ROBERT KOCH INSTITUT

Cancer in Germany 2013/2014

GERMAN CENTRE FOR CANCER REGISTRY DATA

GEKID

A JOINT PUBLICATION OF THE ROBERT KOCH INSTITUTE AND THE ASSOCIATION OF POPULATION-BASED CANCER REGISTRIES IN GERMANY

Cancer in Germany 2013/2014

11th Edition

Robert Koch Institute, Berlin 2018

Contents

Preface

The main task of the Robert Koch Institute (RKI) is to collect and analyse data on health risks that occur within people's living environments (monitoring, surveillance). The aim of this work is to gather together reliable data which help to develope recommendations on the implementation of targeted measures. Although the RKI has been conducting research into infectious diseases ever since it was founded in 1891, as a public health institute, it is no longer limited to this issue.

Even during Robert Koch's time, when neither the public nor the health service viewed the disease with the same level of importance as they do today, the need for epidemiological data was patently clear. In 1900, during the German Empire, this situation led to the establishment of the first collective research by the Committee for Cancer Research. Robert Koch and Rudolf Virchow were honorary members, and its first director, Ernst von Leyden, had already initiated similar surveys of the spread of influenza and tuberculosis.

Unfortunately, more than 100 years were to elapse between the committee's first cross-sectional survey and the gradual establishment of a comprehensive cancer surveillance system using data from population-based cancer registries from all German federal states, which was finalized in 2009. This process also resulted in the foundation of the German Centre for Cancer Registry Data (ZfKD). Nevertheless, nationwide population-based studies of cancer have been carried out at the RKI since 1994, when the Central Cancer Documentation Unit as part of the former Institute for Social Medicine and Epidemiology was transferred to the RKI.

Since then, it has become clear that cancer registration offers more opportunities than the periodical presentations of cancer incidence data. Therefore, a significant change is currently taking place in the field of cancer registration in Germany: in the future, cancer registration will be primarily used to assess the quality of the care provided to cancer patients. The resulting data on the individual's course of the disease including all cancer directed treatments be collected as part of nationwide system of clinical cancer registration that will have been established by the end of 2018. These changes will result in tremendous opportunities for research. Nevertheless, the registers will face a number of considerable challenges during the period in which these changes are being implemented.

Over the coming years, the ZfKD – responsible for cancer surveillance at the federal level – will also take on many new tasks. On the one hand, it will contribute towards the further development and harmonisation of cancer registration in Germany; on the other, it will conduct research using new data sources and explore methods of defining cancer that provide more precise and timely description of the different public health related aspects of cancer. This will involve the important role of drawing attention to the rising rates of certain types of cancer and, thereby, signalling the need for further epidemiological research. This work will have to be done together with the registers. However, at the same time, it is essential that the ZfKD clearly demonstrates the potential for cancer prevention and describes the impact of measures and programmes that have already been put in place in primary and secondary prevention at the population level. In addition to studies on the early detection of cancer, this especially includes highlighting the importance of the HPV vaccine, which has been recommended by the Standing Commission on Vaccination (STIKO) at the RKI since 2007.

Cancer in Germany, which is now in its 11th edition, is particularly intended as a means for providing information to the public; it is supplemented by further reports, information on the internet and scientific publications with the aim of meeting the needs of a diverse group of addressees and interested parties.

The complex challenges facing health policy and public health today can only be met through close cooperation with other institutions. Therefore, in order to fulfil the RKI's mission to generate evidence, share knowledge and protect and improve health, the ZfKD will also focus on broadening its networking at the national and international level. The existing close cooperation with the cancer registries of the federal-states, which is also reflected in this joint report, will provide a crucial foundation for this work in the future.

Professor Lothar H Wieler
President of the Robert Koch Institute

1 Epidemiological cancer registration in Germany

1.1 Aims and tasks of population-based cancer registries

A population-based (epidemiological) cancer registry is an institution for the collection, storage, processing, analysis and interpretation of data on the incidence and prevalence of cancers within a defined registration area (e. g. a German federal state). Cancer registry data also forms an indispensable basis for further studies into the causes of cancer, the assessment of early detection measures and population-based care of cancer patients.

Findings from population-based cancer registries include:

In Germany, 480,000 people are diagnosed with cancer each year.

Cancer incidence (i. e. how many cancers occur annually in a certain population group) can be described using the data from population-based cancer registries. The incidence is calculated according to cancer type, patient age and gender, as well as other characteristics. Reliable information regarding incidence is indispensable for characterizing the burden that cancer places on a population.

For some years lung cancer has been diagnosed among women under the age of forty just as often as among men of the same age.

Only by using data from population-based cancer registries can developments in incidence over time (trends) be observed. The registries serve a key function for the surveillance of these trends in the context of health reporting.

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

Population-based cancer registries can analyse the regional distribution of various types of cancer. It is also within their remit to investigate any cancer clusters observed. Further clarification of possible causes of these clusters usually involves targeted analytical studies.

In recent years, differences in the prognosis of cancer patients between western and eastern federal states have largely disappeared.

Population-based cancer registries conduct survival-time analyses of all cancer patients in their registration region. Population-based survival rates are an important parameter for assessing the effectiveness of diagnosis, therapy and aftercare. In recent years, German registry data has been used for international comparisons of survival rates.

Because of demographic developments in Germany, the number of new cancer cases is expected to increase by more than 20 % between 2010 and 2030.

Predicting the future number of new cancer cases is an important aspect of health services requirement planning. Population-based cancer registries provide the baseline data needed for this.

The data from population-based cancer registries is also used for scientific research into the causes of cancer or for health services research. Such studies investigate a variety of topics:

- 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?
- Does lung cancer develop more frequently in people in certain occupational groups?
- Are diagnosis, therapy and aftercare being carried out according to the latest standards?

Population-based cancer registries make it possible for research projects to include all cases of the disease that have occurred in a defined population. If the patient participation rate in the project is high, the findings of such studies should be generalizable to the broader population. Population-based case-control studies and cohort studies consequently use data from population-based cancer registries for research into the causes and risks of cancer.

Further or specific issues may also be analysed using registry data. Examples include:

- Detailed analyses regarding survival of cancer patients
- Examination of oncological care and long-term quality of life of cancer patients
- Occurrence of second cancers after a different primary cancer
- Evaluation of screening measures such as mammography screening or colonoscopy screening for bowel cancer
- Studies of the connection between social status and cancer incidence and mortality
- Cooperation with cancer centres, e. g. in the assessment of the long-term patient survival

A detailed list can be found at
www.gekid.de/home

In the coming years, the evaluation of organised screening programs introduced in Germany will present a particular challenge for the population-based cancer registries. Using the data provided by the registries, it will be possible to assess whether screening has had the desired effect of reducing the number of advanced cancers within the population. By linking the registry data with the respective screening program it should also be possible to evaluate reductions in mortality among participants in such measures.

Germany's National Cancer Plan emphasises the central role of cancer registration in assessing the effects of organised cancer early detection programs. A number of implementation recommendations have been adopted in the plan to improve coordination between the early detection programs and the information collected in the cancer registries. These recommendations have been integrated into the federal Cancer Screening and Cancer Registration Act.

One initial focus in this regard has been the assessment of mammography screening, which had been introduced nationwide by 2009. The population-based cancer registries have already provided detailed baseline data for the first evaluation reports on mammography screening (www.mammo-programm.de), and this is being used for quality assurance and an initial assessment of the program. A new task scheduled here is the identification of interval carcinomas (incidence of breast cancer following a negative screening examination). First results from other countries have been published already and show that the objectives from European screening guidelines haven't been achieved.

The early detection of colon and cervical cancers is currently being adapted according to the Cancer Screening and Cancer Registration Act. The cancer registries will play an important role in the evaluation of the population-level effects of these programs as well.

A longer-term task of the population-based cancer registries is also to examine the effectiveness of the vaccination program for girls between 9 and 14 years of age against human papillomaviruses (HPV), which aims to significantly reduce the number of new cases of cervical cancer.

In order to fulfil the stated objectives and tasks of cancer registration, population-based, nationwide cancer registries are needed. By 2009, legal frameworks for comprehensive cancer registration were established in all federal states. The Federal Cancer Registry Data Act, which came into force that same year, further improved the collection and evaluation of anonymised cancer registry data at the national level through creation of the German Centre for Cancer Registry Data at the Robert Koch Institute.

In order to pool information about an individual cancer case from different sources, data is collected by the registries such that all reports concerning the same person are identifiable. Furthermore, for certain research purposes it must be possible to re-establish the link between the data and the individual. However, in order to safeguard patients' privacy and ensure their rights according to data protection legislation, all population-based registries have adopted extensive precautions to protect and secure personal data.

Undistorted evaluation of registry data is only possible if at least 90 % of all new cancer cases are registered. The cooperation of all physicians and dentists involved in diagnosis, treatment and aftercare is therefore crucial to obtaining data of high informational value. Patients are also requested to take an active part in cancer registration. Ask your doctor to report your case to the appropriate cancer registry! This way you too can contribute to cancer surveillance, cancer research and also help to improve cancer detection, treatment and aftercare.

1.2 Current development of cancer registration in Germany

Since 2009, regional legislation stipulates that all new cases of cancer in Germany shall be systematically recorded in a register. Epidemiological cancer registration in Germany, therefore, is currently going through a highly encouraging phase. In 2014, 12 German federal states are estimated to have registered at least 90 % of all cases of cancer diagnosed among residents of their respective jurisdictions. As such, reliable data on new cases of cancer are now available for a population of nearly 65 million people. In 2014, the registries recorded around 93 % of the estimated new cases of cancer in Germany – ten years earlier, this figure was close to 65 %. Very few other countries with a comparable population size have achieved such a high completeness rate.

Numerous initiatives aimed at improving cancer registration throughout Germany have contributed to this welcome result. The implementation of the 2009 German Federal Cancer Registry Data Act and the establishment of the ZfKD at the Robert Koch Institute (RKI) continued the support of epidemiological cancer registration at the national level. Since the end of 2011, all regional cancer registries have annually provided the ZfKD with anonymised data in a standardised format. These data provide the basis for the analyses undertaken by the ZfKD presented here in this 11th edition of *Cancer in Germany*.

The 2013 adoption of the Cancer Screening and Registration Act (KFRG) constitutes a further milestone in the development of cancer registration in Germany. This law focuses on the implementation of the National Cancer Plan's most important recommendations. The KFRG requires that the federal states establish a system of clinical cancer registration in addition to the previously established epidemiological registration. The expanded clinical data includes detailed information on therapies and disease progression. The past two years have been marked by the reorganisation and expansion of cancer registries in Germany. Most regions that previously had no clinical cancer registration have expanded their epidemiological cancer registries into clinical-epidemiological registries. In areas where clinical registries had already been established, these have been adapted to meet the requirements of the KFRG. This has resulted in the passing of new cancer registry laws in almost all German federal states and the beginning of formal clinical cancer registration.

In order to further standardise cancer registration in Germany and to coordinate regional regulations, a working group has been set up with representatives from all federal states. Experts from the registries, organised as the platform »Paragraph 65c Clinical Cancer Registries«, provide support to the working group. Together, the working group and the platform attend to the practical implementation of the KFRG across federal-state borders, ensure that a joint approach to outstanding issues is developed wherever possible, define national standards and create synergies during IT implementation. The Association of Population-based Cancer Registries in Germany (GEKID) and the Association of German Tumour Centres (ADT) also actively support the working group and the platform.

In order to promote further harmonisation and standardisation, the GEKID and the ADT will soon publish a manual on cancer registration as a guideline for collecting and analysing epidemiological and clinical cancer registry data.

The data from the German cancer registries are also used internationally. These data are available together with those from other European countries on the websites of the European Network of Cancer Registries (ENCR – see www.encr.eu) and of the European Commission's Joint Research Centre (JRC). Additionally, the ECIS – the European Cancer Information System – can be used to compare data from Germany with those from other European registries.

During the last two years, the GEKID, whose members also include researchers working in the field of cancer epidemiology as well as representatives of the epidemiological cancer registries, has continued to focus on improving the use of cancer registry data. The GEKID's updated Interactive Cancer Atlas is one important result of this work. The atlas now depicts current cancer incidence and mortality throughout the federal states. Furthermore, it also includes survival rates from cancer at the federal-state level. The atlas is available on the GEKID's website (www.gekid.de/home) as an inter-active map that allows regional comparisons to be made for 23 types of cancer.

In addition to presenting cancer registry data, the epidemiological cancer registries and the GEKID have participated in planning and conducting epidemiological cancer research projects. A focus here was the German Cancer Aid's funding priority »Cancer Epidemiology«. This led to a wide-ranging study of cancer survival that was undertaken together with the German Cancer Research Centre in Heidelberg; the fi ndings were published in international scientific journals.

In addition, several publications with significant international reach have emerged from other research projects, some of which have addressed linkage of research datasets with cancer registry data. Information on further research projects and current publications is available on the GEKID's website and in the annex of this report.

These examples demonstrate that the focus of epidemiological cancer registration in Germany is currently shifting from merely collecting data towards using data for scientifi c research. This development is essential, because without in-depth scientifi c analysis, the knowledge gained from this – painstakingly collected – data would clearly be limited. Additionally, the anonymised data from all the registries may now be accessed and analysed by external researchers on application to the ZfKD; use of this option has increased over the past two years. The diverse work of the cancer registries and the ZfKD also constitute important elements of federal health reporting. With the publication of the first *Federal Report on Cancer in Germany*, the ZfKD set the course towards integrating a wide range of data sources into cancer reporting.

The systematic data collection by clinical cancer registries heralds a brand new era. In the future, data from the clinical cancer registries will be available for comprehensive quality assurance and particularly for health services research. This means that cancer registries will become increasingly important for oncological research and healthcare and, therefore, for cancer patients. The current developments in cancer registration and the use of data on cancer in Germany are certainly to be welcomed, and they promise considerable prospects for the future. Moreover, Germany's nationwide clinical cancer registration has placed the country among the forerunners in this field.

1.3 Current priorities of the German Centre for Cancer Registry Data (ZfKD)

After publishing the last issue of *Cancer in Germany*, the ZfKD initially focused on producing the first ever *Federal Report on Cancer in Germany*, which was published at the end of November 2016 and was well received. The report provided not only in-depth assessments of cancer registry data but also information (including figures) on other aspects of cancer (from prevention to disease sequelae); this was the first time this had been done in Germany. Since then, the ZfKD has published various short articles on topics from the report on its website under »Topic of the Month« (available only in German). This was often done using updated data and in a journalistic format. The report also provided the ZfKD with the impetus to conduct further networking with other data holders, the German Cancer Research Center (DKFZ) and the German Cancer Society. For the Cancer Society's specialist journal *Der Onkologe*, the ZfKD, together with representatives from the registries, helped establish a regular section on epidemiology, including short reports on the main topic of each issue.

In 2016 and 2017, the ZfKD received 20 applications for external use of the cancer registry dataset, almost all of which were approved; however, in some cases minor restrictions were imposed due to data economy requirements. As such, the number of applications has increased significantly: the ZfKD only received an average of about three applications per year between 2010 and 2015. Furthermore, external researchers are showing greater interest in working with the ZfKD, and this has already led to several joint publications on the epidemiology of some rare tumours such as pleural mesothelioma and gynaecological sarcoma. Together with the Department of Obstetrics and Gynaecology at Charité University Hospital in Berlin, a project was developed on the topic of long-term survival of patients with ovarian cancer. This project was funded by the Focus Area DynAge, a joint collaborative effort by research institutes in Berlin to support interdisciplinary research in the field of disease processes associated with aging.

The ZfKD is particularly focused on supporting the next generation of researchers, including supervising master's and PhD theses of internal as well as external candidates. Furthermore, during the last two years, the ZfKD has received around 200 inquiries from the public, students, the press, researchers and politicians.

In the coming years, the ZfKD will prioritise activities focused on the impact of primary and secondary prevention measures, such as HPV vaccination, mammography screening or the development of cervical and colorectal cancer screening into organised early detection programmes. This will mainly involve describing the effects that these measures have on the incidence and mortality associated with the diseases. On these topics, the ZfKD will seek an intensive exchange of ideas with other researchers.

Finally, the ZfKD is committed to further standardisation and harmonisation of cancer registration in Germany. Representatives of the ZfKD are involved in preparing the new manual on clinical-epidemiological cancer registration. Participation in an IARC working group in connection with the 11th edition of the International Classification of Diseases (ICD-11), which is scheduled for 2018, is also planned. The new edition will lead to considerable changes for some types of tumours, such as brain tumours or neoplasms of the lymphatic and hematopoietic system, with significant consequences for cancer registration.

Other focal points include the further development of analysis methods and expanding the information provided to the public. Fact sheets are currently being developed on the epidemiology of common forms of cancer together with the Cancer Information Service of the German Cancer Research Centre.

The ZfKD website (www.krebsdaten.de/english) provides information about the ZfKD's current projects and activities.

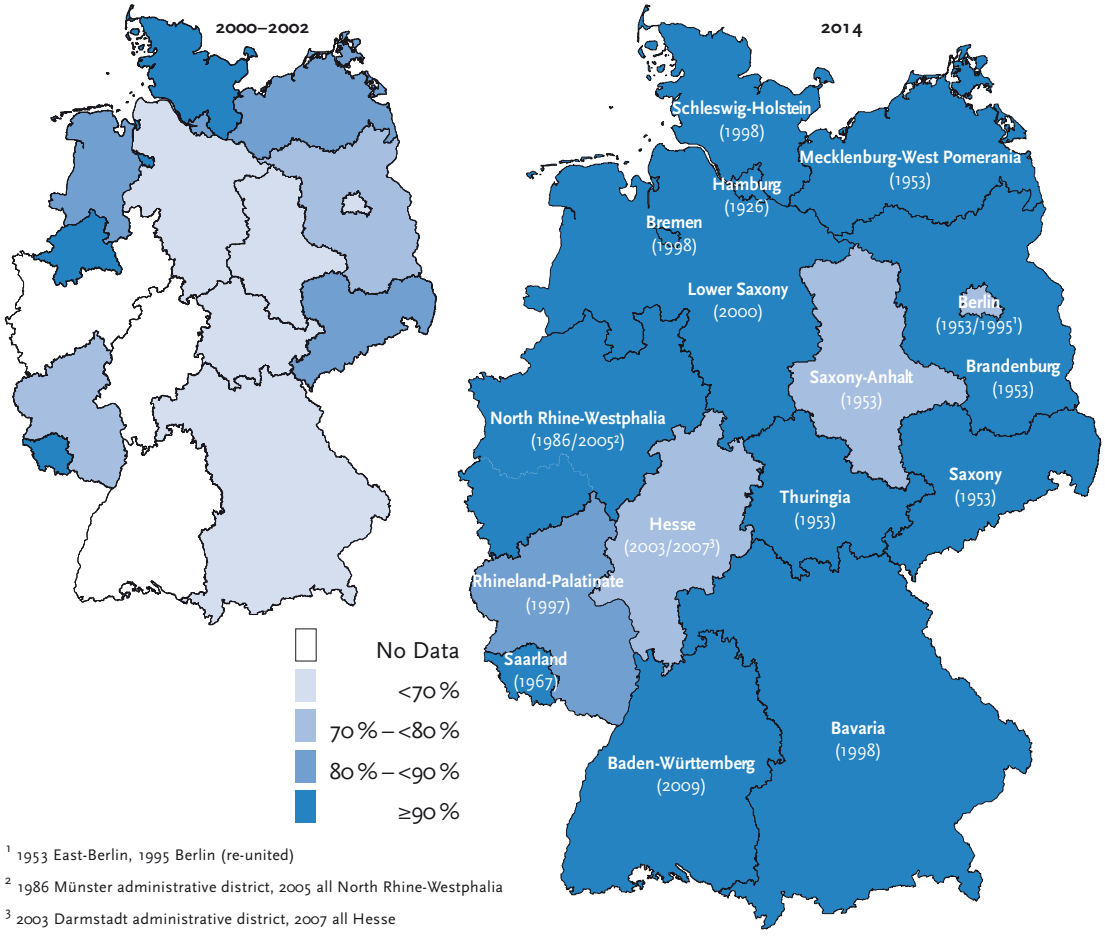
2 Methodological Aspects

2.1 Estimating the degree of capture in the epidemiological cancer registries (Estimation of Completeness)

The usefulness of population-based data with regard to cancer largely depends on the level of completeness with which new cancer cases are registered. Therefore the German Centre for Cancer Registry Data (ZfKD) annually checks the completeness of the data from the population-based cancer registries in Germany; since 2010 this has been done for all federal states. The estimation is made with the help of an internationally accepted indicator of completeness, namely the ratio of mortality to incidence. This ratio (M/I Index) can largely be assumed to be regionally constant for the respective cancer diagnosis, provided there are no fundamental differences in diagnosis and therapy and, therefore, in the survival prospects of cancer patients in Germany. By combining the M/I Index in a reference region where registration is assumed to be complete with regional mortality data, the regional incidence can be estimated and compared with the number of cases actually recorded. The completeness of the registries in the reference region is also estimated in this way. Cases identified through death certificate only (DCO cases) are not taken into account here.

The following inclusion criteria were established for the reference region in 2010.

Figure 2.1.1
Development of the estimated completeness of the population-based cancer registries in Germany 2000 to 2002 and 2014, 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

- Comprehensive cancer registration for a period of at least ten years
- Completeness of more than 90 % for cancer overall over the past ten years (using the previous RKI estimation method) and more than 80 % for all individual years
- Proportion of DCO-cases of less than 15 % for cancer overall over the past ten years or at least from the sixth year since the beginning of registration

These criteria are currently met by the registries in Saarland, Hamburg, Bremen, Schleswig-Holstein, Lower Saxony, Bavaria, Brandenburg, Mecklenburg-Western Pomerania, Saxony, Thuringia and the administrative district of Münster (North Rhine-Westphalia). Due to a delay in providing their data, cases from Bremen and Saarland could not be used in the current reference region.

According to the principle described above, the expected incidence is calculated for six age groups and for 16 (for men) or 17 (for women) diagnosis groups. In order to compensate for random fluctuations the observed and expected values were smoothed using log-linear models.

If mortality in the region being studied is too low (less than five cases of death per year on average) the modelled (smoothed) incidence in the reference region is used instead of the quotients derived from incidence and mortality for the appropriate age group in order to calculate the expected number of new cases. The estimated degree of completeness for each diagnosis group is the result of the ratio of observed and expected case figures accumulated across all age groups. The completeness for cancer overall is again estimated by summing the observed and expected values for all diagnosis groups.

The described procedure has limitations, especially if the mortality for one type of cancer is low in absolute terms or relative to incidence (testicular cancer, malignant melanoma, thyroid cancer), or if the real ratio of mortality to incidence differs between the regions. This may, for example, be the case if early detection measures are utilised to varying degrees in the federal states or if they are introduced at different points in time, as was the case with mammography-screening. Regional differences can also be caused by different distributions of tumor stage or subtypes (as with thyroid cancer, for example).

According to current estimates, 12 federal states achieved an estimated completeness of at least 90 % for 2014, as compared with the aforementioned reference region; seven states achieved over 95 % completeness. Over the past few years, completeness in most registries has stabilized. Positive developments have particularly been seen for Baden-Württemberg, the last federal state to implement statewide cancer registration. Due to the current restructuring of cancer registration in some regions, temporary reductions in registration activity – particularly for diagnosis years 2015 through 2017 – cannot be ruled out. After completion of this restructuring, epidemiological cancer registration should also profit from the expansion of clinical registration, which is expected to help fill current holes in data collection.

2.2 Estimating national incidence for Germany

The estimation of cancer incidence rates for Germany is based on the completeness estimates as explained in section 2.1. The estimated nationwide number of new cases for individual diagnoses and years are derived on one hand from the cases reported by registries with estimated completeness above a certain threshold and the expected cases from those regions that are not (yet) deemed to be complete for the respective year.

For all diagnoses except thyroid cancer and malignant melanoma, registries with completeness of at least 90 % are considered as complete. Due to strong fluctuations in the ratio of mortality to incidence, the threshold levels for thyroid cancer and for malignant melanoma were set to 70 % and 80 %, respectively.

Death Certificate Only (DCO) cases from complete registries were included beginning from the sixth year of statewide registration. For incomplete registries and for the first five years of statewide registration, the DCO proportions from the reference registries (according to site, age and gender) were used to calculate DCO cases. Because of differing stages of registry development, North Rhine-Westphalia was divided into three regions (the administrative districts of Münster, Düsseldorf/Cologne and Arnsberg/Detmold).

Because the entire dataset is analyzed anew each year to estimate incidence, the results may change (usually slightly) from estimate to estimate. This can partly be caused by delayed notification of incident cases and partly by the estimation methodology itself. Thus, the current incidence estimate for the year 2012 is approximately 2.5 % higher than the estimate from the last report. This is nearly equal to the number of delayed registration for this year. For the individual diagnoses that appear in this report, the deviations ranged from –1 % (vulva) to +10 % (leukemias).

This report presents estimated trends over time since 1999. Since population-based cancer registries in some populous federal states only commenced registration between 2002 and 2009, the estimates

for recent years are based on substantially more data than those for the period before 2002. Although the same methodology was used for both periods, estimates for recent years can generally be viewed as more reliable. Estimates were also conducted for rarer types of cancer according to the same principle, but under the assumption that completeness within the diagnosis groups does not differ substantially. The results are shown in Chapter 3.29 and in even more detail on the website www.krebsdaten.de/database.

An estimate of the incidence of non-melanoma skin cancers (C44) is not possible using the method described above, due amongst other things to its low mortality. Experience shows that the acquisition of data on these diseases in population-based cancer registries is difficult, since treatment often occurs on a purely out-patient basis. Consequently, there is very little reliable data, even in an international context. However, in recent years some registries in Germany have made successful efforts to integrate registered dermatologists into the registration process. The estimate of nationwide incidence is thus based on the data of those registries where the age-standardised incidence rate over the past two years deviated by less than 25 % from the federal state with the highest recorded incidence (Schleswig-Holstein, Lower Saxony, North Rhine-Westphalia, Saarland, Hesse, Mecklenburg-Western Pomerania and Rhineland-Palatinate). The calculation was performed by projecting the pooled, age-specific incidence rates in these states onto the entire German population. However, a great degree of uncertainty still surrounds the incidence estimates for non-melanoma skin cancers, and these do not yet allow any reliable statements to be made regarding trends over time, which is why they are not presented in their own chapter. Non-melanoma skin cancers are not included in total cancer incidence (chapter 3.1), an internationally common practice.

2.3 Indicators and graphical presentations

The following section explains the statistical measures and graphical presentations found in the results chapters.

Age-specific rates

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

Age-standardised rates

As the age-specific incidence for men and women in this report shows, the cancer incidence rate usually increases considerably with age. Thus, before comparing incidence or mortality in different countries or regions, or within the same population at different times, differences in the age structure of the compared populations must first be removed with the help of age-standardisation. This is achieved through weighting and subsequent summing of the observed age-specific rates. An age-standardised rate indicates the incidence of an illness or cause of death per 100,000 people in a pre-defined age structure (standard population). In this report the old European Standard Population has been used.

Cancer incidence and mortality risks

Age-specific incidence rates and mortality rates may be interpreted as age- and sex-specific risks of developing or dying from a specific cancer within a year. In order to make this form of risk communication clearer, age- and sex-specific risks of developing or dying from a specific form of cancer within the next ten years or at any point in the future were calculated. The results are presented both as a percentage and as one in N individuals of the same age and sex. So-called »competing risks« – for example, the probability that a 75-year-old man will die from a cause other than cancer within the next ten years – were also taken into consideration. Similarly, the »lifetime risk« was calculated, i.e. the risk of developing a certain cancer at any point during an entire lifespan. However, only the respective current rates (incidence and mortality rates and general life expectancy) are used in the calculations. No prediction is therefore made regarding future changes in these values. Furthermore, these results are to be viewed as average values for the entire German population, and individual risks may differ considerably due to the presence or absence of specific risk factors. The DevCan programme developed by the US National Cancer Institute was used to perform the calculations.

International comparison

To place the estimated cancer incidence and cancer mortality in Germany in an international context, we compared current age-standardised incidence and mortality rates with those in the countries bordering on Germany as well as the United Kingdom, Finland, Sweden, and the USA (see Annex for data sources). These statistics were not checked for plausibility or completeness, and so an underestimation – particularly of the incidence – cannot be ruled out. For France, only mortality figure are given, since current

data on nationwide incidence were unavailable by the editorial deadline. For some types of cancer (e.g. bladder cancer, renal cancer) the grouping of diagnoses according to ICD-10 in some countries differs somewhat from that used in Germany. Therefore, comparability in these cases is somewhat limited (see appropriate footnote).

Median age at diagnosis and death

The median age at diagnosis by cancer site and sex was calculated using data from complete registries and included cases diagnosed in 2013 and 2014. The inclusion of DCO cases, for which the age at death is used place of the unknown age at diagnosis, inevitably leads to a slight overestimation of this value. The median age at death was calculated with an approximation equation using official cause-of-death statistics from the Federal Statistical Office, which are only available in 5-year age groups.

Mortality

Cancer mortality is based on annual numbers of deaths due to cancer according to the official cause-of-death statistics. The deaths are attributed to the underlying cause of death and grouped by age and sex. The mortality rate is expressed as the ratio of the annual number of deaths to the size of the underlying population. The rates are relative to 100,000 people. In this report, the absolute number of deaths, as well as crude and the age-standardised (old European Standard) mortality rates from 1999 to 2015 are presented.

Prediction of incidence for 2018

To predict the number of cancer cases for the year 2018, current sex- and age group-specific trends were determined for all diagnoses covered in this report. For this, the Joinpoint method was used, which uses regression models to identify time points at which there is a statistically significant change in time trend. The average annual percent change since the most recent joinpoint was carried forward to the year 2018 to calculate the prognoses. The resulting age- and sex-specific rates for the year 2018 were transformed into absolute case numbers using the 13th coordinated population prognosis (variation 4) from the Federal Statistical Office. For malignant melanoma and prostate cancer as well as breast cancer among women in the age group 50-74 years, the current trends are heavily influenced by recently introduced screening programs or by changes in the utilization of opportunistic screening, such that the projection of current trends to the year 2018 would seem unrealistic. Therefore, the age-specific incidence rates in 2014 were held constant for these diagnoses, thereby intentionally indicating only demographic effects on the projected number of new cases.

Regional comparison

The mean age-standardised incidence rates (old European Standard) for 2013 and 2014 from the federal states are depicted in bar plots alongside the corresponding nationwide estimates for Germany. Federal states with an estimated completeness for the year 2014 of less than 90 % (80 % for melanoma and 70 % for thyroid) are indicated by lighter colors of the respective incidence bars. Mean age-standardised mortality for the same years is shown by diagnosis, sex and federal state in comparison to nationwide mortality in Germany, using data from the German Federal Statistical Office (www.gbe-bund.de).

Crude rates

A crude incidence or mortality rate for a specific cancer site and population 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 pre-determined time period by the total number of all women and/or men in the corresponding population (in this case the residential population of Germany). The result is expressed as the number of new diagnoses or deaths per 100,000 residents per year. In contrast to the age-standardised rates, crude rates are highly dependent on the age structure of a population.

Survival rates

The survival analyses in this report describe the average survival prospects of patients 15 years of age or older at diagnosis of a specific cancer type. Absolute and relative survival rates from one to ten years have been calculated for this purpose. Absolute survival rates represent 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 with a specific type of cancer have survived the first five years after their diagnosis.

Relative survival rates approximate the cancer-related mortality in terms of the ratio of the absolute survival of cancer patients to the expected survival in the general population of the same age and sex. For example, a relative 5-year survival rate of 100 % means that within 5 years of diagnosis, just as many persons with cancer have died as would have been expected even without the diagnosis. The relative survival rate is always higher than the corresponding absolute rate. Expected survival has been calculated using the so-called »Ederer II method« using lifetables from the German Federal Statistical Office.

Based on previously determined data quality criteria, data from Hamburg, Lower Saxony, Brandenburg, Mecklenburg-Western Pomerania, Saxony and the administrative district of Münster (North Rhine-Westphalia) were used for current survival es-

timates. Three registries that were included in survival estimates in the last edition of »Cancer in Germany« had not completed mortality linkage for 2014 prior to the current data transmission. Therefore, data from these registries was not included in analyses presented here. This limits the comparability of survival estimates with those from earlier editions.

In order to make the most up-to-date estimates of survival prospects possible, the so-called »period method« was used. This takes into account the survival of people with cancer who have been alive during a specific period (in this case 2013–2014).

The ranges quoted for five- and ten- year survival represent the lowest and highest values in the individual regions included, though for these purposes only regions with a standard error for the estimated survival of less than 7 % were taken into account. If this criterion was not met by at least four regions, no range details are presented. The ranges reflect differences in the quality of care most likely only to a very small degree. Differences in data quality or in the proportion of DCO cases may play a role, as well as random fluctuations, especially for smaller federal states. Differences in registration practices between registries may also influence results, in particular trace-back for DCO cases, which is not performed in all federal states. Survival calculations 10 years after diagnosis are based on far fewer cases than for survival after five years. For this reason, the registry-specific 10-year survival demonstrates a larger statistical uncertainty than 5-year survival. Therefore, it may occur that some values for the range of 10-year survival lie slightly higher than the corresponding values for 5-year survival.

Overall, it can be assumed that the estimated survival rates for Germany are slightly over-estimated, at least for cancers with poor prognosis. However, this is probably also the case for most internationally published results.

Tumour stage distribution

The extent of solid malignant tumours at the time of diagnosis in the years 2013 to 2014 was evaluated using the TNM-classification (7th edition). Given the missing data on lymph node status and distant metastases, only the distribution of T stages (tumour size or spread) are presented here. Those registries with proportions of missing values (including DCO cases) less than 50 % for the respective cancer site were included in the stage analyses. The stages of sites for which fewer than four federal states were able to fulfil this criterion, are not presented.

5-year prevalence

The 5-year prevalence refers to the number of people living at a given time (here 31 December 2014) who had been newly diagnosed with cancer within the previous five years, i. e. between 2010 and 2014. The prevalence is calculated using the Pisani method from the estimated incidence rates for Germany and the absolute survival rates calculated using the Kaplan-Meier method (according to age, sex, cancer site, and calendar year) for the regions listed under ›survival rates‹ (see above).

Additional analyses

For some cancer sites, additional analyses – for example by histology or sub-site – can be found in this report or on the ZfKD website (www.krebsdaten.de/english). When not otherwise indicated, these analyses are based on the data from complete registries (estimated completeness > 90 % for the respective diagnosis).

