

3 Results

3.0 Overview of incident cancer cases and cancer deaths

Figure 3.o.1
 Most frequent tumour sites as percent of all new cancer cases in Germany 2018
 not including non-melanoma skin cancer (C44)

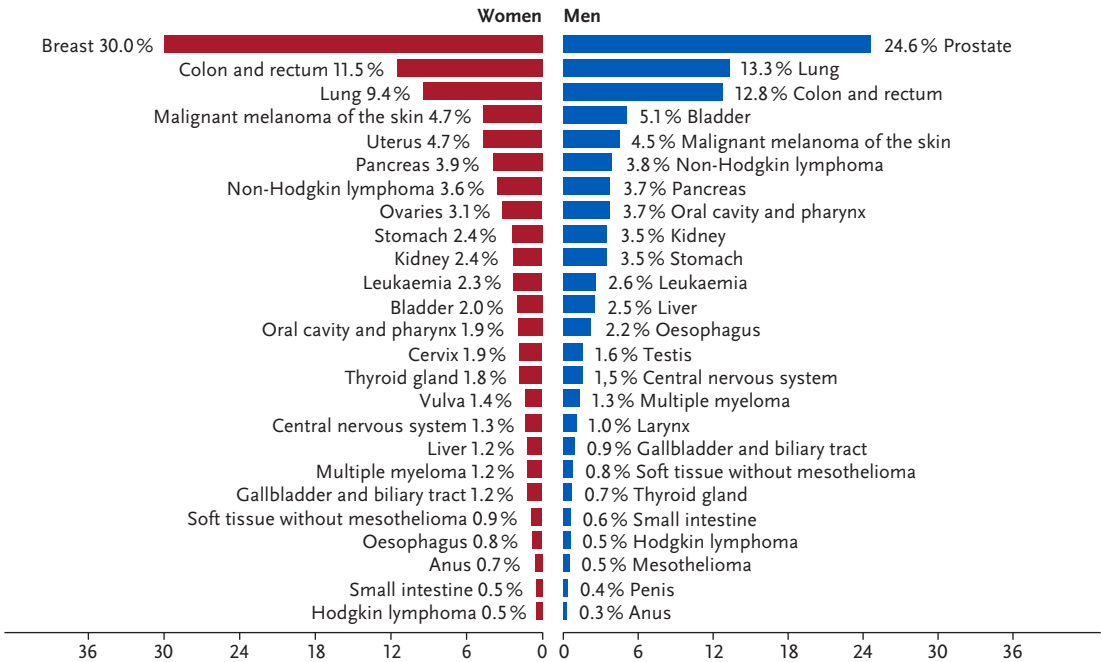


Figure 3.o.2
 Most frequent tumour sites when cancer was cause of death in Germany 2018

