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GEKID

Cancer in Germany 2007/2008

A joint publication of the Robert Koch Institute and the Association of Population-based Cancer Registries in Germany

8th Edition 2012

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Contents

1 About this report

1.1 Introduction

"Cancer in Germany" is published every two years by the Association of Population-based Cancer Registries in Germany (GEKID) and the German Centre for Cancer Registry Data (ZfKD) at the Robert Koch Institute.

This eighth edition includes data supplied in anonymised form by the regional cancer registries under the Federal Cancer Registry Data Act. The data is processed and evaluated by the German Centre for Cancer Registry Data, which was newly established at the beginning of 2010. Data for 2007 and 2008 was received for all federal states (Laender) with the exception of Baden-Württemberg, which only began registration in 2009. They have contributed to the results presented here according to the estimated completeness of registration for each cancer site.

Although some new elements are included, the overall structure of "Cancer in Germany" has been retained.

The basic principles are outlined in this introductory chapter, which includes a section on cancer registration in Germany provided by representatives of GEKID. This is followed by a chapter on methodology and an overview of the results. Following this, the results and epidemiological data for the most important cancer diseases are presented on a series of double-page spreads, together with an account of key risk factors and available early detection measures. As in previous editions, these two chapters were contributed by co-workers of the Cancer Information Service. The final chapter on cancers in childhood is written by the German Childhood Cancer Registry.

This edition includes additional sections on liver cancer, cancer of the bladder and biliary tract, and multiple myeloma. This means that the results now cover about 93 % of all new cases of cancer in Germany (not including non-melanoma skin cancers).

For the first time, this report presents tumour stages (T stage) for all sites for which sufficient data is available. In addition, pooled survival rates have been evaluated with data fromeight federal states. Even though the data do not cover Germany as a whole (the inclusion criteria are described in the chapter on methodology), the use of the broader database means it is possible to make much more representative statements about the survival prospects of cancer patients in Germany than were possible in the past.

Methodological developments in the estimation of incidence have also shifted the focus of the trends for incidence and mortality. This edition of the report concentrates on the developments over the past decade. These can be presented and assessed more accurately because modelling has largely been dispensed with and the database has become much broader since about 1999. The changed methodology will also ensure a smooth transition from "estimating" to "counting" the frequency of cases in Germany. However, this will only be possible when sufficiently complete data are received from all federal stateson their cases of cancer. In addition to the age-standardised rates, the report also shows the development of absolute numbers for incidence and mortality. The figures indicate in particular how demographic changes are affecting the impact which cancer has on society.

As well as presenting the results up to 2008, this edition includes a prognosis of the numbers of new cases of cancer for 2012. Current trends for the various cancer sites according to age and sex are also taken into consideration.

There is usually a period of two to three years in population-based cancer registries between the deadline for the receipt of reports covering a diagnosis year and the publication of the relevant statistics. This is due in part to the delays in reporting and in part to the extent of the data processing in the registries. The incoming data has to be compared continually with the existing data and also with death reports and causes of death. By bringing deadlines for the delivery of cancer registry data forward by about three months and shortening the processing time in ZfKD, it will in future be possible be publish "Cancer in Germany" some six months earlier. In addition, an annual update of key results will be provided in an interactive database on the ZfKD Website (www.krebsdaten.de). In the near future, more detailed results about epidemiological cancer developments in Germany will be available sooner than in the past.

A key goal of the German Centre for Cancer Registry Data with this report, with further planned publications and the restructuring of the Website is to provide better data about cancer epidemiology in Germany.

An important contribution is also made by the population-based cancer registries of the federal stateswith their regular publication of regional results.

1.2 Aims and tasks of population-based cancer registries

Population-based cancer registries are institutions for the collection, storage, processing, analysis and interpretation of epidemiological data on the occurrence and frequency of cancers within defined registration areas (e.g. the inhabitants of a German federal state). The data from the cancer registries are also indispensable as a basis for further research into the causes of cancer and for efforts to improve patient care.

Findings from population-based cancer registries include:

- The prostate, intestines and lungs are the most common cancer sites among men.

The incidence of cancers (i.e. how frequently they occur annually in a certain population) can be described with the data from population-based cancer registries. The incidence is broken down according to cancer type, patient age and sex, and other characteristics. Reliable information on incidence is indispensable for describing the extent and type of the burden that cancer places on a population.

- For some years there have been as many new cases of lung cancer among women under the age of forty as among men in the same age group.

The development (trend) of incidence over time can only be observed with the data from population-based cancer registries. The registries have a key function for health reporting in this context

- Regional differences in the incidence of malignant melanoma of the skin can be observed in Europe and in Germany.

Population-based cancer registries can analyse the regional distribution of types of cancer. It is also their task to examine observed cancer clusters and their causes, which usually involves more detailed analytical studies.

- The survival expectations of men with testicular cancer have improved markedly over the last quarter century.

Population-based cancer registries conduct survival analyses of all cancer patients in their registration region. Population-based survival rates are an important parameter for assessing the effectiveness of the diagnosis, therapy and aftercare of cancers.

- Predicting the future number of new cancer cases is important for requirement planning in the health service. The population-based cancer registries provide the data needed for this.

The data from population-based cancer registries not only serve to describe the incidence of cancer in the population, they are also used for scientific research into the causes of cancer and for research on healthcare effectiveness. Such studies (case-control studies, cohort studies, etc.) investigate issues such as:

- What are the causes of childhood leukaemia?
- Do women who take hormone-replacement therapy for menopausal problems have a higher risk of developing breast cancer?
- Do people in certain occupational groups develop lung cancer more frequently?
- Are diagnosis, therapy and aftercare being carried out according to the latest standards?

Population-based cancer registries make it possible for all cases of the disease that have occurred in a defined population to be taken into account in research projects. This ensures that the findings of such studies usually apply not only to a specific hospital or group of patients, but to the entire population. Population-based case-control studies and cohort studies use data from population-based cancer registries for research into the causes and risks of cancer.

- Does mammography screening lead to a decrease in the discovery of tumours at late stages, thus reducing breast cancer mortality?

The data from population-based cancer registries with complete coverage can be used to objectively assess the effectiveness of preventive and screening programmes. For example, a possible decline in the numbers of advanced cases of cancer in the population can be assessed on the basis of data from population-based registries. The aim is to show the desired reduction in mortality among the participants of such a measure by linking the registry data with the screening programme.

The degree of completeness of data capture that has now been reached in many registries has also led to an increase in the use of the registry data. For example:

- Analyses of survival prospects after contracting cancer
- A study of the oncological care and long-term quality of life of cancer patients

- An evaluation of pilot projects on mammography screening, quality-assured breast cancer diagnostics, and skin-cancer screening
- A study of the connection between social strata and cancer incidence and mortality
- Cooperation with the cancer centres, e.g. in the assessment of the long-term survival of treated patients
- A study on the effectiveness of colonoscopy screening
- (for a detailed list see: www.gekid.de).

The evaluation of the screening measures introduced in Germany presents a special challenge for the population-based cancer registries. Among other things, the focus is on assessing mammography screening, which has been introduced nationwide. The population-based cancer registries have already provided detailed basic data for the first evaluation report on mammography screening (www.mammo-programm.de), and this is being used for quality assurance and an initial assessment of the programme. A new task here is the identification of interval carcinomas.

In 2008, the statutory health insurers introduced screening for skin cancer, and the effects of this on the incidence of skin cancer and mortality can also be investigated with the data from the cancer registries. The National Cancer Plan emphasised the key role of cancer registration for assessing the effects of organised programmes for the early detection of cancer. A number of measures were recommended to ensure improved harmonisation between the early recognition programmes and the information collected in the cancer registries.

A longer-term task of the population-based cancer registries is examining the effectiveness of the vaccination programme for girls aged between 12 and 17 against human papilloma viruses (HPV) with the aim of significantly reducing the number of new cases of cervical cancer.

In order to establish nationwide health monitoring and an on-going comparative analysis of cancer, it is necessary to have population-based cancer registries covering all federal states. This goal was achieved with the inclusion of Baden-Württemberg in 2009. The Federal Cancer Registry Data Act, which came into force in the same year, further improved the scope for collecting and evaluating the anonymised cancer registry data at the national level by the newly established German Centre for Cancer Registry Data at the Robert Koch Institute.

In order to be able to pool information about an individual's cancer condition from different sources, the data are collected in such a way that multiple reports on the same person are recognizable. For research purposes it should be possible to re-establish a link between the data and the individual. However, in order to safeguard patients' privacy and their right to control what happens to their data, all population- based registries are required under state legislation to adopt extensive precautions to protect and secure personal data.

Undistorted evaluation of the data is only possible if more than 90 % of all new cancer cases are registered. The cooperation of all physicians and dentists involved in diagnosis, treatment and aftercare is therefore crucial for the informational value of data from a population-based cancer registry. Patients are also requested to take an active part in cancer registration. Ask your doctor to report your case to the cancer registry! This way you too can make a contribution to the assessment of cancer trends and to cancer research and help to improve cancer detection, treatment and aftercare.

1.3 Developments of cancer registration in Germany

After the expansion of the cancer registry of Baden-Württemberg to cover the whole federal state, new cases of cancer can now be registered systematically throughout Germany on the basis of regional legislation. The current situation of population-based cancer registration is very good. The long-standing cancer registries of many federal states have also achieved considerable improvements in their rates of registration since the last issue of “Cancer in Germany” in 2010.

Whereas for 2005/2006 only seven federal statesand the administrative district of Muenster in North Rhine-Westphaliawere estimated to have achieved complete registration, by 2008 this was the case for ten federal states, together with four out of five administrative districts of North Rhine-Westphalia. This means that reliable data about new cases of cancer is now available for more than 60 % of the population. Germany has thus caught up with the leading group of nations.

Numerous individual initiatives in the federal states have contributed to the improved performance of the cancer registries. The Federal Government has also provided further support for the population-based cancer registration, with the Federal Cancer Registry Data Act of 2009 and the establishment of the German Centre for Cancer Registry Data (ZfKD) in the Robert Koch Institute. Since the end of 2010, all regional cancer registries have been supplying their data to the ZfKD in a uniform format. These data form the basis for the analysescarried out by the ZfKD which are presented in this 8th edition of “Cancer in Germany”.

The International Agency for Research on Cancer of theWorld Health Organisation (IARC, Lyon/F) once

again called on the German cancer registries to contribute to the 2012 edition of "Cancer Incidence in Five Continents" (Vol. X), and they transferred their anonymised datasets on new cancer cases to the IARC. In the previous issue, data was presented from seven German cancer registries, but with the improved quality of the data gathered in Germany it is now possible for further federal states'registries to meet the strict criteria of the IARC and qualify for inclusion in the WHO's central publication series.

The Association of Population-based Cancer Registries in Germany (GEKID), which has cancer epidemiologists as members in addition to all the population-based cancer registries, has continued to work intensively over the past two years on the improved use of the cancer registry data. An important result is the new interactive cancer atlas of GEKID on cancer incidence and mortality. The atlas is available on the Website of GEKID (www.gekid.de), with maps offering interactive regional comparisons for 23 cancer sites. Important agreements were also reached on the methodology for calculating survival rates, with the aim of improving the transparency and comparability of this important parameter.

In addition to presenting the cancer registry data, the population-based cancer registries and GEKID have also been involved in planning and carrying out research projects, in particular within the "Cancer epidemiology" funding programme of the German Cancer Aid (Deutsche Krebshilfe). These research projects have already led to a number of important international publications, for example on survival after cancer in Germany or on the connections between research and cancer registry data. Information about further research projects and current publications is provided on the GEKID Website.

These examples show clearly that the focus of cancer registration in Germany is shifting towards the active utilisation of the data. This development is essential, because without scientific utilisation of the laboriously gathered data, cancer registration would amount to little more than meaningless countingexercises. In addition to the research, the cancer registries have also made numerous significant contributions to public health reporting. Finally, the pooled anonymised datasets from the registries can now also be used by external scientists (on application to the German Centre for Cancer Registry Data).

Within the framework of the National Cancer Plan, both the German Centre for Cancer Registry Data and the population-based cancer registries, through GEKID,havetaken active roles. In the field "Further development of the early detection of cancer", GEKID is playing a leading role in the sub-target "Evaluation of cancer screening using the data of the regional cancer registries", and it is also closely involved in the sub-section "Clinical cancer registration". Together with the German Tumour Centres Working Group (ADT) a basic uniform dataset is being developed for cancer registration. The reports and recommendations (in German)can be accessed on the Website of the Federal Ministry of Health (www.bundesgesundheitsministerium.de).

Overall, cancer registration and data utilisation are developing satisfactorily and the prospects for the future are positive. If the doctors and patients remain willing to report, and with the necessary financial and political support for the cancer registries, the goal of comprehensive, nationwide cancer registration in Germany will soon be reached.

The improved and internationally accepted cancer registration in Germany marks the start of a new era of utilisation of the data from cancer registries for oncological research and treatment, to the benefit of patients with cancer.

2 Methodology

2.1 Completeness of cancer registration

The usefulness of population-based data on cancer depends to a large extent on how completely new cases of cancer are registered. Therefore the Robert Koch Institute (RKI) regularly checks the completeness of the data from the population-based cancer registries in Germany. For 2008, data was available for all the federal states with the exception of Baden-Württemberg, where registration only began in 2009. There are various ways of estimating the completeness of population-based cancer registration. A simple and reliable method is the determination of the DCO-percentage, i.e. the proportion of cancer cases which are only ascertained from death certificates. A high DCO-percentage is generally an indication of incomplete registration of cases at an earlier stage. However, if a registry has only been gathering data over a relatively short period, a DCO-case could be linked to a cancer diagnosis which preceded the start of registration. New methods to estimate completeness, e.g. the 'flow method' developed in Great Britain, cannot be implemented with the dataset currently available to the German Centre for Cancer Registry Data (ZfKD), among other things because of the lack of details about the dateof first registration. However, these methods have not yet proved to be superior.

The German Centre for Cancer Registry Data therefore estimates the degree of completeness using another internationally accepted indicator, namely the ratio of mortalityto incidence. Assuming that diagnostics and treatment and thus the survival

prospects of cancer patients do not differ significantly throughout Germany and that regionally varying cancer risks are reflected in the official cause-of-death statistics, the incidence in each region can be estimated using the mortality /incidence ratio in the reference registry in combination with the regional mortality. The incidence in the catchment area of a cancer registry is estimated on the basis of the data from another cancer registry in which registration is known to be complete. This figure is then compared with data actually collected.

In a working group made up of ZfKD personnel, representatives of the registries and external scientists, key modifications were made in 2011 to aspects of the method used to estimate completeness, while retaining the mortality to incidence ratio. The following inclusion criteria were agreed on for a new reference region:

- Comprehensive data over at least 10 years (i.e. at present since 1999)
- Completeness for cancer overall as a mean since 1999 of more than 90 % (using the previous method) and more than 80 % for all individual years
- DCO-proportion for cancer overall as a mean since 1999 or from the sixth year since the founding of the registry of less than 15 %.

These criteria were met by Saarland (the previous reference region) and also by registries from Hamburg, Bremen, Saxony and the Münster administrative district (NRW). It will be possible to extend this 'reference pool' of registries step by step over the coming years as further registries meet the criteria. The completeness of the registries in the reference region can now also be estimated by comparison with the expected values. Assuming a largely constant M/I ratio across Germany with respect to site, age group, and sex, the expected incidence values are calculated for six age groups (for men and women in each case) and for 24 cancer sites as well as for the group of 'other sites'. In contrast to the previous models, only (log)-linear trends over time are used for modelling (smoothing) the expected values, since a shortened period does not offer sufficient data for more complex models. Furthermore, in order to allow for occasional fluctuations, the observed incidence values are also smoothed.

If the age-, sex- and site-specific mortality in the investigation region was less than 50 fatalities over the 10-year period of investigation, then instead of the ratio of mortality and incidence we used the modelled incidence in the reference region to calculate the expected number of new cases of cancer.

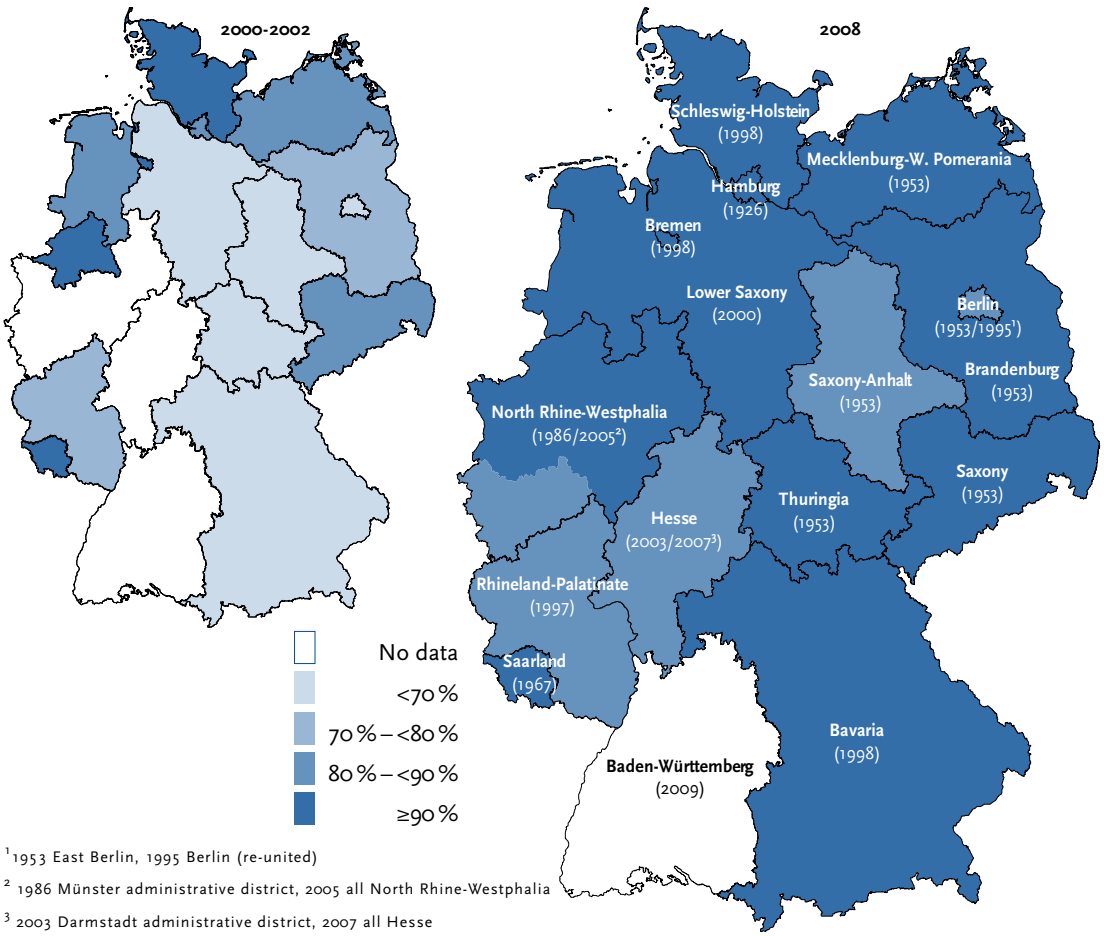
The completeness for cancer overall was calculated for the first time by means of an additive method, i.e. by summing the observed and expected values for all individual sites.

The results presented in this report for individual sites showed some shifts in comparison with previous estimates, but for the majority of registries the values calculated retrospectively for 2006 using the new method only differed very slightly (<2 %) from the previous estimates. Therefore, despite the change in the methodology, it seems justifiable to make a direct comparison between the earlier and the current estimates when assessing the completeness of registration (Figure 2.1.1). However, the new method for estimating completeness also has its limitations, in particular if the mortality of a type of cancer is low, either in absolute terms or relative to the incidence (e.g. testicular cancer, malignant melanomas, thyroid gland cancer) or if the introduction of screening measures affects the ratio of mortality to incidence differently for different regions. This is the case in particular for breast cancer. The national Mammography Screening Programme was introduced successively across Germany between 2005 and 2008, so that in particular in the early stages of screening the anticipated spike in incidence showed marked regional differences over time, which in turn impacted on the M/I indices and thus also on the estimates of completeness. Taking this into account, two registries were assessed as complete which had reached a completeness of more than 90 % in the previous estimate (which had been largely unaffected by screening effects), although they did not reach this value in the current estimates. In a few years' time, assuming comparable levels of participation in screening programmes in all German federal states, this limitation will no longer apply for the estimation of completeness of registration of new cases of breast cancer.

According to the current estimate for 2008, already ten federal states and four out of five administrative districts of North Rhine-Westphalia reached an estimated completeness of at least 90 %. Of these, eight federal states (and the eastern part of NRW) achieved more than 95 % in comparison with the above-mentioned reference registries. This marks a considerable increase in completeness within 6-8 years (Figure 2.1.1). However, while this development is very positive, it should be noted that in two federal states with well-established registration the degree of completeness remains only slightly above 80 %.

Using the new method, some differences remain in the completeness for specific cancer sites. Registration is best for thyroid gland carcinomas and breast cancer, with 12 and 13 of the federal states regarded as complete, respectively. The deficits are greatest for cancers of the liver, gall bladder and pancreas, with only six federal states having complete

Figure 2.1.1
Development of the estimated completeness of the population-based cancer registries in Germany, 2000 to 2002 and 2008, by federal state or region (showing start of registration)



[1] 1953 East Berlin, 1995 Berlin (re-united)

[2] 1986 Münster administrative district, 2005 all North Rhine-Westphalia

[3] 2003 Darmstadt administrative district, 2007 all Hesse

reporting. For most sites, reporting to between eight and ten registries was rated as complete for 2008, so that the estimates of incidence for Germany now have a very broad basis, and have correspondingly become more reliable and stable.

2.2 Estimating incidence and numbers of new cases, with results for Germany up to 2008

On the basis of the data from the population-based cancer registries in Germany, the German Centre for Cancer Registry Data estimates the numbers of all new cases of cancer in Germany every year. The modification of the method used to estimate the completeness of registration also made it necessary to adapt the method previously used to estimate the incidences. As a result of the steady extension of the data base, particularly since 1999, and the medium-term perspective of complete cancer registration throughout Germany, it was required that the new method should ensure a smooth transition from estimating to counting the number of new cases of cancer every year in Germany, while also making it possible to assess trends over time. The figures presented in this report are still based on the estimates of completeness. In contrast to the previous method, modelling is dispensed with as far as possible. The numbers of new cases by site and diagnosisyear are derived from the summation of the results of the 'complete' registries and the expected values from the estimates for the federal states which were judged not to be complete, or for which data was not yet available (Baden-Württemberg). DCO cases were also included for the registries estimated to be complete, but only beginning with the sixth year of comprehensive registration. For the first five years, the DCO-proportions(by site, age, and sex) for the reference region were used.

In contrast to earlier estimates, for which the incidence was modelled over the full period of observation, the data is now only smoothed slightly by means of the log-linear modelled expectation values, and this will be used less and less as growing numbers of registries provide complete reporting. The incidence trend therefore increasingly resembles 'counted' values for mortality from the cause of death statistics andthe trends reported from the registries,and includes random fluctuations from year to year.

A key advantage of the modified method is the more precise presentation, which allows improved assessment of current trends, for example those that arose in recent years as a result of the introduction of screening programmes, in particular for breast cancer and malignant melanoma. However, it is not yet possible to present long-term trends. The new methods can only be used to estimate completeness and incidences since 1999 and the results of the earlier estimates are not directly comparable. Long term trends are therefore not presented in this report, but in some cases qualitative comments are included.

A further advantage is that the new method is more stable. The results for the years presented here will now only change significantly if amendments are made to the data in the registries themselves (due to late reports or corrections). This applies primarily of course to the last year of diagnosis.

As expected, the methodological alterations have led to some changes in comparison to the figures published in 2010 for the diagnosis years up to 2006. The estimates for the numbers of new cases of cancer for 2006 for the oesophagus, the ovaries, testicles, and the central nervous system are now some 15-20 % lower, for tumours in the oral cavity and pharynx, the larynx, and for leukaemia and lymphoma they are some 10-15 % higher. The new overall estimates for 2006are higher by 3 % for men and 6 % for women, and this is attributable to a more realistic estimate of the cancer sites which are not considered individually in this report, e.g. tumours of bone and articular cartilage, of the efferent urinary tract, or of the reproductive organs. The incidence rates for these rare cancer sites can now be calculated using the new method. In particular for these cases the broader data base offers much better opportunities for interpretation than the extrapolation of results from individual registries. This applies both for the assessment of current trends and for the comparison with international results. The nationwide estimates of incidences for these sites will in future be presented on the ZfKD Website or in special publications.

After age-standardisation, mortality rates for men and women have declined since1999 and incidence rates for men have remained more or less steady. For women, an increase in incidence rates is found after 2005. This is mainly attributable to the start of the Mammography Screening Programme for the early detection of breast cancer. The increase was expected and can be interpreted as a first indication of the effectiveness of screening. The increase in the number of cases discovered in the early stages of the programme suggests that many tumours are being discovered at a much earlier stage than in the past. Given the staggered introduction of screening across Germany between 2005 and 2008 it is difficult to estimate at present whether the increase in incidence rates will continue. In the Muenster administrative district, where the programme was introduced in 2005, there were already reports of a slight decline for 2009, whereas in Hamburg the rates in the same year showed a further marked increase (www.krebs- register-nrw.de and www.krebsregister-hamburg. de). The experience in other countries after the introduction of screening suggests that in the long term the incidence rates in the relevant age group (50-69 years) will be higher than the level before the start of screening. By linkage with the data from the early detection units, the data from the population-based cancer registries will contribute in the coming years to the evaluation of the screening programme in particular regardingany reduction in mortality from breast cancer.

When the intensive screening programme for skin cancer was launched in mid-2008 it already led in the same year to a marked increase in the reported incidence rates for malignant melanomas. However, it is once again difficult to predict the future developments, especially because in this case there is no comparable experience from other countries, in contrast to mammography screening.

There is no ready explanation for the increasing incidence of thyroid gland cancer in recent years, although similar trends can be observed in some other European countries and the USA. Screening programmes as such do not play any role but it may well be possible that diagnostic procedures have meanwhile become more intensive, leading to the increased discovery of smaller, slowly growing tumours. This is supported by the fact that mortality is also continuing to decline slightly, although from a low level.

Other trends, such as the falling rates of stomach cancer, of lung and bladder cancer for men, or the increasing rates of lung cancer for women, have already been observed over a longer period and can be attributed, among other factors, to changes in smoking habits.

The improved data situation also makes it possible to make more reliable statements about regional variations in the frequency of cancer in Germany. Stable differences, both in mortality and incidence,

Table 2.2.1
Estimated numbers of new cases of cancer in Germany 2008

		No. of incident cases		Incidence rate[1]	
Cancer site	**ICD-10**	**Men**	**Woman**	**Men**	**Woman**
Oral cavity and pharynx	C00-C14	9,520	3,490	19.1	5.9
Oesophagus	C15	4,800	1,380	9.0	2.1
Stomach	C16	9,210	6,660	16.8	8.6
Colon and rectum	C18-21	35,350	30,040	63.0	39.4
Liver	C22	5,270	2,340	9.4	3.2
Gallbladder and biliary tract	C23-24	2,270	2,890	4.0	3.6
Pancreas	C25	7,390	7,570	13.4	9.8
Larynx	C32	3,610	510	6.9	0.9
Lung	C33-34	33,960	15,570	60.6	24.3
Malignant melanoma of the skin	C43	8,910	8,890	17.1	16.6
Breast	C50	520	71,660	1.0	123.1
Cervix	C53		4,880		9.5
Uterus	C54-55		11,280		17.2
Ovaries	C56		7,790		12.2
Prostate	C61	63,440		110.9	
Testis	C62	3,970		9.5	
Kidney	C64	8,960	5,540	16.5	8.2
Bladder	C67	11,460	4,510	20.1	5.6
Central nervous system	C70-72	3,810	2,990	7.7	5.3
Thyroid gland	C73	1,710	4,160	3.5	8.6
Hodgkin's lymphoma	C81	1,160	920	2.7	2.0
Non-Hodgkin lymphomas	C82-85	7,270	6,430	13.7	9.8
Multiple myeloma	C90	2,980	2,650	5.3	3.6
Leukaemias	C91-95	6,340	5,080	12.4	7.9
Other cancer sites		14,760	15,870	27.3	22.5
Total cancer[2]	**C00-C97 w/o C44**	**246,700**	**223,100**	**450.0**	**349.9**

[1] Age-standardised (European Standard) [2] Not including non-melanoma skin cancer

Figure 2.2.1
The most frequent tumour sites as a percentage of all new cases of cancer in Germany 2008 (not including non-melanoma skin cancer)

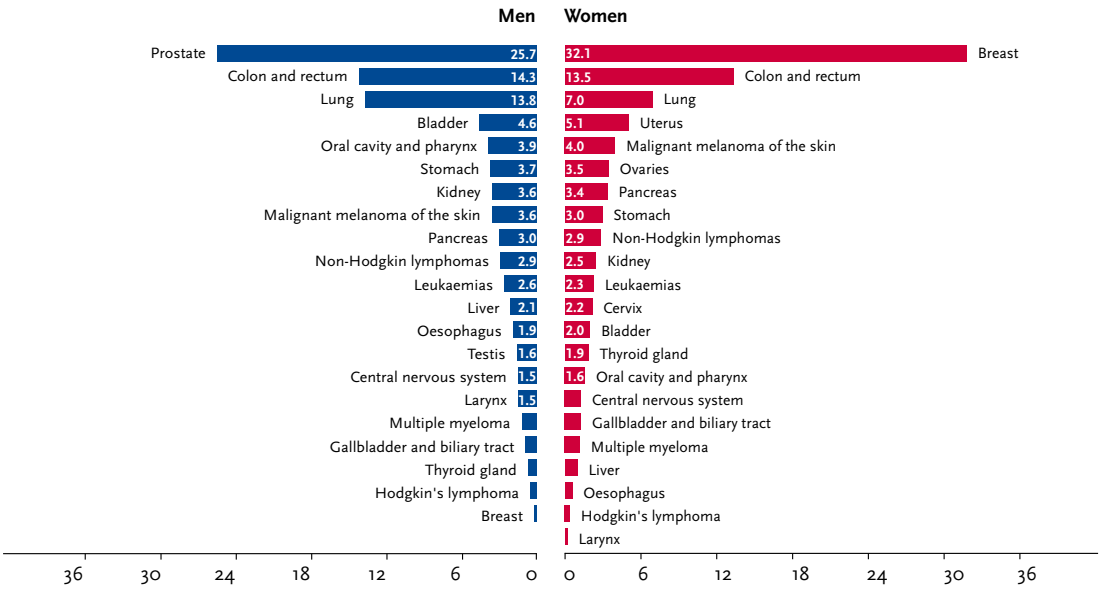
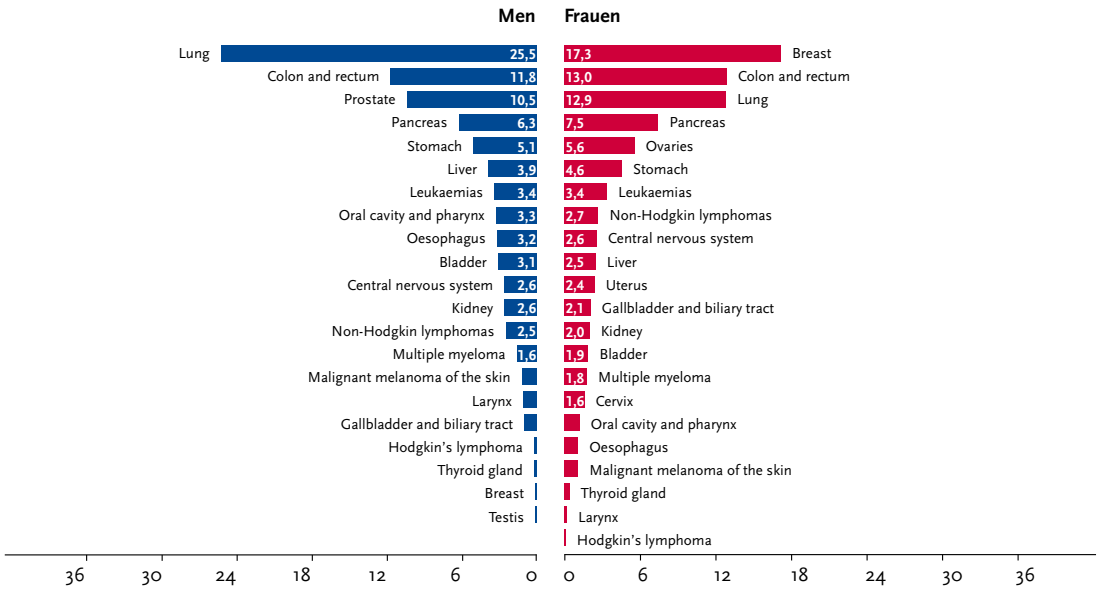


Table 2.2.2
Number of deaths from cancer in Germany 2008
Source: Official cause of death statistics, Federal Statistical Office, Wiesbaden

		No. of deaths		Mortality rate[1]	
Cancer site	**ICD-10**	**Men**	**Woman**	**Men**	**Woman**
Oral cavity and pharynx	C00-C14	3,776	1,170	7.4	1.8
Oesophagus	C15	3,655	1,135	6.8	1.6
Stomach	C16	5,929	4,581	10.5	5.6
Colon and rectum	C18-21	13,726	12,936	24.0	14.7
Liver	C22	4,523	2,539	7.9	3.1
Gallbladder and biliary tract	C23-24	1,153	2,092	2.0	2.6
Pancreas	C25	7,327	7,508	13.0	9.2
Larynx	C32	1,275	209	2.4	0.3
Lung	C33-34	29,505	12,841	52.3	19.2
Malignant melanoma of the skin	C43	1,365	1,135	2.5	1.6
Breast	C50	136	17,209	0.2	24.6
Cervix	C53		1,596		2.6
Uterus	C54-55		2,420		3.0
Ovaries	C56		5,529		7.6
Prostate	C61	12,134		20.6	
Testis	C62	153		0.3	
Kidney	C64	3,060	2,041	5.4	2.5
Bladder	C67	3,611	1,921	6.2	2.0
Central nervous system	C70-72	3,008	2,554	5.8	4.0
Thyroid gland	C73	279	429	0.5	0.5
Hodgkin's lymphoma	C81	193	148	0.4	0.2
Non-Hodgkin lymphomas	C82-85	2,926	2,658	5.2	3.2
Multiple myeloma	C90	1,882	1,786	3.3	2.2
Leukaemias	C91-95	3,908	3,400	6.9	4.2
Other cancer sites		12,346	11,735	22.0	14.1
Total cancer[2]	**C00-C97 w/o C44**	**115,870**	**99,572**	**205.6**	**130.5**

[1] Age-standardised (European Standard) [2] Not including non-melanoma skin cancer

Figure 2.2.2
Most frequent tumour sites when cancer was the cause of death in Germany 2008
Source: Official cause of death statistics, Federal Statistical Office, Wiesbaden



can still be observed between western and eastern Germany (higher rates for stomach and bladder cancer in the east, or for breast cancer in the west). In the case of thyroid gland cancer and liver cancer the rates are higher in the south and south-east, respectively, whereas for lung cancer the ratesare lower in both regions.

An overview of the figures for cancer incidence and mortality for 2008 in Germany are provided in the Tables and Figures 2.2.1 and 2.2.2. There were approximately470,000 new cases of cancer in 2008. This further increase is due at least in part to the further rise in the number of older people in the German population. With an almost constant number of deaths caused by cancer (approx. 215,000 in 2008), the numbers of new cases of cancer in the years 1999 to 2008 increased more for men than for women, although the age-standardised rates only rose for women, as mentioned above. This is partly due to the demographic development in Germany. There has been a marked increase in the proportion of the elderly in the male population over recent decades and this can be interpreted as an indirect effect of World War II. In 1999, the demographic statistics clearly showed the war losses in the male cohorts born between 1920 and 1925. Today's 75- to 80-year-old male cohort is no longer directly affected by the effects of war in this way. Therefore in future the number of new cases of cancer among men will most probably not increase as much as in the previous two or three decades. However, the demographic statistics indicate that for both sexes the numbers of new cases will continue to increase for several decades, even though the age-specific incidence rates remain constant.

2.3 Indicators and graphical presentations

This section provides details of the indicators used and explanations of the graphical presentations.

Age-specific rate

The age-specific rate is determined by dividing the number of cases of cancer or deathsin a certain age group by the number of men or women in this group in the population. The graphical presentation of these rates shows the relationship between age and incidence for men and women. The age-specific incidence and mortality rates are expressed as annual rates per 100,000 inhabitants for the age group in question.

Age-standardised rates

In descriptive epidemiology, one may compare the frequencies (incidence or mortality) of a certain type of cancer in the populationsofvarious regions or at various times within a singleregion. As the presentation of the age-specific incidence for men and women in this report shows, the incidence rate usually increases considerably with age, so that before comparing incidence or mortality in various countries and regions, or in the same population at different times, it is important to carry out age-standardisation to allow for the differences in age structure. This involves weighting and then summing the age-specific rates. The frequency of a disease or a cause of death is then presented for a total of 100,000 people with a defined age structure, in this report the European Standard (WHO, 1976).

Cancer incidence and mortality risks

Age-specific incidence rates and mortality rates can be interpreted as measures for the age- and sex-specific risk of developing or dying from a specific malignant tumour within a year. To clarify the presentation of this form of risk communication, we calculated the risk which 40-, 50-, 60- and 70-year-old men and women have of developing and/ or dying of a specific cancer within the next ten years and also at any time in their life. The results are presented both as a percentage and as one in N individuals of the same age and sex. "Competing risks" were also considered, e.g. there is a certain probability that a 70-year-old man might die from some other disease within the next ten years. Furthermore, the "lifetime risk" was also calculated, i.e. the risk of developing a tumour during the lifespan of an average person. However the calculations are only based on current rates (incidence and mortality rates and the general life expectancy). No prediction is made about the future development of these values. Furthermore, these risks relate to the entire population (according to age and sex), but an individual's risk can vary considerably depending on the presence or absence of specific risk factors. The Devcan program developed by the US National Cancer Institute was used for the calculations.

International comparison

The estimated cancer incidence and the cancer mortality in Germany were compared with current age-standardised incidence and mortality rates in the countries bordering on Germany and also the United Kingdom, Finland, and the USA (sources are given in the appendix). Where the relevant figures were available at the end of 2011, the results represent the mean for 2007 and 2008, otherwise the latest available results were used for the comparison (France: 2005, Switzerland: mean value 2004-2008, Belgium: mortality only for 2008). For some types of cancer (e.g. bladder cancer, renal cancer) the grouping of diagnoses in accordance with ICD-10 in some countries differs from the grouping in Germany, which slightly limits comparability in some cases.

The international results were not checked further for completeness or plausibility. It is therefore possible that the incidence is underestimated in a country if new cases are underreported. As a rule, if a neighbouring country shows a marked deviation from the mortality / incidence ratio in Germany this can indicate underestimation. If the incidence rate is lower than the mortality rate for a specific cancer site this indicates underreporting.

Median age at diagnosis

The age at which a specific cancer develops is expressed in terms of the median age at diagnosis for all cases included for the diagnosis years 2007 and 2008 by the registries with complete reporting. Here, the inclusion of DCO-cases, for which the age at death is used instead of the age at diagnosis, inevitably leads to a slight overestimation. However, excluding DCO-cases, which generally account for a much larger proportion for sites with shorter survival periods in old age, would have ledto a marked underestimation.

Mortality

The cancer mortality is based on the annual number of deaths dueto cancer according to the official cause-of-death statistics. The deaths are attributedto the underlying cause of death and grouped in terms of age and sex. The mortality rate is usually expressed as the annual number of deaths per 100,000 people. In this report, both the absolute number of deaths from 1999 to 2008 and the age-standardised mortality rates European Standard) are presented.

Predicting incidences for 2012

The incidence rates and numbers of cases of cancer were predicted for 2012 by extrapolating linear trends of the estimated age-, sex- and site-specific logarithmic incidence rates for Germany over the past ten years, drawing on the current demographic extrapolations fromthe German Federal Statistical Office. In the case of female breast cancer, as an exception, it was assumed that for the age groups between 50 and 69 years (target group of the mammography screening programme) the incidence rates will remain constant from 2008 onwards. For prostate cancer, constant incidence rates were assumed for all age groups.

Regional comparison

The mean age-standardised incidence rates for 2007 and 2008 (European Standard) in 15 federal stateswere presented in comparison with the corresponding national estimates. In Baden-Württemberg the cancer registry has only recorded new cases of cancer since 2009, so that population-based data is not yet available. In Hesse and North Rhine-Westphalia, DCO-cases had only been registered fully for a few years, so these are not yet included in their calculations. The completeness of case registration in the population-based cancer registries is indicated by colour-coding in the graphs and tables. An estimated degree of completeness for 2008 below 90 % is denoted by a lighter shade of the incidence bar. The age-standardised mortality according to site and sexfor all federal states was presented in comparison with the national mortality, using figures from the German Federal Statistical Office (www.gbe-bund.de).

Crude rates

For a specific cancer site and population, a crude rate of incidence or mortality is calculated by dividing the total number of new cases of cancer reported (incidence) or the number of deaths due to cancer (mortality) in a given period by the total number of people in the relevant population (here: residential population of Germany). The result is usually expressed as the rate per 100,000 residents per year. In contrast to the age-standardised rate, crude rates are highly dependent on the age-structure of a population, particularly in the case of cancer.

Survival rates

The results of survival analyses in this report describe the average survival prospects of people over the age of 15 years after diagnosis witha specific form of cancer. Absolute and relative survival rates were calculated. Absolute survival rates present the proportion of patients who are still alive at a certain time after their diagnosis. For example, an absolute 5-year survival rate of 80 % means that 80 people out of 100 diagnosed with a type of cancer have survived the first five years after their diagnosis.

The relative survival rate takes into account the fact that only a part of the mortality rate of cancer patients is attributable to cancer, and that some mortality is expected among people of the same age and sexdue to other causes. Relative survival rates present the cancer-related mortality in terms of the absolute survival rate of cancer patients divided by the expected survival rates in the general population. For example, a relative 5-year survival rate of 80 % means that the proportion of the cancer patients surviving five years after diagnosis is 80 % of the expected proportion of survivors among the general population of the same age and sexwithout cancer. The relative survival rate is always higher than the corresponding absolute rate. The expected rate of survival was calculated using the EdererII method and the national life tables of the German Federal Statistical Office.

In order to make up-to-date estimates of survival prospects the so-called “period” method was used. This takes into account the survival of people with

cancer who have lived within some recent time period. Here the 1- to 5-year period survival was calculated for 2007 – 2008.

Because the accuracy of the survival analyses is highly dependent on the quality of the available data, registries were required to meet two criteria for inclusion in the current calculations. Firstly, DCO-cases should not account for more than 15 % of all malignant cancers (C00-C97 not including C44) for the period being considered. Since there is no date of diagnosis for DCO cases (which are only recorded by the death certificate), they have to be excluded from the survival analysis. This can lead to an overestimation of survival rates, because many studies have shown that DCO-cases tend to include patients with short survival times.

The second criterion concerns the quality of data on the vital status of patients . International studies show a very poor prognosis for patients diagnosed with pancreatic cancer or lung cancer with metastases. Furthermore, the average survival prospects for patients with these diagnoses have not changed substantially over a long period. This means that if a cancer registry reports a large proportion of surviving patients with these types of cancer it indicates deficiencies in the quality of the data (a substantial-proportion of 'missed' deaths). Therefore, registries were only included in the evaluation if patients diagnosed with pancreatic cancer or metastasised lung cancer showed an average relative 5-year survival rate of not more than 7.5 %.

After applying these two criteria, the cancer registries of Hamburg, Lower Saxony, Bremen, and Saarland were used in the evaluations, as well as the data from the Joint Cancer Registry for Brandenburg, Mecklenburg-West Pomerania, Saxony and Thuringia. The lowest andhighest values are presented for five year survival for the individual regions, and regions wereonly taken into account if they had at least 50 patients included in the analysis. If this criterion wasnot met by at least five regions then the range was not presented. According to past estimates, the presented range probably only reflects differences in the quality of treatment to a very small extent. Differences in the data quality or in the proportion of DCO cases can play a role, as can random fluctuations, above all in the smaller federal states. Methodological differences between the registries may influence the results, in particular the efforts made to follow back DCO cases. Overall, it can be assumed that the estimated survival rates forGermany are slightly overestimated, but this is probably the case for most international results too.

Distribution of stages of tumours

The extent of newly diagnosed solid malignant tumours is categorised by means of the TNM-classification: T refers to the size of the tumour, N to the regional lymph nodes that are involved, and M to distant metastases. For 2007 and 2008 the 6th edition of this classification was valid.

Given the data situation, only the T stages are presented here. For each cancer site the registries were included which had less than 50 % of reports missing (including DCO-cases). For NRW and Hesse the DCO-proportion was estimated on the basis of reports from other registries with comparable completeness. If fewer than five registries met the criteria for a cancer site then the T-stages were not presented.

5-year prevalence

The 5-year prevalence refers to the number of people living at a given time (here: 31.12.2008) who had been newly diagnosed with cancer within the previous five years, i.e. between 2004 and 2008. The prevalence is calculated using the Pisani method from the estimated incidence rates for Germany and the absolute survival rates calculated using the period method (according to age, sex, site, and calendar year) for the regions listed in the Survival rates subsection above.

3 Results

3.1 All cancer sites

Table 3.1.1
Overview of key epidemiological parameters for Germany, ICD-10 C00-97 without C44

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	243,900	215,100	246,700	223,100	*258,000*	*228,200*
Crude incidence rate[1]	605.5	512.5	613.0	532.7	*646.9*	*551.1*
Standardised incidence rate[1,2]	453.1	338.2	450.0	349.9	*441.2*	*350.0*
Median age at diagnosis	69	69	69	69		
Deaths	113,121	98,137	115,870	99,572		
Crude mortality rate[1]	280.8	233.8	288.0	237.8		
Standardised mortality rate[1,2]	205.9	129.8	205.6	130.5		
5-year prevalence	650,700	637,400	669,200	658,500	*697,900*	*698,000*
Absolute 5-year survival rate (2007–2008)[3]			50 (44-52)	57 (50-59)		
Relative 5-year survival rate (2007–2008)[3]			59 (52-60)	64 (57-66)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

'All cancer sites' refers here to all malignant neoplasms including lymphomas and leukaemias, but omitting non-melanoma skin cancer in line with international practice. A conservative estimate on the basis of data from the German cancer registries for 2008 suggests between 160,000 and 170,000 new cases of these so-called 'non-melanoma skin cancers' (mostly basal cell carcinomas). However, despite this large number of cases, these diseases only result in about 600 deaths each year, far fewer than for the much rarer malignant melanoma.

For the first time, the incidence estimatesof the Robert Koch Institute for Germany usedirect measurements in those cancer registries with sufficiently complete records. These are augmented by estimated values for the federal states in which diagnosed cases are not yet registered with sufficient completeness. The figures were calculated for the years 1999 to 2008. In comparison with the previous incidence estimates for2006, the newly calculated figures for the same year for all cancer sites differ by about + 3 % for men and + 6 % for women, for methodological reasons. In 2008, breast cancer is still the most common form for women, with approx. 71,700 cases. For men the most common form is still prostate cancer, with approx. 63,400 diagnosed cases.

The number of newly diagnosed cases of cancer in Germany increased between 1980 and 2006 by 35 % for women and by more than 80 % for men, while the age-standardised incidence rates increased by 15 % and 23 %, respectively. The changing demographic structure has led to these marked increases in incidence and mortality, particularly in the case of men. Since 1990, the incidence rates for 55- to 80-year-old men and 45- to 70-year-old women have increased, whereas the incidence rates for the younger age groups have decreased. This century, the number of cases of newly diagnosed cancer among men has increased more than for women, although the annual numbers of deaths caused by cancer have remainedalmost unchanged. Age-standardisedmortality rates have been decreasing for men and women since 1999, and incidence rates for men have beenmore or less constant. After 2005, there was an increase in the age-standardizedincidence for women, most probably due to the start of the mammography screening programme.

Cancer can occur in a wide range of bodily organs, and can originate from various cell types. Most cases of cancer originate at the internal and external surfaces of the body. Some 70 % are adenocarcinomas in glandular tissue. A further 10 % are squamous epithelial carcinomas or small-cell carcinomas, which occur for example in the lungs. In addition to leukaemias and lymphomas there are also rarer forms of cancer occurring for example in the nervous system or pigment-producing cells (melanomas). Rarer types of cancer include forms originating in the connective tissue, e.g. mesothelioma, and various sarcomas.

People in Germany are diagnosed with cancer at a median age of 69 years. Women die of cancer at a median age of 76 years, and men at73 years. Every second man and 43 % of all women develop cancer in the course of their life, but the age-pattern of inci-

dence differs considerably between the sexes. Whereas the age-specific incidence rate for women below 55 yearsofage is higher than the corresponding rate for men, above the age of 70 the incidence rate for men is nearly double that for women. For men, only 13 % of all cases of cancer are diagnosed before the age of 55, compared with 21 % for women.

The relative 5-year survival rates range from above 90 % for malignant melanoma of the skin, testicular cancer, and meanwhile also prostate cancer, to survival rates of less than 20 % for lung and oesophagus cancer, and below 10 % for pancreatic cancer. Compared to the survival rates from the 1980s in Saarland(50 % to 53 % for women and 38 % to 40 % for men), the recent survival rates of cancer patients in Germany have shown considerable improvements. Using the period method and including data from eight federal states for patients diagnosed in 2007 and 2008, 5-year relative survival rates of 59 % for men and 64 % for womenwere estimated. The improved overall cancer survival rates are due in part to shifts in the localisation spectrum, for example the decline in cases of stomach cancer and lung cancer among men (for which the prognoses are poor) and a larger proportion of colon, breast, and prostate cancer with better prognoses.

Risk factors and early detection

The aetiology of many cancers is not known, and in other cases, known risk factors cannot be influenced. Prevention strategies are therefore only available for a few tumour types. However, these include types of cancer which affect large numbers of people. The World Health Organization estimates that more than 30 % of all cancer cases could be avoidedwithpreventive measures.

Among avoidable risk factors, tobacco consumption is the most important. Also the roles of excess weight andlack of exercise have long been known from observational epidemiological investigations. Possible underlying biological mechanisms are being revealed by on-going research into the metabolic syndrome. This chronic "metabolic imbalance" is linked with hypertension, high blood cholesterol and hyperglycaemia. Inflammatory processes in adipose tissue are also suspected of being involved in the development of cancer. Avoidable risk factors also include exposure to ultra-violet radiation.

Among nutrition-related factors, alcohol consumption plays an important role. Insufficient fruit, vegetables, and dietary fibre, often combined with a high intake of red meat, have been identified as risk factors for a number of types of cancer. However it has not always been possible in observational studies to separate the influence of specific foodstuffs and their constituentsfrom that of the energy balance.

Many people, particularly in Germany, overestimate the influence of hazardoussubstances and impurities in foodstuffs, as well as environmental influences or exposure at the workplace. However, in certain cases these factors can also play a substantialrole in the development of cancer. An example is the regionally occurring noble gas radon, which is thought to be responsible for five to ten per cent of the lung cancer cases in Germany. Nor can the influence of medical procedures be generalised. Potential risks include diagnostic procedures and therapies involving exposure to radiation, cytostatic agents aschemotherapy, andhormone replacement therapy for menopausal women, which has been identified as a risk factor for breast cancer.

Chronic infections are now known to be risk factors for some widespread forms of cancer, and vaccinations or the treatment of causal factors can contribute to the reduction of cancer risk. This has been established for vaccinations against hepatitis viruses as a risk factor for liver cancer, and it is also hoped that vaccination against human papilloma viruseswill reduce the cervical carcinoma rate.

The relevant risk factors for specific types of cancer are presented in more detail in the individual sections.

The early detection programmes supported by the statutory health insurance companies in Germany screen for cancer of the skin and colon, cancer of the uterus and breast for women, and prostate cancer for men. These early detection measures are presented in the individual sections.

Figure 3.1.1a
Age-standardised incidence and mortality rates, ICD-10 C00 – 97 without C44, Germany, 1999 – 2008
100,000 (European standard)

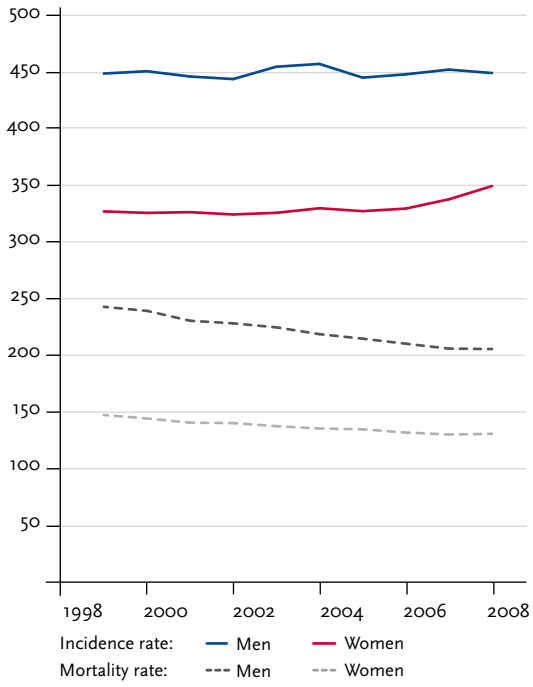


Figure 3.1.1b
Absolute numbers of incident cases and deaths, ICD-10 C00 – 97 without C44, Germany, 1999 – 2008

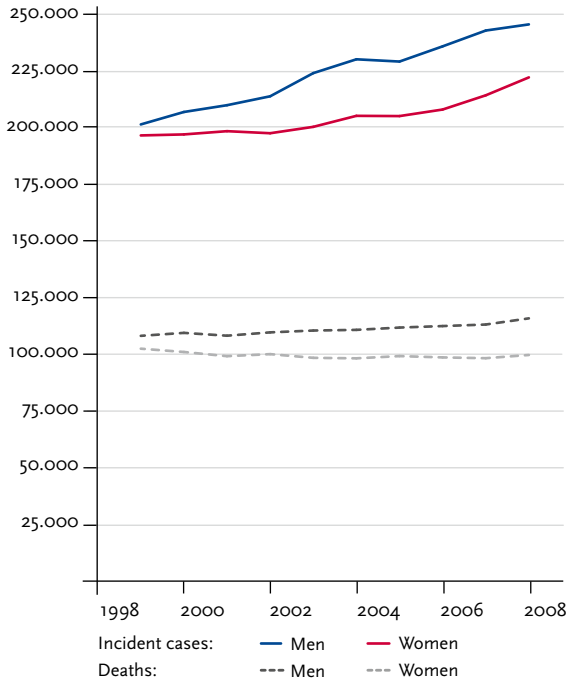


Figure 3.1.2
Distribution of T-stages at first diagnosis by sex
Not included because tumour stages are site-specific.