3 Results

3.0 Overview of incident cancer cases and cancer deaths

Table 3.0.1
Estimated numbers of incident cancer cases in Germany 2014

		No. of incident cases		Incidence rate[1]	
Cancer site	**ICD-10**	**Men**	**Women**	**Men**	**Women**
Oral cavity and pharynx	C00–C14	9,130	3,700	16.9	5.9
Oesophagus	C15	5,370	1,560	9.3	2.2
Stomach	C16	9,340	6,090	15.3	7.7
Colon and rectum	C18–C21	33,120	27,890	54.0	35.7
Liver	C22	6,370	2,710	10.4	3.6
Gallbladder and biliary tract	C23, C24	2,380	2,990	3.7	3.4
Pancreas	C25	8,550	8,580	13.9	10.4
Larynx	C32	2,980	520	5.3	0.9
Lung	C33, C34	34,560	19,280	57.3	29.0
Malignant melanoma of the skin	C43	10,910	10,310	19.5	18.6
Mesothelioma	C45	1,290	310	1.9	0.4
Soft tissue not incl. Mesothelioma	C46–C49	2,040	1,870	3.9	3.2
Breast	C50	650	69,220	1.1	114.6
Vulva	C51		3,130		4.4
Cervix	C53		4,540		9.2
Uterus	C54, C55		10,680		15.9
Ovaries	C56		7,250		11.0
Prostate	C61	57,370		92.7	
Testis	C62	4,070		10.3	
Kidney	C64	9,480	5,480	16.5	7.8
Bladder	C67	11,680	4,170	18.2	4.9
Central nervous system	C70–C72	3,880	3,160	7.6	5.4
Thyroid gland	C73	1,840	4,280	3.8	9.2
Hodgkin's lymphoma	C81	1,340	1,030	3.1	2.4
Non-Hodgkin lymphomas	C82–C88	9,160	7,880	15.9	11.2
Multiple myeloma	C90	3,550	2,960	5.7	3.8
Leukaemias	C91–C95	7,640	6,060	13.6	8.9
Other cancer sites		12,460	11,340	21.1	15.0
Total cancer[2]	**C00–C97 w/o C44**	**249,160**	**226,960**	**420.9**	**344.3**

[1] age-standardised (old European Standard) [2] not including non-melanoma skin cancer (C44)

Figure 3.0.1
Most frequent tumour sites as a percentage of all new cancer cases in Germany 2014 (not including non-melanoma skin cancer)

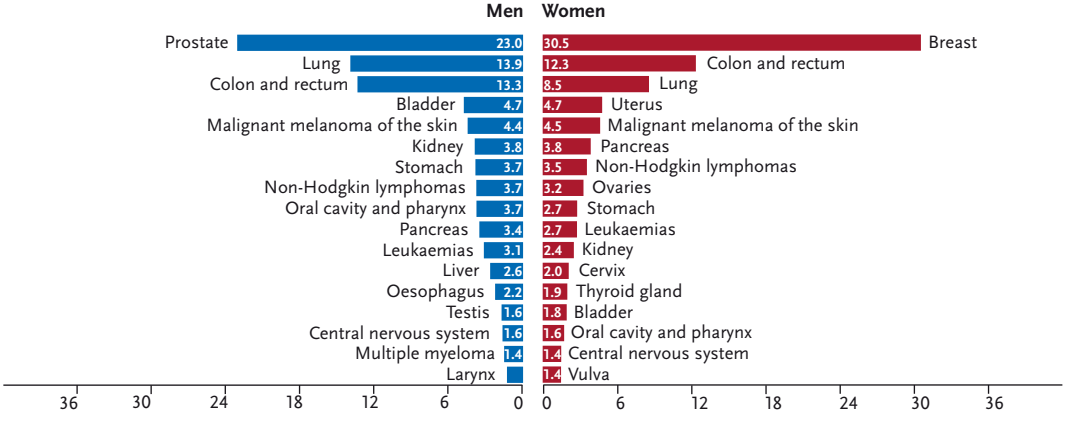
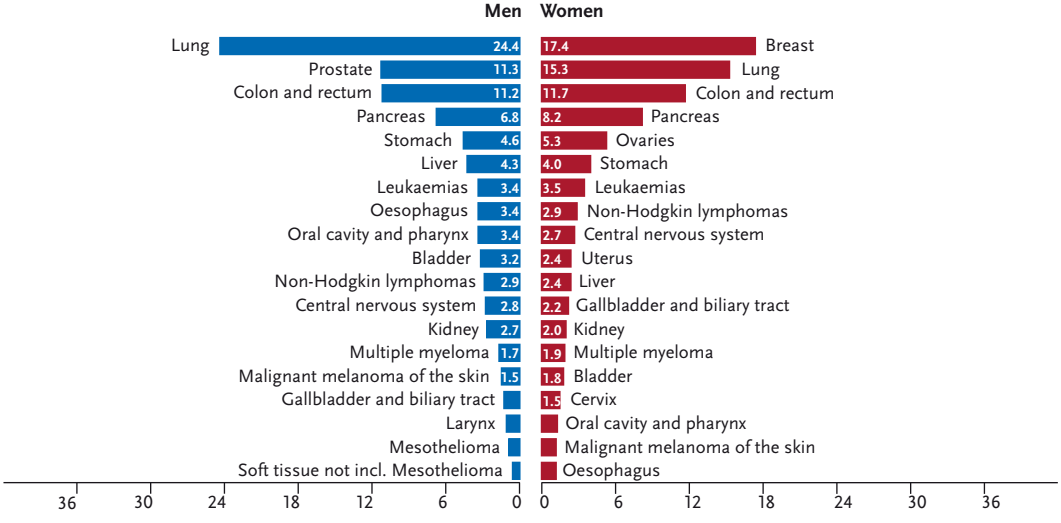


Table 3.0.2
Number of deaths from cancer in Germany 2014
Source: Official cause of death statistics, Federal Statistical Office, Wiesbaden

		No. of deaths		Mortality rate[1]	
Cancer site	**ICD-10**	**Men**	**Women**	**Men**	**Women**
Oral cavity and pharynx	C00–C14	4,095	1,353	7.3	1.9
Oesophagus	C15	4,107	1,236	6.9	1.6
Stomach	C16	5,545	4,065	8.8	4.6
Colon and rectum	C18–C21	13,580	11,932	21.0	12.8
Liver	C22	5,246	2,440	8.2	2.9
Gallbladder and biliary tract	C23, C24	1,544	2,199	2.4	2.3
Pancreas	C25	8,231	8,384	13.0	9.5
Larynx	C32	1,301	224	2.2	0.3
Lung	C33, C34	29,560	15,524	47.6	21.7
Malignant melanoma of the skin	C43	1,804	1,270	2.9	1.7
Mesothelioma	C45	1,151	277	1.7	0.3
Soft tissue not incl. Mesothelioma	C46–C49	724	901	1.2	1.2
Breast	C50	134	17,670	0.2	23.0
Vulva	C51		849		0.9
Cervix	C53		1,506		2.4
Uterus	C54, C55		2,472		2.9
Ovaries	C56		5,354		6.9
Prostate	C61	13,704		19.7	
Testis	C62	153		0.3	
Kidney	C64	3,243	2,035	5.1	2.2
Bladder	C67	3,897	1,795	5.8	1.8
Central nervous system	C70–C72	3,340	2,765	6.1	4.1
Thyroid gland	C73	342	390	0.6	0.4
Hodgkin's lymphoma	C81	183	150	0.3	0.2
Non-Hodgkin lymphomas	C82–C88	3,560	2,949	5.5	3.1
Multiple myeloma	C90	2,071	1,910	3.1	2.1
Leukaemias	C91–C95	4,168	3,575	6.4	4.0
Other cancer sites		9,648	8,416	15.3	9.3
Total cancer[2]	**C00–C97 w/o C44**	**121,331**	**101,641**	**191.5**	**124.1**

[1] age-standardised (old European Standard) [2] not including non-melanoma skin cancer (C44)

Figure 3.0.2
Most frequent tumour sites when cancer was the cause of death in Germany 2014



3.1 All cancer sites

Table 3.1.1
Overview of key epidemiological parameters for Germany, ICD-10 C00–C97 without C44

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	255,830	231,280	249,160	226,960	259,300	234,300
Crude incidence rate[1]	648.2	561.7	627.7	549.7	647.1	567.4
Standardised incidence rate[1,2]	439.9	354.1	420.9	344.3	415.1	347.8
Median age at diagnosis	70	69	70	69		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	121,313	101,775	121,331	101,641	122,452	103,071
Crude mortality rate[1]	307.4	247.2	305.7	246.2	304.8	248.3
Standardised mortality rate[1,2]	196.5	126.7	191.5	124.1	189.1	124.2
Median age at death	73	76	74	76	74	76

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	774,100	771,500	1,304,200	1,322,400
Absolute survival rate (2013–2014)[3]	50 (48–51)	58 (55–59)	38 (36–39)	47 (44–48)
Relative survival rate (2013–2014)[3]	59 (57–61)	65 (63–66)	55 (53–56)	60 (58–63)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

The term »all cancer sites« refers to all forms of malignant neoplasms including lymphomas and leukaemias. When used in this report, »malignant tumours« (in other words, tumours that invade the surrounding tissue or spread via the blood and lymphatic systems) is used in line with the definition drawn up by the International Statistical Classification of Diseases and Related Health Problems (ICD 10, Chapter C). Tumours can be described as either benign or malignant neoplasms depending on their characteristic forms of growth. However, the categories that this leads to have been subject to change and do not always reflect the clinical course of a disease. Some tumours, such as non-invasive papillary carcinomas of the urinary bladder and certain neoplasms of the blood-forming organs (such as myelodysplastic syndromes), are associated with greater risks and heavier burdens for the patients than certain thyroid tumours, for example, which, although malignant, have a particularly favourable prognosis. Furthermore, for tumours of the central nervous system, the risks of serious complications are less dependent on the patterns of growth they display than on their localisation. The categories that result from dividing neoplasms as benign, malignant or tumours of uncertain or unknown behaviour have been defined differently in the past –for example, this has been the case with tumours of the bladder. Finally, non-melanotic forms of skin cancer (»white skin cancer«) are not included in »all cancer sites«, which is common practice in cancer registration internationally. Estimates of the frequency of this widespread, yet seldom life-threatening disease can be found in chapter 3.29.

Malignant neoplasms can occur in all kinds of organs in the body and develop from many different types of cell. Nevertheless, most cancers are found on internal or external body surfaces (epithelia). Approximately 70 % of cancers are adenocarcinomas that originate in glandular tissue. A further 15 % are squamous-cell carcinomas, malignant tumours of the transitional epithelium (urothelium carcinoma) and small-cell carcinoma, which occur, for example, in the lung. Leukaemias and lymphomas develop from blood-forming bone marrow and lymphoid tissues, lymph nodes or the spleen. However, malignant tumours may also develop out of the supporting cells of the nervous system (glial cells) or from pigment-forming cells (melanomas). Cancers of connective tissues (such as the bone, cartilage and blood vessels), including mesotheliomas and sarcomas, are among the rarer types of cancer.

In 2014, the ZfKD estimates that around 476,000 cases of cancer were initially diagnosed in Germany (men: approximately 249,200; women: 227,000). Breast cancer accounted for over half of all cases (69,900), followed by cancer of the bowel (61,000), the prostate (57,400) and the lung (53,800) (see Table 3.0.1).

Between 2004 and 2014, the absolute number of new cancer cases increased among men by around 6 % and among women by 9 %. These figures, particularly in the case of men, can be explained by the differences that have occurred to the age structure of the population (the increase in the number of elderly people). Once these figures have been adjusted for age, it becomes clear that a 10 % drop occurred in the rate of new cases of cancer among men whereas the rate rose by 3 % among women. These contrasting tendencies mainly reflect the different trends among men and women in terms of lung cancer and other smoking-related cancers (see Chapter 3.10).

Between 2005 and 2015, age-standardised mortality rates decreased by 12 % among men and 7 % among women. However, due to demographic changes, the absolute number of deaths from cancer have actually increased by 10 % among men and 4 % among women. On the other hand, the proportion of deaths attributed to cancer as an underlying cause has remained constant since the end of the 1990s (women: 22 %; men 28 %). This indicates that achievements in in cancer treatment and prevention have contributed to an increased life expectancy of about two or three years over this period.

Every second man and woman in Germany can expect to develop cancer during the course of life. Although cancer is generally less common among women, it tends to affect women earlier. Women under the age of 55 have higher incidences of cancer than men of the same age, but this trend is reversed among higher age groups with the incidence for men aged over 65 almost twice as high as that among women.

Relative 5-year survival rates compare the higher mortality of cancer patients to that of the general population of the same age and gender. They range from favourable rates of above 90 % for malignant melanoma of the skin, testicular cancer, and prostate cancer, to survival rates of less than 20 % for lung, liver and pancreatic cancer and mesothelioma (see Figure 3.1.0). During the last thirty years, the overall prognosis for cancer patients in Germany has improved considerably. The most significant improvements among adult cancer patients have been achieved for malignant tumours of the breast, bowel and prostate, while for children, particularly the prognosis for leukaemia patients has been improved substantially.

Risk factors and early detection

The aetiology of many cancers is often unknown, and even in cases where it is known, there may be no way of influencing the risk factors associated with the disease. As such, prevention strategies can only have an impact on the incidence of certain types of tumours. Nevertheless, this includes cancer that affects large numbers of people. In fact, the World Health Organization estimates that more than 30 % of all cancer cases could be avoided with preventive measures.

Tobacco consumption is the most important avoidable risk factor associated with cancer. According to estimates by the German Centre for Cancer Registry Data, a total of around 16 % of all cancer cases in Germany are attributable to smoking. For a long time, observational epidemiological investigations have shown that overweight and a lack of exercise are also linked to cancer. Moreover, recent research into metabolic syndrome is revealing the possible biological mechanisms behind this link. Metabolic syndrome is a chronic »metabolic imbalance« linked to hypertension, high blood cholesterol levels and hyperglycaemia. Inflammatory processes in adipose tissue are also suspected of being associated with cancer.

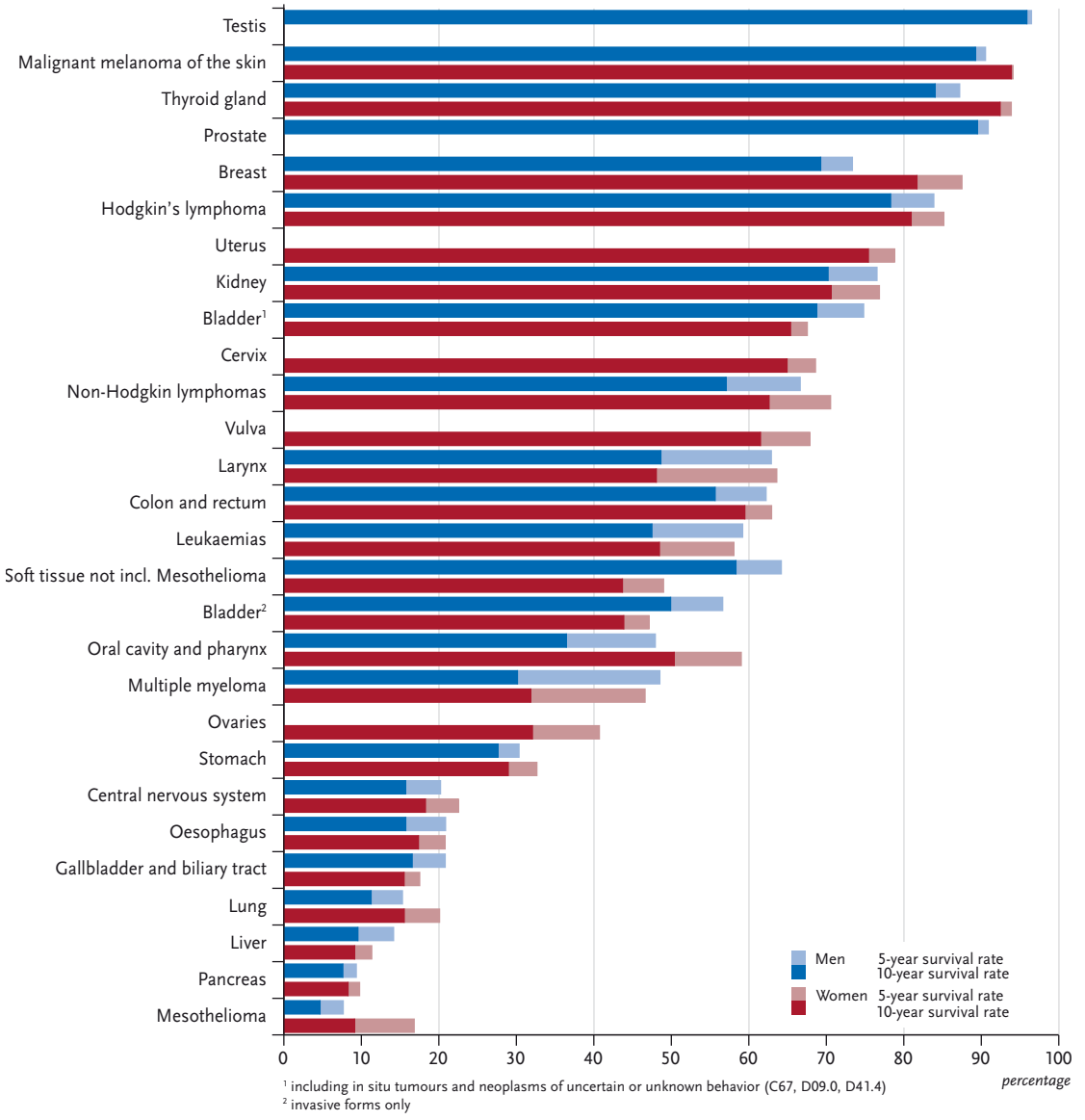
Among the factors linked to diet, alcohol plays an important role. Low quantities of fruit, vegetables, and dietary fibre, often combined with a high intake of red meat, have also been identified as risk factors associated with a number of frequently occurring types of cancer. In observational studies, however, the influence of certain foodstuffs and the substances that they contain cannot always be separated from a person's energy balance or other factors.

Ultraviolet light (UV radiation) from sunlight is a further avoidable risk factor linked to cancer. Many people overestimate the influence of hazardous substances and impurities in foodstuffs, as well as environmental factors or exposure to toxins in the workplace in Germany. However, these factors can also play a substantial role in the development of cancer, even in this country. Examples include radon, a naturally occurring noble gas, which is estimated to be responsible for about 5 % of lung cancer deaths in Germany, or occupational exposure to asbestos in the past, which, due to its long latency period, still leads to mesotheliomas of the pleural cavity and peritoneum. Even medical procedures may have an impact on an individual's risk of cancer. Potential risks include diagnostic procedures and therapies involving exposure to radiation, cytostatic agents used in chemotherapy and hormone replacement therapy for menopausal women, which has been identified as a risk factor for breast cancer. Chronic infections are now known as risk factors associated with some widespread forms of cancer. Vaccinations or causal thera-

pies, in contrast, can help lower the risk of cancer. These include vaccinations against hepatitis viruses (a risk factor linked to liver cancer), and it is hoped that vaccination against human papilloma viruses will have a similar effect in reducing the incidence of cervical carcinoma. In addition to avoidable risk factors, however, genetic causes may also increase the risk of developing cancer. Until now, only very few of these genetic mutations have been clearly identified. The risk factors linked to specific types of cancer are presented in more detail in the individual sections.

Finally, the statutory health insurers in Germany provide cancer screening for malignant tumours of the skin and bowel as well as for breast and cervical cancer in women and prostate cancer in men. These investigative measures are described in more detail in the relevant sections.

Figure 3.1.0
Relative 5-/10-year survival rates, by tumour sites and sex, Germany 2013–2014 (period analysis)



[1] including in situ tumours and neoplasms of uncertain or unknown behavior (C67, D09.0, D41.4)
[2] invasive forms only

Figure 3.1.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C00–C97 without C44, Germany 1999–2014/2015
per 100,000 (old European Standard)

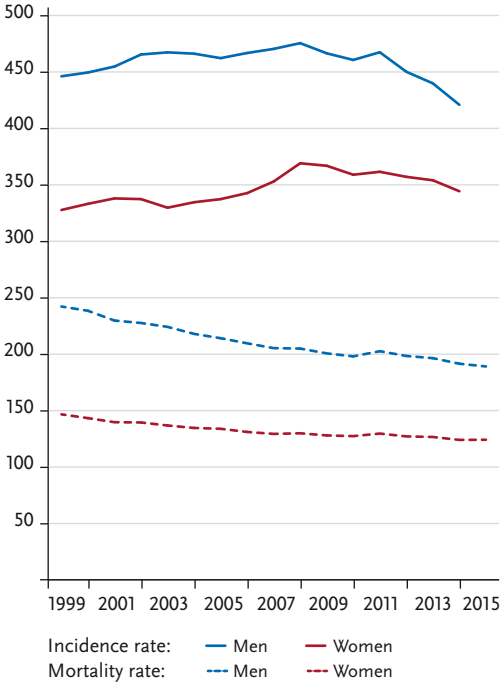


Figure 3.1.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C00–C97 without C44, Germany 1999–2014/2015

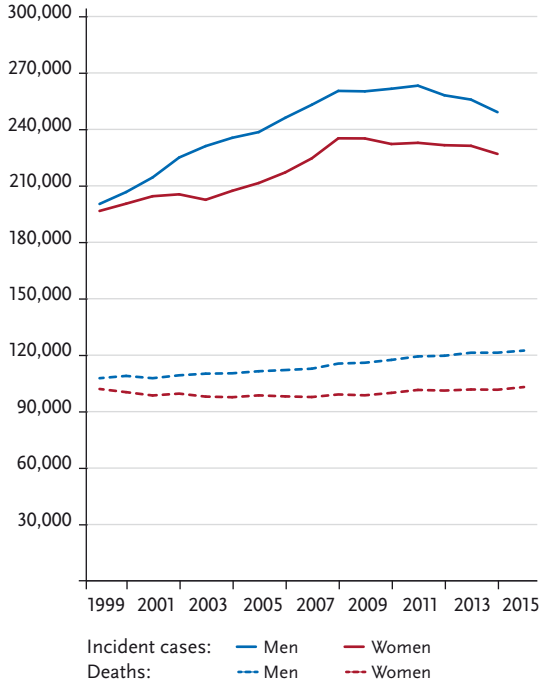


Figure 3.1.2
Age-specific incidence rates by sex, ICD-10 C00–C97 without C44, Germany 2013–2014
per 100,000

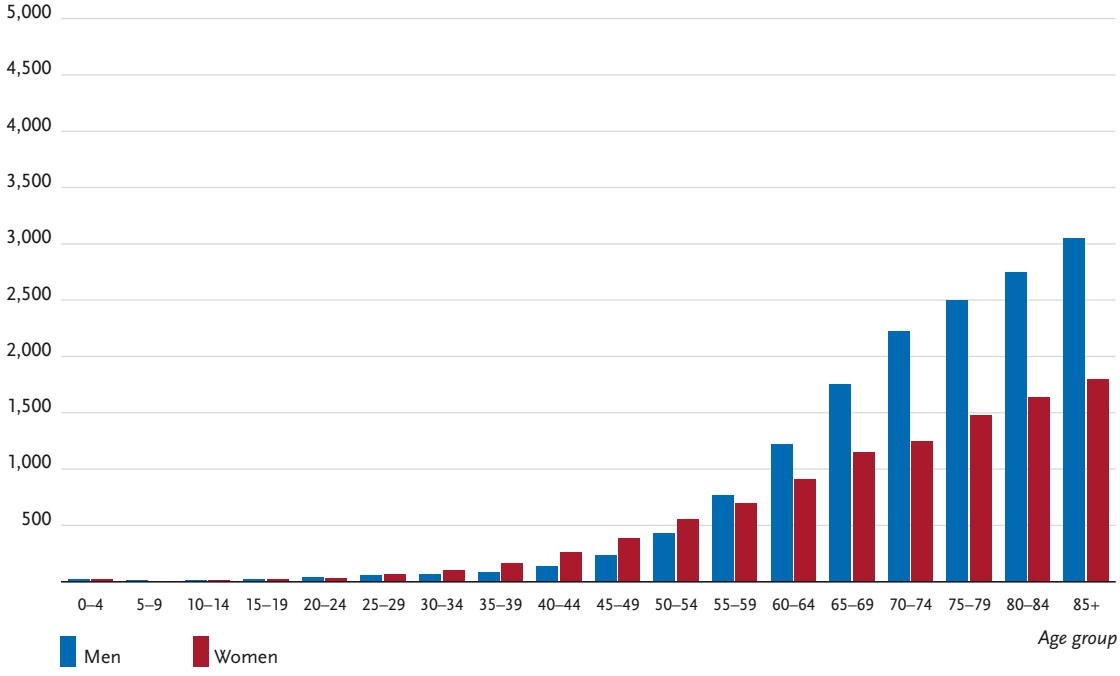


Table 3.1.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C00–C97 without C44, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	1.2 %	(1 in 84)	50.5 %	(1 in 2)	0.2 %	(1 in 410)	25.9 %	(1 in 4)
45 years	3.5 %	(1 in 28)	50.4 %	(1 in 2)	1.2 %	(1 in 87)	26.0 %	(1 in 4)
55 years	10.2 %	(1 in 10)	50.0 %	(1 in 2)	3.7 %	(1 in 27)	25.8 %	(1 in 4)
65 years	20.3 %	(1 in 5)	47.3 %	(1 in 2)	7.9 %	(1 in 13)	24.4 %	(1 in 4)
75 years	27.2 %	(1 in 4)	39.9 %	(1 in 3)	12.7 %	(1 in 8)	21.0 %	(1 in 5)
Lifetime risk			50.4 %	(1 in 2)			25.7 %	(1 in 4)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	2.2 %	(1 in 45)	43.1 %	(1 in 2)	0.3 %	(1 in 320)	20.1 %	(1 in 5)
45 years	4.9 %	(1 in 20)	41.9 %	(1 in 2)	1.1 %	(1 in 95)	19.9 %	(1 in 5)
55 years	8.6 %	(1 in 12)	39.4 %	(1 in 3)	2.6 %	(1 in 38)	19.3 %	(1 in 5)
65 years	13.2 %	(1 in 8)	34.6 %	(1 in 3)	4.9 %	(1 in 20)	17.6 %	(1 in 6)
75 years	16.7 %	(1 in 6)	26.7 %	(1 in 4)	7.9 %	(1 in 13)	14.4 %	(1 in 7)
Lifetime risk			43.5 %	(1 in 2)			20.1 %	(1 in 5)

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

Figure 3.1.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C00–C97 without C44, Germany 2013–2014

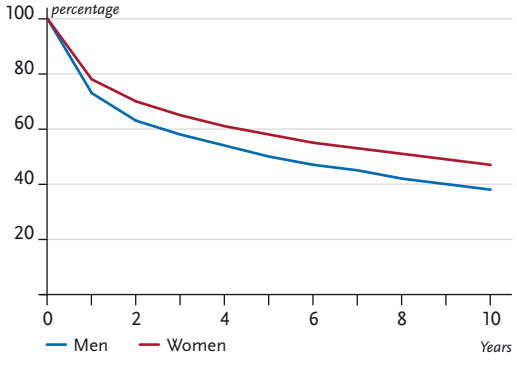


Figure 3.1.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C00–C97 without C44, Germany 2013–2014

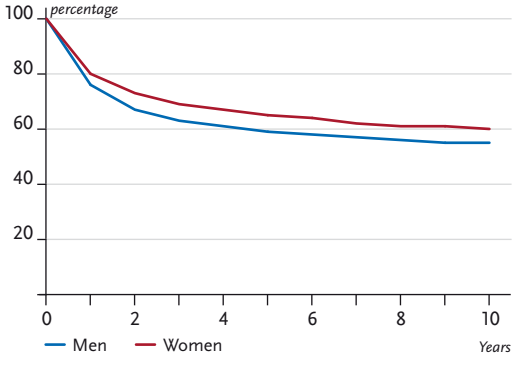


Figure 3.1.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C00–C97 without C44, 2013–2014
per 100,000 (old European Standard)

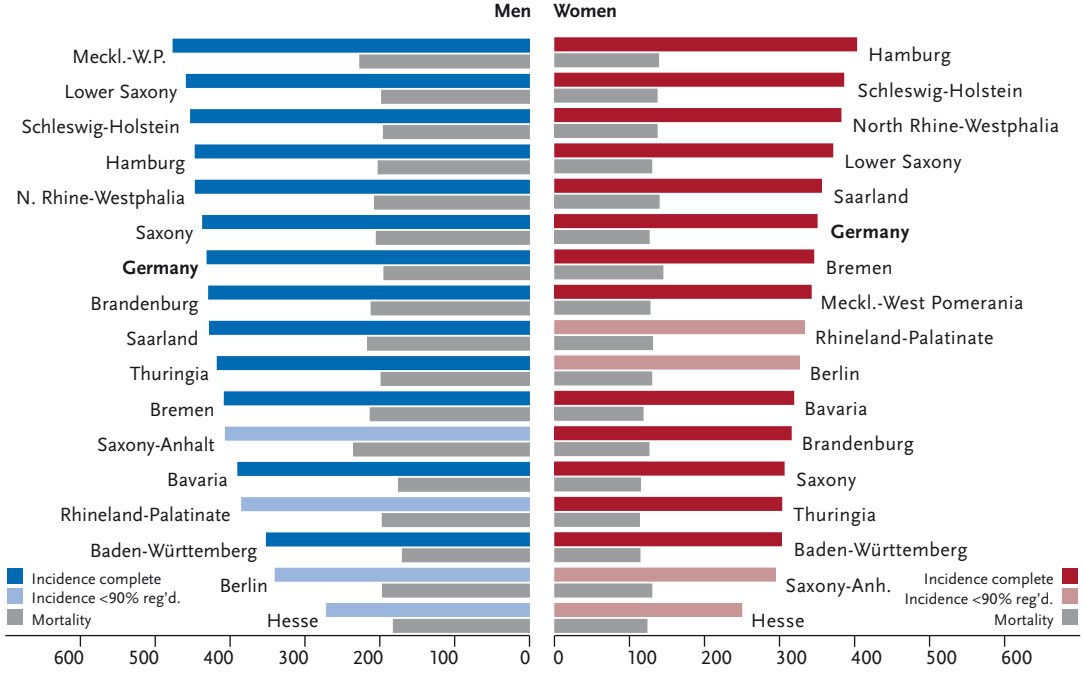
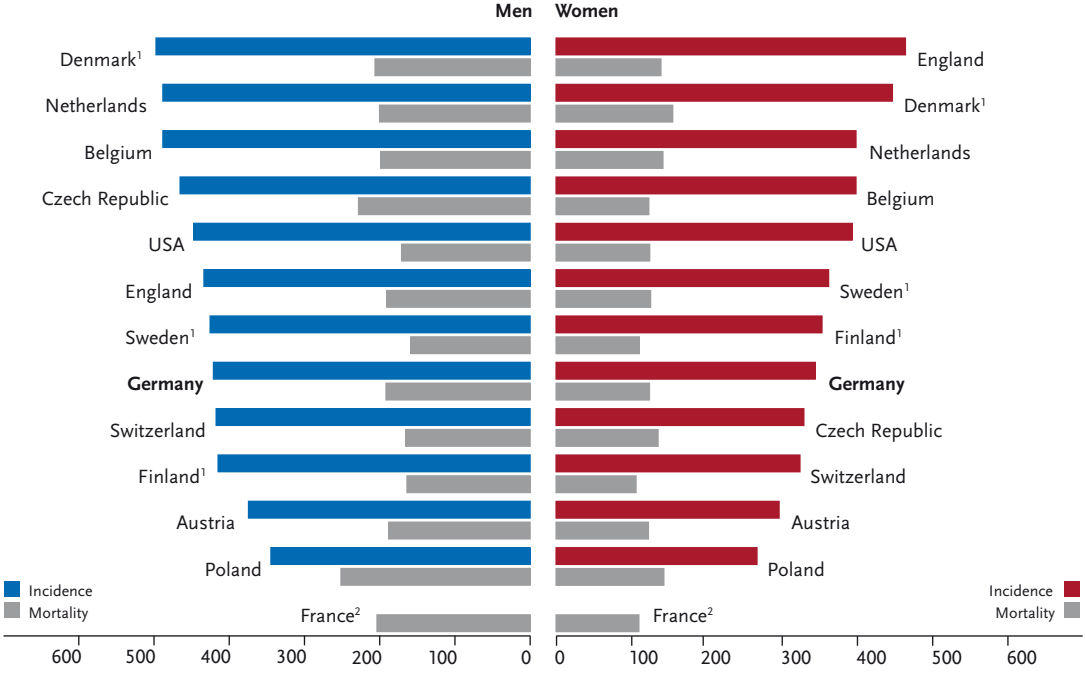


Figure 3.1.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C00–C97 without C44, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data incl. D09.0–1, D30.1–9, D35.2–4, D41.1–9, D32–D33, D42–D43, D44.3–5, D46–D47 but excl. C46.0
[2] no data for incidence

3.2 Oral cavity and pharynx

Table 3.2.1
Overview of key epidemiological parameters for Germany, ICD-10 C00–C14

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	9,630	3,740	9,130	3,700	9,400	4,300
Crude incidence rate[1]	24.4	9.1	23.0	9.0	23.4	10.4
Standardised incidence rate[1,2]	18.2	6.1	16.9	5.9	16.4	6.5
Median age at diagnosis	62	66	63	66		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	4,084	1,389	4,095	1,353	4,086	1,378
Crude mortality rate[1]	10.4	3.4	10.3	3.3	10.2	3.3
Standardised mortality rate[1,2]	7.5	2.0	7.3	1.9	7.2	1.9
Median age at death	64	71	65	71	65	71

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	28,200	12,600	44,700	20,600
Absolute survival rate (2013–2014)[3]	43 (40–45)	53 (52–58)	29 (29–30)	40 (37–49)
Relative survival rate (2013–2014)[3]	48 (43–51)	59 (57–65)	36 (34–38)	50 (47–60)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Cancer of the oral cavity and the pharynx are part of a heterogeneous group of malignant neoplasms. In terms of their histology, more than 90 % of cases occur as squamous cell carcinomas, with slightly more than 5 % of cases developing as adenocarcinomas, most of which are of the salivary glands.

Men are more likely to develop these forms of cancer than women are, and, on average, they do so three years earlier than women do (men: 63; women: 66).

Age-standardised mortality rates have increased slightly over the previous 15 years among women, but there has been a recent decline among men. Death and disease rates increased more in men and women aged 60 years and older, but decreased among the younger age groups.

Overall, women have a higher relative 5-year survival rate (59 %) than men (48 %). Due to differences in alcohol and tobacco use, a lower proportion of women develop cancers of the mouth, tongue or throat. The lower survival rates associated with these cancers compared to malignant tumours of the lip and salivary glands contribute towards the differences in survival rates. According to the data available on tumour stages (which are available for between 75 % and 80 % of cases), more than one in three tumours are diagnosed at an early stage among women (T1), but this can be said of only every fourth case in men.

Risk factors

The most important risk factors linked to cancer of the mouth and throat are tobacco use and alcohol consumption. Importantly, these two risk factors reinforce each another in combination.

Another main risk factor is chronic infection with high-risk human papilloma viruses (HPV). In particular, some cancers of the parts of the pharynx that adjoin the oral cavity (oropharynx) may be partly caused by these viruses.

Further possible risk factors include a one-sided diet that is low in vitamins, and excessive meat consumption. A lack of proper oral hygiene and mechanical irritations, such as those caused by poorly fitting dentures, are also possible risk factors. Exposure to sunlight can contribute to carcinoma of the lips. People with type 2 diabetes, a marked immunodeficiency, as well as rare pre-existing illnesses, may also have an increased risk of tumours of the oral cavity and the lips.

Epstein-Barr virus is regarded as a further viral risk factor, in particular for nasopharyngeal carcinoma. Finally, there is clear evidence that a genetic predisposition also plays a role in the development of carcinomas in the head and neck area.

Figure 3.2.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C00–C14, Germany 1999–2014/2015
per 100,000 (old European Standard)

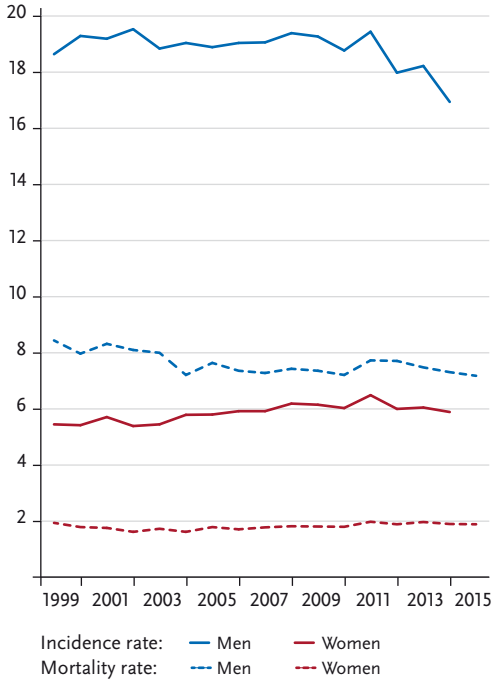


Figure 3.2.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C00–C14, Germany 1999–2014/2015

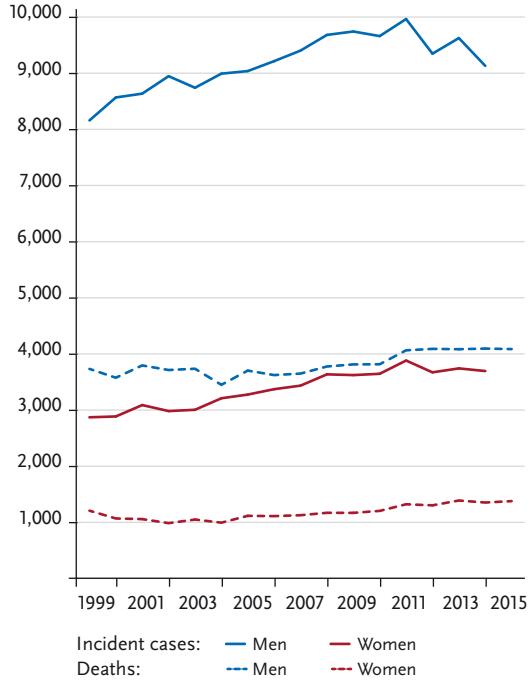


Figure 3.2.2
Age-specific incidence rates by sex, ICD-10 C00–C14, Germany 2013–2014
per 100,000

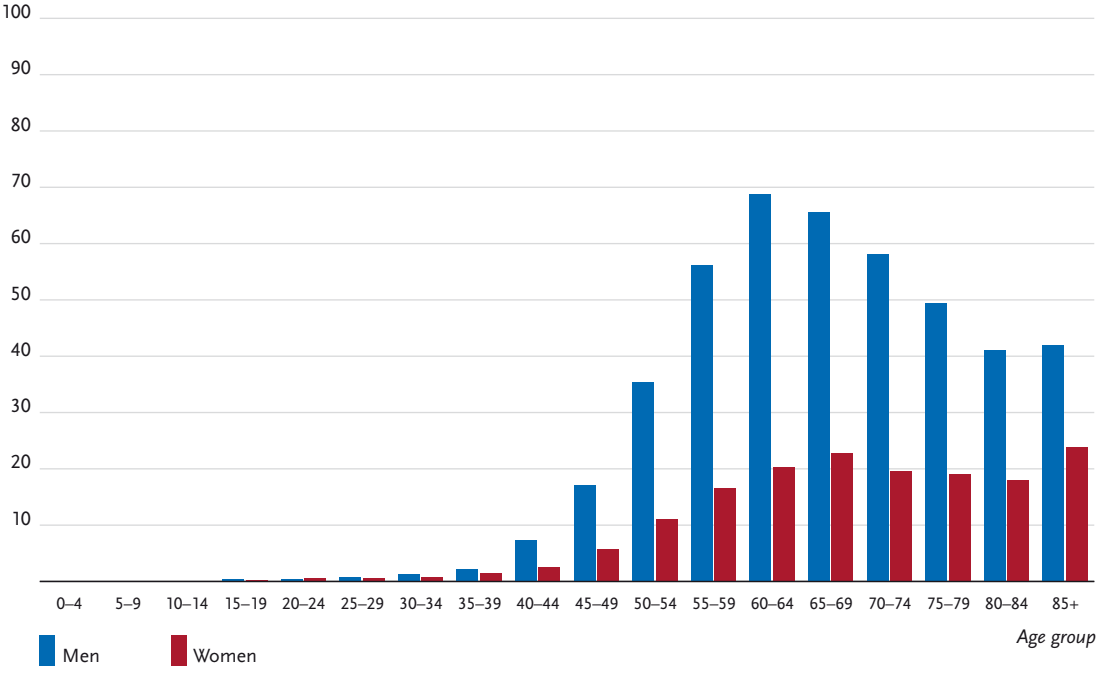


Table 3.2.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C00–C14, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 2,000)	1.7%	(1 in 60)	<0.1%	(1 in 8,000)	0.8%	(1 in 130)
45 years	0.2%	(1 in 410)	1.6%	(1 in 61)	0.1%	(1 in 1,100)	0.8%	(1 in 130)
55 years	0.6%	(1 in 180)	1.4%	(1 in 69)	0.2%	(1 in 430)	0.7%	(1 in 140)
65 years	0.6%	(1 in 180)	1.0%	(1 in 100)	0.3%	(1 in 380)	0.5%	(1 in 190)
75 years	0.4%	(1 in 270)	0.5%	(1 in 190)	0.2%	(1 in 470)	0.3%	(1 in 300)
Lifetime risk			1.7%	(1 in 61)			0.8%	(1 in 130)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 4,600)	0.7%	(1 in 150)	<0.1%	(1 in 24,700)	0.3%	(1 in 380)
45 years	0.1%	(1 in 1,200)	0.7%	(1 in 150)	<0.1%	(1 in 5,000)	0.3%	(1 in 380)
55 years	0.2%	(1 in 560)	0.6%	(1 in 170)	0.1%	(1 in 1,900)	0.2%	(1 in 400)
65 years	0.2%	(1 in 510)	0.4%	(1 in 230)	0.1%	(1 in 1,400)	0.2%	(1 in 490)
75 years	0.2%	(1 in 610)	0.3%	(1 in 360)	0.1%	(1 in 1,400)	0.1%	(1 in 670)
Lifetime risk			0.7%	(1 in 140)			0.3%	(1 in 380)