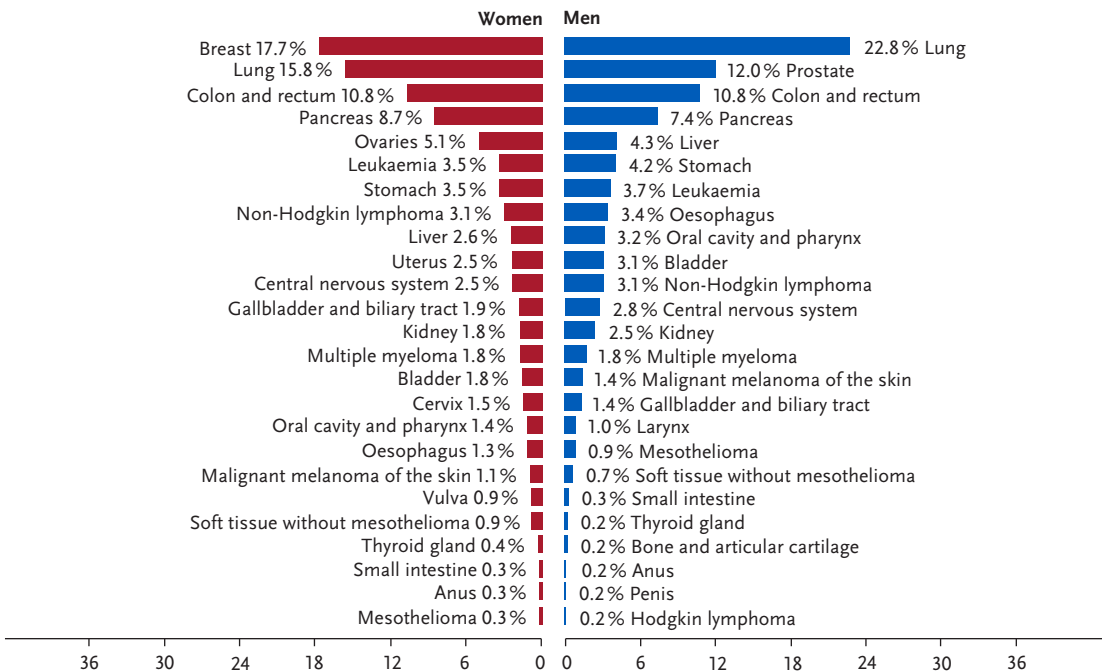


Table 3.o.1

Estimated numbers of incident cancer cases and numbers of deaths from cancer in Germany 2018

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	4,490	9,820	6.8	17.2	1,442	3,970	1.9	6.6
Oesophagus	C15	1,840	5,710	2.4	9.3	1,358	4,278	1.6	6.8
Stomach	C16	5,560	9,200	6.8	14.3	3,674	5,187	4.1	7.7
Small intestine	C17	1,160	1,520	1.7	2.5	346	407	0.4	0.6
Colon and rectum	C18 – C20	26,710	33,920	32.7	52.1	11,008	13,240	11.3	18.9
Anus	C21	1,530	800	2.4	1.4	336	221	0.4	0.4
Liver	C22	2,820	6,690	3.5	10.3	2,689	5,301	3.0	7.7
Gallbladder and biliary tract	C23, C24	2,700	2,380	3.0	3.5	2,017	1,706	2.1	2.4
Pancreas	C25	9,160	9,860	10.8	15.1	9,143	9,189	9.9	13.5
Nasal cavity, nasal sinuses and middle ear	C30, C31	460	660	0.7	1.1	72	134	0.1	0.2
Larynx	C32	540	2,770	0.8	4.6	203	1,201	0.3	1.8
Lung	C33, C34	21,930	35,290	31.5	55.3	16,514	28,365	22.0	42.8
Bone and articular cartilage	C40, C41	360	500	0.7	1.1	184	268	0.3	0.5
Malignant melanoma of the skin	C43	10,880	12,010	18.9	20.2	1,176	1,766	1.4	2.6
Non-melanoma skin cancer	C44	94,200	105,230	122.4	152.2	430	536	0.3	0.7
Mesothelioma	C45	340	1,290	0.4	1.8	269	1,092	0.3	1.4
Soft tissue without mesothelioma	C46 – C49	2,160	2,140	3.4	3.8	943	913	1.3	1.5
Breast	C50	69,900	720	112.6	1.1	18,591	195	22.8	0.3
Vulva	C51	3,270		4.4		957		1.0	
Vagina	C52	470		0.6		186		0.2	
Cervix	C53	4,320		8.6		1,612		2.6	
Uterus	C54, C55	10,860		15.9		2,631		3.0	
Ovaries	C56	7,300		10.7		5,326		6.6	
Penis	C60		1,010		1.5		217		0.3
Prostate	C61		65,200		99.1		14,963		19.2
Testis	C62		4,160		10.4		178		0.4
Kidney	C64	5,480	9,350	7.6	15.4	1,931	3,108	1.9	4.5
Renal pelvis and ureter	C65, C66	790	1,310	0.9	1.9	113	170	0.1	0.2
Bladder	C67	4,770	13,500	5.5	19.7	1,840	3,862	1.7	5.1
Eye	C69	230	290	0.4	0.6	134	131	0.2	0.2
Central nervous system	C70 – C72	3,130	4,100	5.4	7.8	2,615	3,441	3.9	5.9
Thyroid gland	C73	4,270	1,930	9.1	3.9	390	300	0.4	0.4
Without specification of site	C80	5,020	4,700	5.5	7.0	5,424	5,462	5.7	7.9
Hodgkin lymphoma	C81	1,100	1,440	2.5	3.2	124	197	0.1	0.3
Non-Hodgkin lymphoma	C82 – C88	8,280	10,190	11.4	16.6	3,220	3,835	3.2	5.2
Multiple myeloma	C90	2,810	3,540	3.5	5.4	1,881	2,299	1.9	3.2
Leukaemia	C91 – C95	5,310	6,870	7.6	11.5	3,682	4,588	3.9	6.5
Other cancer sites		2,750	2,310	3.8	3.8	2,760	4,090	2.9	5.7
All cancers	C00 – C97	326,920	370,390	465.2	574.5	105,221	124,810	122.6	181.4
All cancers²	C00 – C97 w/o C44	232,720	265,170	342.9	422.3	104,791	124,274	122.3	180.7