Figure 3.1.3a
Absolute survival rates up to 5 years after first diagnosis by sex, ICD-10 C00 – 97 without C44, Germany, 2007 – 2008

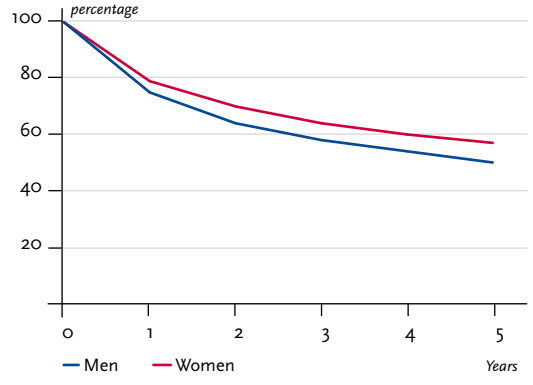


Figure 3.1.3b
Relative survival rates up to 5 years after first diagnosis by sex, ICD-10 C00 – 97 without C44, Germany, 2007 – 2008

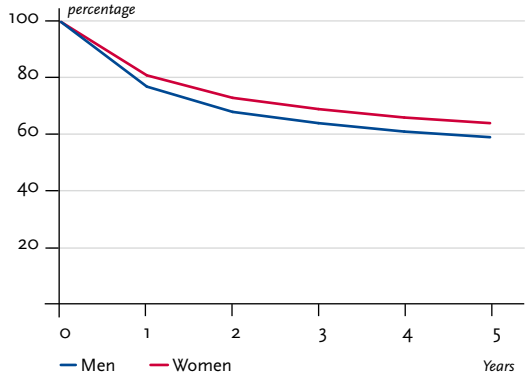


Figure 3.1.4
Age-specific incidence rates in Germany by sex, ICD-10 C00 – 97 without C44, 2007 – 2008
per 100,000

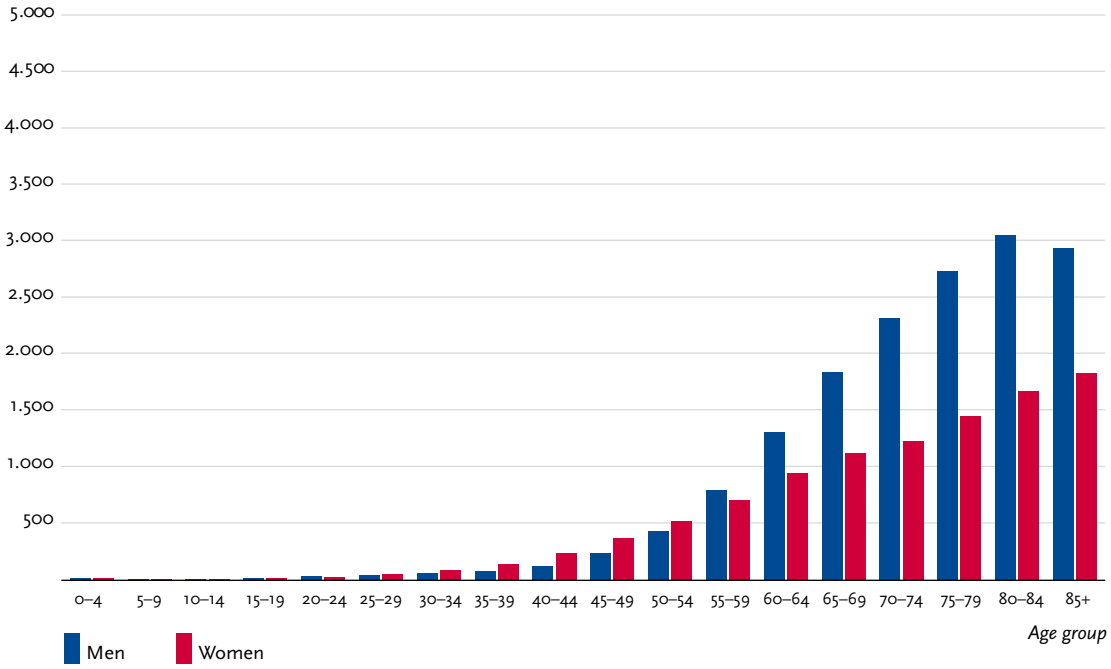


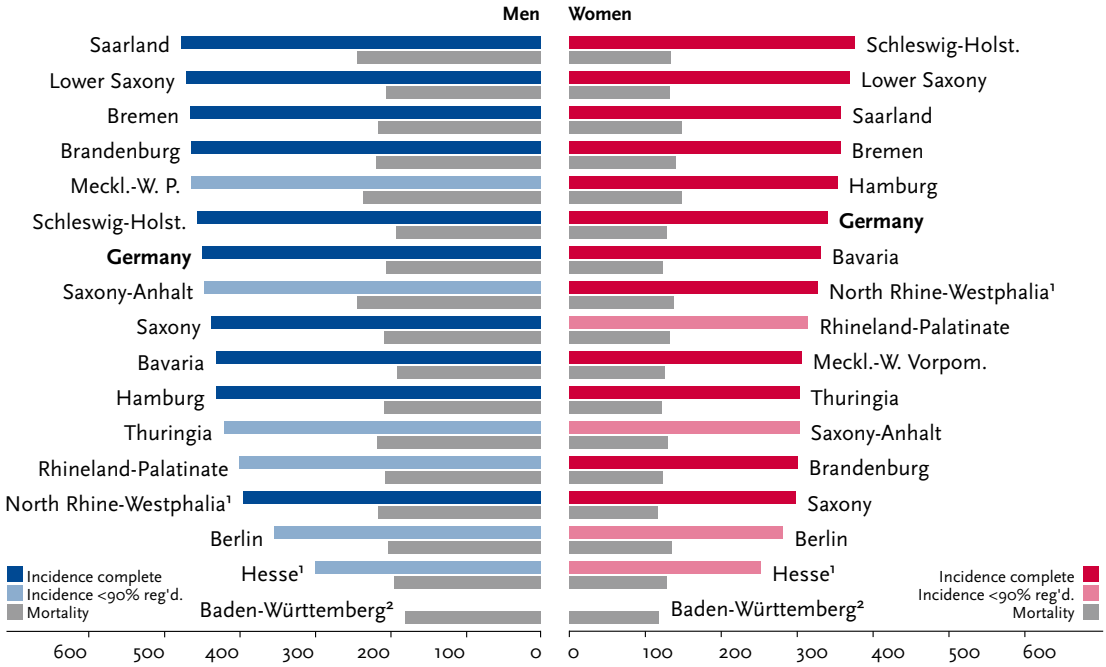
Table 3.1.2
Age-specific incidence rates in Germany by sex, ICD-10 C00 – 97 without C44, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	21.7	11.0	10.9	20.7	34.1	48.4	60.5	85.4	127.5	238.2	442.1	805.5	1,325.7	1,854.6	2,344.0	2,758.3	3,034.1	2,963.8
Woman	19.5	10.0	9.9	19.0	28.4	50.6	87.7	146.3	239.7	379.5	526.4	711.4	954.0	1,134.4	1,240.4	1,467.7	1,690.5	1,845.3

Table 3.1.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C00 – 97 without C44, database 2008

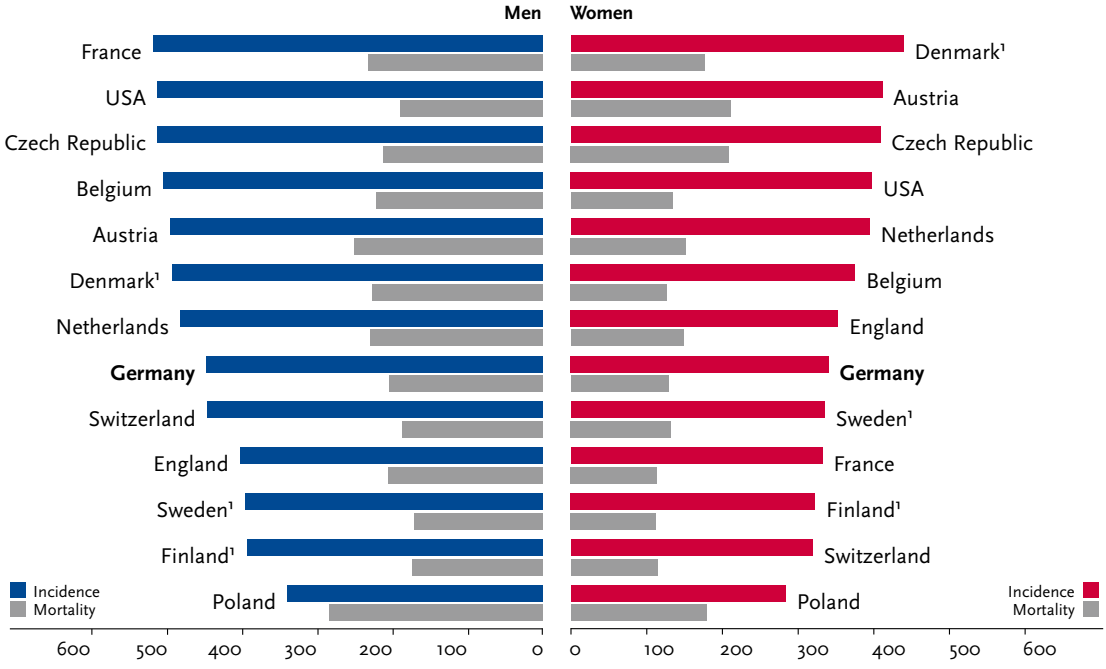
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	1.9%	(1 in 52)	51.0%	(1 in 2)	0.6%	(1 in 160)	26.3%	(1 in 4)
50 years	6.4%	(1 in16)	50.9%	(1 in 2)	2.4%	(1 in 41)	26.3%	(1 in 4)
60 years	15.8%	(1 in 6)	49.8%	(1 in 2)	5.9%	(1 in 17)	25.6%	(1 in 4)
70 years	25.4%	(1 in 4)	44.8%	(1 in 2)	10.9%	(1 in 9)	23.1%	(1 in 4)
Lifetime risk			50.7%	(1 in 2)			25.9%	(1 in 4)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	3.2%	(1 in 31)	42.1%	(1 in 2)	0.6%	(1 in 160)	20.2%	(1 in 5)
50 years	6.6%	(1 in 15)	40.5%	(1 in 2)	1.8%	(1 in 55)	19.8%	(1 in 5)
60 years	11.2%	(1 in 9)	36.9%	(1 in 3)	3.7%	(1 in 27)	18.6%	(1 in 5)
70 years	14.9%	(1 in 7)	30.3%	(1 in 3)	6.5%	(1 in 15)	16.2%	(1 in 6)
Lifetime risk			42.8%	(1 in 2)			20.2%	(1 in 5)

Figure 3.1.5
Registered age-standardised incidence rates in German federal states, ICD-10 C00 – 97 without C44, 2007 – 2008
per 100,000 (European standard)



¹ without DCOcases ² no incidence data

Figure 3.1.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C00 – 97 without C44, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ Including other tumours, e.g. benign brain neoplasms

3.2 Oral cavity and pharynx

Table 3.2.1
Overview of the key epidemiological parameters for Germany, ICD-10 C00 – 14

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	9,260	3,340	9,520	3,490	*10,100*	*3,800*
Crude incidence rate[1]	23.0	8.0	23.7	8.3	*25.3*	*9.1*
Standardised incidence rate[1,2]	18.7	5.7	19.1	5.9	*19.2*	*6.2*
Median age at diagnosis	61	65	61	66		
Deaths	3,650	1,127	3,776	1,170		
Crude mortality rate[1]	9.1	2.7	9.4	2.8		
Standardised mortality rate[1,2]	7.3	1.8	7.4	1.8		
5-year prevalence	23,000	9,500	23,700	9,900	*25,200*	*10,900*
Absolute 5-year survival rate (2007–2008)[3]			42 (40-45)	54 (50-59)		
Relative 5-year survival rate (2007–2008)[3]			46 (43-50)	60 (56-65)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Cancer of the oral cavity and the pharynx is made up of a heterogeneous group of malignant neoplasms. In 2008, some 13,000 new cases were diagnosed in Germany. More than 90 % were squamous epithelial carcinomas, but in the salivary gland region the majority were adenocarcinomas.

The relative 5-year survival rate for women, is 60 %, compared with 46 % for men. This difference is due in part to the fact that fewer women suffer from cancers of the floor of the mouth, tongue, and hypopharynx: Theseare all linked to tobacco and alcohol consumption and have less favourable prognoses than other malignant tumours e.g. those affecting the lips or salivary glands. In addition, every fourth tumour in women is diagnosed at an early stage (T1) compared with only every fifth tumour in men.

The fact that men are affected more frequently than women and are diagnosed at a younger median age is also linked to the risk factors tobacco and alcohol consumption. Women are diagnosed at a median age of 66 years, 5 years later than men.

The incidence rates for cancer of the oral cavity and pharynx have increased since the year 2000, while the age-standardised mortality rate has remained constant for women and has declined slightly for men. The highest incidence and mortality rates for women in Germany are reported from Hamburg and Bremen, and for men in Mecklenburg-West Pomerania. In an international comparison, France has the highest incidence rate among men.

Risk factors

The most important triggers for cancer of the oral cavity and pharynx are tobacco and alcohol consumption, and these reinforce one another. Further possible risk factors can be insufficient intake of fruit and vegetables, inadequate oral hygiene, and mechanical irritations, for example due to poorly fitting dentures. Exposure to sunlight can contribute to carcinoma of the lips. Regular or occupational contact with sawdust or some chemicals can increase the risk of developing tumours, in particular in the nasopharynx.

New light has been cast on the origins of cancer of the oral cavity and pharynx by research into the role of viruses, in particular in cases where known risk factors are not involved (e.g. non-smokers or teetotallers). Tumours caused by human papilloma viruses (HPV) may have a different course and a better prognosis. Epstein-Barr viruses are regarded as a further viral risk factor, in particular for nasopharyngeal carcinoma. People with Type II diabetes, a marked immunodeficiency or previous infection with some rare diseases may also have an increased risk, possibly linked in particular with the risk of an HPV infection.

Figure 3.2.1a
Age-standardised incidence and mortality rates, ICD-10 C00 – 14, Germany, 1999 – 2008
per 100,000 (European standard)

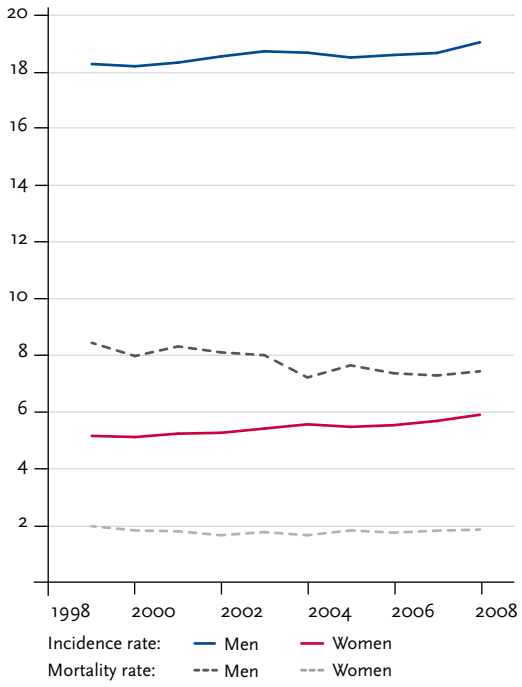


Figure 3.2.1b
Absolute numbers of new cases and deaths, ICD-10 C00 – 14, Germany, 1999 – 2008
per 100,000

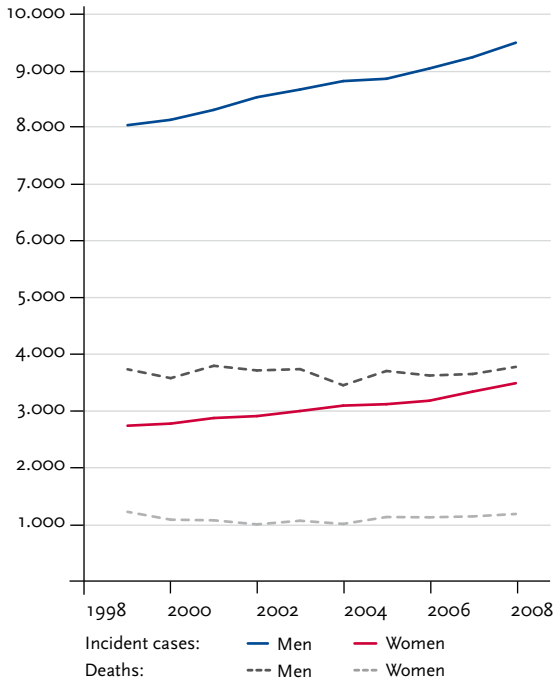


Figure 3.2.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: valid reports) ICD-10 C00 – 14, Germany, 2007 – 2008

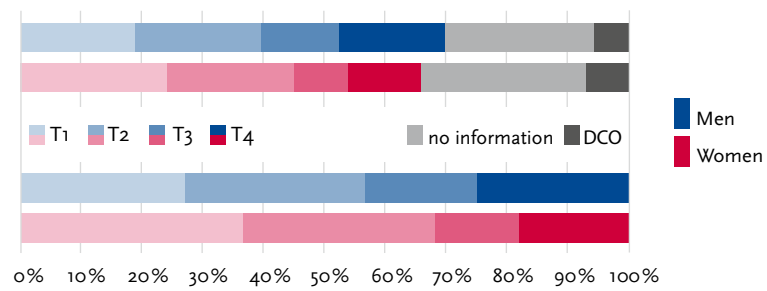


Figure 3.2.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C00 – 14, Germany, 2007 – 2008

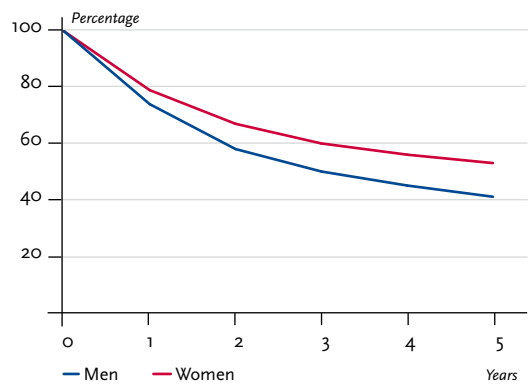


Figure 3.2.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C00 – 14, Germany, 2007 – 2008

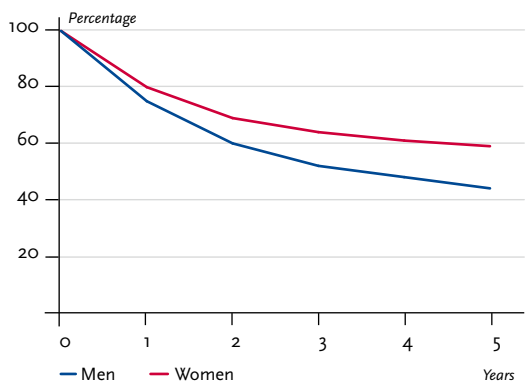


Figure 3.2.4
Age-specific incidence rates in Germany by sex ICD-10 C00 – 14, 2007 – 2008
per 100,000

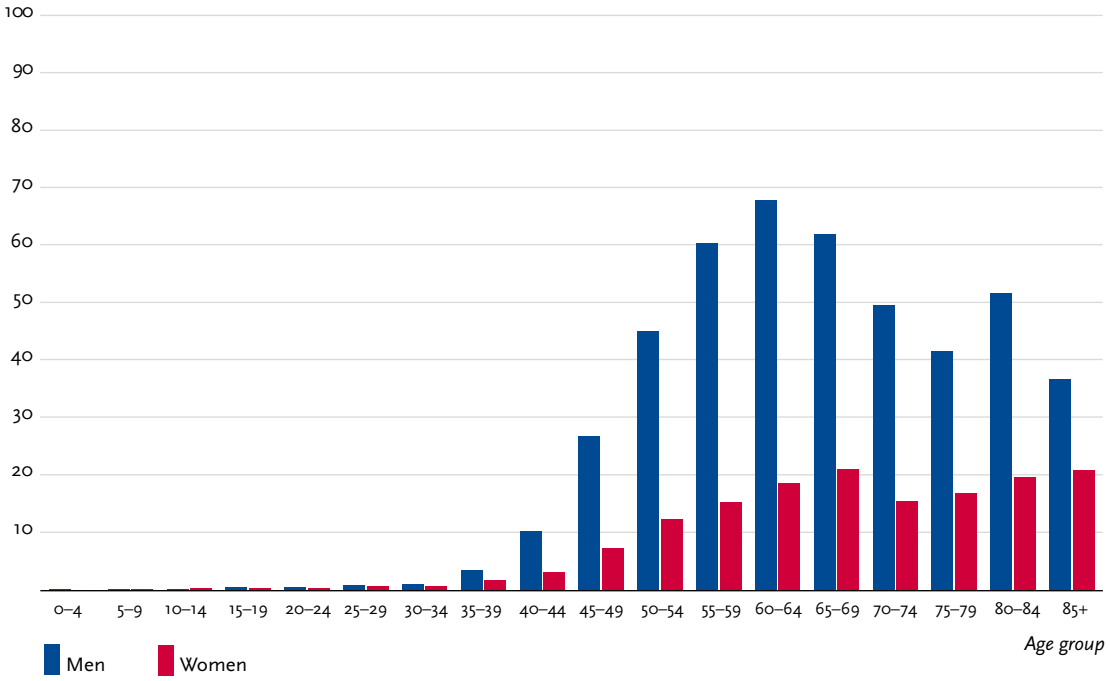


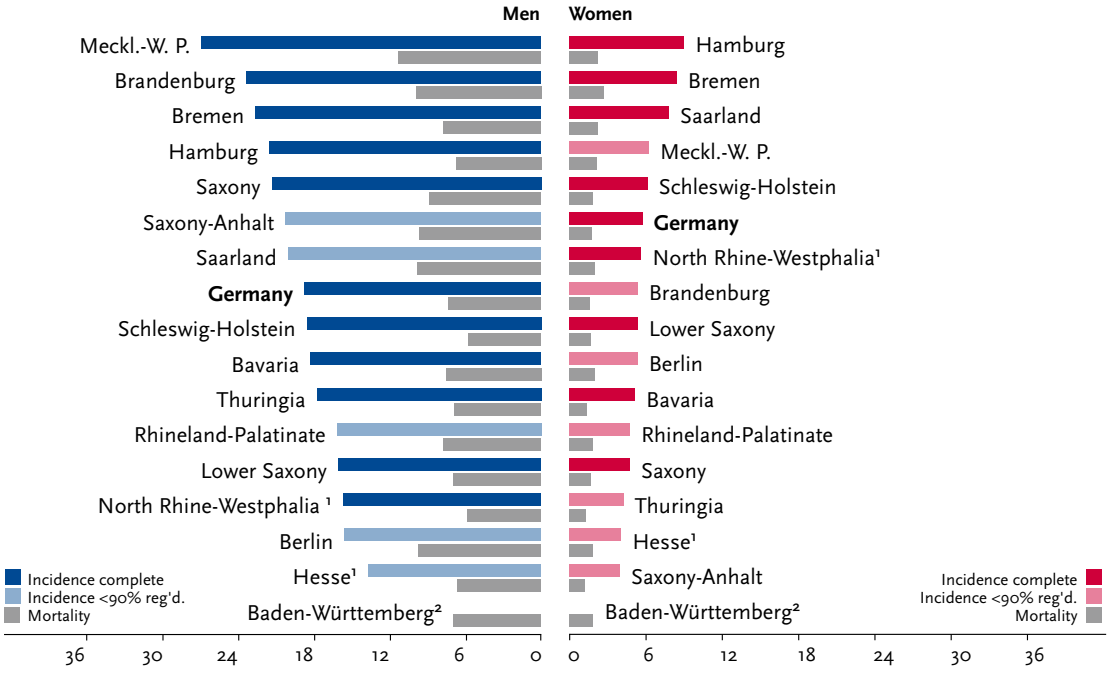
Table 3.2.2
Age-specific incidence rates in Germany by sex, ICD-10 C00 – 14, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.1	0.1	0.1	0.5	0.5	0.8	1.1	3.4	10.2	26.8	45.1	60.3	67.9	62.0	49.7	41.6	51.8	36.7
Woman	0.0	0.1	0.3	0.3	0.3	0.6	0.7	1.8	3.2	7.3	12.4	15.3	18.7	21.0	15.5	16.8	19.6	20.9

Table 3.2.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C00 – 14, database 2008

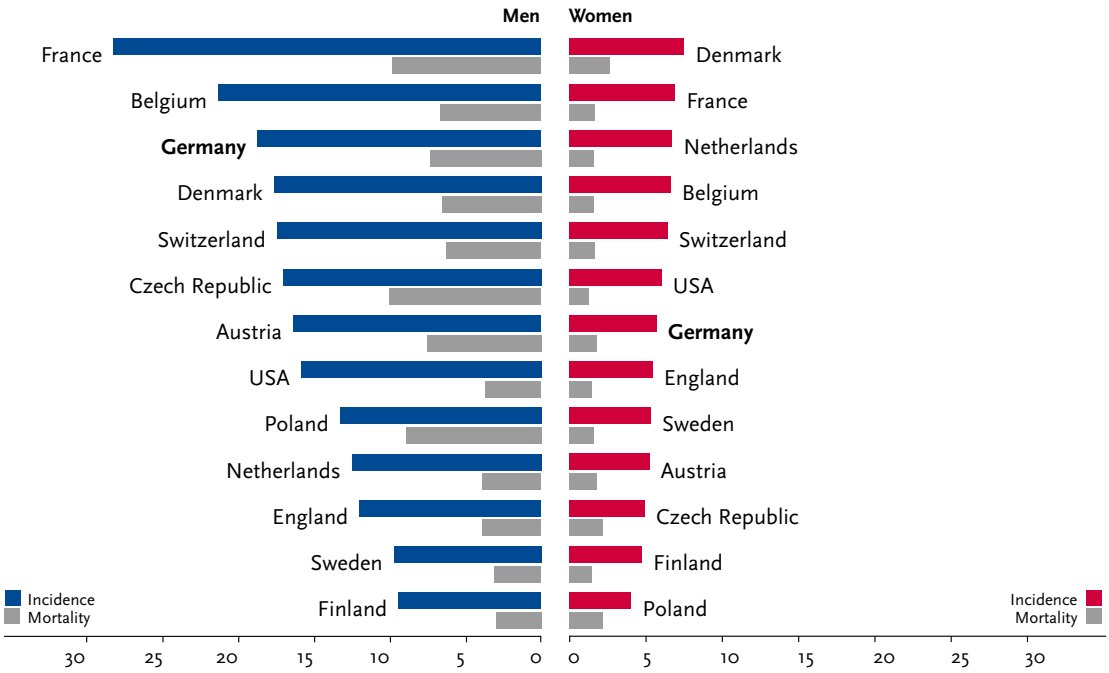
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2%	(1 in 540)	1.7%	(1 in 58)	0.1%	(1 in 1,700)	0.7%	(1 in 140)
50 years	0.5%	(1 in 200)	1.6%	(1 in 63)	0.2%	(1 in 530)	0.7%	(1 in 150)
60 years	0.6%	(1 in 160)	1.2%	(1 in 86)	0.2%	(1 in 400)	0.5%	(1 in 190)
70 years	0.4%	(1 in 250)	0.6%	(1 in 155)	0.2%	(1 in 530)	0.3%	(1 in 310)
Lifetime risk			1.7%	(1 in 58)			0.7%	(1 in 140)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,900)	0.6%	(1 in 160)	<0.1%	(1 in 7,700)	0.2%	(1 in 440)
50 years	0.1%	(1 in 730)	0.6%	(1 in 170)	<0.1%	(1 in 2,500)	0.2%	(1 in 460)
60 years	0.2%	(1 in 500)	0.5%	(1 in 210)	0.1%	(1 in 1,700)	0.2%	(1 in 540)
70 years	0.2%	(1 in 650)	0.3%	(1 in 330)	0.1%	(1 in 1,600)	0.1%	(1 in 720)
Lifetime risk			0.7%	(1 in 150)			0.2%	(1 in 440)

Figure 3.2.5
Registered age-standardised incidence rates in German federal states, ICD-10 C00 – 14, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.2.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C00 – 14, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.3 Oesophagus

Table 3.3.1
Overview of the key epidemiological parameters for Germany, ICD-10 C15

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	4,860	1,330	4,800	1,380	*5,300*	*1,400*
Crude incidence rate[1]	12.1	3.2	11.9	3.3	*13.2*	*3.5*
Standardised incidence rate[1,2]	9.3	2.0	9.0	2.1	*9.1*	*2.2*
Median age at diagnosis	67	69	67	69		
Deaths	3,725	1,120	3,655	1,135		
Crude mortality rate[1]	9.3	2.7	9.1	2.7		
Standardised mortality rate[1,2]	7.0	1.6	6.8	1.6		
5-year prevalence	6,200	1,700	6,300	1,800	*6,700*	*1,900*
Absolute 5-year survival rate (2007–2008)[3]			14 (8-21)	17 (7-27)		
Relative 5-year survival rate (2007–2008)[3]			16 (10-24)	20 (8-30)		

[1] per 100,000 persons [2] age-standardised(European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In Germany, cancer of the oesophagus accounts for about 3 % of all deaths due to cancer in men, and some 1 % in women. Four to five-times more men in Germany are diagnosed with this cancer than women, which is attributable to the most important risk factors alcohol and tobacco consumption. In addition, men are diagnosed at a median age of 67 years with cancer of the oesophagus, which is two years earlier than women.

The age-standardised incidence and mortality rates have increased slightly for women since the start of this millennium and have remained more or less unchanged for men.

Despite considerable improvements in recent years, the survival prospects for patients with cancer of the oesophagus are still not favourable. The relative 5-year survival rates are currently 16 % for men and 20 % for women. This is partly due to the fact that only some 7 % of all cases are diagnosed at an early stage (T1).

Squamous epithelial carcinomas account for 50 % to 60 % of all cases of cancer of the oesophagus., Adenocarcinomas, which are mainly found in the lower third of the oesophagus, showed a marked increase in recent years and now account for 25 % to 30 % of cases.

Risk factors

The most important risk factors for the development of the more frequent squamous epithelial carcinoma in the oesophagus include alcohol and tobacco consumption. In combination, the two factors reinforce one another. Studies have also shown a possible protective effect of vegetables and fruit. For squamous epithelial carcinomas at the transition between stomach and oesophagus,changes to the mucous lining as a result of long-term infection with Helicobacter pylori bacteria can also play a part.

Adenocarcinomas frequently originate in connection with a gastro-oesophageal reflux disease (long-term flow of gastric juices back into the oesophagus, chronic heartburn). This leads to changes to the mucous lining of the lower part of the oesophagus, causing a Barrett oesophagus, which is regarded as a precursor to cancer.

Recently, adenocarcinomas of the oesophagus have been associated with smoking and with smokingand possibly also with overweight and Type II diabetes. Diet-related risk factors also play an important but possibly indirect role for adenocarcinomas risk factors. Family clusters of cases are known, but these may possibly be attributable to shared lifestyle risks. A possible influence of the human papilloma viruses is a topic of debate.

Figure 3.3.1a
Age-standardised incidence and mortality rates, ICD-10 C15, Germany, 1999 – 2008
per 100,000 (European standard)

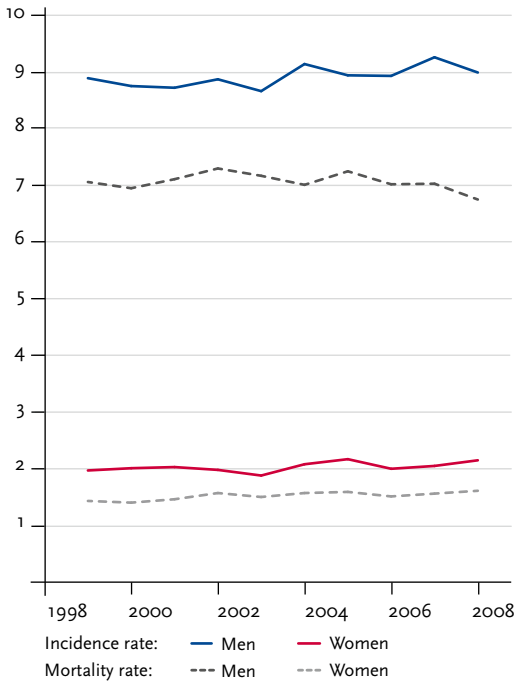


Figure 3.3.1b
Absolute numbers of new cases and deaths, ICD-10 C15, Germany, 1999 – 2008

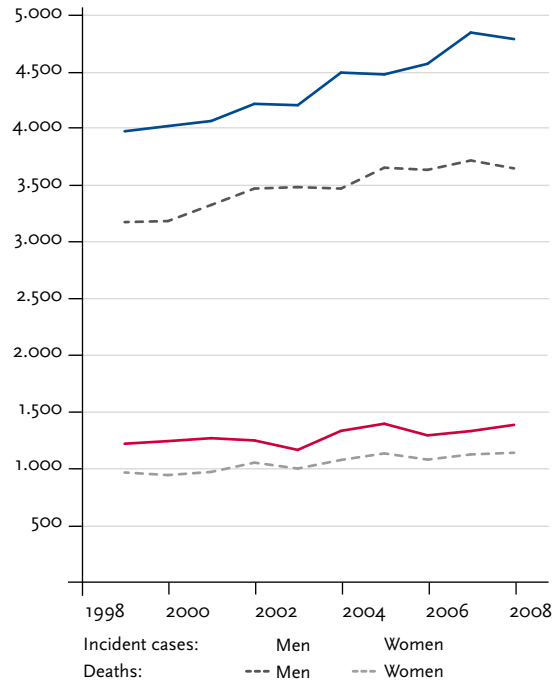


Figure 3.3.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C15, Germany, 2007 – 2008

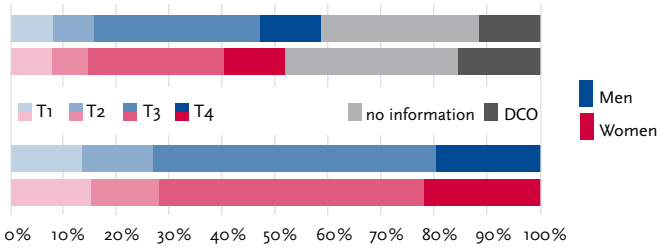


Figure 3.3.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C15, Germany, 2007 – 2008

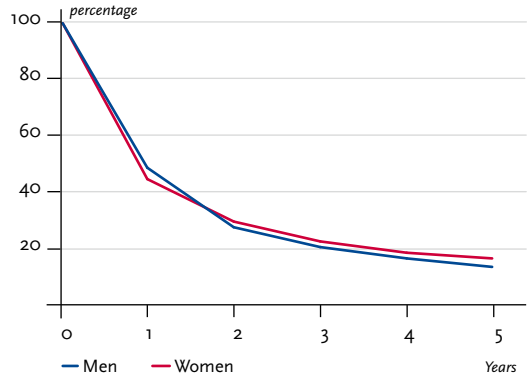


Figure 3.3.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C15, Germany, 2007 – 2008

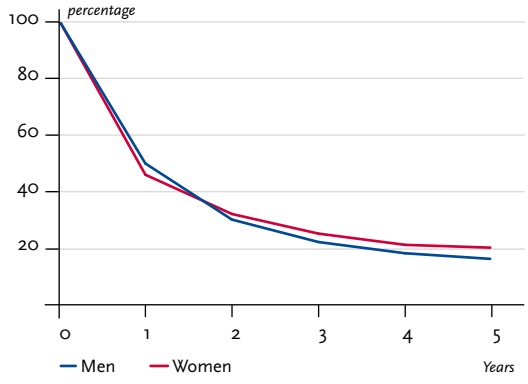


Figure 3.3.4
Age-specific incidence rates in Germany by sex ICD-10 C15, 2007 – 2008
per 100,000

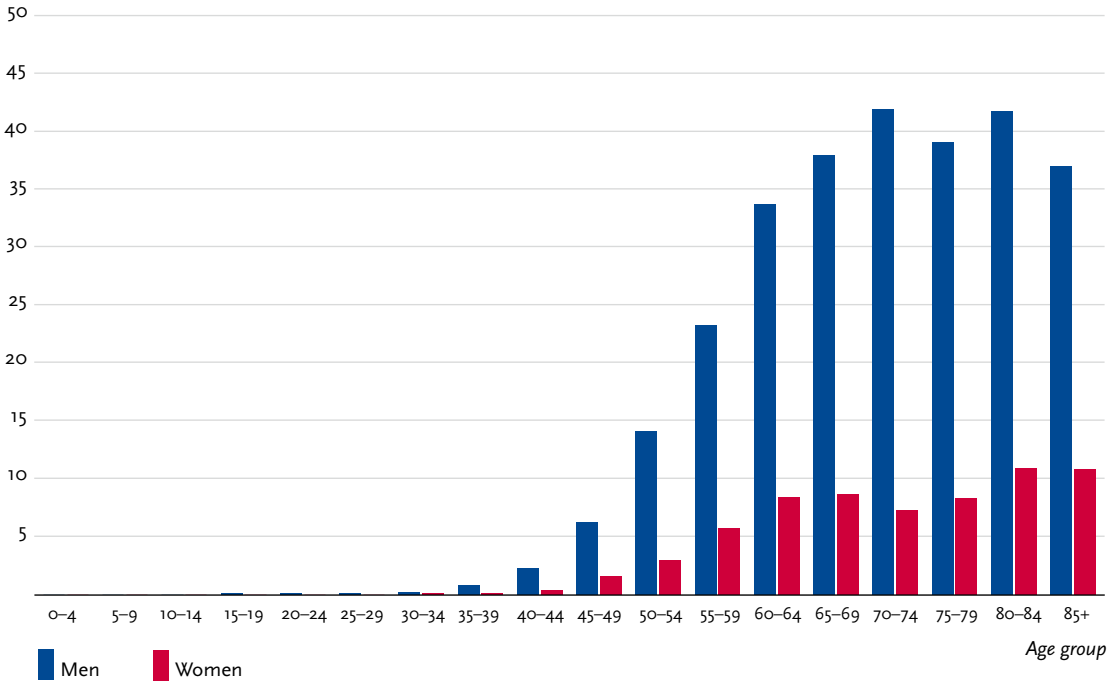


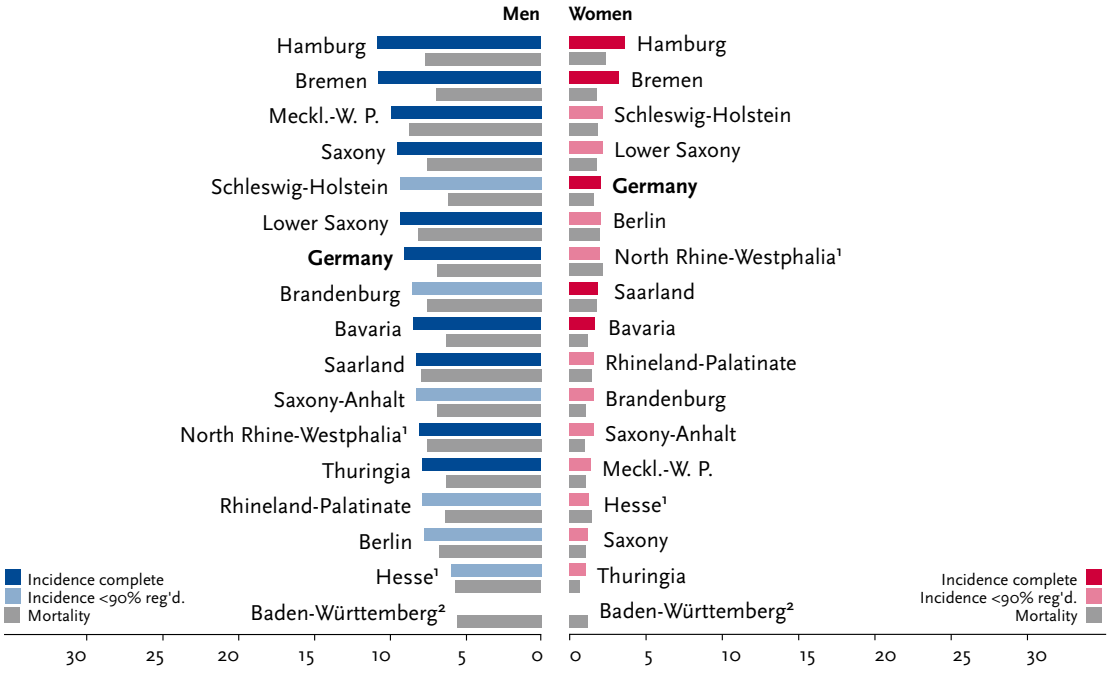
Table 3.3.2
Age-specific incidence rates in Germany by sex, ICD-10 C15, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.8	2.3	6.3	14.2	23.4	33.9	38.2	42.2	39.3	42.0	37.2
Woman	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4	1.6	3.0	5.8	8.5	8.7	7.3	8.4	11.0	10.9

Table 3.3.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C15, database 2008

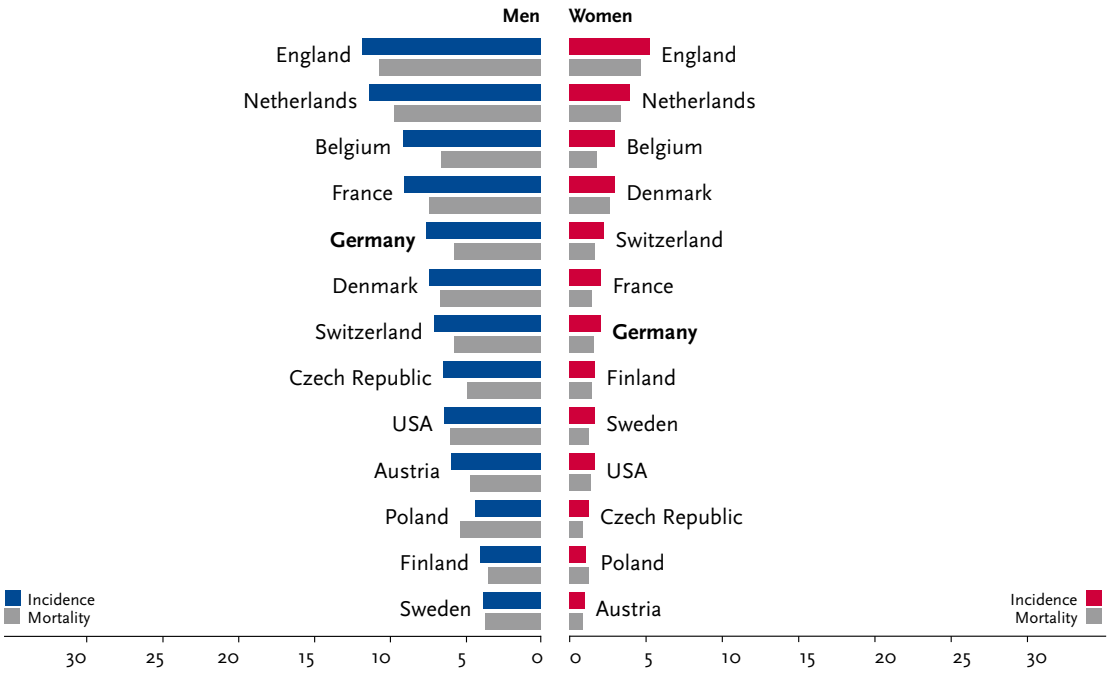
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,100)	0.9%	(1 in 110)	<0.1%	(1 in 3,200)	0.7%	(1 in 140)
50 years	0.2%	(1 in 560)	0.9%	(1 in 110)	0.1%	(1 in 790)	0.7%	(1 in 140)
60 years	0.3%	(1 in 310)	0.8%	(1 in 130)	0.2%	(1 in 410)	0.6%	(1 in 160)
70 years	0.3%	(1 in 290)	0.6%	(1 in 180)	0.3%	(1 in 370)	0.5%	(1 in 220)
Lifetime risk			0.9%	(1 in 110)			0.7%	(1 in 140)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 9,400)	0.3%	(1 in 370)	<0.1%	(1 in 16,000)	0.2%	(1 in 440)
50 years	<0.1%	(1 in 2,200)	0.3%	(1 in 380)	<0.1%	(1 in 3,800)	0.2%	(1 in 450)
60 years	0.1%	(1 in 1,200)	0.2%	(1 in 440)	0.1%	(1 in 1,800)	0.2%	(1 in 490)
70 years	0.1%	(1 in 1,400)	0.2%	(1 in 650)	0.1%	(1 in 1,400)	0.2%	(1 in 620)
Lifetime risk			0.3%	(1 in 370)			0.2%	(1 in 440)

Figure 3.3.5
Registered age-standardised incidence rates in German federal states, ICD-10 C15, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.3.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C15, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.4 Stomach

Table 3.4.1
Overview of the key epidemiological parameters for Germany, ICD-10 C16

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	9,570	6,840	9,210	6,660	*9,100*	*6,200*
Crude incidence rate[1]	23.7	16.3	22.9	15.9	*22.8*	*14.9*
Standardised incidence rate[1,2]	17.8	8.9	16.8	8.6	*15.7*	*7.7*
Median age at diagnosis	71	76	71	76		
Deaths	5,846	4,641	5,929	4,581		
Crude mortality rate[1]	14.5	11.1	14.7	10.9		
Standardised mortality rate[1,2]	10.6	5.7	10.5	5.6		
5-year prevalence	15,700	11,300	15,800	11,200	*15,400*	*10,400*
Absolute 5-year survival rate (2007–2008)[3]			25 (15-30)	26 (15-36)		
Relative 5-year survival rate (2007–2008)[3]			30 (18-36)	31 (19-42)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

For more than 30 years in Germany – as in other industrialised nations – there has been a steady decline in the incidence and mortality rates for stomach cancer. Men are diagnosed at a median age of 71 years, women at 76 years. This is above all due to the greater life expectancy of women and the larger number of older women in the population. One in 74 women and one in 51 men can currently expect to develop stomach cancer.

The survival prospects with stomach cancer have improved recently, but in comparison with other types of cancer they remain less favourable. The relative 5-year survival rates are about 30 %. The stage of the tumour at diagnosis is only reported in just over half the cases – and of these most cases in men and in women are diagnosed in stages T2 or T3.

Histologically various forms of adenocarcinomas predominate in the stomach, some of which are only found there, for example signet ring cell carcinoma (15 %) or certain neuroendocrinal carcinomas.

Particularly for men, there are appreciable higher incidence and mortality rates in the federal states of eastern Germany than in western Germany; similar differences are also found between the eastern and western neighbours of Germany.

Risk factors

A bacterial infection of the stomach with Helicobacter pylori is the most important risk factor, and this can probably reinforce the effects of other risks. A diet low in fresh fruit and vegetables, and the frequent consumption of meat, heavily salted, grilled, pickled or smoked foods can also increase the incidence of stomach cancer. In addition, smoking and excessive alcohol consumption clearly exert an unfavourable influence. There are indications that chronic heartburn or gastro-oesophageal reflux increases the risk for certain forms of tumour at the transition from the stomach to the oesophagus. Overweight can also promote these carcinomas. It is not possible at present to quantify the contributions of the known risks. Many people with stomach cancer have no signs of risk factors in the medical history.

First-degree relatives of patients have twice or three-times the risk of the normal population. However, it is not always clear whether this is due to a shared lifestyle, the transfer of Helicobacter pylori within the family, or hereditary gene mutations. In the case of young patients it can be appropriate for the relatives to receive genetic counselling, also for members of families with rare hereditary bowel cancer (HNPCC, Lynch syndrome). Pernicious anaemia, Ménétrier's disease and other diseases predispose to cancer, but only affect relatively few people. Among the mostly benign stomach polyps only the rare adenoma is regarded as a cancer precursor.

Figure 3.4.1a
Age-standardised incidence and mortality rates, ICD-10 C16, Germany, 1999 – 2008
per 100,000 (European standard)

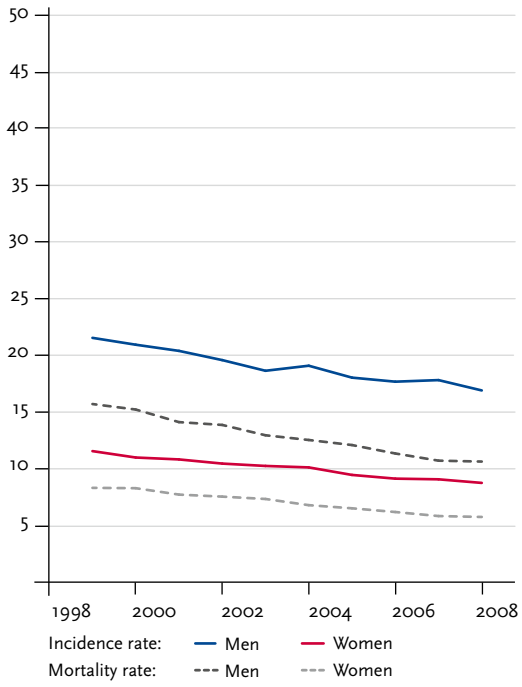


Figure 3.4.1b
Absolute numbers of new cases and deaths, ICD-10 C16, Germany, 1999 – 2008

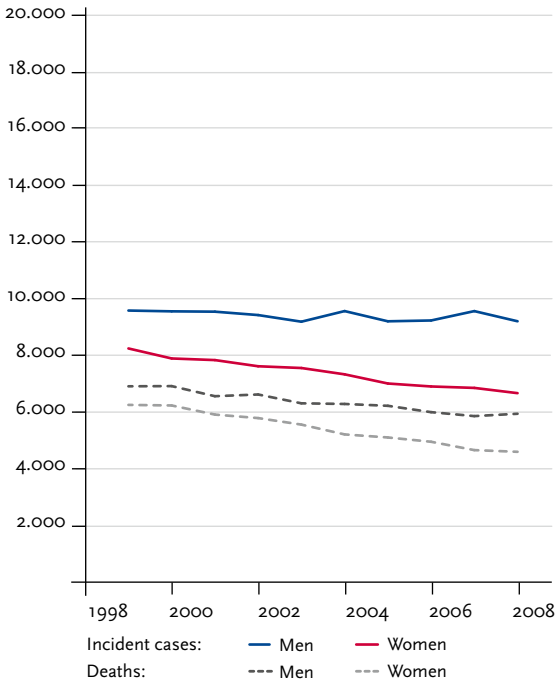


Figure 3.4.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C16, Germany, 2007 – 2008

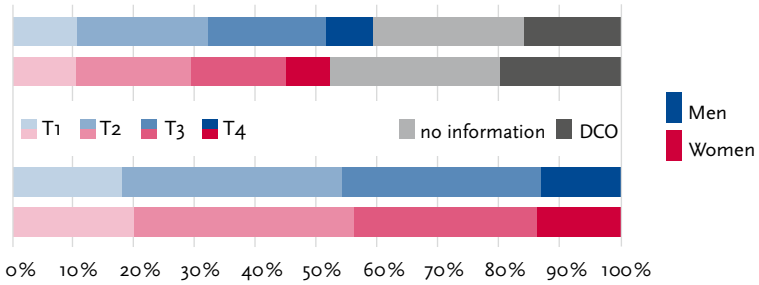


Figure 3.4.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C16, Germany, 2007 – 2008

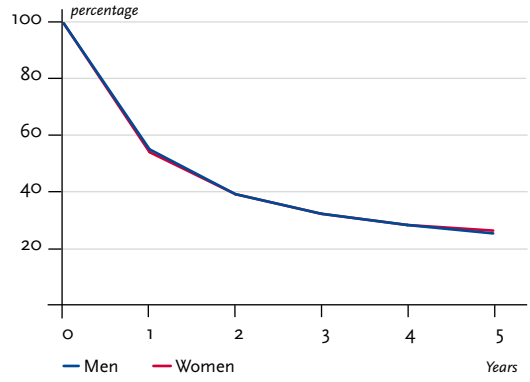


Figure 3.4.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C16, Germany, 2007 – 2008

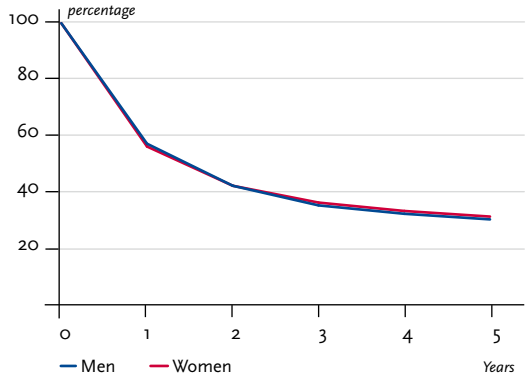


Figure 3.4.4
Age-specific incidence rates in Germany by sex ICD-10 C16, 2007 – 2008
per 100,000

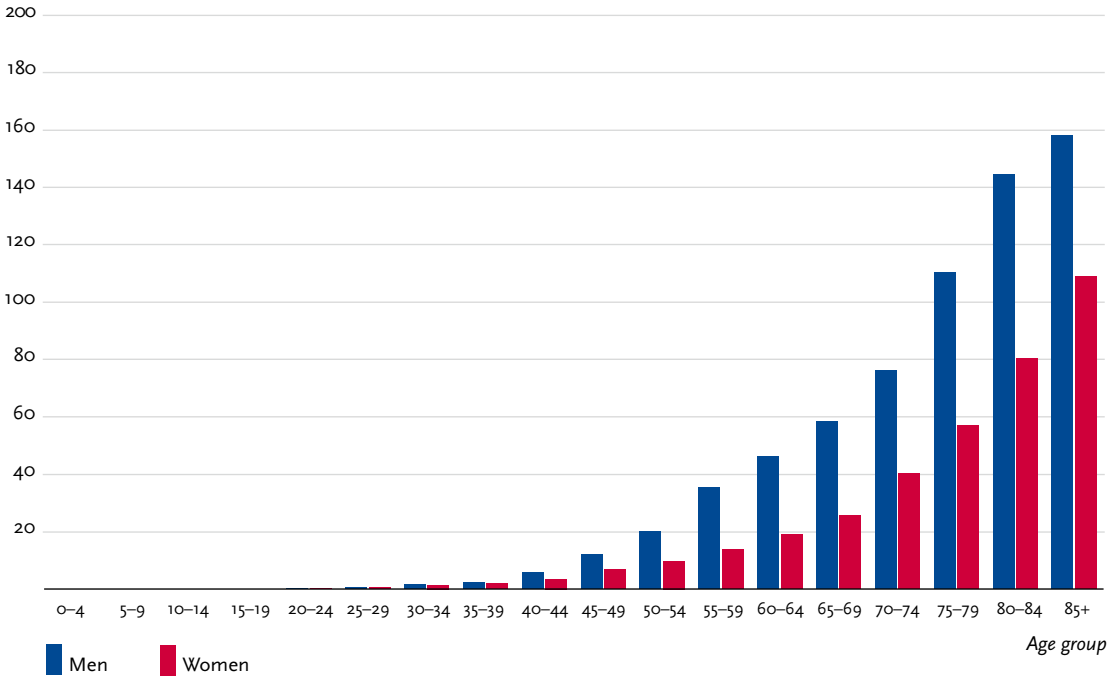


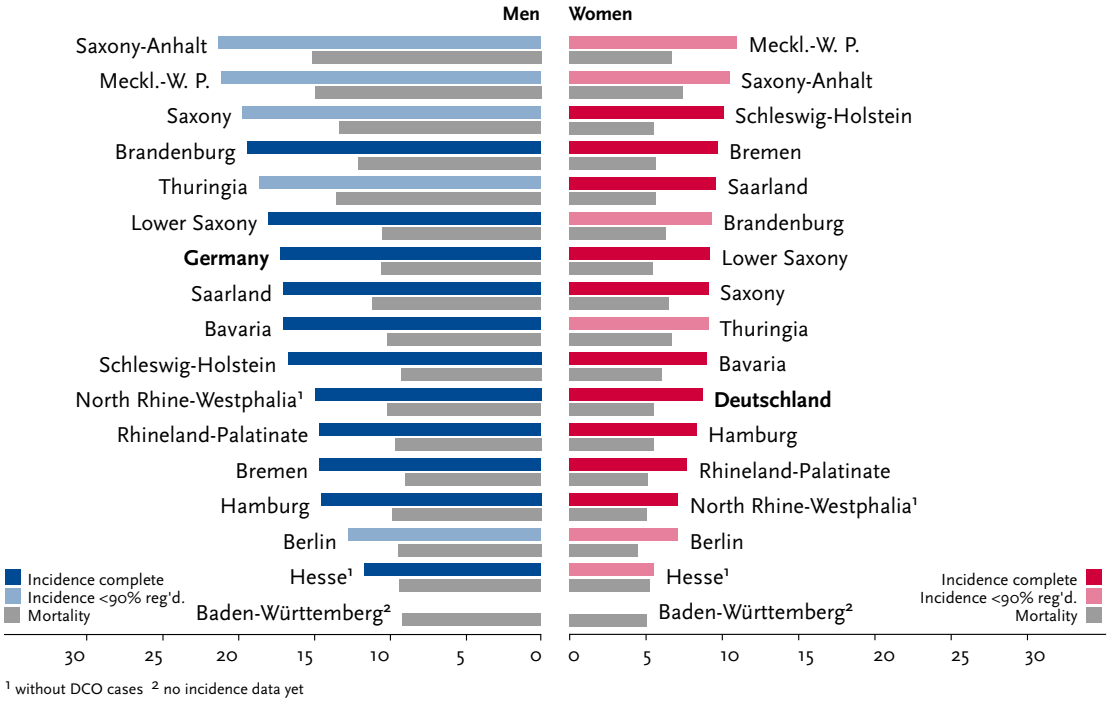
Table 3.4.2
Age-specific incidence rates in Germany by sex, ICD-10 C16, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.3	0.5	1.5	2.2	5.7	12.1	20.2	35.4	46.3	58.5	76.5	110.6	144.9	158.4
Woman	0.0	0.0	0.0	0.2	0.3	0.6	1.4	2.0	3.5	6.7	9.8	13.9	19.0	25.8	40.5	57.2	80.6	109.2

Table 3.4.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C16, database 2008

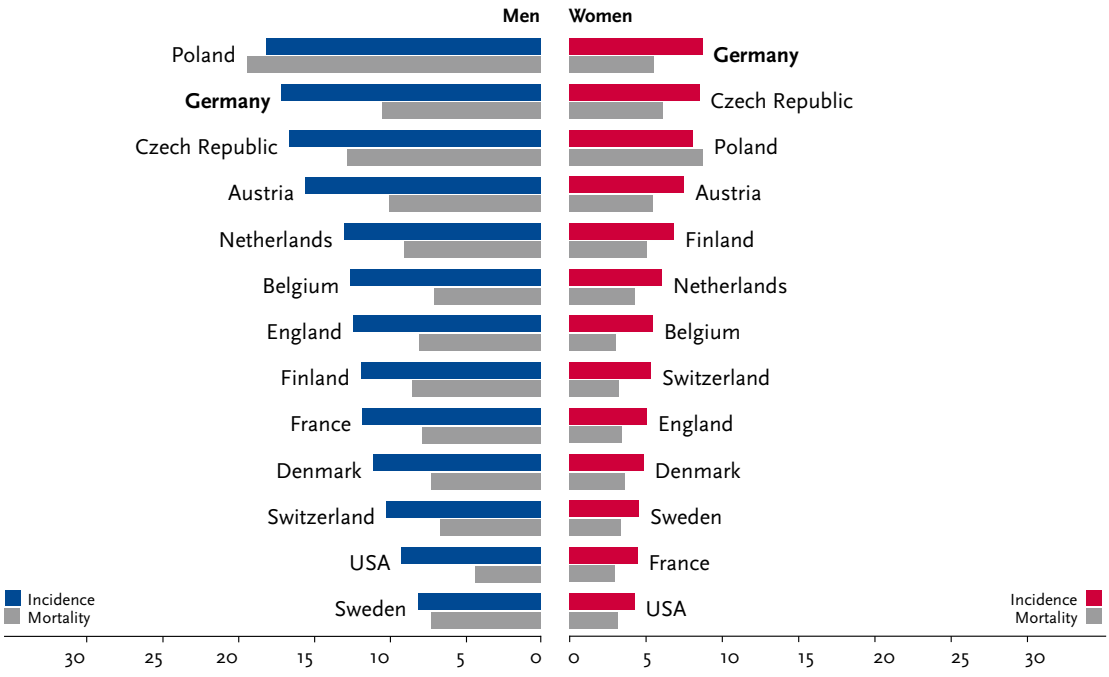
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,200)	2.0%	(1 in 50)	<0.1%	(1 in 2,500)	1.4%	(1 in 72)
50 years	0.3%	(1 in 380)	2.0%	(1 in 51)	0.1%	(1 in 820)	1.4%	(1 in 73)
60 years	0.5%	(1 in 210)	1.8%	(1 in 55)	0.3%	(1 in 390)	1.3%	(1 in 75)
70 years	0.8%	(1 in 130)	1.6%	(1 in 63)	0.6%	(1 in 180)	1.3%	(1 in 79)
Lifetime risk			2.0%	(1 in 51)			1.4%	(1 in 73)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,900)	1.3%	(1 in 74)	<0.1%	(1 in 3,400)	1.0%	(1 in 110)
50 years	0.1%	(1 in 850)	1.3%	(1 in 76)	0.1%	(1 in 1,500)	0.9%	(1 in 110)
60 years	0.2%	(1 in 470)	1.2%	(1 in 81)	0.1%	(1 in 790)	0.9%	(1 in 110)
70 years	0.4%	(1 in 230)	1.1%	(1 in 90)	0.3%	(1 in 350)	0.8%	(1 in 120)
Lifetime risk			1.3%	(1 in 74)			1.0%	(1 in 110)

Figure 3.4.5
Registered age-standardised incidence rates in German federal states, ICD-10 C16, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.4.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C16, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.5 Colon and rectum

Table 3.5.1
Overview of the key epidemiological parameters for Germany, ICD-10 C18 – 21

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	34,960	30,300	35,350	30,040	*38,300*	*31,100*
Crude incidence rate[1]	86.8	72.2	87.9	71.7	*95.9*	*75.1*
Standardised incidence rate[1,2]	63.7	40.2	63.0	39.4	*63.0*	*39.3*
Median age at diagnosis	71	75	71	75		
Deaths	13,385	13,048	13,726	12,936		
Crude mortality rate[1]	33.2	31.1	34.1	30.9		
Standardised mortality rate[1,2]	24.0	15.2	24.0	14.7		
5-year prevalence	100,300	87,200	103,100	87,800	*109,400*	*88,600*
Absolute 5-year survival rate (2007–2008)[3]			52 (40-54)	52 (43-56)		
Relative 5-year survival rate (2007–2008)[3]			63 (49-64)	62 (52-65)		

[1] per 100,000 persons [2] age-standardised(European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

About every seventh case of cancer in Germany originates in the bowel, and in 2008 some 35,000 men and 30,000 women were diagnosed, in addition to some 4,500 in situ tumours. Nearly two thirds of tumours were located in the large intestine, some 30% affecting the rectum, the remainder are located at the transition between the colon and rectum (rectosigmoid) or the anus. The very rare upper intestinal tumours (C17) are not included in this group, in line with international practice. Histologically, adenocarcinomas predominate, with the exception of the squamous epithelial carcinomas of the anus and the rare neuroendocrinal tumours (approx. 1 %).

The risk of developing disease increases steadily with advancing age. More than half the cases were diagnosed after the age of 70 years, only about 10 % before 55 years of age. The age-standardised incidence rates for women have recently shown a slight downward trend. Rates for men have remained fairly stable, although due to demographic effects there has been an increase in the absolute number of cases. The age-standardised mortality rates for men and women have declined by more than 20 % over the past ten years. In 2008, some 3,000 fewer women died of bowel cancers than in 1999, while the number for men remained about the same. Colorectal cancer has a moderately good prognosis, and five years after diagnosis about half the patients are still alive.

Risk factors

The risk of suffering colorectal cancer is increased by being overweight, by insufficient exercise, and by a diet which is low in fibres and rich in fats, with a high proportion of red meat and processed meats and a low proportion of vegetables. Regular consumption of alcohol or tobacco also has an unfavourable effect. People with first degree relatives with bowel cancer are themselves more frequently affected. There is an elevated risk of developing cancer in early years in the cases of the very rare familial adenomatous polyposis (FAP) and the hereditary Lynch syndrome (non-polyposis colorectal cancer). Chronic inflammatory bowel diseases also slightly increase the risk of developing cancer.

Early detection

Under the screening programmes of the statutory health insurance companies, people aged 50 to 54 years can have an annual test for blood in stool. From the age of 55 years they are entitled to a colonoscopy investigation, in the course of which colon polyps, which may develop into malignant tumours, can also be removed. If there are no pathological findings, they canhave a repeat examination after ten years.

Alternatively the above-mentioned test for blood in stool can be repeated every two years above the age of 55 years, with a follow-up colonoscopy where clarification is required. Special provisions are made for people with an increased risk.