Figure 3.2.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C00–C14, Germany 2013–2014

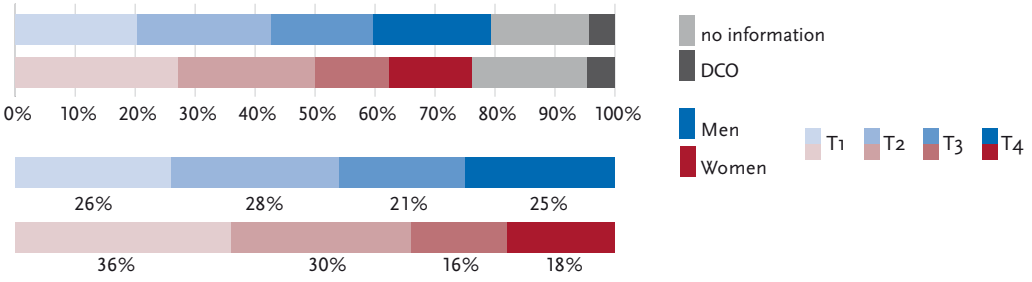


Figure 3.2.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C00–C14, Germany 2013–2014

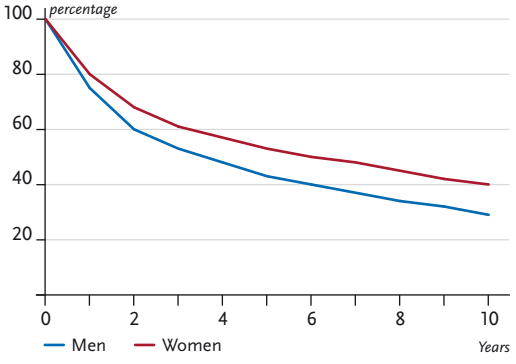


Figure 3.2.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C00–C14, Germany 2013–2014

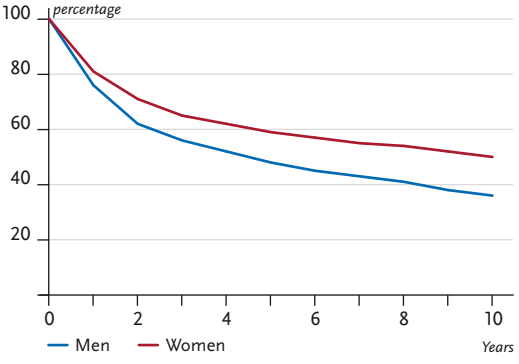


Figure 3.2.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C00–C14, 2013–2014
per 100,000 (old European Standard)

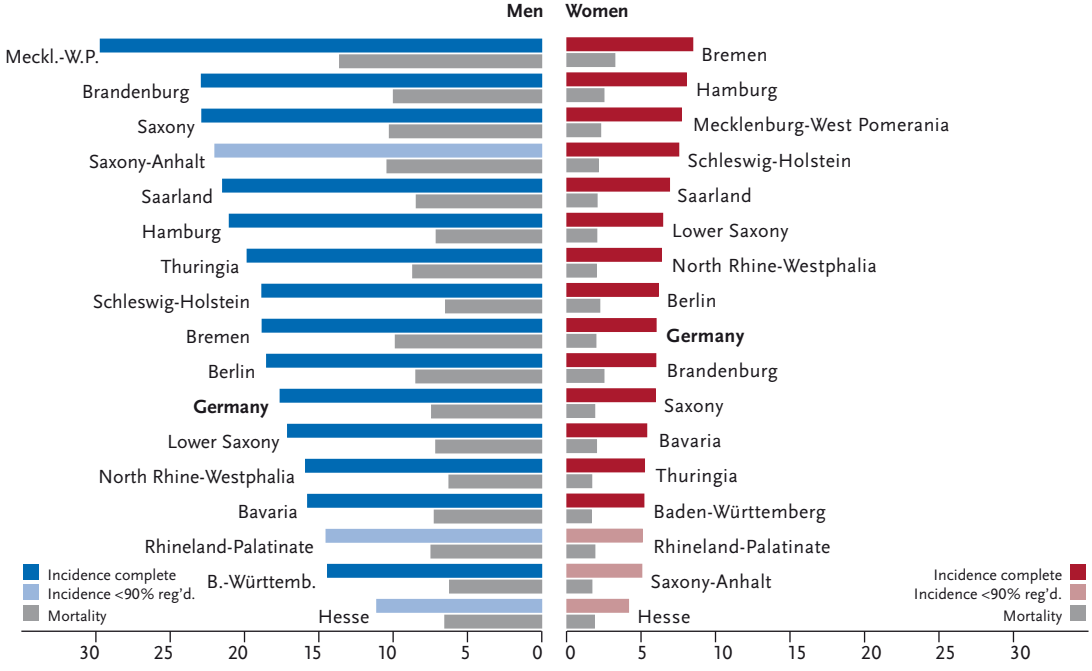
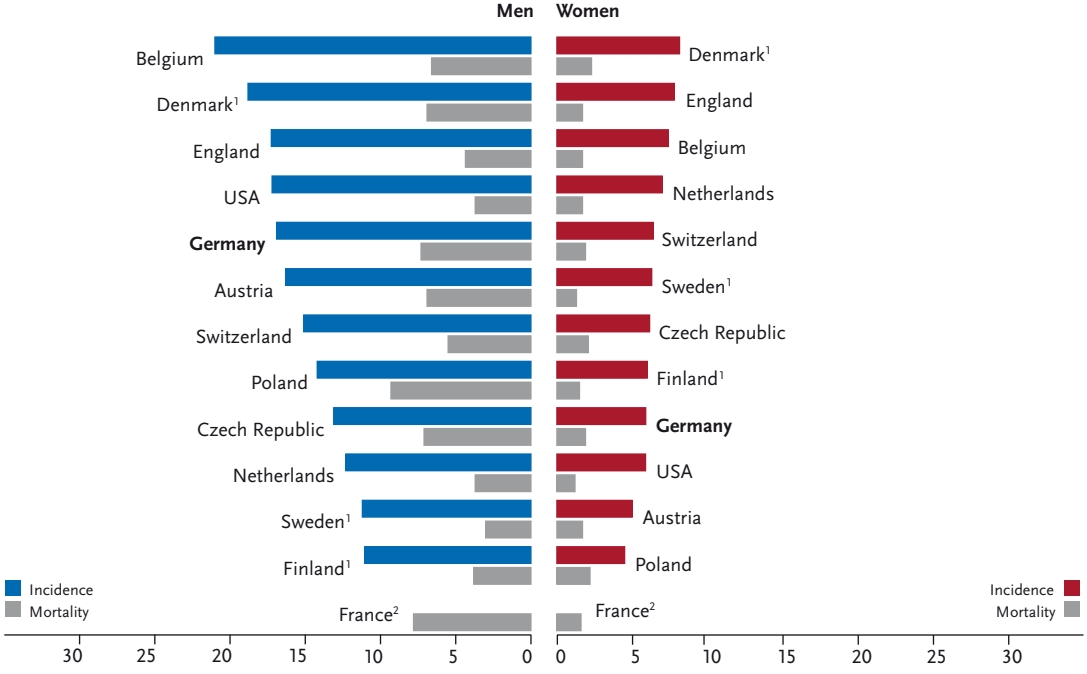


Figure 3.2.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C00–C14, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data without C10.1
[2] no data for incidence

3.3 Oesophagus

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	5,150	1,490	5,370	1,560	5,700	1,700
Crude incidence rate[1]	13.0	3.6	13.5	3.8	14.2	4.1
Standardised incidence rate[1,2]	9.1	2.1	9.3	2.2	9.3	2.3
Median age at diagnosis	67	73	67	71		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	4,244	1,192	4,107	1,236	4,269	1,238
Crude mortality rate[1]	10.8	2.9	10.3	3.0	10.6	3.0
Standardised mortality rate[1,2]	7.4	1.5	6.9	1.6	7.1	1.5
Median age at death	69	74	70	74	69	75

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	9,100	2,500	12,400	3,500
Absolute survival rate (2013–2014)[3]	18 (13–22)	18 (13–23)	12 (8–15)	13 (10–18)
Relative survival rate (2013–2014)[3]	21 (15–24)	21 (14–27)	16 (11–20)	17 (13–23)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Cancer of the oesophagus causes about 3 % of all cancer deaths in men and 1 % in women. In Germany, men are diagnosed with cancer of the oesophagus around four to five times more frequently than women and, at an average age of 67, typically four years earlier. Whereas the incidence rates among men aged 65 or above remain almost constant, death rates for both genders rise with increasing age.

Since 1999, age-standardised incidence and mortality rates have continued to increase among women but have remained virtually unchanged in men. In addition, this type of cancer is occurring less among people aged under 60 years, but increasing among older age groups.

Squamous-cell carcinomas account for between 50 % and 60 % of all cases of cancer of the oesophagus. The proportion of adenocarcinomas, which are almost exclusively found in the transitionary area between the oesophagus and the stomach, has risen by more than one third over recent years.

Men and women who develop oesophageal carcinoma have unfavourable survival prospects, with a relative 5-year survival rate of just 21 %. Only one in seven tumours is diagnosed at an early stage (T1).

Risk factors

Alcohol and tobacco consumption are among the most important risk factors associated with the most common forms of squamous cell carcinomas of the oesophagus. These factors reinforce each other in combination. Studies have also shown that people affected by this form of cancer often eat very low levels of fruit and vegetables.

The somewhat rarer adenocarcinomas are often associated with gastroesophageal reflux diseases (persistent reflux of gastric juice into the oesophagus/chronic heartburn). This can also lead to mucosal changes in the lower section of the oesophagus, and the development of »Barrett's oesophagus«, which is regarded as a precancerous condition. A lower-than-average consumption of fruit and vegetables also increases the risk of developing adenocarcinomas. Further risk factors include smoking and overweight; family clusters of cases have been recorded. Finally, research into the possible links between this type of cancer and human papilloma viruses has produced contradictory findings.

Figure 3.3.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C15, Germany 1999–2014/2015
per 100,000 (old European Standard)

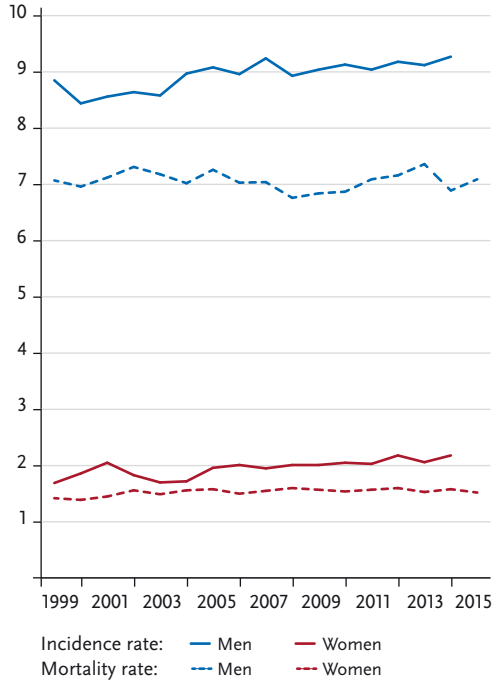


Figure 3.3.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C15, Germany 1999–2014/2015

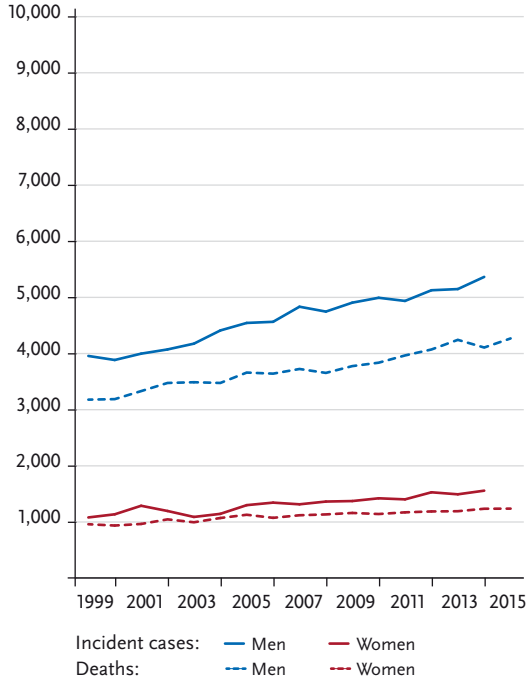


Figure 3.3.2
Age-specific incidence rates by sex, ICD-10 C15, Germany 2013–2014
per 100,000

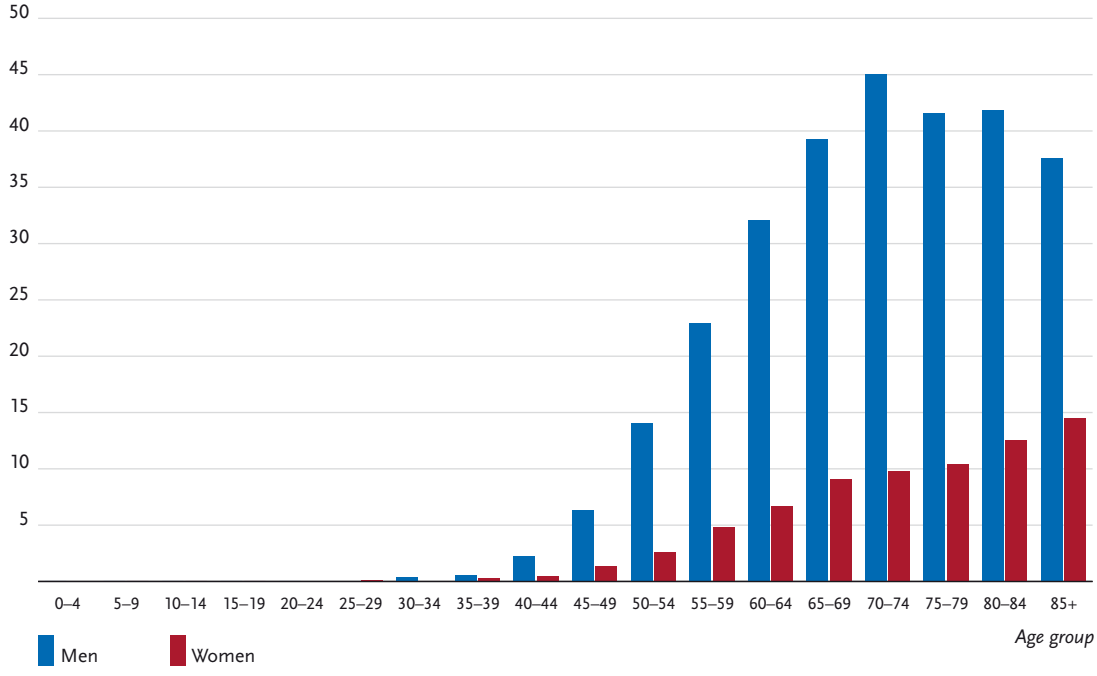


Table 3.3.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C15, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 6,800)	1.0%	(1 in 100)	<0.1%	(1 in 9,500)	0.8%	(1 in 120)
45 years	0.1%	(1 in 960)	1.0%	(1 in 100)	0.1%	(1 in 1,400)	0.8%	(1 in 120)
55 years	0.3%	(1 in 380)	0.9%	(1 in 110)	0.2%	(1 in 500)	0.8%	(1 in 130)
65 years	0.4%	(1 in 270)	0.7%	(1 in 140)	0.3%	(1 in 330)	0.7%	(1 in 150)
75 years	0.3%	(1 in 320)	0.4%	(1 in 230)	0.3%	(1 in 330)	0.4%	(1 in 230)
Lifetime risk			1.0%	(1 in 100)			0.8%	(1 in 120)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 23,400)	0.3%	(1 in 350)	<0.1%	(1 in 48,700)	0.2%	(1 in 430)
45 years	<0.1%	(1 in 4,800)	0.3%	(1 in 350)	<0.1%	(1 in 8,400)	0.2%	(1 in 430)
55 years	0.1%	(1 in 1,900)	0.3%	(1 in 370)	<0.1%	(1 in 2,800)	0.2%	(1 in 440)
65 years	0.1%	(1 in 1,200)	0.2%	(1 in 440)	0.1%	(1 in 1,500)	0.2%	(1 in 490)
75 years	0.1%	(1 in 980)	0.2%	(1 in 610)	0.1%	(1 in 1,200)	0.2%	(1 in 650)
Lifetime risk			0.3%	(1 in 350)			0.2%	(1 in 430)

Figure 3.3.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C15, Germany 2013–2014

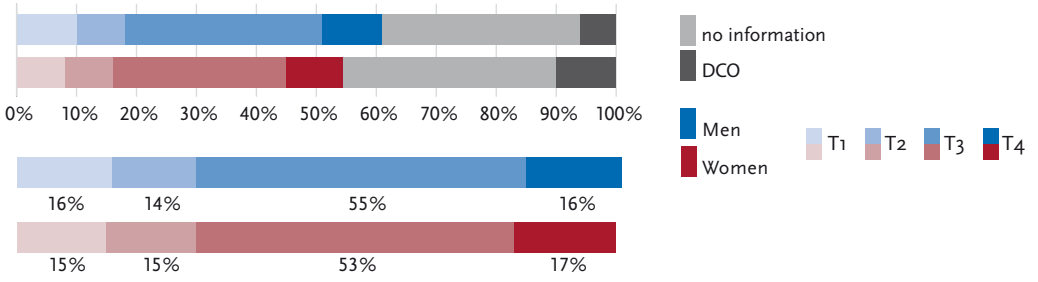


Figure 3.3.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C15, Germany 2013–2014

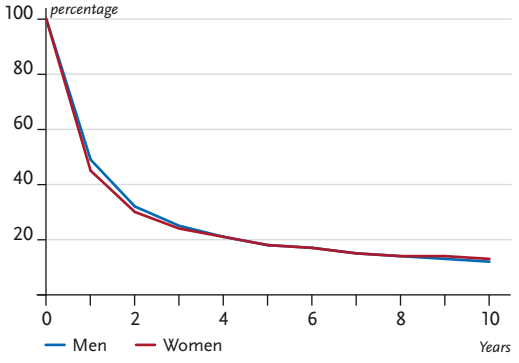


Figure 3.3.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C15, Germany 2013–2014

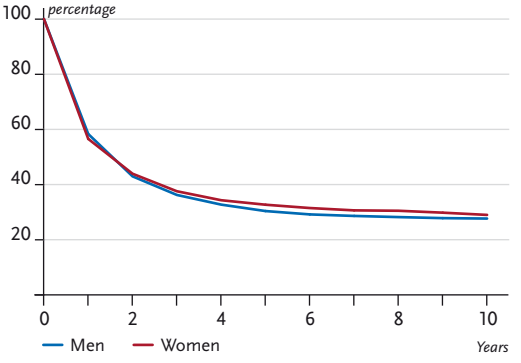


Figure 3.3.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C15, 2013–2014
per 100,000 (old European Standard)

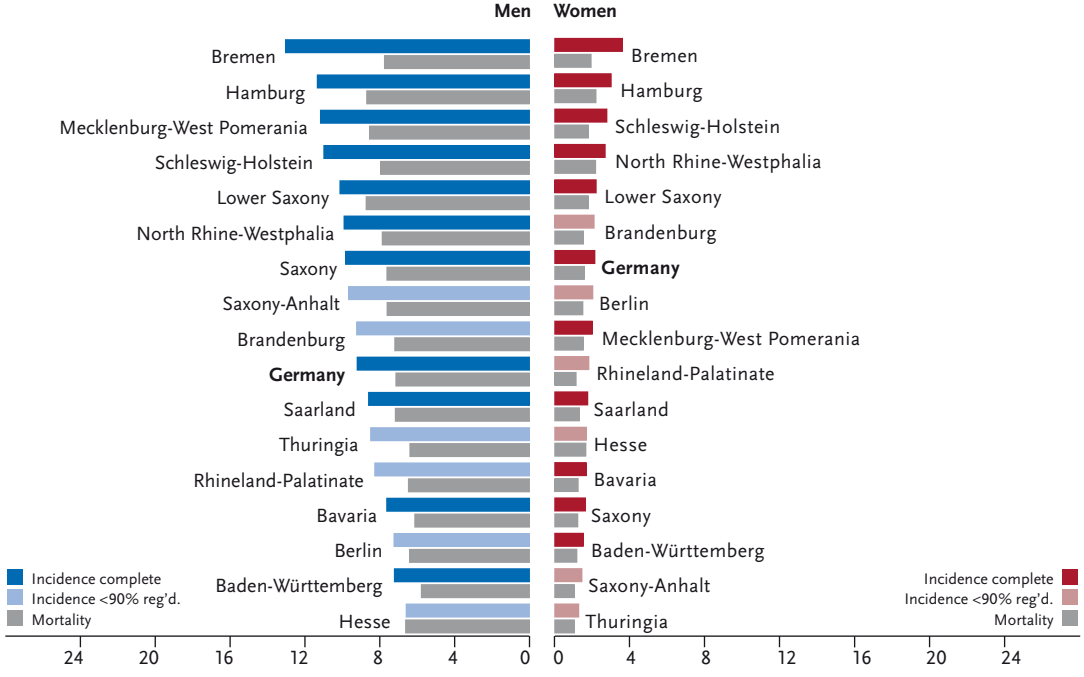
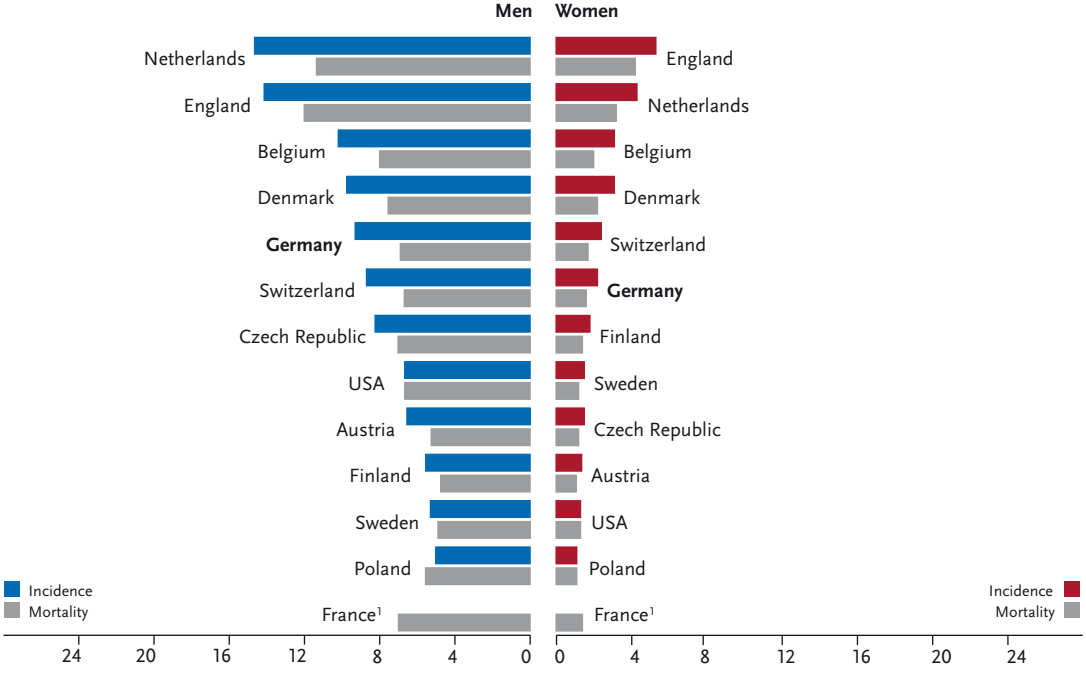


Figure 3.3.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C15, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.4 Stomach

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	9,490	6,380	9,340	6,090	9,100	5,600
Crude incidence rate[1]	24.0	15.5	23.5	14.8	22.5	13.4
Standardised incidence rate[1,2]	15.8	8.1	15.3	7.7	14.0	6.9
Median age at diagnosis	72	75	72	75		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	5,591	4,031	5,545	4,065	5,429	3,829
Crude mortality rate[1]	14.2	9.8	14.0	9.9	13.5	9.2
Standardised mortality rate[1,2]	9.1	4.6	8.8	4.6	8.4	4.3
Median age at death	74	78	74	79	74	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	19,300	13,300	29,600	20,700
Absolute survival rate (2013–2014)[3]	25 (24–29)	27 (22–30)	18 (17–21)	19 (16–22)
Relative survival rate (2013–2014)[3]	30 (29–36)	33 (27–36)	28 (26–32)	29 (25–32)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

A steady decline in the incidence and mortality associated with gastric cancer has been observed in Germany over many decades, as in other industrial nations. This trend applies to all age groups, and both women and men. The decline in gastric cancer is particularly due to fewer cases of tumours occurring in the gastric outlets (the antrum and pylorus). The risk of developing this form of cancer, however, increases steadily with age. On average, men are diagnosed with gastric cancer at 72; women are most likely to be diagnosed with the disease at 75. About 1% of all deaths in Germany are due to stomach cancer. The 5-year relative survival rate is currently estimated to be 33% for women and 30% for men. Although prospects for survival have improved recently, they are still unfavourable compared to other cancers. The stage of the tumour is noted on just over half of all diagnoses. In about two-thirds of these cases, cancer was discovered at an advanced stage (T3 or T4). In terms of histology, the stomach is predominately affected by special forms of adenocarcinoma. Mucosa-associated MALT lymphomas that originate in the mucosa of the stomach and which are counted among low-grade non-Hodgkin lymphomas, are particularly noteworthy in this respect.

Risk factors

The most important risk factor linked to gastric cancer is a bacterial infection of the stomach with Helicobacter pylori. Smoking and excessive alcohol consumption also increase the risk of stomach cancer. Nutritional factors play a complex role: diets that are low in vegetables, or rich in animal products, are associated with a higher risk. In addition, there are indications that chronic heartburn or gastro-oesophageal reflux disease increase the risk of certain forms of tumour at the transition from the stomach to the oesophagus. Obesity can also promote the development of these carcinomas. Low socio-economic status and stomach surgery in the past continue to be associated with a higher frequency of stomach cancer.

First-degree relatives of patients are at a two to three times higher risk than the general population. It is not always clear whether this is due to a shared lifestyle, the transmission of H. pylori within the family, or hereditary genetic conditions. Some hereditary syndromes certainly increase the risk of gastric carcinomas.

Pernicious anaemia and certain other pre-existing diseases increase the risk of this cancer but are relevant only for comparatively few people.

Figure 3.4.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C16, Germany 1999–2014/2015
per 100,000 (old European Standard)

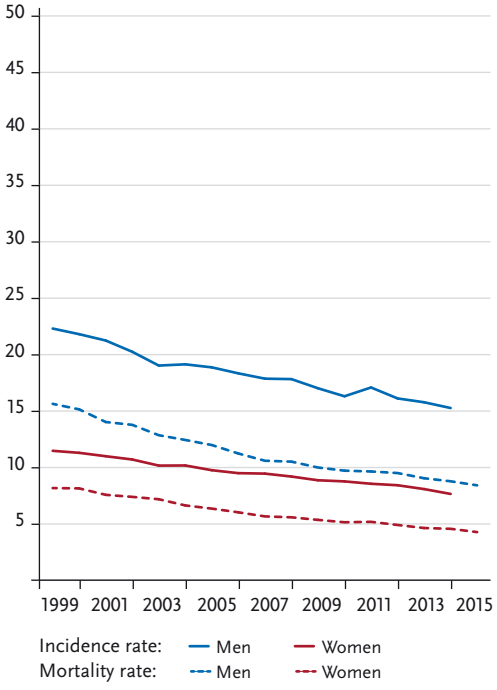


Figure 3.4.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C16, Germany 1999–2014/2015

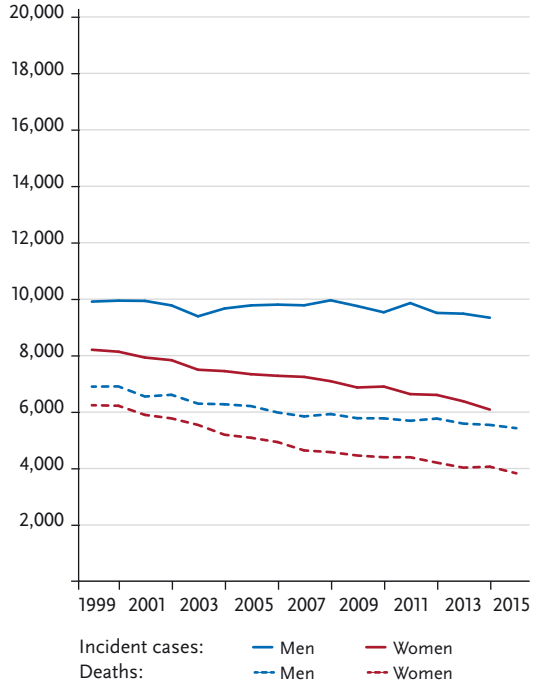


Figure 3.4.2
Age-specific incidence rates by sex, ICD-10 C16, Germany 2013–2014
per 100,000

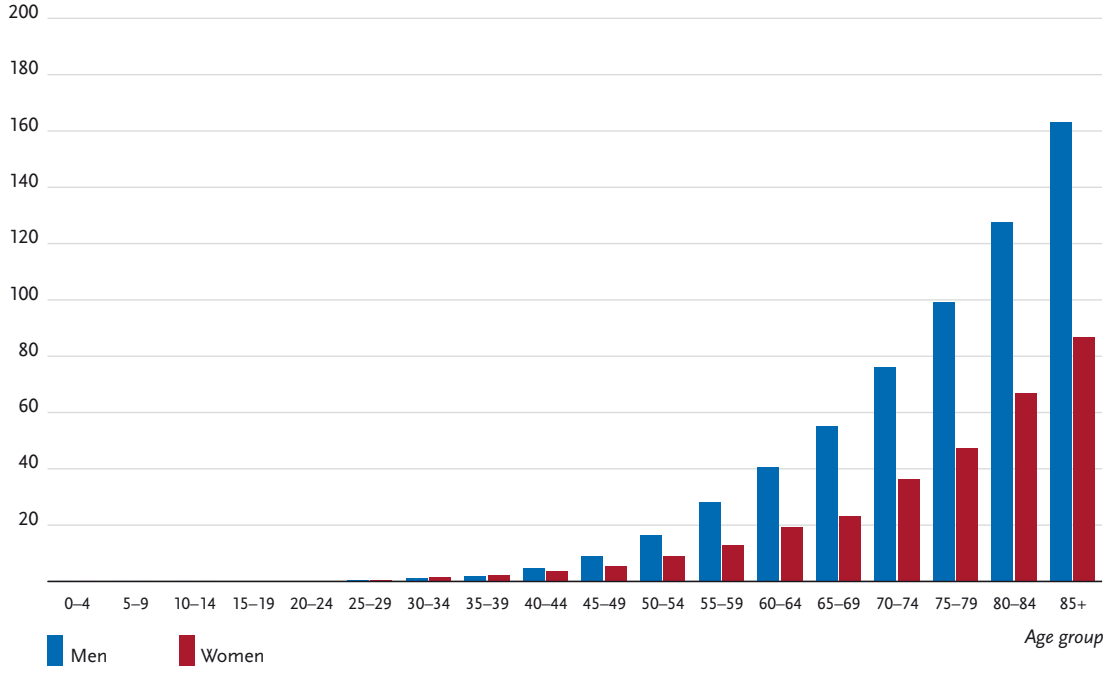


Table 3.4.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C16, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,800)	2.0%	(1 in 51)	<0.1%	(1 in 6,300)	1.2%	(1 in 82)
45 years	0.1%	(1 in 760)	1.9%	(1 in 51)	0.1%	(1 in 1,500)	1.2%	(1 in 82)
55 years	0.3%	(1 in 310)	1.9%	(1 in 53)	0.2%	(1 in 620)	1.2%	(1 in 84)
65 years	0.6%	(1 in 170)	1.7%	(1 in 58)	0.3%	(1 in 310)	1.1%	(1 in 87)
75 years	0.9%	(1 in 110)	1.4%	(1 in 70)	0.6%	(1 in 170)	1.0%	(1 in 96)
Lifetime risk			1.9%	(1 in 52)			1.2%	(1 in 83)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 3,500)	1.2%	(1 in 80)	<0.1%	(1 in 6,400)	0.8%	(1 in 120)
45 years	0.1%	(1 in 1,400)	1.2%	(1 in 82)	<0.1%	(1 in 3,000)	0.8%	(1 in 120)
55 years	0.2%	(1 in 620)	1.2%	(1 in 85)	0.1%	(1 in 1,300)	0.8%	(1 in 130)
65 years	0.3%	(1 in 340)	1.1%	(1 in 93)	0.2%	(1 in 620)	0.7%	(1 in 130)
75 years	0.5%	(1 in 200)	0.9%	(1 in 110)	0.3%	(1 in 290)	0.7%	(1 in 150)
Lifetime risk			1.2%	(1 in 80)			0.8%	(1 in 120)

Figure 3.4.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C16, Germany 2013–2014

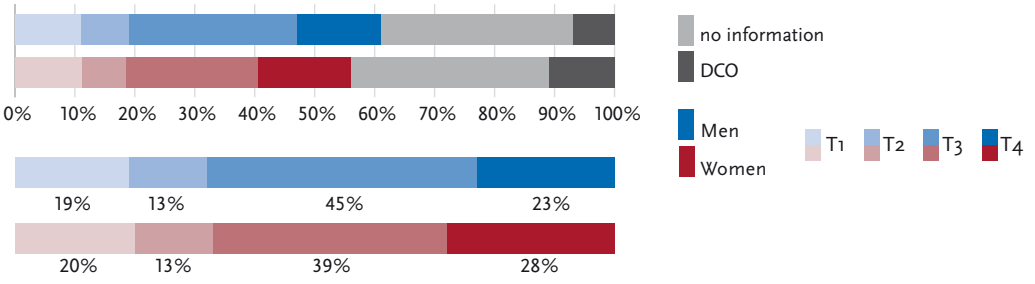


Figure 3.4.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C16, Germany 2013–2014

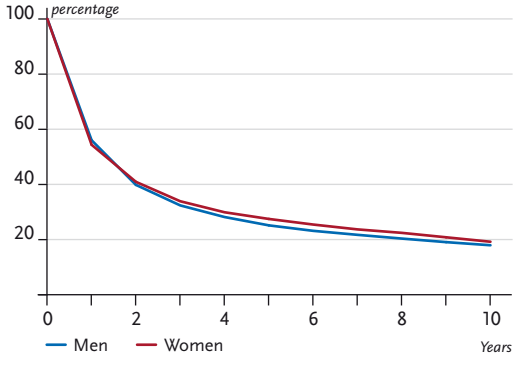


Figure 3.4.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C16, Germany 2013–2014

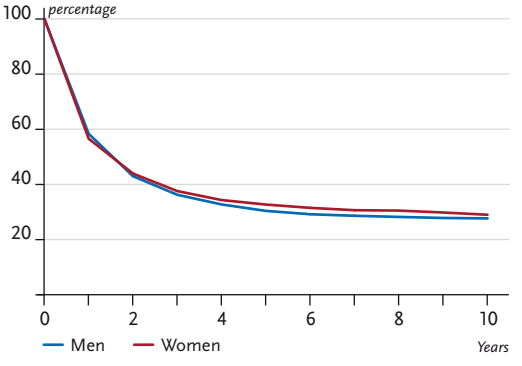


Figure 3.4.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C16, 2013–2014
per 100,000 (old European Standard)

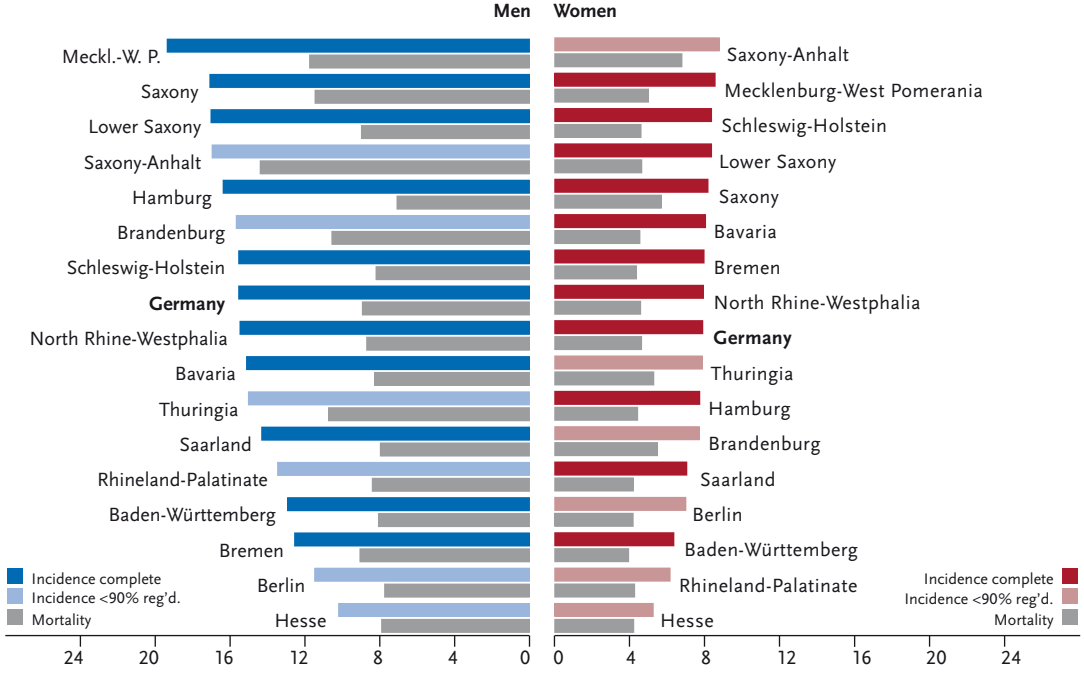
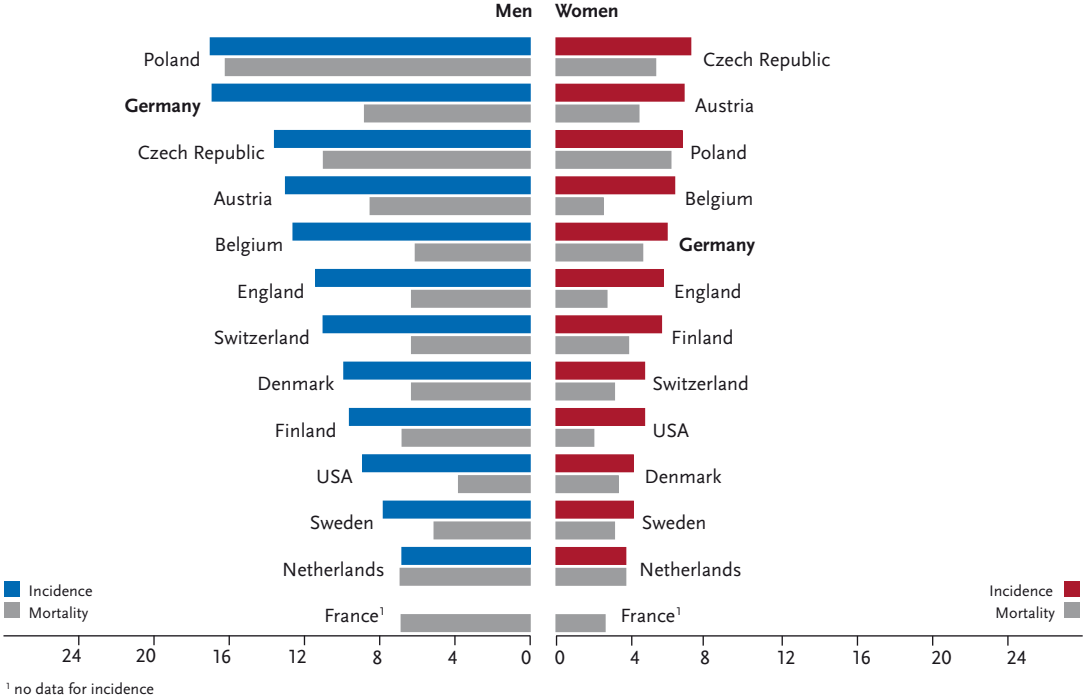


Figure 3.4.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C16, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.5 Colon and rectum

Table 3.5.1
Overview of key epidemiological parameters for Germany, ICD-10 C18–C21

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	34,100	28,410	33,120	27,890	32,900	26,000
Crude incidence rate[1]	86.4	69.0	83.4	67.6	81.6	62.6
Standardised incidence rate[1,2]	56.7	36.5	54.0	35.7	50.6	32.8
Median age at diagnosis	72	75	72	75		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	13,608	12,085	13,580	11,932	13,649	11,769
Crude mortality rate[1]	34.5	29.4	34.2	28.9	34.0	28.4
Standardised mortality rate[1,2]	21.6	13.0	21.0	12.8	20.6	12.4
Median age at death	75	80	75	79	75	80

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	112,500	95,000	188,500	161,600
Absolute survival rate (2013–2014)[3]	51 (50–53)	52 (50–53)	36 (36–37)	39 (36–43)
Relative survival rate (2013–2014)[3]	62 (62–64)	63 (60–65)	56 (54–59)	59 (57–67)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

About every eighth person with cancer in Germany has cancer of the colon and rectum. In 2014, around 33,100 men and 27,900 women were diagnosed with the disease. Over the course of life, one in 15 men and one in 18 women develop cancer of the colon and rectum. Almost two-thirds of cases are detected in the colon.