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 C00–C97 without C44

Incidence	2017		2018		Prediction for 2022	
	Women	Men	Women	Men	Women	Men
Incident cases	236,000	265,200	232,700	265,200	235,900	274,300
Crude incidence rate ¹	563.5	650.5	554.1	648.2	557.8	664.9
Age-standardised incidence rate ^{1, 2}	348.9	427.2	342.9	422.3	340.3	417.0
Median age at diagnosis	69	70	69	70		
Mortality	2017		2018		2019	
	Women	Men	Women	Men	Women	Men
Deaths	104,077	122,603	104,791	124,274	105,682	124,560
Crude mortality rate ¹	248.5	300.7	249.5	303.8	251.1	303.8
Age-standardised mortality rate ^{1, 2}	123.0	181.4	122.3	180.7	121.3	177.1
Median age at death	76	75	77	75	77	75
Prevalence and survival rates	5 years		10 years		25 years	
	Women	Men	Women	Men	Women	Men
Prevalence	779,300	796,700	1,356,900	1,344,700	2,311,600	2,129,300
Absolute survival rate (2017–2018) ³	59	51	48	39		
Relative survival rate (2017–2018) ³	66	61	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. invading surrounding tissue or spreading through 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 the non-invasive papillary carcinomas of the bladder and certain neoplasms of the haematopoietic organs (e.g. the myelodysplastic syndromes) are sometimes associated with greater risks and burdens for those affected than, for example, certain thyroid tumours which, although histologically malignant, have a very favourable prognosis. In the central nervous system, on the other hand, the threat of neoplasms depends less on their biological behaviour but on their localisation. The classification into benign, malignant and uncertain neoplasms also shows historical changes, for example in bladder tumours. For the sum of all malignant neoplasms (>all cancers<), non-melanotic skin cancers were not taken into account to facilitate international comparisons

and because, they contribute only very slightly to cancer mortality, despite their frequency (see Chapter 3.14).

Malignant neoplasms can originate from different cell types in the most diverse organs of the body. The starting point of most cancers are the internal and external body surfaces (epithelia). About 70% of tumours are adenocarcinomas originating from the glandular tissue alone. Another 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 blood-forming bone marrow and lymphatic tissues. In addition, malignant tumours can also originate in the connective and supporting tissue (including sarcomas), in the supporting cells of the nervous system (gliomas) or in the pigment-forming cells (melanomas).

According to estimates by the ZfKD, in 2018 a total of around 498,000 cancers were newly diagnosed in Germany. Of these, approximately 265,200 occurred in men and 232,700 in women. About half of the cases involved breast (70,600), prostate (65,200), colon (60,600) or lung (57,200) (Table 3.0.1). Between 2008 and 2018, the absolute number of new cancer cases has hardly changed for both sexes. Since for almost all types of cancer the risk of developing

the disease increases with age, theoretically an increase of around 1% per year could have been expected in recent years due to the rising number of older people in the population. If one adjusts for these demographic changes by means of age standardisation, a decrease in the incidence rates of 13% is shown for men and 9% for women within the last 10 years. These differences are mainly due to the contrary trends between the two sexes in lung cancer and other cancers promoted by cigarette smoking (see Chapter 3.12). The favourable incidence trends for stomach and colorectal cancer with decreases of more than 20% in the last 10 years have a high share in the declining age-standardised incidence rates for total cancer.

