” is used here to refer to all malignant neoplasms including lymphomas and leukaemias. The definition of a malignant (invasive, i.e. penetrating the surrounding tissue or spreading via the blood and lymphatic system) disease in this report is based solely on the current “International Statistical Classification of Diseases and Related Health Problems” (ICD-10, Chapter II). This classification into benign and malignant neoplasms is based on the biological behaviour of the neoplasm. It does not always reflect the clinical course of the diseases: some tumour diseases, such as non-invasive papillary carcinomas of the bladder and certain neoplasms of the haematopoietic organs (e.g. myelodysplastic syndromes) are sometimes associated with greater risks and burdens for those affected than certain thyroid tumours, for example, which are histologically malignant but have a very favourable prognosis. In the central nervous system, on the other hand, the danger of neoplasms depends less on their biological behaviour and more on their localisation. The classification of neoplasms into benign, malignant and uncertain behaviour also shows historical changes, for example in bladder tumours. In the sum of all malignant neoplasms (“all cancers”), non-melanotic forms of skin cancer were not included, as is customary internationally,

partly because they only make a very small contribution to cancer mortality, despite their frequency (see Chapter 3.14).

Malignant neoplasms can originate from different cell types in various organs of the body. The starting point for most cancers is the internal and external body surfaces (epithelia). About 70% of tumours are adenocarcinomas originating from glandular tissue alone. A further 15% or so are squamous cell carcinomas, malignant tumours of the transitional epithelium (urothelial carcinomas) and small cell carcinomas, which occur in the lungs, for example. Leukaemias and lymphomas originate from the haematopoietic bone marrow and lymphatic tissues. In addition, malignant tumours can also originate in connective and supporting tissue (e.g. sarcomas), in the supporting cells of the nervous system (gliomas) or in pigment-forming cells (melanomas).

According to estimates by the ZfKD, around 493,000 cases of cancer were diagnosed for the first time in Germany in 2020. Of these, approximately 261,800 occurred in men and 231,400 in women. About half of the cases involved breast (71,300), prostate (65,800), colon (54,800) or lung (56,700) (Table 3.0.1).

As in almost all European and North American cancer registries, there was a decline in the number of new cancer cases recorded in the registries in the

first year of the pandemic in 2020 compared to the previous year, which had already become apparent in Germany to a similar extent in the hospital diagnosis and surgery statistics. In a European comparison, this was still rather moderate in Germany at about 6%. The most significant declines, measured in absolute case numbers, were seen in colorectal cancer (–11%), malignant tumours of the larynx (–10%) and the prostate (–9%). In contrast, only around 1% fewer cases of cancer of the cervix, central nervous system and pancreas were recorded in 2020 than in 2019.

In addition to delays in the diagnosis of cancer, for example due to temporary restrictions on services and reduced utilisation of cancer screening, restrictions on reporting activities and data processing in the cancer registries may also play a role. It is not yet possible to say whether the chances of treatment and survival of people who developed cancer during the pandemic were impaired.

Age-standardised cancer mortality rates in Germany in 2019 – 2021 were 27% lower for men and 17% lower for women than 20 years ago. Compared to the European Union as a whole, cancer mortality in Germany in 2019/2020 was 4% higher for women and 5% lower for men.

About 1.6 million people in Germany are living with cancer that has been diagnosed in the last 5 years. It is estimated that more than 4.5 million people have been diagnosed with cancer in the last 25 years, and the number of people who have ever been diagnosed with cancer is likely to be almost 10% higher.

The relative 5-year survival rates are a measure of the survival chances of cancer patients compared to the general population of the same age and gender. They are highly dependent on the type of tumour and range from results below 10% for malignant tumours of the pancreas and mesothelioma to values above 90% for malignant melanoma of the skin, testicular cancer and thyroid cancer (Figure 3.1.0).

Risk factors and early detection

The aetiology of many cancers is unknown or the known triggers cannot be influenced. Prevention strategies are therefore only available for certain types of tumour. However, these include forms of cancer that affect many people. The World Health Organisation (WHO) assumes that 30 to 50% of all cancers worldwide could be prevented. According to estimates by the German Cancer Research Centre (DKFZ), at least 37% of all new cancer cases in Germany can be explained by preventable or at least modifiable risk factors.