Rectal cancers account for 26 % of colorectal cancer cases among women and 33 % of cases among men. Fewer cases are being reported as originating from the transition zone between the colon and rectum (rectosigmoid tumours). Only a small number of cancers (1 %–2 %) occur in the anal canal, but their incidence is increasing.

The risk of colorectal cancer rises with age. This leads to a comparatively high mean age of onset (women: 75 years; men: 72 years). More than half of patients affected are diagnosed after they have reached the age of 70, only about 10 % of cases being diagnosed below the age of 55 years.

The decline in age-standardised incidence rates, which began around 2003, has gathered pace recently. In addition, the decline in age-standardised mortality rates has been particularly pronounced during the last 10 years – with this period accounting for more than 20 % of the reduction. The 5-year relative survival rates for colorectal cancer are approximately 62 % for women and men.

Risk factors and early detection

The most important risk factors for colorectal cancer are tobacco use and obesity, followed by a lack of exercise and a diet low in fibre. People who regularly consume alcohol or eat a lot of red or processed red meat are also more prone to developing colorectal cancer. First-degree relatives of colorectal cancer patients also have an above-average risk of developing this cancer themselves, and people with rare hereditary conditions have a very high risk of contracting this form of cancer at a young age. Chronic inflammatory bowel diseases also slightly increase the risk of developing colorectal cancer. Chronic infection with human papillomavirus increases the risk of anal cancer.

People aged between 50 and 54 years in Germany are eligible to have their stool tested annually for traces of blood as part of the cancer screening programme. From the age of 55, one can undergo a colonoscopy. This enables colorectal adenomas to be removed, as these could develop into cancer later on. If the procedure finds nothing untoward, the person is entitled to a further colonoscopy in ten years. Alternatively, people aged 55 years or above can have a stool test conducted every two years instead of a colonoscopy. If the test returns a positive result, a colonoscopy is usually recommended. However, different recommendations apply to people at increased risk of colorectal cancer.

Figure 3.5.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C18–C21, Germany 1999–2014/2015
per 100,000 (old European Standard)

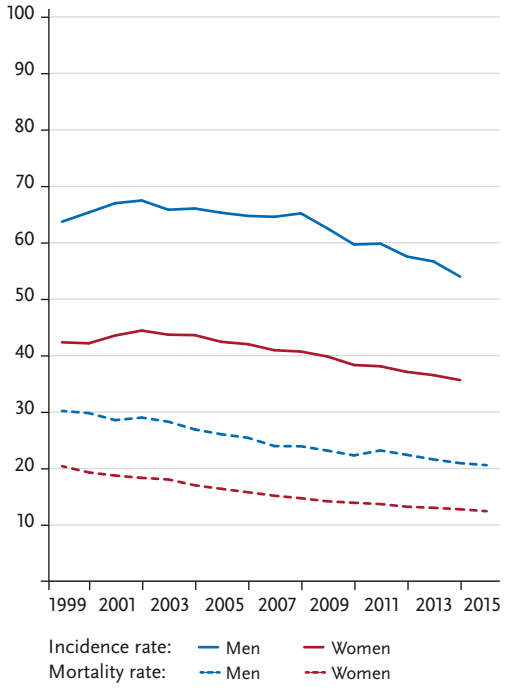


Figure 3.5.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C18–C21, Germany 1999–2014/2015

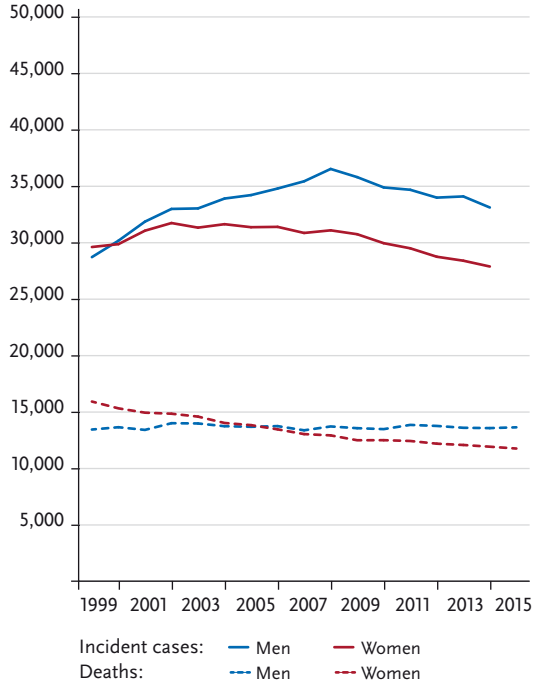


Figure 3.5.2
Age-specific incidence rates by sex, ICD-10 C18–C21, Germany 2013–2014
per 100,000

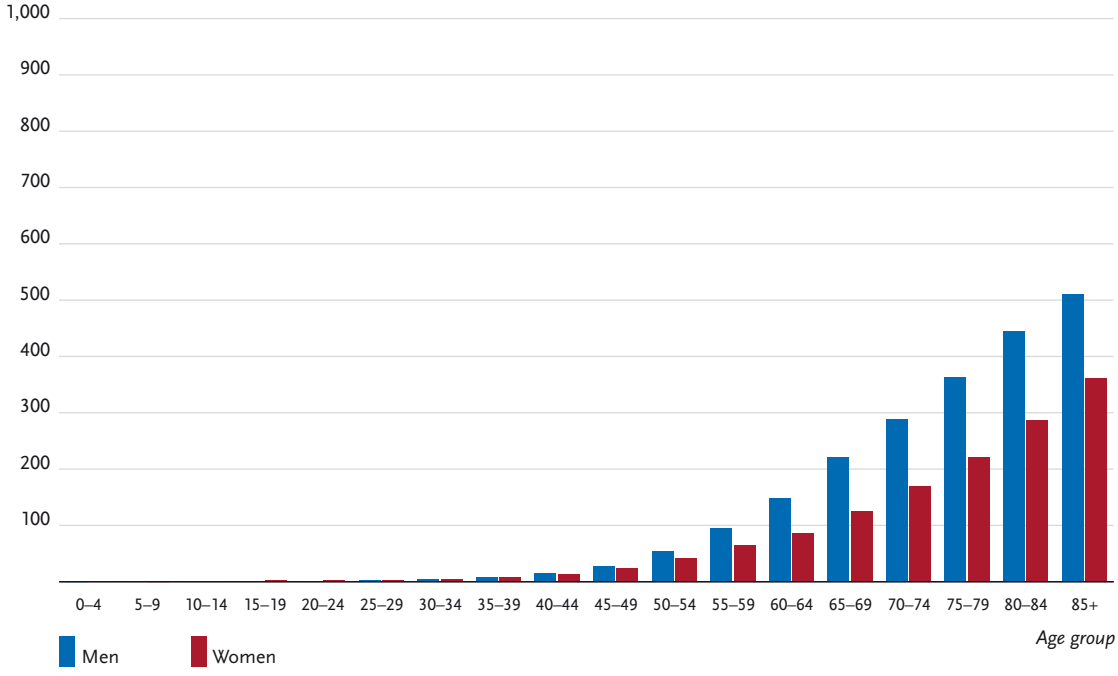


Table 3.5.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C18–C21, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 850)	6.9%	(1 in 14)	<0.1%	(1 in 4,800)	3.0%	(1 in 33)
45 years	0.4%	(1 in 240)	6.9%	(1 in 14)	0.1%	(1 in 960)	3.0%	(1 in 33)
55 years	1.2%	(1 in 83)	6.8%	(1 in 15)	0.4%	(1 in 280)	3.0%	(1 in 33)
65 years	2.4%	(1 in 42)	6.2%	(1 in 16)	0.9%	(1 in 120)	3.0%	(1 in 34)
75 years	3.3%	(1 in 31)	5.0%	(1 in 20)	1.5%	(1 in 65)	2.7%	(1 in 38)
Lifetime risk			6.9%	(1 in 15)			3.0%	(1 in 34)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 890)	5.5%	(1 in 18)	<0.1%	(1 in 4,800)	2.5%	(1 in 40)
45 years	0.3%	(1 in 300)	5.5%	(1 in 18)	0.1%	(1 in 1,300)	2.5%	(1 in 40)
55 years	0.8%	(1 in 130)	5.2%	(1 in 19)	0.2%	(1 in 490)	2.5%	(1 in 40)
65 years	1.4%	(1 in 70)	4.8%	(1 in 21)	0.5%	(1 in 210)	2.4%	(1 in 42)
75 years	2.2%	(1 in 45)	3.8%	(1 in 26)	1.0%	(1 in 96)	2.2%	(1 in 46)
Lifetime risk			5.5%	(1 in 18)			2.5%	(1 in 40)

Figure 3.5.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C18–C21, Germany 2013–2014

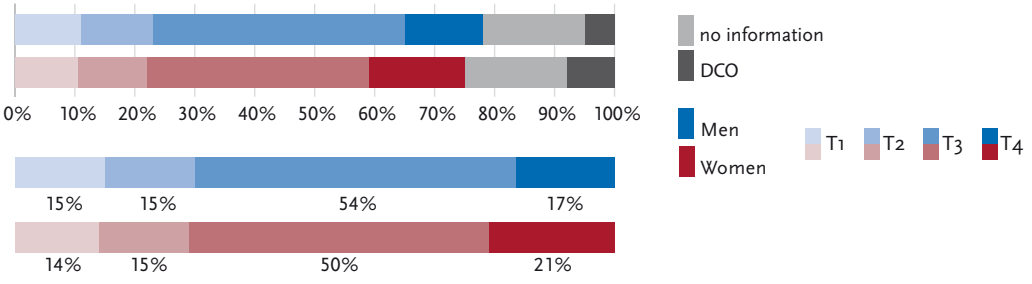


Figure 3.5.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C18–C21, Germany 2013–2014

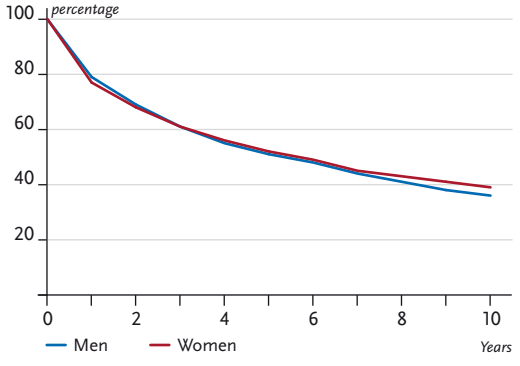


Figure 3.5.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C18–C21, Germany 2013–2014

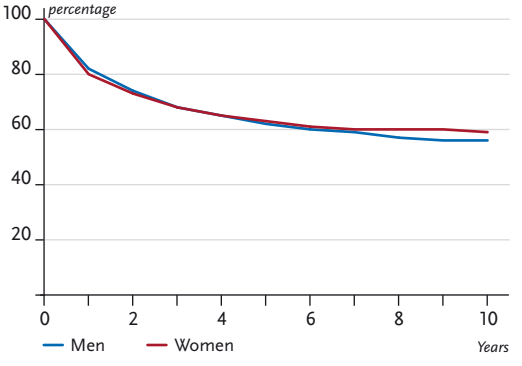


Figure 3.5.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C18–C21, 2013–2014
per 100,000 (old European Standard)

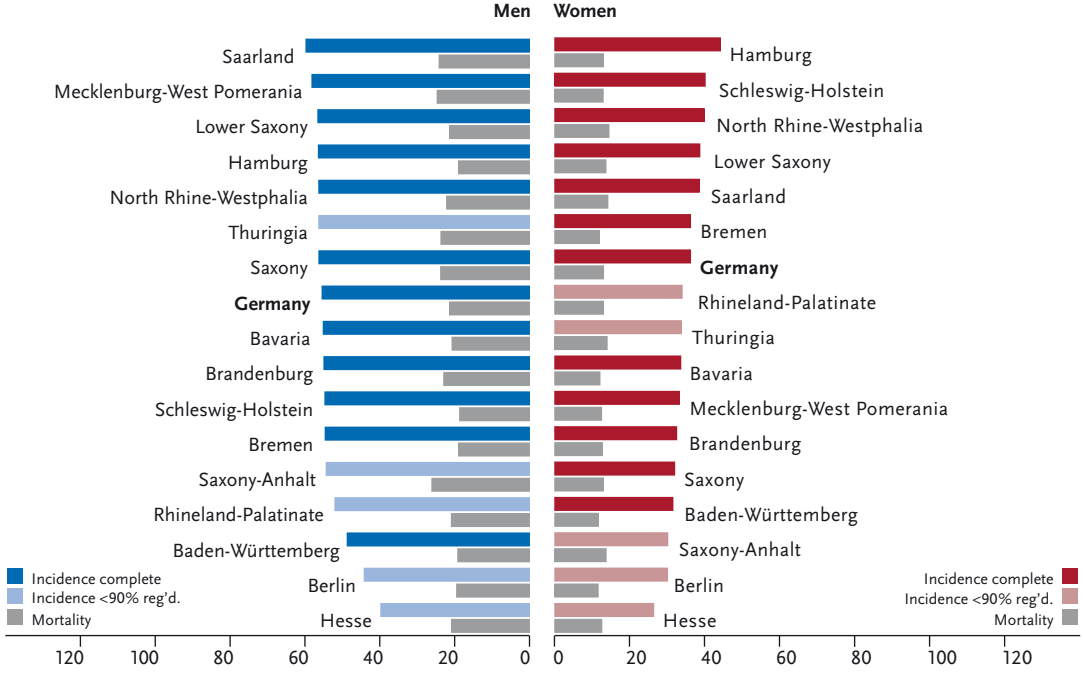
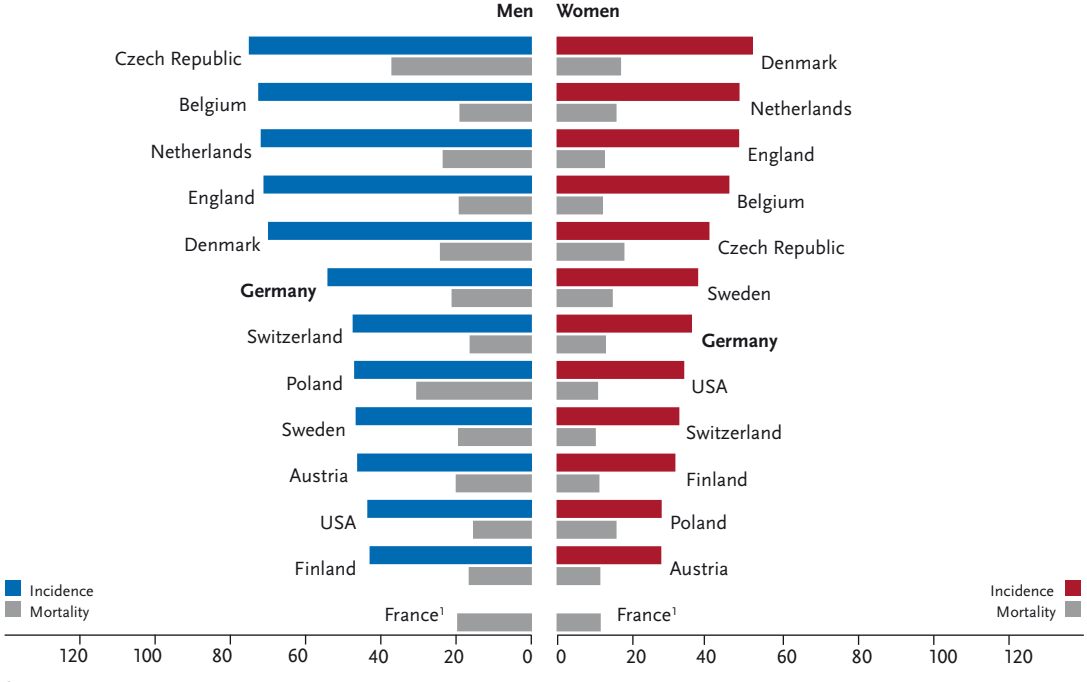


Figure 3.5.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C18–C21, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.6 Liver

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	6,240	2,700	6,370	2,710	7,200	3,100
Crude incidence rate[1]	15.8	6.6	16.1	6.6	17.9	7.5
Standardised incidence rate[1,2]	10.5	3.6	10.4	3.6	11.0	3.9
Median age at diagnosis	71	74	71	75		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	5,000	2,467	5,246	2,440	5,231	2,611
Crude mortality rate[1]	12.7	6.0	13.2	5.9	13.0	6.3
Standardised mortality rate[1,2]	8.1	3.0	8.2	2.9	8.1	3.1
Median age at death	72	76	73	76	73	76

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	8,300	3,200	10,500	4,400
Absolute survival rate (2013–2014)[3]	12 (7–17)	10 (8–16)	7 (4–10)	7 (5–13)
Relative survival rate (2013–2014)[3]	14 (9–19)	11 (9–18)	10 (6–13)	9 (7–18)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Although liver cancer is relatively rare, its poor prognosis means that it is one of the forms of cancer that is most likely to result in death. There are currently around 9,100 new cases per year in Germany and nearly 8,000 deaths. One in 84 men and one in 190 women in Germany will develop a malignant liver tumour during the course of their life. The 5-year relative survival rates are currently 14 % for men and 11 % for women.

Around 64 % of malignant tumours develop from liver cells (hepatocellular carcinomas), and 25 % from cells in the intrahepatic bile ducts (cholangiocarcinoma). The differences between these figures is wider among men than women.

Between 1999 and 2006, the age-standardised incidence and mortality rates rose slightly for both sexes. Among men this increase has been somewhat stronger and can be seen as early as the early 1980s. Since about 2006, however, the rates seem to have stabilised.

Currently, incidence and mortality rates in northwest Germany are somewhat lower than in other parts of the country. Finally, an international comparison shows high mortality rates in France, particularly among men: the rate in France is about three times higher than in the Netherlands.

Risk factors and early detection

Cirrhosis is the most important risk factor associated with liver cancer. In Germany, cirrhosis is usually caused by high levels of alcohol consumption and chronic hepatitis C infections. Non-alcoholic fatty liver disease also increases the risk of liver cancer. This condition may, for example, occur as a consequence of diabetes mellitus or metabolic syndrome. Metabolic syndrome is often triggered by obesity.

A chronic hepatitis B infection, even without liver cirrhosis, also constitutes a risk factor for liver cancer, as does smoking. The consumption of mouldy foods containing aflatoxin B1 (a toxin produced by mould) is particularly relevant in less developed countries. Finally, hereditary metabolic diseases such as hemochromatosis can also increase the risk of liver cancer.

No statutory liver of cancer screening programme has been implementedfor the general population. Regular ultrasound check-ups are recommended for all patients with liver cirrhosis, chronic hepatitis B or C infections, or fatty liver disease. Blood tests (for alpha-fetoprotein), in contrast, are only of minor relevance.

Figure 3.6.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C22, Germany 1999–2014/2015
per 100,000 (old European Standard)

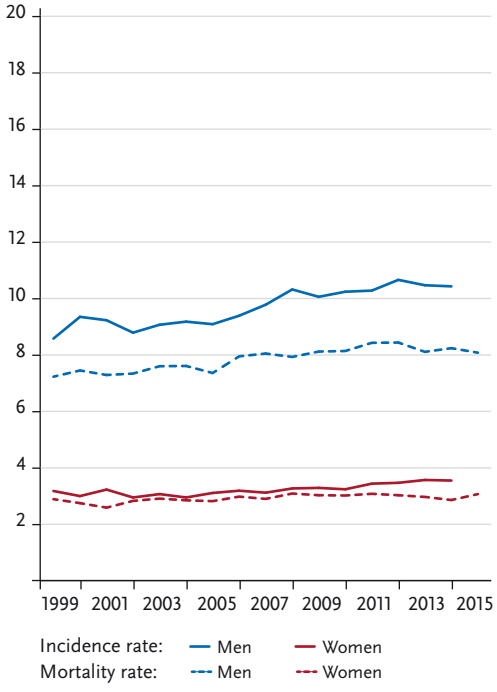


Figure 3.6.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C22, Germany 1999–2014/2015

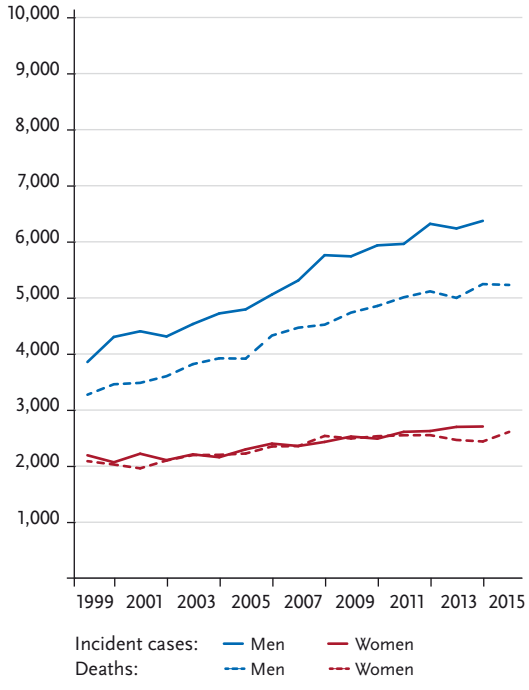


Figure 3.6.2
Age-specific incidence rates by sex, ICD-10 C22, Germany 2013–2014
per 100,000

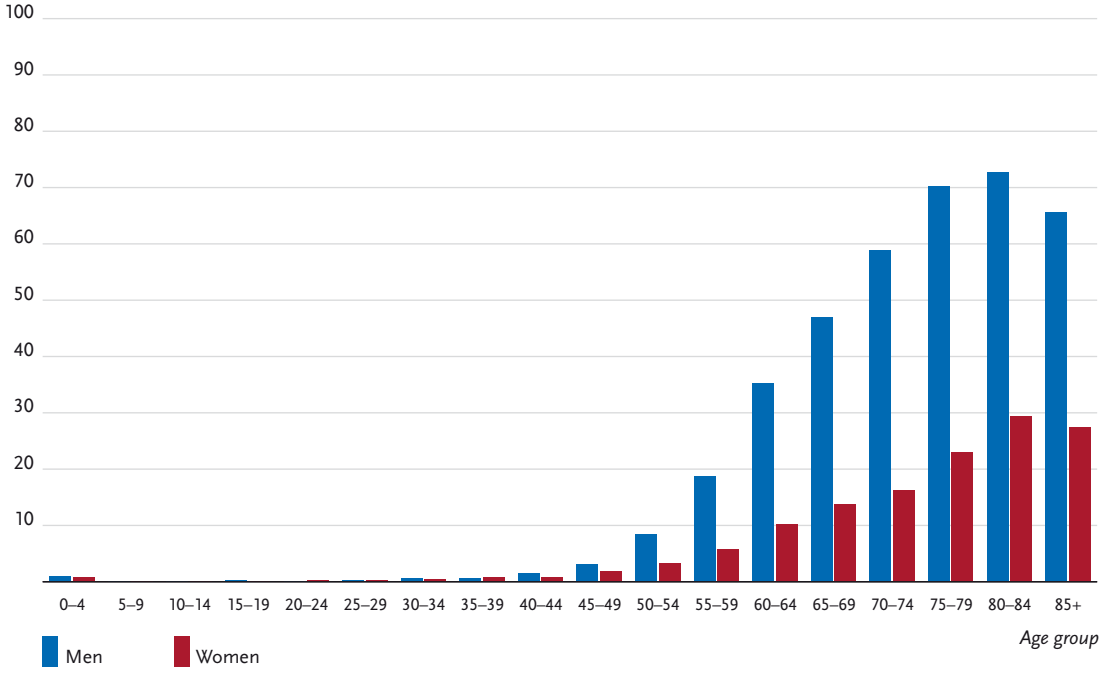


Table 3.6.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C22, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 8,800)	1.2%	(1 in 81)	<0.1%	(1 in 17,400)	1.0%	(1 in 98)
45 years	0.1%	(1 in 1,600)	1.2%	(1 in 81)	<0.1%	(1 in 2,300)	1.0%	(1 in 98)
55 years	0.3%	(1 in 390)	1.2%	(1 in 82)	0.2%	(1 in 560)	1.0%	(1 in 98)
65 years	0.5%	(1 in 220)	1.1%	(1 in 94)	0.4%	(1 in 270)	0.9%	(1 in 110)
75 years	0.5%	(1 in 180)	0.8%	(1 in 130)	0.5%	(1 in 210)	0.7%	(1 in 140)
Lifetime risk			1.2%	(1 in 82)			1.0%	(1 in 100)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 13,000)	0.5%	(1 in 190)	<0.1%	(1 in 13,200)	0.5%	(1 in 210)
45 years	<0.1%	(1 in 3,600)	0.5%	(1 in 190)	<0.1%	(1 in 5,400)	0.5%	(1 in 210)
55 years	0.1%	(1 in 1,200)	0.5%	(1 in 200)	0.1%	(1 in 1,700)	0.5%	(1 in 210)
65 years	0.1%	(1 in 700)	0.4%	(1 in 230)	0.1%	(1 in 810)	0.4%	(1 in 230)
75 years	0.2%	(1 in 460)	0.3%	(1 in 300)	0.2%	(1 in 470)	0.4%	(1 in 280)
Lifetime risk			0.5%	(1 in 190)			0.5%	(1 in 210)

Figure 3.6.3
Distribution of T-stages at first diagnosis by sex
Not presented due to the large proportion of missing data.

Figure 3.6.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C22, Germany 2013–2014

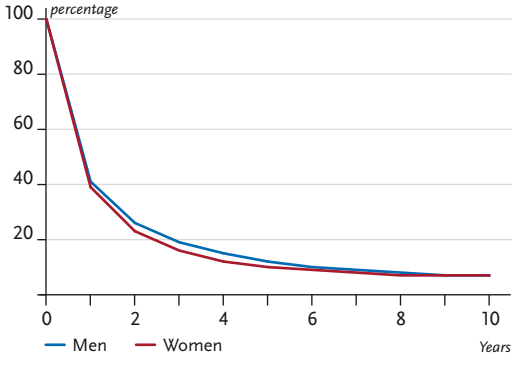


Figure 3.6.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C22, Germany 2013–2014

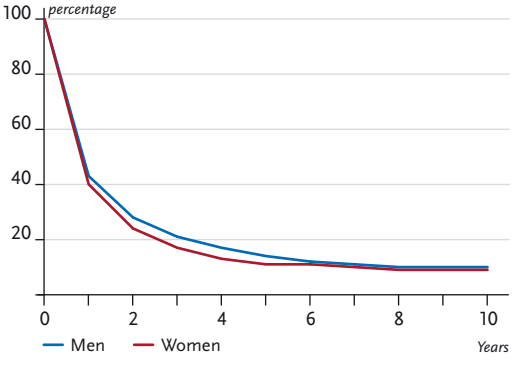


Figure 3.6.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C22, 2013–2014
per 100,000 (old European Standard)

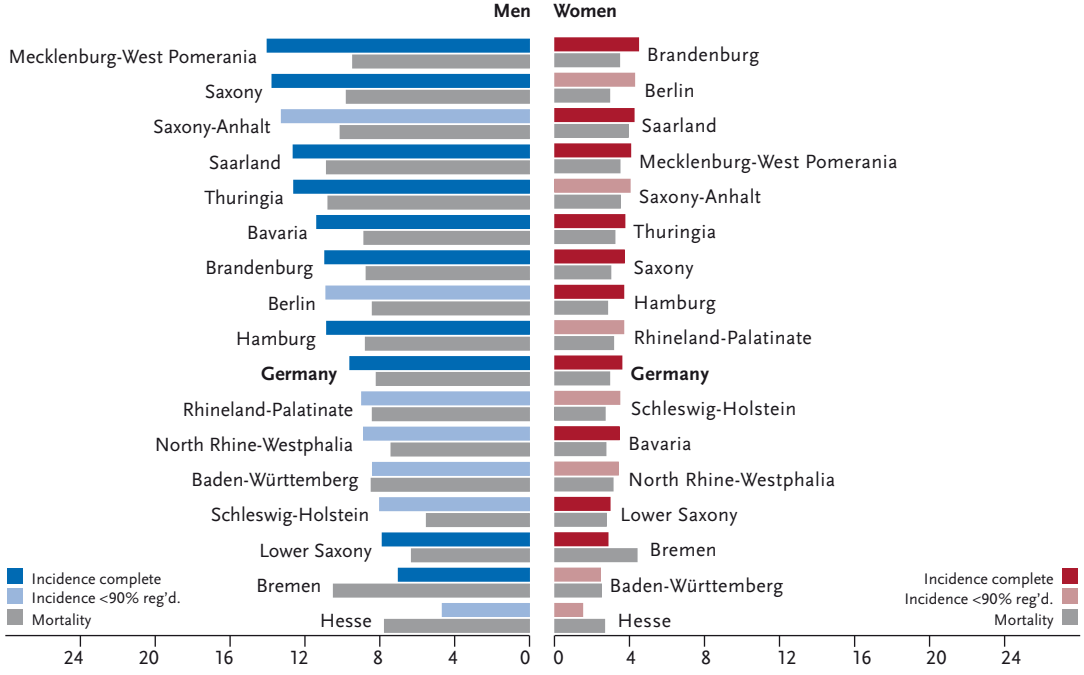
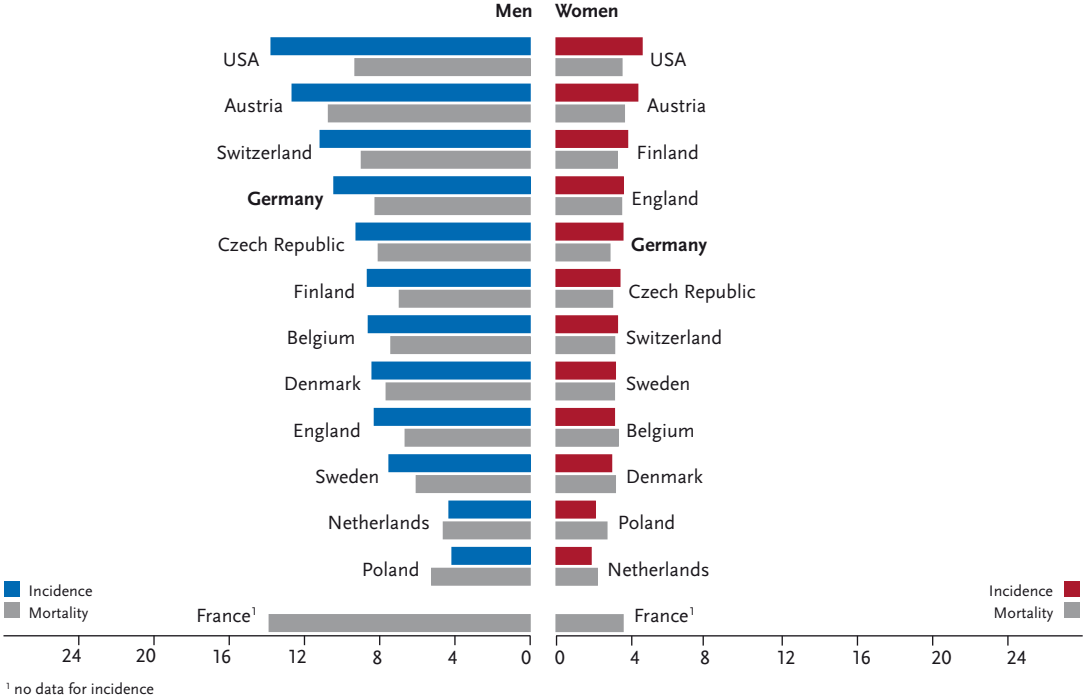


Figure 3.6.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C22, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.7 Gall bladder and biliary tract

Table 3.7.1
Overview of key epidemiological parameters for Germany, ICD-10 C23–C24

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	2,460	3,030	2,380	2,990	2,600	2,600
Crude incidence rate[1]	6.2	7.4	6.0	7.2	6.3	6.3
Standardised incidence rate[1,2]	3.9	3.6	3.7	3.4	3.7	2.9
Median age at diagnosis	73	76	74	77		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	1,489	2,086	1,544	2,199	1,611	2,090
Crude mortality rate[1]	3.8	5.1	3.9	5.3	4.0	5.0
Standardised mortality rate[1,2]	2.3	2.3	2.4	2.3	2.4	2.2
Median age at death	74	78	75	78	75	78

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	4,000	4,000	5,400	5,700
Absolute survival rate (2013–2014)[3]	17 (12–21)	15 (12–20)	11 (7–14)	10 (7–16)
Relative survival rate (2013–2014)[3]	21 (14–25)	18 (14–23)	17 (9–22)	16 (12–26)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In Germany, about 5,370 new malignant gallbladder tumours and extrahepatic tumours of the biliary tracts were diagnosed in 2014 (gall bladder: 35 %; biliary tract: 65 %). Among women, roughly equal proportions of these two types of cancer were recorded: 46 % gallbladder cancer versus 54 % cancer of the biliary tract. Among men, however,, tumours of the extrahepatic biliary tracts are much more common (79 %). In terms of histology, the majority of gall bladder and biliary tract cancers are adenocarcinomas; about 12 % of biliary tract cancers were »Klatskin tumours«.

As with liver cancer, the risk of developing this type of cancer increases steadily with age. One in every 170 women and one in every 200 men will develop gall bladder or biliary tract cancer during the course of their life.

Since 1999, age-standardised incidence rates in Germany have declined among women (particularly with regard to gall bladder cancer), but have remained largely unchanged among men. Age-standardised mortality rates dropped until around 2009, after which they began to rise slightly among men. Both sexes have seen reductions in gall bladder cancer incidence and death rates.

The 5-year relative survival rates for malignant tumours of the gall bladder and biliary tract are quite low at 18 % for women and 21 % for men.

Risk factors

Factors that cause bile duct and gallbladder carcinomas have not yet been clearly established, although severe obesity is considered to be a risk factor associated with both tumours. Gallbladder polyps, inflammation of the gallbladder, and gallbladder stones can increase the risk of gallbladder carcinomas.

Possible risk factors associated with bile duct carcinomas include chronic inflammatory diseases of the bile ducts, such as primary sclerosing cholangitis (PSC), congenital anomalies of the biliary tract (Caroli syndrome), bile duct stones in the liver, choledochal cysts, diabetes mellitus (diabetes mellitus), hepatitis B and C virus infections, liver diseases due to high levels of alcohol consumption, chronic inflammatory bowel disease and smoking. In Asia, in particular, parasitic liver flukes are also linked to carcinomas of the bile ducts and gallbladder.