About 1.6 million people in Germany are living with a cancer that was diagnosed in the last 5 years. It is estimated that more than 4.4 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 probably another 10% higher. The age-standardised mortality rates from cancer in Germany decreased by 12% for men and 5% for women between 2009 and 2019. Compared to the European Union as a whole, cancer mortality in Germany in 2016 was 2% higher for women and 6% lower for men (more recent figures for the EU are not yet available).

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 sex. They are highly dependent on the type of tumour and range from results below 20% for malignant tumours of the lung, liver and pancreas to values above 90% for malignant melanoma of the skin, testicular cancer and thyroid cancer (Figure 3.1.0).

Risk factors and early detection

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

Among these, tobacco consumption has the greatest significance. About 19% of all cancer cases in Germany per year are attributable to smoking (attributable fraction). The role of obesity and lack of exercise has also been known for some time from observational, epidemiological studies. Possible biological mechanisms behind this association are

becoming clearer through recent research on metabolic syndrome. This chronic »metabolic imbalance« is associated with high blood pressure, high blood lipid and blood sugar levels. Inflammatory processes in the fatty tissue are probably involved in the development of cancer.

Among the diet-related individual factors, alcohol consumption plays an important role. Low consumption of fruit, vegetables or dietary fibre with an often simultaneously high intake of red and processed meat could be identified as a risk factor for several common tumour types. In observational studies, however, the influence of individual foods and their ingredients cannot always be separated from that of energy balance and other possible factors.

Another cancer risk factor accessible by preventive measures is the ultraviolet component of sunlight (UV radiation).

Many people in Germany overestimate the influence of pollutants and contaminants in food, as well as that of environmental influences or stress at the workplace. In individual cases, however, these factors may also play a significant role in the development of cancer in this country. Examples are the regionally naturally occurring noble gas radon, which is held responsible for about 6% of lung cancer cases in Germany, or former occupational asbestos exposure, which still leads to mesothelioma of the thoracic or peritoneal pleura 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 for women in the menopause, which has been identified as a risk factor for breast cancer.

Chronic infections are now known to be risk factors for some common cancers; about 4% of new cancer cases in Germany can be attributed to them. Vaccinations or causal therapies can contribute to reducing 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 HPV vaccination: In addition to reducing 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 get vaccinated. Studies have already shown a significantly reduced rate of pre-cancerous lesions of the cervix for those who have been vaccinated, as well as a decrease in cervical carcinomas in women up to 30 years of age.

In addition to preventable risk factors, genetic causes can also increase the risk of developing cancer. Certain hereditary genetic alterations have been clearly identified as the cause of certain types of tumours, such as breast and ovarian cancer or