Figure 3.5.1a
Age-standardised incidence and mortality rates, ICD-10 C18 – 21, Germany, 1999 – 2008
per 100,000 (European standard)

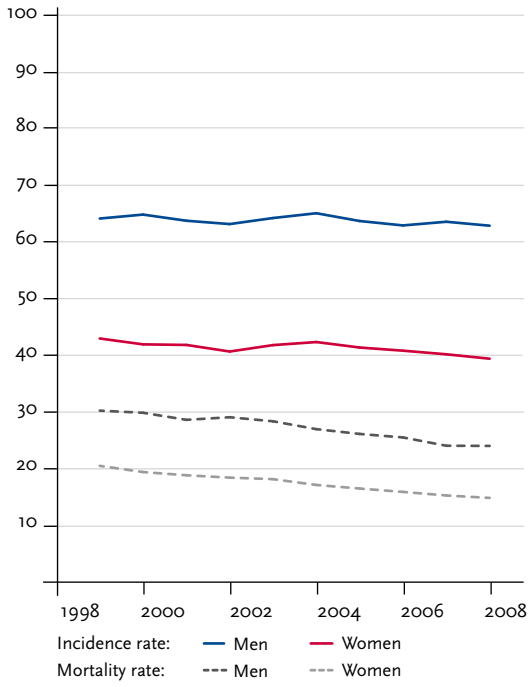


Figure 3.5.1b
Absolute numbers of new cases and deaths, ICD-10 C18 – 21, Germany, 1999 – 2008

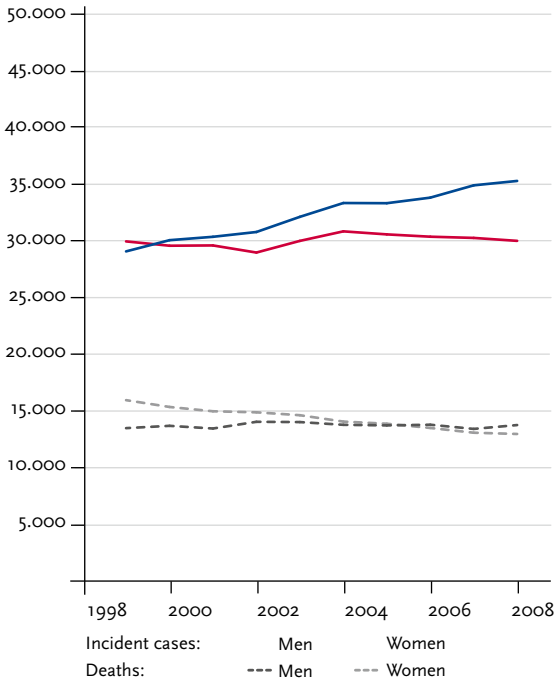


Figure 3.5.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C18 – 21, Germany, 2007 – 2008

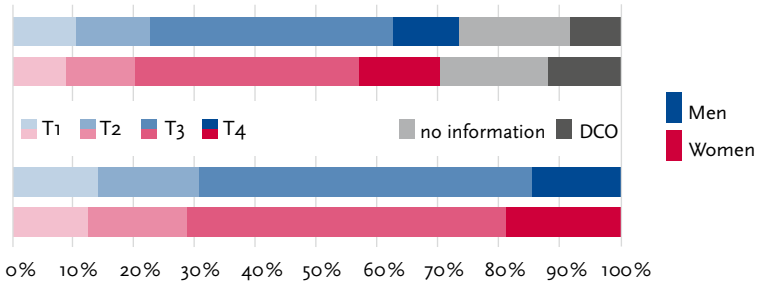


Figure 3.5.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C18 – 21, Germany, 2007 – 2008

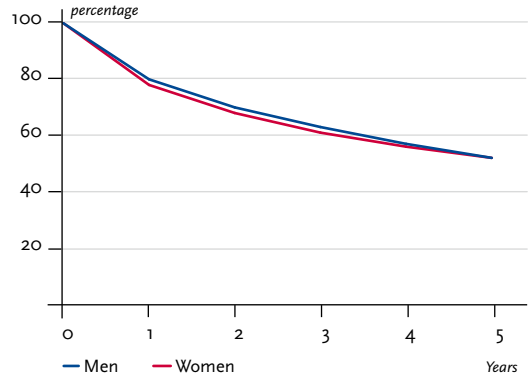


Figure 3.5.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C18 – 21, Germany, 2007 – 2008

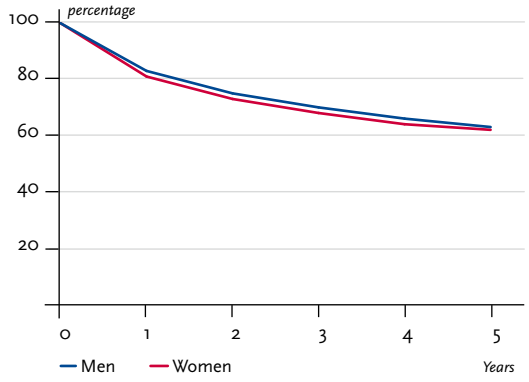


Figure 3.5.4
Age-specific incidence rates in Germany by sex ICD-10 C18 – 21, 2007 – 2008
per 100,000

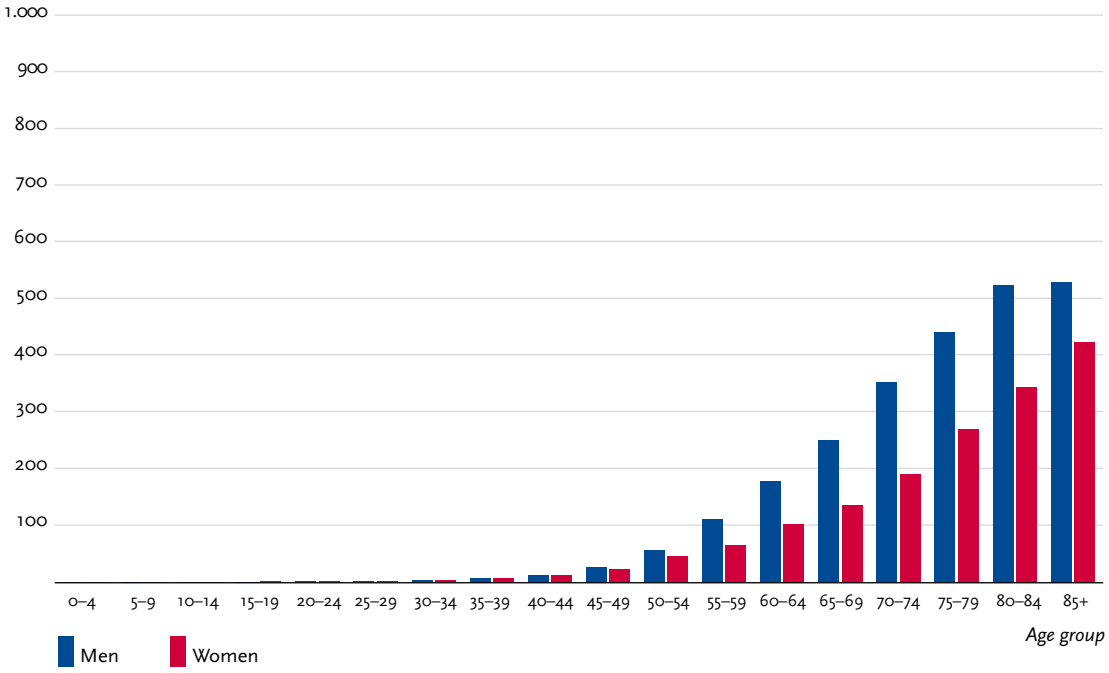


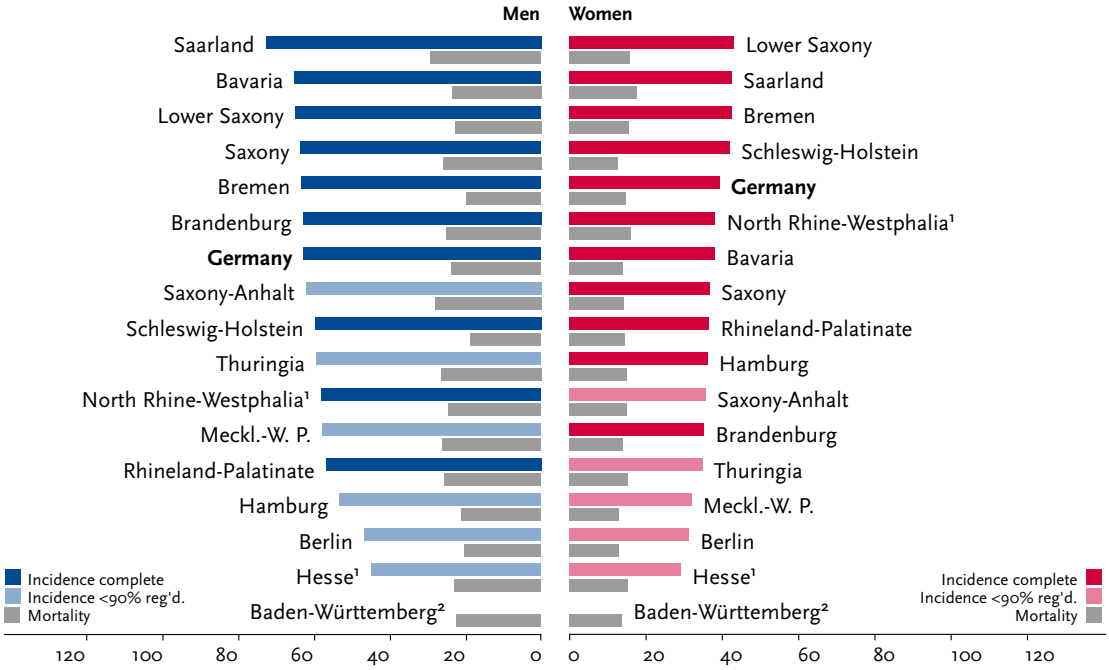
Table 3.5.2
Age-specific incidence rates in Germany by sex, ICD-10 C18 – 21, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.1	0.0	0.5	0.9	1.5	3.2	7.2	12.9	27.2	56.3	111.6	178.0	250.8	353.0	441.9	526.0	531.3
Woman	0.0	0.0	0.0	0.7	0.7	1.3	2.9	6.4	11.8	22.8	45.9	64.6	103.3	135.4	191.6	270.5	345.2	424.7

Table 3.5.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C18 – 21, database 2008

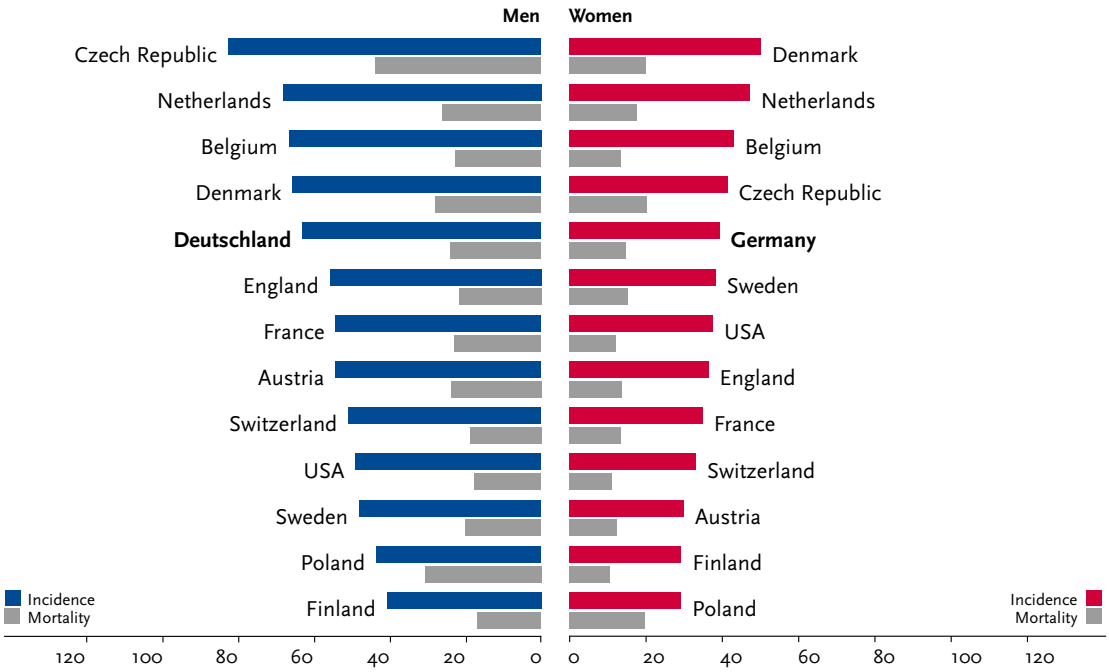
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 470)	7.6 %	(1 in 13)	0.1 %	(1 in 2,000)	3.2 %	(1 in 31)
50 years	0.8 %	(1 in 120)	7.6 %	(1 in 13)	0.2 %	(1 in 430)	3.3 %	(1 in 31)
60 years	2.0 %	(1 in 49)	7.3 %	(1 in 14)	0.7 %	(1 in 150)	3.3 %	(1 in 31)
70 years	3.3 %	(1 in 30)	6.3 %	(1 in 16)	1.4 %	(1 in 73)	3.0 %	(1 in 33)
Lifetime risk			7.5 %	(1 in 13)			3.2 %	(1 in 31)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 540)	6.1 %	(1 in 16)	<0.1 %	(1 in 2,300)	2.8 %	(1 in 36)
50 years	0.6 %	(1 in 180)	6.0 %	(1 in 17)	0.1 %	(1 in 700)	2.8 %	(1 in 36)
60 years	1.1 %	(1 in 88)	5.7 %	(1 in 18)	0.4 %	(1 in 280)	2.7 %	(1 in 37)
70 years	2.1 %	(1 in 48)	4.9 %	(1 in 20)	0.8 %	(1 in 120)	2.6 %	(1 in 39)
Lifetime risk			6.1 %	(1 in 17)			2.7 %	(1 in 36)

Figure 3.5.5
Registered age-standardised incidence rates in German federal states, ICD-10 C18 – 21, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.5.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C18 – 21, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.6 Liver

Table 3.6.1
Overview of the key epidemiological parameters for Germany, ICD-10 C22

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	5,170	2,130	5,270	2,340	*6,000*	*2,400*
Crude incidence rate[1]	12.8	5.1	13.1	5.6	*15.2*	*5.9*
Standardised incidence rate[1,2]	9.5	2.9	9.4	3.2	*9.9*	*3.2*
Median age at diagnosis	69	73	70	73		
Deaths	4,469	2,358	4,523	2,539		
Crude mortality rate[1]	11.2	5.6	11.1	6.1		
Standardised mortality rate[1,2]	8.1	2.9	7.9	3.1		
5-year prevalence	5,200	2,000	5,300	2,100	*5,900*	*2,300*
Absolute 5-year survival rate (2007–2008)[3]			13 (5-15)	11 (5-16)		
Relative 5-year survival rate (2007–2008)[3]			15 (6-17)	13 (6-18)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Liver cancer, which is included for the first time, is relatively uncommon, but in view of the poor prognosis it is among the ten most frequent causes of deaths due to cancer for both men and women. In Germany, some 7,600 new cases are diagnosed every year, with roughly the same number of deaths. The median age at diagnosis is 70 years for men and 73 years for women. Only about 4 % of cases are diagnosed before 50 years of age. One in 92 men and one in 210 women in Germany develop a malignant liver tumour in the course of their life.

Some 70 % of liver tumours develop from liver cells (hepatocellular carcinoma), others above all from epithelial cells in the intrahepatic bile ducts (cholangiocarcinoma).

Since 1980, the mortality rate for men has risen steadily, even after age-standardisation, while it has remained more or less unchanged for women. The age-standardised incidence rate for men has also increased slightly over the past 10 years.

Currently, incidence and mortality rates in the north-western federal states are somewhat lower than in the rest of Germany.

The survival prospects for liver cancer depend on the stage of the tumour at diagnosis and the state of the liver (cirrhosis). Only slightly more than 10 % of patients survive the first five years after diagnosis. The prognosis is only worse for malignant pancreatic tumours.

Risk factors

Proven risk factors for liver cancer are chronic infection with the hepatitis-B or hepatitis-C virus. There is also a relationship between regular high alcohol consumption and the risk of developing liver cancer. Foodstuffs contaminated with aflatoxin B1 (produced by the fungi Aspergillus parasiticus and A. flavus) represents a further risk factor. Tobacco consumption is associated with an increased risk. Lifestyle related risk factors also include type II diabetes mellitus and obesity. Finally, hereditary metabolic diseases such as haemochromatosis increase the risk for liver cancer.

Figure 3.6.1a
Age-standardised incidence and mortality rates, ICD-10 C22, Germany, 1999 – 2008
per 100,000 (European standard

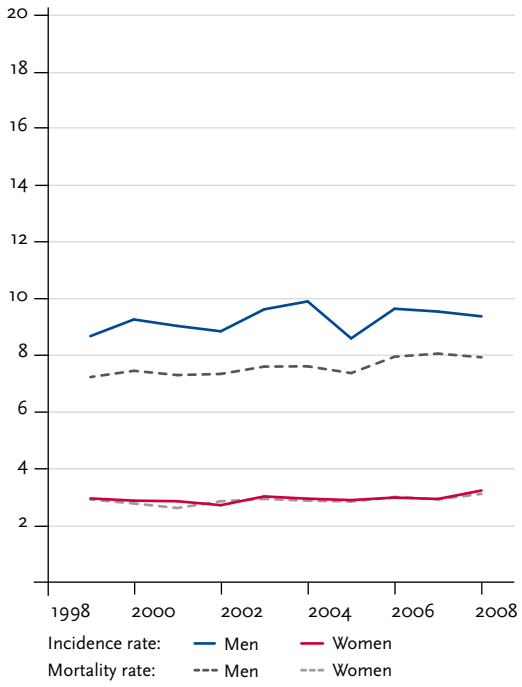


Figure 3.6.1b
Absolute numbers of new cases and deaths, ICD-10 C22, Germany, 1999 – 2008

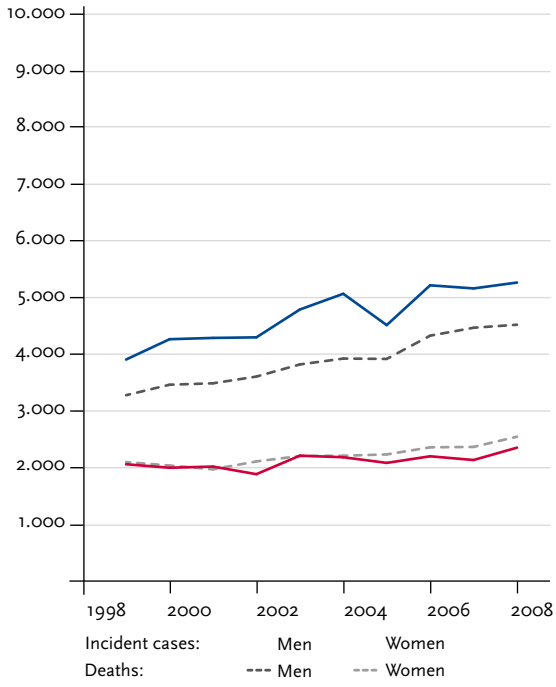


Figure 3.6.2
Distribution of T-stages at first diagnosis
Not presented due to the large proportion of missing data.

Figure 3.6.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C22, Germany, 2007 – 2008

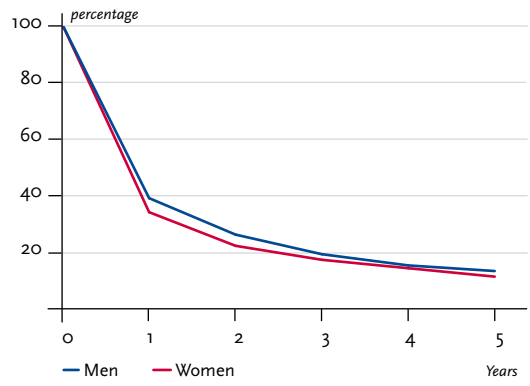


Figure 3.6.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C22, Germany, 2007 – 2008

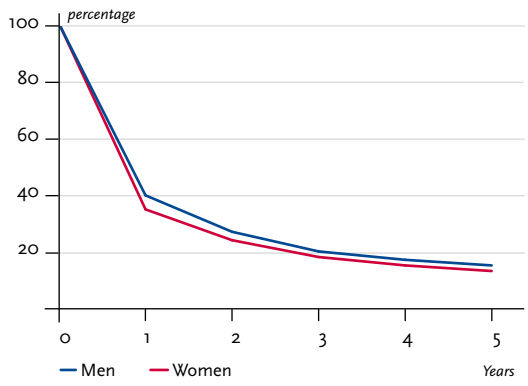


Figure 3.6.4
Age-specific incidence rates in Germany by sex ICD-10 C22, 2007 – 2008
per 100,000

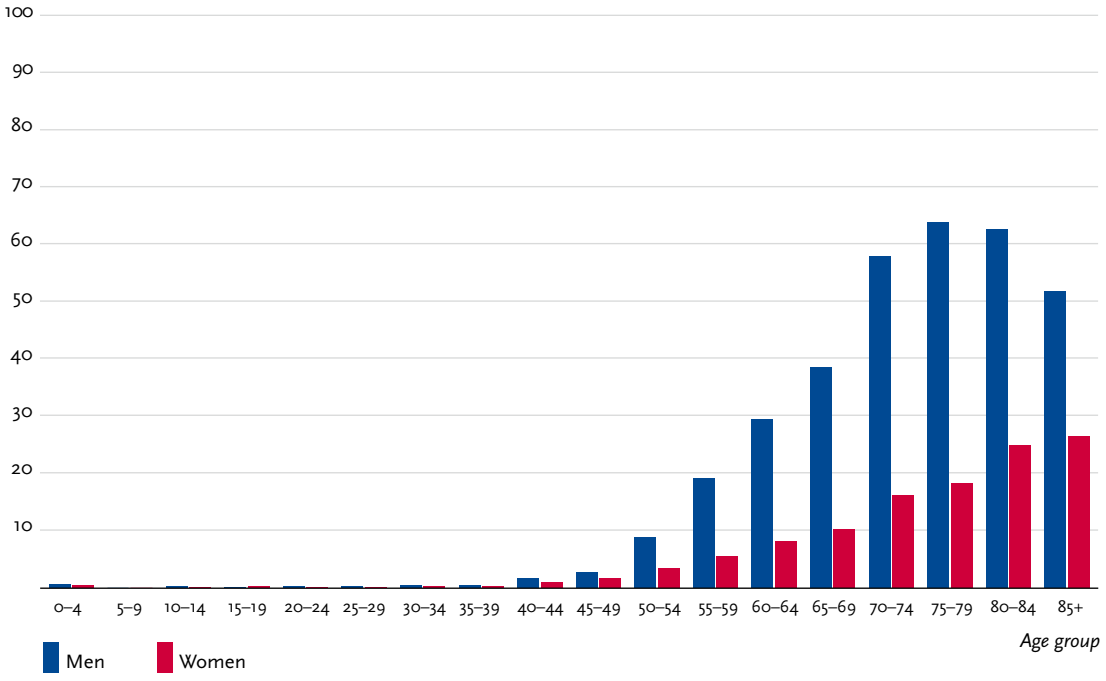


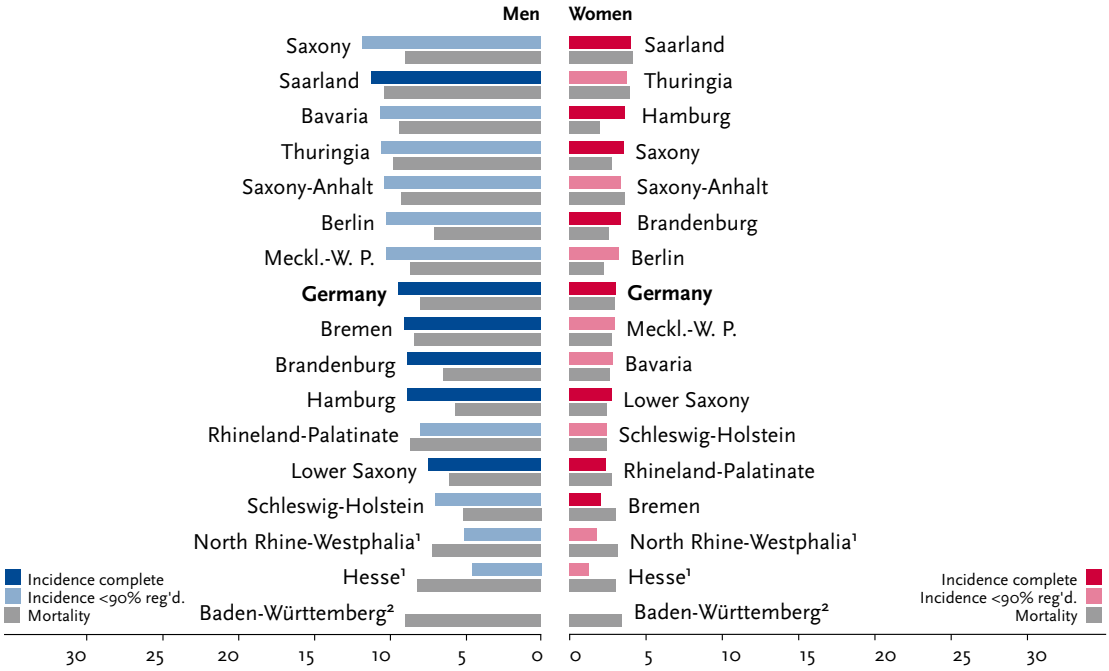
Table 3.6.2
Age-specific incidence rates in Germany by sex, ICD-10 C22, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.6	0.0	0.2	0.1	0.2	0.3	0.4	0.4	1.6	2.7	8.9	19.3	29.7	38.7	58.2	64.3	63.1	52.1
Woman	0.4	0.0	0.1	0.2	0.1	0.1	0.2	0.2	0.9	1.7	3.4	5.5	8.2	10.3	16.3	18.3	25.1	26.7

Table 3.6.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C22, database 2008

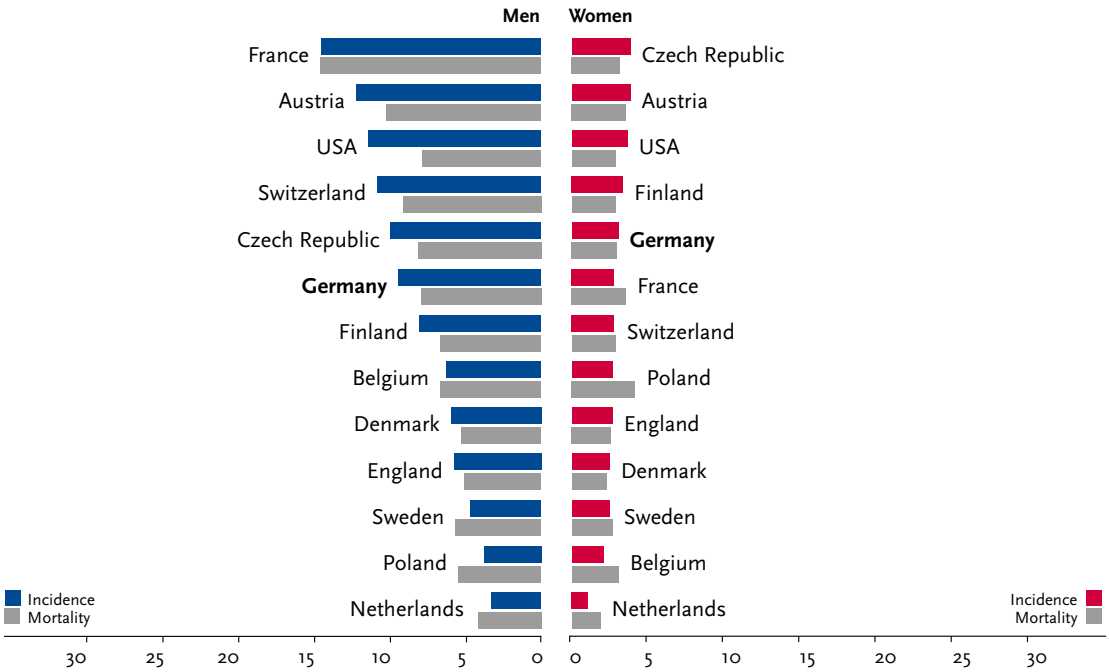
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 5,000)	1.1%	(1 in 91)	<0.1%	(1 in 6,800)	1.0%	(1 in 103)
50 years	0.1%	(1 in 760)	1.1%	(1 in 91)	0.1%	(1 in 1,000)	1.0%	(1 in 102)
60 years	0.3%	(1 in 310)	1.0%	(1 in 96)	0.3%	(1 in 380)	1.0%	(1 in 105)
70 years	0.5%	(1 in 190)	0.8%	(1 in 120)	0.4%	(1 in 220)	0.8%	(1 in 125)
Lifetime risk			1.1%	(1 in 92)			1.0%	(1 in 104)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 7,400)	0.5%	(1 in 220)	<0.1%	(1 in 11,000)	0.5%	(1 in 190)
50 years	<0.1%	(1 in 2,000)	0.5%	(1 in 220)	<0.1%	(1 in 3,000)	0.5%	(1 in 190)
60 years	0.1%	(1 in 1,000)	0.4%	(1 in 240)	0.1%	(1 in 1,200)	0.5%	(1 in 200)
70 years	0.2%	(1 in 610)	0.4%	(1 in 280)	0.2%	(1 in 520)	0.5%	(1 in 220)
Lifetime risk			0.5%	(1 in 210)			0.5%	(1 in 190)

Figure 3.6.5
Registered age-standardised incidence rates in German federal states, ICD-10 C22, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.6.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C22, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.7 Gall bladder and biliary tract

Table 3.7.1
Overview of the key epidemiological parameters for Germany, ICD-10 C23 – 24

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	2,170	3,130	2,270	2,890	*2,400*	*2,700*
Crude incidence rate[1]	5.4	7.5	5.6	6.9	*6.1*	*6.6*
Standardised incidence rate[1,2]	4.0	4.0	4.0	3.6	*4.0*	*3.3*
Median age at diagnosis	71	75	72	76		
Deaths	1,208	2,245	1,153	2,092		
Crude mortality rate[1]	3.0	5.4	2.9	5.0		
Standardised mortality rate[1,2]	2.2	2.8	2.0	2.6		
5-year prevalence	2,800	3,300	2,900	3,100	*3,200*	*2,900*
Absolute 5-year survival rate (2007–2008)[3]			18 (12-25)	13 (8-16)		
Relative 5-year survival rate (2007–2008)[3]			21 (14-30)	16 (10-20)		

[1] per 100,000 persons [2] age-standardised(European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In Germany, some 5,200 new cases of malignant tumours were diagnosed in 2008 in the gall bladder (accounting for about 40 % of all cases) and the biliary tract outside the liver (60 %). Women develop gall bladder carcinomas more frequently, whereas tumours in the extrahepatic biliary tracts are diagnosed more frequently for men. As with liver cancer, the risk of developing disease increases steadily with age. The lifetime risk is about 0.5 % for women and 0.6 % for men.

Histologically, some 95 % of malignant tumours of the gall bladder and extrahepatic biliary tract are adenocarcinomas. Other histological variants such as squamous epithelial carcinomas, neuroendocrine tumours, and sarcomas are rare.

Since 1999 the age-standardised incidence rate in Germany has declined for women and remained largely unchanged for men. The age-standardised mortality rates have decreased markedly for both genders over this period. Due to special demographic effects in the older male population, the absolute number of new diagnosed cases has increased while the number of mortalities has decreased slightly.

The survival prospects with malignant tumours of the gall bladder and biliary tract are as a rule poor, but better than for liver cancer. The relative 5-year survival rates were 16 % for women and 21 % for men.

Risk factors

The triggers for gall bladder carcinomas are not clear. Possible risk factors cited in the literature include the presence of gallstones, chronic inflammatory diseases of the biliary tract, such as a primary sclerosing cholangitis (PSC), the inflammatory bowel disease ulcerative colitis, liver diseases as a result of the high consumption of alcohol, hepatitis-C virus infection, and HIV infection. As lifestyle-related risk factors, obesity and smoking are suspected of increasing the risk of biliary tract carcinomas. Diabetes can also increase the risk, however available studies do not clearly show if this applies for both type I and type II diabetes. Above all in Asia, infection with the parasitic liver flukes Clonorchis sinensis or Opisthorchis viverrini is a further risk factor.

Figure 3.7.1a
Age-standardised incidence and mortality rates, ICD-10 C23 – 24, Germany, 1999 – 2008
per 100,000 (European standard)

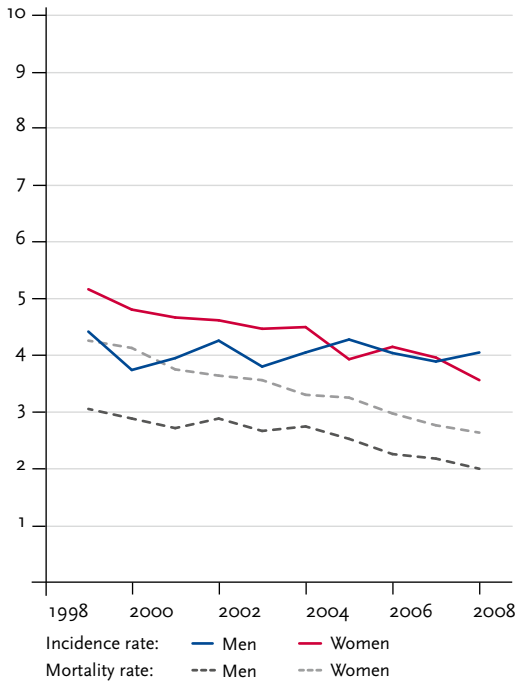


Figure 3.7.1b
Absolute numbers of new cases and deaths, ICD-10 C23 – 24, Germany, 1999 – 2008

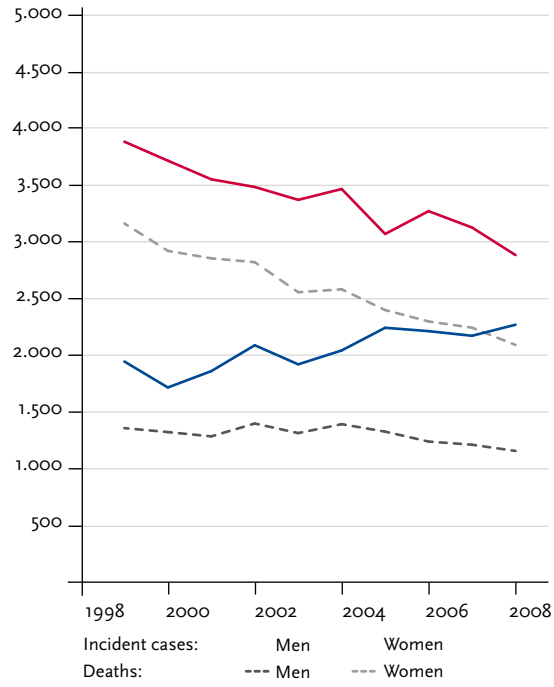


Figure 3.7.2
Distribution of T-stages at first diagnosis
Not presented due to the large proportion of missing data.

Figure 3.7.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C23 – 24, Germany, 2007 – 2008

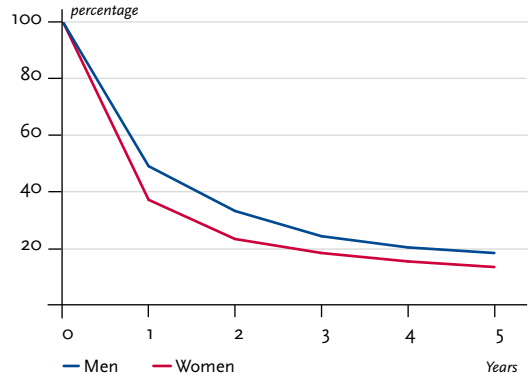


Figure 3.7.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C23 – 24, Germany, 2007 – 2008

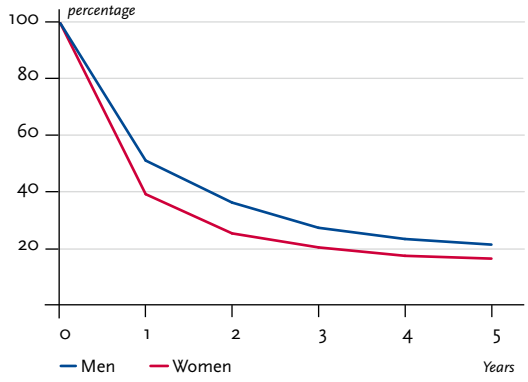


Figure 3.7.4
Age-specific incidence rates in Germany by sex, ICD-10 C23 – 24, 2007 – 2008
per 100,000

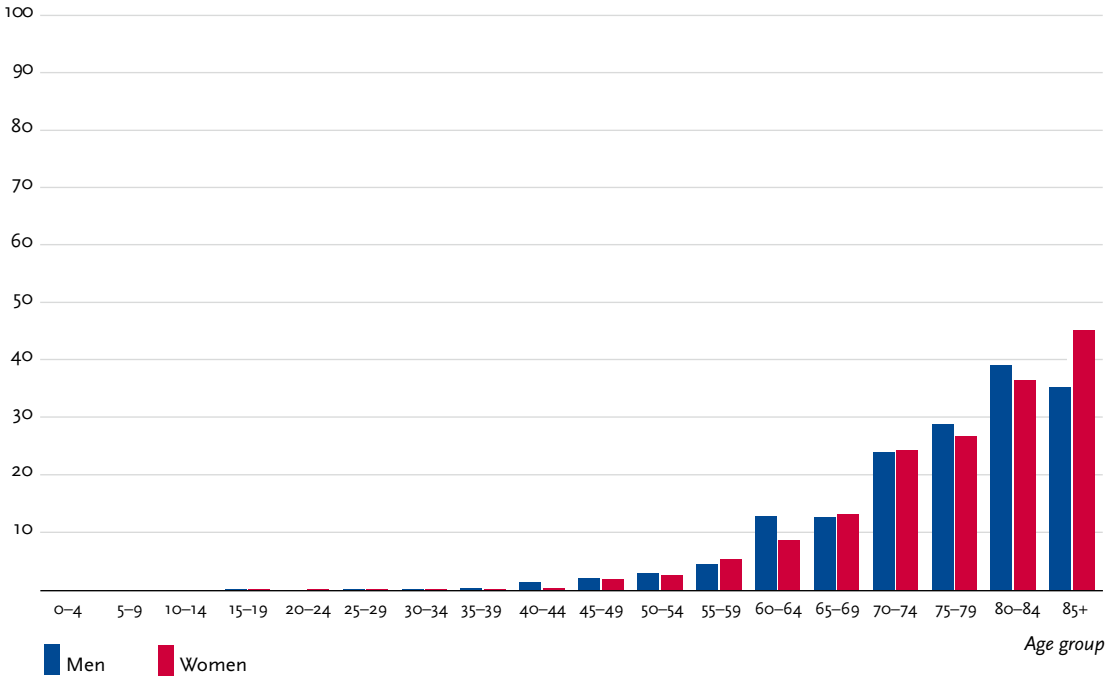


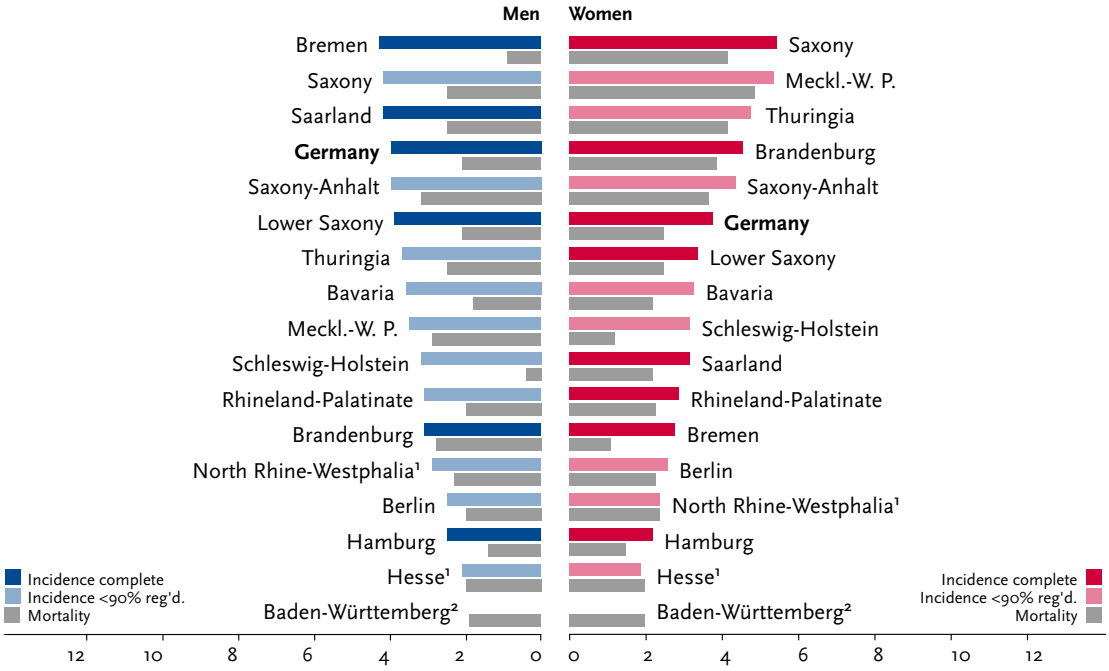
Table 3.7.2
Age-specific incidence rates in Germany by sex, ICD-10 C23 – 24, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.4	1.3	2.1	2.9	4.5	12.9	12.8	24.0	28.9	39.2	35.5
Woman	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	1.8	2.6	5.3	8.7	13.3	24.4	26.8	36.6	45.3

Table 3.7.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C23 – 24, database 2008

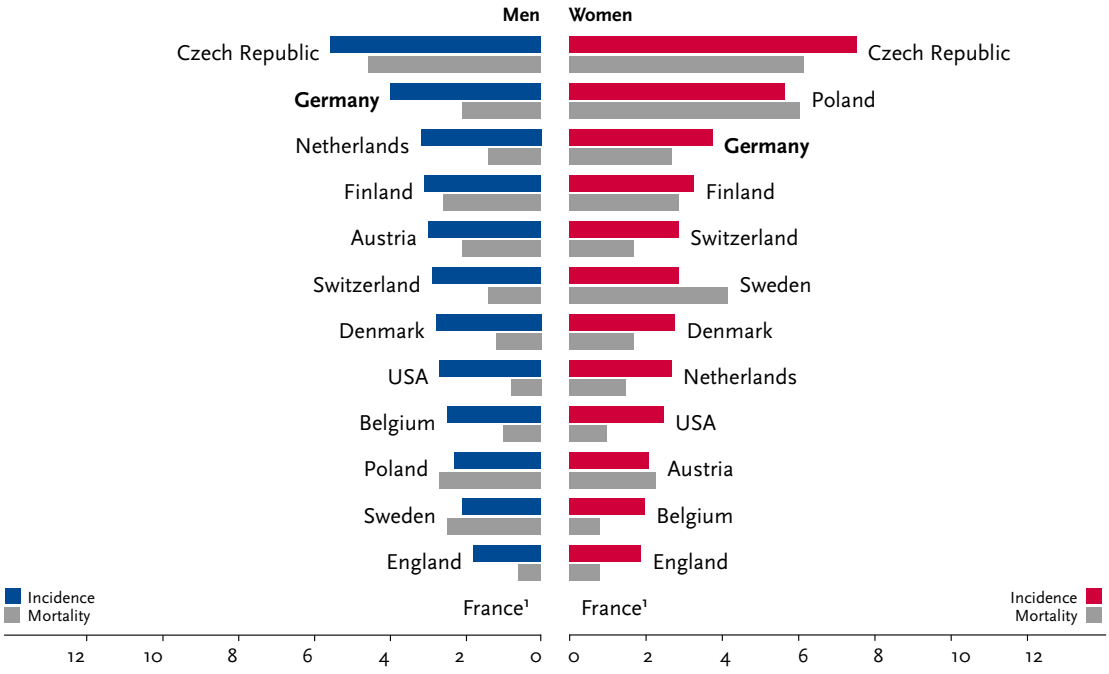
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 5,600)	0.5%	(1 in 200)	<0.1%	(1 in 26,000)	0.3%	(1 in 370)
50 years	<0.1%	(1 in 2,100)	0.5%	(1 in 200)	<0.1%	(1 in 5,800)	0.3%	(1 in 360)
60 years	0.1%	(1 in 810)	0.5%	(1 in 210)	0.1%	(1 in 1,800)	0.3%	(1 in 360)
70 years	0.2%	(1 in 470)	0.4%	(1 in 240)	0.1%	(1 in 860)	0.3%	(1 in 390)
Lifetime risk			0.5%	(1 in 210)			0.3%	(1 in 370)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 13,000)	0.6%	(1 in 170)	<0.1%	(1 in 23,000)	0.4%	(1 in 230)
50 years	<0.1%	(1 in 2,500)	0.6%	(1 in 170)	<0.1%	(1 in 4,500)	0.4%	(1 in 230)
60 years	0.1%	(1 in 930)	0.6%	(1 in 170)	0.1%	(1 in 1,600)	0.4%	(1 in 230)
70 years	0.2%	(1 in 480)	0.5%	(1 in 200)	0.2%	(1 in 640)	0.4%	(1 in 250)
Lifetime risk			0.6%	(1 in 170)			0.4%	(1 in 230)

Figure 3.7.5
Registered age-standardised incidence rates in German federal states, ICD-10 C23 – C24, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.7.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C23 – 24, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ no comparable data

3.8 Pancreas

Table 3.8.1
Overview of the key epidemiological parameters for Germany, ICD-10 C25

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	7,300	7,250	7,390	7,570	*7,800*	*7,600*
Crude incidence rate[1]	18.1	17.3	18.4	18.1	*19.5*	*18.3*
Standardised incidence rate[1,2]	13.5	9.4	13.4	9.8	*13.2*	*9.5*
Median age at diagnosis	70	76	70	76		
Deaths	6,904	7,541	7,327	7,508		
Crude mortality rate[1]	17.1	18.0	18.2	17.9		
Standardised mortality rate[1,2]	12.6	9.3	13.0	9.2		
5-year prevalence	5,600	5,600	5,800	5,800	*6,100*	*6,000*
Absolute 5-year survival rate (2007–2008)[3]			7 (3-9)	6 (4-10)		
Relative 5-year survival rate (2007–2008)[3]			8 (3-10)	7 (4-11)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

The pancreas produces hormones (endocrinal function) as well as digestive juices (exocrinal function). Tumours originate most frequently in the exocrinal portion of the pancreas, and these account for approx. 95 % of all pancreatic carcinoma.

In 2008, some 15,000 people were diagnosed with pancreatic cancer, making the pancreatic carcinoma one of the ten most common tumours in Germany. The prognosis is unfavourable and it accounts for 6.3 % of all deaths due to cancer for men and 7.5 % for women – the fourth most frequent cause of cancer deaths.

The incidence and mortality rates are about equal due to the poor prognosis for pancreatic cancer, and the rates have remained fairly constant since the end of the 1990s.

In the early stages, malignant neoplasms of the pancreas frequently cause few or only unspecific symptoms, so that the tumour is not recognised until it has reached an advanced stage. The relative 5-year survival rate is correspondingly unfavourable, and in Germany it is 8 % for men and 7 % for women. The pancreatic carcinoma has the lowest survival rates of all types of cancer.

The median age at diagnosis is 70 years for men and 76 years for women. The lifetime risk is 1.5 % for both genders.

Risk factors and early detection

Definite risk factors are tobacco consumption, including passive smoking, and obesity. The influence of further lifestyle-related factors, in particular diet, is not clear. It is therefore not possible to make definite recommendations for the prevention of a pancreatic carcinoma, with one exception: alcohol should be avoided if possible. At least high levels of alcohol consumption clearly increase the risk.

The probability of developing pancreatic cancer is also higher for patients with type 2 diabetes mellitus or with long-term chronic inflammation of the pancreas (pancreatitis).

First degree relatives of patients with a pancreatic carcinoma have a statistically higher risk of themselves developing the cancer, although it is not clear if this is due to a hereditary genetic predisposition or to a shared lifestyle. A hereditable risk seems to play a role for at least some patients. People with two or more first-degree relatives with pancreatic cancer are at a much higher risk than the normal population.

It is not yet clear what role is played by environmental factors or occupational exposure to harmful substances.

Figure 3.8.1a
Age-standardised incidence and mortality rates, ICD-10 C25, Germany, 1999 – 2008
100.000 (European standard)

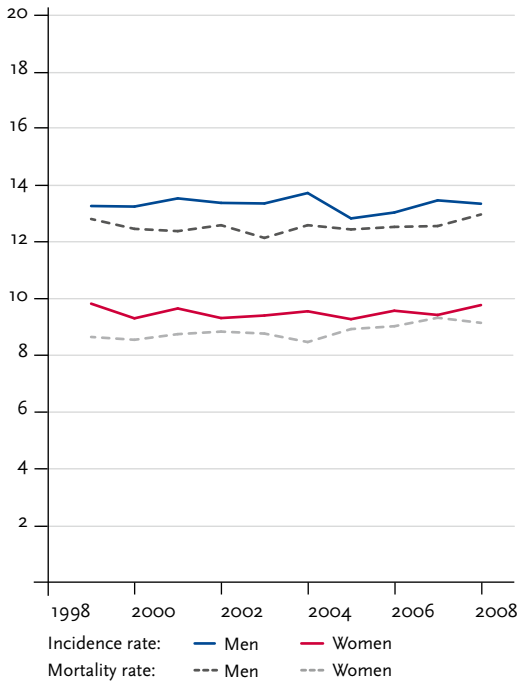


Figure 3.8.1b
Absolute numbers of new cases and deaths, ICD-10 C25, Germany, 1999 – 2008

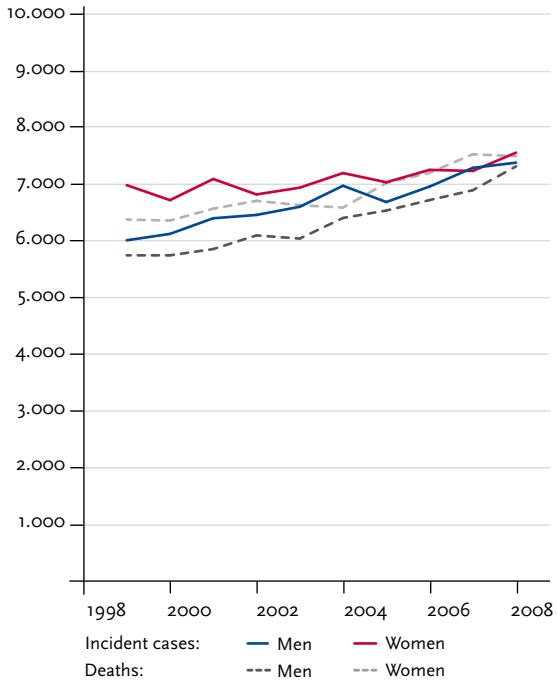


Figure 3.8.2
Distribution of T-stages at first diagnosis
Not presented due to the large proportion of missing data.

Figure 3.8.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C25, Germany, 2007 – 2008

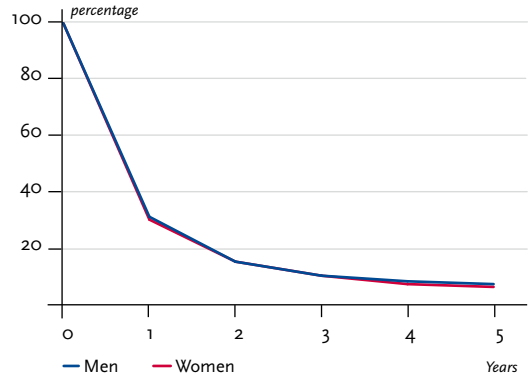


Figure 3.8.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C25, Germany, 2007 – 2008

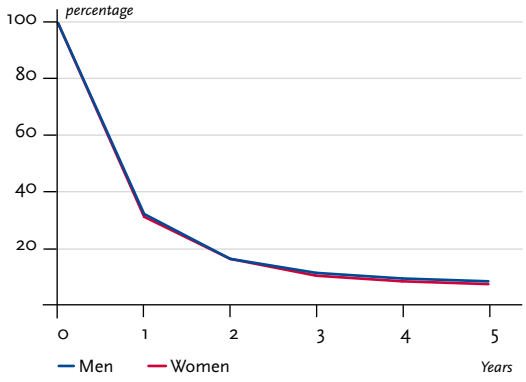


Figure 3.8.4
Age-specific incidence rates in Germany by sex ICD-10 C25, 2007 – 2008
per 100,000

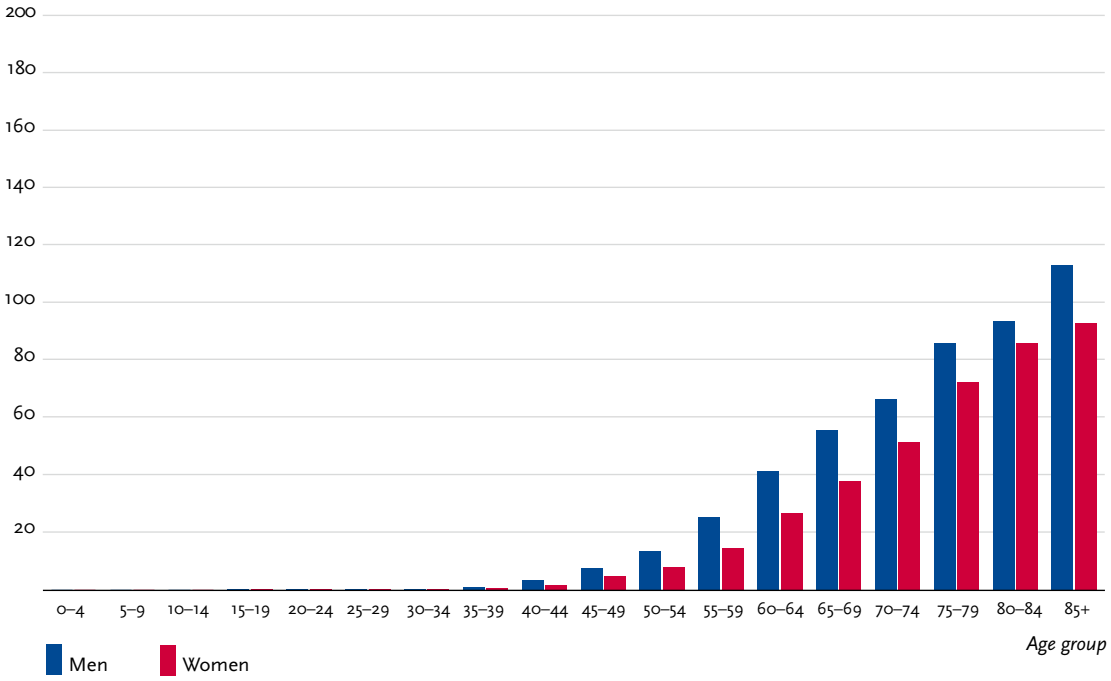


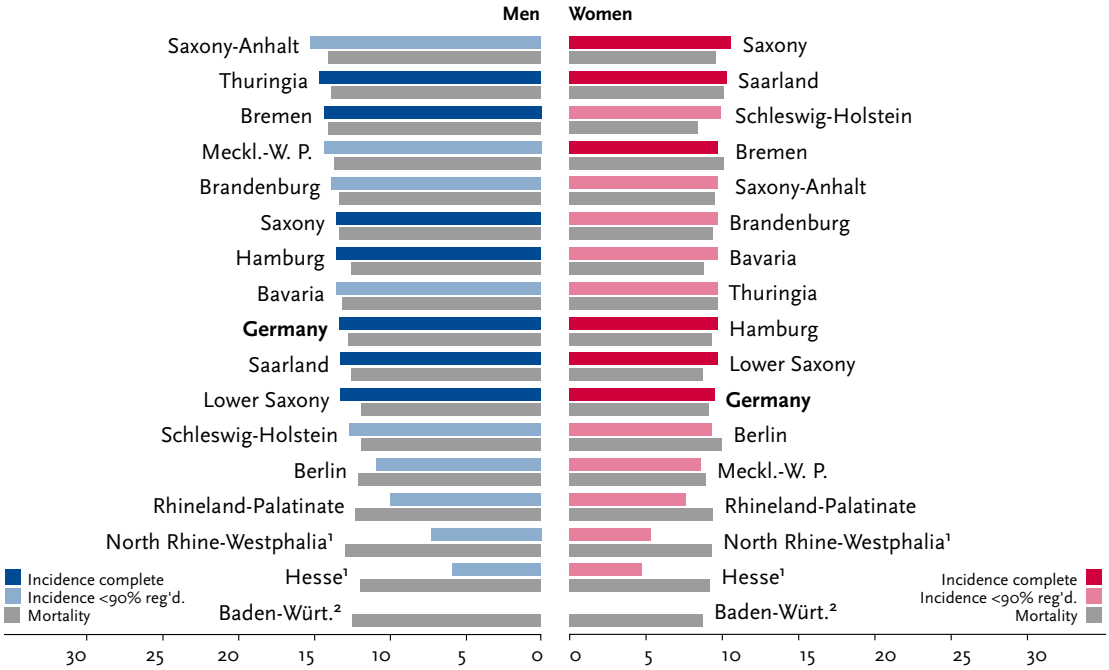
Table 3.8.2
Age-specific incidence rates in Germany by sex, ICD-10 C25, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.2	0.1	0.2	1.0	3.4	7.4	13.4	25.2	41.4	55.8	66.6	86.0	94.0	113.3
Woman	0.0	0.0	0.0	0.2	0.3	0.2	0.3	0.5	1.6	4.8	7.8	14.4	26.9	37.8	51.7	72.6	86.1	93.2

Table 3.8.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C25, database 2008

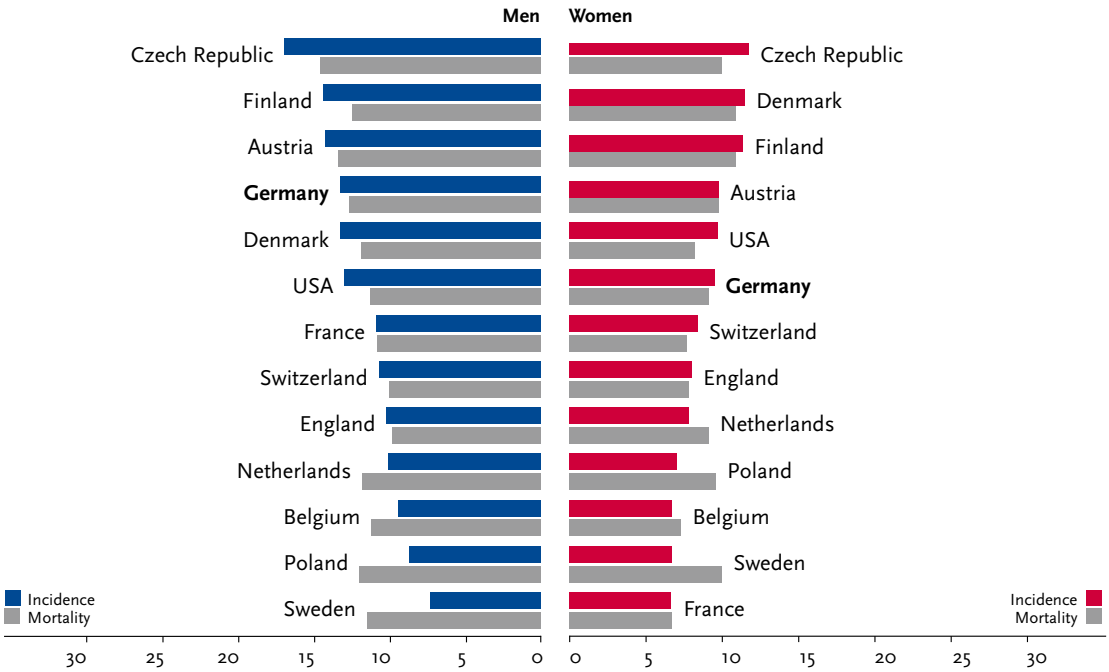
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,800)	1.6%	(1 in 64)	<0.1%	(1 in 2,200)	1.6%	(1 in 62)
50 years	0.2%	(1 in 520)	1.6%	(1 in 64)	0.2%	(1 in 610)	1.6%	(1 in 63)
60 years	0.5%	(1 in 220)	1.5%	(1 in 69)	0.4%	(1 in 240)	1.5%	(1 in 65)
70 years	0.6%	(1 in 160)	1.2%	(1 in 85)	0.7%	(1 in 140)	1.3%	(1 in 76)
Lifetime risk			1.5%	(1 in 65)			1.6%	(1 in 64)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 3,000)	1.5%	(1 in 65)	<0.1%	(1 in 4,300)	1.6%	(1 in 64)
50 years	0.1%	(1 in 860)	1.5%	(1 in 66)	0.1%	(1 in 1,000)	1.6%	(1 in 64)
60 years	0.3%	(1 in 320)	1.5%	(1 in 69)	0.3%	(1 in 360)	1.5%	(1 in 66)
70 years	0.6%	(1 in 170)	1.2%	(1 in 81)	0.6%	(1 in 180)	1.3%	(1 in 75)
Lifetime risk			1.5%	(1 in 66)			1.5%	(1 in 65)

Figure 3.8.5
Registered age-standardised incidence rates in German federal states, ICD-10 C25, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.8.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C25, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.9 Larynx

Table 3.9.1
Overview of the key epidemiological parameters for Germany, ICD-10 C32

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	3,550	520	3,610	510	*3,600*	*600*
Crude incidence rate[1]	8.8	1.2	9.0	1.2	*9.0*	*1.4*
Standardised incidence rate[1,2]	6.9	0.9	6.9	0.9	*6.5*	*0.9*
Median age at diagnosis	66	64	66	64		
Deaths	1,263	220	1,275	209		
Crude mortality rate[1]	3.1	0.5	3.2	0.5		
Standardised mortality rate[1,2]	2.4	0.4	2.4	0.3		
5-year prevalence	11,600	1,600	11,700	1,600	*11,600*	*1,750*
Absolute 5-year survival rate (2007–2008)[3]			55 (37-61)	55		
Relative 5-year survival rate (2007–2008)[3]			62 (42-68)	60		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Men are affected by laryngeal cancer considerably more frequently than women due to their higher consumption of tobacco and alcohol. Currently one in 150 men in Germany develops laryngeal cancer, but only one in 1,000 women (lifetime risk). Both men and women are diagnosed at a median age of 65 years, which is four years earlier than the average for all types of cancer.