Figure 3.7.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C23–C24, Germany 1999–2014/2015
per 100,000 (old European Standard)

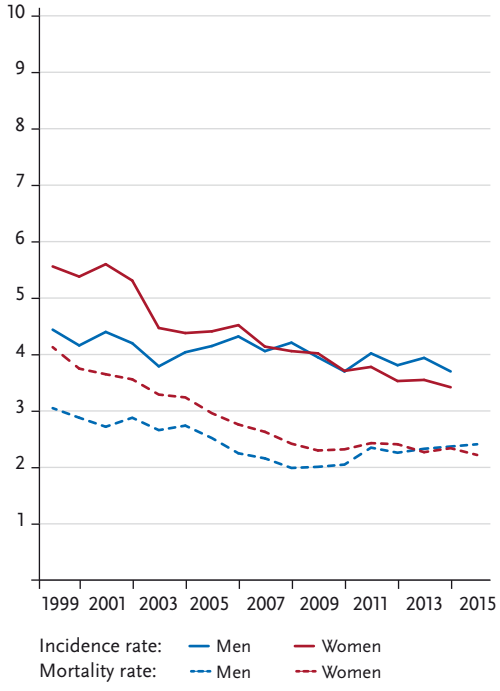


Figure 3.7.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C23–C24, Germany 1999–2014/2015

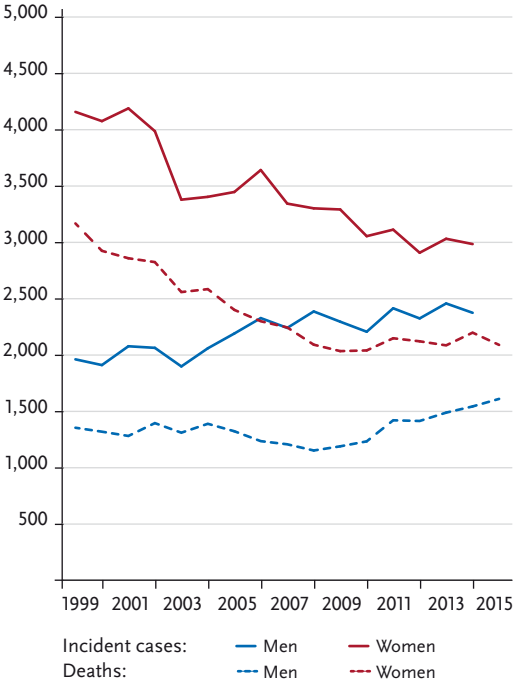


Figure 3.7.2
Age-specific incidence rates by sex, ICD-10 C23–C24, Germany 2013–2014
per 100,000

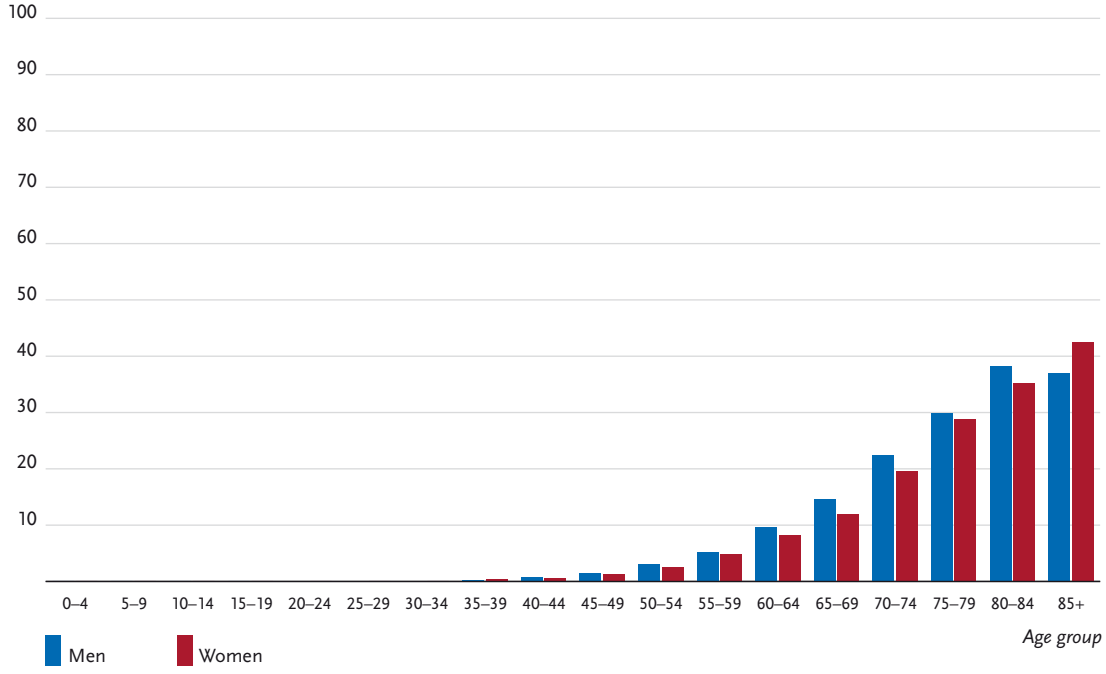


Table 3.7.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C23–C24, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 18,700)	0.5%	(1 in 200)	<0.1%	(1 in 62,300)	0.3%	(1 in 310)
45 years	<0.1%	(1 in 4,100)	0.5%	(1 in 200)	<0.1%	(1 in 10,700)	0.3%	(1 in 310)
55 years	0.1%	(1 in 1,400)	0.5%	(1 in 200)	<0.1%	(1 in 2,900)	0.3%	(1 in 310)
65 years	0.2%	(1 in 580)	0.5%	(1 in 210)	0.1%	(1 in 920)	0.3%	(1 in 310)
75 years	0.3%	(1 in 380)	0.4%	(1 in 260)	0.2%	(1 in 600)	0.3%	(1 in 370)
Lifetime risk			0.5%	(1 in 200)			0.3%	(1 in 320)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 17,600)	0.6%	(1 in 170)	<0.1%	(1 in 56,500)	0.4%	(1 in 240)
45 years	<0.1%	(1 in 4,800)	0.6%	(1 in 170)	<0.1%	(1 in 9,100)	0.4%	(1 in 240)
55 years	0.1%	(1 in 1,500)	0.6%	(1 in 170)	<0.1%	(1 in 2,600)	0.4%	(1 in 240)
65 years	0.2%	(1 in 640)	0.6%	(1 in 180)	0.1%	(1 in 1,100)	0.4%	(1 in 250)
75 years	0.3%	(1 in 380)	0.5%	(1 in 220)	0.2%	(1 in 520)	0.4%	(1 in 280)
Lifetime risk			0.6%	(1 in 170)			0.4%	(1 in 240)

Figure 3.7.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C23–C24, Germany 2013–2014

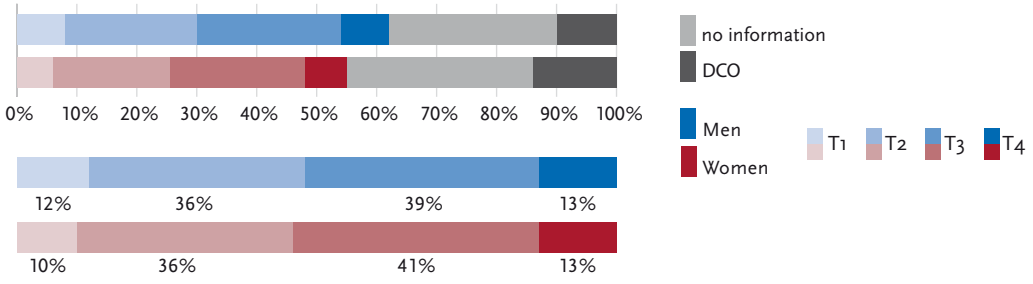


Figure 3.7.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C23–C24, Germany 2013–2014

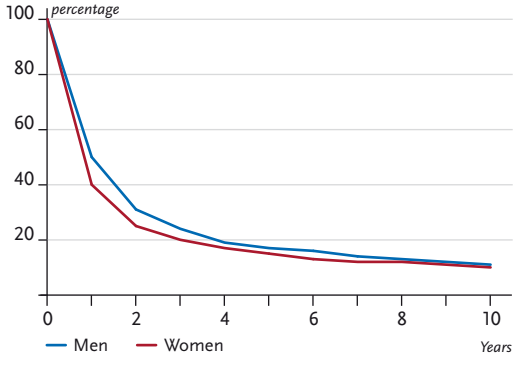


Figure 3.7.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C23–C24, Germany 2013–2014

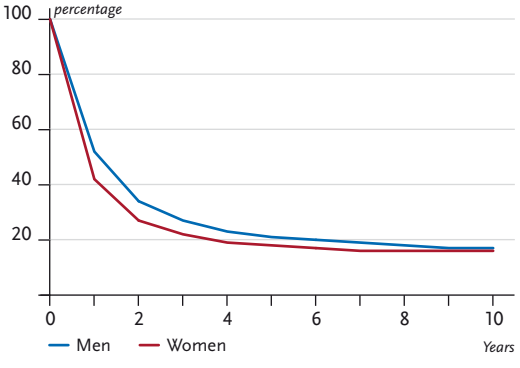


Figure 3.7.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C23–C24, 2013–2014
per 100,000 (old European Standard)

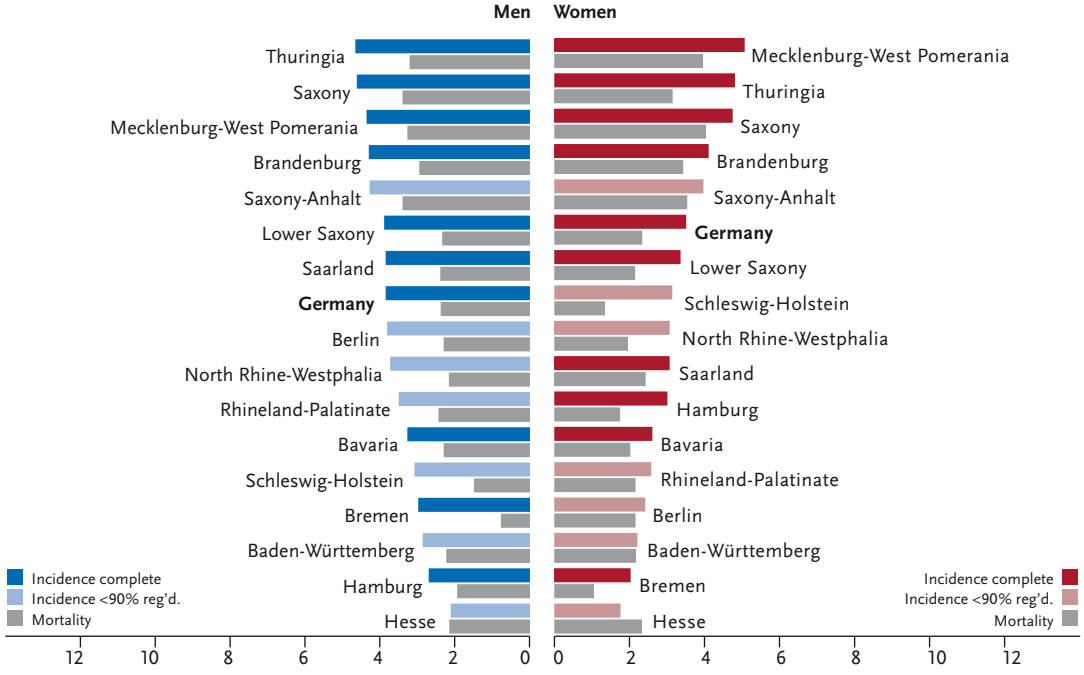
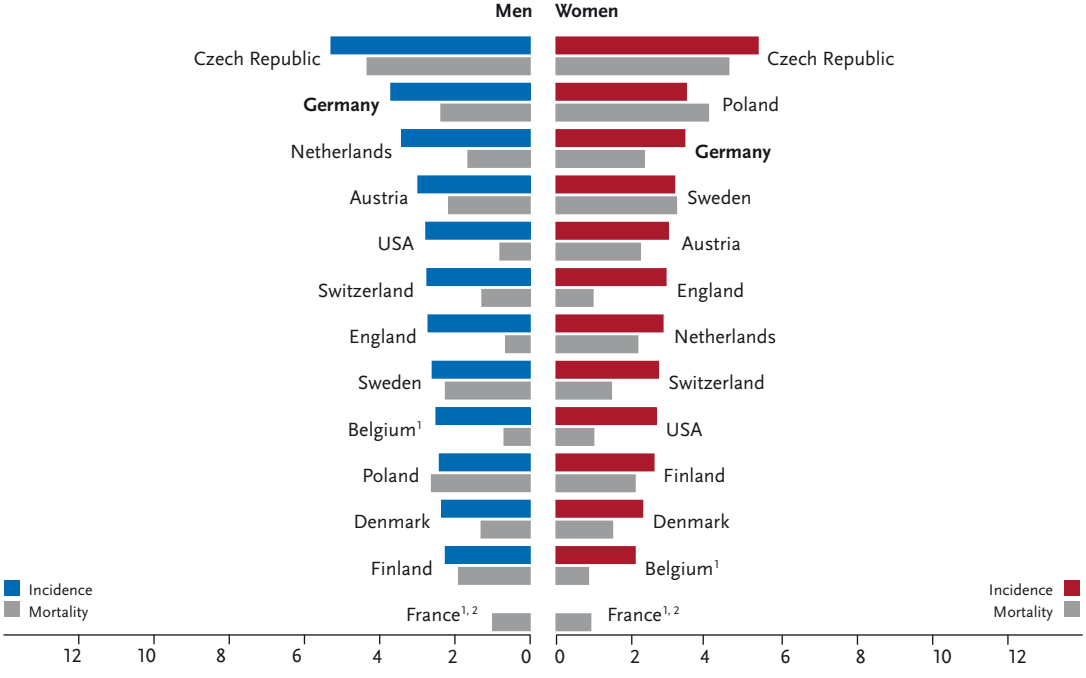


Figure 3.7.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C23–C24, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] mortality only 2013
[2] no data for incidence

3.8 Pancreas

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	8,750	8,690	8,550	8,580	9,500	9,500
Crude incidence rate[1]	22.2	21.1	21.6	20.8	23.5	22.9
Standardised incidence rate[1,2]	14.5	10.7	13.9	10.4	14.4	11.1
Median age at diagnosis	72	75	72	75		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	8,273	8,328	8,231	8,384	8,497	8,659
Crude mortality rate[1]	21.0	20.2	20.7	20.3	21.2	20.9
Standardised mortality rate[1,2]	13.4	9.7	13.0	9.5	13.2	9.8
Median age at death	73	77	73	77	73	77

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	8,900	8,800	10,900	11,000
Absolute survival rate (2013–2014)[3]	8 (7–10)	9 (7–12)	5 (4–8)	6 (5–8)
Relative survival rate (2013–2014)[3]	9 (8–12)	10 (7–14)	8 (6–11)	8 (6–11)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, around 17,100 people developed pancreatic cancer. Due to its unfavourable prognosis, almost as many people died of the disease. Since the 1990s, the age-standardised incidence and mortality rates have increased slightly, particularly among women. This development is especially evident among people aged 65 or older. The absolute numbers of new cases and deaths have steadily increased over the years in both genders; a factor that is also linked to demographics.

Malignant neoplasms of the pancreas frequently cause no or non-specific symptoms in their early stages, meaning that they often go undetected until a later stage. This results in a correspondingly unfavourable 5-year relative survival rate of just 9 % for men and 10 % for women, although rare malignant pancreatic islet cell tumours are associated with a significantly better prognosis. Pancreatic carcinomas also lead to the lowest survival rates among all forms of cancer. They are also the fourth most common cause of death by cancer among women (8.2 %) and men (6.8 %), with a median age at diagnosis of 72 for men and 75 for women.

Risk factors

Passive and active smoking have been confirmed as risk factors associated with pancreatic cancer. Severe overweight (adiposity) and diabetes (type 2) as well as a very high level of alcohol consumption have negative impacts on health in this respect.

Patients with chronic inflammation of the pancreas (pancreatitis) also have an increased risk of developing pancreatic cancer. An above-average incidence of this disease is also found among first-degree relatives of pancreatic cancer patients. It is unclear whether this is due to a shared hereditary disposition or lifestyle.

Frequent consumption of processed meats and smoked or grilled foods may also increase the risk of pancreatic cancer.

The role played by environmental factors and occupational exposure to harmful substances is still unclear. However, contact with pesticides, herbicides and fungicides may increase the risk of pancreatic carcinoma. Chlorinated hydrocarbons, chromium and chromium compounds, electromagnetic fields and fuel vapour are also suspected of increasing the risk of pancreatic carcinoma.

Figure 3.8.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C25, Germany 1999–2014/2015
per 100,000 (old European Standard)

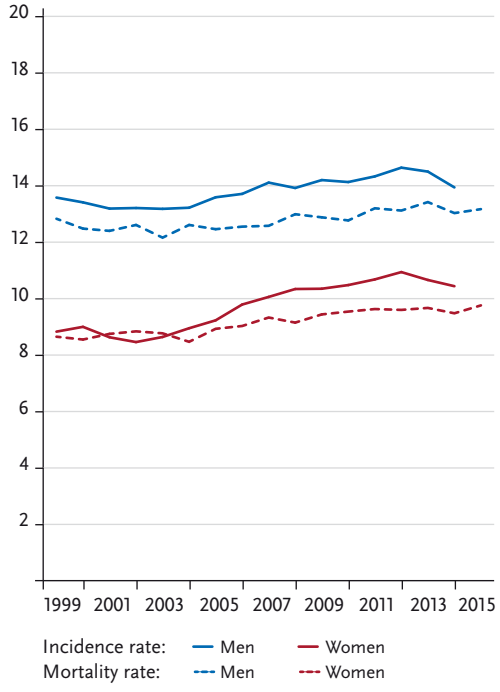


Figure 3.8.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C25, Germany 1999–2014/2015

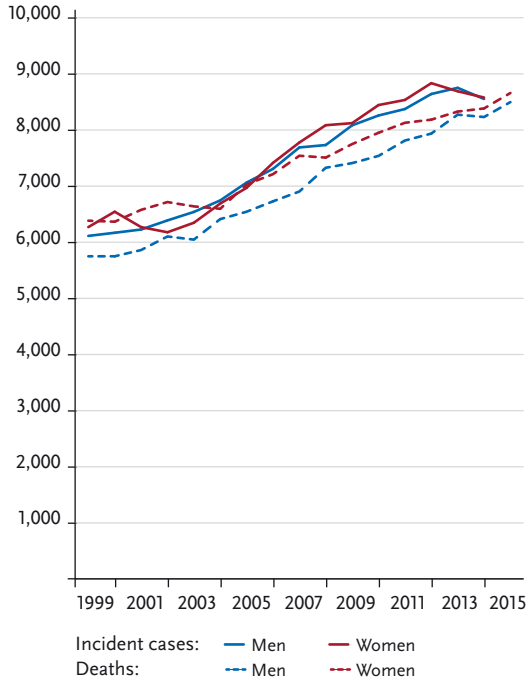


Figure 3.8.2
Age-specific incidence rates by sex, ICD-10 C25, Germany 2013–2014
per 100,000

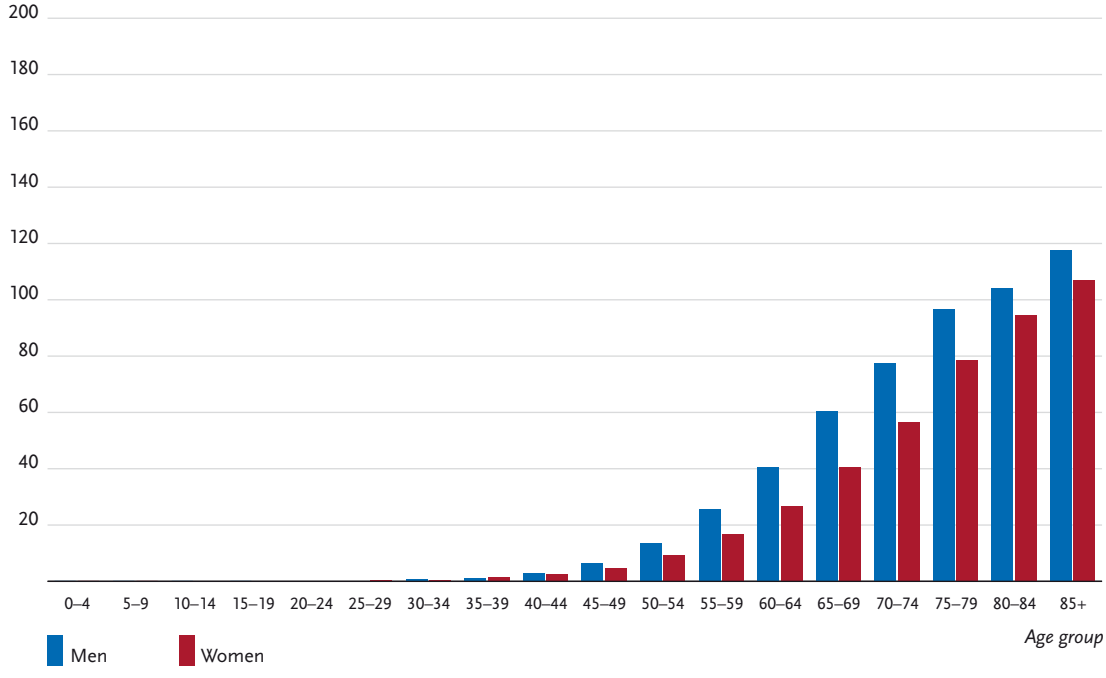


Table 3.8.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C25, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 4,300)	1.8%	(1 in 57)	<0.1%	(1 in 5,600)	1.7%	(1 in 59)
45 years	0.1%	(1 in 960)	1.8%	(1 in 57)	0.1%	(1 in 1,200)	1.7%	(1 in 58)
55 years	0.3%	(1 in 310)	1.7%	(1 in 58)	0.3%	(1 in 360)	1.7%	(1 in 59)
65 years	0.6%	(1 in 160)	1.6%	(1 in 64)	0.6%	(1 in 170)	1.6%	(1 in 64)
75 years	0.8%	(1 in 130)	1.2%	(1 in 86)	0.8%	(1 in 120)	1.2%	(1 in 80)
Lifetime risk			1.7%	(1 in 57)			1.7%	(1 in 59)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 4,900)	1.7%	(1 in 59)	<0.1%	(1 in 9,100)	1.7%	(1 in 60)
45 years	0.1%	(1 in 1,400)	1.7%	(1 in 59)	0.1%	(1 in 1,800)	1.7%	(1 in 60)
55 years	0.2%	(1 in 460)	1.7%	(1 in 60)	0.2%	(1 in 580)	1.6%	(1 in 61)
65 years	0.5%	(1 in 220)	1.5%	(1 in 66)	0.4%	(1 in 230)	1.5%	(1 in 65)
75 years	0.7%	(1 in 140)	1.2%	(1 in 83)	0.7%	(1 in 140)	1.3%	(1 in 79)
Lifetime risk			1.7%	(1 in 59)			1.6%	(1 in 61)

Figure 3.8.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C25, Germany 2013–2014

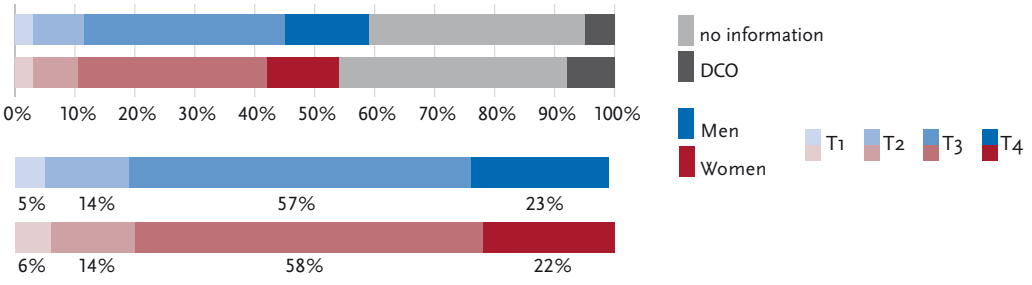


Figure 3.8.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C25, Germany 2013–2014

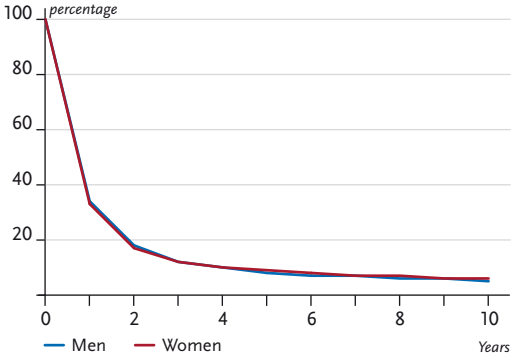


Figure 3.8.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C25, Germany 2013–2014

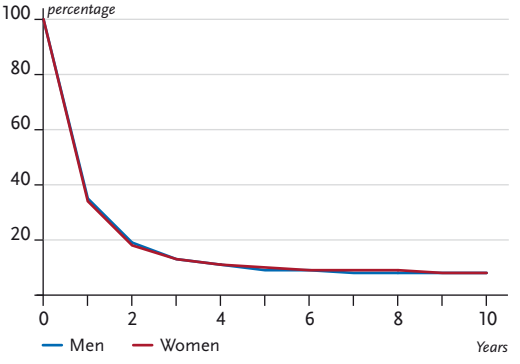


Figure 3.8.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C25, 2013–2014
per 100,000 (old European Standard)

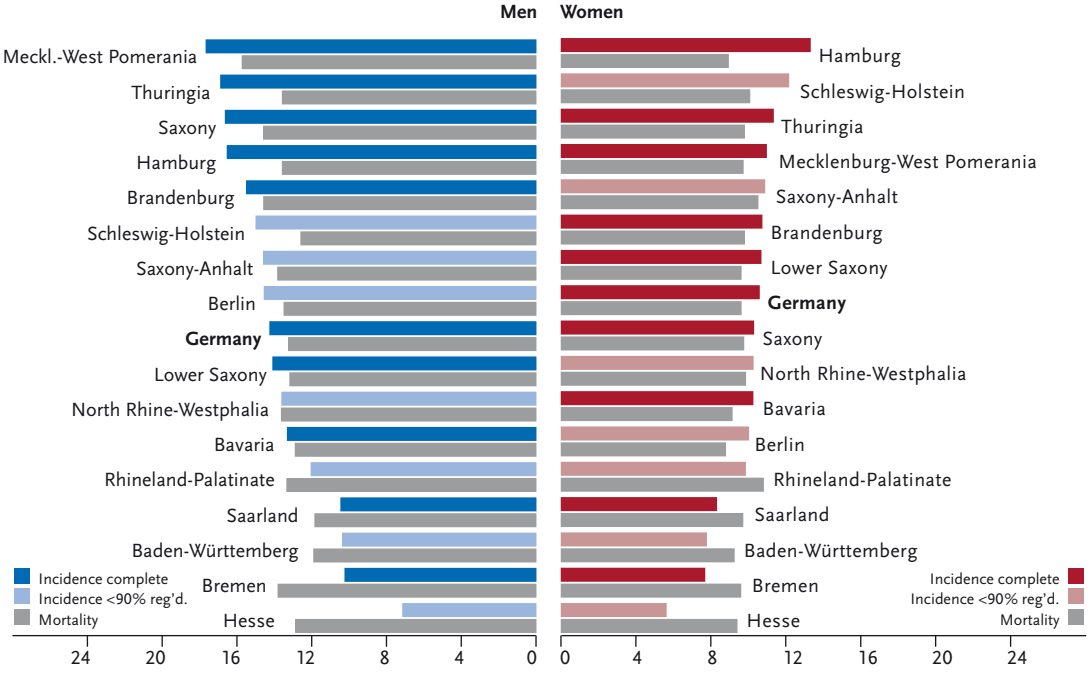
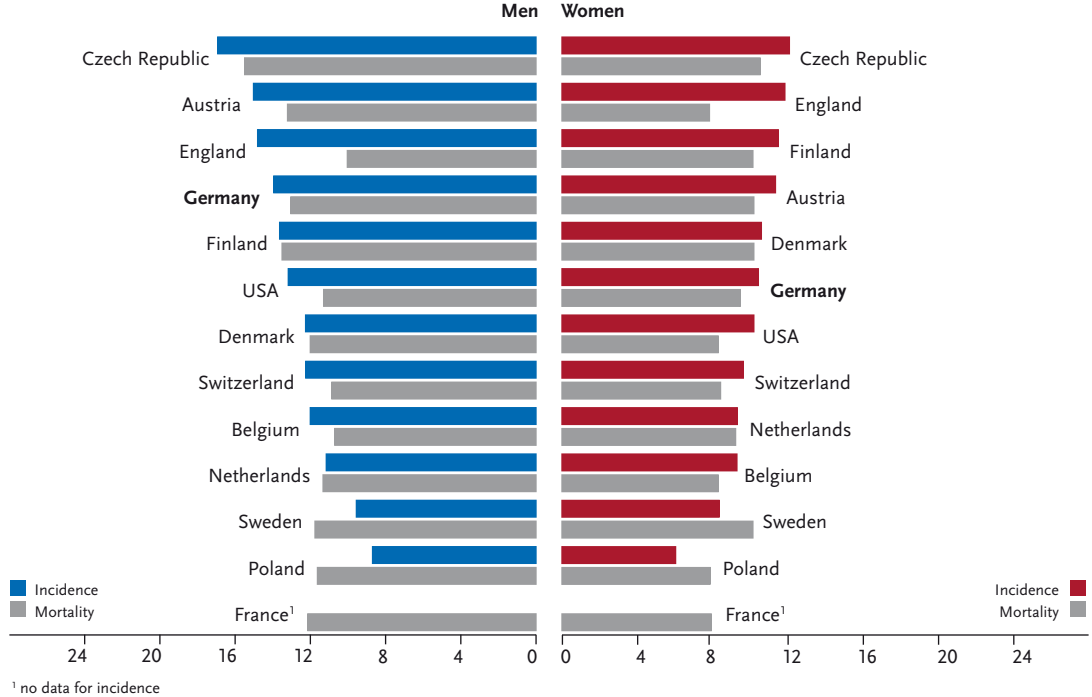


Figure 3.8.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C25, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.9 Larynx

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	3,050	540	2,980	520	2,900	600
Crude incidence rate[1]	7.7	1.3	7.5	1.3	7.1	1.5
Standardised incidence rate[1,2]	5.4	0.9	5.3	0.9	4.8	1.0
Median age at diagnosis	66	64	66	65		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	1,254	230	1,301	224	1,291	205
Crude mortality rate[1]	3.2	0.6	3.3	0.5	3.2	0.5
Standardised mortality rate[1,2]	2.2	0.3	2.2	0.3	2.1	0.3
Median age at death	69	68	71	70	70	69

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	10,900	1,800	18,500	2,900
Absolute survival rate (2013–2014)[3]	55 (49–59)	59	37 (29–42)	40
Relative survival rate (2013–2014)[3]	63 (56–66)	64	49 (39–54)	48

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Laryngeal cancer originates almost exclusively from squamous cells. Men are affected by laryngeal cancer considerably more often than women due to higher levels of consumption of tobacco products and alcohol. Over the course of a person's life, one in 180 men, but just one in 1,000 women in Germany develops cancer of the larynx. The median age at diagnosis is 65 years for women and 66 years for men; this is earlier than the average age for all types of cancer. Age-specific disease rates for cancer of the larynx are highest in women aged between 55 and 75 years, and men aged between 65 and 75 years; incidence and mortality rates among men have been declining since the early 1980s. However, despite significant increases during the late 1980s and the 1990s, since the turn of the millennium, rates among women have remained largely unchanged. Demographic changes have led women to experience an increase in the absolute number of deaths and morbidity rates from laryngeal cancer, and this is particularly the case among older women. In contrast, the absolute number of cases among men has reduced slightly. There is no significant difference between 5-year relative survival rates in men and women, with 63 % for men, and 64 % for women. A higher proportion (44 %) of early tumour stages (T1) is diagnosed among men than women (37 %).

Risk factors

Smoking is the most important risk factor associated with the development of laryngeal cancer. Alcohol consumption also increases the likelihood of the condition, with the combination of both being particularly harmful. The influences of lifestyle and diet are still unclear, because, in the majority of cases, tobacco and alcohol consumption superimposeother risk factors. However, there are indications that increased consumption of red meat, and a vitamin-deficient diet may also be linked to an increased risk of laryngeal cancer. There is a known link between tumours of the larynx and occupational exposure to asbestos, nickel, chromates, arsenics and polycyclic aromatic hydrocarbons. The role of infections with human papilloma viruses (HPV) has yet to be completely clarified. There are indications that infections with Helicobacter pylori may also be of significance.

First-degree relatives of patients with a laryngeal carcinoma have a higher risk of developing this cancer themselves.