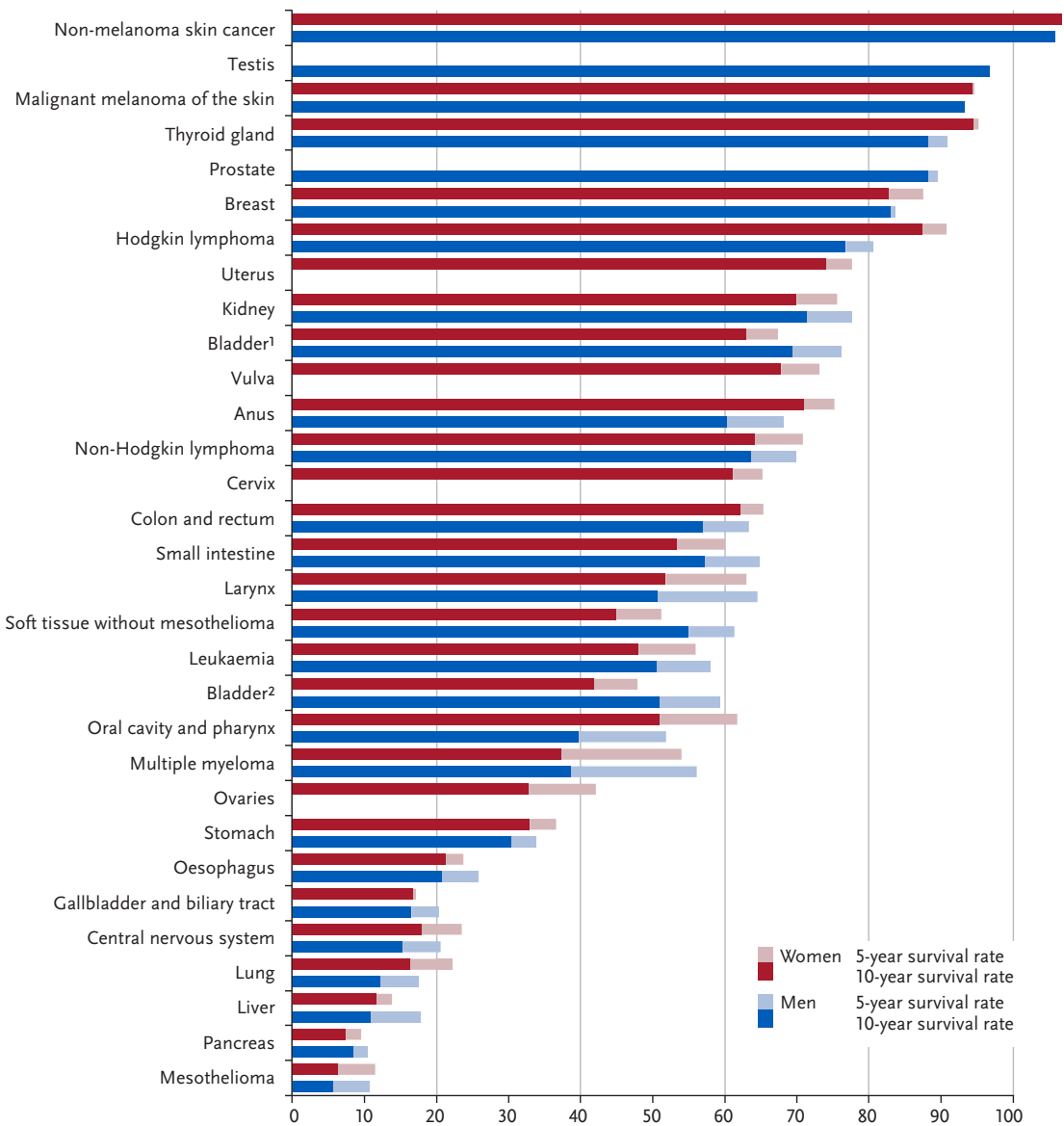
colorectal cancer. In the course of tumour genome sequencing, more and more hereditary mutations are being found that can significantly increase the risk of developing certain tumours.

The most important, non-preventable risk factor for cancer is age, since the probability of developing cancer-causing genetic changes in human 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 3.1.0
Relative 5-/10-year survival rates, by tumour site and sex, Germany 2017–2018 (period analysis)



¹ including in situ tumours and neoplasms of uncertain or unknown behavior (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 1999–2018/2019, projection (incidence) through 2022
 per 100,000 (old European Standard)