Of these, tobacco consumption is the most significant. Around 19% of all cancers in Germany per year are attributable to smoking (attributable fraction). Obesity and lack of exercise also play a role. This has also been known for some time from obser-

vational, epidemiological studies. Possible biological mechanisms behind this association have become clearer as a result of recent research into metabolic syndrome. This chronic “metabolic imbalance” is associated with high blood pressure, high blood lipid and blood sugar levels. Inflammatory processes in fatty tissue are presumably involved in the development of cancer.

Among the nutrition-related individual factors, alcohol consumption plays an important role. A low intake of fruit, vegetables or fibre, often accompanied by a high proportion of red and processed meat in the diet, has been identified as a risk factor for several common types of tumour. In observational studies, however, the influence of individual foods and their ingredients cannot always be separated from that of the energy balance and other possible factors. Avoidable cancer risk factors also include the ultraviolet component of sunlight (UV radiation).

Many people in Germany overestimate the influence of harmful substances and contaminants in food, as well as that of environmental influences or workplace exposure. In individual cases, however, these factors can also play a significant role in the development of cancer in Germany. Examples include the regionally naturally occurring noble gas radon, which is held responsible for around 6% of lung cancer cases in Germany, or former occupational exposure to asbestos, which still leads to mesothelioma of the pleura or peritoneum today due to the long latency period. Medical procedures can also increase the risk of cancer in individual cases: for example, diagnostic and therapeutic procedures associated with radiation exposure, cytostatics for chemotherapy or hormone therapy in menopausal women, which has been identified as a risk factor for breast cancer.

Chronic infections are now known to be risk factors for some common types of cancer; about 4% of new cancer cases in Germany can be attributed to them. Vaccinations or causal therapies can help to reduce the risk of cancer. This has been proven, for example, for vaccination against hepatitis B viruses as a protective factor against liver cancer. A similar effect can be expected as a result of the HPV vaccination: in addition to the incidence of cervical cancer, it should also reduce the incidence of tumours of the oropharynx, penis and anus as well as the vulva and vagina. The prerequisite is that enough young people are vaccinated. Studies have already shown a significantly reduced rate of pre-cancerous lesions on the cervix for vaccinated women and a reduction in cervical cancer in women up to the age of 30.

In addition to preventable risk factors, genetic causes can also increase the risk of developing cancer. Certain hereditary genetic mutations have been clearly