Since the 1980s the incidence and mortality rates for men have been declining, in particular for the under 50-year-olds. The rates for women have remained unchanged after a marked increase in the 1980s and 1990s. This resulted after the year 2000 in an increase in the numbers of deaths and diagnosed cases for women, in particular in the higher age groups – while the numbers of cases diagnosed for men remained unchanged.

The relative 5-year survival rates of men and women differ little from one another (62 % and 60 %, respectively). In contrast to many other types of cancer, tumours of the larynx are more frequently diagnosed at an early stage (T1) for men than for women (40 % and 34 %, respectively). Malignant neoplasms of the larynx are almost exclusively squamous epithelial carcinomas.

Risk factors

Smoking is the most-important risk factor for the development of laryngeal cancer. Alcohol consumption also increases the probability of developing the cancer, and the combination of both factors is particularly harmful. The influences of lifestyle, nutrition, or environmental factors are not yet clear, because in the majority of cases the influence of tobacco and alcohol consumption overshadows other effects. However, there are indications of a protective effect of eating carotene-rich vegetables and fruit. There is a known link between tumours of the larynx and occupational exposure to asbestos, nickel or polycyclical aromatic hydrocarbons. Infection with human papilloma viruses (HPV) can also play a role in the development of laryngeal cancer. First-degree relatives of patients have a higher risk of developing the cancer, but it is not clear in detail whether this is attributable to genes which are directly involved in the development of the tumour or to genes which determine the individual susceptibility to carcinogens.

Figure 3.9.1a
Age-standardised incidence and mortality rates, ICD-10 C32, Germany, 1999 – 2008
per 100,000 (European standard)

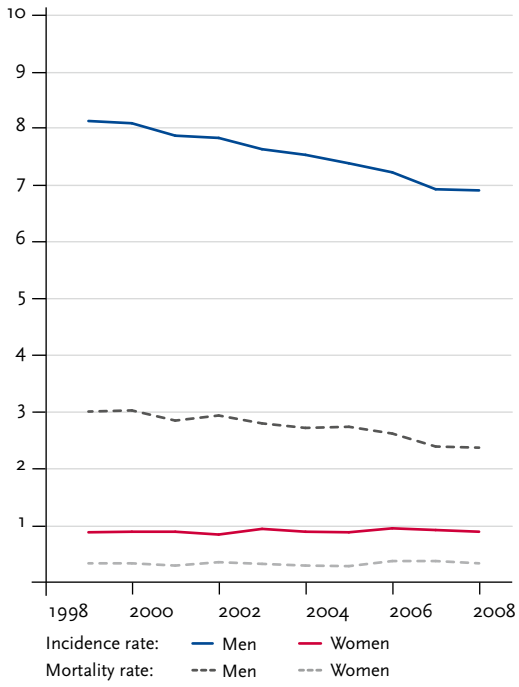


Figure 3.9.1b
Absolute numbers of new cases and deaths, ICD-10 C32, Germany, 1999 – 2008

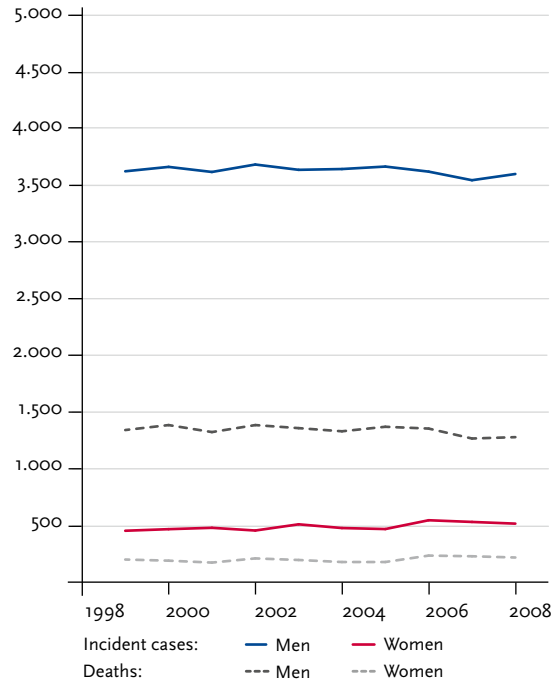


Figure 3.9.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C32, Germany, 2007 – 2008

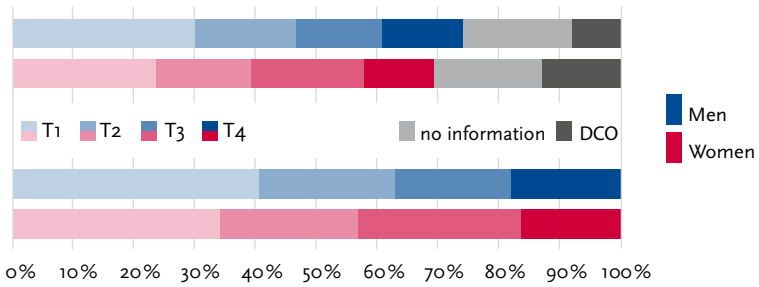


Figure 3.9.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C32, Germany, 2007 – 2008

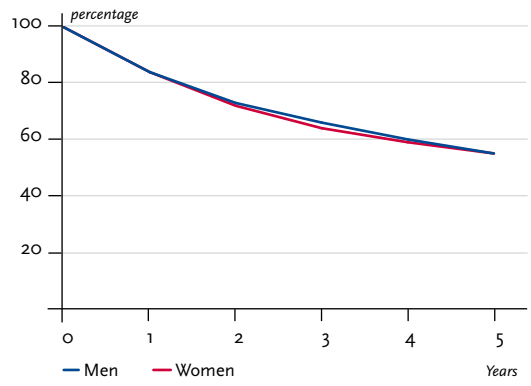


Figure 3.9.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C32, Germany, 2007 – 2008

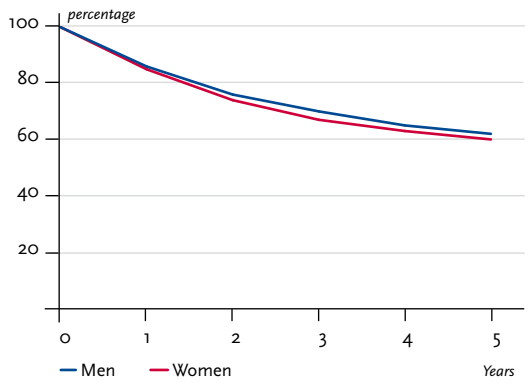


Figure 3.9.4
Age-specific incidence rates in Germany by sex ICD-10 C32, 2007 – 2008
per 100,000

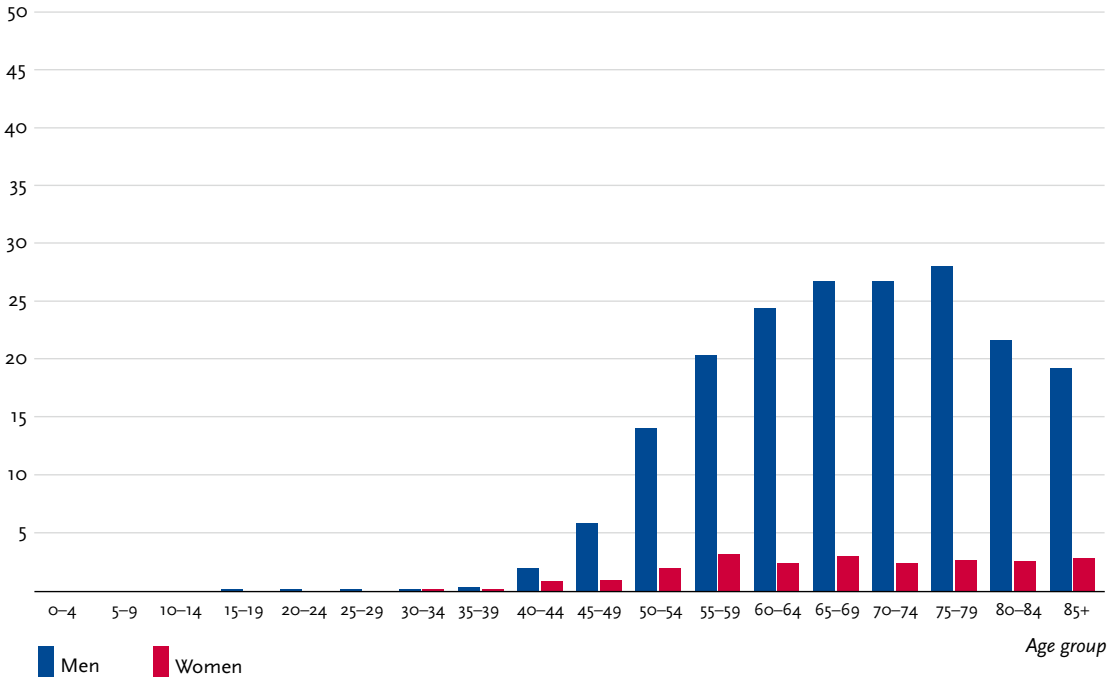


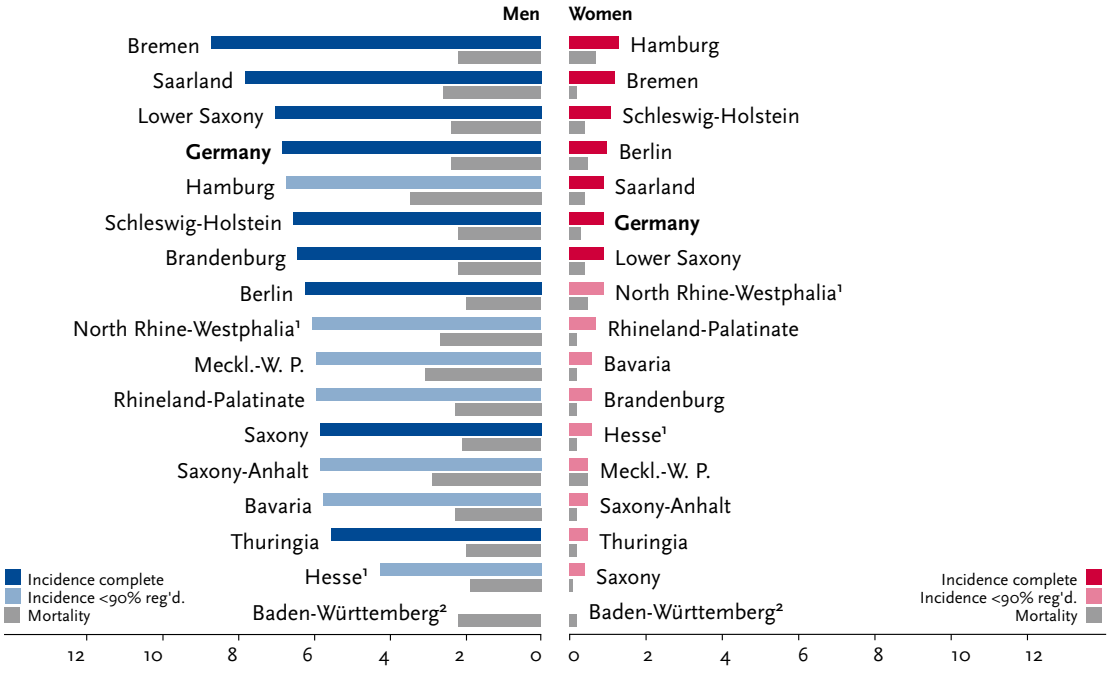
Table 3.9.2
Age-specific incidence rates in Germany by sex, ICD-10 C32, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	2.0	5.9	14.2	20.5	24.6	27.0	27.0	28.3	21.8	19.4
Woman	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.8	0.9	2.0	3.2	2.4	3.0	2.4	2.7	2.6	2.8

Table 3.9.3
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C32, database 2008

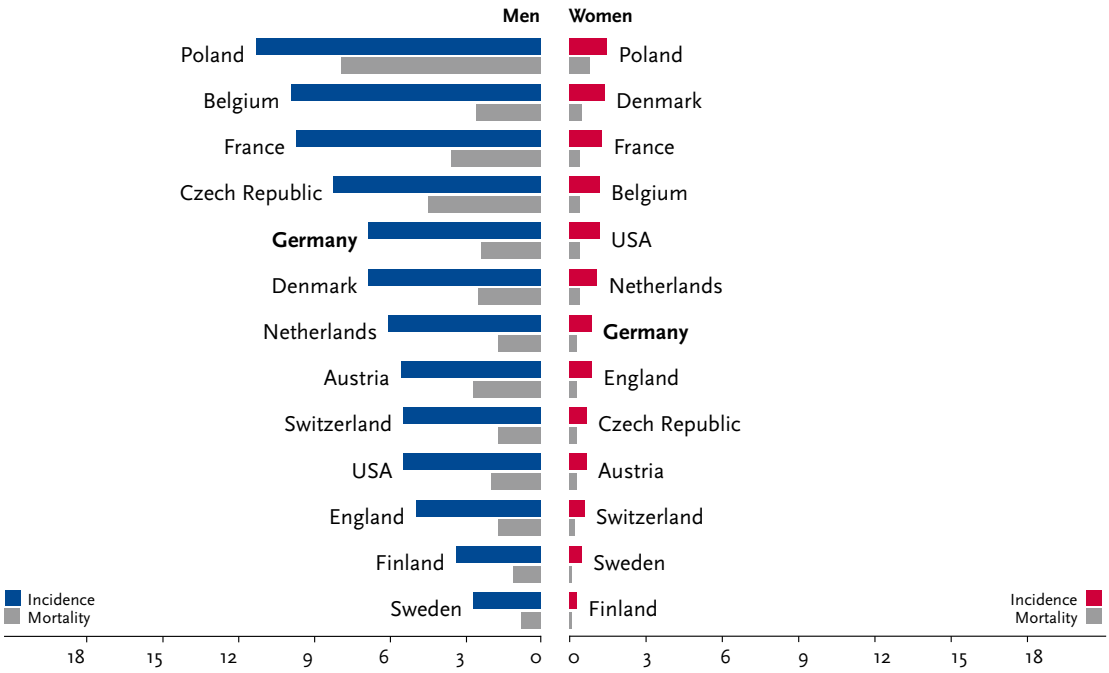
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,400)	0.7%	(1 in 150)	<0.1%	(1 in 11,000)	0.3%	(1 in 380)
50 years	0.2%	(1 in 610)	0.7%	(1 in 150)	<0.1%	(1 in 2,200)	0.3%	(1 in 380)
60 years	0.2%	(1 in 410)	0.5%	(1 in 190)	0.1%	(1 in 1,200)	0.2%	(1 in 430)
70 years	0.2%	(1 in 430)	0.3%	(1 in 290)	0.1%	(1 in 1,000)	0.2%	(1 in 560)
Lifetime risk			0.7%	(1 in 150)			0.3%	(1 in 380)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 12,000)	0.1%	(1 in 1,000)	<0.1%	(1 in 63,000)	<0.1%	(1 in 2,400)
50 years	<0.1%	(1 in 4,300)	0.1%	(1 in 1,100)	<0.1%	(1 in 16,000)	<0.1%	(1 in 2,500)
60 years	<0.1%	(1 in 3,700)	0.1%	(1 in 1,500)	<0.1%	(1 in 8,600)	<0.1%	(1 in 2,800)
70 years	<0.1%	(1 in 4,600)	<0.1%	(1 in 2,300)	<0.1%	(1 in 9,400)	<0.1%	(1 in 3,900)
Lifetime risk			0.1%	(1 in 1,000)			<0.1%	(1 in 2,400)

Figure 3.9.5
Registered age-standardised incidence rates in German federal states, ICD-10 C32, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.9.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C32, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.10 Lung

Table 3.10.1
Overview of the key epidemiological parameters for Germany, ICD-10 C33 – 34

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	33,650	15,280	33,960	15,570	*33,700*	*17,700*
Crude incidence rate[1]	83.5	36.4	84.4	37.2	*84.4*	*42.7*
Standardised incidence rate[1,2]	61.4	24.0	60.6	24.3	*55.9*	*26.8*
Median age at diagnosis	69	68	69	68		
Deaths	29,143	12,379	29,505	12,841		
Crude mortality rate[1]	72.3	29.5	73.3	30.7		
Standardised mortality rate[1,2]	52.7	18.5	52.3	19.2		
5-year prevalence	39,200	19,200	39,500	20,000	*38,600*	*22,900*
Absolute 5-year survival rate (2007–2008)[3]			13 (10-15)	18 (15-23)		
Relative 5-year survival rate (2007–2008)[3]			15 (11-18)	19 (16-25)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Lung cancer is the third most common form of cancer both for men and women. In 2008 about 34,000 men and 15,500 women were newly diagnosed with lung cancer, and for approx. 29,500 men and 13.000 women it was the cause of death. This means that lung cancer accounts for 26 % of cancer-related deaths for menin Germany, by far the most common cause, and 13 % for women, the third most common cause of cancer-related deaths.

While the age-standardised incidence and mortality rates for men are continually declining, since the end of the 1990s both rates have increased for women by some 30 %. Similar trends are also found in other European industrialised countries. This contrary development is attributable to the changing smoking habits of both sexes.

The prognosis for lung tumours is rather unfavourable. In Germany, the relative 5-year survival rate for men is 15 % and for women 19 %.

The stage distribution at diagnosis for men and women is very similar, with a high proportion of T4 cases (approx. 40 %). The median age at diagnosis is about 69 years for men and 68 years for women and roughly corresponds to the average figure for cancer cases overall.

Risk factors and early detection

Exposure to tobacco smoke has long been recognised as the main risk factor for lung cancer. For men at least nine out of ten cases of lung cancer, and for women at least six out of ten cases are attributable to active smoking. Passive smoke inhalation also increases the cancer risk and is a major contributor to indoor pollution.

Other risk factors play a relatively minor role. Between 9 and 15 out of 100 lung cancer cases are attributable to exposure to various carcinogenic substances, including asbestos and quartz dust, polycyclical aromatic hydrocarbons, and nickel dust. In areas with a high natural exposure to radon in buildings the lung cancer risk is higher for residents, particularly for dwellings near ground level. The risk is also increased by occupational exposure to radon or other sources of ionising radiation. Diesel exhaust fumes are the most important risk factor among air pollutants. The impact of other environmental pollutants (e.g. particulate matter) is a matter for further research. The same applies for the influence of genetic factors. There is also a relationship between an infection with a human papilloma virus (HPV) or Epstein Barr virus (EBV) and the development of lung carcinomas. Higher consumption of vegetables and fruit has a protective effect, but in smokers it cannot make up for the tobacco-related increase in risk.

Figure 3.10.1a
Age-standardised incidence and mortality rates, ICD-10 C33 – 34, Germany, 1999 – 2008
je 100,000 (European standard)

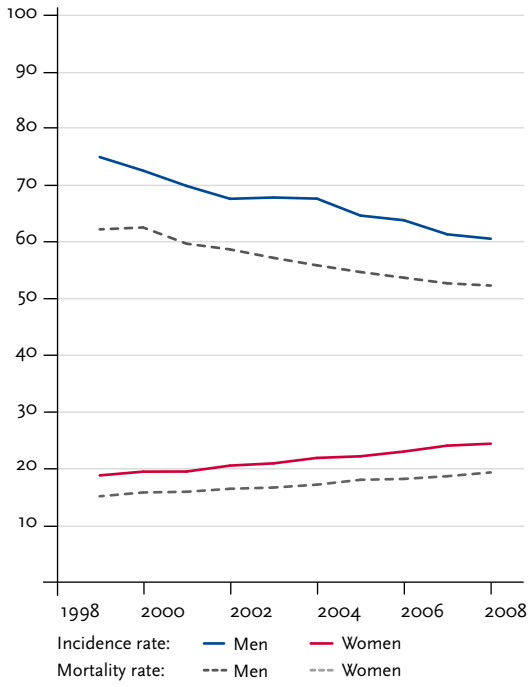


Figure 3.10.1b
Absolute numbers of new cases and deaths, ICD-10 C33 – 34, Germany, 1999 – 2008

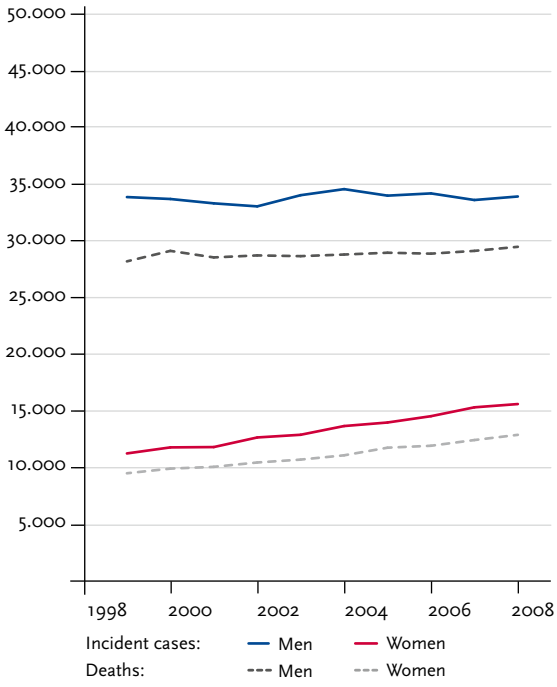


Figure 3.10.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C33 – 34, Germany, 2007 – 2008

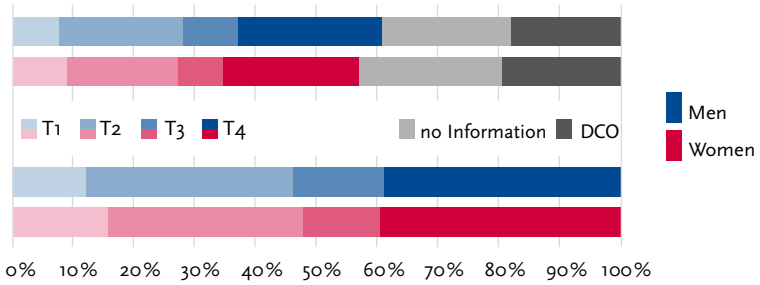


Figure 3.10.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C33 – 34, Germany, 2007 – 2008

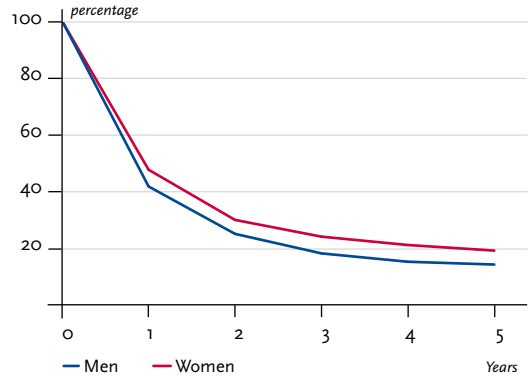


Figure 3.10.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C33 – 34, Germany, 2007 – 2008

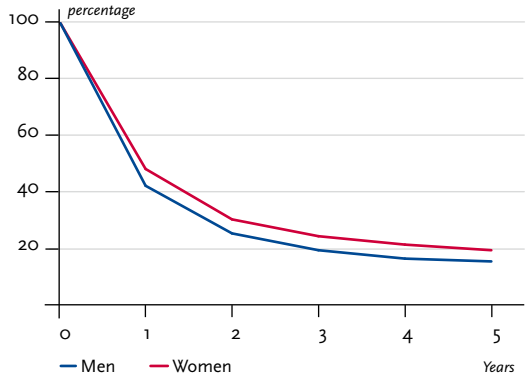


Figure 3.10.4
Age-specific incidence rates in Germany by gender ICD-10 C33 – 34, 2007 – 2008
per 100,000

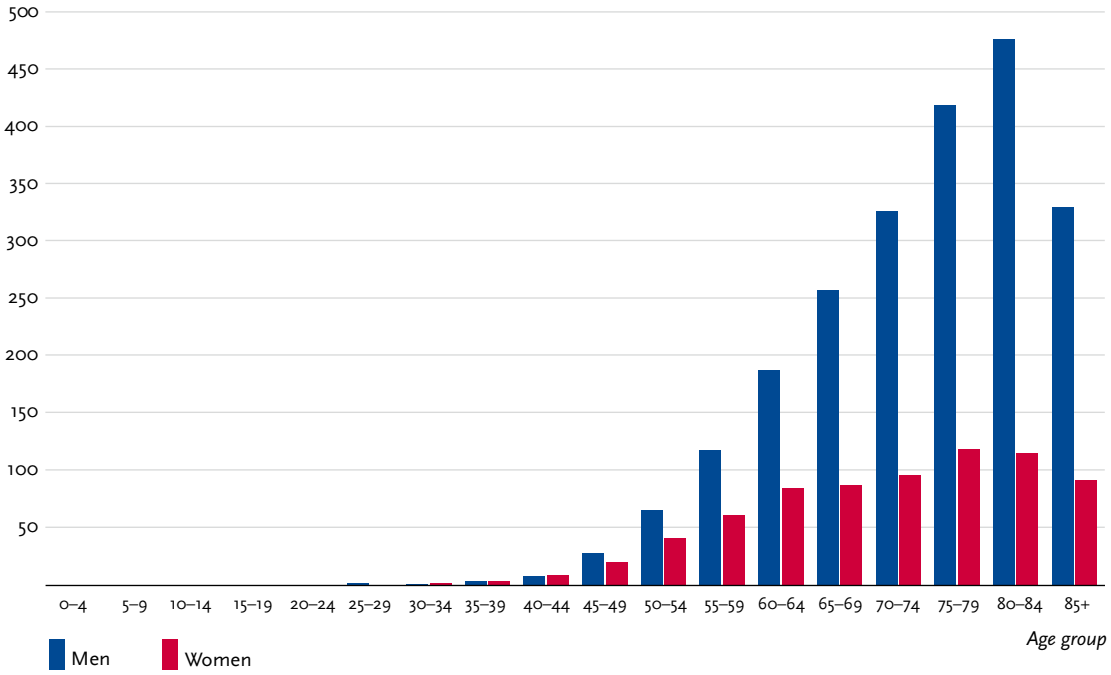


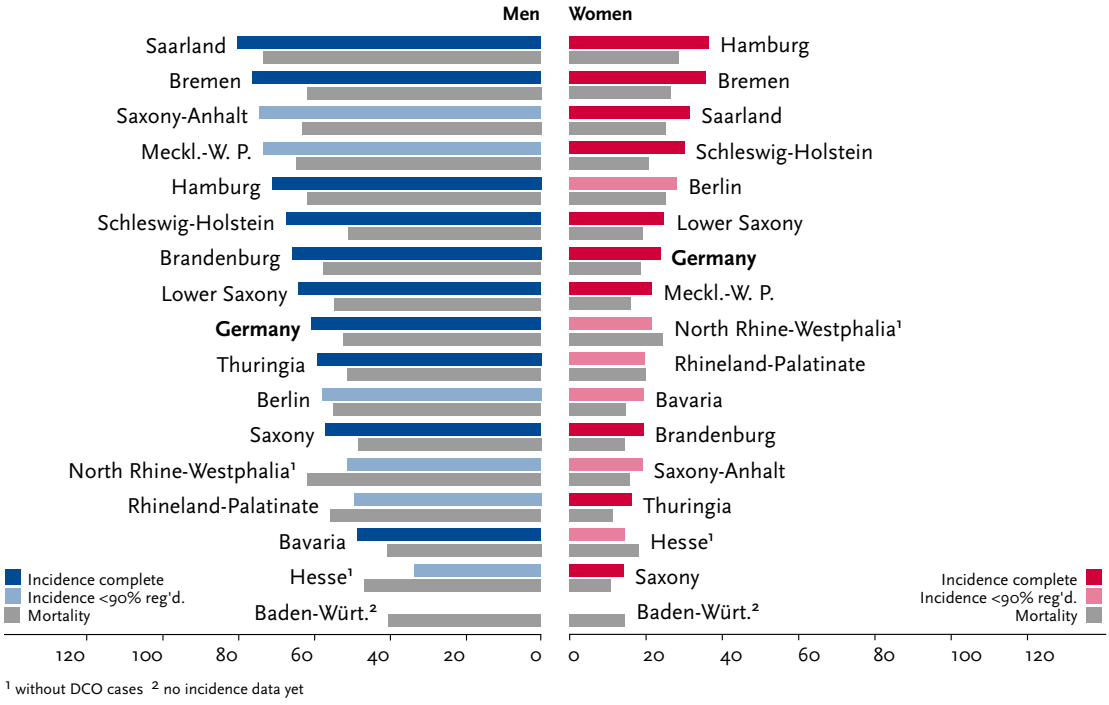
Table 3.10.2
Age-specific incidence rates in Germany by gender, ICD-10 C33 – 34, 2007 – 2008
per 100 .000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.2	0.3	1.3	0.8	3.2	7.9	28.2	66.1	119.1	189.5	259.6	329.2	422.0	480.6	332.9
Woman	0.0	0.0	0.0	0.3	0.3	0.3	1.5	3.4	8.3	20.5	41.1	61.5	85.1	87.8	97.1	119.6	116.3	92.3

Table 3.10.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C33 – 34, database 2008

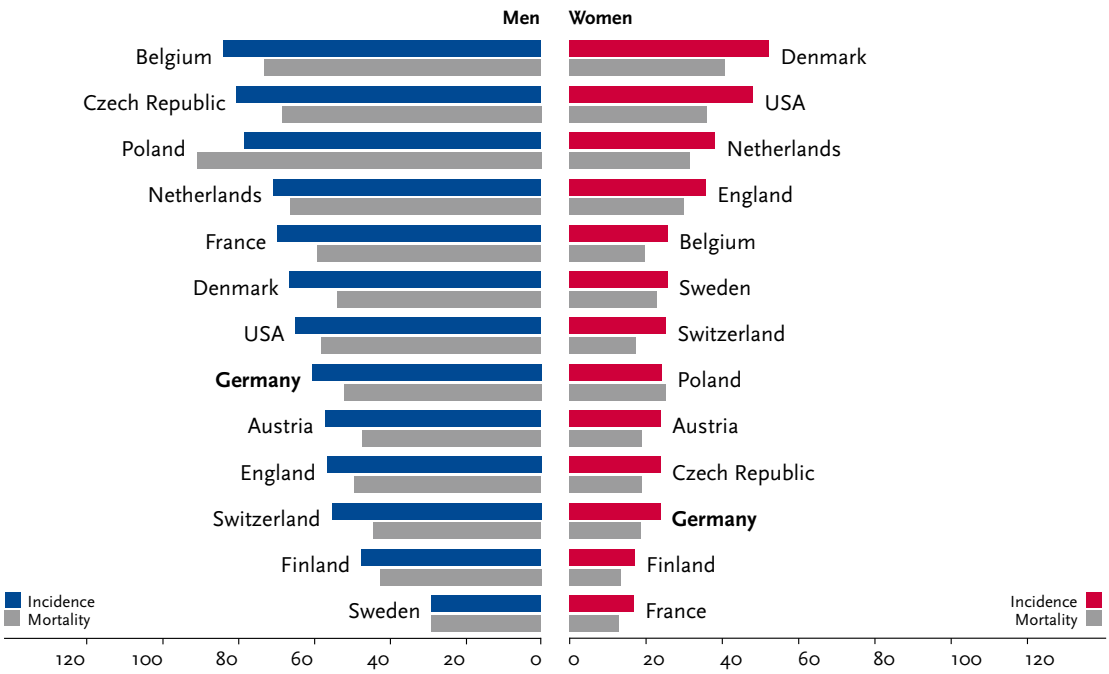
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 530)	7.1 %	(1 in 14)	0.2 %	(1 in 660)	6.3 %	(1 in 16)
50 years	0.9 %	(1 in 110)	7.1 %	(1 in 14)	0.7 %	(1 in 140)	6.3 %	(1 in 16)
60 years	2.1 %	(1 in 48)	6.6 %	(1 in 15)	1.8 %	(1 in 57)	6.0 %	(1 in 17)
70 years	3.1 %	(1 in 32)	5.3 %	(1 in 19)	2.8 %	(1 in 36)	4.9 %	(1 in 20)
Lifetime risk			7.0 %	(1 in 14)			6.2 %	(1 in 16)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1 %	(1 in 670)	3.0 %	(1 in 34)	0.1 %	(1 in 910)	2.5 %	(1 in 40)
50 years	0.5 %	(1 in 200)	2.9 %	(1 in 35)	0.4 %	(1 in 260)	2.4 %	(1 in 41)
60 years	0.8 %	(1 in 120)	2.4 %	(1 in 41)	0.6 %	(1 in 160)	2.1 %	(1 in 47)
70 years	1.0 %	(1 in 100)	1.7 %	(1 in 58)	0.8 %	(1 in 120)	1.6 %	(1 in 63)
Lifetime risk			3.0 %	(1 in 34)			2.5 %	(1 in 40)

Figure 3.10.5
Registered age-standardised incidence rates in German federal states, ICD-10 C33 – 34, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.10.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C33 – 34, 2007 – 2008 or latest available year (details and sources, see Annex)
per 100,000 (European standard)



3.11 Malignant melanoma of the skin

Table 3.11.1
Overview of the key epidemiological parameters for Germany, ICD-10 C43

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	7,340	7,740	8,910	8,890	*9,200*	*8,400*
Crude incidence rate[1]	18.2	18.4	22.1	21.2	*23.0*	*20.2*
Standardised incidence rate[1,2]	14.3	14.4	17.1	16.6	*16.9*	*15.6*
Median age at diagnosis	65	60	66	60		
Deaths	1,368	1,099	1,365	1,135		
Crude mortality rate[1]	3.4	2.6	3.4	2.7		
Standardised mortality rate[1,2]	2.6	1.6	2.5	1.6		
5-year prevalence	28,600	32,600	30,900	34,200	*36,100*	*37,000*
Absolute 5-year survival rate (2007–2008)[3]			77 (71-82)	83 (76-85)		
Relative 5-year survival rate (2007–2008)[3]			87 (84-94)	91 (82-94)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Nearly 18,000 people were diagnosed in 2008 with a malignant melanoma of the skin (men and women in near equal parts), with in addition some 5,000 in situ melanomas. Malignant skin melanomas are distinguished in terms of their growth behaviour. The most common type is the superficial spreading melanoma (SSM), for which the prognosis is good.

The median age of women at diagnosis is 60 years, which is comparatively young. Men are diagnosed at a median age of 66 years. This corresponds to higher risks of developing disease among younger women and older men. Only about one in 440 women and one in 350 men in Germany die of a malignant melanoma of the skin.

Since the 1980s, the age-standardised incidence rates have more than tripled. The mortality rates of women have declined by about 10 %, whereas mortality rates for men have increased to a similar extent. Since the end of the 1990s the mortality rates have been unchanged, but the incidence rates increased in 2008 alone by 15-20 %. This was the year in which the new screening programme for skin cancer was introduced.

Currently, the relative 5-year survival rate in Germany for women with malignant melanoma of the skin is above 90 % and for men is 87 %. The survival rates are favourable in part due to the fact that every second melanoma is discovered at an early stage (T1).

Risk factors

More than half of all skin melanomas develop on skin without previous noticeable changes, while the remainder originate from existing skin pigmentations. People with a light skin type, or with a large number of skin pigmentations (moles, birth marks, or dysplastic naevi) have a higher risk of developing a melanoma, and genetic factors can therefore also play a part. High-risk genes have been identified which are linked to rare family clusters of melanoma, other genes are associated with a medium risk, and some increase the likelihood of "spontaneously" developing malignant melanomas as a result of other risk factors.

The most important exogenous risk factor is exposure to natural sunlight or artificial UV-radiation in solariums, in particular during childhood and youth. A further risk factor is exposure to ultraviolet radiation at the workplace, e.g. during welding.

Early detection

In 2008, new screening regulations were introduced in Germany for all forms of skin cancer within the framework of the legislation on the early detection of cancer. Men and women above 35 years of age with statutory health insurance are entitled to a medical examination by a suitably trained doctor (dermatologist, general practitioner, etc.).

Figure 3.11.1a
Age-standardised incidence and mortality rates, ICD-10 C43, Germany, 1999 – 2008
per 100,000 (European standard)

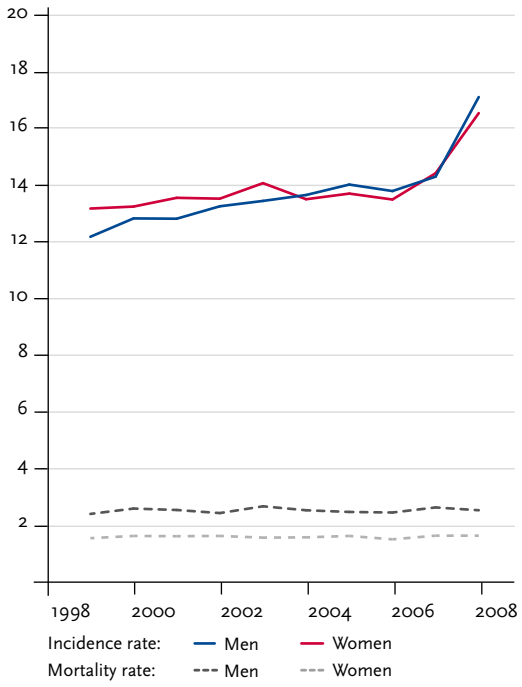


Figure 3.11.1b
Absolute numbers of new cases and deaths, ICD-10 C43, Germany, 1999 – 2008

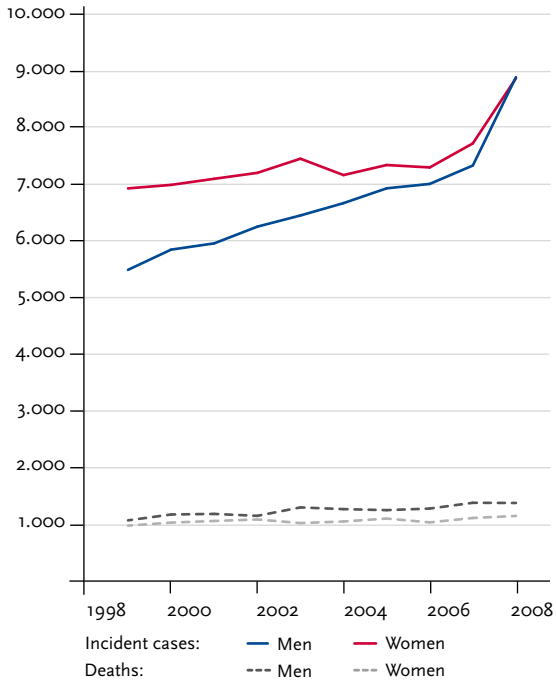


Figure 3.11.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C43, Germany, 2007 – 2008

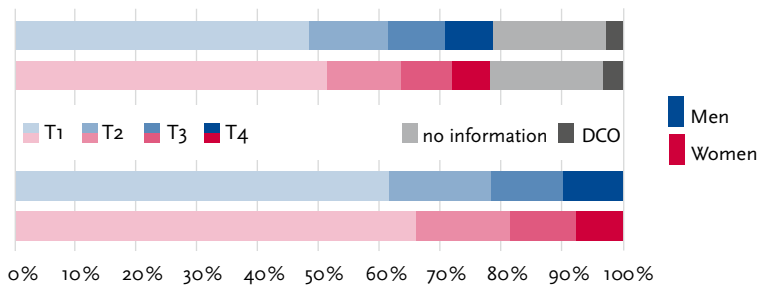


Figure 3.11.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C43, Germany, 2007 – 2008

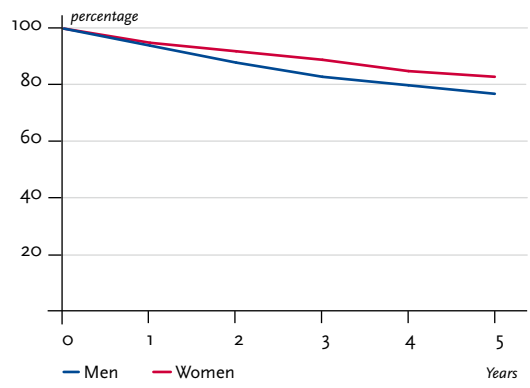


Figure 3.11.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C43, Germany, 2007 – 2008

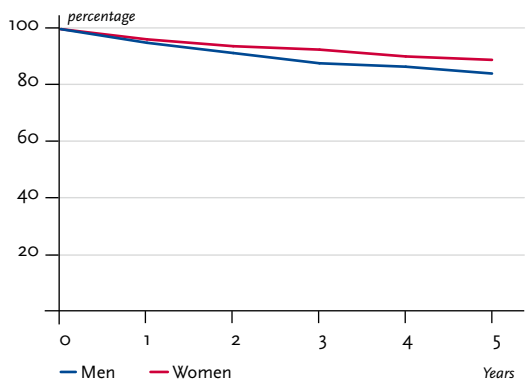


Figure 3.11.4
Age-specific incidence rates in Germany by gender ICD-10 C43, 2007 – 2008
per 100,000

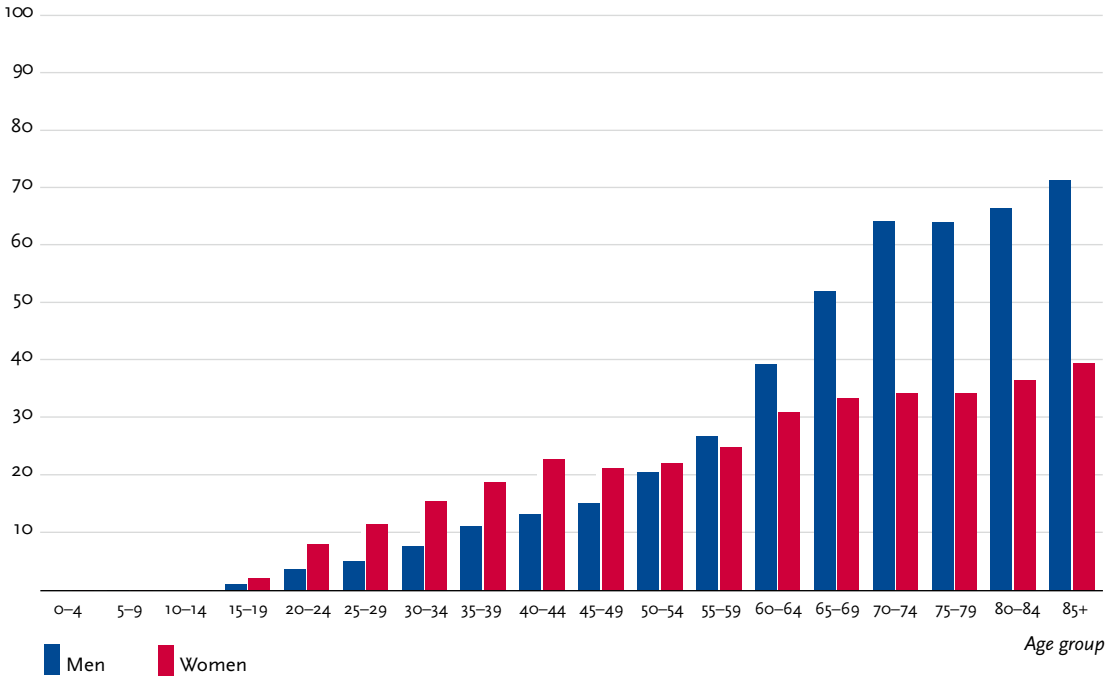


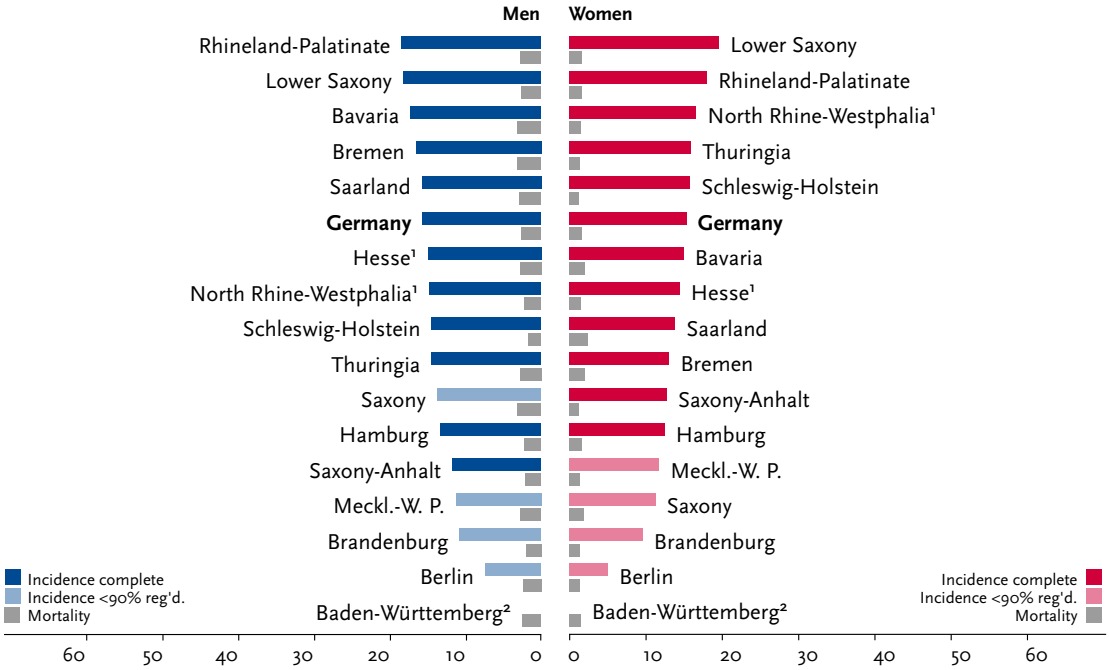
Table 3.11.2
Age-specific incidence rates in Germany by gender, ICD-10 C43, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.1	0.0	1.1	3.7	5.1	7.7	11.2	13.3	15.2	20.6	27.0	39.6	52.2	64.5	64.4	66.7	71.7
Woman	0.1	0.1	0.1	2.1	8.1	11.5	15.6	18.9	23.0	21.3	22.3	25.1	31.2	33.6	34.4	34.5	36.8	39.7

Table 3.11.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C43, database 2008

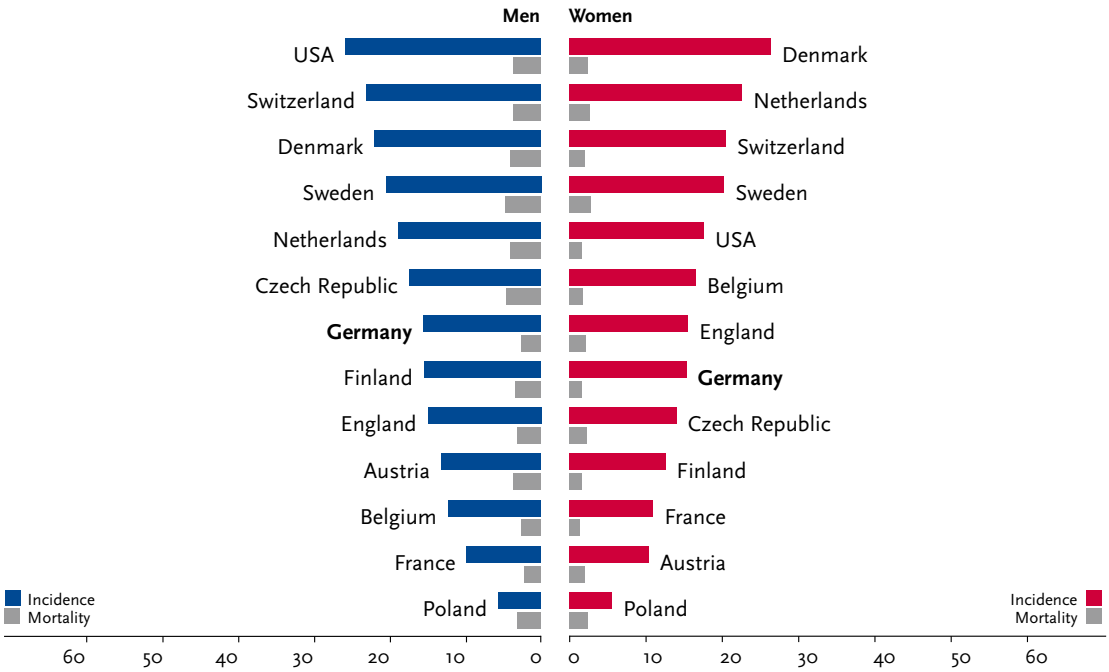
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 640)	1.6 %	(1 in 63)	<0.1 %	(1 in 5,900)	0.3 %	(1 in 350)
50 years	0.3 %	(1 in 390)	1.5 %	(1 in 68)	<0.1 %	(1 in 2,900)	0.3 %	(1 in 370)
60 years	0.5 %	(1 in 210)	1.3 %	(1 in 76)	0.1 %	(1 in 1,600)	0.3 %	(1 in 390)
70 years	0.6 %	(1 in 170)	1.0 %	(1 in 100)	0.1 %	(1 in 920)	0.2 %	(1 in 440)
Lifetime risk			1.7 %	(1 in 58)			0.3 %	(1 in 350)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 420)	1.4 %	(1 in 74)	<0.1 %	(1 in 6,300)	0.2 %	(1 in 450)
50 years	0.3 %	(1 in 390)	1.1 %	(1 in 88)	<0.1 %	(1 in 4,000)	0.2 %	(1 in 480)
60 years	0.3 %	(1 in 310)	0.9 %	(1 in 110)	<0.1 %	(1 in 2,600)	0.2 %	(1 in 530)
70 years	0.3 %	(1 in 290)	0.6 %	(1 in 160)	0.1 %	(1 in 1,600)	0.2 %	(1 in 610)
Lifetime risk			1.6 %	(1 in 61)			0.2 %	(1 in 440)

Figure 3.11.5
Registered age-standardised incidence rates in German federal states, ICD-10 C43, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.11.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C43, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.12 Breast

Table 3.12.1
Overview of the key epidemiological parameters for Germany, ICD-10 C50

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	520	66,490	520	71,660	*600*	*74,500*
Crude incidence rate[1]	1.3	158.4	1.3	171.1	*1.5*	*180.0*
Standardised incidence rate[1,2]	0.9	114.4	1.0	123.1	*1.0*	*124.7*
Median age at diagnosis	69	66	68	65		
Deaths	249	16,780	136	17,209		
Crude mortality rate[1]	0.6	40.0	0.3	41.1		
Standardised mortality rate[1,2]	0.5	24.3	0.2	24.6		
5-year prevalence	1,800	260,000	1,900	273,000	*2,100*	*300,900*
Absolute 5-year survival rate (2007–2008)[3]			63 (52-64)	78 (75-79)		
Relative 5-year survival rate (2007–2008)[3]			76 (61-77)	86 (83-87)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

With some 72,000 new cases diagnosed annually, breast cancer is by far the most frequent type of cancer in women; there are annually also an additional 6,500 in situ tumours. According to current figures, about one woman in eight will develop breast cancer in the course of herlife. Of these, a quarter of the women are younger than 55 years at diagnosis, and one in ten is younger than 45 years old.

In 2008, twice as many women were diagnosed as in 1980. The age-standardised incidence rate has since increased by 50 %. The current incidence and mortality rates are comparable with the results for neighbouring countries. However, they are still some 25 % lower across eastern Germany than in the western federal states.

With the gradual introduction of mammography screening across the country, beginning in 2005, the incidence rates initially spiked. This indicates that in the first phase of the programme many tumours were diagnosed at a much earlier stage than they would have been without screening. However, it is also possible that some tumours were diagnosed that would otherwise have gone unrecognised for the whole life of the patient (over-diagnosis). There has been an appreciable increase in the proportion of smaller tumours (T1) in the screening age group.

Despite the increased incidence, fewer women die of cancer now than 20 years ago. The survival prospects have been improved considerably by advances in therapy. It will not be possible to tell if screening leads to a further reduction in breast cancer mortality before 2015 at the earliest.

Risk factors

Early first menses and late last menses, no children or a late first child are associated with an increased risk of breast cancer in women. Conversely, several or early births and longer periods of breast-feeding reduce the risk of breast cancer. Hormone replacement therapy with oestrogen, either alone or in combination with progestogen during and after menopause increase the risk of breast cancer. Ovulation inhibitors containing hormones (the "Pill") only have a slight influence.

Studies have shown an increased risk with overweight and a lack of exercise after menopause, and alcohol is also a proven risk factor. There is increasing evidence that the risk is increased by smoking and passive exposure to tobacco smoke.

Women with very dense breast tissue or with certain benign neoplasms (lobular neoplasias and atypical ductal hyperplasias) have an increased risk, the same applies if there are cases of breast or ovary cancer in the family. However, so-called "breast cancer genes" (BRCAs) can only be identified in some 5 to 10 % of patients; other genes play a part in the development of mammary carcinomas.

Early detection

Under the early detection programme, women above the age of 30 years are offered an annual palpation examination by a physician. Between 2005 und 2008, the Mammography Screening Programme was introduced in Germany, and women between 50 and 69 years are invited to an x-ray examination of the breasts every two years.

Figure 3.12.1a
Age-standardised incidence and mortality rates, ICD-10 C50, Germany, 1999 – 2008
per 100,000 (European standard)

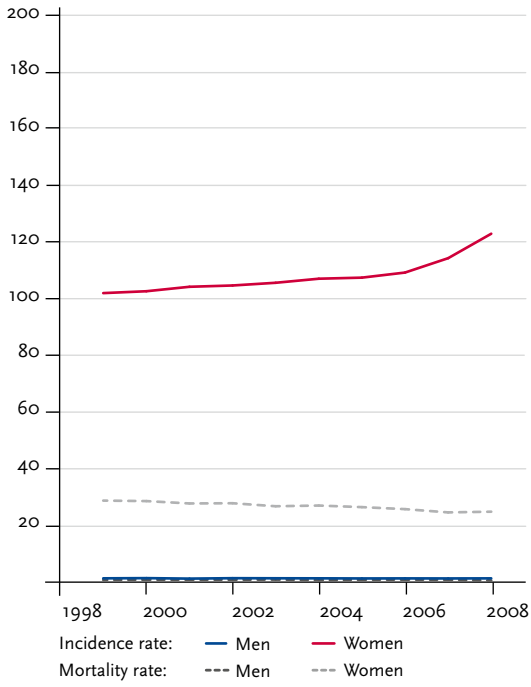


Figure 3.12.1b
Absolute numbers of new cases and deaths, ICD-10 C50, Germany, 1999 – 2008

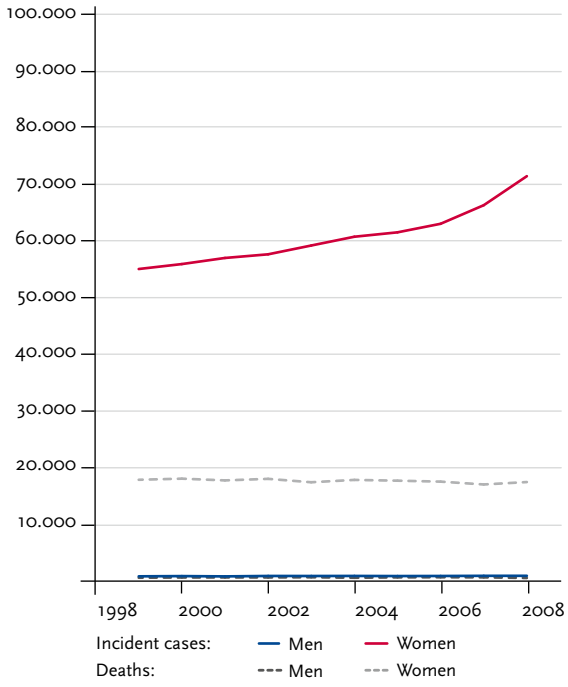


Figure 3.12.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C50, Germany, 2007 – 2008

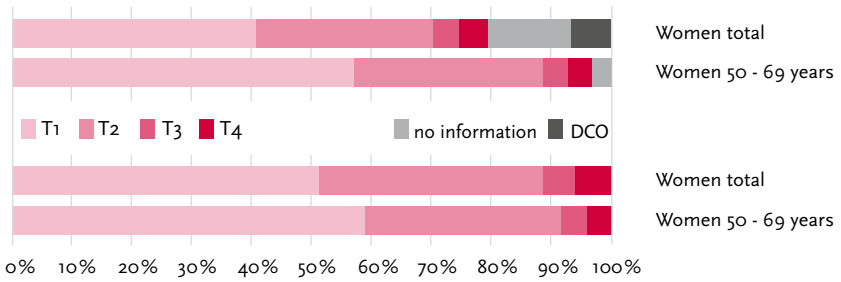


Figure 3.12.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C50, Germany, 2007 – 2008

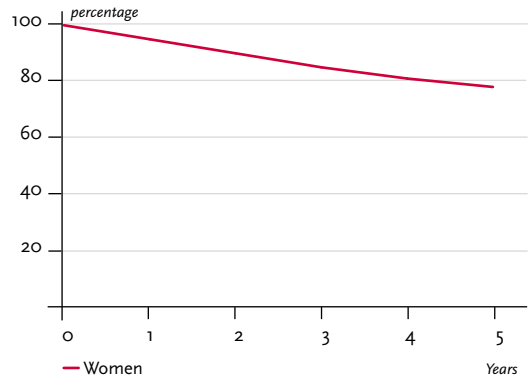


Figure 3.12.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C50, Germany, 2007 – 2008

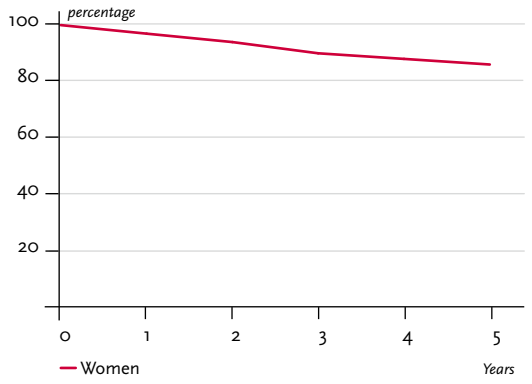


Figure 3.12.4
Age-specific incidence rates in Germany by gender ICD-10 C50, 2007 – 2008
per 100,000

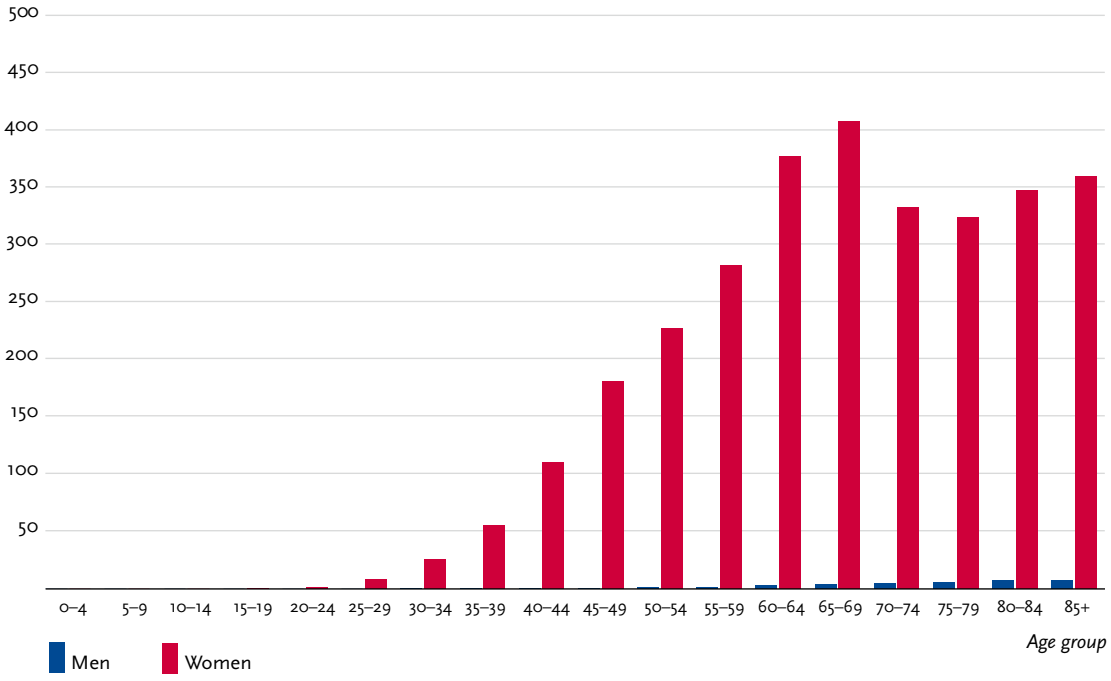


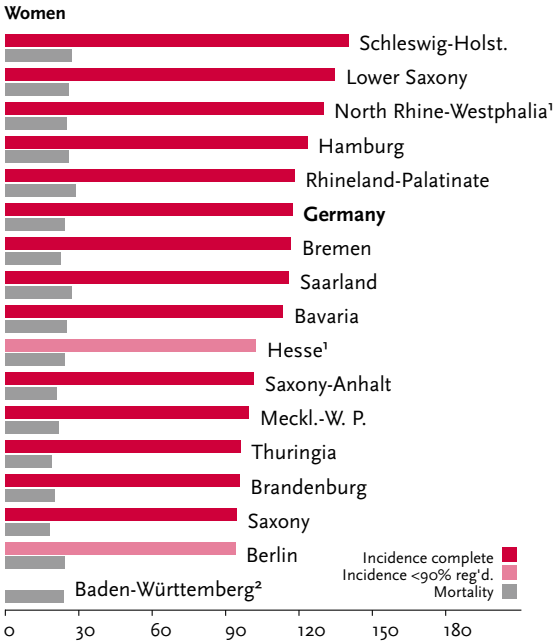
Table 3.12.2
Age-specific incidence rates in Germany by gender, ICD-10 C50, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.3	0.5	1.0	1.5	3.0	4.0	4.8	5.6	7.6	7.6
Woman	0.0	0.0	0.0	0.3	1.5	8.0	25.9	55.9	110.4	181.3	228.1	283.5	378.8	409.6	333.8	325.3	348.6	361.5

Table 3.12.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C50, database 2008

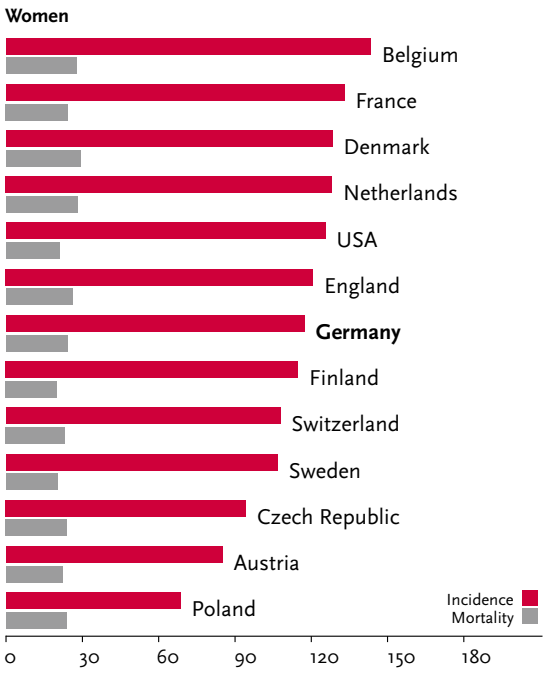
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 30,000)	0.1%	(1 in 670)	<0.1%	(1 in 46,000)	0.1%	(1 in 1,500)
50 years	<0.1%	(1 in 8,800)	0.1%	(1 in 670)	<0.1%	(1 in 24,000)	0.1%	(1 in 1,500)
60 years	<0.1%	(1 in 3,300)	0.1%	(1 in 680)	<0.1%	(1 in 7,900)	0.1%	(1 in 1,500)
70 years	0.1%	(1 in 730)	0.1%	(1 in 730)	0.1%	(1 in 1,500)	0.1%	(1 in 1,500)
Lifetime risk			0.1%	(1 in 680)			0.1%	(1 in 1,500)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	1.5%	(1 in 68)	13.0%	(1 in 8)	0.2%	(1 in 570)	3.4%	(1 in 30)
50 years	2.7%	(1 in 37)	11.8%	(1 in 8)	0.4%	(1 in 240)	3.3%	(1 in 31)
60 years	4.1%	(1 in 24)	9.7%	(1 in 10)	0.8%	(1 in 130)	2.9%	(1 in 34)
70 years	3.4%	(1 in 29)	6.3%	(1 in 16)	1.0%	(1 in 100)	2.4%	(1 in 42)
Lifetime risk			13.3%	(1 in 8)			3.4%	(1 in 29)

Figure 3.12.5
Registered age-standardised incidence rates in German federal states, only women ICD-10 C50, 2007 – 2008
per 100,000 (European standard)



¹ ohne DCO-Fälle ² noch keine Inzidenzdaten

Figure 3.12.6
International comparison of age-standardised incidence and mortality rates, only women, ICD-10 C50, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.13 Cervix

Table 3.13.1
Overview of the key epidemiological parameters for Germany, ICD-10 C53

	2007	2008	Prediction for 2012
	Woman	Woman	Woman
Incident cases	4,780	4,880	*4,600*
Crude incidence rate[1]	11.4	11.6	*11.0*
Standardised incidence rate[1,2]	9.4	9.5	*9.0*
Median age at diagnosis	52	52	
Deaths	1,566	1,596	
Crude mortality rate[1]	3.7	3.8	
Standardised mortality rate[1,2]	2.6	2.6	
5-year prevalence	16,700	17,000	*16,400*
Absolute 5-year survival rate (2007–2008)[3]		65 (53-72)	
Relative 5-year survival rate (2007–2008)[3]		68 (56-75)	

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In Germany some 4,900 women were diagnosed with a cervical carcinoma in 2008. About three-quarters of the invasive cervical tumours are squamous epithelial carcinomas. Adenocarcinomas (approx. 20 %) have a higher origin at the transition from uterus to cervix.