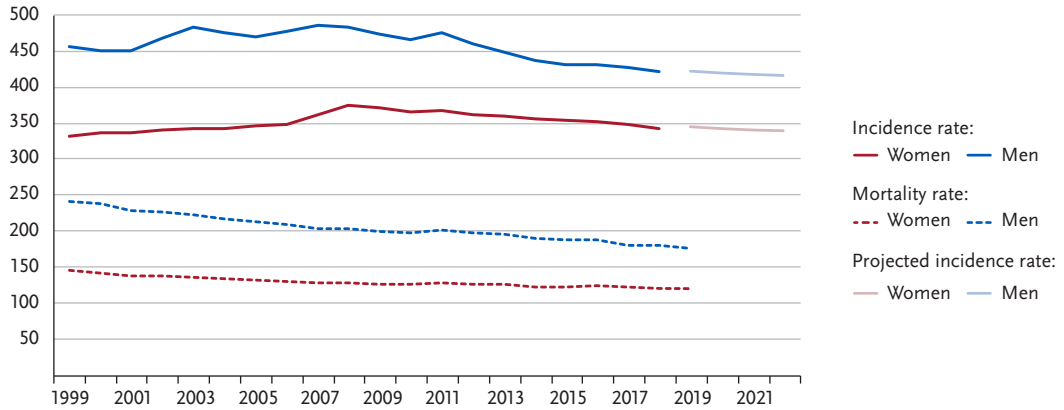


Figure 3.1.1b
 Absolute numbers of incident cases and deaths by sex, ICD-10 C00–C97 without C44, Germany 1999–2018/2019, projection (incidence) through 2022

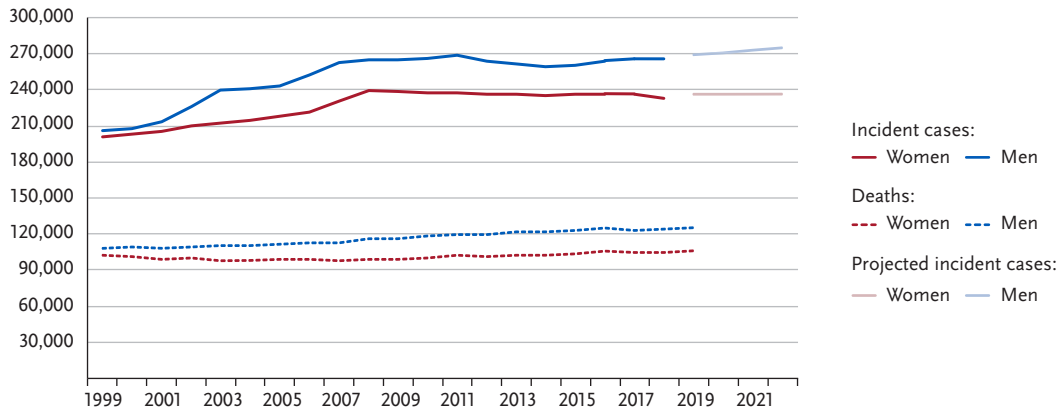


Figure 3.1.2
 Age-specific incidence rates by sex, ICD-10 C00–C97 without C44, Germany 2017–2018
 per 100,000

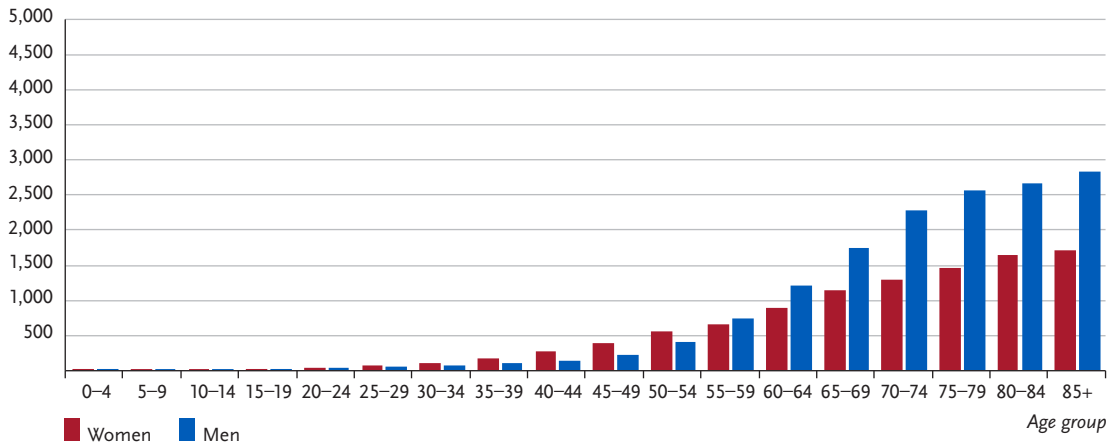


Table 3.1.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 Co0–C97 without C44, database 2018