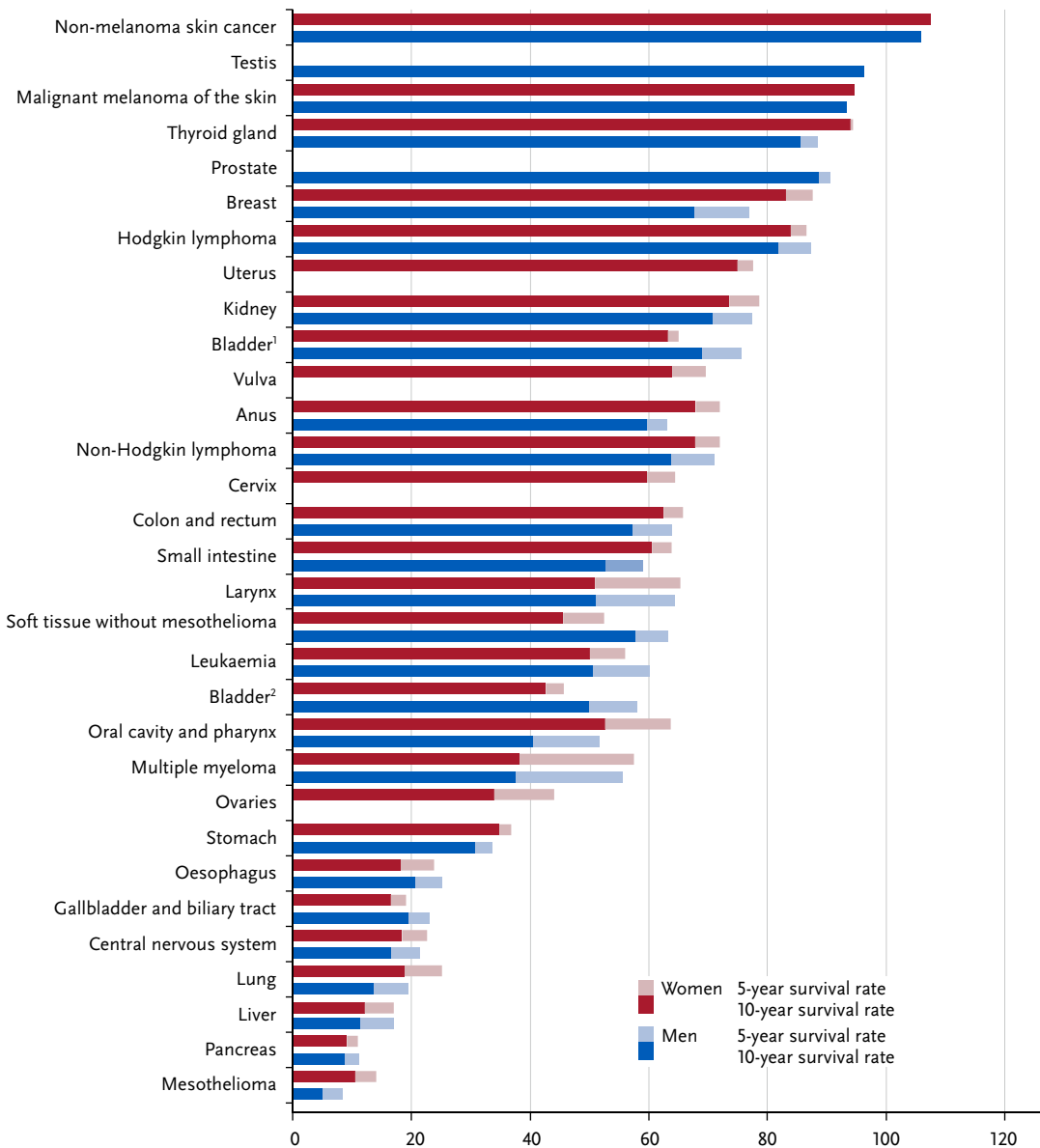
identified as the cause of certain types of tumours, such as breast and ovarian cancer or colorectal cancer. In the course of tumour genome sequencing, more and more hereditary mutations being found that can moderately or significantly increase the risk of developing certain tumours.

The most important, non-preventable risk factor for cancer is age, as the probability of cancer-causing genetic changes in the body's cells increases with age.

The relevant risk factors for certain cancers are described in more detail in the individual chapters.

The statutory cancer screening programme in Germany aims at the early diagnosis of malignant tumours of the skin and colorectum as well as breast cancer and cancers of the reproductive organs (especially cervical cancer) in women and prostate cancer in men. These measures are described in the corresponding chapters.

Figure 3.1.o
Relative 5-/10-year survival rates, by tumour site and sex, Germany 2019 – 2020 (period analysis)



¹ including in situ tumours and neoplasms of uncertain or unknown behavior (C67, D09.9, D41.4)

² malignant forms only (C67)

Figure 3.1.1a
Age-standardised incidence and mortality rates by sex, ICD-10 C00-C97 without C44, Germany 1999 – 2020/2021 per 100,000 (old European Standard)