The incidence rates of invasive (fully developed) cervical carcinoma are continuing to decline among women. Since the 1990s, however, the rate of decline has slowed down. The highest incidence rates are currently for 40- to 49-year-old women. In the 1980s, older women had the highest relative incidence rates. The median age at diagnosis for invasive cancer is 52 years, in comparison with 69 years for all types of cancer. The median age at diagnosis for in situ carcinomas is 36 years. These are some three to four times more frequent than invasive carcinomas, a result of the early detection programme that is aimed at the identification and treatment of cancer precursors. The mortality rates have also declined markedly since 1980. Overall in Germany, one in 340 women dies as a result of cervical cancer, which corresponds to nearly 1,600 deaths every year – 30 years ago it was twice as many.

The relative 5-year survival rate after diagnosis of an invasive cervical tumour is 68 %. More than half of every invasive carcinoma is diagnosed at an early stage (T1).

Risk factors and early detection

Cervical cancer is mostly the result of sexually transmitted infection with human papilloma viruses (HPV). The majority of women are infected with HPV at some stage in their life. Usually, the infection heals without further effects, but in some cases it persists and a cervical carcinoma can develop, above all with virus subtypes from the high risk group (e.g. HPV 16 and 18). Further risk factors are smoking, infections in the genital area with sexually transmitted pathogens such as herpes simplex or chlamydia, multiple births, or a severely impaired immune system. Taking old-generation oral contraceptives is also associated with a slightly increased incidence risk. However there are not yet any reliable findings concerning new generations of the "Pill".

Women in Germany aged 20 years and above are entitled to an annual cervical smear test (PAP smear) as part of the statutory cancer screening arrangements. In March 2007, the German Standing Committee on Vaccination Recommendations (STIKO) proposed inoculating girls between 12 and 17 years of age against HPV 16 and 18, which are responsible for some 70 % of all cervical carcinomas. It has been proved that the vaccination can prevent the development of preliminary stages of cervical cancer. However, the vaccination does not render the PAP-smear test superfluous, because it only protects against the more common high-risk papilloma viruses.

Figure 3.13.1a
Age-standardised incidence and mortality rates, ICD-10 C53, Germany, 1999 – 2008
per 100,000 (European standard)

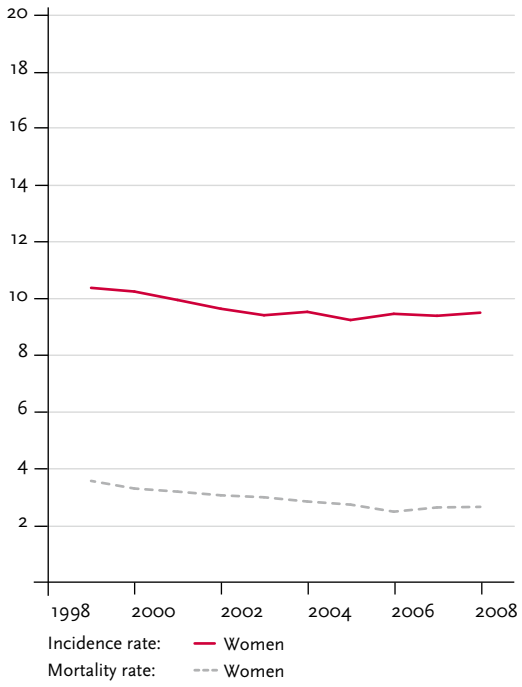


Figure 3.13.1b
Absolute numbers of new cases and deaths, ICD-10 C53, Germany, 1999 – 2008

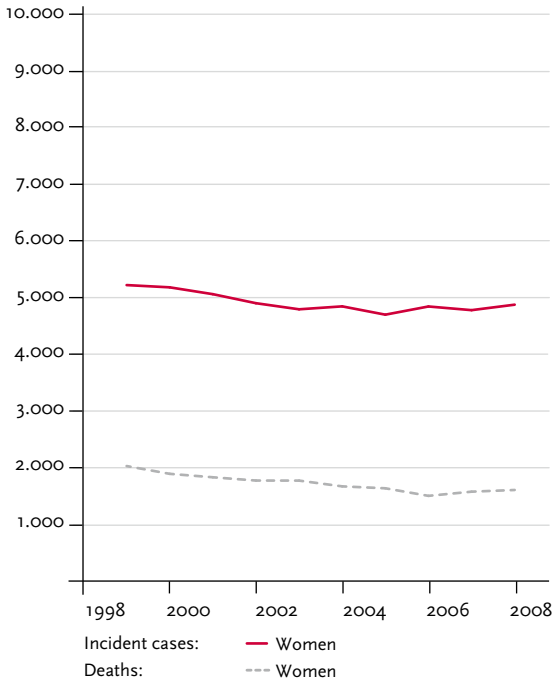


Figure 3.13.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C53, Germany, 2007 – 2008

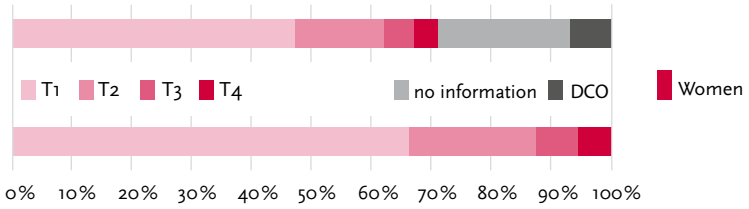


Figure 3.13.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C53, Germany, 2007 – 2008

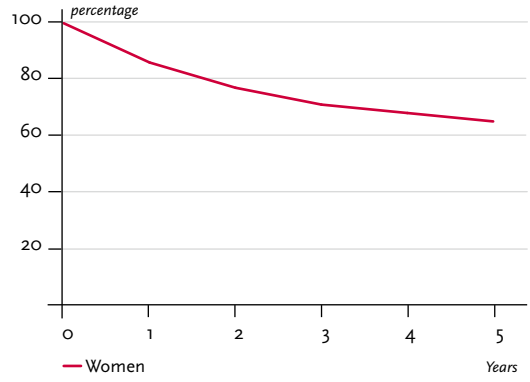


Figure 3.13.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C53, Germany, 2007 – 2008

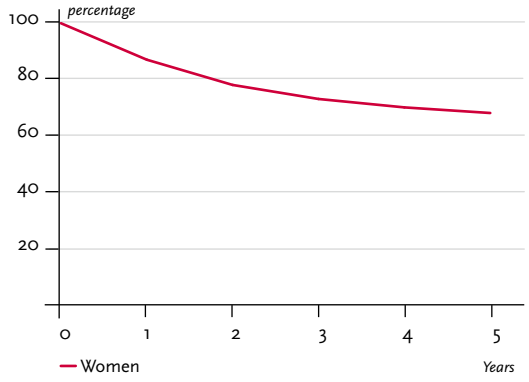


Figure 3.13.4
Age-specific incidence rates, ICD-10 C53, Germany, 2007 – 2008
per 100,000

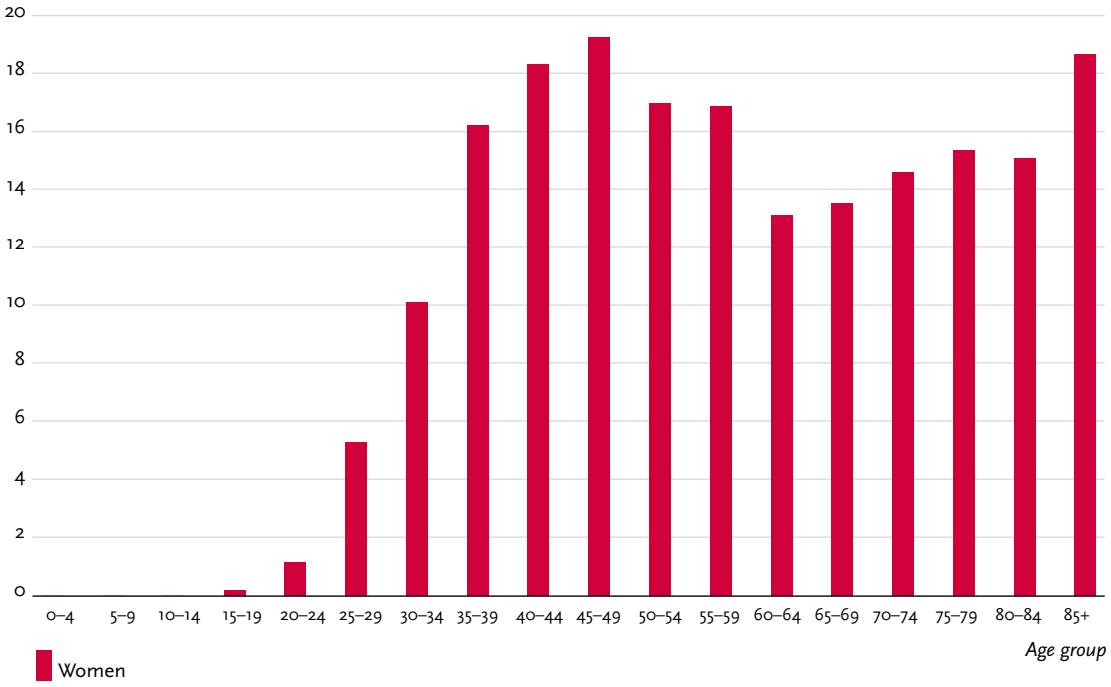


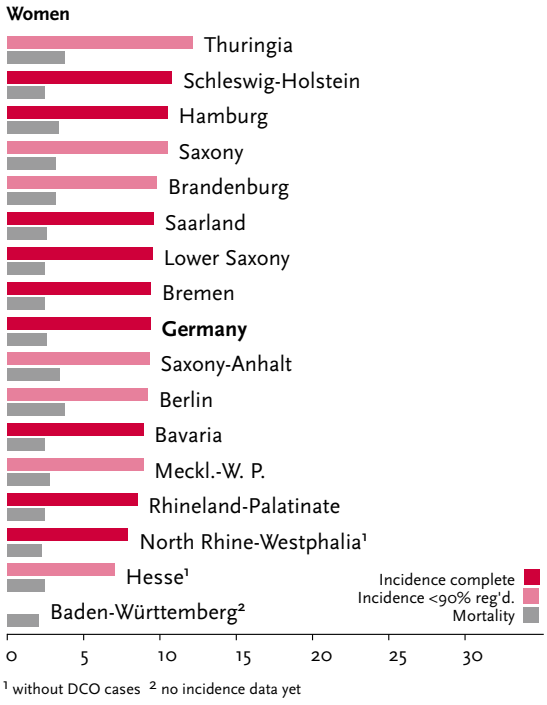
Table 3.13.2
Age-specific incidence rates, ICD-10 C53, Germany, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Woman	0.0	0.0	0.0	0.2	1.1	5.3	10.2	16.3	18.4	19.3	17.0	16.9	13.2	13.6	14.6	15.4	15.2	18.7

Table 3.13.3
Incidence and mortality risks in Germany by age, ICD-10 C53, Database 2008

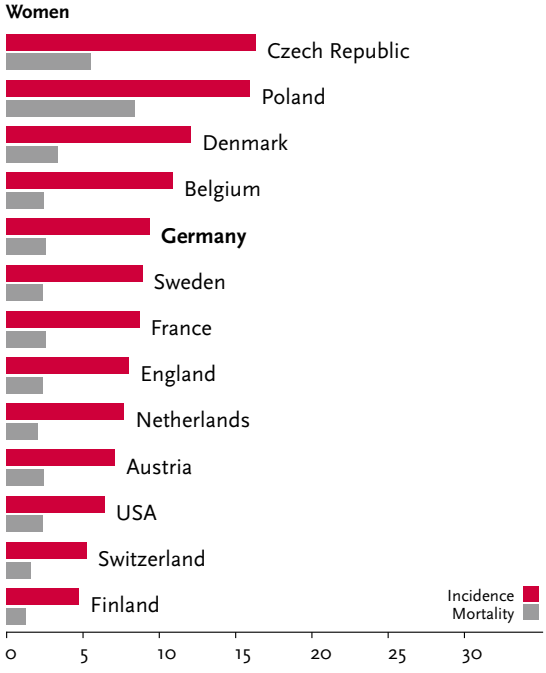
	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2 %	(1 in 530)	0.7 %	(1 in 140)	<0.1 %	(1 in 2,500)	0.3 %	(1 in 350)
50 years	0.2 %	(1 in 590)	0.5 %	(1 in 190)	<0.1 %	(1 in 1,900)	0.3 %	(1 in 400)
60 years	0.1 %	(1 in 730)	0.4 %	(1 in 260)	0.1 %	(1 in 1,700)	0.2 %	(1 in 490)
70 years	0.1 %	(1 in 750)	0.3 %	(1 in 380)	0.1 %	(1 in 1,400)	0.2 %	(1 in 630)
Lifetime risk			0.9 %	(1 in 120)			0.3 %	(1 in 340)

Figure 3.13.5
Registered age-standardised incidence rates in German federal states, ICD-10 C53, 2007 – 2008
per 100,000 (European standard)



[1] without DCO cases [2] no incidence data yet

Figure 3.13.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C53, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.14 Uterus

Table 3.14.1
Overview of the key epidemiological parameters for Germany, ICD-10 C54 – 55

	2007	2008	Prediction for 2012
	Woman	Woman	Woman
Incident cases	11,340	11,280	*11,200*
Crude incidence rate[1]	27.0	26.9	*26.9*
Standardised incidence rate[1,2]	17.6	17.2	*16.4*
Median age at diagnosis	69	69	
Deaths	2,443	2,420	
Crude mortality rate[1]	5.8	5.8	
Standardised mortality rate[1,2]	3.1	3.0	
5-year prevalence	42,300	42,700	*42,600*
Absolute 5-year survival rate (2007–2008)[3]		70 (63-76)	
Relative 5-year survival rate (2007–2008)[3]		79 (72-85)	

[1] per 100,000 persons [2] age-standardised(European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

With an annual incidence of some 11,280 newly diagnosed cases, and accounting for 5.1 % of all malignant neoplasms, uterine cancer is the fourth most common form of cancer for women and the most common cancer of the female genital organs. However, due to the good prognosis, it only leads to 2.4 % of all cancer related deaths.

One in 47 women (2.1 %) develops cancer of the uterus in the course of her life, one in 200 dies as a result. Nevertheless, the age-standardised incidence rate in Germany continues to decrease. Like the mortality rate for cervical cancer, the mortality rate for uterine cancer is also steadily declining. The incidence and mortality risks are highest at 70 years of age. The median age at diagnosis is 69 years. Histologically, cancers of the uterus are mostly endometrial, i.e. adenocarcinomas originating from the lining of the uterus.(approx. 68 %). Some 78 % of carcinomas are diagnosed while still in Stage T1.

Uterus carcinomas have a good prognosis. The relative 5-year survival rate in Germany is approx. 79 %.

Risk factors

In addition to age, the long-term influence of oestrogen is a key risk factor. Therefore, the risk is increased by factors such as early first menses (menarche) and late onset of menopause, as well as childlessness or diseases of the ovaries, e.g. polycystic ovary syndrome (PCOS). Oestrogen as monotherapy during menopause also increases the risk, although the combination with progesterone does not. Oral contraceptives, in particular oestrogen-progesterone combinations, lower the risk. Women with breast cancer who have been treated with tamoxifen frequently develop a hyperplasia of the endometrial lining of the uterus and as a result have a higher carcinoma risk.

For hormone-dependent tumours, life-style related risk factors play a role, above all overweight and lack of exercise. Women with diabetes mellitus 2 develop uterine cancer more frequently. Gene mutations which can lead to hereditary nonpolyposis colorectal carcinoma (HNPCC), also contribute to a higher risk of uterine cancer.

For the rarer oestrogen-independent forms of this tumour, advanced age is a risk. Exposure of the uterus to radiation can also increase the risk. It is not possible to specify the role played by lifestyle factors or genetic factors for this form of uterus tumour.

Figure 3.14.1a
Age-standardised incidence and mortality rates, ICD-10 C54 – 55, Germany, 1999 – 2008
per 100,000 (European standard)

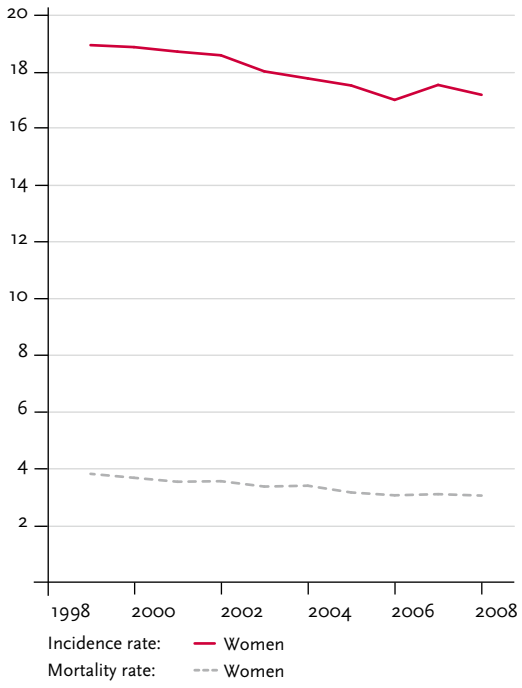


Figure 3.14.1b
Absolute numbers of new cases and deaths, ICD-10 C54 – 55, Germany, 1999 – 2008

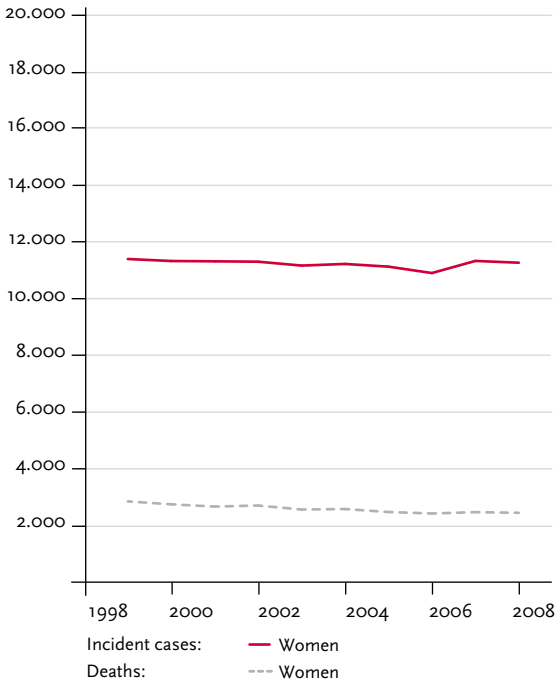


Figure 3.14.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C54 – 55, Germany, 2007 – 2008

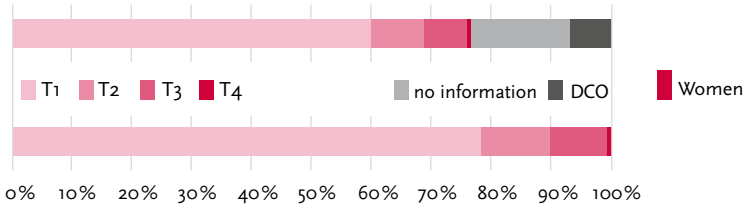


Figure 3.14.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C54 – 55, Germany, 2007 – 2008

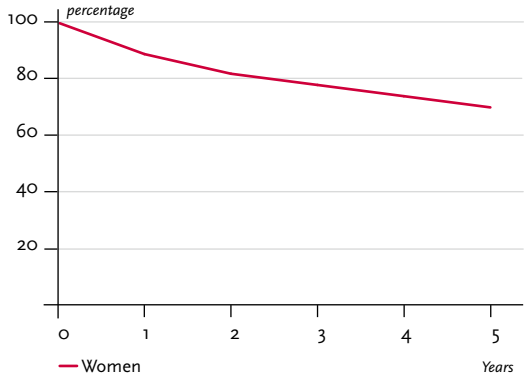


Figure 3.14.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C54 – 55, Germany, 2007 – 2008

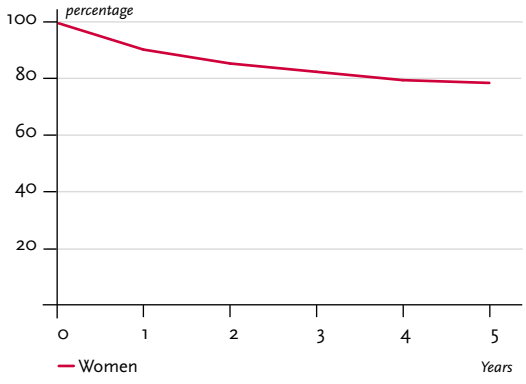


Figure 3.14.4
Age-specific incidence rates, ICD-10 C54 – 55, Germany, 2007 – 2008
per 100,000

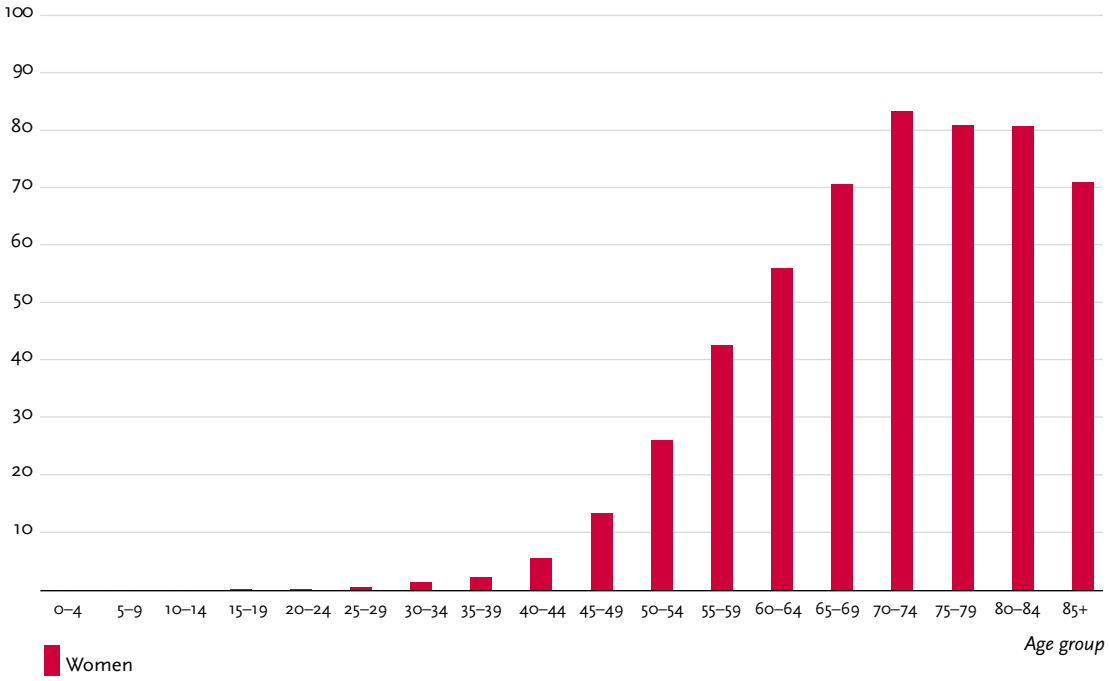


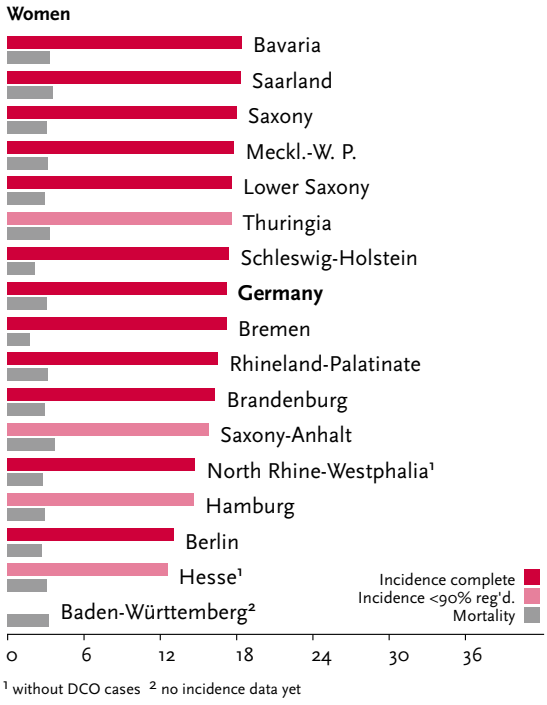
Table 3.14.2
Age-specific incidence rates, ICD-10 C54 – 55, Germany, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Frauen	0.0	0.0	0.0	0.1	0.1	0.5	1.4	2.3	5.5	13.6	26.4	43.1	56.5	70.8	84.1	81.5	81.1	71.5

Table 3.14.3
Incidence and mortality rates in Germany by age, ICD-10 C54 – 55, Database 2008

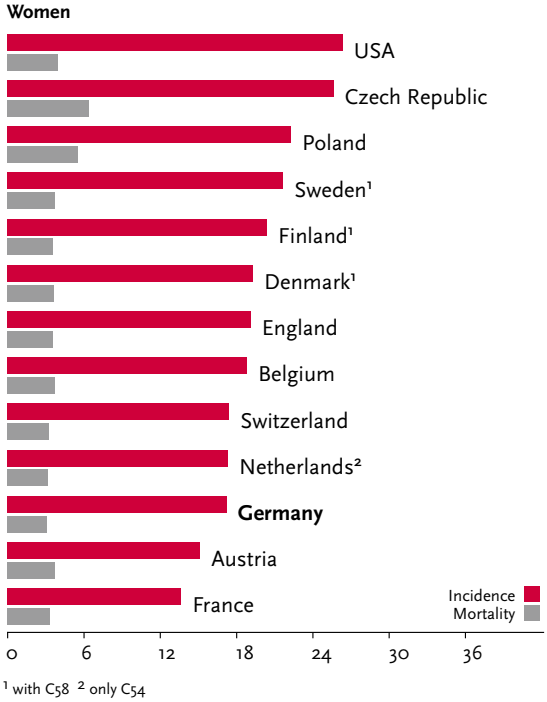
	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1 %	(1 in 980)	2.1 %	(1 in 47)	<0.1 %	(1 in 12,000)	0.5 %	(1 in 200)
50 years	0.3 %	(1 in 290)	2.1 %	(1 in 48)	<0.1 %	(1 in 3,200)	0.5 %	(1 in 200)
60 years	0.6 %	(1 in 170)	1.8 %	(1 in 55)	0.1 %	(1 in 1,000)	0.5 %	(1 in 210)
70 years	0.8 %	(1 in 130)	1.3 %	(1 in 76)	0.2 %	(1 in 550)	0.4 %	(1 in 240)
Lifetime risk			2.1 %	(1 in 47)			0.5 %	(1 in 200)

Figure 3.14.5
Registered age-standardised incidence rates in German federal states, ICD-10 C54 – 55, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.14.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C54 – 55, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ with C58 ² only C54

3.15 Ovaries

Table 3.15.1
Overview of the key epidemiological parameters for Germany, ICD-10 C56

	2007	2008	Prediction for 2012
	Woman	Woman	Woman
Incident cases	8,010	7,790	*7,200*
Crude incidence rate[1]	19.1	18.6	*17.5*
Standardised incidence rate[1,2]	12.7	12.2	*11.0*
Median age at diagnosis	69	69	
Deaths	5,564	5,529	
Crude mortality rate[1]	13.3	13.2	
Standardised mortality rate[1,2]	7.7	7.6	
5-year prevalence	20,300	20,300	*18,800*
Absolute 5-year survival rate (2007–2008)[3]		37 (28-42)	
Relative 5-year survival rate (2007–2008)[3]		40 (31-45)	

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Histologically, more than 90 % of malignant tumours of the ovaries are adenocarcinomas. For women, cancer of the ovaries account for 3.5 % of all malignant neoplasms and 5.6 % of all deaths due to cancer. The incidence rates increase continually up to the age of 75 years and then remain fairly constant. Between 5 and 10 % of all cases of ovarian cancer (mostly germ cell tumours) affect women under the age of 45 years. The median age at diagnosis is 69 years. The risk of developing a malignant ovarian tumour is 1.5 % (1 in 68 women).

There has been a marked decrease in the incidence of ovarian cancer in Germany since the 1990s, but the decline in the numbers of deaths is less pronounced. At diagnosis, 59 % of cases are already at the T3 stage, and 29 % are T1 stage.

The survival prospects of patients with ovarian cancer are poor in comparison with women with other cancers of the genital organs. The relative 5-year survival rate is currently about 40 %.

Risk factors

The risk of developing ovarian cancer increases with age. Among the lifestyle-related risk factors, obesity plays a role. There are important relationships with hormonal influences: childlessness, an early first menstruation, and a late onset of menopause lead to a comparatively large number of ovulatory cycles and thus to a higher risk of ovarian carcinomas compared to women with numerous births, longer periods of breast-feeding, and an early onset of menopause. During menopause, hormone replacement therapy (in particular with oestrogen monotherapy) represents a risk factor. In contrast, hormonal ovulation inhibitors (the "Pill") protects against ovarian cancer. The risk is also higher for women with polycystic ovaries, presumably also due to hormonal factors.

Women have an increased risk of ovarian cancer if first degree relatives have been diagnosed with breast or ovarian cancer, or if they themselves have already had cancer of the breast, uterus or bowel. Underlying genetic mutations, above all of BRCA1 and BRCA2, considerably increase the incidence risk, but they only play a role in a small proportion of cases. Other genetic factors are currently still a topic of research.

Figure 3.15.1a
Age-standardised incidence and mortality rates, ICD-10 C56, Germany 1999 – 2008
per 100,000 (European standard)

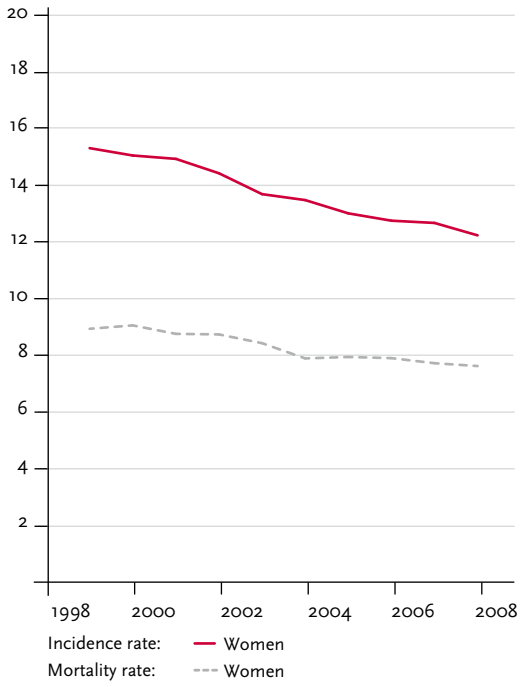


Figure 3.15.1b
Absolute numbers of new cases and deaths, ICD-10 C56, Germany 1999 – 2008

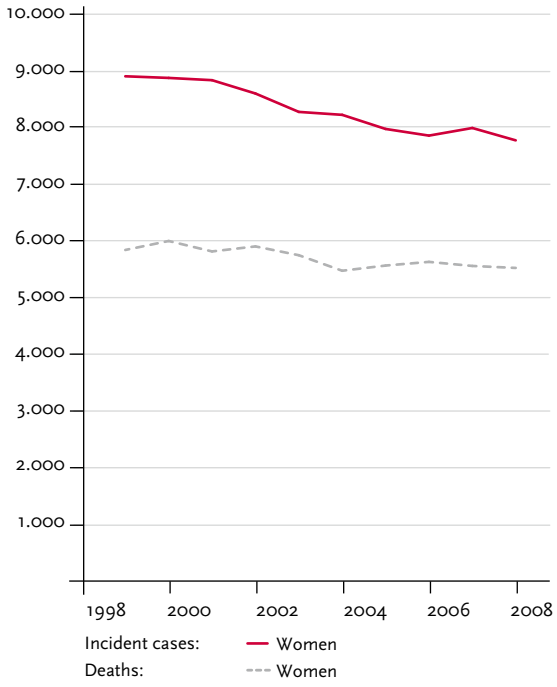


Figure 3.15.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C56, Germany, 2007 – 2008

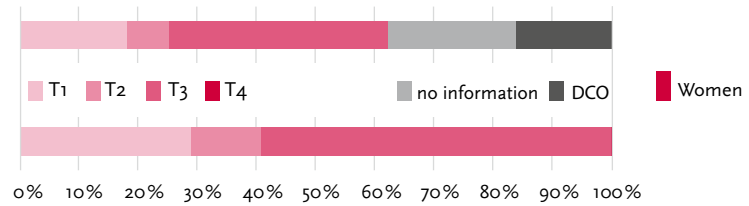


Figure 3.15.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C56, Germany, 2007 – 2008

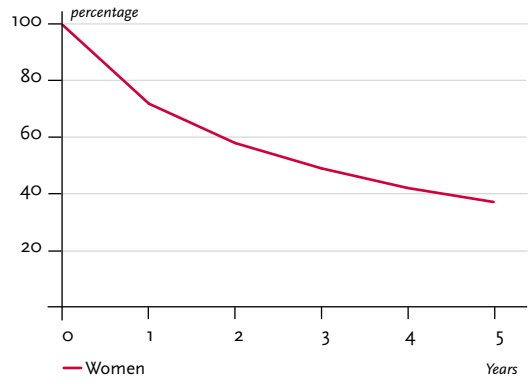


Figure 3.15.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C56, Germany, 2007 – 2008

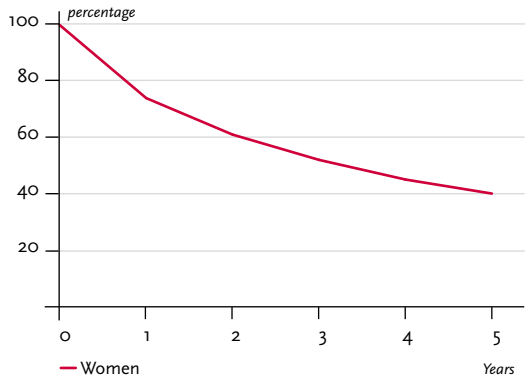


Figure 3.15.4
Age-specific incidence rates, ICD-10 C56, Germany, 2007 – 2008
per 100,000

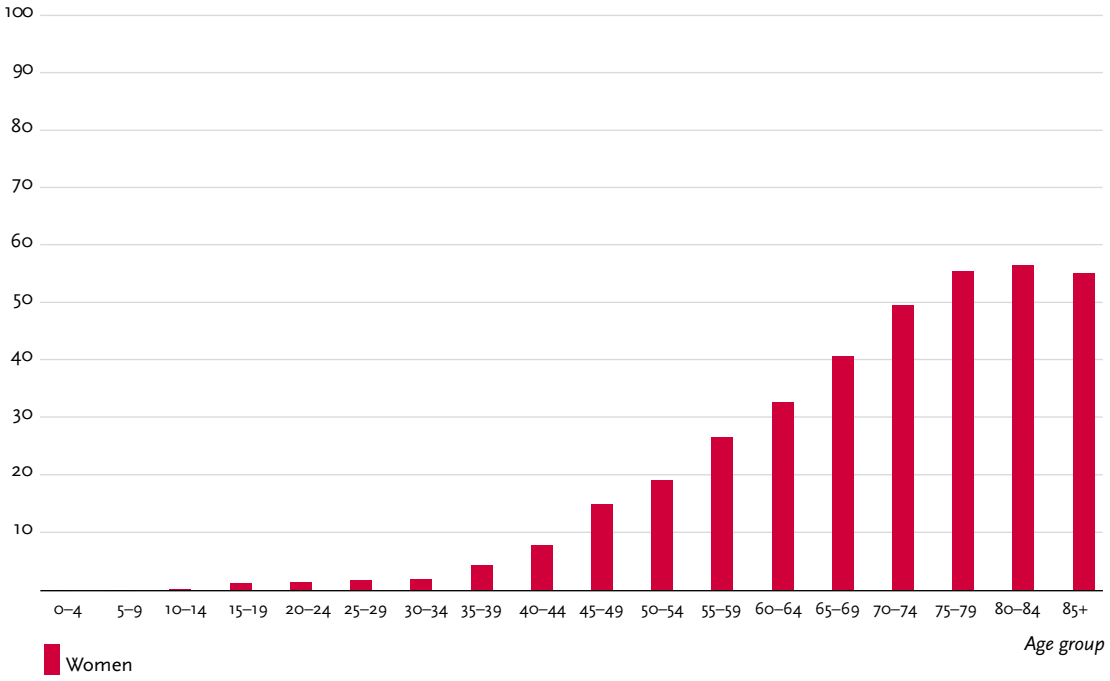


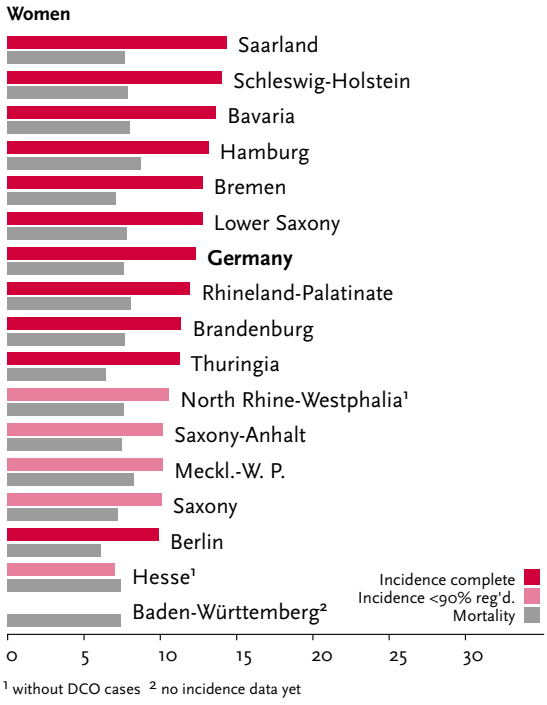
Table 3.15.2
Age-specific incidence rates, ICD-10 C56, Germany, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Woman	0.0	0.1	0.2	1.4	1.4	1.8	2.0	4.5	8.0	15.3	19.4	27.0	33.1	41.2	50.1	56.1	57.1	55.7

Table 3.15.3
Incidence and mortality rates in Germany by age, ICD-10 C56, Database 2008

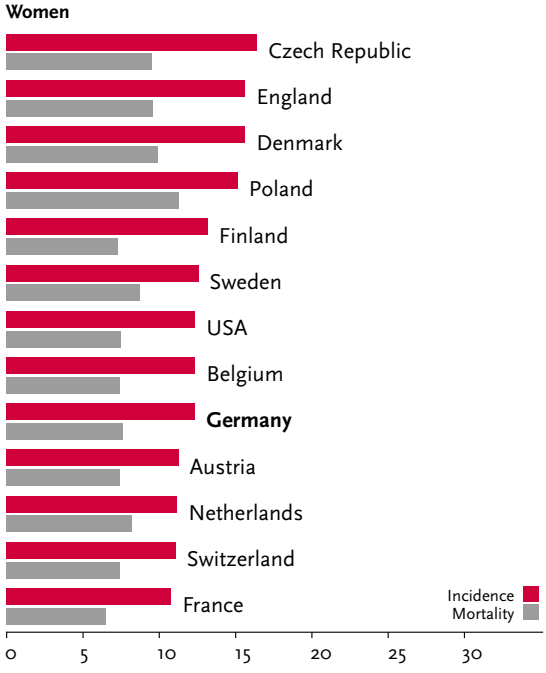
	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1 %	(1 in 880)	1.4 %	(1 in 70)	<0.1 %	(1 in 2,900)	1.1 %	(1 in 91)
50 years	0.2 %	(1 in 440)	1.3 %	(1 in 74)	0.1 %	(1 in 840)	1.1 %	(1 in 93)
60 years	0.3 %	(1 in 290)	1.2 %	(1 in 87)	0.2 %	(1 in 410)	1.0 %	(1 in 100)
70 years	0.5 %	(1 in 210)	0.9 %	(1 in 110)	0.4 %	(1 in 260)	0.8 %	(1 in 120)
Lifetime risk			1.5 %	(1 in 68)			1.1 %	(1 in 92)

Figure 3.15.5
Registered age-standardised incidence rates in German federal states, ICD-10 C56, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.15.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C56, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.16 Prostate

Table 3.16.1
Overview of the key epidemiological parameters for Germany, ICD-10 C61

	2007	2008	Prediction for 2012
	Men	Men	Men
Incident cases	64,500	63,440	*67,600*
Crude incidence rate[1]	160.1	157.7	*169.6*
Standardised incidence rate[1,2]	114.8	110.9	*110.9*
Median age at diagnosis	70	70	
Deaths	11,448	12,134	
Crude mortality rate[1]	28.4	30.2	
Standardised mortality rate[1,2]	20.2	20.6	
5-year prevalence	243,100	251,700	
Absolute 5-year survival rate (2007–2008)[3]		77 (73-80)	
Relative 5-year survival rate (2007–2008)[3]		92 (87-94)	

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Prostate cancer remains the most common form of cancer among men and the third most common cause of cancer-related deaths among men in Germany. In 2008 there were some 63,400 newly diagnosed cases. The annual number of newly diagnosed prostate tumours has therefore risen by some 50 % since 1999, and the age-standardised incidence rate has increased by 25 %. On the other hand, the mortality rate shows a slight decline since 2003. The upward trend in incidence rates which already began in the early 1980s is largely attributable to the increased discovery of early-stage tumours by the prostate specific antigen (PSA) test. This has led to appreciably higher incidence rates among men between 50 and 69 years of age and to a reduction in the median age at diagnosis to 70 years in 2008.

Hardly any cases of prostate cancer are diagnosed before the age of 50 years. This risk of a 40-year-old man of developing prostate cancer in the next ten years is only 0.1 %, compared with 6.6 % for a 70-year-old.

The relative 5-year survival rate for prostate cancer in Germany has improved considerably in recent years, in part due to diagnosis at an earlier stage. It is now 92 %, which is the second highest survival rate in Germany after testicular cancer (96 %).

Diagnosis at T1 and T2 stages accounts together for 76 % of cases, compared with only 3 % for the T4 stage.

Risk factors and early detection

Little is known about the causes of prostate carcinoma development and the factors influencing its progression. A major risk factor, however, is age. Testosterone also clearly plays a role, and without it prostate cancer would not develop. There is also evidence of clusters of cases among close relatives, although it is not clear whether inheritable gene mutations are involved.

Despite extensive research, there are few reliable findings about risk factors relating to lifestyle, diet, or the environment. However, there does appear to be a link between regular, high levels of alcohol consumption and the risk of developing prostate cancer. A large-scale cancer prevention study has shown that taking vitamin E as a dietary supplement increases the risk of having prostate cancer.

The statutory early detection programme in Germany provides for an annual prostate examination for all men above the age of 45 years. This includes questions about symptoms and other health changes, the investigation of the external sexual organs, and palpation examination of the prostate and the lymph nodes. A test for levels of prostate-specific antigen (PSA) in blood is not part of the screening programme, because so far its benefits have not been established.

Figure 3.16.1a
Age-standardised incidence and mortality rates, ICD-10 C61, Germany, 1999 – 2008
per 100,000 (European standard)

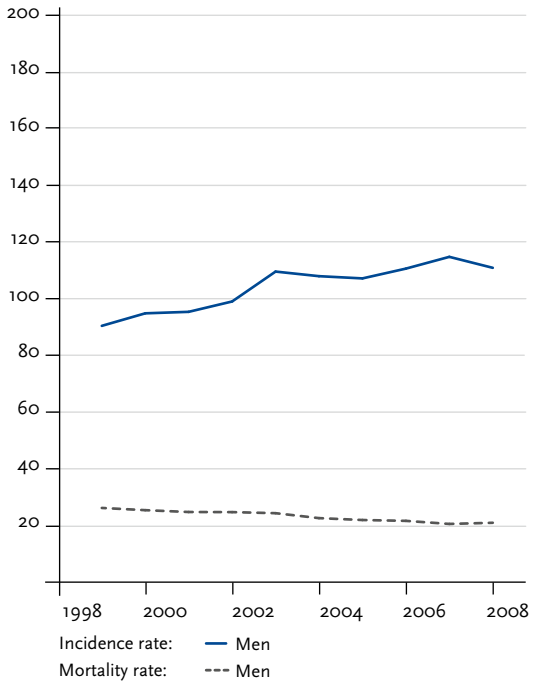


Figure 3.16.1b
Absolute numbers of new cases and deaths, ICD-10 C61, Germany, 1999 – 2008

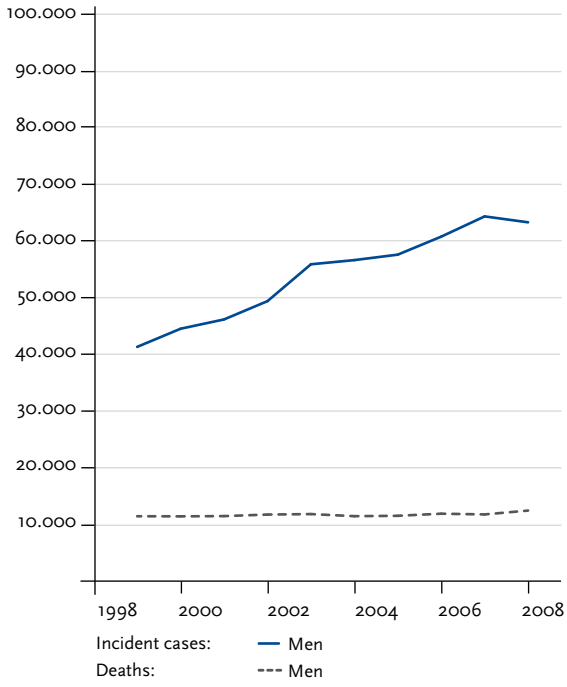


Figure 3.16.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C61, Germany, 2007 – 2008

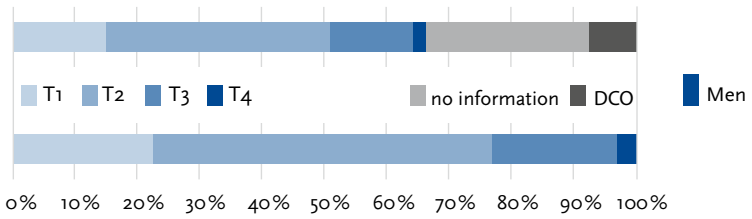


Figure 3.16.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C61, Germany, 2007 – 2008

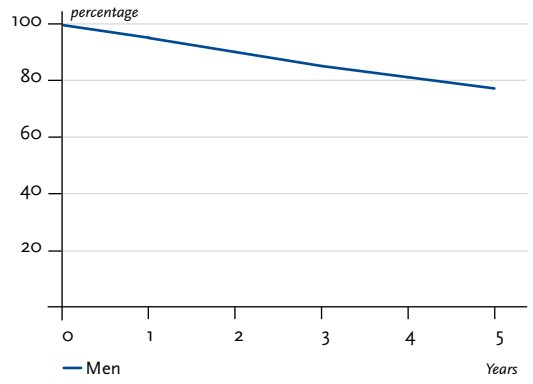


Figure 3.16.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C61, Germany, 2007 – 2008

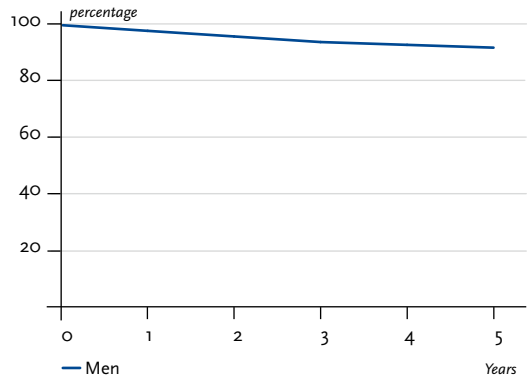


Figure 3.16.4
Age-specific incidence rates, ICD-10 C61, Germany, 2007 – 2008
per 100,000

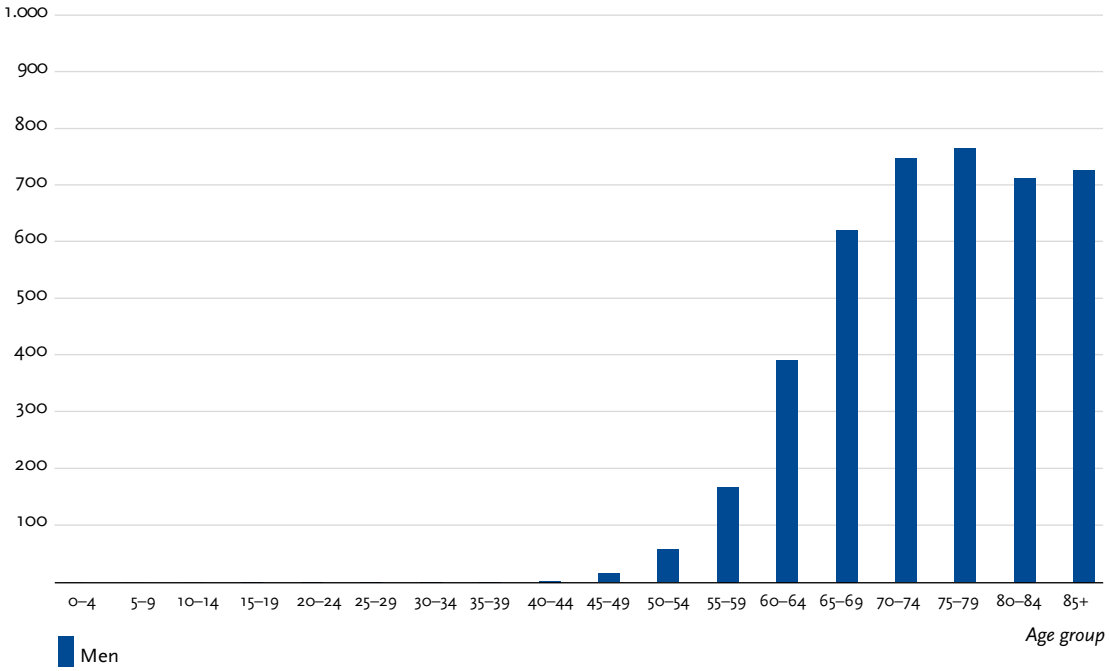


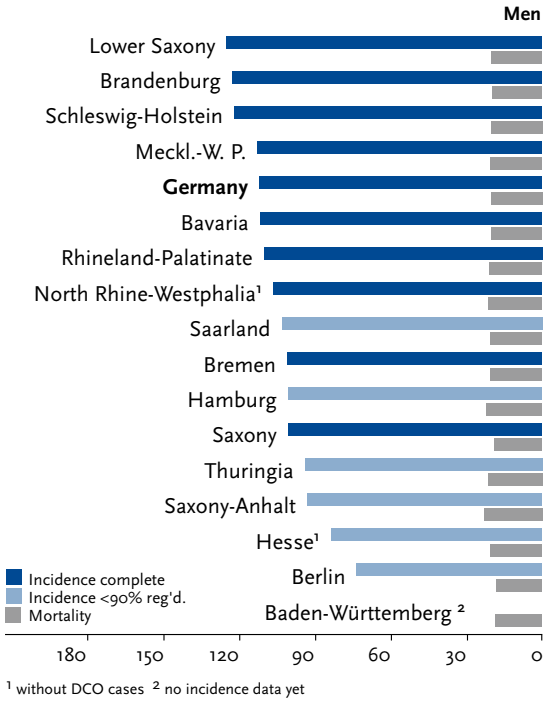
Table 3.16.2
Age-specific incidence rates, ICD-10 C61, Germany, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.3	2.3	15.3	58.2	169.4	395.5	626.3	753.1	771.4	718.9	732.7

Table 3.16.3
Incidence and mortality rates in Germany by age, ICD-10 C61, Database 2008

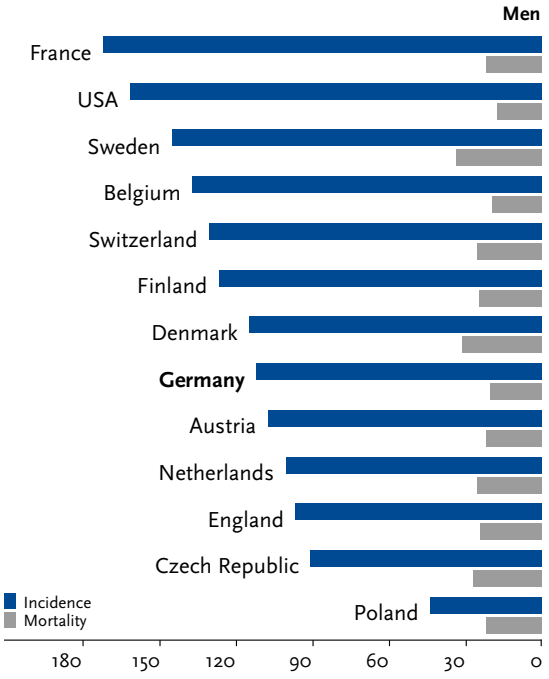
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1 %	(1 in 900)	13.3 %	(1 in 7)	<0.1 %	(1 in 20,000)	3.3 %	(1 in 30)
50 years	1.2 %	(1 in 83)	13.6 %	(1 in 7)	0.1 %	(1 in 1,400)	3.4 %	(1 in 29)
60 years	4.6 %	(1 in 22)	13.4 %	(1 in 7)	0.4 %	(1 in 250)	3.6 %	(1 in 28)
70 years	6.6 %	(1 in 15)	10.8 %	(1 in 9)	1.3 %	(1 in 79)	3.8 %	(1 in 27)
Lifetime risk			13.0 %	(1 in 8)			3.3 %	(1 in 31)

Figure 3.16.5
Registered age-standardised incidence rates in German federal states, ICD-10 C61, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.16.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C61, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.17 Testicle

Table 3.17.1
Overview of the key epidemiological parameters for Germany, ICD-10 C62

	2007	2008	Prediction for 2012
	Men	Men	Men
Incident cases	4,030	3,970	*3,900*
Crude incidence rate[1]	10.0	9.9	*9.8*
Standardised incidence rate[1,2]	9.6	9.5	*9.5*
Median age at diagnosis	38	38	
Deaths	152	153	
Crude mortality rate[1]	0.4	0.4	
Standardised mortality rate[1,2]	0.3	0.3	
5-year prevalence	19,000	18,900	*18,500*
Absolute 5-year survival rate (2007–2008)[3]		94 (91-97)	
Relative 5-year survival rate (2007–2008)[3]		96 (92-98)	

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2008 some 3,970 men in Germany were diagnosed with testicular cancer. It accounts for 1.6 % of all cases of cancer, making it a relatively rare form. Due to the low number of deaths from testicular cancer (153 in 2008) registration completeness cannot be estimated with certainty, and the projection of the national incidence rate for Germany is also uncertain. In contrast to almost all other types of cancer, most cases are diagnosed at a relatively young age, namely between 25 and 45 years. In this age group, testicular cancer is the most common malignant tumour for men. The median age at diagnosis is 38 years. The highest lifetime risk of ever being diagnosed with testicular cancer is at the age of 20 years (1 in 150 men).

In Germany, as in other European countries, the age-standardised incidence of testicular cancer has been increasing for decades, while the mortality has decreased. The decline in mortality is explained by the successful use of cis-platinum in the cytostatic therapy of testicular cancer. Some 92 % of testicular tumours are diagnosed either in stage T1 (58 %) or T2 (34 %). Histologically, approx. 62 % of cases of testicular cancers are seminomas and approx. 18 % of cases are malignant teratomas.

With a relative 5-year survival rate of approx. 96 %, testicular cancer has one of the more favourable prognoses among malignant neoplasms.

Risk factors

A confirmed risk factor for testicular cancer is cryptorchism (undescended testis), even after this has been properly treated. Men who have already had cancer in one testicle have an increased risk of developing a tumour in the other one. Infertility and rare, genetically caused disturbances in sexual development such as Klinefelter's syndrome also increase the likelihood of developing testicular cancer. In a small proportion of cases there may be a genetic predisposition. Sons and brothers (particularly twin brothers) of patients with testicular cancer have a markedly higher incidence risk. A hypothesis is that the predisposition for seminoma tumours, the most common type, may have its origins in cells which are scattered during the embryonic stage, and which then undergo a malignant development in puberty. A birth weight below 2500g or above 4500g and tall stature are discussed as possible risk factors. The causes of the increase in incidence observed in recent decades are not clear. It has been proven that an early diagnosis is correlated with the stage of the cancer and with a better prognosis. Men between 20 and 40 years of age are advised to carry out regular self-examinations by palpation of the testes.