Women aged	Risk of developing cancer				Mortality risk			
	in the next 10 years		ever		in the next 10 years		ever	
35 years	2.2 %	(1 in 45)	41.8 %	(1 in 2)	0.3 %	(1 in 330)	19.9 %	(1 in 5)
45 years	4.8 %	(1 in 21)	40.6 %	(1 in 2)	0.9 %	(1 in 110)	19.7 %	(1 in 5)
55 years	8.2 %	(1 in 12)	38.0 %	(1 in 3)	2.5 %	(1 in 40)	19.1 %	(1 in 5)
65 years	12.8 %	(1 in 8)	33.4 %	(1 in 3)	4.9 %	(1 in 21)	17.5 %	(1 in 6)
75 years	16.2 %	(1 in 6)	25.7 %	(1 in 4)	7.8 %	(1 in 13)	14.4 %	(1 in 7)
Lifetime risk			42.3 %	(1 in 2)			19.8 %	(1 in 5)
Men aged	in the next 10 years		ever		in the next 10 years		ever	
35 years	1.2 %	(1 in 85)	49.3 %	(1 in 2)	0.2 %	(1 in 460)	24.7 %	(1 in 4)
45 years	3.3 %	(1 in 30)	49.2 %	(1 in 2)	1.0 %	(1 in 110)	24.8 %	(1 in 4)
55 years	9.7 %	(1 in 10)	48.7 %	(1 in 2)	3.4 %	(1 in 30)	24.7 %	(1 in 4)
65 years	20.0 %	(1 in 5)	46.2 %	(1 in 2)	7.4 %	(1 in 13)	23.6 %	(1 in 4)
75 years	26.7 %	(1 in 4)	38.7 %	(1 in 3)	12.0 %	(1 in 8)	20.4 %	(1 in 5)
Lifetime risk			49.3 %	(1 in 2)			24.5 %	(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 2017–2018

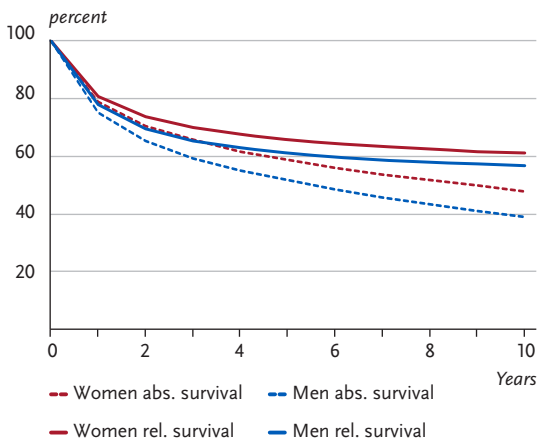


Figure 3.1.5
Relative 5-year survival by UICC stage and sex, ICD-10 Co0–C97 without C44, Germany 2016–2018
Not included because UICC stages are site-specific.

Figure 3.1.6

Age-standardised incidence and mortality rates in German federal states by sex, ICD-10 C00–C97 without C44, 2017–2018 per 100,000 (old European Standard)