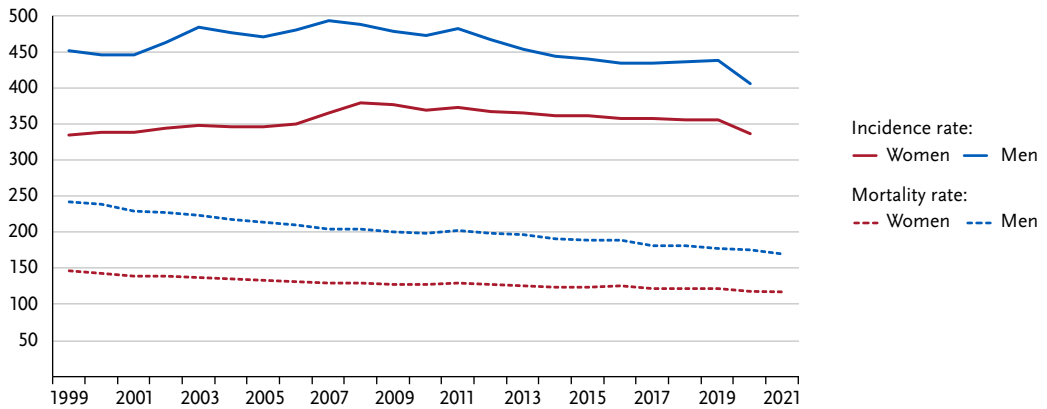


Figure 3.1.1b
Absolute numbers of incident cases and deaths by sex, ICD-10 C00-C97 without C44, Germany 1999 – 2020/2021

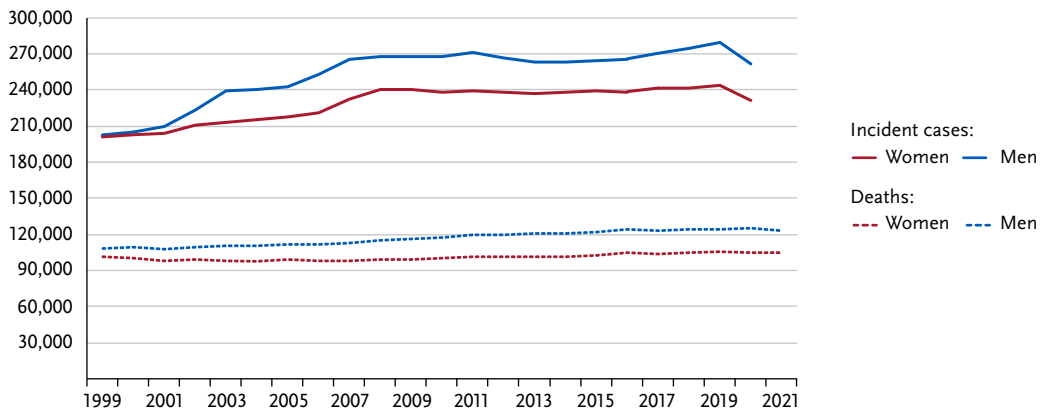


Figure 3.1.2
Age-specific incidence rates by sex, ICD-10 C00-C97 without C44, Germany 2019 – 2020 per 100,000

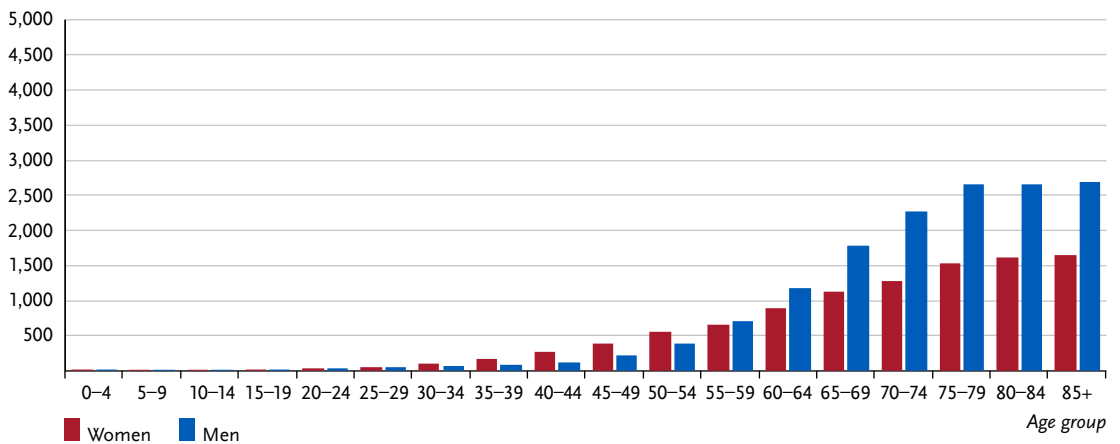


Table 3.1.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 Co0-C97 without C44, database 2019