Figure 3.9.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C32, Germany 1999–2014/2015
per 100,000 (old European Standard)

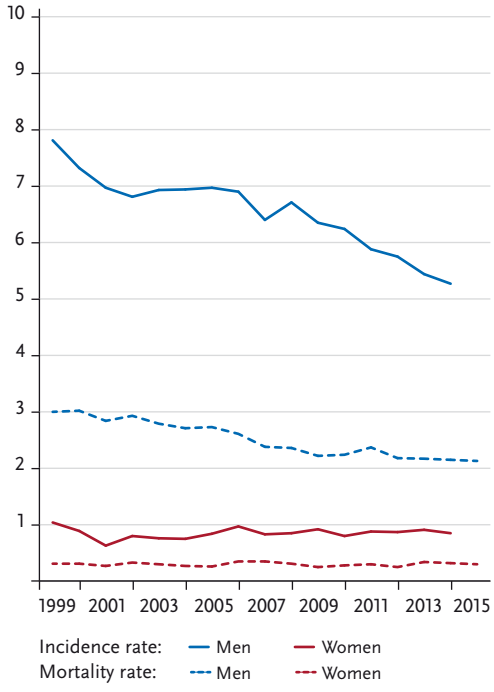


Figure 3.9.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C32, Germany 1999–2014/2015

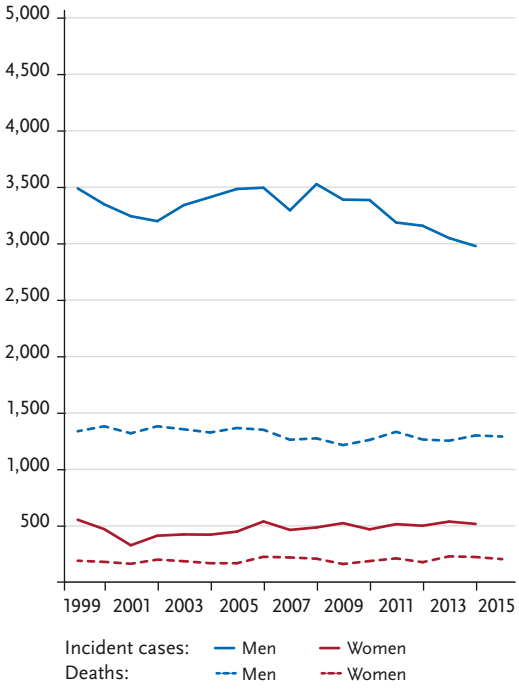


Figure 3.9.2
Age-specific incidence rates by sex, ICD-10 C32, Germany 2013–2014
per 100,000

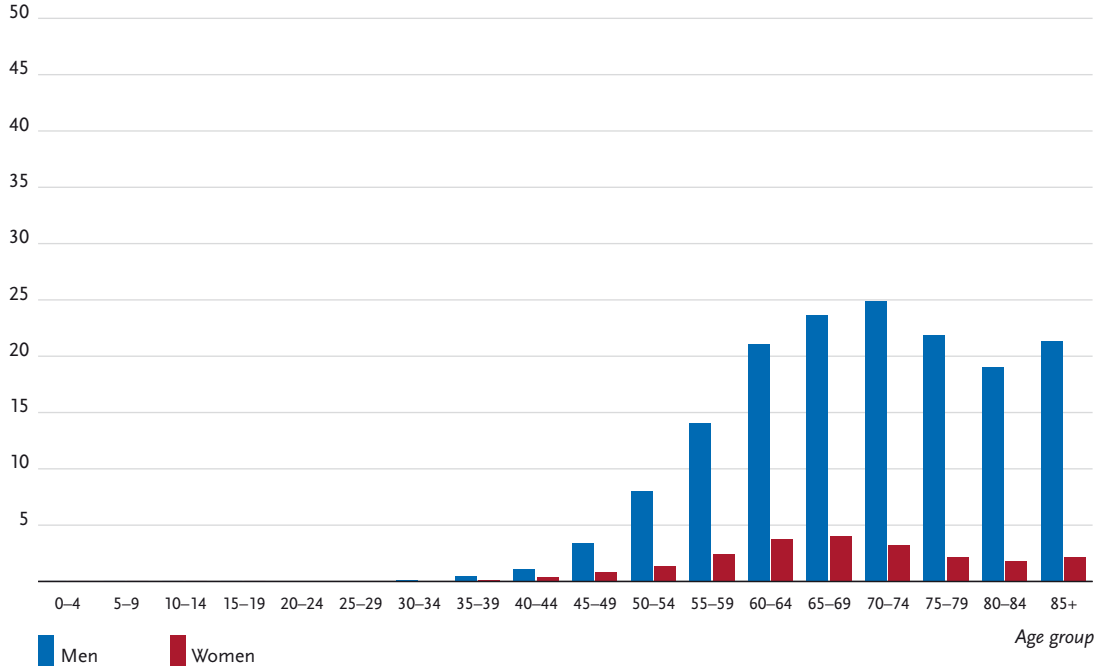


Table 3.9.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C32, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 11,000)	0.6%	(1 in 170)	<0.1%	(1 in 50,000)	0.2%	(1 in 400)
45 years	0.1%	(1 in 1,700)	0.6%	(1 in 170)	<0.1%	(1 in 6,300)	0.3%	(1 in 400)
55 years	0.2%	(1 in 600)	0.5%	(1 in 190)	0.1%	(1 in 1,600)	0.2%	(1 in 410)
65 years	0.2%	(1 in 450)	0.4%	(1 in 240)	0.1%	(1 in 1,000)	0.2%	(1 in 490)
75 years	0.2%	(1 in 580)	0.2%	(1 in 420)	0.1%	(1 in 1,200)	0.1%	(1 in 760)
Lifetime risk			0.6%	(1 in 180)			0.2%	(1 in 410)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 40,500)	0.1%	(1 in 1,000)	<0.1%	(1 in 298,900)	<0.1%	(1 in 2,300)
45 years	<0.1%	(1 in 8,100)	0.1%	(1 in 1,000)	<0.1%	(1 in 31,600)	<0.1%	(1 in 2,300)
55 years	<0.1%	(1 in 3,300)	0.1%	(1 in 1,200)	<0.1%	(1 in 8,700)	<0.1%	(1 in 2,400)
65 years	<0.1%	(1 in 2,900)	0.1%	(1 in 1,700)	<0.1%	(1 in 7,100)	<0.1%	(1 in 3,100)
75 years	<0.1%	(1 in 5,700)	<0.1%	(1 in 3,700)	<0.1%	(1 in 8,400)	<0.1%	(1 in 4,900)
Lifetime risk			0.1%	(1 in 1,000)			<0.1%	(1 in 2,300)

Figure 3.9.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C32, Germany 2013–2014

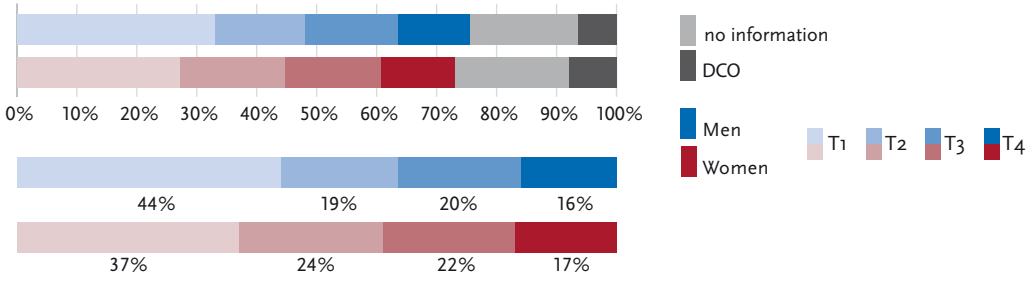


Figure 3.9.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C32, Germany 2013–2014

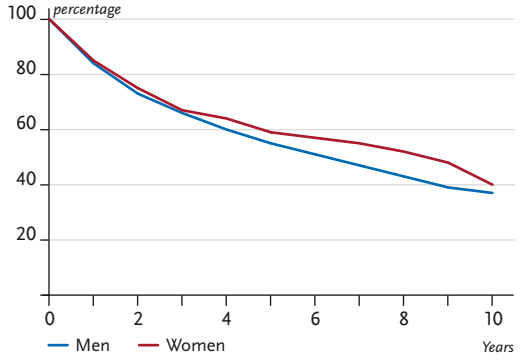


Figure 3.9.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C32, Germany 2013–2014

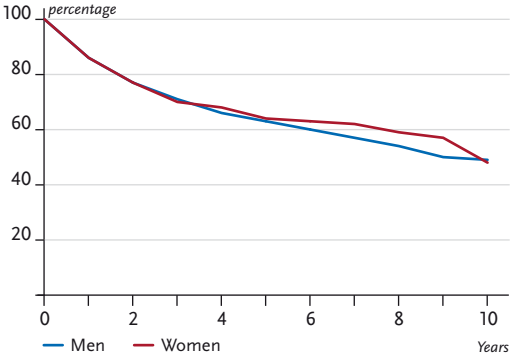


Figure 3.9.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C32, 2013–2014
per 100,000 (old European Standard)

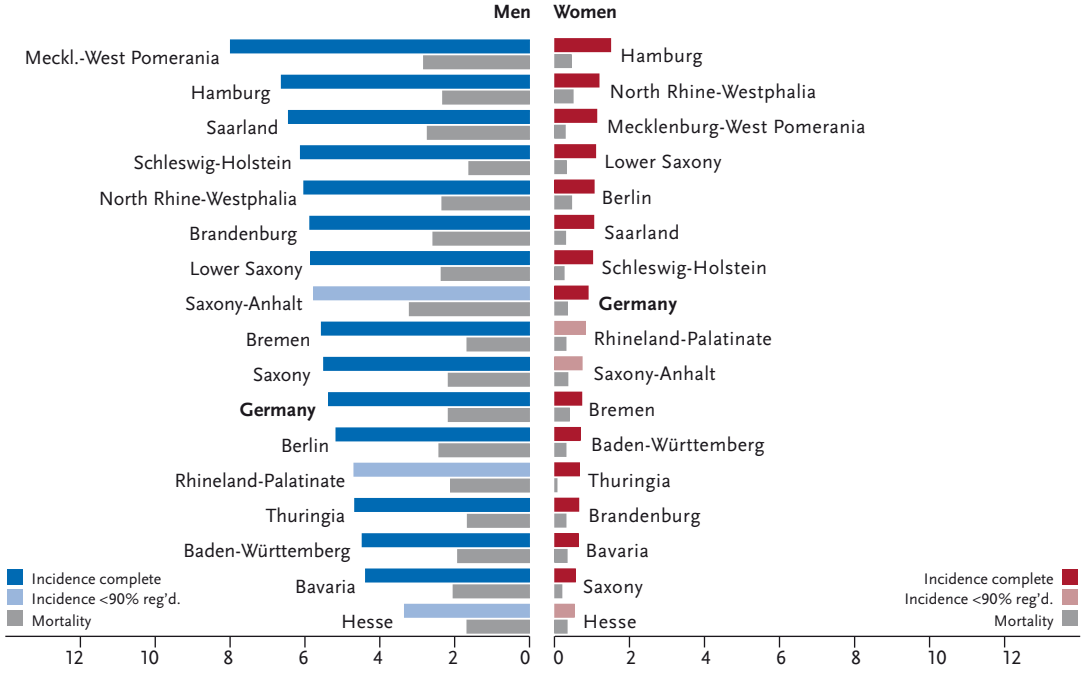
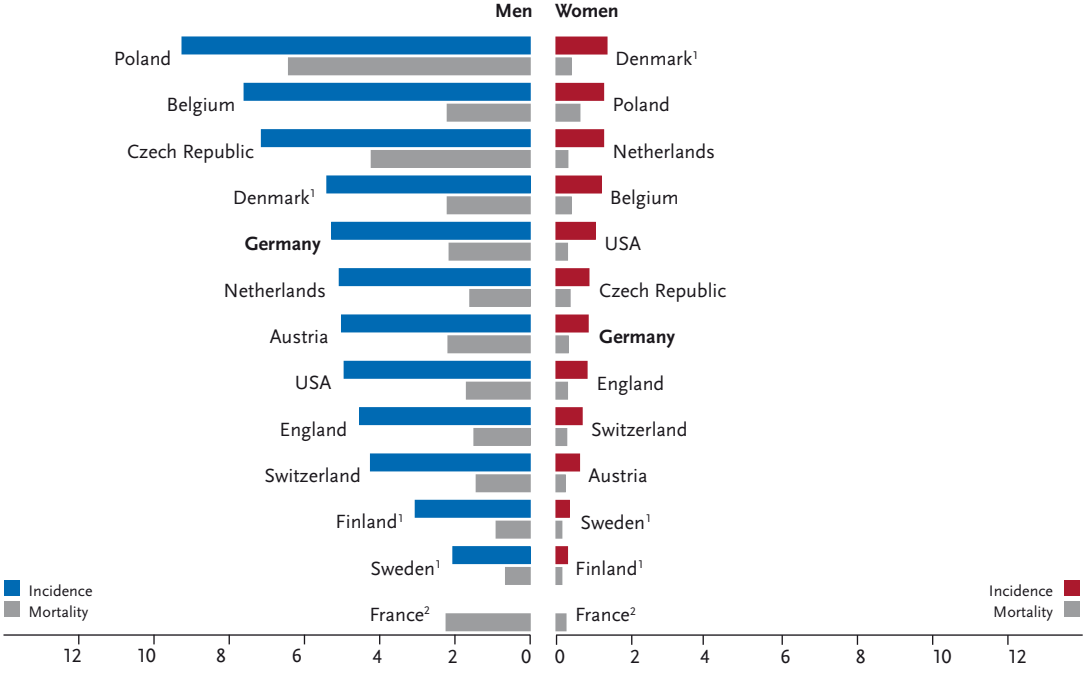


Figure 3.9.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C32, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data with C10.1 (Anterior surface of epiglottis)
[2] no data for incidence

3.10 Lung

Table 3.10.1
Overview of key epidemiological parameters for Germany, ICD-10 C33–C34

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	35,310	19,200	34,560	19,280	33,700	22,000
Crude incidence rate[1]	89.5	46.6	87.1	46.7	83.7	52.9
Standardised incidence rate[1,2]	59.6	29.1	57.3	29.0	53.1	31.8
Median age at diagnosis	70	69	70	69		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	29,708	15,140	29,560	15,524	29,378	15,881
Crude mortality rate[1]	75.3	36.8	74.5	37.6	73.1	38.3
Standardised mortality rate[1,2]	48.8	21.7	47.6	21.7	46.6	22.1
Median age at death	72	71	72	71	72	71

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	49,400	32,100	67,800	43,600
Absolute survival rate (2013–2014)[3]	13 (12–15)	18 (17–21)	8 (7–10)	12 (11–14)
Relative survival rate (2013–2014)[3]	15 (14–18)	20 (18–23)	11 (9–14)	16 (14–19)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, about 19,300 women and 34,500 men were diagnosed with malignant tumours of the lungs; 15,524 women and 29,560 men died of the disease.

Age-standardised incidence and mortality rates show opposing trends among men and women. Rates have risen continuously since the end of the 1990s among women, but they have decreased over the same period among men. These diverging trends can be attributed to changes in smoking habits that occurred in the past and which will probably continue to have an impact in the future. Lung cancer has one of the least favourable prognoses as it is associated with relatively low 5-year survival rates: 20 % for women and 15 % for men. In terms of histology, there are three main types of lung cancer: adenocarcinomas account for about half of all cases; squamous-cell carcinomas account for about one quarter and around one fifth are small-cell lung carcinomas. Small-cell carcinomas have the worst prognosis due to their tendency to metastasise early. In an international comparison of selected countries, the highest rates of lung cancer morbidity were found among women in Denmark and men in Belgium.

Risk factors and early detection

Tobacco smoke is the main risk factor associated with lung cancer. Among men, up to nine in ten, and at least six out of ten cases of lung cancer in women are due to active smoking. Passive smoking also increases a person's risk of developing lung cancer.

Other risk factors play a comparatively minor role. Between 9 and 15 of 100 cases of lung cancer are attributable to exposure to various carcinogenic substances, including asbestos, polycyclic aromatic hydrocarbons and quartz and nickel dust. People who live in areas with a high natural radon emission have a higher risk of lung cancer, especially those who live in a building's lower storeys. This also applies to occupational exposure to radon or other sources of ionising radiation. Diesel exhaust fumes are the most important risk factor in terms of air pollutants. Other forms of environmental pollution (particulate matter) and hereditary factors are also presumed to increase the risk of lung cancer.

No established screening procedure for the early detection of lung cancer has been put in place for the population as a whole. The role that examinations, such as regular computed tomography scans, could have for risk groups, is being explored as part of clinical trials.

Figure 3.10.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C33 – C34, Germany 1999 – 2014/2015
per 100,000 (old European Standard)

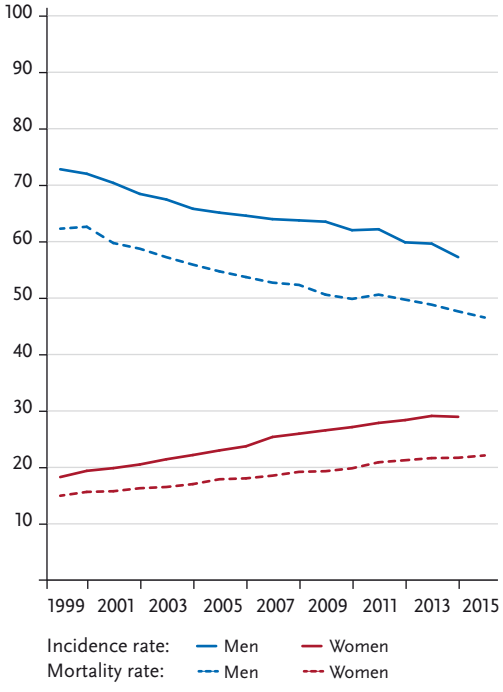


Figure 3.10.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C33 – C34, Germany 1999 – 2014/2015

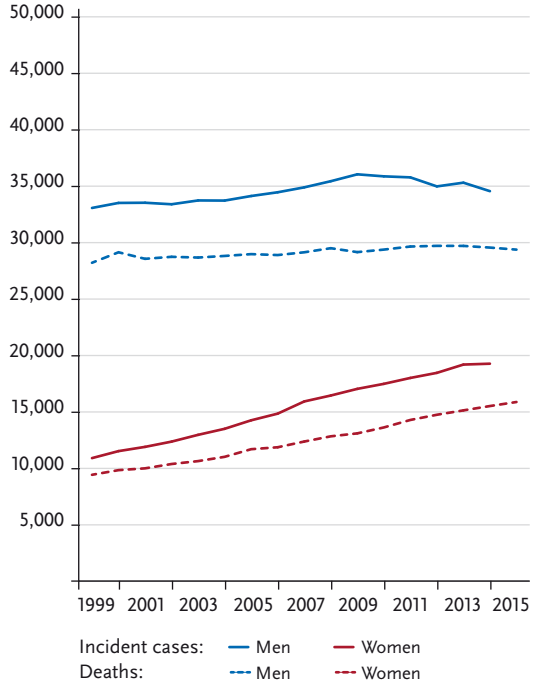


Figure 3.10.2
Age-specific incidence rates by sex, ICD-10 C33 – C34, Germany 2013 – 2014
per 100,000

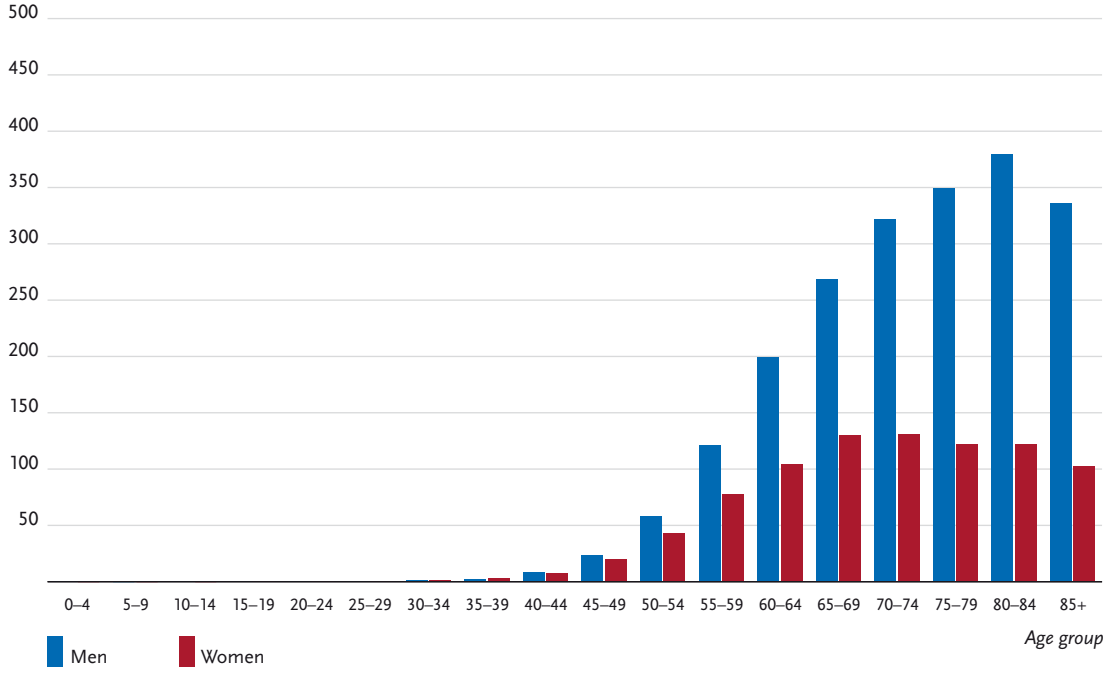


Table 3.10.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C33–C34, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 1,500)	6.9%	(1 in 14)	<0.1%	(1 in 2,500)	6.0%	(1 in 17)
45 years	0.4%	(1 in 230)	7.0%	(1 in 14)	0.3%	(1 in 330)	6.0%	(1 in 17)
55 years	1.6%	(1 in 64)	6.8%	(1 in 15)	1.2%	(1 in 87)	6.0%	(1 in 17)
65 years	2.7%	(1 in 37)	5.8%	(1 in 17)	2.2%	(1 in 46)	5.3%	(1 in 19)
75 years	2.9%	(1 in 35)	4.0%	(1 in 25)	2.8%	(1 in 36)	4.0%	(1 in 25)
Lifetime risk			6.8%	(1 in 15)			5.9%	(1 in 17)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 1,700)	3.6%	(1 in 28)	<0.1%	(1 in 3,600)	2.9%	(1 in 35)
45 years	0.3%	(1 in 300)	3.5%	(1 in 28)	0.2%	(1 in 470)	2.9%	(1 in 35)
55 years	0.9%	(1 in 110)	3.3%	(1 in 30)	0.6%	(1 in 160)	2.7%	(1 in 37)
65 years	1.2%	(1 in 84)	2.5%	(1 in 40)	0.9%	(1 in 110)	2.2%	(1 in 45)
75 years	1.1%	(1 in 95)	1.5%	(1 in 66)	0.9%	(1 in 110)	1.5%	(1 in 69)
Lifetime risk			3.6%	(1 in 28)			2.9%	(1 in 35)

Figure 3.10.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C33–C34, Germany 2013–2014

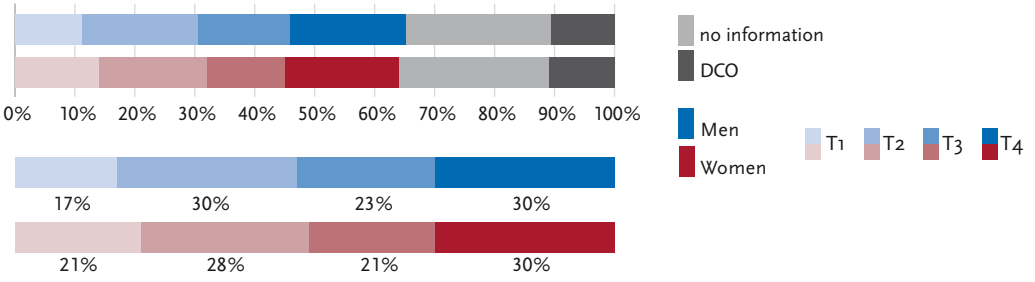


Figure 3.10.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C33–C34, Germany 2013–2014

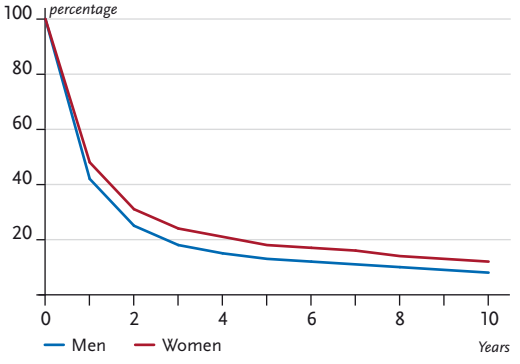


Figure 3.10.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C33 – C34, Germany 2013–2014

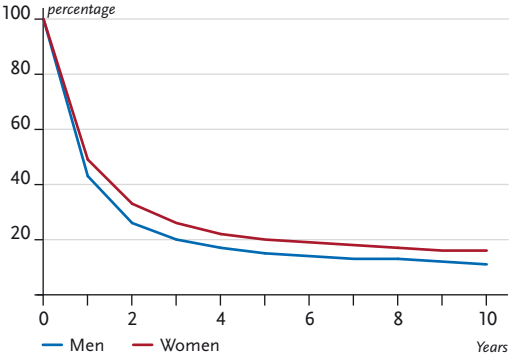


Figure 3.10.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C33 – C34, 2013 – 2014
per 100,000 (old European Standard)

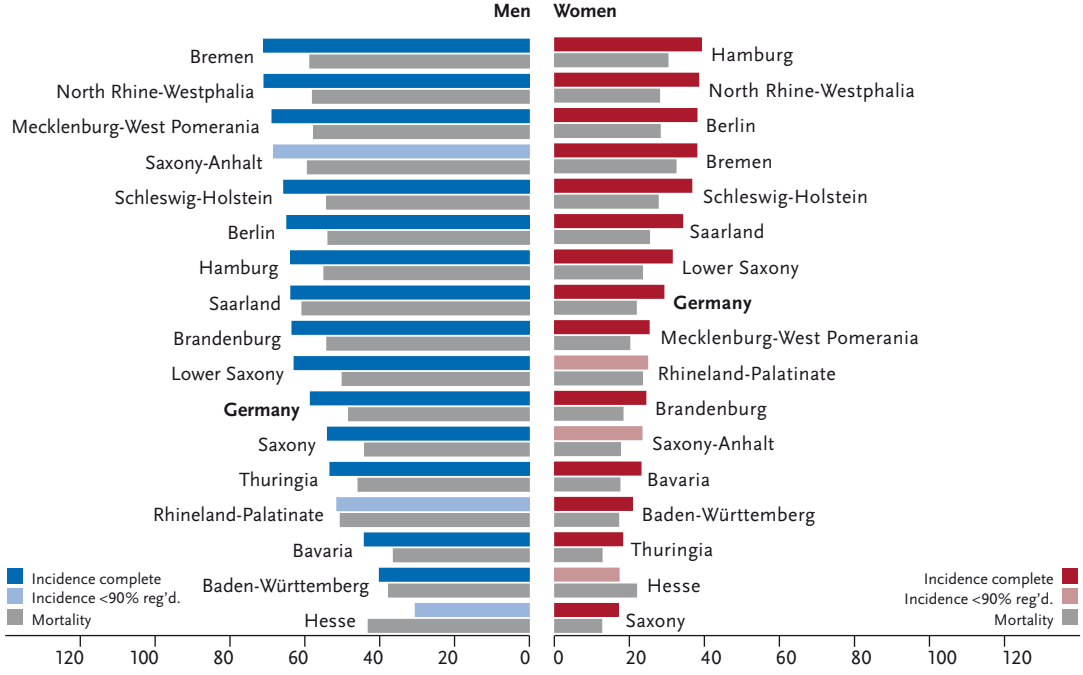
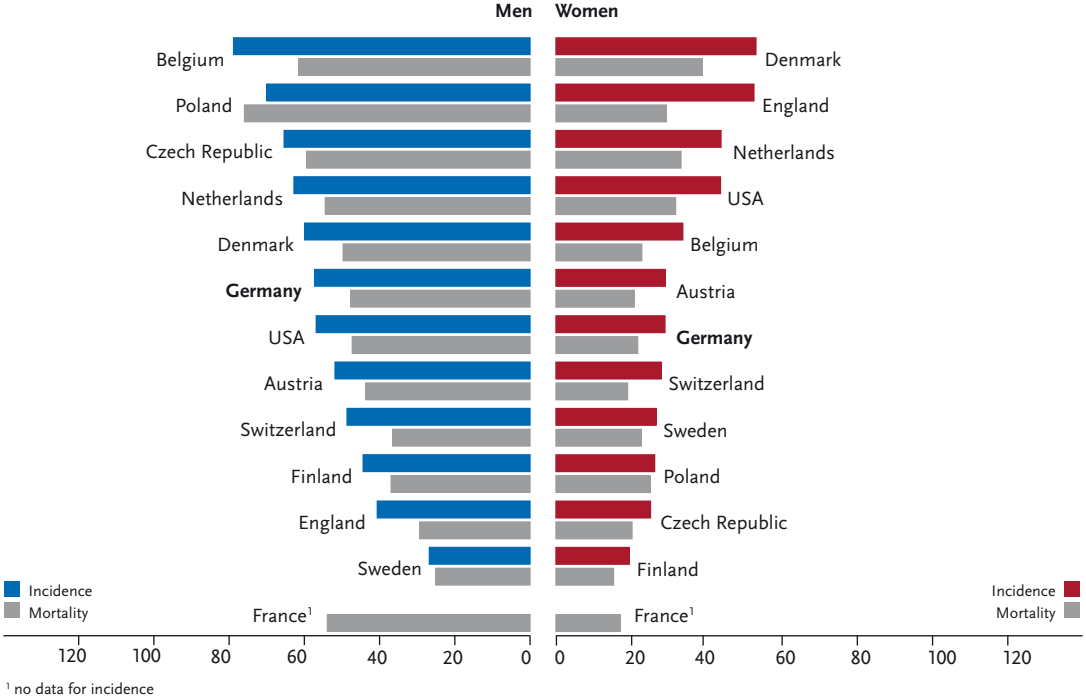


Figure 3.10.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C33 – C34, 2013 – 2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.11 Malignant melanoma of the skin

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

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	11,300	10,810	10,910	10,310	11,400	10,500
Crude incidence rate[1]	28.6	26.3	27.5	25.0	28.2	25.2
Standardised incidence rate[1,2]	20.6	19.8	19.5	18.6	19.4	18.6
Median age at diagnosis	67	59	67	60		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	1,787	1,255	1,804	1,270	1,767	1,287
Crude mortality rate[1]	4.5	3.1	4.5	3.1	4.4	3.1
Standardised mortality rate[1,2]	3.0	1.7	2.9	1.7	2.8	1.7
Median age at death	72	75	73	75	74	76

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	47,600	49,000	78,200	84,500
Absolute survival rate (2013–2014)[3]	78 (73–81)	86 (81–88)	65 (59–69)	77 (71–80)
Relative survival rate (2013–2014)[3]	91 (87–93)	94 (89–97)	89 (83–94)	94 (89–99)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, around 21,200 people in Germany – roughly about the same number of men and women – developed malignant melanoma of the skin. The median age at diagnosis for women was 60, which is comparatively low; for men it was seven years higher. The age-standardised incidence rates among women and men have markedly increased since 2008. This increase is probably due to the fact that skin cancer screening began in Germany in July 2008. However, the incidence for both genders has increased five-fold since the 1970s. Nevertheless, death rates have only increased slightly among men during the same period. The predominant type of malignant melanoma is superficial spreading melanoma, which has a favourable prognosis and is predominantly responsible for the increase in incidence rates. Other forms, in particular nodular and amelanotic melanoma, have considerably less favourable prognoses. The 5-year relative survival rate in Germany for people with malignant melanoma of the skin is 94% (women) and 91% (men). Two-thirds of all melanomas are detected at an early stage (T1). As of 2014, no decline in the number of tumours identified at an advanced stage has been identified.

Risk factors and early detection

The most important endogenous risk factor associated with the development of malignant melanoma is the number of pigmented moles a person has. Malignant melanomas are more likely to occur in people with a light skin type than in people with a darker skin type. If first-degree relatives have developed malignant melanomas, a family may have a genetic predisposition to this form of cancer. However, the level of risk associated with developing a malignant melanoma in this situation depends on the genetic mutation in question. Moreover, patients who have already developed a melanoma, have an increased risk of developing skin cancer in the future.

The most important exogenous risk factor linked to malignant melanoma is ultraviolet (UV) radiation. This applies both to natural radiation from sunlight and to artificial UV radiation (such as in solariums). Exposure to the sun during childhood and adolescence as well as »intermittent exposure to the sun« (typical during summer holidays) increases the risk of malignant melanoma. The current screening programme enables men and women aged 35 or above to have their skin examined by a doctor with relevant training (such as dermatologists and general practitioners) every two years.

Figure 3.11.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C43, Germany 1999–2014/2015
per 100,000 (old European Standard)

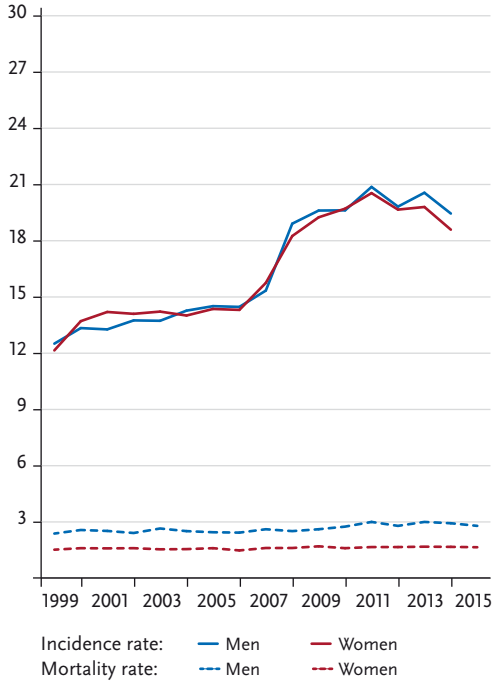


Figure 3.11.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C43, Germany 1999–2014/2015

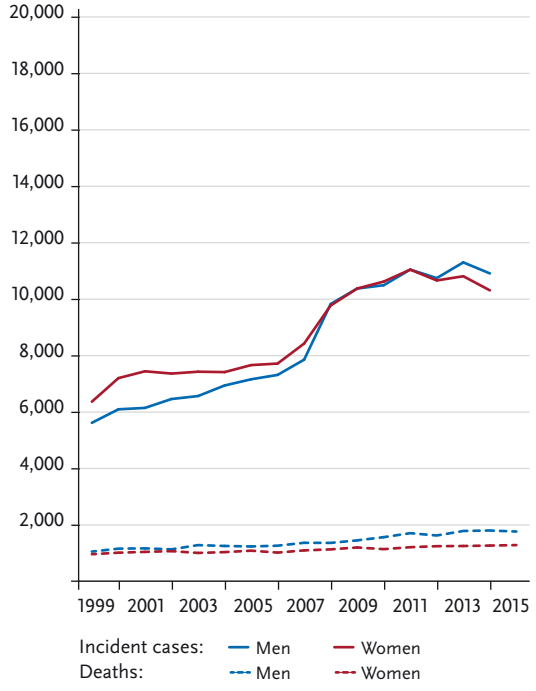


Figure 3.11.2
Age-specific incidence rates by sex, ICD-10 C43, Germany 2013–2014
per 100,000

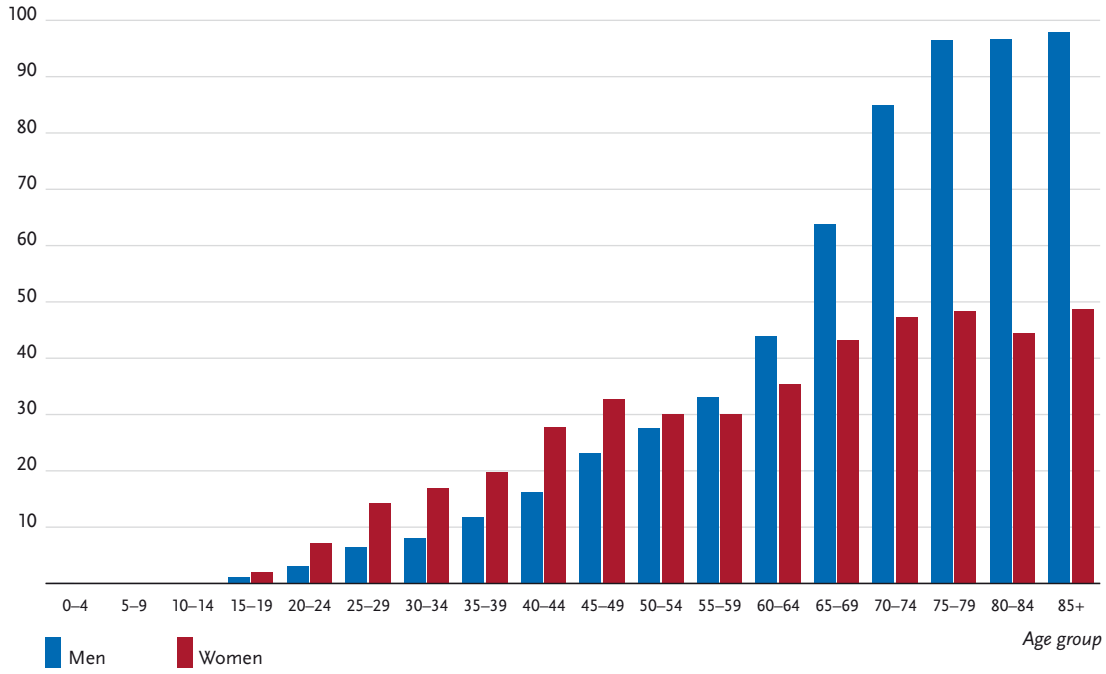


Table 3.11.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C43, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1 %	(1 in 680)	2.1 %	(1 in 48)	<0.1 %	(1 in 9,300)	0.4 %	(1 in 270)
45 years	0.3 %	(1 in 390)	2.0 %	(1 in 51)	<0.1 %	(1 in 3,700)	0.4 %	(1 in 280)
55 years	0.4 %	(1 in 260)	1.8 %	(1 in 57)	0.1 %	(1 in 1,900)	0.3 %	(1 in 290)
65 years	0.7 %	(1 in 150)	1.5 %	(1 in 65)	0.1 %	(1 in 900)	0.3 %	(1 in 300)
75 years	0.8 %	(1 in 130)	1.1 %	(1 in 92)	0.2 %	(1 in 600)	0.3 %	(1 in 360)
Lifetime risk			2.1 %	(1 in 47)			0.4 %	(1 in 270)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.3 %	(1 in 400)	1.8 %	(1 in 56)	<0.1 %	(1 in 8,900)	0.2 %	(1 in 410)
45 years	0.3 %	(1 in 320)	1.5 %	(1 in 65)	<0.1 %	(1 in 4,900)	0.2 %	(1 in 430)
55 years	0.3 %	(1 in 300)	1.3 %	(1 in 79)	<0.1 %	(1 in 3,500)	0.2 %	(1 in 460)
65 years	0.4 %	(1 in 230)	1.0 %	(1 in 100)	0.1 %	(1 in 1,900)	0.2 %	(1 in 500)
75 years	0.4 %	(1 in 240)	0.6 %	(1 in 160)	0.1 %	(1 in 1,200)	0.2 %	(1 in 590)
Lifetime risk			2.0 %	(1 in 50)			0.2 %	(1 in 410)

Figure 3.11.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C43, Germany 2013–2014

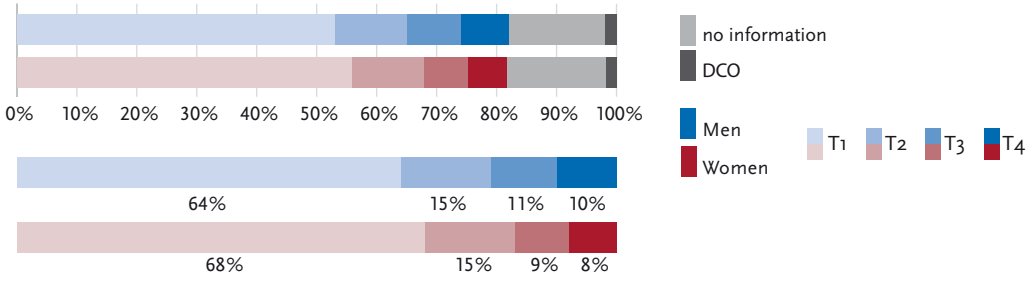


Figure 3.11.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C43, Germany 2013–2014

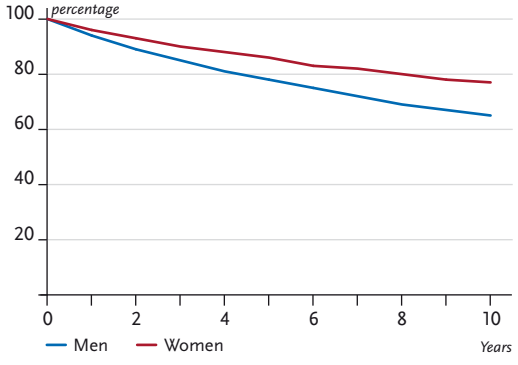


Figure 3.11.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C43, Germany 2013–2014

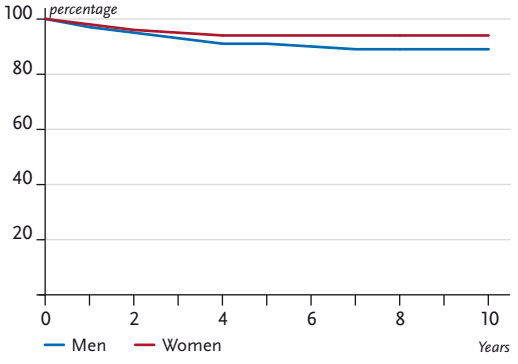


Figure 3.11.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C43, 2013–2014
per 100,000 (old European Standard)

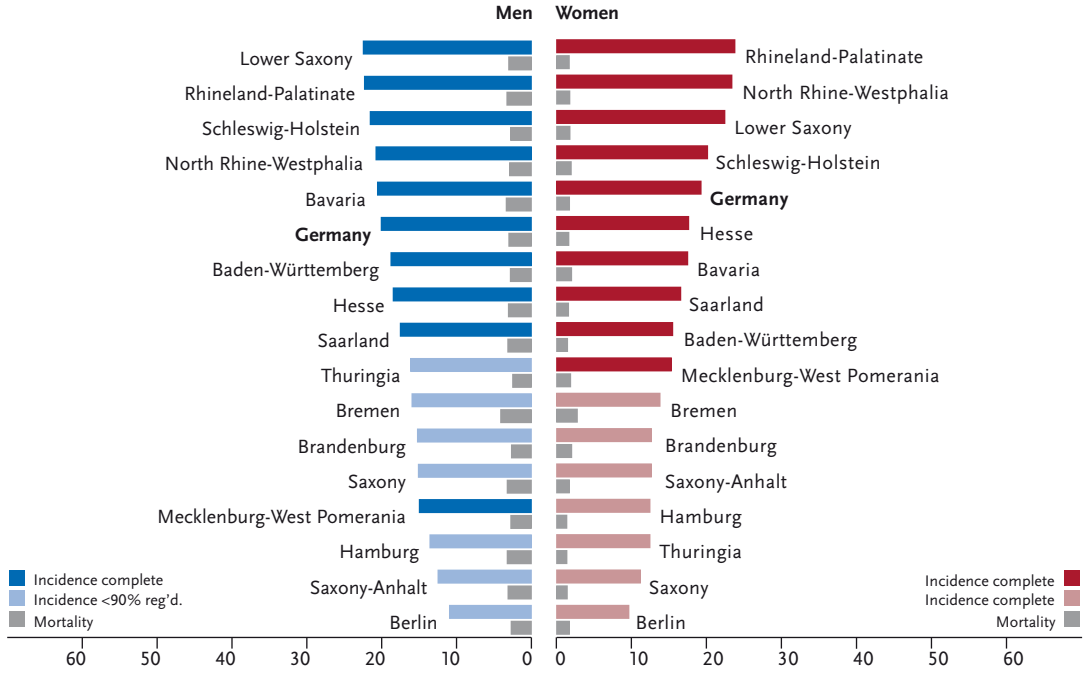


Figure 3.11.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C43, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)

[1] no data for incidence

3.12 Mesothelioma

Table 3.12.1
Overview of key epidemiological parameters for Germany, ICD-10 C45

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	1,370	350	1,290	310	1,380	340
Crude incidence rate[1]	3.5	0.9	3.3	0.7	3.4	0.8
Standardised incidence rate[1,2]	2.1	0.5	1.9	0.4	1.9	0.4
Median age at diagnosis	73	73	74	75		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	1,157	297	1,151	277	1,128	305
Crude mortality rate[1]	2.9	0.7	2.9	0.7	2.8	0.7
Standardised mortality rate[1,2]	1.7	0.4	1.7	0.3	1.6	0.3
Median age at death	75	75	75	76	76	76

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	1,700	600	2,000	800
Absolute survival rate (2013–2014)[3]	6	15	3	7
Relative survival rate (2013–2014)[3]	8	17	5	9

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Malignant mesothelioma refers to a rare soft-tissue tumour that mainly occurs among elderly men. The pleura is affected in about 90 % of cases. In 2014, about 1,290 men and 310 women developed this disease in Germany.