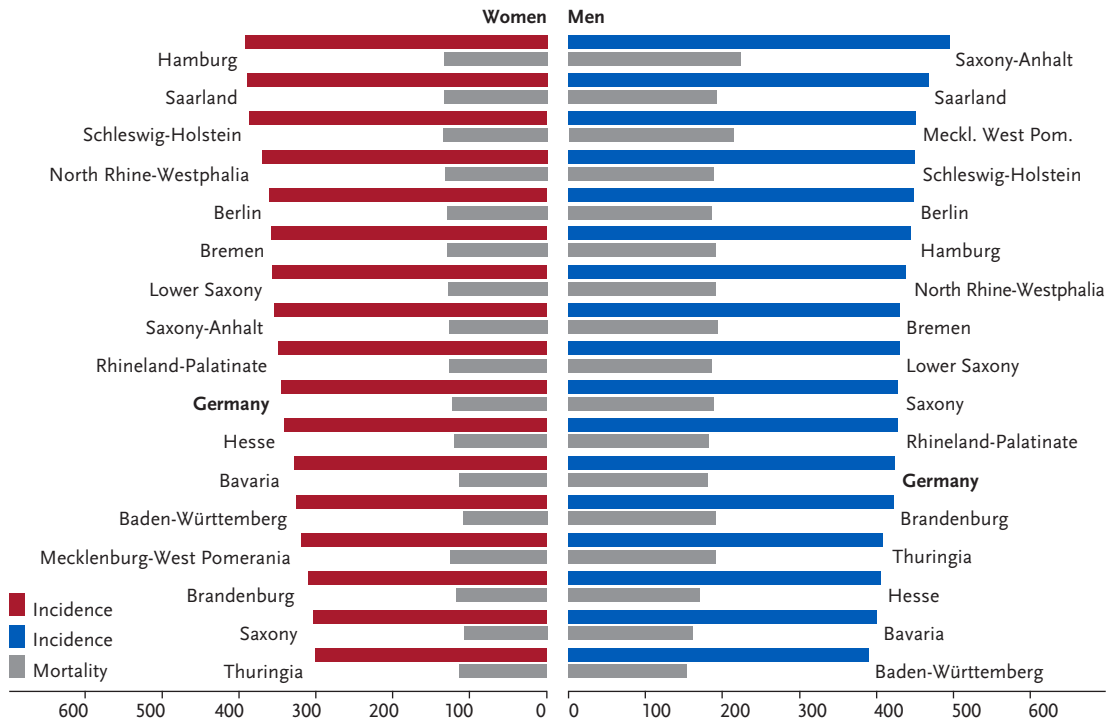
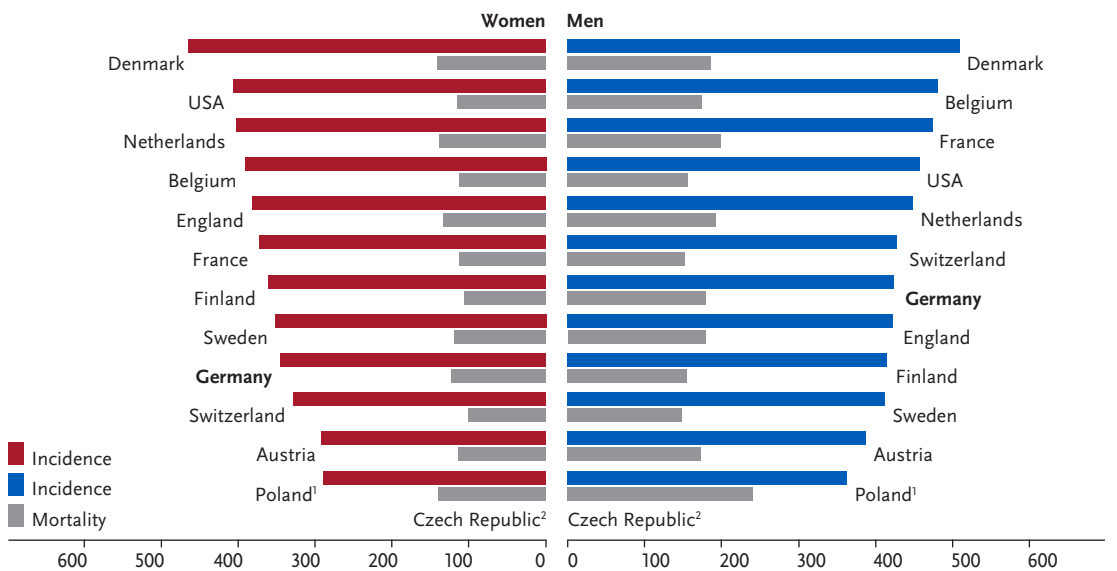


Figure 3.1.7

International comparison of age-standardised incidence and mortality rates by sex, ICD-10 C00–C97 without C44, 2017–2018 or latest available year (details and sources, see appendix) per 100,000 (old European Standard)



¹ Data for C00 to C97
² No data available