Women aged	Risk of developing cancer				Mortality risk			
	in the next 10 years		ever		in the next 10 years		ever	
35 years	2.3 %	(1 in 43)	44.1 %	(1 in 2)	0.3 %	(1 in 340)	20.3 %	(1 in 5)
45 years	4.9 %	(1 in 20)	42.9 %	(1 in 2)	0.9 %	(1 in 110)	20.1 %	(1 in 5)
55 years	8.5 %	(1 in 12)	40.3 %	(1 in 2)	2.4 %	(1 in 41)	19.6 %	(1 in 5)
65 years	13.5 %	(1 in 7)	35.7 %	(1 in 3)	4.9 %	(1 in 20)	18.0 %	(1 in 6)
75 years	17.5 %	(1 in 6)	27.8 %	(1 in 4)	8.0 %	(1 in 13)	14.9 %	(1 in 7)
Lifetime risk			44.5 %	(1 in 2)			20.2 %	(1 in 5)
Men aged	in the next 10 years		ever		in the next 10 years		ever	
35 years	1.2 %	(1 in 85)	52.3 %	(1 in 2)	0.2 %	(1 in 480)	25.0 %	(1 in 4)
45 years	3.3 %	(1 in 30)	52.2 %	(1 in 2)	0.9 %	(1 in 110)	25.1 %	(1 in 4)
55 years	10.0 %	(1 in 10)	51.8 %	(1 in 2)	3.2 %	(1 in 31)	25.0 %	(1 in 4)
65 years	21.3 %	(1 in 5)	49.6 %	(1 in 2)	7.4 %	(1 in 14)	24.0 %	(1 in 4)
75 years	29.2 %	(1 in 3)	42.3 %	(1 in 2)	12.0 %	(1 in 8)	20.8 %	(1 in 5)
Lifetime risk			52.1 %	(1 in 2)			24.8 %	(1 in 4)

Figure 3.1.3
Distribution of UICC stages at diagnosis by sex
Not included because UICC stages are site-specific.

Figure 3.1.4
Absolute and relative survival rates up to 10 years after diagnosis, by sex, ICD-10 Co0 – C97 without C44, Germany 2019 – 2020

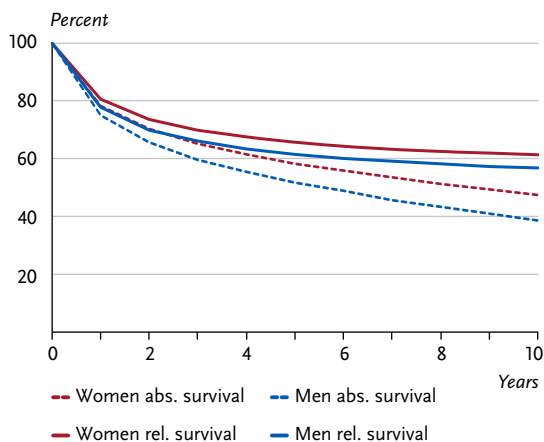


Figure 3.1.5
Relative 5-year survival by UICC stage and sex, ICD-10 Co0 – C97 without C44, Germany 2019 – 2020
Not included because UICC stages are site-specific.

Figure 3.1.6
Age-standardised incidence and mortality rates in German federal states by sex, ICD-10 C00 – C97 without C44, 2019 – 2020 per 100,000 (old European Standard)