Figure 3.17.1a
Age-standardised incidence and mortality rates, ICD-10 C62, Germany, 1999 – 2008
per 100,000 (European standard)

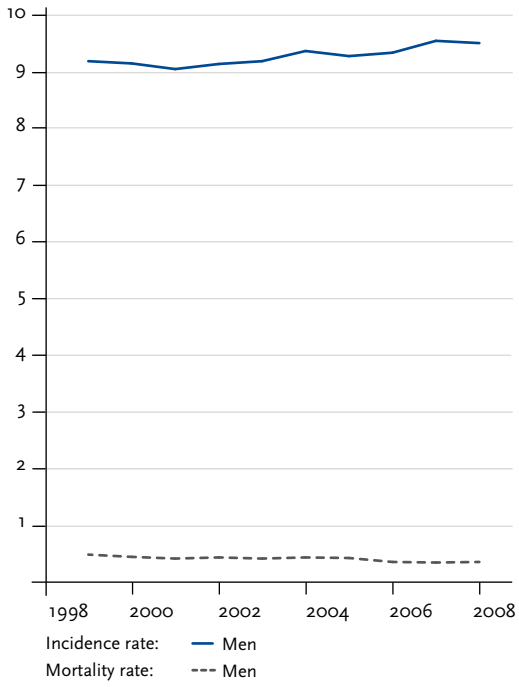


Figure 3.17.1b
Absolute numbers of new cases and deaths, ICD-10 C62, Germany, 1999 – 2008

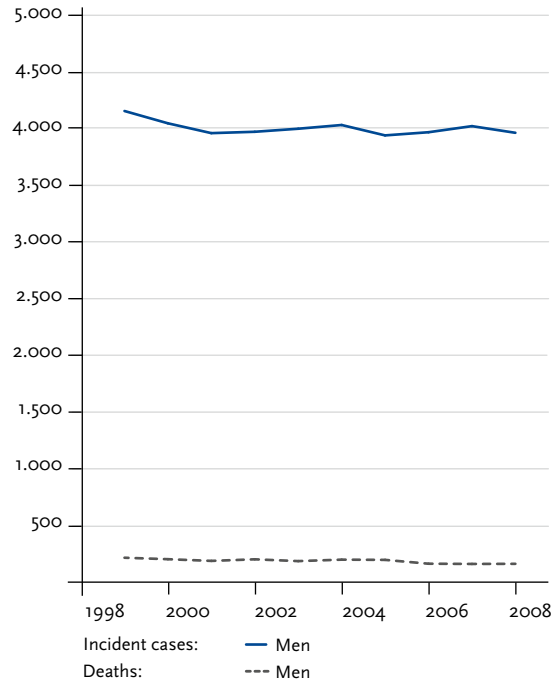


Figure 3.17.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C62, Germany, 2007 – 2008

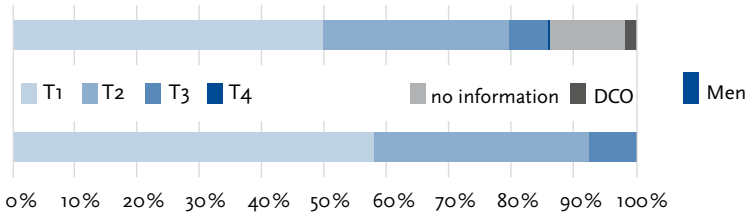


Figure 3.17.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C62, Germany, 2007 – 2008

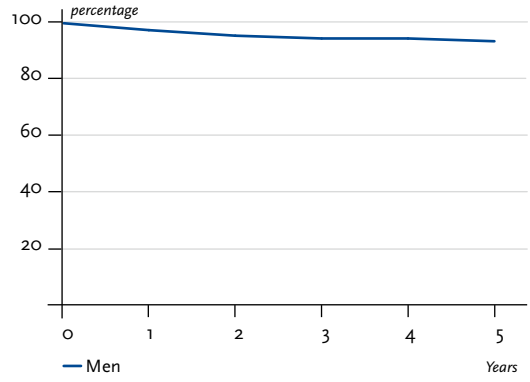


Figure 3.17.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C62, Germany, 2007 – 2008

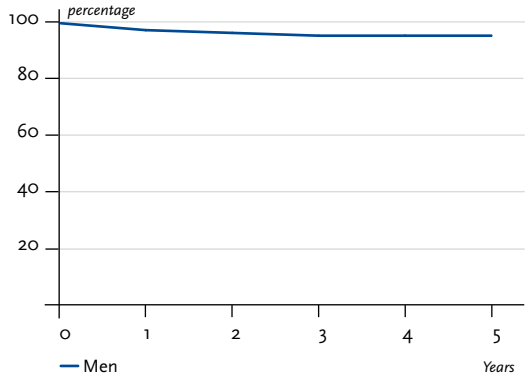


Figure 3.17.4
Age-specific incidence rates, ICD-10 C62, Germany, 2007 – 2008
per 100,000

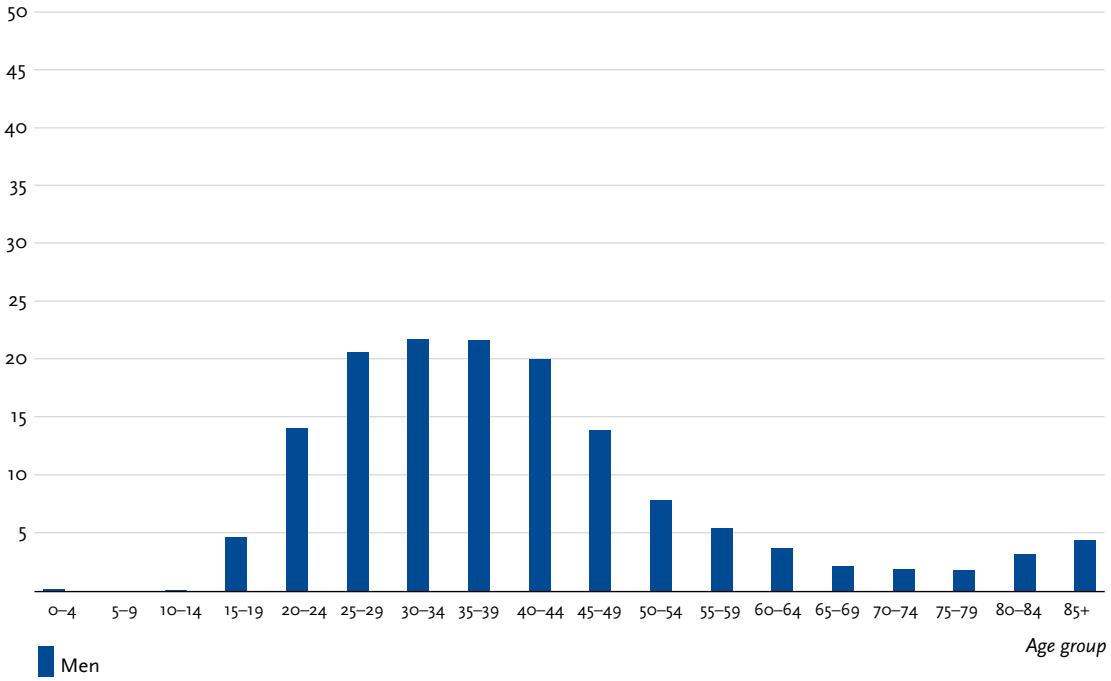


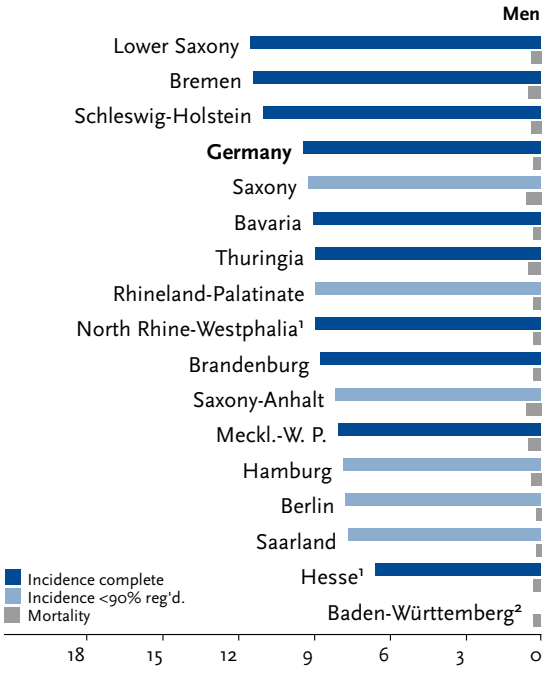
Table 3.17.2
Age-specific incidence rates, ICD-10 C62, Germany, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.3	0.1	0.1	4.7	14.1	20.7	21.8	21.7	20.1	13.9	7.9	5.5	3.7	2.2	2.0	1.8	3.3	4.5

Table 3.17.3
Incidence and mortality rates in Germany by age, ICD-10 C62, Database 2008

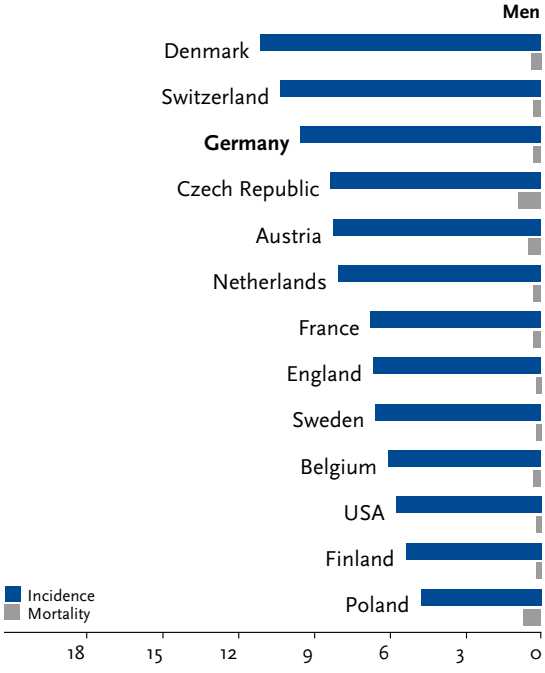
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.2%	(1 in 610)	0.7%	(1 in 150)	<0.1%	(1 in 40,000)	<0.1%	(1 in 3,600)
50 years	0.2%	(1 in 460)	0.5%	(1 in 200)	<0.1%	(1 in 21,000)	<0.1%	(1 in 3,900)
60 years	0.2%	(1 in 610)	0.3%	(1 in 350)	<0.1%	(1 in 17,000)	<0.1%	(1 in 4,800)
70 years	0.1%	(1 in 1,500)	0.1%	(1 in 790)	<0.1%	(1 in 21,000)	<0.1%	(1 in 6,400)
Lifetime risk			0.7%	(1 in 150)			<0.1%	(1 in 3,600)

Figure 3.17.5
Registered age-standardised incidence rates in German federal states, ICD-10 C62, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.17.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C62, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.18 Kidney

Table 3.18.1
Overview of the key epidemiological parameters for Germany, ICD-10 C64

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	8,830	5,490	8,960	5,540	*9,300*	*5,800*
Crude incidence rate[1]	21.9	13.1	22.3	13.3	*23.3*	*13.9*
Standardised incidence rate[1,2]	16.7	8.2	16.5	8.2	*16.1*	*8.3*
Median age at diagnosis	68	71	68	71		
Deaths	2,888	2,031	3,060	2,041		
Crude mortality rate[1]	7.2	4.8	7.6	4.9		
Standardised mortality rate[1,2]	5.2	2.4	5.4	2.5		
5-year prevalence	30,000	18,600	30,800	19,100	*31,700*	*20,000*
Absolute 5-year survival rate (2007–2008)[3]			65 (58-67)	67 (58-72)		
Relative 5-year survival rate (2007–2008)[3]			74 (67-77)	75 (66-79)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Malignant neoplasms of the kidney can develop from various tissues. Renal cell carcinomas (hypernephromas) account for 90 % of all kidney tumours in adults. In contrast, nephroblastomas (Wilms' tumours), lymphomas, and sarcomas of the kidney are more frequent in children.

The age-standardised incidence rates since the end of the 1990s have been fairly constant for men and women, although the incidence rate for men is markedly higher than that for women. The raw incidence rates have increased slightly in recent years, whereas the age-standardised mortality rates have shown a downward trend for both sexes.

The lifetime risk of developing kidney cancer is 1.8 % for men, compared with 1.1 % for women. The median age at diagnosis is 68 years for men and 71 years for women.

The relative 5-year survival rate for kidney tumours is approx. 75 %, and the prognosis for tumours which are diagnosed at an early stage is good. However, at an advanced stage the prognosis is rather unfavourable. As the figure shows, kidney cancer in Germany is mostly diagnosed in the early stages (T1 and T2) – these account for 74 % of cases for men and women.

Risk factors and early detection

Smoking and passive exposure to tobacco smoke, as well as hypertension and obesity are the most important risk factors. There seems to be a relationship between overweight and the development of kidney cancer in women, in particular. In men, the nature of the fat distribution may possibly be decisive. Studies have also found that alcohol consumption is a possible risk factor.

Occupational exposure to substances which may damage the kidneys, e.g. halogenated hydrocarbons or cadmium, can also increase the risk of cancer. Carcinogenesis in the kidney can be promoted by chronic renal insufficiency, regardless of the cause of the latter. After a kidney transplant the immunosuppressed patient still has a risk of developing a renal cell carcinoma.

Familial predisposition probably plays a role in relatively few cases. About four per cent of renal cell carcinomas occur in patients with complex hereditary diseases such as Hippel-Lindau syndrome. Such genetically associated renal cell carcinomas are often multifocal and occur more often at a younger age than kidney cancers not associated with a genetic disposition.

Figure 3.18.1a
Age-standardised incidence and mortality rates, ICD-10 C64, Germany, 1999 – 2008
per 100,000 (European standard)

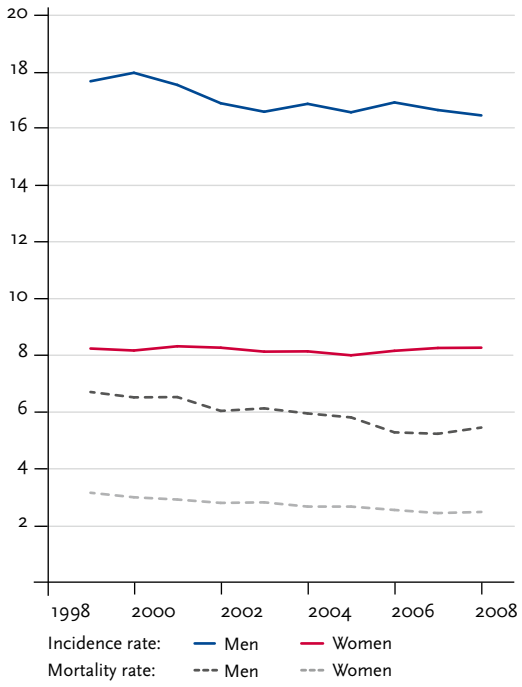


Figure 3.18.1b
Absolute numbers of new cases and deaths, ICD-10 C64, Germany, 1999 – 2008

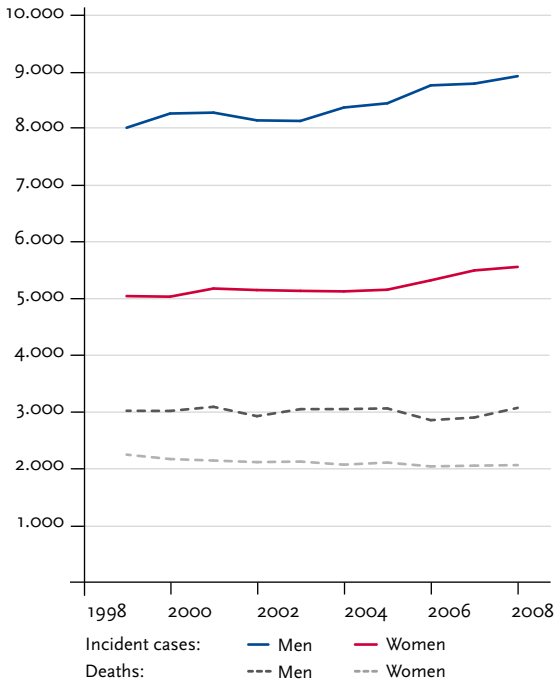


Figure 3.18.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C64, Germany, 2007 – 2008

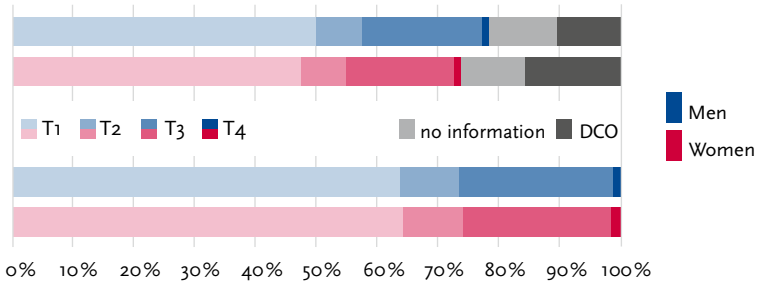


Figure 3.18.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C64, Germany, 2007 – 2008

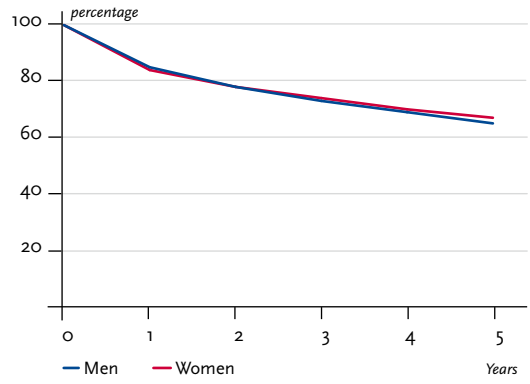


Figure 3.18.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C64, Germany, 2007 – 2008

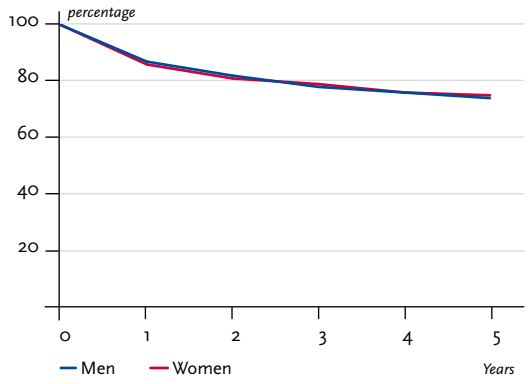


Figure 3.18.4
Age-specific incidence rates in Germany by gender ICD-10 C64, 2007 – 2008
per 100,000

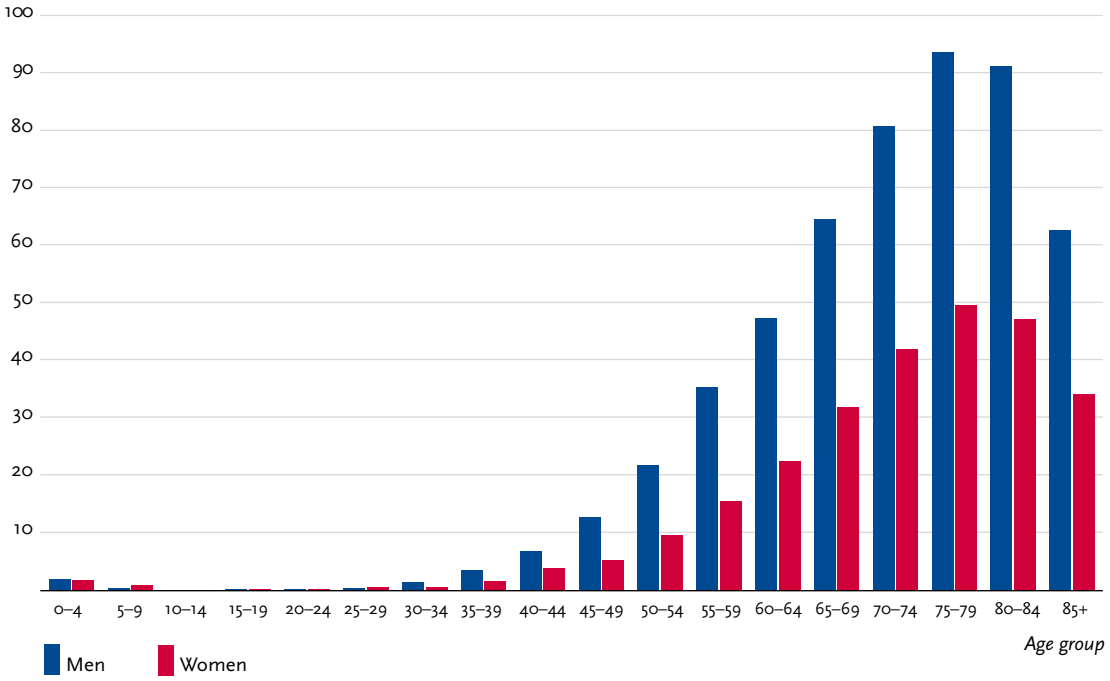


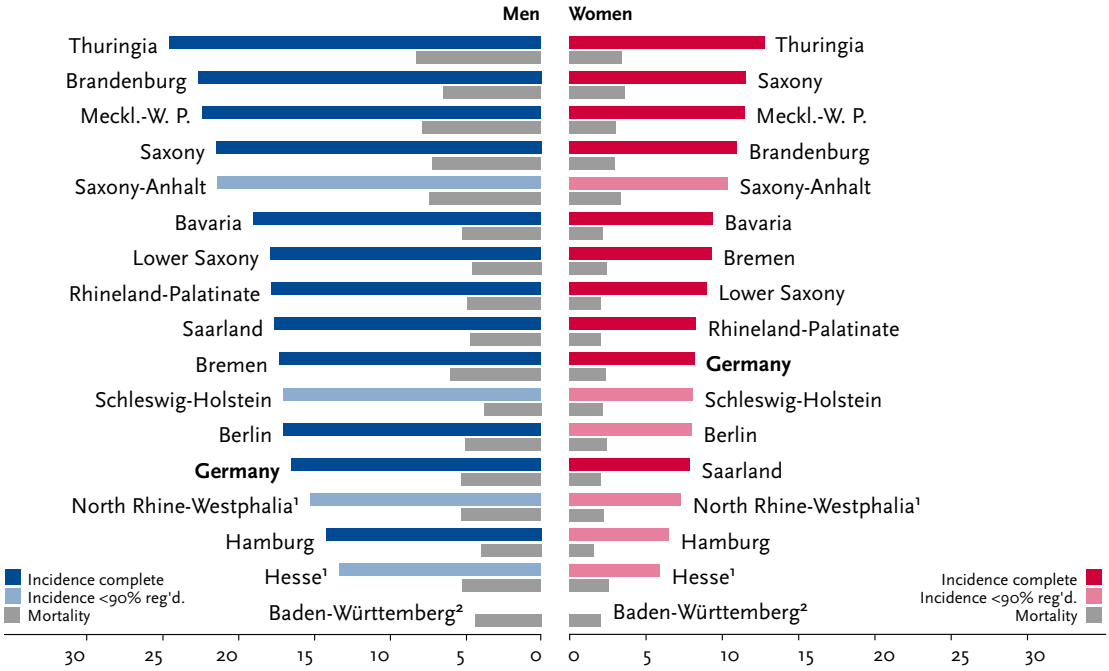
Table 3.18.2
Age-specific incidence rates in Germany by gender, ICD-10 C64, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	2.0	0.4	0.1	0.2	0.2	0.5	1.6	3.6	7.0	12.9	22.1	35.8	47.8	65.2	81.5	94.6	92.0	63.3
Woman	1.9	0.9	0.2	0.2	0.2	0.6	0.6	1.7	4.0	5.4	9.7	15.7	22.7	32.2	42.5	50.2	47.7	34.5

Table 3.18.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C64, database 2008

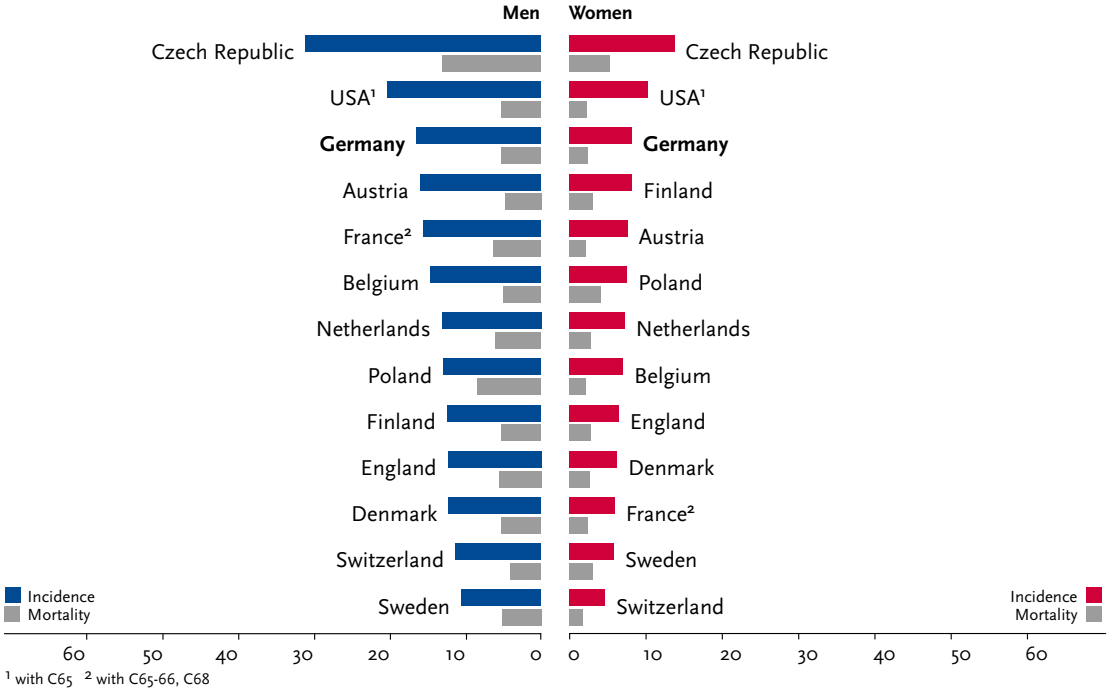
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 970)	1.8%	(1 in 57)	<0.1%	(1 in 6,300)	0.7%	(1 in 150)
50 years	0.3%	(1 in 360)	1.7%	(1 in 59)	0.1%	(1 in 1,400)	0.7%	(1 in 150)
60 years	0.5%	(1 in 190)	1.5%	(1 in 66)	0.2%	(1 in 620)	0.6%	(1 in 150)
70 years	0.7%	(1 in 130)	1.2%	(1 in 85)	0.3%	(1 in 340)	0.6%	(1 in 180)
Lifetime risk			1.8%	(1 in 57)			0.7%	(1 in 150)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 2,000)	1.1%	(1 in 95)	<0.1%	(1 in 17,000)	0.4%	(1 in 240)
50 years	0.1%	(1 in 800)	1.0%	(1 in 98)	<0.1%	(1 in 3,700)	0.4%	(1 in 240)
60 years	0.3%	(1 in 380)	0.9%	(1 in 110)	0.1%	(1 in 1,600)	0.4%	(1 in 250)
70 years	0.4%	(1 in 240)	0.7%	(1 in 140)	0.2%	(1 in 640)	0.4%	(1 in 270)
Lifetime risk			1.1%	(1 in 93)			0.4%	(1 in 240)

Figure 3.18.5
Registered age-standardised incidence rates in German federal states, ICD-10 C64, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.18.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C64, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ with C65 ² with C65-66, C68

3.19 Bladder

Table 3.19.1
Overview of the key epidemiological parameters for Germany, ICD-10 C67

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	11,090	4,310	11,460	4,510	*11,500*	*4,700*
	(20,470)[5]	(7,040)[5]	(20,850)[5]	(7,490)[5]		
Crude incidence rate[1]	27.5 (50.7)[5]	10.3 (16.7)[5]	28.5 (52.4)[5]	10.8 (17.8)[5]	*28.9*	*11.4*
Standardised incidence rate[1,2]	19.8 (36.7)[5]	5.4 (9.4)[5]	20.1 (37.1)[5]	5.6 (9.9)[5]	*18.5*	*5.7*
Median age at diagnosis	73 (72)[5]	77 (75)[5]	73 (72)[5]	77 (74)[5]		
Deaths	3,639	1,965	3,611	1,921		
Crude mortality rate[1]	9.0	4.7	9.0	4.6		
Standardised mortality rate[1,2]	6.5	2.1	6.2	2.0		
5-year prevalence	32,300	10,400	32,900	10,700	*33,500*	*11,400*
Absolute 5-year survival rate (2007–2008)[3]			48 (38-57)	40 (31-51)		
Relative 5-year survival rate (2007–2008)[3]			60 (50-69)	49 (39-62)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states) [4] in parentheses: including in situ tumours (D09.0) and neoplasms of uncertain or unknown behavior (D41.4)

Epidemiology

Some 16,000 people were diagnosed with an invasive bladder carcinoma in 2008 in Germany, only just over a quarter of them women. In addition, there were more than 12,000 cases of in situ tumours or indeterminate neoplasms. The latter are counted with bladder cancer cases in many registries in order to present long-term trends, because the criteria for determining malignancy of neoplasms of the bladder have been changed several times in recent decades. Some 95 % of invasive tumours of the bladder are carcinomas of the urothelium, which are frequently multifocal (occurring simultaneously at various places in the same organ).

The incidence rates increase steadily with age, with only about one in five being diagnosed before 65 years of age. The age-standardised incidence and mortality rates for men show a clear downward trend, probably due to a decline in tobacco consumption, but possibly also because of a decrease in occupational exposure to carcinogens. However, with the increasing proportion of older people in the population, the number of newly diagnosed cases in men increased slightly. For women, the age-standardised incidence rate has been increasing in recent years, while the mortality rate went down slightly. The mortality rate for bladder cancer continues to be higher in the eastern federal states than in the rest of Germany. This corresponds to higher mortality rates in the eastern neighbouring countries, particularly for men.

The higher survival rates for men compared with women relates to the more favourable distribution of tumour stages at diagnosis (48 % vs. 37 % T1 for invasive carcinomas, respectively). The relative proportion of in situ carcinomas for men is 45 %, compared with 40 % for women.

Risk factors

Tobacco consumption is a key risk factor for the development of cancer of the bladder. Passive smoking also contributes to an increase in risk. The risk is further increased by exposure to chemical substances such as aromatic amines, especially for certain occupational groups. The known hazardous substances have largely been eliminated from industrial processes and the workplace in Europe. However, there is a long latency period between exposure and the development of cancer, so that bladder carcinomas caused by occupational exposure will continue to be registered. Cytostatic drugs used in chemotherapy and radiation therapy of this part of the body can increase the risk. The risk potential for other medications is under discussion. Chronic inflammatory damage to the mucosa of the bladder also increases the risk of cancer of the bladder. Family clusters have been observed. There are indications that genetic factors play a direct role in the occurrence of bladder cancer, by influencing the susceptibility to carcinogens.

Figure 3.19.1a
Age-standardised incidence and mortality rates, ICD-10 C67, Germany, 1999 – 2008
per 100,000 (European standard)

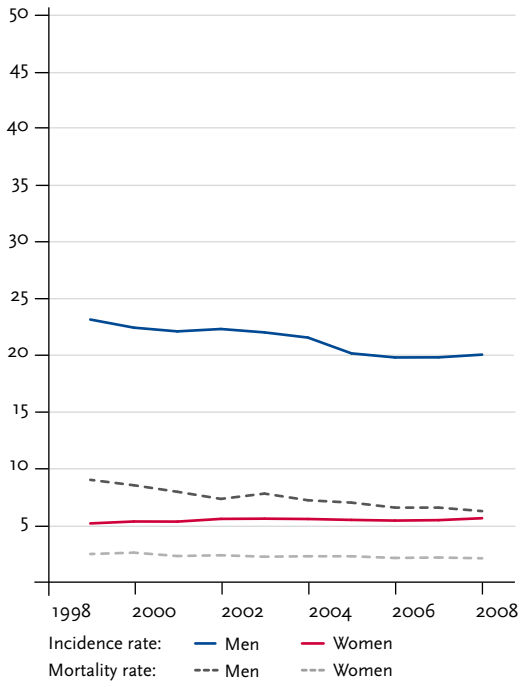


Figure 3.19.1b
Absolute numbers of new cases and deaths, ICD-10 C67, Germany, 1999 – 2008

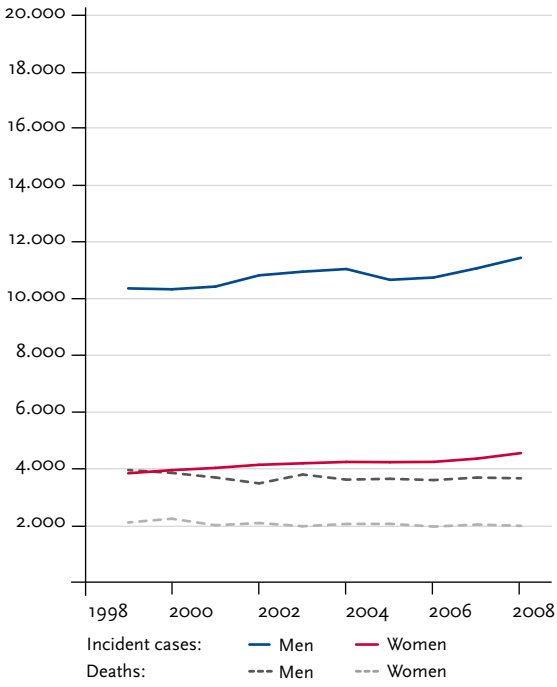


Figure 3.19.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C67, Germany, 2007 – 2008

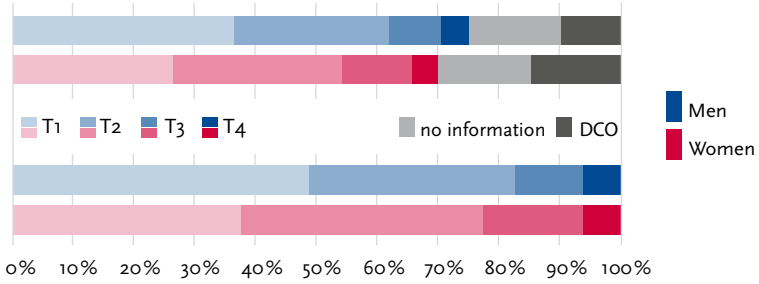


Figure 3.19.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C67, Germany, 2007 – 2008

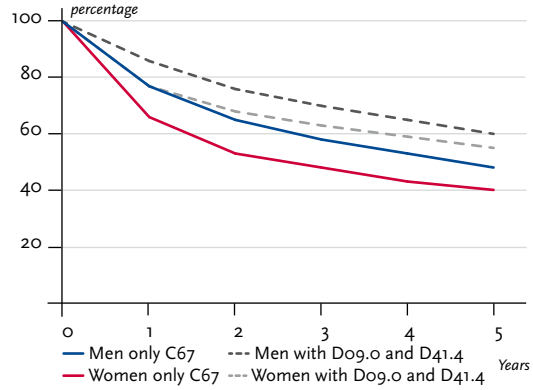


Figure 3.19.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C67, Germany, 2007 – 2008

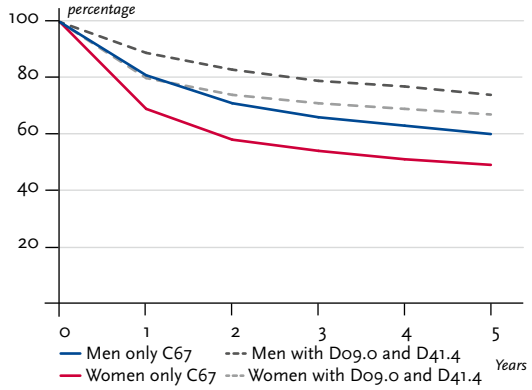


Figure 3.19.4
Age-specific incidence rates in Germany by gender ICD-10 C67, 2007 – 2008
per 100,000

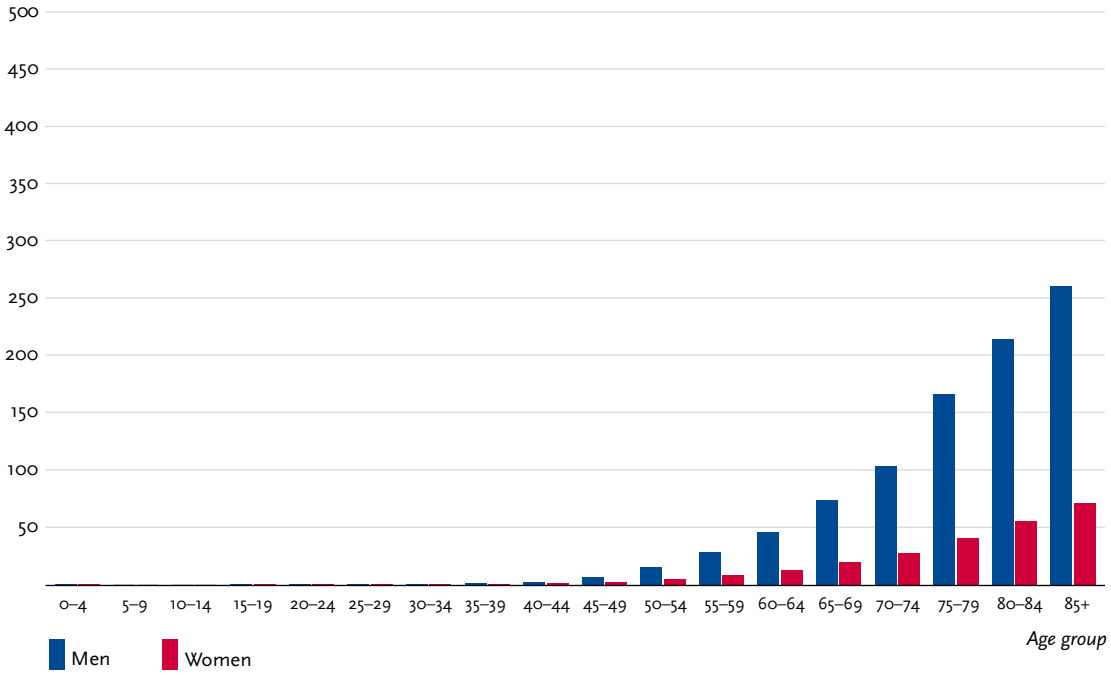


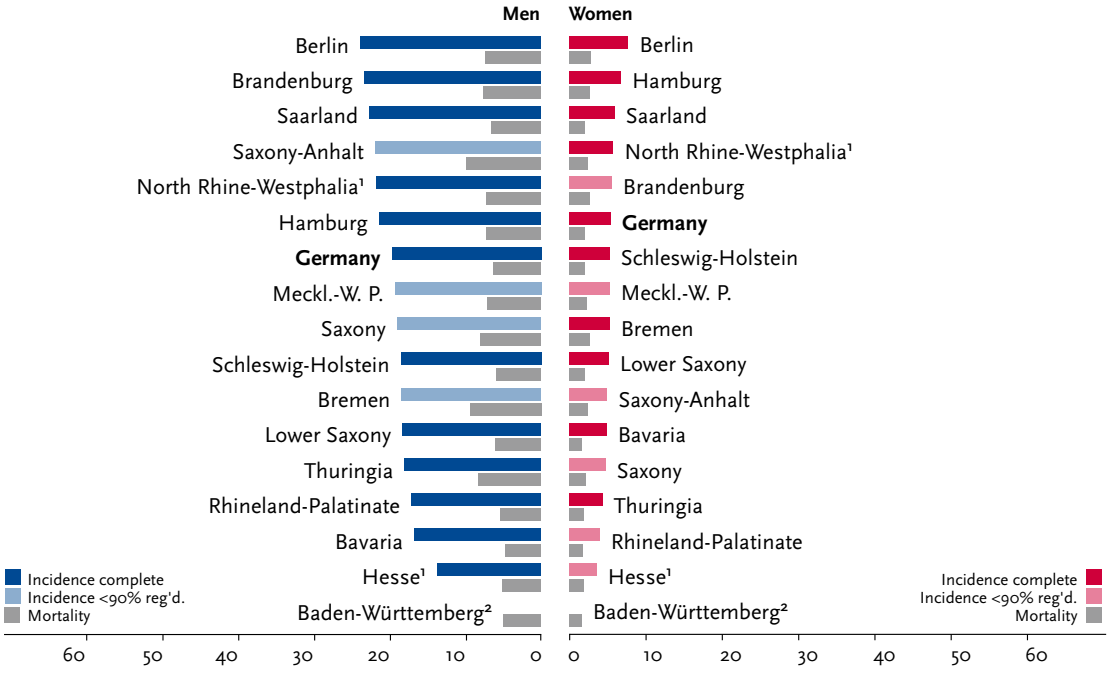
Table 3.19.2
Age-specific incidence rates in Germany by gender, ICD-10 C67, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.2	0.0	0.0	0.1	0.1	0.2	0.3	1.1	2.2	6.9	15.2	28.3	46.0	74.1	104.1	167.7	216.2	262.3
Woman	0.1	0.0	0.0	0.1	0.1	0.1	0.3	0.5	1.1	2.6	4.7	8.0	12.4	19.6	28.0	40.7	55.9	71.5

Table 3.19.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C67, database 2008

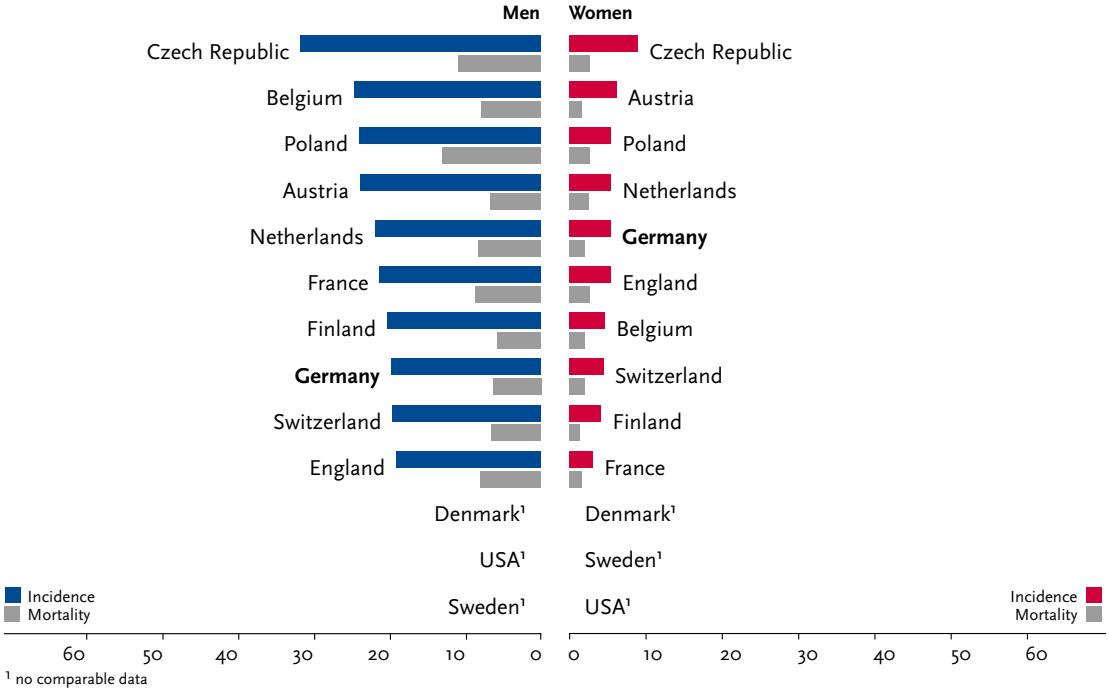
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,000)	2.7%	(1 in 38)	<0.1%	(1 in 11,600)	1.0%	(1 in 100)
50 years	0.2%	(1 in 460)	2.7%	(1 in 37)	<0.1%	(1 in 2,600)	1.0%	(1 in 100)
60 years	0.6%	(1 in 180)	2.6%	(1 in 38)	0.1%	(1 in 840)	1.0%	(1 in 100)
70 years	1.1%	(1 in 88)	2.4%	(1 in 41)	0.4%	(1 in 280)	1.0%	(1 in 100)
Lifetime risk			2.6%	(1 in 38)			0.9%	(1 in 110)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 4,900)	0.9%	(1 in 110)	<0.1%	(1 in 22,000)	0.4%	(1 in 240)
50 years	0.1%	(1 in 1,600)	0.9%	(1 in 110)	<0.1%	(1 in 6,500)	0.4%	(1 in 240)
60 years	0.2%	(1 in 630)	0.9%	(1 in 110)	<0.1%	(1 in 2,600)	0.4%	(1 in 240)
70 years	0.3%	(1 in 310)	0.8%	(1 in 130)	0.1%	(1 in 860)	0.4%	(1 in 240)
Lifetime risk			0.9%	(1 in 110)			0.4%	(1 in 240)

Figure 3.19.5
Registered age-standardised incidence rates in German federal states, ICD-10 C67, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.19.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C67, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ no comparable data

3.20 Central nervous system

Table 3.20.1
Overview of the key epidemiological parameters for Germany, ICD-10 C70 – 72

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	3,710	2,960	3,810	2,990	*4,100*	*3,000*
Crude incidence rate[1]	9.2	7.1	9.5	7.1	*10.3*	*7.3*
Standardised incidence rate[1,2]	7.6	5.3	7.7	5.3	*7.9*	*5.3*
Median age at diagnosis	64	67	64	68		
Deaths	2,922	2,500	3,008	2,554		
Crude mortality rate[1]	7.2	5.9	7.4	6.1		
Standardised mortality rate[1,2]	5.7	4.0	5.8	4.0		
5-year prevalence	5,700	4,400	5,800	4,500	*6,000*	*4,600*
Absolute 5-year survival rate (2007–2008)[3]			17 (11-24)	21 (9-28)		
Relative 5-year survival rate (2007–2008)[3]			18 (12-26)	22 (10-29)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Cancers of the central nervous system (CNS) affect the brain, including the brain stem, in 95 % of cases. The remaining 5 % are cancers of the meninges, the cranial nerves, and the spinal nerves in the cauda equina. Malignant neoplasms of the central nervous system originate from glial cells, nerve sheaths and meninges. Histologically, they are mostly glioblastomas, other gliomatous tumours and astrocytomas.

In 2008, some 7,000 people in Germany were diagnosed with a CNS tumour, women at a median age of 68 years, men already at 64 years. CNS tumours can occur at all ages, and they account for more than 20 % of all childhood cancers.

The increase in the mortality rates for malignant neoplasms of the central nervous system through the 1980s to the mid-1990s in Germany affected almost exclusively the over-65-year-olds. Recently, mortality rates have been decreasing while the age-standardised incidence rates in Germany have been largely stable since the start of the millennium. Only in the case of men over the age of 70 has there been a slight increase in incidence.

The relative 5-year survival rates for patients with cancer of the central nervous system were calculated as 18 % for men and 22 % for women, although almost one case in five could not be taken into account because of an unknown date of diagnosis (DCO cases). Current survival rates in the USA are higher, namely 34 % and 38 %, respectively.

Risk factors

The causes of the various brain tumours are currently unclear. The only exception is among patients with very rare hereditable tumour syndromes. They have a markedly higher risk of developing a brain tumour. While there is a slightly increased risk after a therapeutic radiation of the head in childhood (after a considerable latency period), currently no data show a measureable risk from exposure to ionising radiation as part of diagnostic imaging procedures or from other forms of exposure to radiation. At the present state of knowledge, neither environmental factors nor electromagnetic radiation from sources such as mobile phone contribute to increasing the risk. There is also no proof, to date, that viruses or toxic substances can cause brain tumours in humans.

Figure 3.20.1a
Age-standardised incidence and mortality rates, ICD-10 C70 – 72, Germany, 1999 – 2008
per 100,000 (European standard)

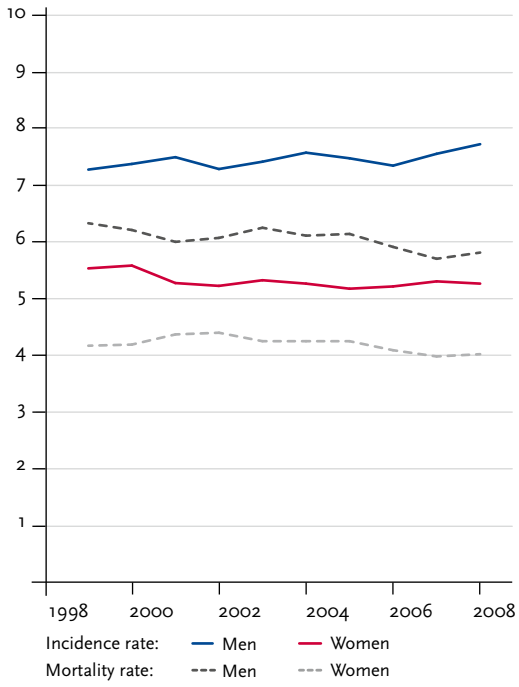


Figure 3.20.1b
Absolute numbers of new cases and deaths, ICD-10 C70 – 72, Germany, 1999 – 2008

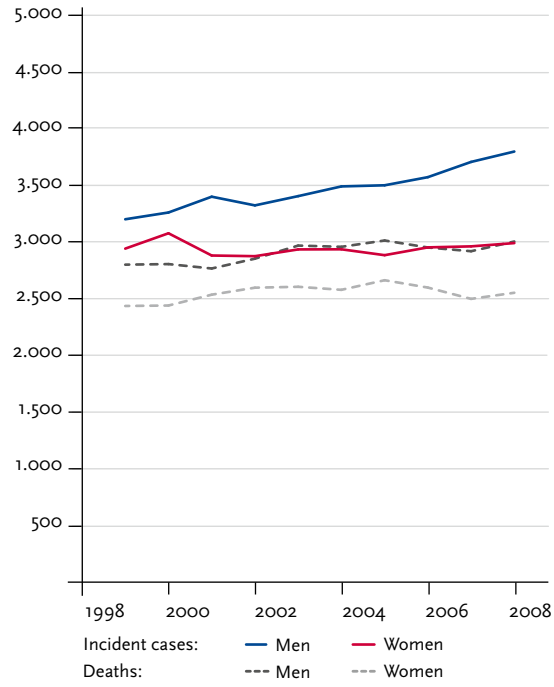


Figure 3.20.2
Distribution of T-stages at first diagnosis
T-stages are not defined for tumours of the central nervous system.

Figure 3.20.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C70 – 72, Germany, 2007 – 2008

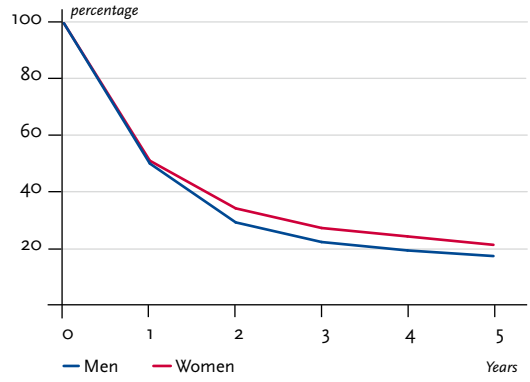


Figure 3.20.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C70 – 72, Germany, 2007 – 2008

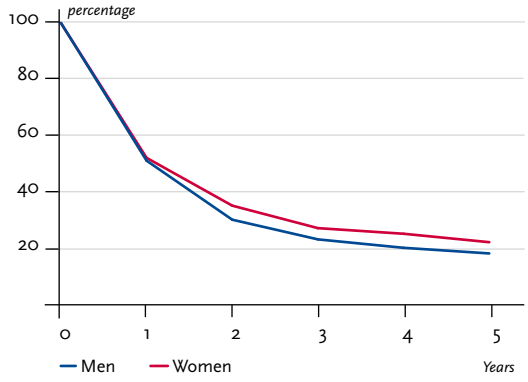


Figure 3.20.4
Age-specific incidence rates in Germany by gender ICD-10 C70 – 72, 2007 – 2008
per 100,000

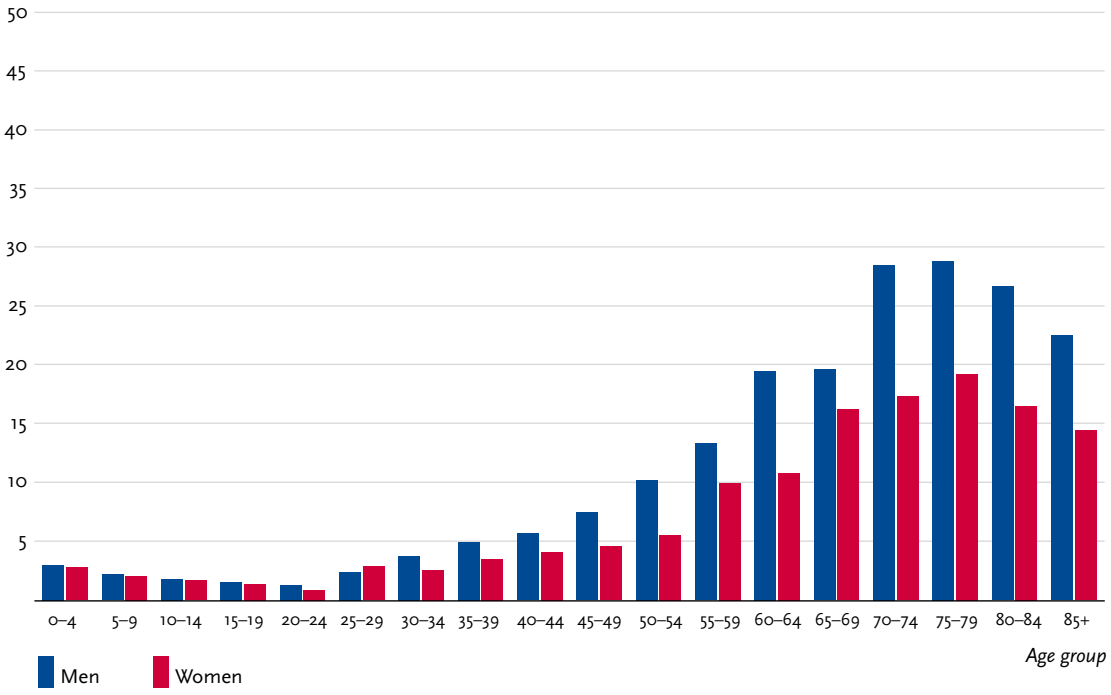


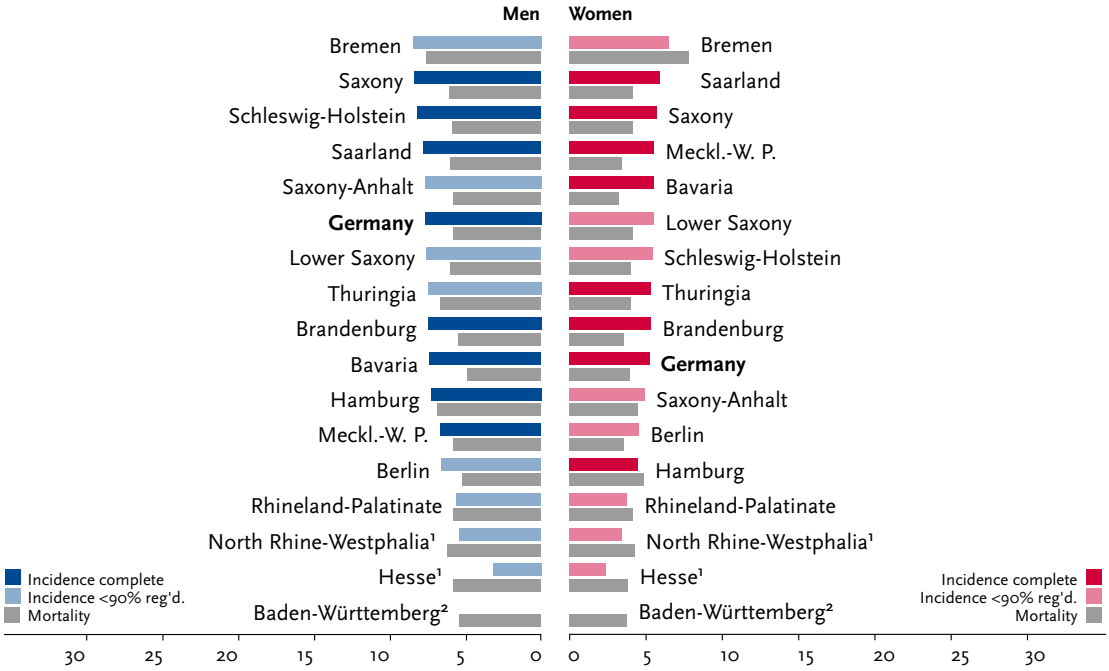
Table 3.20.2
Age-specific incidence rates in Germany by gender, ICD-10 C70 – 72, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	3.0	2.2	1.8	1.6	1.3	2.4	3.8	5.0	5.7	7.5	10.3	13.4	19.6	19.7	28.6	29.0	26.8	22.6
Woman	2.8	2.1	1.7	1.4	0.9	2.9	2.6	3.5	4.1	4.6	5.6	10.0	10.9	16.3	17.4	19.3	16.6	14.5

Table 3.20.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C70 – 72, database 2008

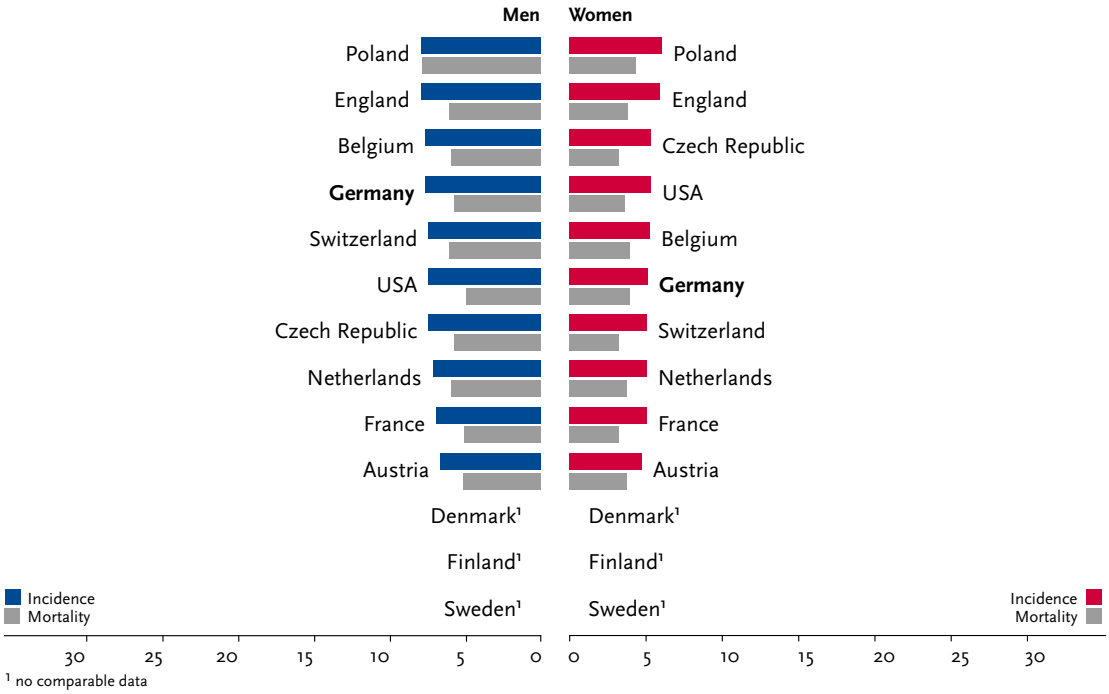
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,500)	0.6%	(1 in 160)	<0.1%	(1 in 2,100)	0.5%	(1 in 180)
50 years	0.1%	(1 in 840)	0.6%	(1 in 170)	0.1%	(1 in 1,000)	0.5%	(1 in 200)
60 years	0.2%	(1 in 540)	0.5%	(1 in 200)	0.2%	(1 in 610)	0.5%	(1 in 220)
70 years	0.2%	(1 in 410)	0.4%	(1 in 260)	0.2%	(1 in 470)	0.3%	(1 in 300)
Lifetime risk			0.7%	(1 in 140)			0.6%	(1 in 170)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,500)	0.5%	(1 in 200)	<0.1%	(1 in 3,600)	0.5%	(1 in 220)
50 years	0.1%	(1 in 1,300)	0.5%	(1 in 220)	0.1%	(1 in 1,800)	0.4%	(1 in 230)
60 years	0.1%	(1 in 780)	0.4%	(1 in 250)	0.1%	(1 in 830)	0.4%	(1 in 250)
70 years	0.2%	(1 in 580)	0.3%	(1 in 340)	0.2%	(1 in 600)	0.3%	(1 in 330)
Lifetime risk			0.6%	(1 in 170)			0.5%	(1 in 200)

Figure 3.20.5
Registered age-standardised incidence rates in German federal states, ICD-10 C70 – 72, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.20.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C70 – 72, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



¹ no comparable data

3.21 Thyroid gland

Table 3.21.1
Overview of the key epidemiological parameters for Germany, ICD-10 C73

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	1,560	3,690	1,710	4,160	*1,800*	*4,300*
Crude incidence rate[1]	3.9	8.8	4.3	9.9	*4.5*	*10.3*
Standardised incidence rate[1,2]	3.2	7.5	3.5	8.6	*3.6*	*9.0*
Median age at diagnosis	57	53	56	52		
Deaths	274	420	279	429		
Crude mortality rate[1]	0.7	1.0	0.7	1.0		
Standardised mortality rate[1,2]	0.5	0.5	0.5	0.5		
5-year prevalence	5,500	14,400	5,900	15,600	*6,800*	*18,300*
Absolute 5-year survival rate (2007–2008)[3]			80 (70-90)	88 (80-91)		
Relative 5-year survival rate (2007–2008)[3]			86 (76-96)	92 (84-95)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Thyroid cancer accounts for about 1.9 % of malignant neoplasms for women and 0.7 % for men and causes 0.4 % and 0.2 % of all cancer-related deaths, respectively. The lifetime risk of developing thyroid cancer is more than twice as high for women than for men (0.7 % and 0.3 %, respectively).