The long latency period between exposure and illness means that despite the fact that more than 20 years have passed since asbestos processing was banned in Germany, a clear decline in age-standardised disease or death rates has yet to be seen. However, morbidity and mortality rates among men under the age of 65 years have declined markedly during this period, while they continued to rise among higher age groups until a few years ago.

Comparatively high morbidity rates continue to occur in northwest Germany in locations where the ship building industry was located and partly in those linked to the steel industry (such as in Bremen and neighbouring regions, Hamburg, Kiel and the Ruhr region). Populations in regions where asbestos products were produced are also occasionally affected. Mesotheliomas have a very unfavourable prognosis, with 5-year relative survival rates of just 8 % in men and 17 % in women. As such, the number of deaths from this type of cancer is only slightly less than the number of new cases.

Risk factors

Even though Germany banned the processing of asbestos in 1993 (and an EU-wide ban soon followed), the inhalation of asbestos fibres still remains the main cause of the majority of newly diagnosed cases of mesothelioma. This is due to an average latency period between exposure and cancer diagnosis of over 30 years in average. The affected occupational groups include metalworkers, welders, electricians, plumbers, roofers, bricklayers, construction workers, automotive engineers and tilers. Every year, Germany's employer liability insurance associations recognise approximately 1,000 newly diagnosed cases. Even in cases where an occupation-related exposition to asbestos cannot be determined, X-rays and tissue samples will often provide evidence for an asbestos contamination.

Loosely bound asbestos with high fibre content is particularly dangerous. By contrast, provided it remains intact, asbestos-cement, which is found even today both in and on buildings, is deemed largely safe.

Further risk factors play only a subordinate role. Among them are exposure to other fibres such as Erionit or radiotherapy (of breast and abdomen).

Figure 3.12.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C45, Germany 1999–2014/2015
per 100,000 (old European Standard)

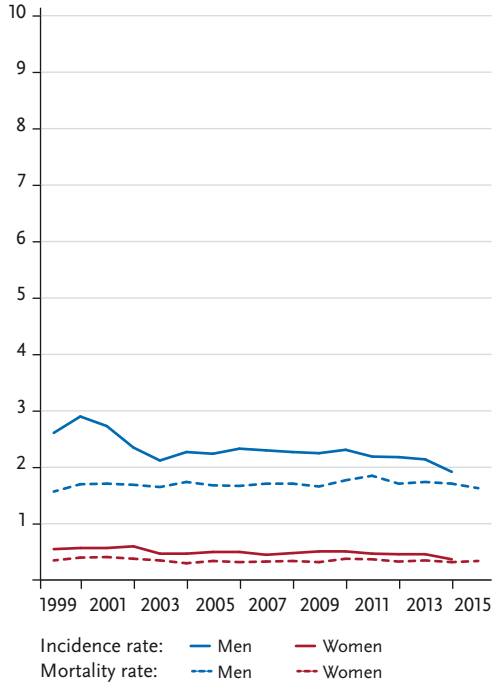


Figure 3.12.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C45, Germany 1999–2014/2015

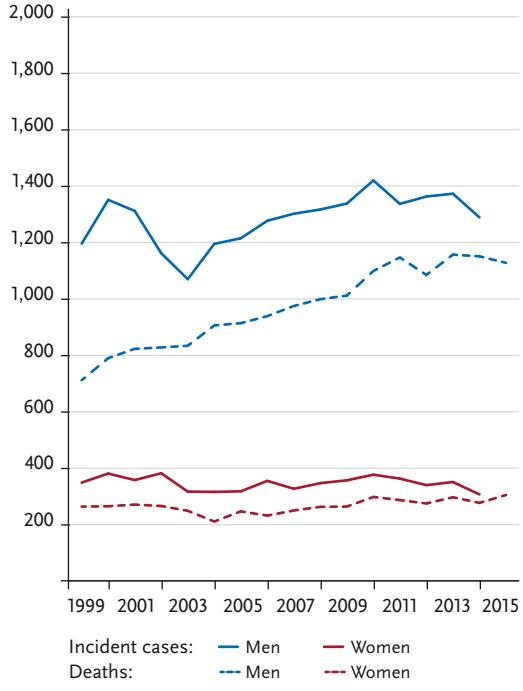


Figure 3.12.2
Age-specific incidence rates by sex, ICD-10 C45, Germany 2013–2014
per 100,000

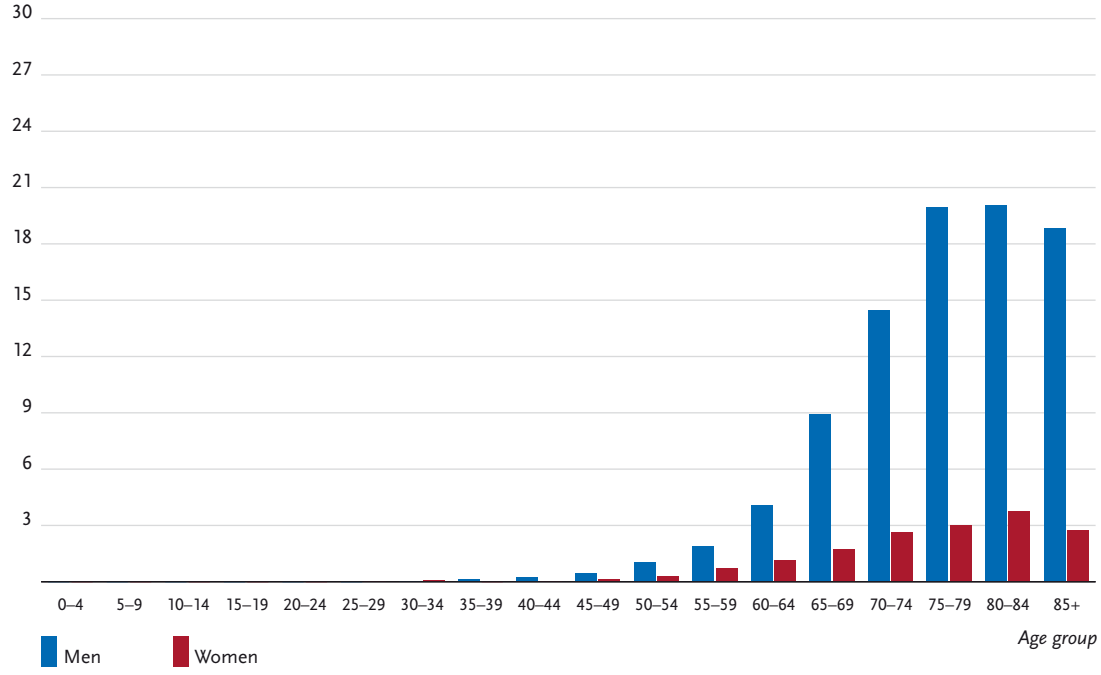


Table 3.12.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C45, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 50,000)	0.3%	(1 in 360)	<0.1%	(1 in 105,000)	0.2%	(1 in 410)
45 years	<0.1%	(1 in 11,000)	0.3%	(1 in 360)	<0.1%	(1 in 20,000)	0.2%	(1 in 410)
55 years	<0.1%	(1 in 2,900)	0.3%	(1 in 350)	<0.1%	(1 in 4,500)	0.2%	(1 in 400)
65 years	0.1%	(1 in 910)	0.3%	(1 in 360)	0.1%	(1 in 1,100)	0.3%	(1 in 400)
75 years	0.2%	(1 in 650)	0.2%	(1 in 480)	0.1%	(1 in 700)	0.2%	(1 in 490)
Lifetime risk			0.3%	(1 in 360)			0.2%	(1 in 420)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 360,000)	0.1%	(1 in 1,500)	<0.1%	(1 in 1,600,000)	0.1%	(1 in 1,700)
45 years	<0.1%	(1 in 43,000)	0.1%	(1 in 1,500)	<0.1%	(1 in 65,000)	0.1%	(1 in 1,700)
55 years	<0.1%	(1 in 9,200)	0.1%	(1 in 1,500)	<0.1%	(1 in 16,000)	0.1%	(1 in 1,700)
65 years	<0.1%	(1 in 4,300)	0.1%	(1 in 1,700)	<0.1%	(1 in 5,000)	0.1%	(1 in 1,800)
75 years	<0.1%	(1 in 3,600)	<0.1%	(1 in 2,600)	<0.1%	(1 in 4,000)	<0.1%	(1 in 2,500)
Lifetime risk			0.1%	(1 in 1,500)			0.1%	(1 in 1,700)

Figure 3.12.3
Distribution of T-stages at first diagnosis by sex
Not presented due to the large proportion of missing data.

Figure 3.12.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C45, Germany 2013–2014

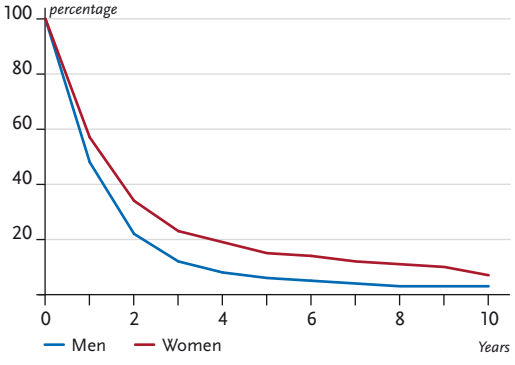


Figure 3.12.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C45, Germany 2013–2014

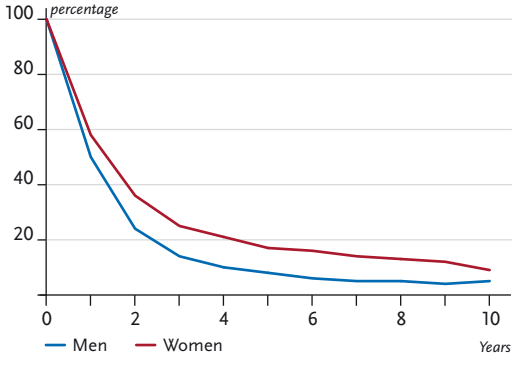


Figure 3.12.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C45, 2013–2014
per 100,000 (old European Standard)

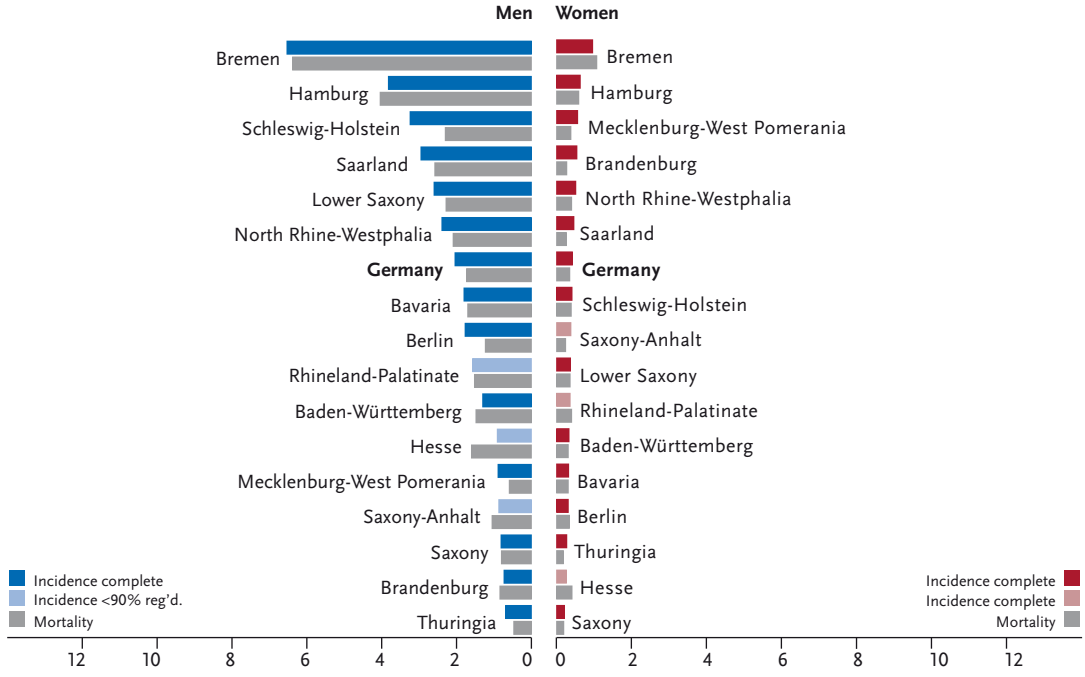
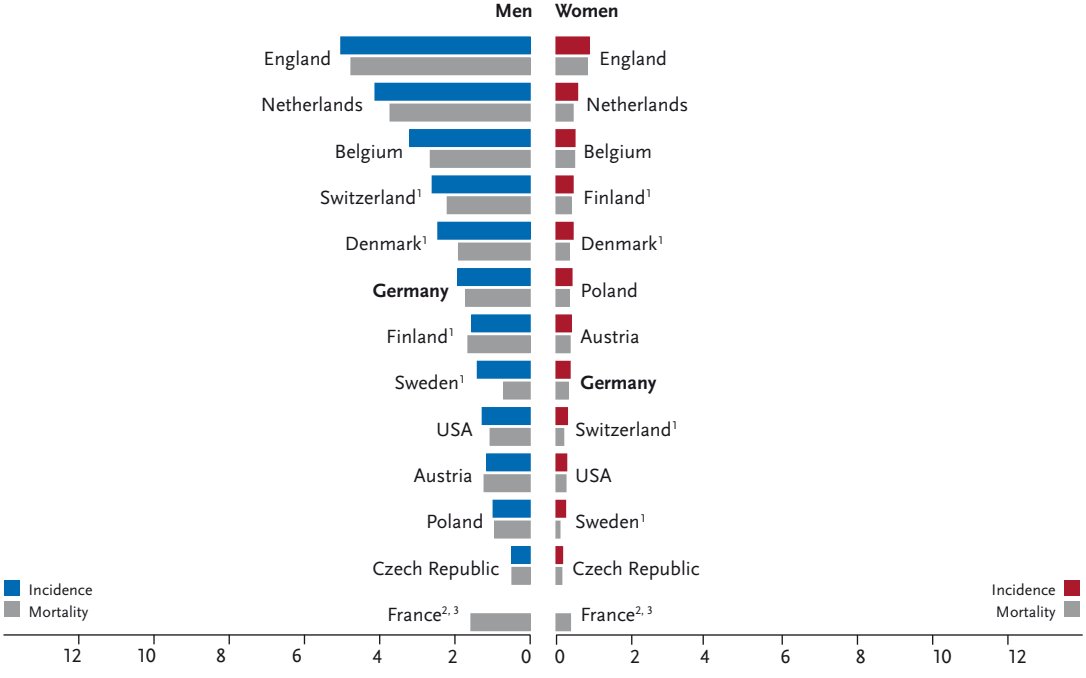


Figure 3.12.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C45, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data incl. C38.4 (Malignant neoplasm of Pleura)
[2] no data for incidence
[3] mortality only 2013

3.13 Soft tissue without mesothelioma

Table 3.13.1
Overview of key epidemiologic parameters for Germany, ICD-10 C46–C49

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	2,140	1,880	2,040	1,870	2,300	2,000
Crude incidence rate[1]	5.4	4.6	5.2	4.5	5.8	4.8
Standardised incidence rate[1,2]	4.1	3.2	3.9	3.2	4.2	3.3
Median age at diagnosis	65	69	67	66		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	744	831	724	901	843	927
Crude mortality rate[1]	1.9	2.0	1.8	2.2	2.1	2.2
Standardised mortality rate[1,2]	1.3	1.2	1.2	1.2	1.4	1.3
Median age at death	72	73	72	73	71	74

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	6,700	5,600	10,800	9,200
Absolute survival rate (2013–2014)[3]	55 (48–59)	44 (35–47)	43	34 (27–39)
Relative survival rate (2013–2014)[3]	64 (55–69)	49 (38–53)	58	44 (35–50)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

This disease group includes the rare Kaposi sarcoma, occurring mainly on the skin and malignant tumours of the peripheral nerves, connective and other soft tissue such as the peritoneum and retroperitoneal soft tissue behind it. 84 % of all cases are sarcomas, which unlike carcinomas do not develop from epithelial or glandular tissue, but from connective tissue structures, which also include fatty tissue and muscles. Conversely, around 50 % of all sarcomas occur in organs such as the gastro-intestinal tract, the sexual organs and the breast.

Out of the around 4,000 new malignant soft tissue tumour cases, 35 % occur in the extremities. The two most prevalent types of soft tissue sarcoma in adulthood are the leiomyosarcoma originating in smooth muscle and liposarcoma (fatty tissue tumour). Rhabdomyosarcoma (RMS) occur almost exclusively in children and adolescents.

Since 1999, the age-standardised incidence and mortality rates for malignant soft tissue tumours in Germany have remained almost constant.

Risk factors

In most cases, soft tissue sarcomas have no clearly identifiable cause. Patients with rare hereditary cancer syndromes, however, face a higher risk of developing sarcomas. Presumably, a single (or multiple) genetic mutation also may influences a person's risk of developing a sarcoma.

In rare cases, following radiation therapy, a sarcoma may occur in the irradiated area of the body. The human herpes virus type 8 (HHV8) causes the Kaposi sarcoma. In severely immuno-deficient patients, the Epstein-Barr virus (EBV) potentially also plays a role in the development of soft tissue sarcoma.

Environmental toxins and chemicals are potentially also factors in sarcoma development. Evidence strongly indicates a link between vinyl chloride exposure and angiosarcoma of the liver. Chronic inflammatory processes possibly also increase the risk of soft tissue sarcoma. Chronic lymphedema as a consequence of a mastectomy (breast removal) can in rare cases result in the emergence of an angiosarcoma (Stewart Treves Syndrome). Whether diet or other lifestyle factors, such as tobacco and alcohol consumption also have an influence remains unclear.

Figure 3.13.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C46–C49, Germany 1999–2014/2015
per 100,000 (old European Standard)

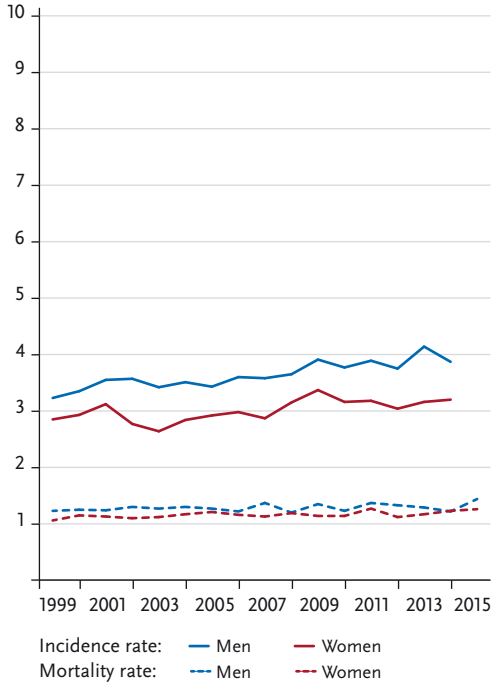


Figure 3.13.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C46–C49, Germany 1999–2014/2015

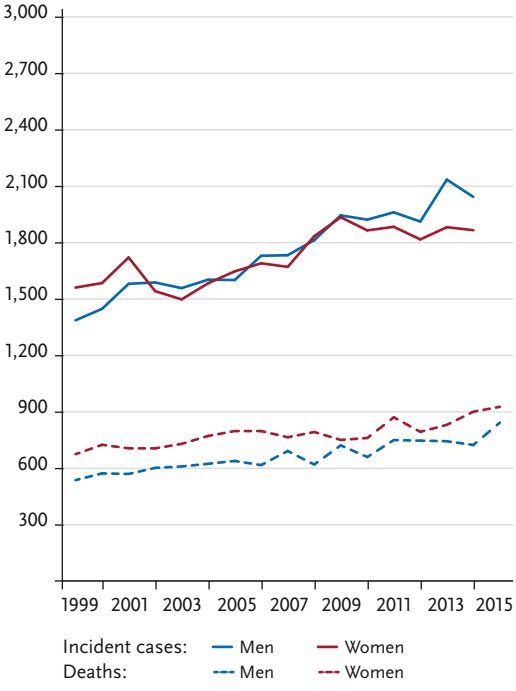


Figure 3.13.2
Age-specific incidence rates by sex, ICD-10 C46–C49, Germany 2013–2014
per 100,000

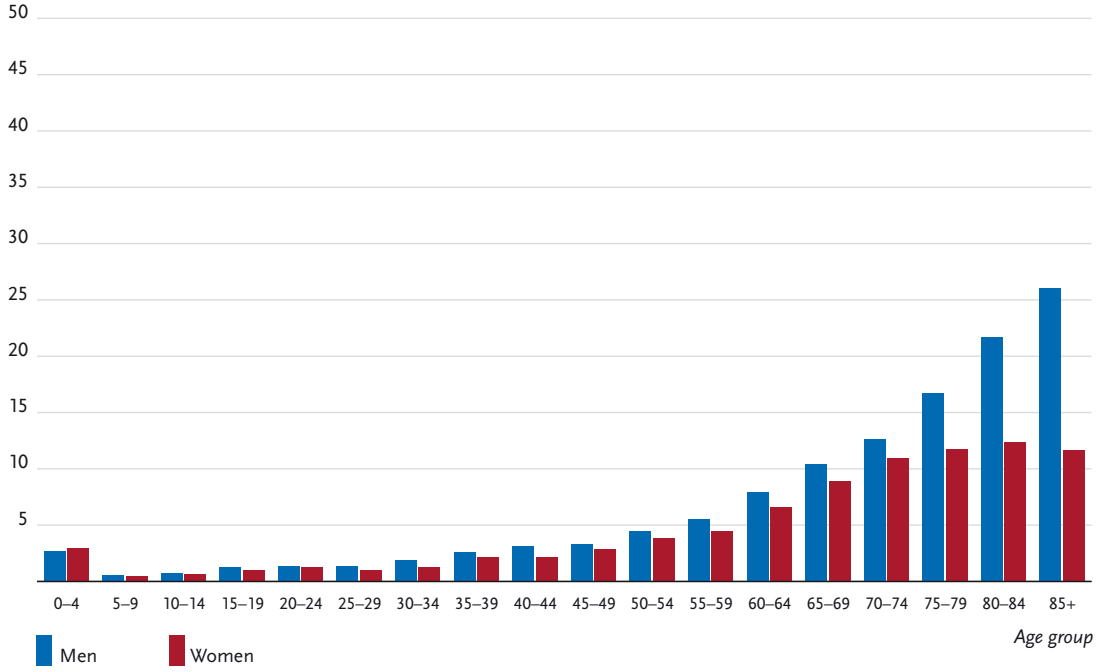
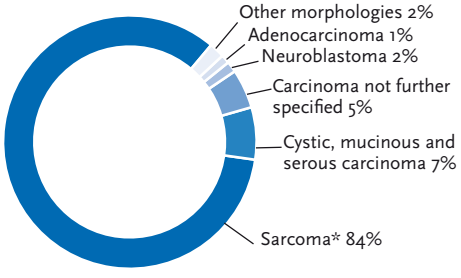


Table 3.13.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C46–C49, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 3,600)	0.4%	(1 in 260)	<0.1%	(1 in 22,400)	0.1%	(1 in 690)
45 years	<0.1%	(1 in 2,500)	0.4%	(1 in 280)	<0.1%	(1 in 9,200)	0.1%	(1 in 700)
55 years	0.1%	(1 in 1,500)	0.3%	(1 in 300)	<0.1%	(1 in 5,200)	0.1%	(1 in 730)
65 years	0.1%	(1 in 980)	0.3%	(1 in 350)	<0.1%	(1 in 2,400)	0.1%	(1 in 770)
75 years	0.2%	(1 in 650)	0.2%	(1 in 420)	0.1%	(1 in 1,400)	0.1%	(1 in 890)
Lifetime risk			0.4%	(1 in 230)			0.2%	(1 in 650)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 4,700)	0.3%	(1 in 310)	<0.1%	(1 in 15,100)	0.2%	(1 in 640)
45 years	<0.1%	(1 in 2,900)	0.3%	(1 in 330)	<0.1%	(1 in 8,000)	0.2%	(1 in 660)
55 years	0.1%	(1 in 1,900)	0.3%	(1 in 360)	<0.1%	(1 in 5,000)	0.1%	(1 in 710)
65 years	0.1%	(1 in 1,000)	0.2%	(1 in 430)	<0.1%	(1 in 2,400)	0.1%	(1 in 780)
75 years	0.1%	(1 in 950)	0.2%	(1 in 640)	0.1%	(1 in 1,700)	0.1%	(1 in 1,000)
Lifetime risk			0.4%	(1 in 280)			0.2%	(1 in 620)

Figure 3.13.3a
Proportion of histologic group of malignant soft tissue tumours, ICD-10 C46–C49, Germany 2013–2014



* classified according to NCIN criteria (2013, see »further literature«)

Figure 3.13.3b
Distribution of sarcoma localizations, Germany 2013–2014

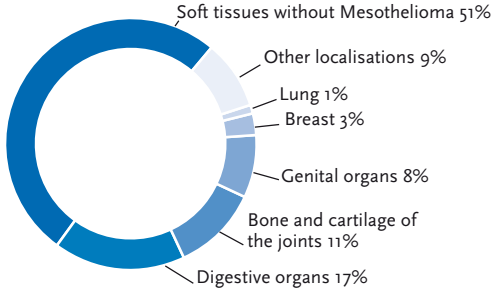


Figure 3.13.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C46–C49, Germany 2013–2014

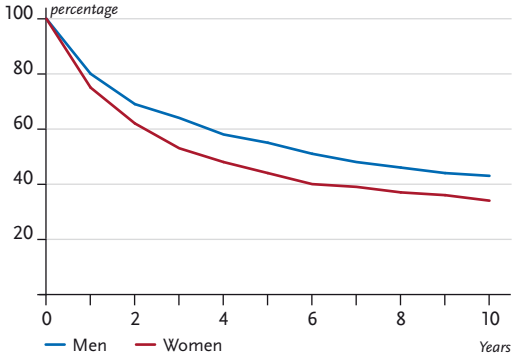


Figure 3.13.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C46–C49, Germany 2013–2014

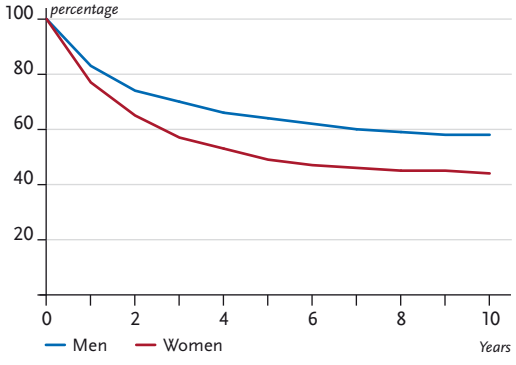


Figure 3.13.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C46–C49, 2013–2014
per 100,000 (old European Standard)

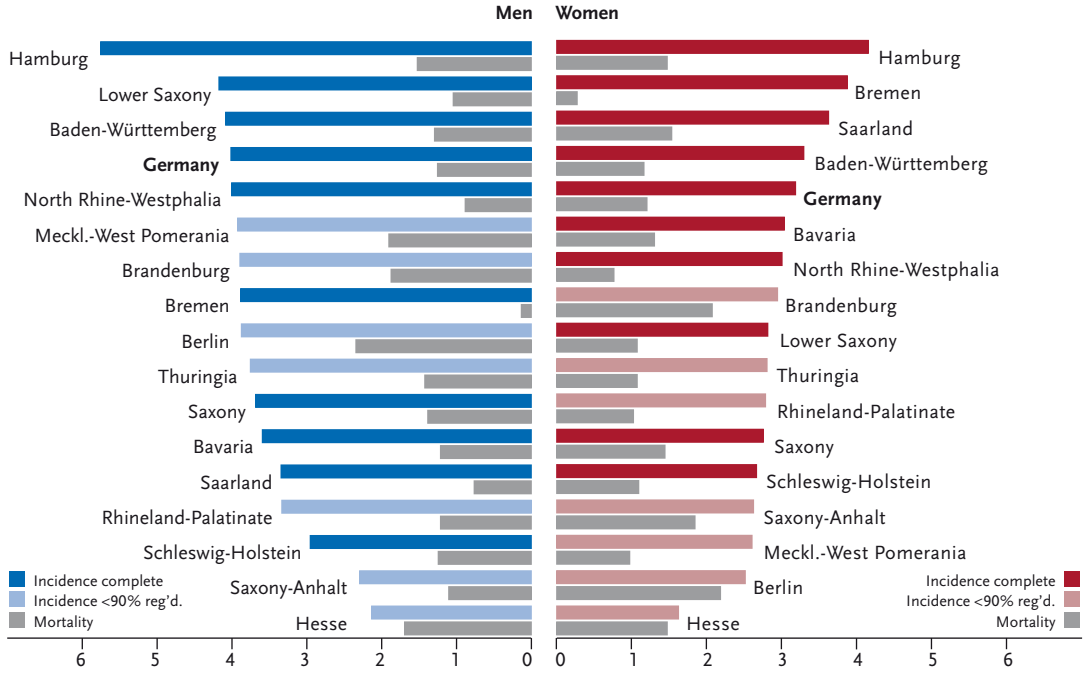
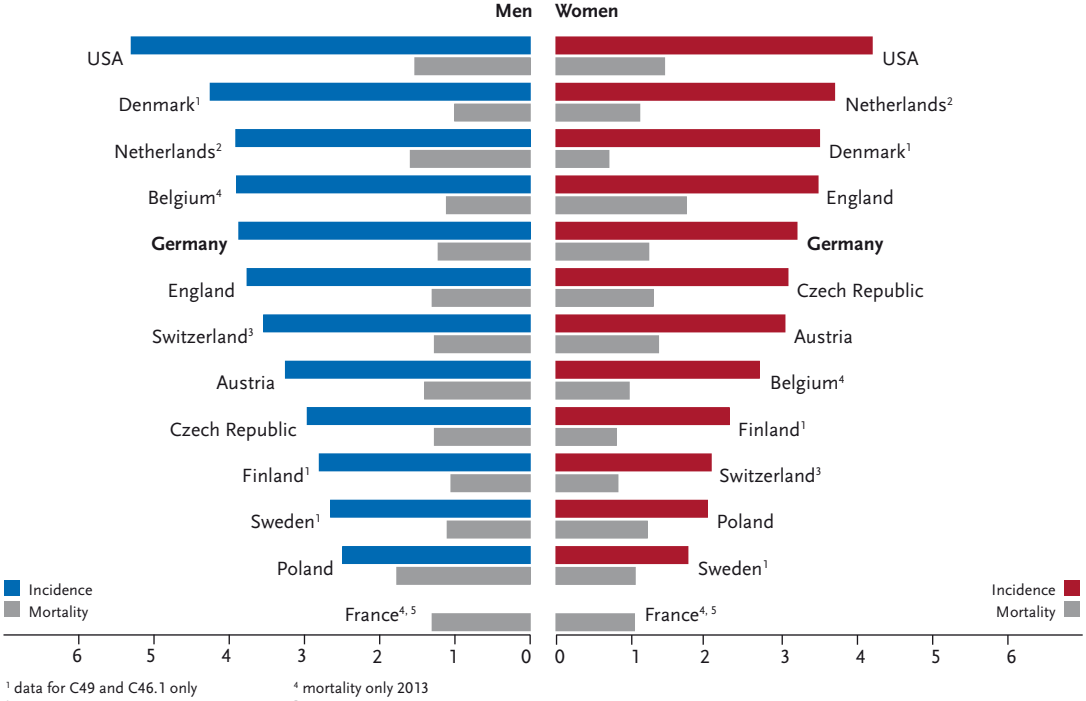


Figure 3.13.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C46–C49, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data for C49 and C46.1 only
[2] data incl. C38
[3] data for C47 and C49 only
[4] mortality only 2013
[5] no data for incidence

3.14 Breast

Table 3.14.1
Overview of key epidemiological parameters for Germany, ICD-10 C50

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	670	70,820	650	69,220	700	71,900
Crude incidence rate[1]	1.7	172.0	1.6	167.7	1.8	173.0
Standardised incidence rate[1,2]	1.1	118.3	1.1	114.6	1.1	116.5
Median age at diagnosis	72	64	71	64		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	156	17,853	134	17,670	159	18,136
Crude mortality rate[1]	0.4	43.4	0.3	42.8	0.4	43.7
Standardised mortality rate[1,2]	0.2	23.6	0.2	23.0	0.3	23.0
Median age at death	74	74	73	74	75	75

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	2,400	311,400	3,800	559,900
Absolute survival rate (2013–2014)[3]	60	79 (79–81)	45	66 (64–68)
Relative survival rate (2013–2014)[3]	73	88 (87–88)	69	82 (81–83)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

With around 69,000 new cases every year, breast cancer is by far the most common form of cancer among women. Roughly an additional 6,000 women are being diagnosed with a cancer in situ each year. Around 1% of new cases affect men.

Based on current incidence figures, about one in eight women will develop breast cancer over the course of her life. Almost three in every ten women are younger than 55 years at diagnosis. Incidence and mortality rates in former East Germany remain lower than in former West Germany. For women under 55 years old, however, these differences have largely diminished by now.

Incidence rates of more recent years show the typical curve of a sharp increase after mammography screening was introduced between 2005 and 2009 and a subsequent slow decline.

Progress in therapy has significantly increased patients' chances of survival and led to a drop in mortality rates. In a few years, it should be possible to evaluate whether and to what degree screening can help further reduce the number of cases. A clear tendency, however, is that in the corresponding age group fewer women suffer advanced forms of cancer than before the introduction of screenings.

Risk factors and early detection

An early menarche and a late menopause, childlessness and higher age at first birth are all associated with an increased risk of developing breast cancer. Conversely, several and/or early births and longer periods of breast-feeding reduce the risk of breast cancer. Hormone replacement therapy during and after menopause increases the risk of breast cancer. Ovulation inhibitors containing hormones (»the pill«), on the other hand, have only a minor influence on incidence rates.

Further risk factors include overweight and a lack of exercise after menopause, as well as alcohol consumption. Moreover, smoking could also slightly increase the risk.

In addition, the risk for women with very dense breast tissue or with certain benign breast neoplasms (lobular neoplasias and atypical ductal hyperplasias) is increased. Family clusters of breast or ovarian cancer, or undergoing radio therapy of the breast during childhood or at adolescent age constitute further risk factors. The statutory early detection programme offers women above 30 years of age an annual palpation examination of the breasts by a physician. Between 2005 and 2009, Germany introduced a quality assured Mammography Screening Programme where women between 50 and 69 years of age are now invited to have their breasts X-rayed every two years.