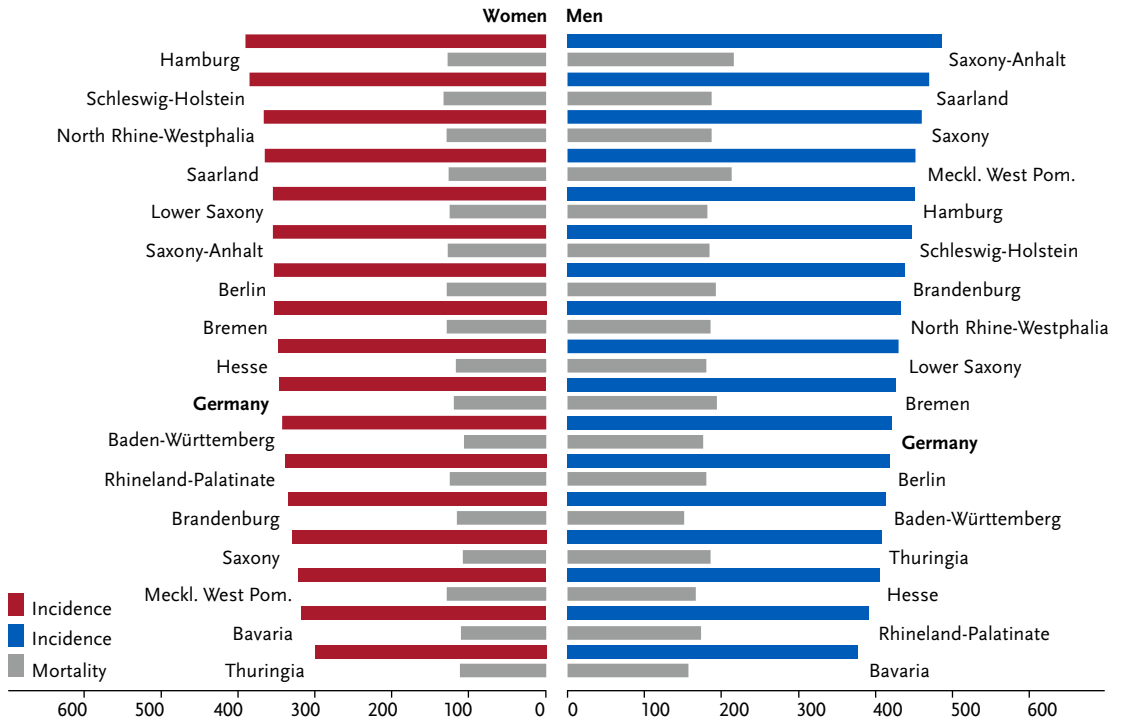
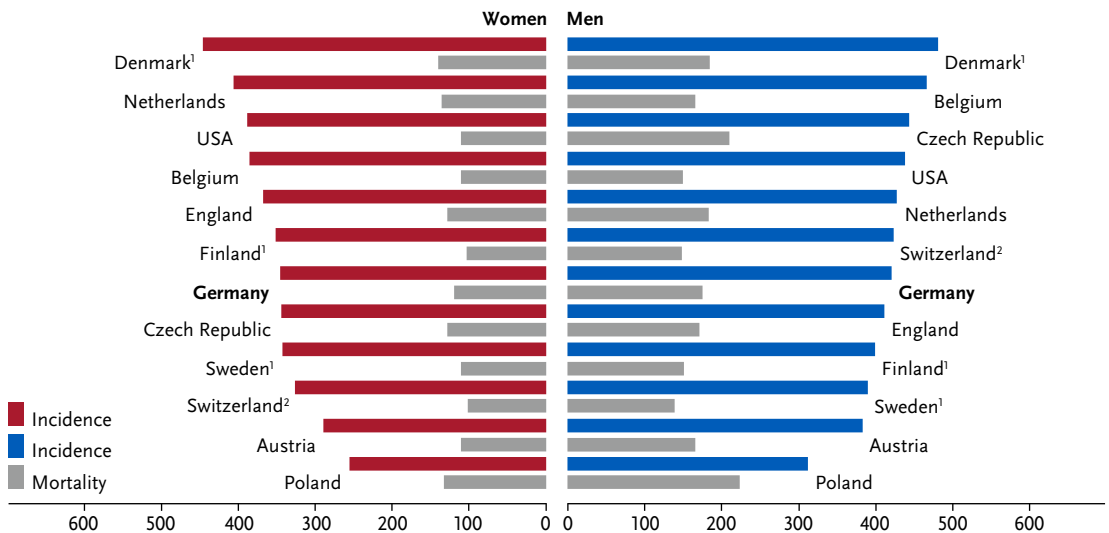


Figure 3.1.7
International comparison of age-standardised incidence and mortality rates by sex, ICD-10 C00 – C97 without C44, 2019 – 2020 or latest available year (details and sources, see appendix) per 100,000 (old European Standard)



¹ incl. D09.0 – D09.1, D30.1 – D30.9 D32 – D33, D35.2 – D35.4, D41.1 – D41.9, D42 – D43, D44.3 – D44.5

² Switzerland: incidence data for 2015 – 2019