In the period from 1999 to 2008, the mortality rates in Germany have decreased slightly for both men and women, while the numbers of newly diagnosed cases and the age-standardised incidence rates have increased markedly for both sexes. This trend is more marked for women than for men, and is observed to a similar extent in other countries, such as England, Austria, and the USA.

In 2008, the highest incidence rates for women were between ages 55 and 60 years, and for men between 60 and 65 years. The median age at diagnosis for women was 52 years and for men 56 years. Cancers of the thyroid gland are diagnosed earlier for women and at a better stage for treatment (approx. 62 % in Stage T1, 18 % in Stage T3). For men, approximately 52 % of cases were diagnosed in Stage T1 and 23 % in Stage T3. Histologically, cases most frequently involve papillary adenocarcinomas (72 %) and follicular adenocarcinomas (14 %).

In Germany, the relative 5-year survival rate is currently approximately 92 % for women and 86 % for men. In both Finland and the USA, survival rates for women (93 % and 98 %, respectively) were also more favourable than for men (85 % and 94 %, respectively).

Risk factors

The only certain, although comparatively rare environmental risk factor is exposure to ionising radiation, particularly in childhood. This includes radiotherapy which extends to the thyroid gland. There is no clear proof of other diet- or lifestyle-related risk factors or environmental risks. It is also unclear why more women are affected than men. Many patients have a history of iodine deficiency or benign thyroid complaints such as struma (goitre) and adenoma, which increase the risk for thyroid carcinomas. About a fifth of patients with a rare medullary thyroid carcinoma have inheritable genetic changes with autosomal dominant inheritance. Medullary thyroid carcinomas can also occur together with other endocrine tumours as a type 2 multiple endocrine neoplasia (MEN 2). A genetic component is also suspected for the papillary thyroid carcinomas.

Figure 3.21.1a
Age-standardised incidence and mortality rates, ICD-10 C73, Germany, 1999 – 2008
per 100,000 (European standard)

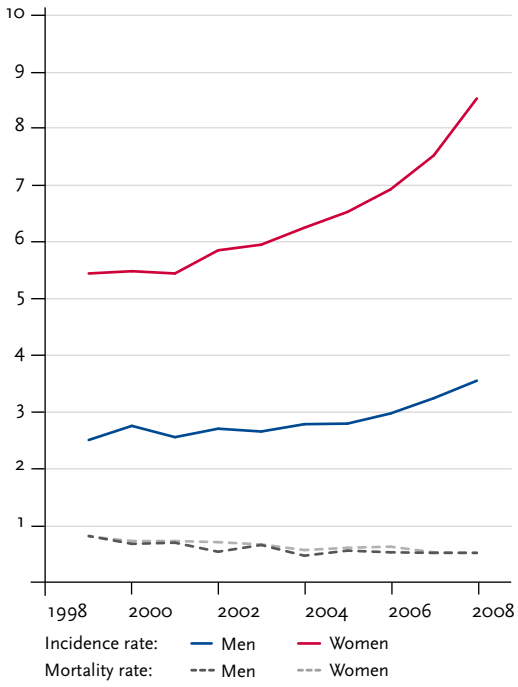


Figure 3.21.1b
Absolute numbers of new cases and deaths, ICD-10 C73, Germany, 1999 – 2008

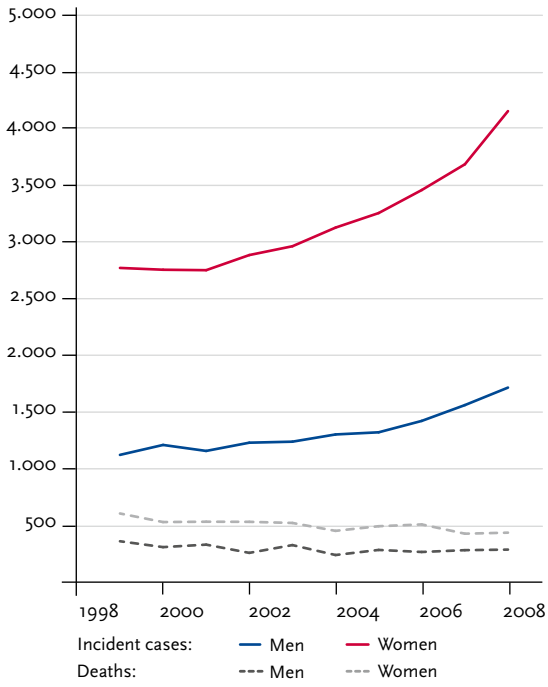


Figure 3.21.2
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports) ICD-10 C73, Germany, 2007 – 2008

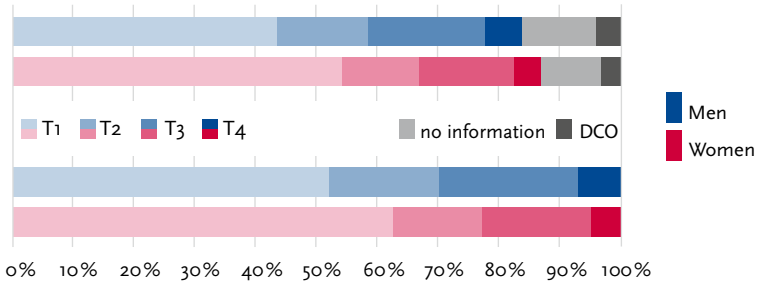


Figure 3.21.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C73, Germany, 2007 – 2008

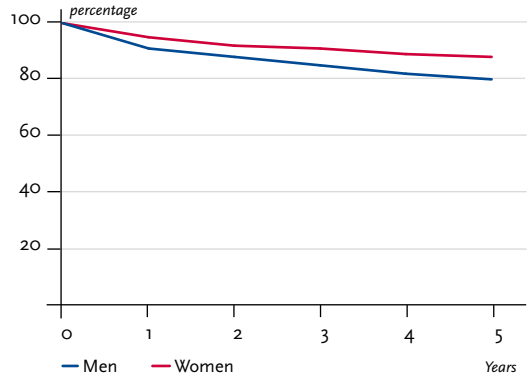


Figure 3.21.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C73, Germany, 2007 – 2008

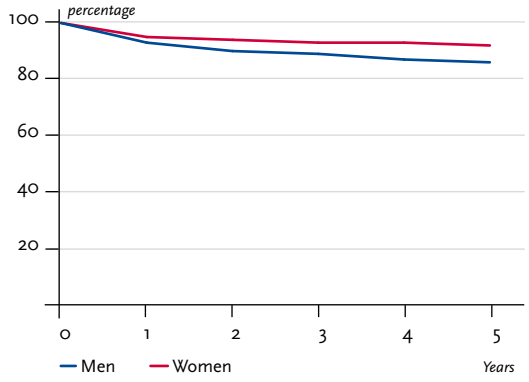


Figure 3.21.4
Age-specific incidence rates in Germany by gender ICD-10 C73, 2007 – 2008
per 100,000

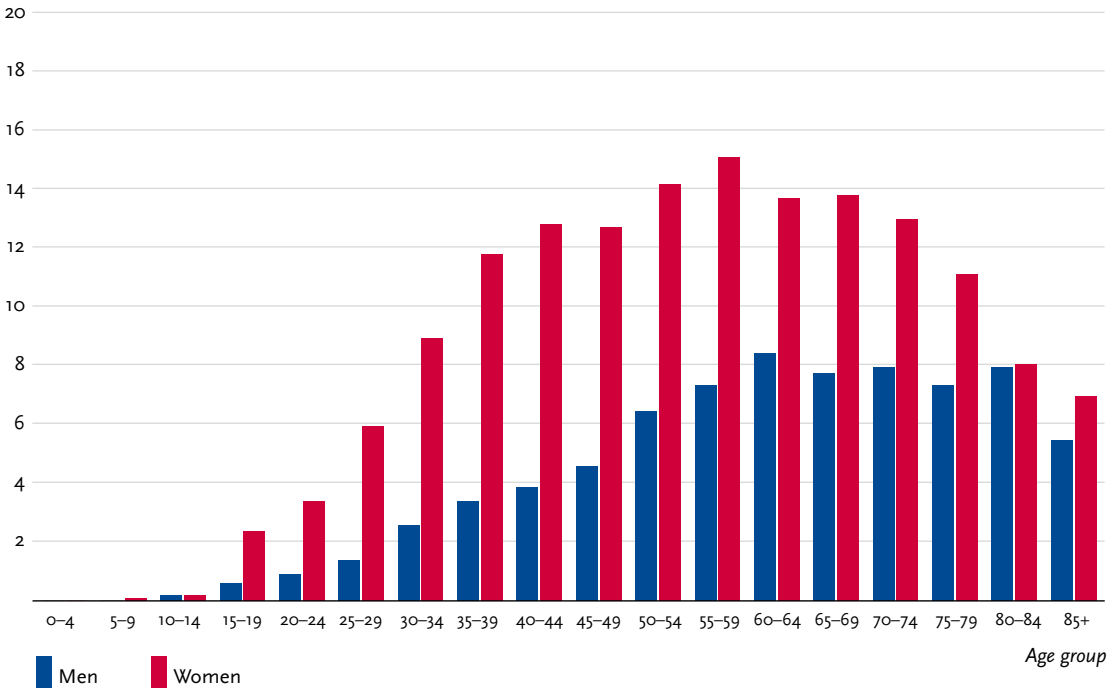


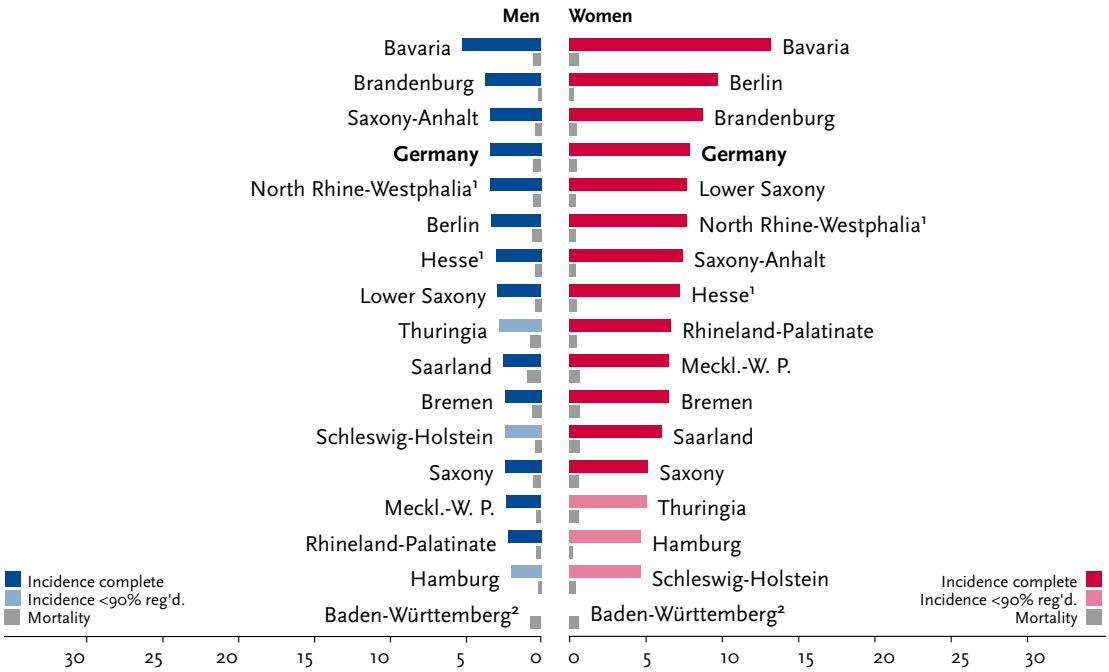
Table 3.21.2
Age-specific incidence rates in Germany by gender, ICD-10 C73, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.2	0.6	0.9	1.4	2.6	3.4	3.9	4.6	6.5	7.4	8.5	7.8	8.0	7.4	8.0	5.5
Woman	0.0	0.1	0.2	2.4	3.4	6.0	9.0	11.9	12.9	12.8	14.3	15.2	13.8	13.9	13.1	11.2	8.1	7.0

Table 3.21.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C73, database 2008

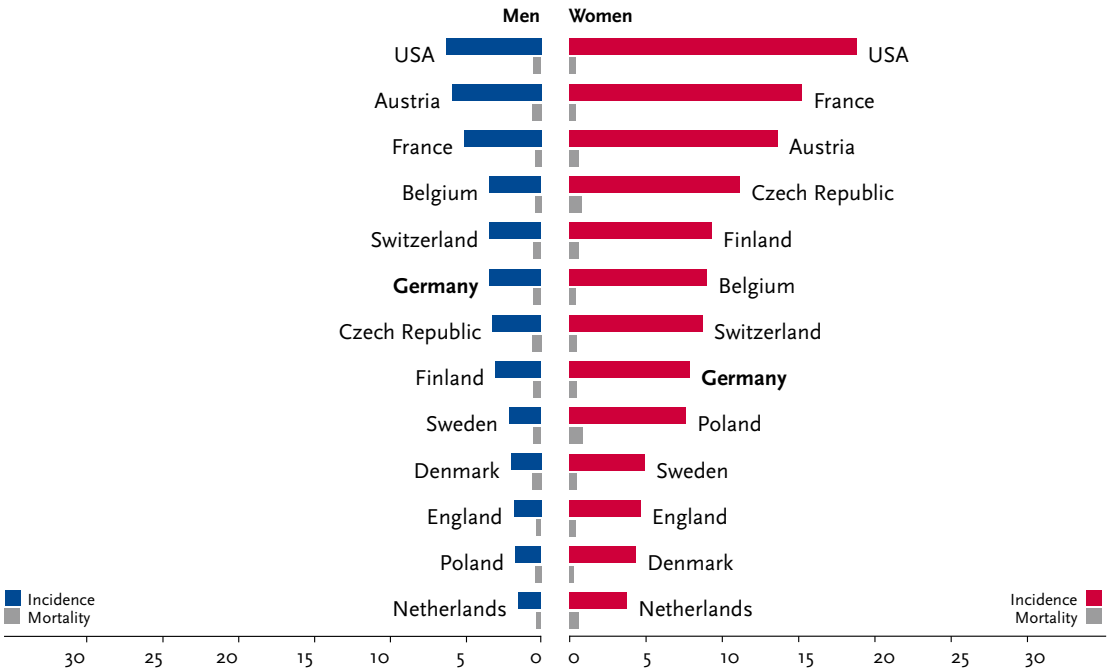
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,300)	0.3%	(1 in 380)	<0.1%	(1 in 58,000)	0.1%	(1 in 1,600)
50 years	0.1%	(1 in 1,400)	0.2%	(1 in 440)	<0.1%	(1 in 16,000)	0.1%	(1 in 1,600)
60 years	0.1%	(1 in 1,300)	0.2%	(1 in 590)	<0.1%	(1 in 7,400)	0.1%	(1 in 1,800)
70 years	0.1%	(1 in 1,500)	0.1%	(1 in 950)	<0.1%	(1 in 3,800)	0.1%	(1 in 1,800)
Lifetime risk			0.3%	(1 in 320)			0.1%	(1 in 1,600)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 730)	0.6%	(1 in 180)	<0.1%	(1 in 77,000)	0.1%	(1 in 1,100)
50 years	0.1%	(1 in 690)	0.4%	(1 in 230)	<0.1%	(1 in 23,000)	0.1%	(1 in 1,100)
60 years	0.1%	(1 in 690)	0.3%	(1 in 330)	<0.1%	(1 in 7,800)	0.1%	(1 in 1,100)
70 years	0.1%	(1 in 880)	0.2%	(1 in 580)	<0.1%	(1 in 3,000)	0.1%	(1 in 1,200)
Lifetime risk			0.7%	(1 in 140)			0.1%	(1 in 1,100)

Figure 3.21.5
Registered age-standardised incidence rates in German federal states, ICD-10 C73, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.21.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C73, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.22 Hodgkin's lymphoma

Table 3.22.1
Overview of the key epidemiological parameters for Germany, ICD-10 C81

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	1,150	880	1,160	920	*1,100*	*900*
Crude incidence rate[1]	2.9	2.1	2.9	2.2	*2.8*	*2.1*
Standardised incidence rate[1,2]	2.6	2.0	2.7	2.0	*2.6*	*2.0*
Median age at diagnosis	44	39	47	49		
Deaths	158	149	193	148		
Crude mortality rate[1]	0.4	0.4	0.5	0.4		
Standardised mortality rate[1,2]	0.3	0.2	0.4	0.2		
5-year prevalence	4,700	3,600	4,700	3,700	*4,700*	*3,500*
Absolute 5-year survival rate (2007–2008)[3]			79 (64-94)	79 (67-93)		
Relative 5-year survival rate (2007–2008)[3]			83 (68-98)	82 (69-95)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Hodgkin's lymphoma is distinguished from non-Hodgkin lymphomas histologically by the presence of Reed-Sternberg giant cells in the bone marrow.

Hodgkin's lymphoma is a rare disease, and in Germany 1,160 men and 920 women were newly diagnosed in 2008. It can occur at any age, and about one patient in ten was under the age of 20 years at diagnosis. In contrast to almost all other types of cancer, the incidence risk does not increase after the age of 15 years.

There have been no clear trends in recent years for incidence rates or the absolute numbers of newly diagnosed cases, but there has been a decline in the number of people dying of Hodgkin's lymphoma in Germany to just above 300 in 2008, nearly 200 fewer than ten years previously. The prognosis is correspondingly favourable, and five years after diagnosis some 80 % of adult patients are still alive.

Risk factors

Risk factors for Hodgkin's lymphoma have not been clarified. Specific lifestyle-related risk factors or environmental risks cannot yet be made responsible for the development of Hodgkin's lymphoma. As with non-Hodgkin lymphomas, congenital and acquired characteristics of the immune system and viral infections are topics of debate, although their influence has not yet been quantified, and it has not been possible to identify a definite cause for an individual patient.

An involvement of the Epstein-Barr virus (which causes glandular fever), and of retroviruses (e.g. HTLV or HIV) has long been suspected, and recent studies have confirmed the role of the Epstein-Barr virus. Among participants in a study who had had glandular fever before they were six years old, the proportion of Hodgkin's patients was nine times higher than in the control group. Recent studies also show that the hepatitis B virus plays a role.

The children and siblings of patients with Hodgkin's lymphoma have a much higher risk of developing the disease themselves. Researchers are therefore paying increasing attention to hereditary factors, although as yet no risk-enhancing inheritable genetic mutations could be clearly identified.

Figure 3.22.1a
Age-standardised incidence and mortality rates, ICD-10 C81, Germany, 1999 – 2008
per 100,000 (European standard)

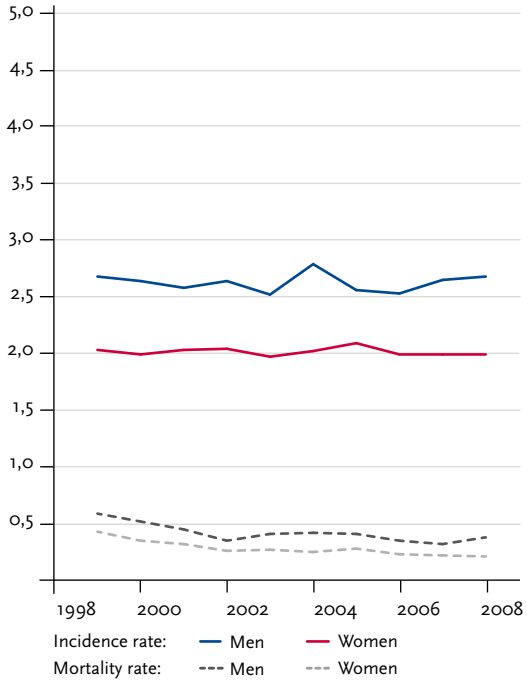


Figure 3.22.1b
Absolute numbers of new cases and deaths, ICD-10 C81, Germany, 1999 – 2008

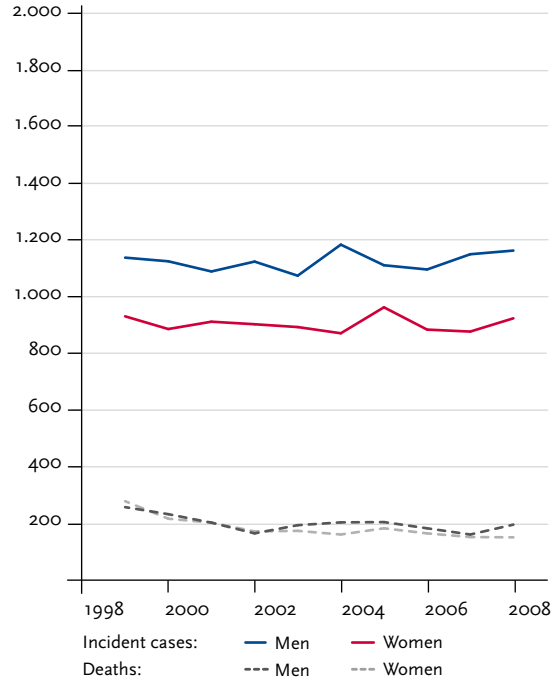


Figure 3.22.2
Distribution of T-stages at first diagnosis
T-Stages are not defined for Hodgkin's lymphoma.

Figure 3.22.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C81, Germany, 2007 – 2008

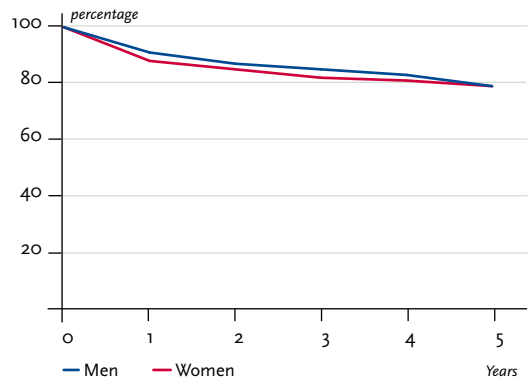


Figure 3.22.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C81, Germany, 2007 – 2008

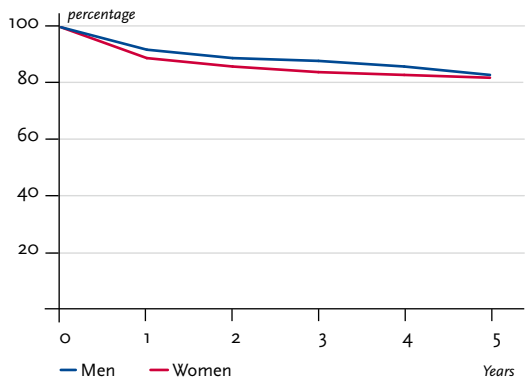


Figure 3.22.4
Age-specific incidence rates in Germany by gender ICD-10 C81, 2007 – 2008
per 100,000

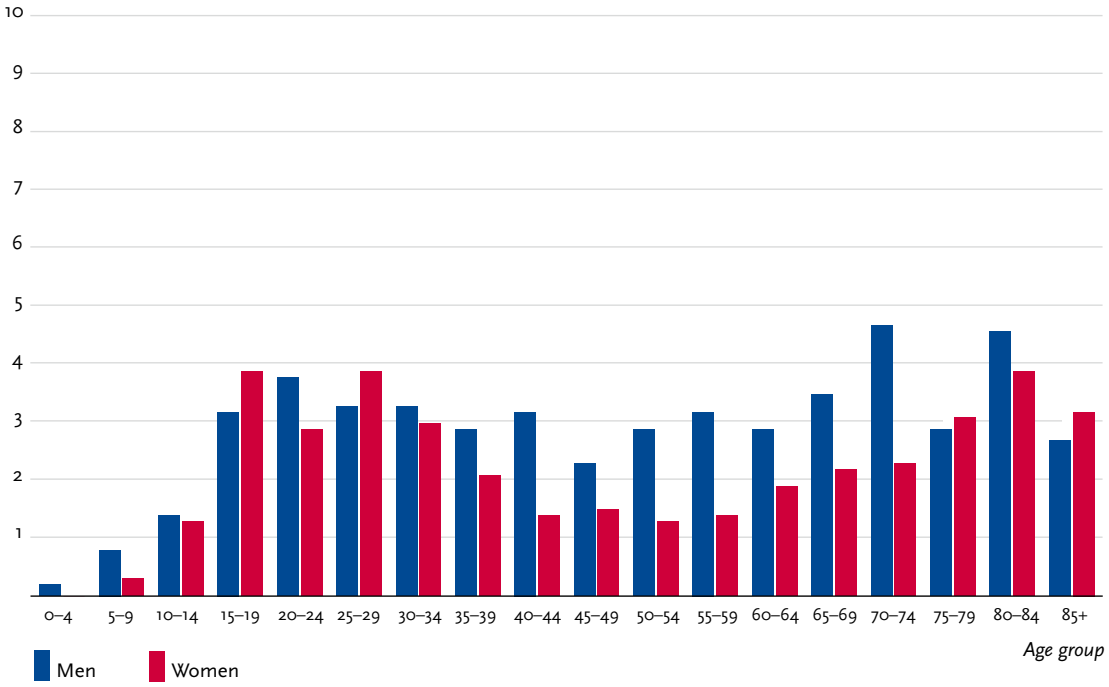


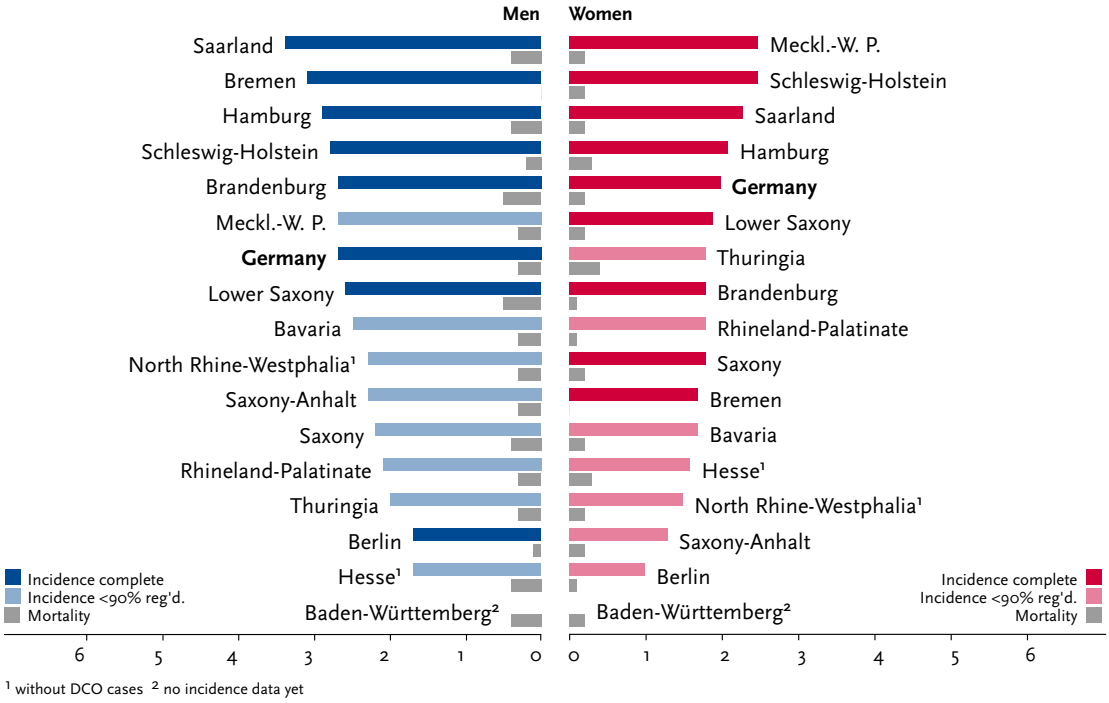
Table 3.22.2
Age-specific incidence rates in Germany by gender, ICD-10 C81, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.2	0.8	1.4	3.2	3.8	3.3	3.3	2.9	3.2	2.3	2.9	3.2	2.9	3.5	4.7	2.9	4.6	2.7
Woman	0.0	0.3	1.3	3.9	2.9	3.9	3.0	2.1	1.4	1.5	1.3	1.4	1.9	2.2	2.3	3.1	3.9	3.2

Table 3.22.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C81, database 2008

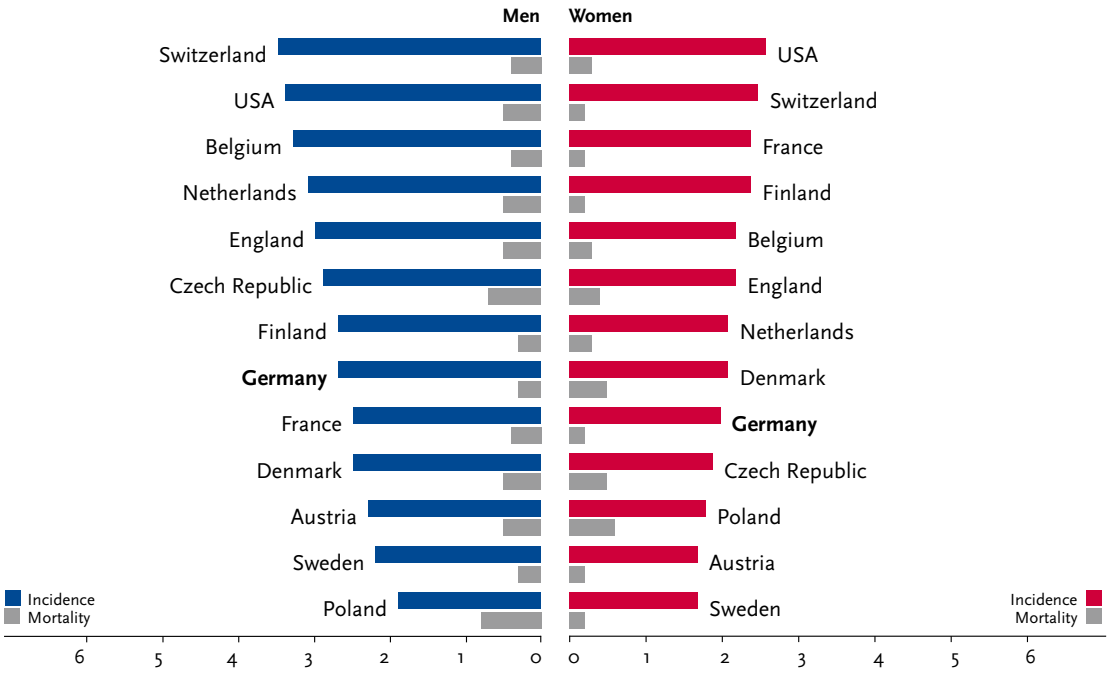
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,800)	0.2%	(1 in 520)	<0.1%	(1 in 141,000)	<0.1%	(1 in 2,500)
50 years	<0.1%	(1 in 3,300)	0.2%	(1 in 640)	<0.1%	(1 in 37,000)	<0.1%	(1 in 2,500)
60 years	<0.1%	(1 in 3,900)	0.1%	(1 in 790)	<0.1%	(1 in 31,000)	<0.1%	(1 in 2,700)
70 years	<0.1%	(1 in 3,400)	0.1%	(1 in 960)	<0.1%	(1 in 24,000)	<0.1%	(1 in 2,900)
Lifetime risk			0.2%	(1 in 460)			<0.1%	(1 in 2,500)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 2,900)	0.2%	(1 in 630)	<0.1%	(1 in 78,000)	<0.1%	(1 in 3,400)
50 years	<0.1%	(1 in 3,900)	0.1%	(1 in 800)	<0.1%	(1 in 146,000)	<0.1%	(1 in 3,500)
60 years	<0.1%	(1 in 3,700)	0.1%	(1 in 1,000)	<0.1%	(1 in 69,000)	<0.1%	(1 in 3,600)
70 years	<0.1%	(1 in 3,500)	0.1%	(1 in 1,200)	<0.1%	(1 in 49,000)	<0.1%	(1 in 3,700)
Lifetime risk			0.2%	(1 in 560)			<0.1%	(1 in 3,400)

Figure 3.22.5
Registered age-standardised incidence rates in German federal states, ICD-10 C81, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.22.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C81, 2007 – 2008 or latest available year (details and data sources see appendix)
per 100,000 (European standard)



3.23 Non-Hodgkin lymphomas

Table 3.23.1
Overview of the key epidemiological parameters for Germany, ICD-10 C82 – 85

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	7,250	6,430	7,270	6,430	*7,800*	*6,500*
Crude incidence rate[1]	18.0	15.3	18.1	15.4	*19.6*	*15.8*
Standardised incidence rate[1,2]	13.9	9.9	13.7	9.8	*14.1*	*10.0*
Median age at diagnosis	68	71	68	71		
Deaths	2,876	2,598	2,926	2,658		
Crude mortality rate[1]	7.1	6.2	7.3	6.3		
Standardised mortality rate[1,2]	5.3	3.2	5.2	3.2		
5-year prevalence	21,700	19,800	22,400	20,200	*23,900*	*20,800*
Absolute 5-year survival rate (2007–2008)[3]			57 (49-61)	60 (55-64)		
Relative 5-year survival rate (2007–2008)[3]			65 (56-70)	68 (64-71)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Non-Hodgkin lymphomas originate from cells of the lymphatic system, mostly from B-lymphocytes. A distinction is made between high-grade and low-grade malignancy forms. In 2008 13,700 people were diagnosed in Germany with a non-Hodgkin lymphoma. The disease already occurs in childhood, but the incidence risk increases almost linearly with age. The median age at diagnosis for men was 68 years and for women 71 years.

The recent increases in age-standardised incidence rates should be seen against the background of falling rates for leukaemias, because chronic lymphatic leukaemias are meanwhile classified clinically under the low-grade malignancy non-Hodgkin lymphomas. The age-standardised mortality rates increased into the late 1990s, but then sank over the following ten years. Some 5,600 people die of the disease in Germany every year.

The prognosis for patients with a non-Hodgkin lymphoma is generally rather good, with relative 5-year survival rates of 65 % for men and 68 % for women, although the prognosis depends on the age at diagnosis and the type and distribution of the disease. Some cases, in particular highly malignant forms, can meanwhile be treated with the prospect of a permanent cure.

Risk factors

The known risk factors for non-Hodgkin lymphomas are not present in all patients. Since this is a group of differing lymphomas, it is only possible to make limited statements about risk factors that are valid for all forms.

An immune system deficiency (due to HIV infection or immunosuppressive treatment) is associated with an increased risk. Rare autoimmune diseases also increase the risk for some lymphomas. Viruses contribute to the development of these diseases, but it is difficult to assess their influence. There is a confirmed relationship between an Epstein-Barr virus infection and Burkitt's lymphoma, which mainly occurs in Africa. T-cell lymphomas are more frequently observed in carriers of the human T-cell leukaemia virus (HTLV-1). Studies suggest that certain types of lymphoma are more likely to develop in people chronically infected with Hepatitis viruses (Type B or C). Chronic infection of the stomach with the bacterium Helicobacter pylori can lead to a lymphoma of the gastric mucosa (MALT lymphoma). Heavy metals, organic solvents, some herbicides, insecticides and fungicides are discussed as possible initiating factors. Exposure to nuclear radiation can also cause malignant lymphomas. It would also seem that smoking and obesity play a role in the highly aggressive forms. However, in general there is as yet no clear proof of the influence of lifestyle. New investigations indicate that inheritable genetic variants could influence the risk of developing the disease without being a direct cause of lymphomas.

Figure 3.23.1a
Age-standardised incidence and mortality rates, ICD-10 C82 – 85, Germany 1999 – 2008
per 100,000 (European standard)

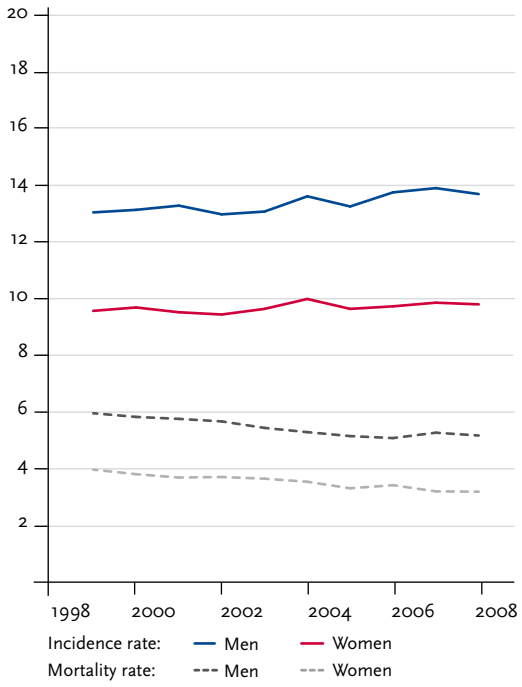


Figure 3.23.1b
Absolute numbers of new cases and deaths, ICD-10 C82 – 85, Germany 1999 – 2008

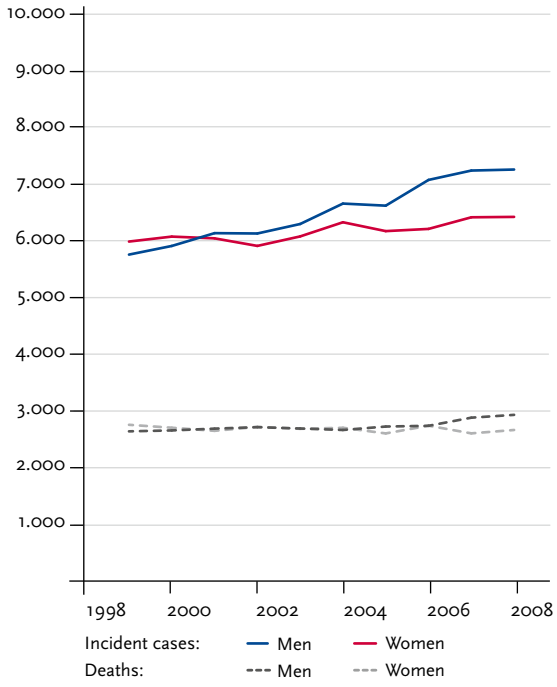


Figure 3.23.2
Distribution of T-stages at first diagnosis
T stages are not defined for non-Hodgkin lymphoma.

Table 3.23.2
Proportion of the various non-Hodgkin lymphomas for all new diagnoses C82-C85, Germany, 2007 – 2008

	C82[1]	C83[2]	C84[3]	C85[4]
Men	18 %	43 %	9 %	29 %
Woman	23 %	40 %	7 %	30 %

[1] Follicular/nodular non-Hodgkin lymphoma
[2] Diffuse non-Hodgkin lymphoma
[3] Peripheral and cutaneous T-cell lymphomas
[4] Other and unspecified types of non-Hodgkin lymphomas

Figure 3.23.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C82 – 85, Germany, 2007 – 2008

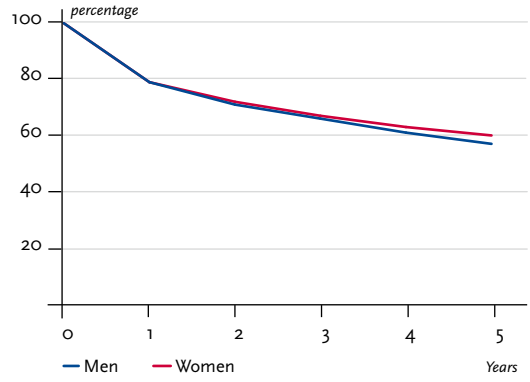


Figure 3.23.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C82 – 85, Germany, 2007 – 2008

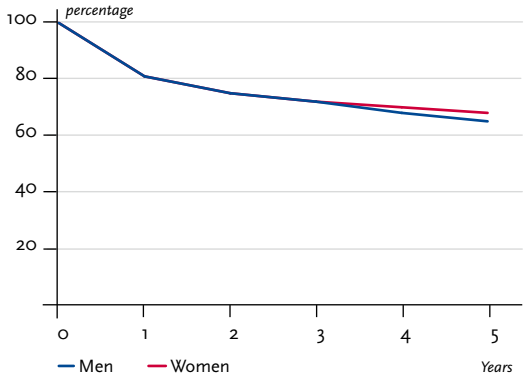


Figure 3.23.4
Age-specific incidence rates in Germany by gender ICD-10 C82 – 85, 2007 – 2008
per 100,000

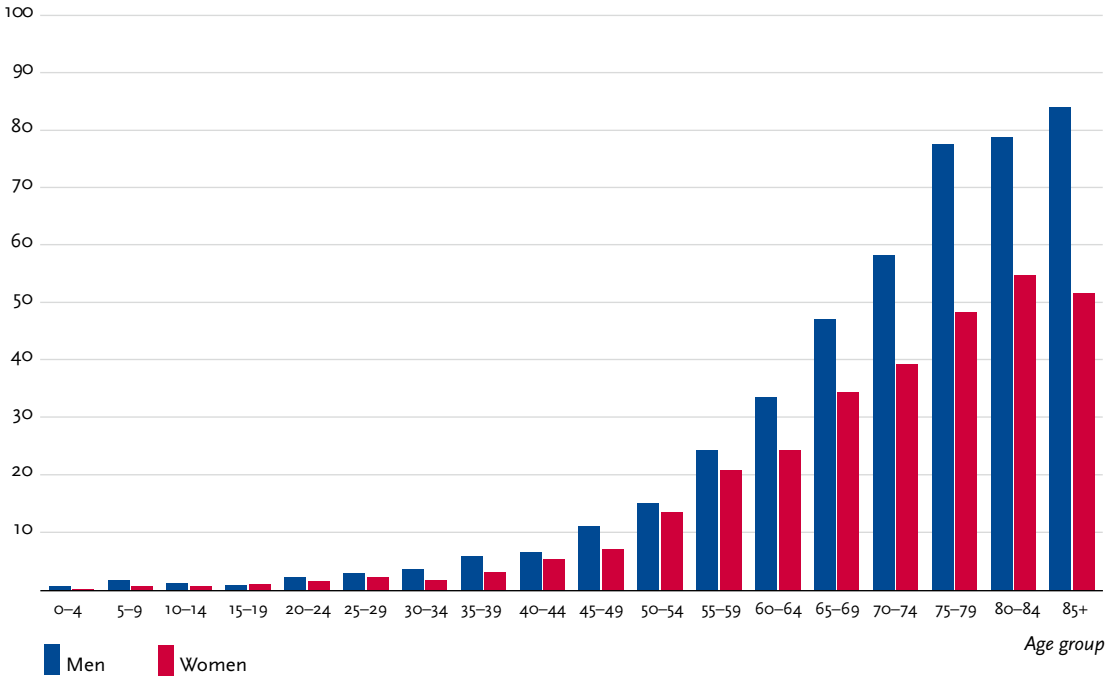


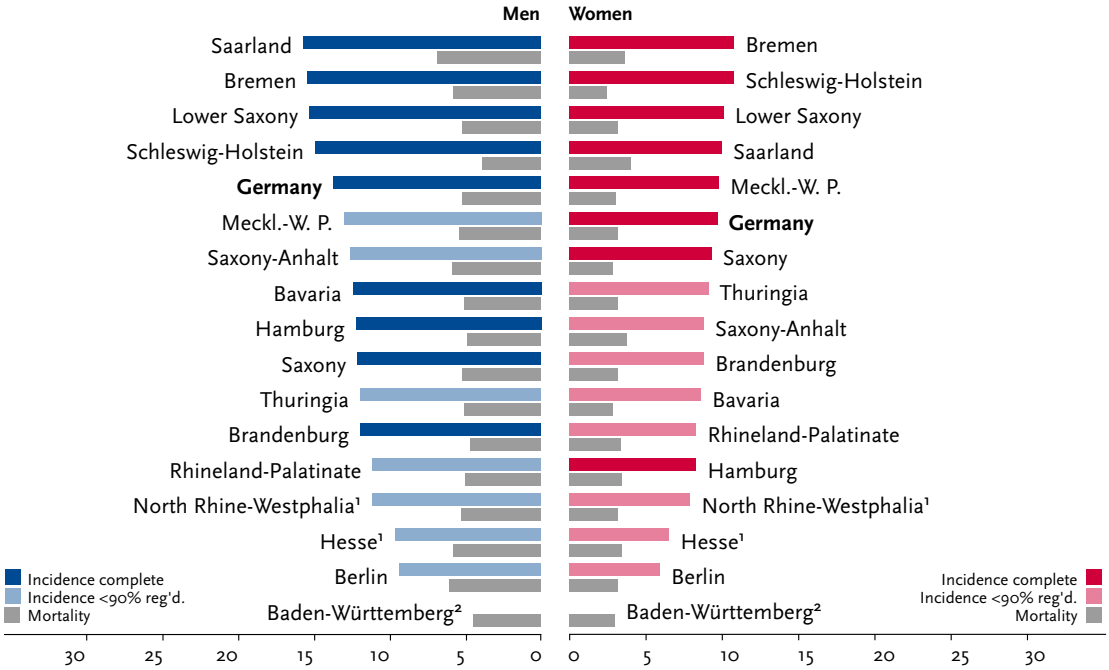
Table 3.23.3
Age-specific incidence rates in Germany by gender, ICD-10 C82 – 85, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.8	1.8	1.3	1.0	2.4	3.0	3.8	6.0	6.7	11.3	15.3	24.6	34.0	47.7	58.8	78.3	79.6	84.9
Woman	0.2	0.8	0.8	1.1	1.6	2.4	1.9	3.3	5.5	7.2	13.7	21.2	24.6	34.8	39.7	48.8	55.4	52.2

Table 3.23.4
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C82 – 85, database 2008

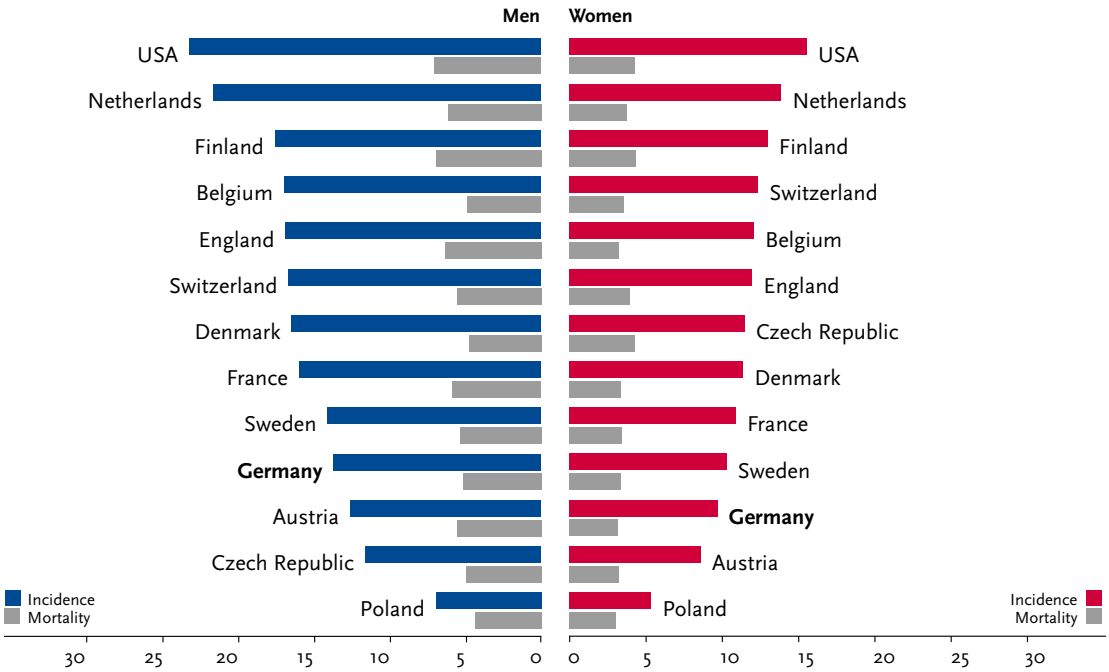
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,100)	1.4%	(1 in 71)	<0.1%	(1 in 6,500)	0.7%	(1 in 150)
50 years	0.2%	(1 in 510)	1.3%	(1 in 74)	0.1%	(1 in 2,000)	0.7%	(1 in 150)
60 years	0.4%	(1 in 260)	1.2%	(1 in 81)	0.1%	(1 in 750)	0.7%	(1 in 150)
70 years	0.6%	(1 in 180)	1.0%	(1 in 100)	0.3%	(1 in 350)	0.6%	(1 in 160)
Lifetime risk			1.5%	(1 in 68)			0.7%	(1 in 150)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,500)	1.2%	(1 in 84)	<0.1%	(1 in 8,200)	0.5%	(1 in 180)
50 years	0.2%	(1 in 590)	1.1%	(1 in 87)	<0.1%	(1 in 3,600)	0.5%	(1 in 180)
60 years	0.3%	(1 in 350)	1.0%	(1 in 99)	0.1%	(1 in 1,300)	0.5%	(1 in 190)
70 years	0.4%	(1 in 250)	0.8%	(1 in 130)	0.2%	(1 in 510)	0.5%	(1 in 200)
Lifetime risk			1.2%	(1 in 81)			0.5%	(1 in 180)

Figure 3.23.5
Registered age-standardised incidence rates in German federal states, ICD-10 C82 – 85, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.23.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C82 – 85, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.24 Multiple myeloma

Table 3.24.1
Overview of the key epidemiological parameters for Germany, ICD-10 C90

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	3,000	2,620	2,980	2,650	*3,200*	*2,800*
Crude incidence rate[1]	7.5	6.2	7.4	6.3	*8.1*	*6.7*
Standardised incidence rate[1,2]	5.4	3.6	5.3	3.6	*5.2*	*3.7*
Median age at diagnosis	70	72	71	74		
Deaths	1,856	1,800	1,882	1,786		
Crude mortality rate[1]	4.6	4.3	4.7	4.3		
Standardised mortality rate[1,2]	3.3	2.2	3.3	2.2		
5-year prevalence	7,100	6,400	7,200	6,500	*7,500*	*6,700*
Absolute 5-year survival rate (2007–2008)[3]			35 (26-40)	36 (22-48)		
Relative 5-year survival rate (2007–2008)[3]			41 (30-46)	41 (25-53)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Multiple myeloma is a malignant accumulation of antibody-producing plasma cells. It usually begins in the bone marrow and frequently forms at various locations in the bone marrow (multiple myeloma) with associated complications such as fractures and bone pains, or changes in blood counts. In some 5 % of cases, diagnosis is the result of other organs being affected in addition to the bone marrow.

In 2008, new cases were diagnosed in Germany for some 3,000 men and 2,600 women. The incidence risk increases markedly in advanced age, but diagnosis before the age of 45 years is extremely rare (about 2 % of all cases). After age-standardisation, both incidence rates and mortality rates have recently shown a slight downward trend. However, the absolute numbers have nevertheless risen due to demographic effects.

The prognosis is rather unfavourable, with a relative 5-year survival rate of about 40 %. Even after maximum therapy, e.g. autologous stem cell transplantation, a cure is not to be expected. However, some patients may experience few symptoms for a relatively long period, and under therapy temporary remission is possible.

Risk factors

The causes of multiple myeloma are mostly unknown. Recognised risk factors are advanced age, male gender, and a case of multiple myeloma among first-degree relatives. Chronic infections such as with HIV or hepatitis C virus are associated with an increased risk for the development of multiple myeloma. Whether certain lifestyle factors, exposure to environmental pollutants or to nuclear radiation significantly increase the risk of developing multiple myeloma is currently a topic of debate. Familial clusters have been observed, but so far there is no proof of heritable factors. Genetic factors are suggested by differences in incidence between ethnic groups. The rates are highest among African Americans in the USA, and lowest in China. A monoclonal gammopathy of undetermined significance (MGUS) is regarded as a preliminary stage of multiple myeloma.

Figure 3.24.1a
Age-standardised incidence and mortality rates, ICD-10 C90, Germany, 1999 – 2008
per 100,000 (European standard)

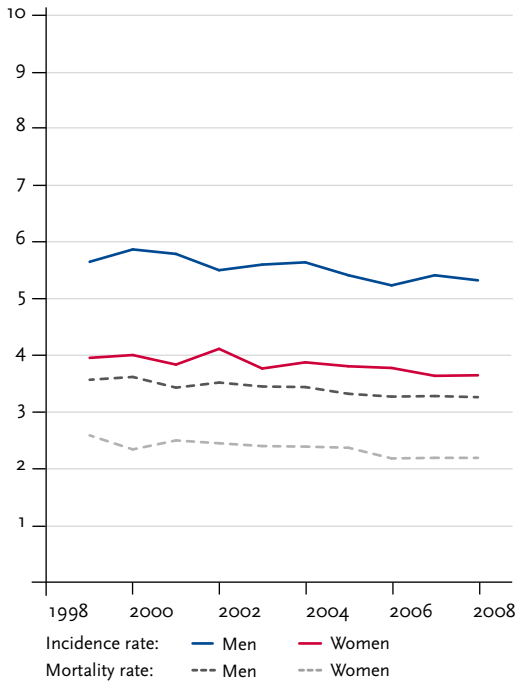


Figure 3.24.1b
Absolute numbers of new cases and deaths, ICD-10 C90, Germany, 1999 – 2008

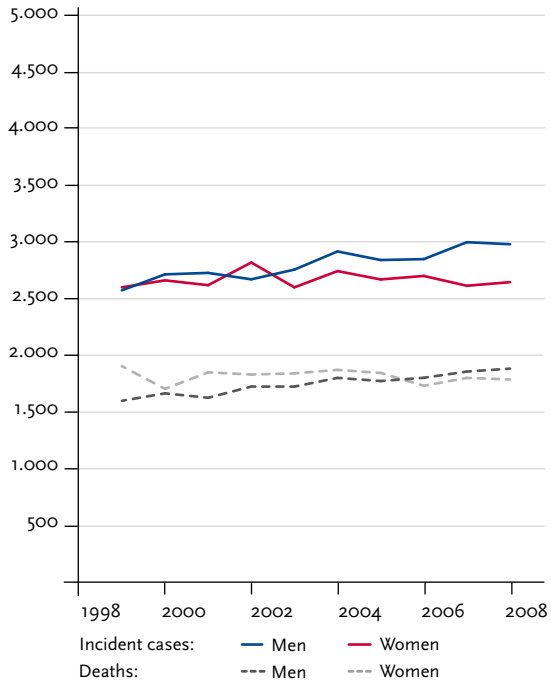


Figure 3.24.2
Distribution of T-stages at first diagnosis
T stages are not defined for Muliple myeloma.

Figure 3.24.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C90, Germany, 2007 – 2008

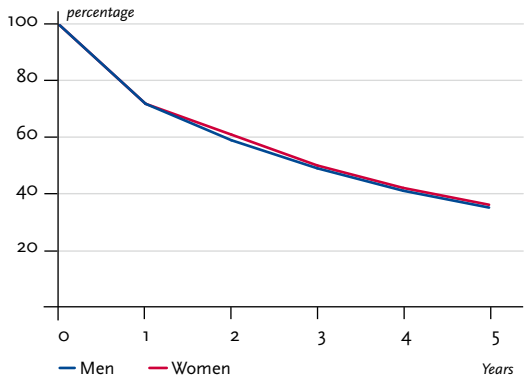


Figure 3.24.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C90, Germany, 2007 – 2008

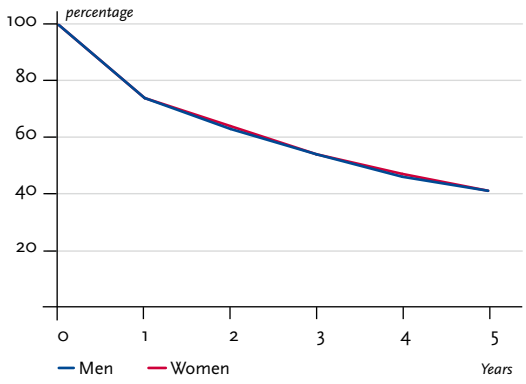


Figure 3.24.4
Age-specific incidence rates in Germany by gender ICD-10 C90, 2007 – 2008
per 100,000

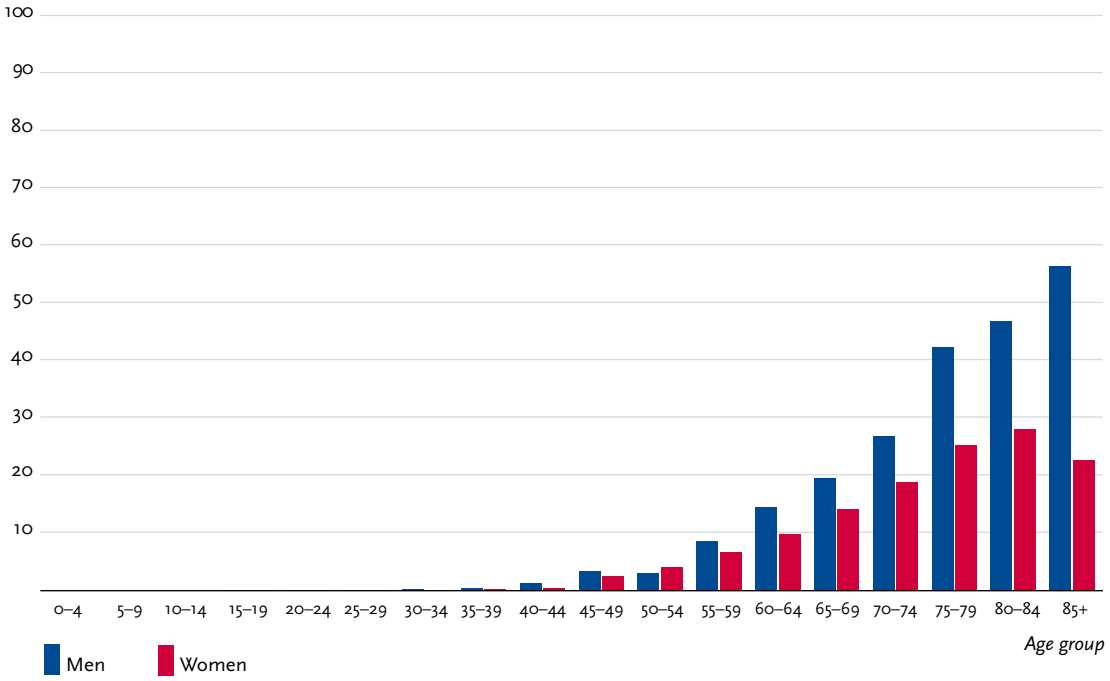


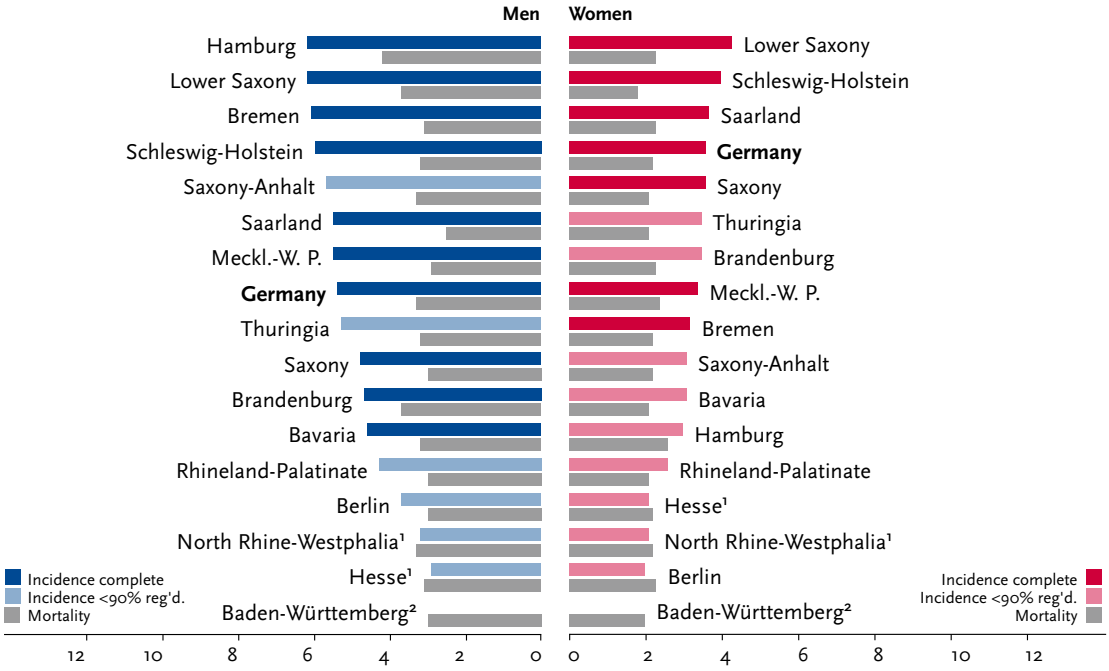
Table 3.24.2
Age-specific incidence rates in Germany by gender, ICD-10 C90, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.5	1.3	3.4	3.1	8.6	14.7	19.8	27.1	42.7	47.3	56.9
Woman	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.5	2.6	4.2	6.8	10.0	14.3	19.0	25.5	28.4	22.9

Table 3.24.3
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C90, database 2008

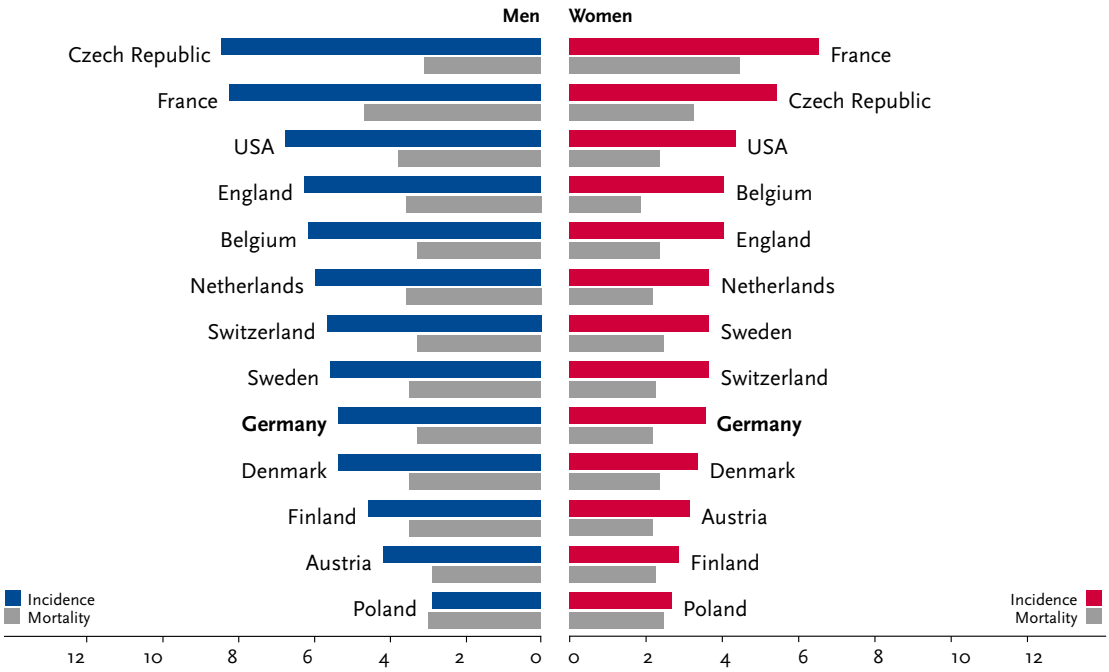
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 4,300)	0.7%	(1 in 150)	<0.1%	(1 in 19,000)	0.4%	(1 in 230)
50 years	0.1%	(1 in 1,600)	0.7%	(1 in 150)	<0.1%	(1 in 3,100)	0.4%	(1 in 220)
60 years	0.2%	(1 in 620)	0.6%	(1 in 160)	0.1%	(1 in 1,100)	0.4%	(1 in 230)
70 years	0.3%	(1 in 350)	0.6%	(1 in 180)	0.2%	(1 in 530)	0.4%	(1 in 240)
Lifetime risk			0.6%	(1 in 150)			0.4%	(1 in 230)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	<0.1%	(1 in 6,200)	0.5%	(1 in 190)	<0.1%	(1 in 18,000)	0.4%	(1 in 270)
50 years	0.1%	(1 in 1,800)	0.5%	(1 in 190)	<0.1%	(1 in 5,200)	0.4%	(1 in 270)
60 years	0.1%	(1 in 840)	0.5%	(1 in 210)	0.1%	(1 in 1,500)	0.4%	(1 in 280)
70 years	0.2%	(1 in 500)	0.4%	(1 in 260)	0.1%	(1 in 710)	0.3%	(1 in 320)
Lifetime risk			0.5%	(1 in 190)			0.4%	(1 in 280)

Figure 3.24.5
Registered age-standardised incidence rates in German federal states, ICD-10 C90, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.24.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C90., 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



3.25 Leukaemias

Table 3.25.1
Overview of the key epidemiological parameters for Germany, ICD-10 C91 – 95

	2007		2008		Prediction for 2012	
	Men	Women	Men	Woman	Men	Women
Incident cases	6,180	5,220	6,340	5,080	*6,500*	*4,900*
Crude incidence rate[1]	15.3	12.4	15.8	12.1	*16.2*	*11.9*
Standardised incidence rate[1,2]	12.3	8.2	12.4	7.9	*11.9*	*7.6*
Median age at diagnosis	70	73	70	73		
Deaths	3,699	3,263	3,908	3,400		
Crude mortality rate[1]	9.2	7.8	9.7	8.1		
Standardised mortality rate[1,2]	6.8	4.2	6.9	4.2		
5-year prevalence	17,100	13,200	17,400	13,300	*17,600*	*12,800*
Absolute 5-year survival rate (2007–2008)[3]			47 (33-55)	43 (29-49)		
Relative 5-year survival rate (2007–2008)[3]			54 (39-63)	49 (34-56)		

[1] per 100,000 persons [2] age-standardised (European Standard) [3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2008, some 11,400 people were diagnosed with leukaemia in Germany, of which some 5 % were below 15 years of age. In more than a third of cases the chronic lymphatic form (CLL) was diagnosed, and in over a quarter of cases an acute myeloid leukaemia (AML).

The incidence risk for leukaemias falls with age during childhood, and then increases again continuously above 20 years of age.

The age-standardised incidence rates have recently shown a downward trend for both sexes. However, in view of the vague distinction between CLL and non-Hodgkin lymphomas (C82-C85) this trend should be interpreted carefully, especially since the incidence rates of the latter have increased to a similar extent. After years of stagnation, the age-standardised mortality rates have declined continuously since the end of the 1990s for both sexes.

The prognosis for leukaemia depends on its form and the age of the subject at diagnosis. It is most favourable for the leukaemia forms in childhood, whereas in adults in particular the acute forms continue to have a very poor prognosis. The prognosis for chronic forms in old age is moderately good: 5 years after diagnosis, about half of the patients are still alive. However, a permanent cure is rarely achieved, e.g. after a risky stem cell transplantation.

Risk factors

Some risk factors are known to cause acute leukaemias, e.g. ionising radiation in radiotherapy, cytostatic drugs in chemotherapy for cancer, and probably also various chemicals (as a result of occupational exposure, etc.). However these factors are not in the medical history of most patients. In particular the causes of chronic leukaemias – the most frequent form of leukaemia among adults – are still unclear.

An influence of dietary habits or lifestyle factors is under discussion, particularly for chronic lymphatic leukaemias. So far, however, there is no proof of such influence for this or for other chronic and acute forms of leukaemia.

Some relatively rare genetic changes can increase the incidence risk, including trisomy 21. Research is being carried out on other genetic changes which may contribute to an increased risk.

The influence of viruses is still unclear and is a topic of on-going research. There is a debate about whether insufficient training of the immune system in childhood contributes towards increased risk, although no conclusion has been reached. No association with exposure to electromagnetic fields of any origin could yet be proven.

Figure 3.25.1a
Age-standardised incidence and mortality rates, ICD-10 C91 – 95, Germany, 1999 – 2008
per 100,000 (European standard)

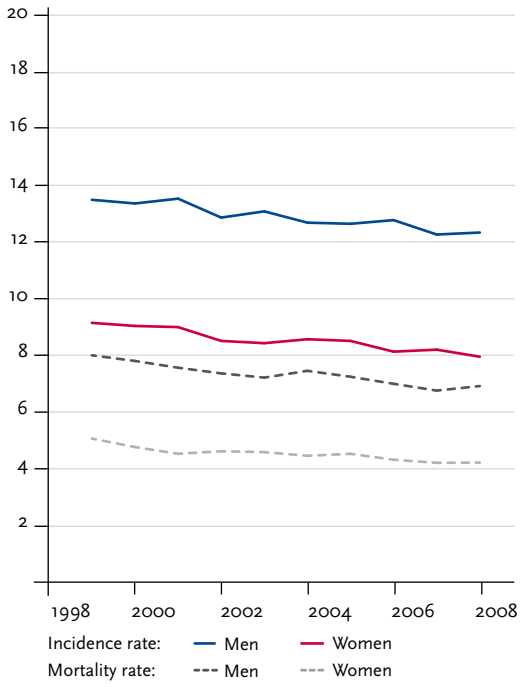


Figure 3.25.1b
Absolute numbers of new cases and deaths, ICD-10 C91 – 95, Germany, 1999 – 2008

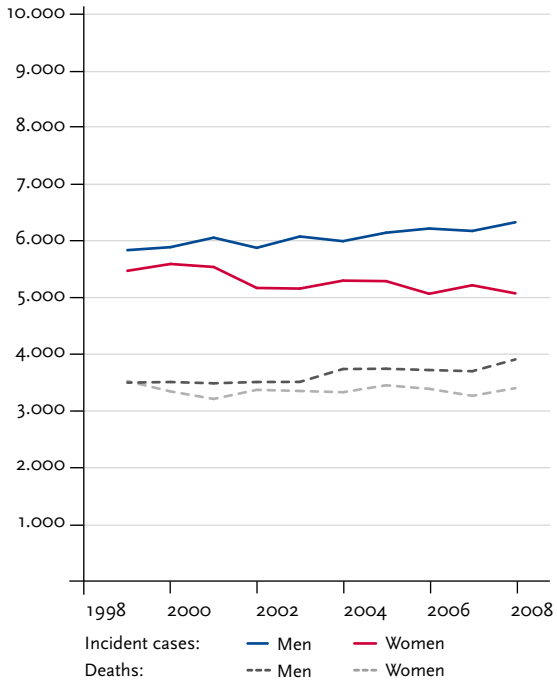


Figure 3.25.2
Distribution of T-stages at first diagnosis
T stages are not defined for leukaemias.

Table 3.25.2
Proportion of forms of leukaemia among all new cases C91 – 95, Germany, 2007 – 2008

	AML[1]	ALL[2]	CML[3]	CLL[4]	Others	Indeterminate
Men	25 %	7 %	10 %	40 %	10 %	8 %
Woman	29 %	8 %	10 %	34 %	9 %	10 %

[1] Acute myeloid leukaemia [2] Acute lymphatic leukaemia [3] Chronic myeloid leukaemia [4] Chronic lymphatic leukaemia

Figure 3.25.3a
Absolute survival rates up to 5 years after diagnosis, ICD-10 C91 – 95, Germany, 2007 – 2008

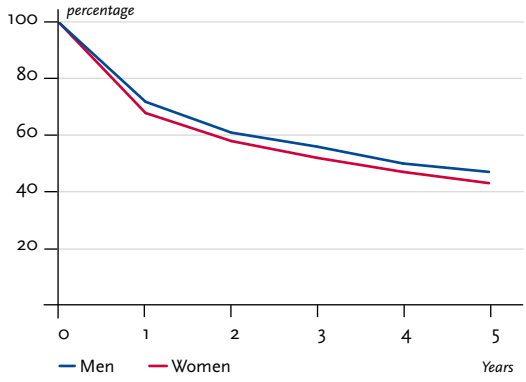


Figure 3.25.3b
Relative survival rates up to 5 years after diagnosis, ICD-10 C91 – 95, Germany, 2007 – 2008

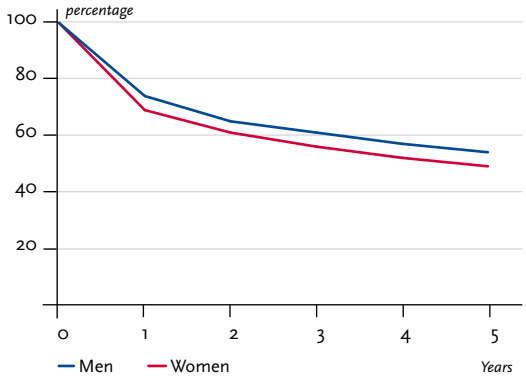


Figure 3.25.4
Age-specific incidence rates in Germany by gender ICD-10 C91 – 95, 2007 – 2008
per 100,000

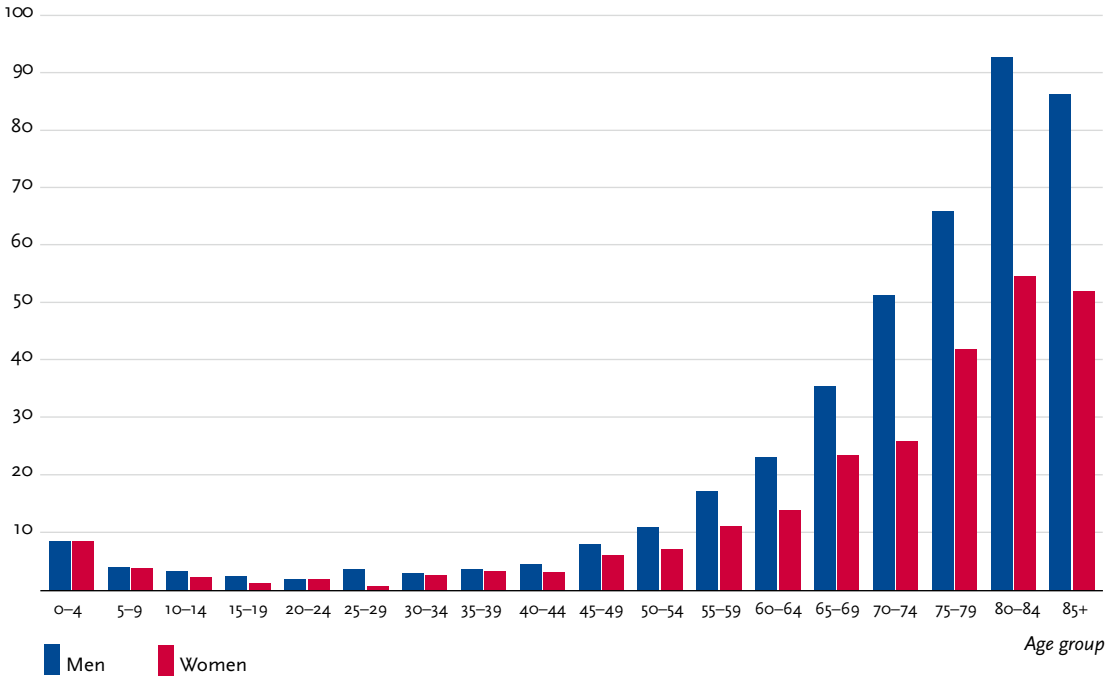


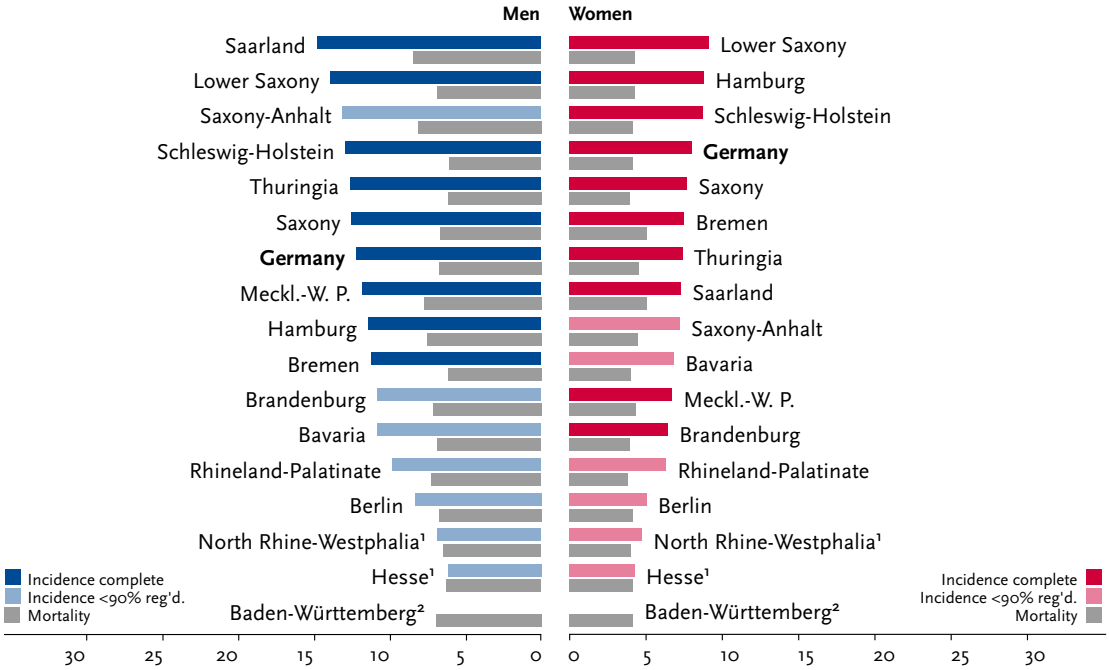
Table 3.25.3
Age-specific incidence rates in Germany by gender, ICD-10 C91 – 95, 2007 – 2008
per 100,000

	0–4	5–9	10–14	15–19	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70–74	75–79	80–84	85+
Men	8.6	4.2	3.4	2.5	2.1	3.8	3.1	3.8	4.6	8.2	11.2	17.4	23.5	35.9	51.9	66.6	91.8	87.1
Woman	8.6	3.9	2.3	1.4	2.0	0.8	2.7	3.5	3.2	6.3	7.3	11.3	14.2	23.7	26.3	42.3	55.2	52.5

Table 3.25.4
Cancer incidence and mortality risks in Germany by age and gender, ICD-10 C91 – 95, database 2008

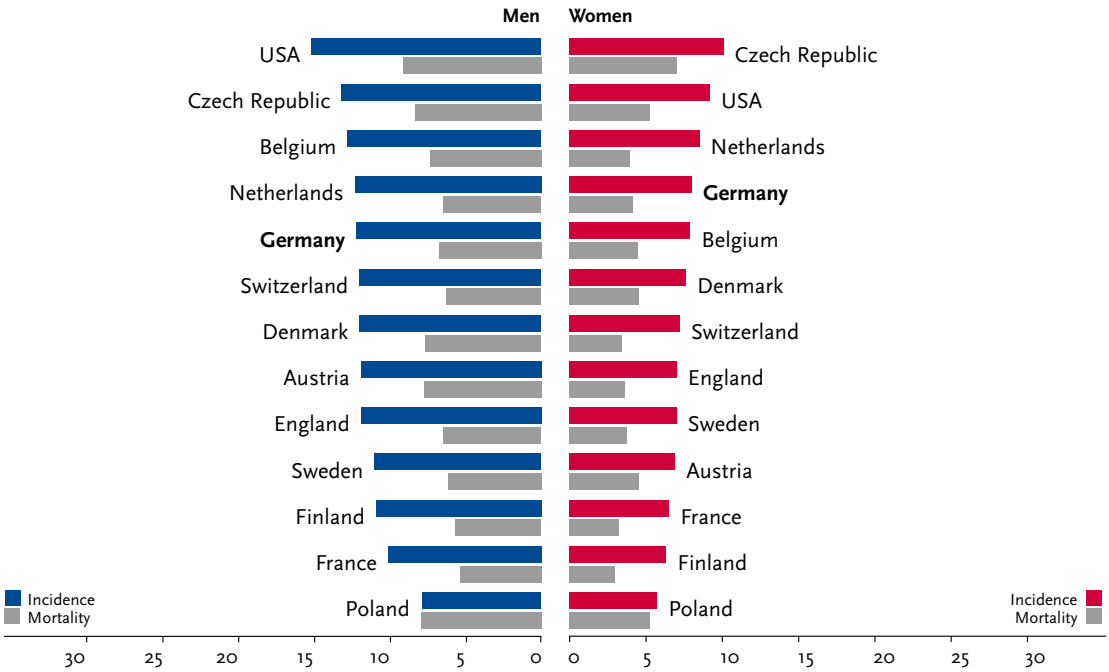
	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
40 years	0.1%	(1 in 1,500)	1.2%	(1 in 83)	<0.1%	(1 in 4,600)	0.9%	(1 in 110)
50 years	0.1%	(1 in 710)	1.2%	(1 in 85)	0.1%	(1 in 1,800)	0.9%	(1 in 110)
60 years	0.3%	(1 in 360)	1.1%	(1 in 90)	0.2%	(1 in 600)	0.9%	(1 in 110)
70 years	0.5%	(1 in 200)	1.0%	(1 in 100)	0.4%	(1 in 250)	0.8%	(1 in 120)
Lifetime risk			1.3%	(1 in 74)			0.9%	(1 in 110)
Women aged	**in den nächsten 10 Jahren**		**jemals**		**in den nächsten 10 Jahren**		**jemals**	
40 years	<0.1%	(1 in 2,100)	0.9%	(1 in 110)	<0.1%	(1 in 6,700)	0.7%	(1 in 150)
50 years	0.1%	(1 in 1,100)	0.9%	(1 in 120)	<0.1%	(1 in 2,600)	0.7%	(1 in 150)
60 years	0.2%	(1 in 570)	0.8%	(1 in 120)	0.1%	(1 in 980)	0.7%	(1 in 150)
70 years	0.3%	(1 in 320)	0.7%	(1 in 150)	0.2%	(1 in 430)	0.6%	(1 in 160)
Lifetime risk			1.0%	(1 in 100)			0.7%	(1 in 140)

Figure 3.25.5
Registered age-standardised incidence rates in German federal states, ICD-10 C91 – 95, 2007 – 2008
per 100,000 (European standard)



¹ without DCO cases ² no incidence data yet

Figure 3.25.6
International comparison of age-standardised incidence and mortality rates
ICD-10 C91 – 95, 2007 – 2008 or latest available year (details and sources, see appendix)
per 100,000 (European standard)



4 Cancer in children

The German Childhood Cancer Registry (GCCR) has been based at the Institute of Medical Biostatistics, Epidemiology and Informatics at the University Medical Centre of the Johannes Gutenberg University, Mainz, since beginning its work in 1980. Close cooperation with the Society for Paediatric Oncology and Haematology (GPOH) and its associated hospitals was part of the GCCR's original conception. This is a characteristic feature of the registry which cannot be easily applied to adult oncology. This nationwide, population based childhood cancer registry with a high level of data quality and a degree of completeness of over 95% (since about 1987) has been built up covering the whole of Germany. The GCCR thus meets international standards for population based cancer registries. A further characteristic of the GCCR is that it has implemented an active, open-end, long-term follow-up which continues long into adulthood. In this way, the registry also provides the basis for research into long-term effects and second tumours, and for studies with long-term survivors in general. The registry population comprises children who are diagnosed with a malignant disease or a histologically benign brain tumour before their 15th birthday and are part of the resident population of the Federal Republic of Germany when diagnosed. Cancer cases in eastern Germany have also been registered since 1991. The current data pool consists of over 48,000 cancer cases. Since 1 January 2009, the GCCR has been registering all children and adolescents up to the age of 18 years (i.e. who are diagnosed before their 18th birthday) on the basis of the „Agreement of the Joint Federal Committee on Quality-Assurance Measures for the In-Patient Care of Children and Adolescents with Haemato-Oncological Diseases (GBA)". This will make it possible to better consider the needs of the collaborating hospitals which have been combining paediatric and adolescent medicine for several years now and thus also treat cancer patients aged 15 years and over.

Incidence of childhood cancers

About 1,800 cases of childhood cancer are newly diagnosed every year in Germany. With an overall population of approx. 11 million children under the age of 15 years, this means an annual incidence of about 15.9 per 100,000 children in this age group. The likelihood that a newborn child will develop a malignant disease within the first 15 years of his/her life is 0.2%. In other words, a malignant cancer is diagnosed in approx. one in 500 children up to their 15th birthday.

Range of diagnoses

The pattern of cancer diagnoses in children is completely different from that of adults. For example, children are mostly affected by hematologic diseases and embryonic tumours (neuroblastomas, retinoblastomas, nephroblastomas, medulloblastomas, embryonic rhabdomyosarcomas or germ-cell tumours); carcinomas, by contrast, are very rare in childhood (making up about 2% of all malignant diseases). The largest diagnostic groups are leukaemias (34.1%), CNS tumours (23.2%) and lymphomas (11.4%). Overall cancer incidence among children under the age of five is about twice as high as in the 5- to 14-year-old age group. The median age at onset among the under-15-year-olds is five years, eleven months. Boys are diagnosed with cancer 1.2 times more frequently than girls.

Leukaemias

Leukaemias make up more than a third of all cancers among the under-15-year-olds. The most common single diagnosis overall (26.7%) is lymphatic

Figure 4.1
Cancer in children (determined for the period 2001-2010)

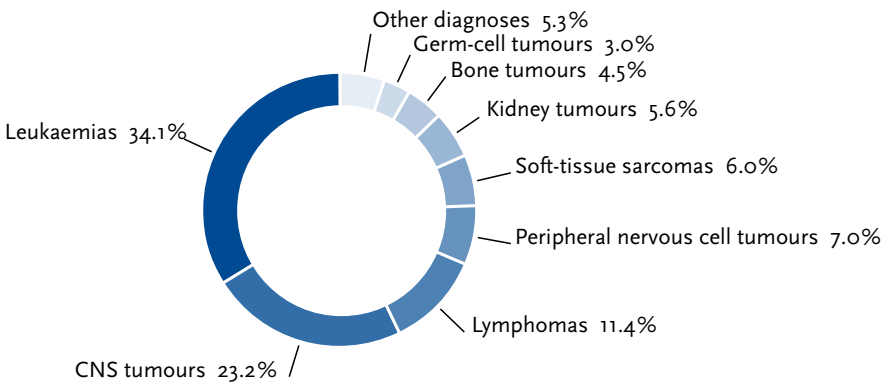
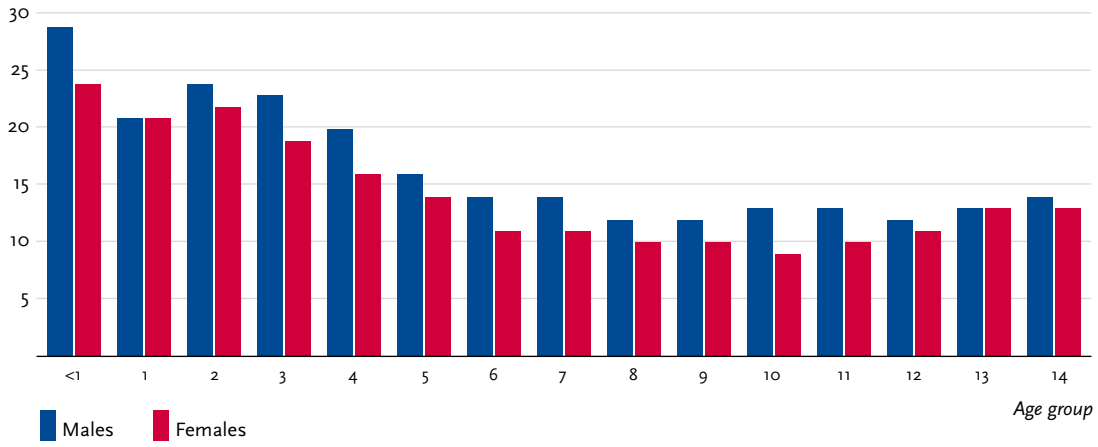


Figure 4.2
New cases by age and sex, all childhood malignancies
Number of cases per 100,000 by age group, determined for the period 2001-2010



leukaemia (LL). It occurs more than twice as frequently among children under the age of five as in the other age groups. 4.5 % of all childhood malignancies are acute myeloid leukaemias (AML). AML is most common among children under the age of two. The survival prospects for AML are markedly lower than for LL. The causes of leukaemias in childhood remain largely uncertain, even today. For a long time, environmental influences were suspected of causing childhood leukaemias. Since then it has been shown that the number of cases caused by most environmental factors (low-dose ionizing radiation, non-ionizing radiation and pesticides) is quite small after all, even if a weak association with leukaemias in childhood cannot be ruled out. A number of clues have meanwhile strengthened hypotheses that assign a key role to infectious pathogens in the development of childhood leukaemias. Especially children with an insufficiently modulated immune system in infancy can have a higher risk of developing leukaemia.

CNS tumours

The most common single diagnoses among CNS tumours are astrocytomas (total: 11.0 %), intracranial and intraspinal embryonal tumours (4.6 %) and ependymomas (2.3 %). The increase in the incidence of CNS tumours observed in a number of western countries over the past decades may be connected with general changes in environmental factors and related exposures. For example, a number of epidemiological studies are looking into the possible influence of ionizing radiation, electromagnetic fields, pesticides, the mother's diet and genetic aspects.

Figure 4.3
New cases by age and sex, childhood lymphatic leukaemia (LL)
Number of cases per 100,000 by age group, determined for the period 2001-2010

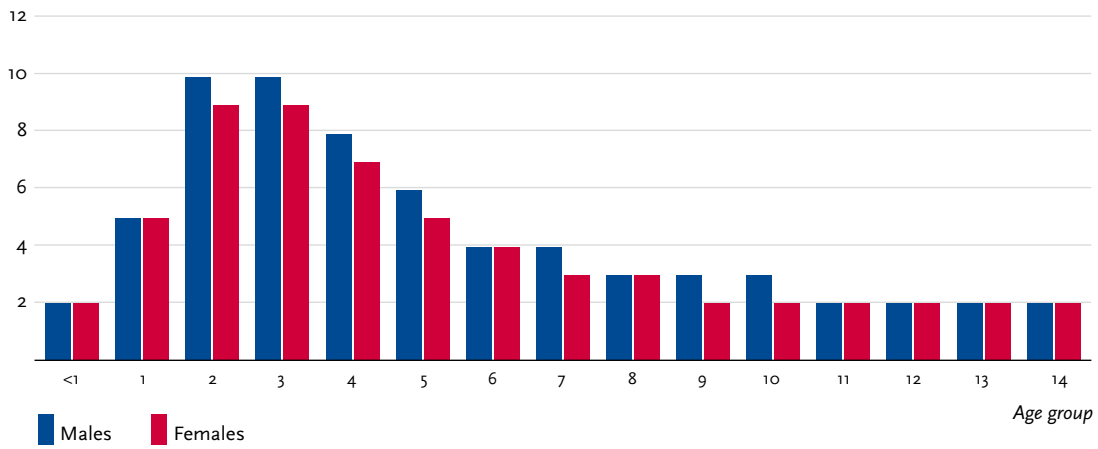


Figure 4.4
Trends in the incidence of selected diagnostic groups and for all childhood malignancies
Number of cases per 100,000 (age standardized), including eastern Germany since 1991

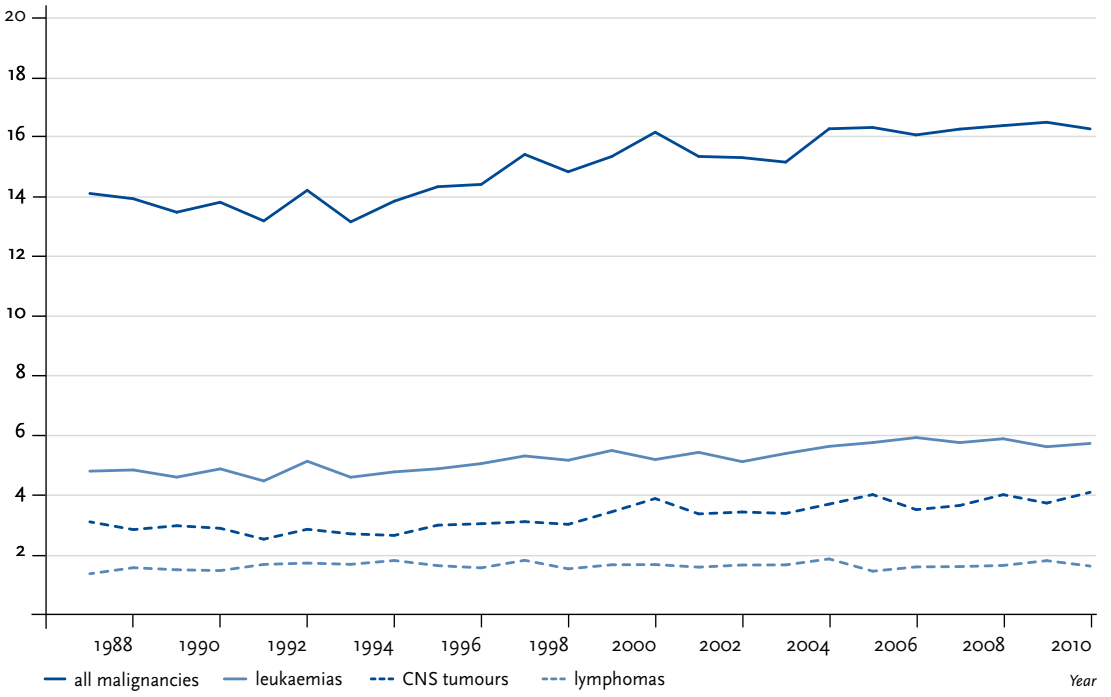
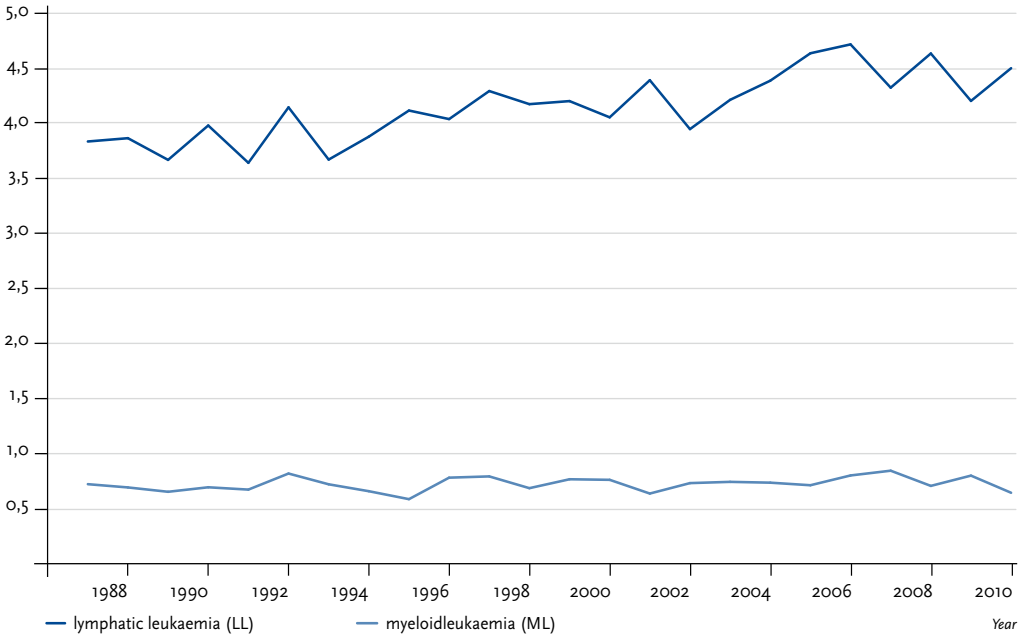


Figure 4.5
Trends in the incidence of childhood leukaemias, myeloproliferative and myelodysplastic disorders
Number of cases per 100,000 (age standardized), including eastern Germany since 1991



Lymphomas

The most common lymphomas are Non-Hodgkin lymphomas (NHL), including Burkitt's lymphoma (total: 6.5 %), and Hodgkin's lymphoma (4.8 %). The chances of survival with Hodgkin's lymphoma are among the best in paediatric oncology. Children with congenital or acquired immunodeficiency and those who have had immunosuppressive therapy are at increased risk of developing NHL. An association is suspected between lymphomas and ionizing radiation; this has not, however, been substantiated.

Other common malignant diseases

Other common malignant diseases in childhood include neuroblastomas (nerve-cell tumours), nephroblastomas (kidney tumours), germ-cell tumours, bone tumours and rhabdomyosarcomas (tumours of the skeletal musculature). Among these malignancies, the prognosis for children with nephroblastoma or a germ-cell tumour is much more favourable than for the others.

Survival

Children with cancer make up fewer than 1 % of all cancer patients. However, malignant neoplasms are the second most common cause of death among children. Fortunately, the survival probability has improved dramatically over the last 30 years thanks to significantly more differentiated diagnostics and the use of multimodal therapy concepts. In the early 1980s the chances of children with cancer being still alive five years after diagnosis were 67 %; this figure has risen to 84 % since then. Looking at all patients of the registry population who were diagnosed between 2000 and 2009 and followed up, the overall chance of survival is 84 % after five years, 81 % after ten years, and 80 % after 15 years. The encouraging increase in the number of long-term survivors is increasingly focusing attention on the long-term observation of former paediatric cancer patients. The GCCR provides an ideal data basis for carrying out studies with long-term survivors. As the above figures show, it is already possible to provide information on long-term survival (for example after 15 years) and to estimate the risk of developing a second malignancy after cancer in childhood. Examples of further research possibilities include the incidence of other long-term effects, such as the possible effects of therapy on fertility, and studies examining the health risks of the descendants of fathers and mothers who had childhood cancer. About 19,000 of the more than 33,000 patients currently known to be alive have been under observation by the registry for at least ten years. About three quarters of these patients are at least 18 years old in the meantime and are thus, in principle, available for studies with long-term survivors.

Table 4.1
Cancer in children
Incidence and survival rates for the most common diagnoses, determined for the period 2000-2009

Cancer sites	Incidence*	Survival rate in percent %**		
		after 5 years	after 10 years	after 15 years
Retinoblastomas	0.4	98	98	98
Hodgkin's lymphomas	0.6	98	97	96
Germ cell tumours	0.5	95	94	93
Nephroblastomas	1.0	93	93	92
Lymphoid leukaemias	4.4	90	88	87
Non-Hodgkin lymphomas	0.6	88	87	85
Astrocytomas	1.7	80	77	75
Neuroblastomas and ganglioneuroblastomas	1.4	78	75	74
Osteosarcomas	0.3	75	71	70
Rhabdomyosarcomas	0.5	74	72	71
Ewing's tumours and related bone sarkomas	0.3	70	67	65
Acute myeloid leukaemias	0.7	70	68	67
Intracranial & intraspinal embryonal tumours	0.8	65	58	55
All malignancies	16.0	84	81	80

* Related to 100,000 children under the age of 15, age standardized (standard: SEGI world population), children diagnosed 2000-2009
** Brenner H, Spix C. Combining cohort and period methods for retrospective time trend analyses of long-term cancer patient survival rates. Br J Cancer 89, 1260-1265, 2003.

Literature on childhood cancer

Brenner H, Spix C. Combining cohort and period methods for retrospective time trend analyses of long-term cancer patient survival rates. Br J Cancer 89, 1260-1265, 2003.

Debling D, Spix C, Blettner M, Michaelis J, Kaatsch P. The cohort of long-term survivors at the German Childhood Cancer Registry. Klin Padiatr 220, 371-377, 2008.

Dieluweit U, Debatin KM, Grabow D, Kaatsch P, Peter R, Seitz DCM, Goldbeck L.. Educational and Vocational Achievement Among Long-Term Survivors of Adolescent Cancer in Germany. Pediatric Blood & Cancer 2011, 56(3): 432-438.

Hammer GP, Seidenbusch MC, Schneider K, Regulla D, Zeeb H, Spix C, Blettner M. Cancer incidence rate after diagnostic X-ray exposure in 1976 - 2003 among patients of a university children's hospital. Rofo. 2010 May;182(5):404-14.

Kaatsch P, Reinisch I, Spix C, Berthold F, Janka-Schaub G, Mergenthaler A, Michaelis J, Blettner M. Case-control study on the therapy of childhood cancer and the occurrence of second malignant neoplasms in Germany. Cancer Causes Control. 2009; 20: 965-980.

Kaatsch P, Spix C, Schulze-Rath R, Schmiedel S, Blettner M. Leukaemia in young children living in the vicinity of German nuclear power plants. Int J Cancer 122, 721-726, 2008

Kaatsch P, Spix C. Jahresbericht 2010 (1980–2009) des Deutschen Kinderkrebsregisters. Institut für Medizinische Biometrie, Epidemiologie und Informatik, Universität Mainz, www.kinderkrebsregister.de

Kaatsch P, Steliarova-Foucher E, Crocetti E, Magnani C, Spix C, Zambon P. Time trends of cancer incidence in European children (1978-1997): report from the ACCIS project. Eur J Cancer 42, 1961-1971, 2006.

Schmiedel S, Blettner M, Kaatsch P, Schuz J. Spatial clustering and space-time clusters of leukemia among children in Germany, 1987-2007. European Journal of Epidemiology. 2010; 25(9): 627-633.

Spix C, Eletr D, Blettner M, Kaatsch P. Temporal trends in the incidence rate of childhood cancer in Germany 1987-2004. Int J Cancer 122, 1859-1867, 2008.

Spix C, Schmiedel S, Kaatsch P, Schulze-Rath R, Blettner M. Case-control study on childhood cancer in the vicinity of nuclear power plants in Germany 1980-2003. Eur J Cancer 44, 275-284, 2008.

Spix C, Schulze-Rath R, Kaatsch P, Blettner M. Case-control study on risk factors for leukaemia and brain tumours in children under 5 years in Germany. Klin Padiatr 221, 362-368, 2009.

Spix C, Spallek J, Kaatsch P, Razum O, Zeeb H. Cancer survival among children of Turkish descent in Germany 1980-2005: a registry-based analysis. BMC Cancer 8, 355, 2008.

Appendix

The German Centre for Cancer Registry Data at the Robert Koch Institute

After the Federal Cancer Registry Data Act (Bundeskrebsregisterdatengesetz – BKRG) came into force in August 2009, the German Centre for Cancer Registry Data was set up as an independent division within the Robert Koch Institute's Department of Epidemiology and Health Reporting to perform the tasks laid down in the Act:

- to check the completeness of case finding and of the variables included in the anonymized data submitted by the epidemiological (population-based) state cancer registries;
- to analyse these data
- to publish the findings on cancer incidence in Germany and its development over time together with the Association of Population based Cancer Registries in Germany (GEKID)
- to conduct a nationwide record linkage with the data from the different state cancer registries to discover any duplicate notifications and to inform the cancer registries accordingly
- to compile, update and extrapolate a dataset from the reviewed data from the state cancer registries
- to regularly estimate and analyse survival rates, stage distribution at diagnosis of the respective cancer, and other indicators, particularly on prevalence, the risk of developing and dying of the disease, and how these indicators develop over time
- to examine data from various states to determine any regional differences in selected cancer sites
- to provide a dataset for evaluating health-policy measures of cancer prevention, cancer screening, cancer treatment and healthcare
- to conduct analyses and studies on all aspects of cancer
- to write a comprehensive report on cancer in Germany every five years
- to further enhance methods and standardization rules on data collection and data transfer, and to analyse the data together with the state cancer registries
- to collaborate in scientific bodies as well as European and international organizations on cancer registration and cancer epidemiology (inter alia active participation in the working groups of the National Cancer Plan)
- To complement the classical printed products through interactive analysis tools and an expanded presence on the Web

The work of the German Centre for Cancer Registry Data is supported by a scientific advisory board with an office at the RKI. This advisory board can also give permission for the dataset at the Centre for Cancer Registry Data to be made available to third parties on application – i.e. in addition to the state cancer registries – if a justified and, in particular, scientific interest can be substantiated. Further information on the German Centre for Cancer Registry Data is available on the Internet at www.krebsdaten.de.

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Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V., GEKID)

The Association of Population-based Cancer Registries in Germany (GEKID) was formed in 2004 as a registered, non-profit-making association. GEKID's members include not only all Germany's population-based cancer registries, but also a tumour centre and interested scientists working in the field of cancer epidemiology. In the field of cancer control, GEKID cooperates closely with the Federal Ministry of Health, particularly in the context of the National Cancer Plan, and the German Centre for Cancer Registry Data based at the Robert Koch Institute (RKI). GEKID also participates actively in a wide range of scientific committees. The association's primary task is to standardize as far as possible the content and methodology of cancer registration, despite the differences in legislation between the federal states. The comparability of results from the cancer registries can only be assured by nationwide cooperation. To promote such cooperation, GEKID published "The Manual of Population-based Cancer Registration in 2008. Furthermore, GEKID is a joint point of contact for the population-based cancer registries on all issues of common interest and represents the registries at the European level, e.g. in the European Network of Cancer Registries (ENCR). In its charter, GEKID has set itself the following tasks:

- to be the point of contact both for national and international cooperation partners and for the interested public
- to provide information on the status of cancer registration in Germany and explain the aims of population-based cancer registration
- to engage in joint information activities and thus help the individual cancer registries achieve and maintain complete registration
- to define standards on content as a basis for the comparability of population-based cancer registries
- to coordinate tasks involving all the registries and foster contacts with clinical tumour documentation
- to initiate joint research activities
- to promote the scientific use of the population based cancer registries
- to use the data to advance quality assurance in oncological care

Important results of GEKID activities in the past two years include:

- Continuing development of the GEKID's interactive Cancer Atlas with current cancer incidence and mortality from the Federal States. The Atlas may be accessed via the GEKID homepage and contributes to the scientific use of cancer registry data.
- Agreement of the population-based cancer registries on a uniform minimal data format for registration as well as an exchange format for the forwarding of data according to place of residence and for the delivery of data to the Centre for Cancer Registry Data at the RKI.
- Development and publication of recommendations by the GEKID Survival Working Group to enhance the comparability of results from survival analyses from different population-based cancer registries.

Information on GEKID can be obtained on the Internet at www.gekid.de or from the respective regional member registries (see address section):
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Dr Stefan Hentschel
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Addresses

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Epidemiologisches Krebsregister (Population-based Cancer Registry)
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Im Neuenheimer Feld 581
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Vertrauensstelle* Baden-Wurttemberg (Baden-Wurttemberg Confidentiality Unit)
Deutsche Rentenversicherung (German Pension Insurance) Baden-Wurttemberg
Gartenstr. 105
76135 Karlsruhe
Telephone: 0721/82 57 90 00 Telefax: 0721/82 59 97 90 99
Email: vs@drv-bw.de

Klinische Landesregisterstelle* (Clinical State Registration Unit)
Baden-Wurttembergische Krankenhausgesellschaft e.V. (Baden-Wurttemberg Hospital Association)
Birkenwaldstr. 145
70191 Stuttgart
Telephone: 0711/257 77 70 Telefax: 0711/257 77 79
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Bevölkerungsbezogenes Krebsregister **Bayern** (Bavaria Population-based Cancer Registry)
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Östliche Stadtmauerstr. 30
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Kleinikum Nürnberg-Nord
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Gemeinsames Krebsregister der Länder **Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen-Anhalt** und der Freistaaten **Sachsen** und **Thüringen** (Joint Cancer Registry of Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony-Anhalt, Saxony and Thuringia), GKR
Brodauer Str. 16 – 22
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vertrauensstelle@gkr.berlin.de
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Krebsregister des Landes **Bremen** (Bremen Cancer Registry)
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Email: krebsregister@bips.uni-bremen.de (R)
vbkr.kvhb@t-online.de (V)
Internet: www.krebsregister.bremen.de

Hamburgisches Krebsregister (Hamburg Cancer Registry)
Behörde für Soziales, Familie, Gesundheit und Verbraucherschutz
(State Ministry of Social Affairs, Family, Health and Consumer Protection)
Billstr. 80
20539 Hamburg
Telephone: 040/428 37 22 11 Telefax: 040/428 37 26 55
Email: HamburgischesKrebsregister@bgv.hamburg.de
Internet: www.hamburg.de/krebsregister

Krebsregister **Hessen** (Hesse Cancer Registry) Registerstelle* (Registry Unit):
Hessischen Landesprüfungs- und Untersuchungsamt im Gesundheitswesen
(Hesse State Health Office, HLPUG)
Wolframstr. 33
35683 Dillenburg
Telephone: 02771/32 06 39 Telefax: 02771/366 71
Email: stefan.gawrich@hlpug.hessen.de
Internet: www.hlpug.de

Vertrauensstelle (Confidentiality Unit):
Landesärztekammer Hessen (Hesse State Medical Council)
Im Vogelsgesang 3
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Telephone: 069/789 04 50 Telefax: 069/78 90 45 29
Email: vertrauensstelle@laekh.de
Internet: www.laekh.de

Epidemiologisches Krebsregister **Niedersachsen** (Lower Saxony Population-based Cancer Registry)
OFFIS CARE GmbH
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0511/450 53 56 (V) 0511/450 51 32 (V)
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Epidemiologisches Krebsregister **NRW** gGmbH
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Internet: www.krebsregister.nrw.de

Krebsregister **Rheinland-Pfalz** (Rhineland-Palatinate Cancer Registry) Registerstelle* (Registration Unit)
Institut für Medizinische Biometrie, Epidemiologie und Informatik
(Institute of Medical Biostatistics, Epidemiology and Informatics), IMBEI
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55131 Mainz
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55131 Mainz
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Internet: www.krebsregister-rheinland-pfalz.de

Epidemiologisches Krebsregister **Saarland** (Saarland Population-based Cancer Registry)
Ministerium fur Gesundheit und Verbraucherschutz (Ministry of Health and Consumer Protection)
Prasident-Baltz-Str. 5
66119 Saarbrucken
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Krebsregister **Schleswig-Holstein** (Schleswig-Holstein Cancer Registry)
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Internet: www.bmg.bund.de

Cancer Information Service
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Internet: www. krebsinformationsdienst.de

* To protect patients' confidentiality, responsibility for cancer registration in Germany is often divided between Confidentiality Units (Vertrauensstellen, V) and Registration Units (Registerstellen, R). Cancer morbidity and mortality notifications are sent to the Confidentiality Units, where personal information is anonymized. Along with the corresponding medical data, these anonymized data are then sent to the Registration Units, which are responsible for maintaining and analyzing the registry database.

Sources for comparing country-specific cancer incidence and mortality rates (for the years 2007/2008 if not otherwise stated)

Netherlands: Netherlands Cancer Registry http://www.cijfersoverkanker.nl/?language=en

Denmark, Finland, Sweden: Association of the Nordic Cancer Registries
http://www-dep.iarc.fr/nordcan/English/frame.asp

France: Institut de veille sanitaire http://www.invs.sante.fr/surveillance/cancers/estimations_cancers/default.htm
(last available year: 2005)

Czech Republic: Institute of Health Information and Statistics of the Czech Republic
http://www.svod.cz/?sec=aktuality&lang=en

Poland: National Cancer Registry http://85.128.14.124/krn/english/index.asp

England: Office for National Statistics:
http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-218569

United States: National Cancer Institute Surveillance Epidemiology and End Results
http://seer.cancer.gov/canques/incidence.html

Switzerland: National Institute for Cancer Epidemiology and Registration
http://www.nicer.org/default.aspx?NavigationID=5&SubNavigationID=35
(averaged rates for years 2004 to 2008)

Belgium: Incidence: Belgian Cancer registry http://www.kankerregister.org
http://kankerregister.nettools.be/media/docs/StK_publicatie.pdf
http://kankerregister.nettools.be/media/docs/StK_appendices.pdf
Mortality (for year 2008 only):
Belgium: Algemene Directie Statistiek en Economische Informatie
http://statbel.fgov.be/nl/statistieken/cijfers/bevolking/sterfte_leven/oorzaken/index.jsp
Flemish region: Vlaams Agentschap Zorg en Gezondheid. Team Gegevensverwerking en Resultaatsopvolging. Afd. Informatie en Ondersteuning
http://www.zorg-en-gezondheid.be/Cijfers/
Brüssel, Bruxelles region: Observatoire de la Santé et du Social de Bruxelles.
Bulletins statistiques de décès
Walloon region: Ministère de la Communauté francaise-Direction générale de la Santé-Cellule desstatistiques des naissances et des décès Bulletins statistiques de décès
www.sante.cfwb.be

Austria: STATISTIK AUSTRIA, Österreichisches Krebsregister (Stand: 13.09.2011)

Further Literature

Becker N (2004) Erfahrungen bei der wissenschaftlichen Nutzung von Krebsregisterdaten. Bundesgesundheitsbl-Gesundheitsforsch-Gesundheitsschutz 47(5): 444–450

Berrino F, De Angelis R, Sant M et al. (2007) EURO¬CARE Working Group. Survival for eight major cancers and all cancers combined for European adults diagnosed in 1995–99: results of the EUROCARE-4 study. Lancet Oncology 8(9): 773–783

Brenner H, Altenhofen L, Katalinic A et al. (2011) Sojourn time of preclinical colorectal cancer by sex and age: estimates from the German national screening colonoscopy database. American Journal of Epidemiology 174(10): 1140-1146

Brenner H, Holleczek B (2011) Deriving valid population-based cancer survival estimates in the presence of non-negligible proportions of cancers notified by death certificates onwly. Cancer Epidemiology, Biomarkers and Prevention 20(12):2480-2486

Bundesgesetzblatt (2009) Begleitgesetz zur zweiten Föderalismusreform. Art. 5 Bundeskrebsregisterdatengesetz (BKRG), BGBl. I S: 2702, 2707; Geltung ab 18.08.2009

Curado MP, Edwards B, Shin HR et al. (2007) Cancer Incidence in Five Continents. Vol. IX. IARC Scientific Publications No. 160. Lyon

DevCan (2011) Probability of Developing or Dying of Cancer Software, Version 6.6.0, Statistical Research and Applications Branch, National Cancer Institute, USA

Gondos A, Holleczek B, Arndt V et al. (2007) Trends in population-based cancer survival in Germany: to what extent does progress reach older patients? Annals of Oncology 18(7): 1253–1259

Haberland J, Bertz J, Wolf U et al. (2010) German cancer statistics 2004. BMC Cancer 10: 52

Haberland J, Schön D, Bertz J et al. (2003) Vollzähligkeitsschätzungen von Krebsregisterdaten in Deutschland. Bundesgesundheitsbl-Gesundheitsforsch-Gesund-heitsschutz 46(9): 770–774

Hentschel S, Heinz J, Schmid-Höpfner S et al. (2010) The impact of menopausal hormone therapy on the incidence of different breast cancer types – Data from the Cancer Registry Hamburg 1991-2006. Cancer Epidemiology 34(5): 639-643

Hentschel S, Pritzkuleit R, Schmid-Höpfner S et al. (2011) Epidemiologische Krebsregistrierung in Deutschland – Aufgaben und aktueller Status. Der Onkologe 17(2): 97-106

Hiripi E, Gondos A, Emrich K et al. (2011) Survival from common and rare cancers in Germany in the early 21st century. Annals of Oncology DOI: 10.1093/annonc/mdr131 (elektronische Publikation)

Holleczek B, Arndt V, Stegmaier C et al. (2011) Trends in breast cancer survival in Germany from 1976 to 2008 – A period analysis by age and stage. Cancer Epidemiology 35(5): 399-406

Holleczek B, Brenner H (2011) Reduction of population-based cancer survival estimates by trace back of death certificate notifications: An empirical illustration. European Journal of Cancer (elektronische Publikation)

International Agency for Research on Cancer (1994) Technical Report No. 19, Lyon

Katalinic A (2004) Epidemiologische Krebsregistrierung in Deutschland – Bestandsaufnahme und Perspektiven. Bundesgesundheitsbl-Gesundheitsforsch-Gesundheitsschutz 47(5): 422–428

Katalinic A, Rawal R (2007) Decline in breast cancer incidence after decrease in utilisation of hormone replacement therapy. Breast Cancer Research and Treatment 107 (3): 427-430.

Kooperationsgemeinschaft Mammographie (2009) Evaluationsbericht 2005–2007. Ergebnisse des Mammographie-Screening-Programms in Deutschland. Unter: http://www.mammo-programm.de/cms_upload/datenpool/evaluationsbericht05-07_web.pdf (Zugriff: Januar 2012)

Kuznetsov L, Maier W, Hunger M et al. (2011) Associations between regional socioeconomic deprivation and cancer risk: Analysis of population-based Cancer Registry data from Bavaria, Germany. Preventive Medicine 53(4/5): 328-330

Lehnert M, Eberle A, Hentschel S et al. (2005) Das maligne Melanom der Haut in epidemiologischen Krebsregistern in Deutschland – Inzidenz, klinische Parameter, Variationen in der Erhebung. Gesundheitswesen 67(10): 729–735

Nennecke A, Brenner H, Eberle A et al. (2010) Überlebenschancen von Krebspatienten in Deutschland – auf dem Weg zu repräsentativen, vergleichbaren Aussagen. Gesundheitswesen 72(10): 692-699

Pisani P, Bray F, Parkin DM (2002) Estimates of the worldwide prevalence of cancer for 25 sites in the adult population. International Journal of Cancer 97(1): 72-81

Robert Koch-Institut (Hrsg) (2010) Verbreitung von Krebserkrankungen in Deutschland – Entwicklung der Prävalenzen zwischen 1990 und 2010. Beiträge zur Gesundheitsberichterstattung des Bundes. RKI, Berlin

Stang A, Katalinic A, Dieckmann KP et al. (2010) A novel approach to estimate the German-wide incidence of testicular cancer. Cancer Epidemiology 34(1): 13-19

Stang A, Rusner C, Eisinger B et al. (2009) Subtype specific incidence of testicular cancer in Germany. A pooled analysis of nine population-based cancer registries. International Journal of Andrology 32(4): 306-316

Urbschat I, Kieschke J, Schlanstedt-Jahn U et al. (2005) Beiträge bevölkerungsbezogener Krebsregister zur Evaluation des bundesweiten Mammographie-Screenings. Gesundheitswesen 67(7): 448-454

Verdecchia A, Francisci S, Brenner H et al. (2007) EURO CARE-4 Working Group. Recent cancer survival in Europe: a 2000-02 period analysis of EUROCARE-4 data. Lancet Oncology 8(9): 784–796

Waldmann A, Eberle A, Hentschel S et al. (2010) Bevölkerungsbezogene Darmkrebsinzidenz im Zeitraum 2000 bis 2006 – deuten sich erste Auswirkungen des Koloskopie-Screenings an? Eine gemeinsame Auswertung der Krebsregisterdaten aus Bremen, Hamburg, dem Saarland und Schleswig Holstein. Zeitschrift für Gastroenterologie 48(12): 1358-1366

Wolf U, Barnes B, Bertz J et al. (2011) Das Zentrum für Krebsregisterdaten (ZfKD) im Robert Koch-Institut (RKI) Berlin. Bundesgesundheitsblatt 54: 1229-1234

Literature on cancer risk factors is available from the editors

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"Cancer in Germany" is published every two years by the Association of Population-based Cancer Registries in Germany e. V. (GEKID) and the Centre for Cancer Register Data (ZfKD) at the Robert Koch Institute. The results in this eighth edition are based on data from 15 out of 16 federal states through to 2008. Data was judged sufficiently complete for 10 federal states and also for large parts of North Rhine-Westphalia, which represents a considerably improved database.

For the first time, this edition covers cancers of the liver and gall bladder, as well as multiple myelomas. The key epidemiological parameters and current trends are presented for all cancers combined and individually for 24 types of cancer. In addition to details on incidence and mortality, with regional and international comparisons, the distribution of tumour stages at diagnosis and survival prospects are also included. As in previous editions, a separate chapter on cancer in children is provided by the German Childhood Cancer Registry.

For 2008, the ZfKD estimates that there were some 470,000 new cases of cancer in Germany, about 70,000 more than in 1999. This increase is due mainly to the continuing increase in the proportion of older people in the population. In addition there was the expected increase in the incidence of breast cancer following the start of the mammography screening programme in Germany between 2005 and 2008.

In 2008, breast cancer was still the most common form for women with some 72,000 new cases. For men the most common form was still prostate cancer with approx. 63,000 diagnosed cases.

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