Figure 3.14.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C50, Germany 1999–2014/2015
per 100,000 (old European Standard)

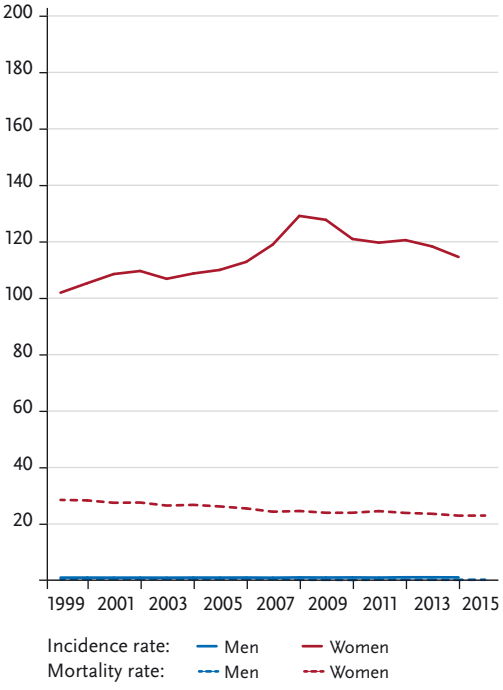


Figure 3.14.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C50, Germany 1999–2014/2015

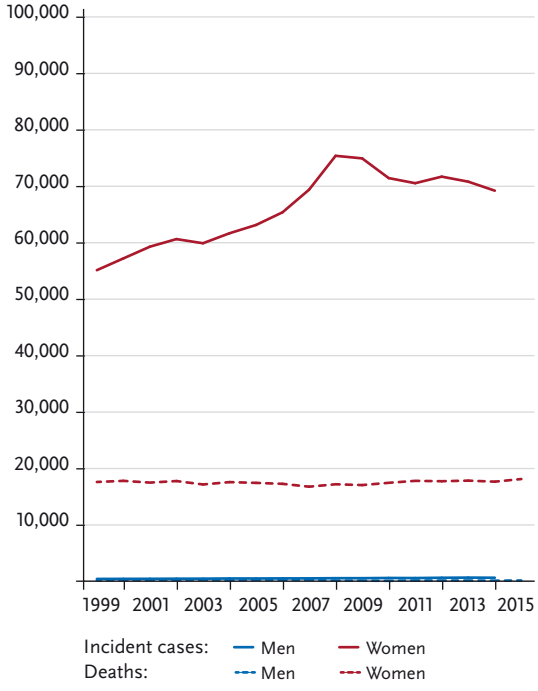


Figure 3.14.2
Age-specific incidence rates by sex, ICD-10 C50, Germany 2013–2014
per 100,000

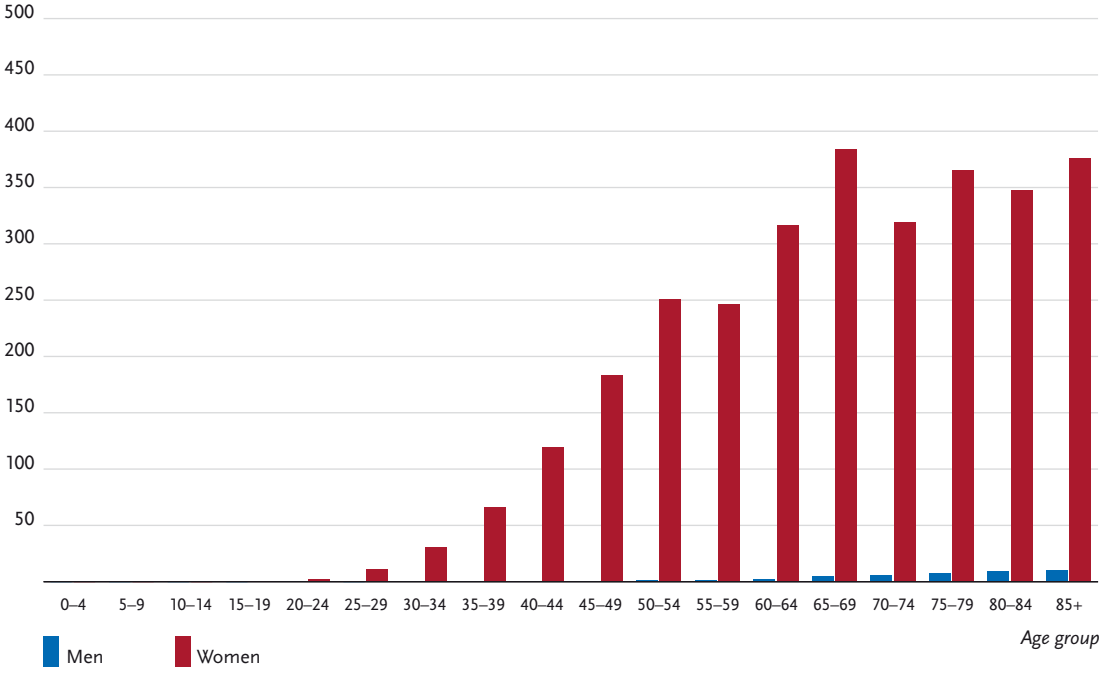


Table 3.14.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C50, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 30,000)	0.1%	(1 in 740)	<0.1%	(1 in 267,000)	<0.1%	(1 in 2,900)
45 years	<0.1%	(1 in 12,100)	0.1%	(1 in 740)	<0.1%	(1 in 96,000)	<0.1%	(1 in 2,900)
55 years	<0.1%	(1 in 5,100)	0.1%	(1 in 760)	<0.1%	(1 in 32,000)	<0.1%	(1 in 2,900)
65 years	<0.1%	(1 in 2,100)	0.1%	(1 in 810)	<0.1%	(1 in 8,600)	<0.1%	(1 in 2,800)
75 years	0.1%	(1 in 1,500)	0.1%	(1 in 1,100)	<0.1%	(1 in 6,400)	<0.1%	(1 in 3,400)
Lifetime risk			0.1%	(1 in 740)			<0.1%	(1 in 2,900)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.9%	(1 in 110)	12.8%	(1 in 8)	0.1%	(1 in 1,000)	3.5%	(1 in 29)
45 years	2.1%	(1 in 47)	12.1%	(1 in 8)	0.3%	(1 in 380)	3.4%	(1 in 29)
55 years	3.0%	(1 in 34)	10.3%	(1 in 10)	0.5%	(1 in 200)	3.2%	(1 in 31)
65 years	3.6%	(1 in 28)	8.0%	(1 in 13)	0.8%	(1 in 120)	2.9%	(1 in 35)
75 years	3.3%	(1 in 30)	5.1%	(1 in 20)	1.2%	(1 in 81)	2.3%	(1 in 43)
Lifetime risk			12.9%	(1 in 8)			3.5%	(1 in 29)

Figure 3.14.3
Distribution of T-stages at first diagnosis for all women and women between 50 and 69 years (top: all cases; bottom: only valid reports) ICD-10 C50, Germany 2013–2014

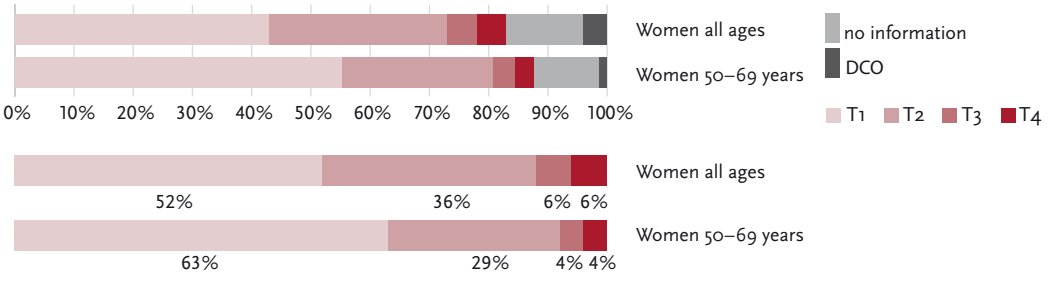


Figure 3.14.4a
Absolute survival rates up to 10 years after first diagnosis, women, ICD-10 C50, Germany 2013–2014

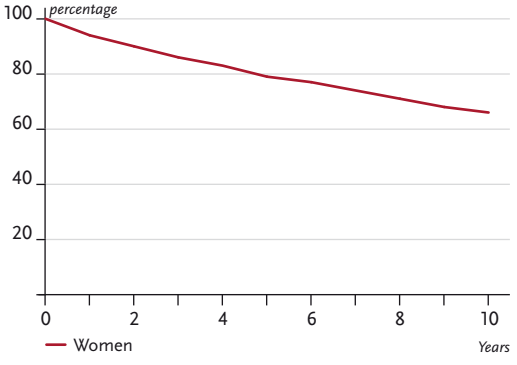


Figure 3.14.4b
Relative survival rates up to 10 years after first diagnosis, women, ICD-10 C50, Germany 2013–2014

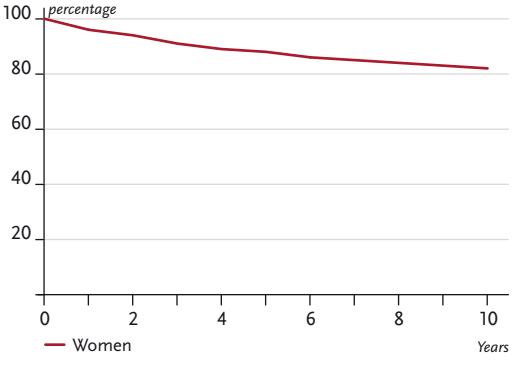


Figure 3.14.5
Registered age-standardised incidence and mortality rates in German federal states, women, ICD-10 C50, 2013–2014
per 100,000 (old European Standard)

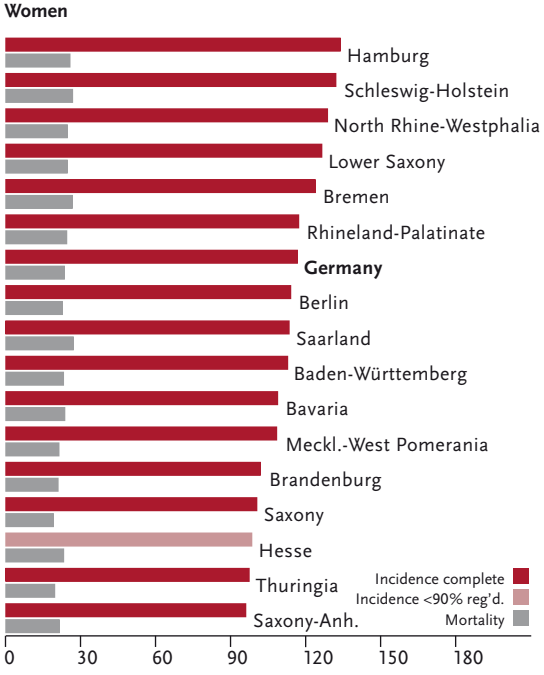
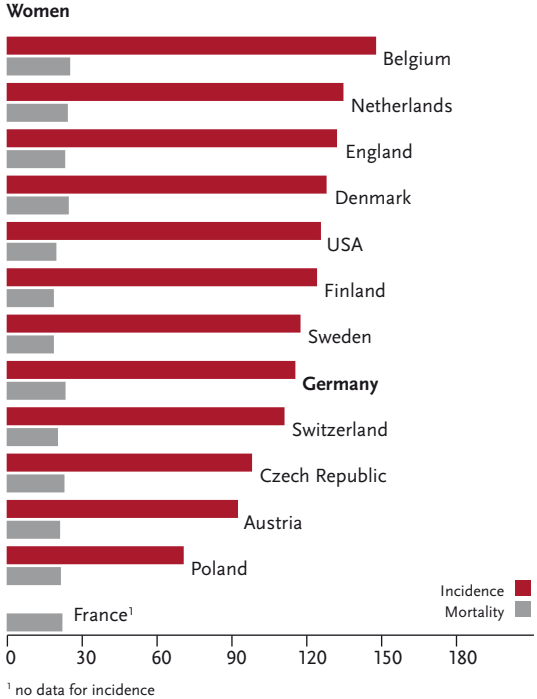


Figure 3.14.6
International comparison of age-standardised incidence and mortality rates, women, ICD-10 C50, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.15 Vulva

Table 3.15.1
Overview of key epidemiological parameters for Germany, ICD-10 C51

Incidence	2013	2014	Prediction for 2018
	Women	Women	Women
Incident cases	3,240	3,130	3,500
Crude incidence rate[1]	7.9	7.6	8.3
Standardised incidence rate[1,2]	4.6	4.4	4.9
Median age at diagnosis	72	72	

Mortality	2013	2014	2015
	Women	Women	Women
Deaths	833	849	940
Crude mortality rate[1]	2.0	2.1	2.3
Standardised mortality rate[1,2]	0.9	0.9	1.0
Median age at death	79	80	80

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Women	Women
Prevalence	11,300	17,700
Absolute survival rate (2013–2014)[3]	57 (52–68)	43 (39–49)
Relative survival rate (2013–2014)[3]	68 (60–80)	62 (53–68)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Over the last decade, Germany has registered a significant increase in the number of malignant vulvar cancers. In 2014, around 3,130 women were diagnosed with this cancer. In the early 2000s, there were fewer than half as many cases. In contrast to the mortality rates for most other gynaecological tumours, mortality rates too have increased slightly in recent years. In 2015, 940 women died from a vulvar cancer.

Women in the age-group under 70 years experienced the greatest increase in incidence rates, yet these figures have stabilised since 2010. Women over 70 years still bear the majority of the disease burden and the median age at diagnosis is 72 years. Patients diagnosed with a malignant vulvar cancer have a 5-year relative survival rate of 68 %. The vast majority of invasive carcinomas are diagnosed at an early tumour stage (T1), although the lymph nodes are already affected in one of every four women diagnosed.

Incidence and mortality rates in Germany are highest in the Saarland. While data was not available for all neighbouring countries, incidence rates in Germany appear to be generally higher, whereas mortality rates are similar.

Risk factors, early detection and prevention

Vulvar cancers are mostly (95 %) squamous cell carcinomas and occur as either non-keratinising or keratinising carcinomas. The latter account for 65-80 % of all vulva squamous cell carcinomas.

Non-keratinising vulvar cancers and their pre-cancerous stages often correlate with a chronic infection with human papilloma virus (HPV) and occur predominantly in younger women.

Keratinising vulvar cancers and their pre-cancerous stages are not associated with HPV and occur mainly in elderly women. Degenerative and chronic inflammatory skin diseases such as Lichen sclerosus belong to the most important risk factors. Smoking and long-term immunosuppression (for example in organ transplant or HIV-patients), also increase the risk of developing vulvar cancer. HIV facilitates an HPV infection and thus increases the risk of developing vulvar cancer. The presence of other genital cancers or their precursors, for example cervical cancer or Paget's disease of the vulva, are further risk factors.

Targeted early detection for vulvar cancer and its precancerous conditions is not available. Gynaecological cancer early detection examinations should however cover the entire vulva. HPV vaccination is a possible means of prevention.

Figure 3.15.1a
Age-standardised incidence and mortality rates, ICD-10 C51, Germany 1999–2014/2015
per 100,000 (old European Standard)

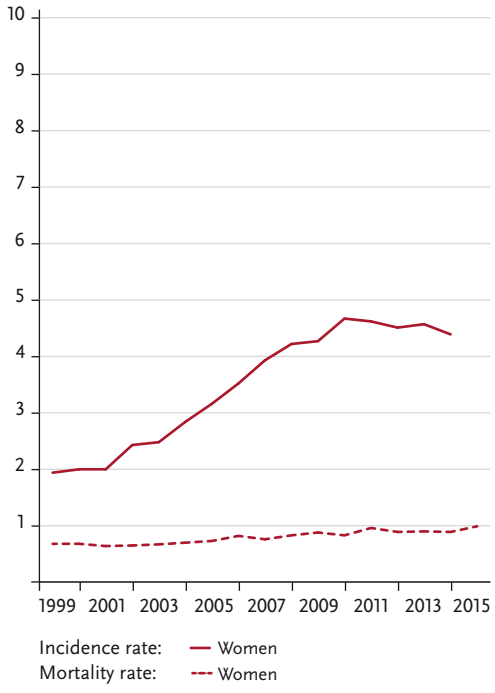


Figure 3.15.1b
Absolute numbers of incident cases and deaths, ICD-10 C51, Germany 1999–2014/2015

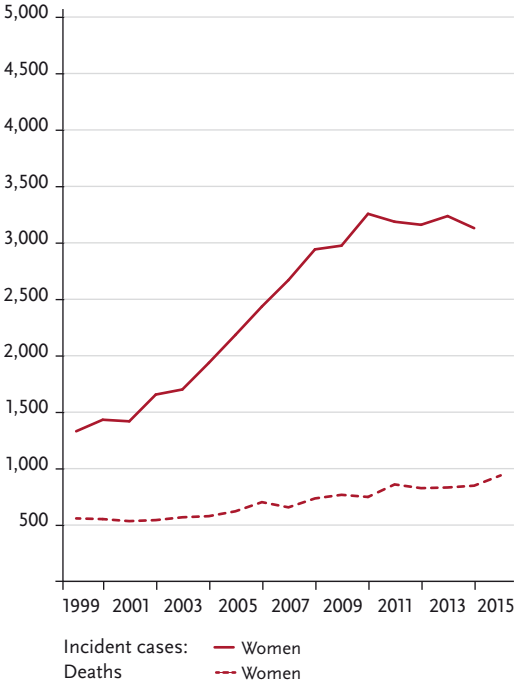


Figure 3.15.2
Age-specific incidence rates, ICD-10 C51, Germany 2013–2014
per 100,000

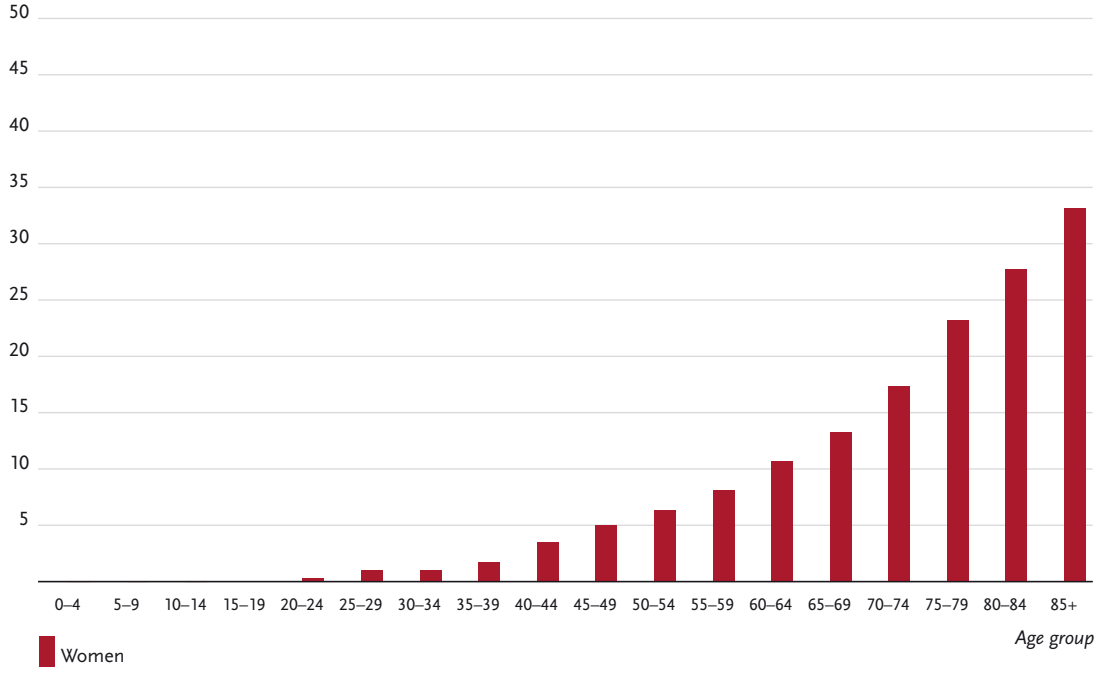


Table 3.15.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C51, database 2014

	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 3,600)	0.6%	(1 in 160)	<0.1%	(1 in 81,800)	0.2%	(1 in 590)
45 years	0.1%	(1 in 1,800)	0.6%	(1 in 170)	<0.1%	(1 in 23,800)	0.2%	(1 in 590)
55 years	0.1%	(1 in 1,100)	0.5%	(1 in 180)	<0.1%	(1 in 6,900)	0.2%	(1 in 590)
65 years	0.2%	(1 in 650)	0.5%	(1 in 210)	<0.1%	(1 in 3,100)	0.2%	(1 in 610)
75 years	0.2%	(1 in 470)	0.4%	(1 in 280)	0.1%	(1 in 1,400)	0.1%	(1 in 670)
Lifetime risk			0.6%	(1 in 160)			0.2%	(1 in 590)

Figure 3.15.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C51, Germany 2013–2014

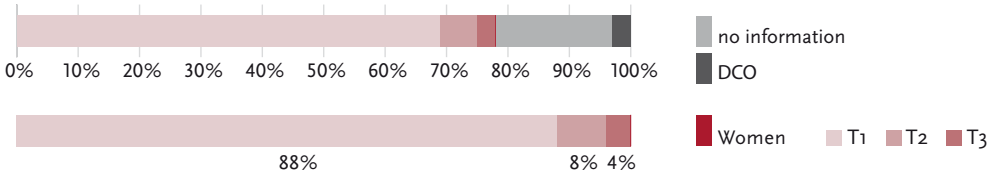


Figure 3.15.4a
Absolute survival rates up to 10 years after first diagnosis, ICD-10 C51, Germany 2013–2014

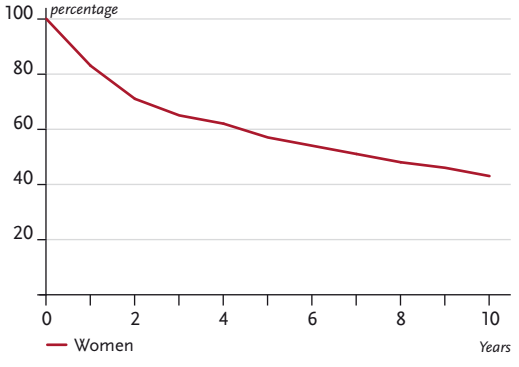


Figure 3.15.4b
Relative survival rates up to 10 years after first diagnosis, ICD-10 C51, Germany 2013–2014

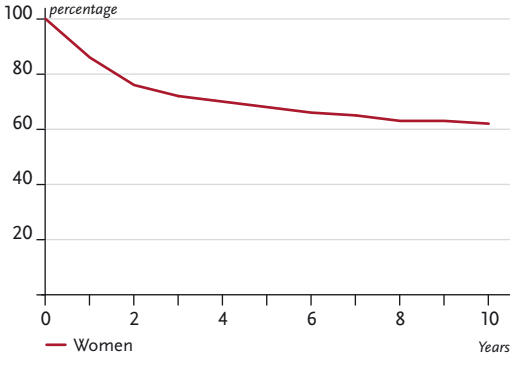


Figure 3.15.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C51, 2013–2014
per 100,000 (old European Standard)

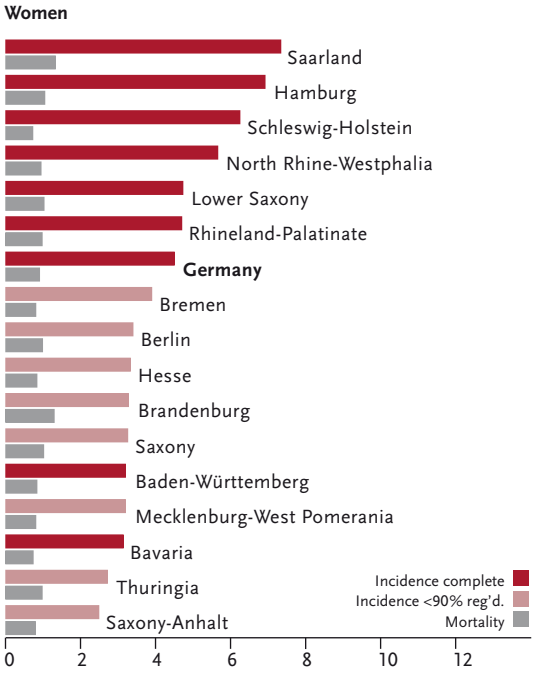
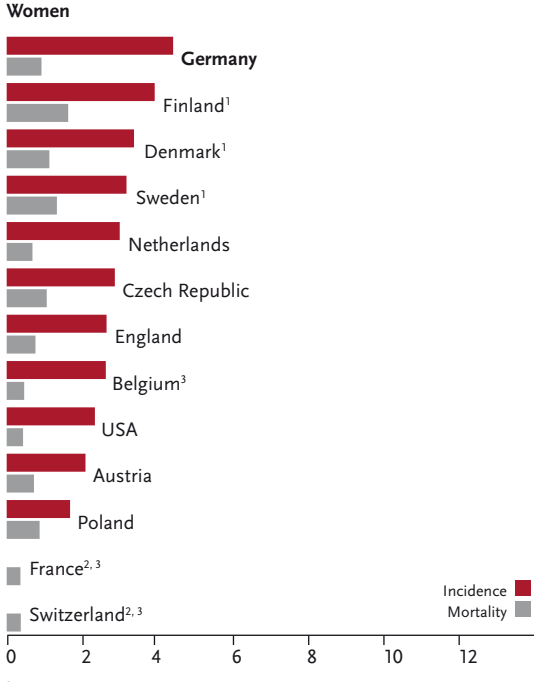


Figure 3.15.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C51, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data incl. C52, C57.7, C57.8 and C57.9
[2] no data for incidence
[3] mortality only 2013

3.16 Cervix

Table 3.16.1
Overview of key epidemiological parameters for Germany, ICD-10 C53

Incidence	2013	2014	Prediction for 2018
	Women	Women	Women
Incident cases	4,700	4,540	4,300
Crude incidence rate[1]	11.4	11.0	10.3
Standardised incidence rate[1,2]	9.4	9.2	8.6
Median age at diagnosis	52	53	

Mortality	2013	2014	2015
	Women	Women	Women
Deaths	1,550	1,506	1,541
Crude mortality rate[1]	3.8	3.7	3.7
Standardised mortality rate[1,2]	2.5	2.4	2.4
Median age at death	65	65	66

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Women	Women
Prevalence	17,500	32,500
Absolute survival rate (2013–2014)[3]	65 (64–73)	58 (55–64)
Relative survival rate (2013–2014)[3]	69 (67–78)	65 (60–72)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, around 4,540 women were diagnosed with cervical cancer in Germany. Around three quarters of these tumours are squamous cell carcinomas. Adenocarcinomas (approx. 20 %) occur more proximal, at the transition from uterus to cervix.

Following the strong decrease over the three past decades, the incidence rates for invasive cervical cancer have remained largely stable over the past decade. The highest incidence rates are currently found among women aged 35 to 60. The median age at diagnosis for invasive carcinoma is 53 years. The far more frequent in situ carcinoma is usually diagnosed in early detection examinations of women generally around 20 years younger.

Currently, about 1,540 women in Germany die of cervical cancer every year. 30 years ago, this figure was more than twice as high. The five-year relative survival rate after diagnosis of an invasive cervical tumour is 69 %. More than half of all invasive carcinomas are diagnosed at an early tumour stage (T1).

By international comparison, incidence and mortality rates in countries with long-standing and well-organised early protection programmes are clearly lower than in countries with no such programmes.

Risk factors, early detection and prevention

The main cause of cervical cancer is a sexually transmitted infection of the human papillomavirus (HPV). Many women contract HPV at some point in their life. Usually the infection disappears without further effect, but in some cases it persists and a cervical carcinoma can develop, especially when it concerns the high-risk virus subtypes HPV 16 or 18. Further risk factors include smoking, infections of the genital area with other sexually transmitted diseases such as herpes simplex or chlamydia, becoming sexually active at a young age, several births and a severely impaired immune system. Taking oral contraceptives (»the pill«) over a long period is also associated with a slightly higher risk of developing cervical cancer. Possibly, a genetic predisposition plays a role in the development of cervical cancers.

In Germany women aged 20 years and older are entitled to an annual cervical smear test (PAP smear) as screening, and, following 2018, women aged over 35 years will be entitled to an HPV test every three years combined with a PAP smear. The German Standing Committee on Vaccination Recommendations (STIKO) recommends vaccinating girls aged 9 to 14 against HPV. Statutory health insurers cover the costs of vaccination for girls who have missed a vaccination up to the age of 17. Nonetheless, this cannot replace screening examinations, as vaccination only provides protection against the most frequent high-risk HPV types.

Figure 3.16.1a
Age-standardised incidence and mortality rates, ICD-10 C53, Germany 1999–2014/2015
per 100,000 (old European Standard)

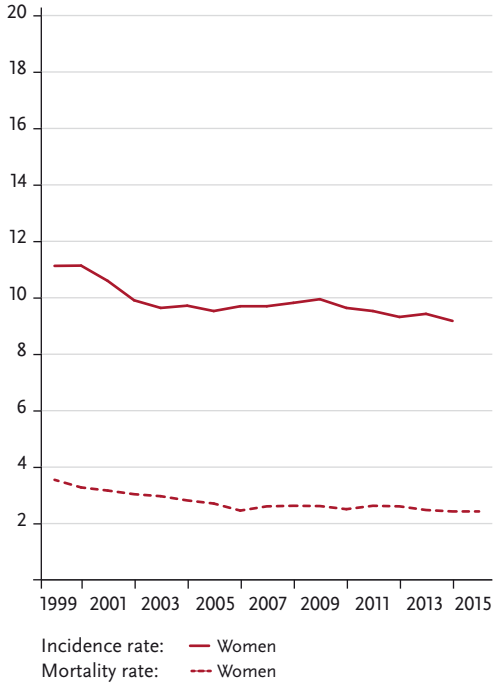


Figure 3.16.1b
Absolute numbers of incident cases and deaths, ICD-10 C53, Germany 1999–2014/2015

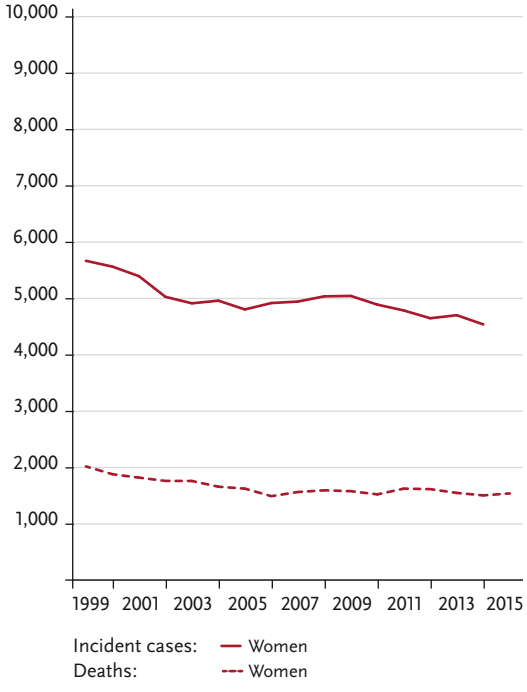


Figure 3.16.2
Age-specific incidence rates, ICD-10 C53, Germany 2013–2014
per 100,000

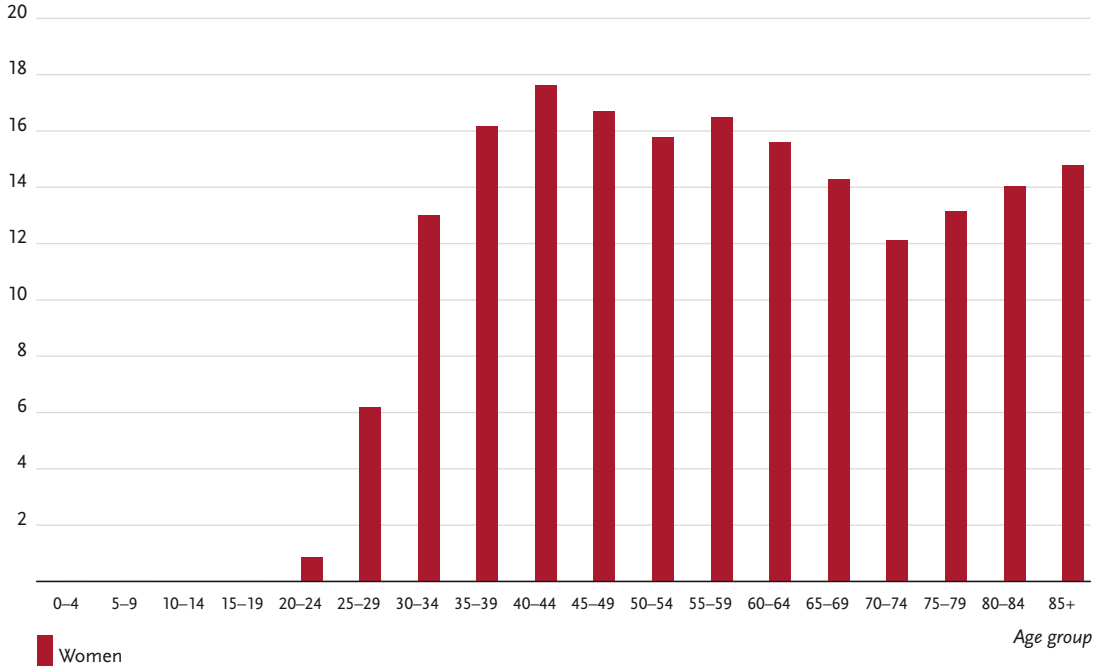


Table 3.16.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C53, database 2014

	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
15 years	<0.1%	(1 in 11,900)	0.9%	(1 in 120)	<0.1%	(1 in 253,600)	0.3%	(1 in 350)
25 years	0.1%	(1 in 1,000)	0.8%	(1 in 120)	<0.1%	(1 in 17,800)	0.3%	(1 in 350)
35 years	0.2%	(1 in 600)	0.8%	(1 in 130)	<0.1%	(1 in 4,900)	0.3%	(1 in 350)
45 years	0.2%	(1 in 600)	0.6%	(1 in 170)	<0.1%	(1 in 2,300)	0.3%	(1 in 380)
55 years	0.2%	(1 in 650)	0.4%	(1 in 230)	0.1%	(1 in 1,700)	0.2%	(1 in 440)
65 years	0.1%	(1 in 790)	0.3%	(1 in 340)	0.1%	(1 in 1,700)	0.2%	(1 in 570)
75 years	0.1%	(1 in 830)	0.2%	(1 in 530)	0.1%	(1 in 1,300)	0.1%	(1 in 760)
Lifetime risk			0.8%	(1 in 120)			0.3%	(1 in 350)

Figure 3.16.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C53, Germany 2013–2014

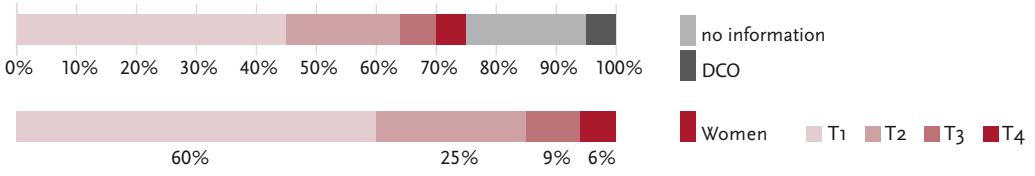


Figure 3.16.4a
Absolute survival rates up to 10 years after first diagnosis,
ICD-10 C53, Germany 2013–2014

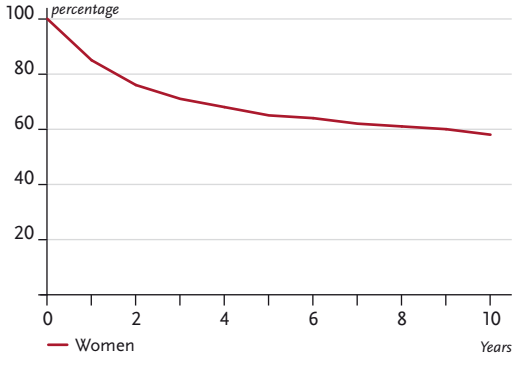


Figure 3.16.4b
Relative survival rates up to 10 years after first diagnosis,
ICD-10 C53, Germany 2013–2014

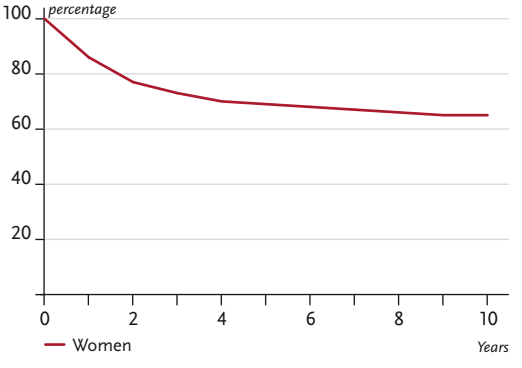


Figure 3.16.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C53, 2013–2014
per 100,000 (old European Standard)

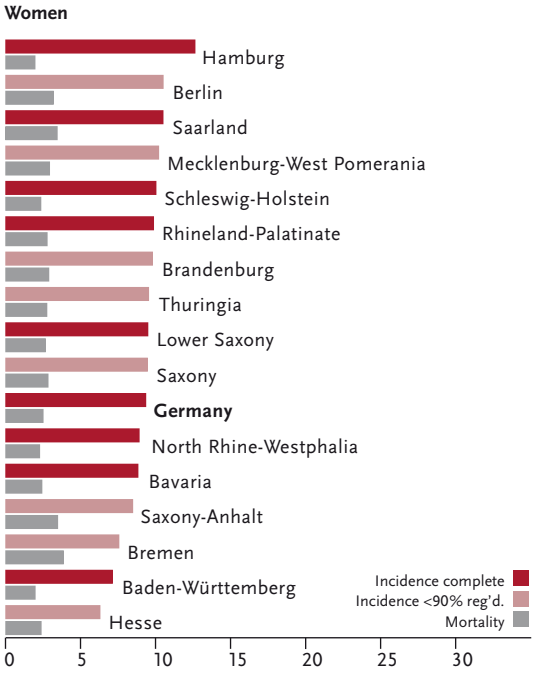
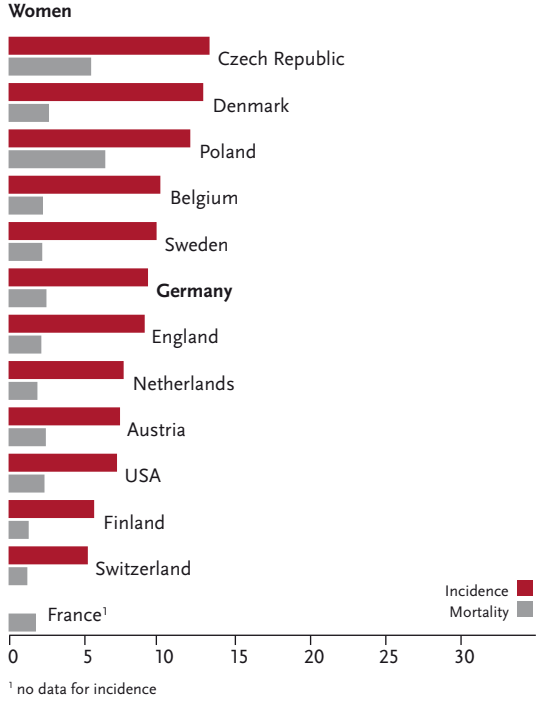


Figure 3.16.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C53, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.17 Uterus

Table 3.17.1
Overview of key epidemiological parameters for Germany, ICD-10 C54–C55

Incidence	2013	2014	Prediction for 2018
	Women	Women	Women
Incident cases	10,740	10,680	10,600
Crude incidence rate[1]	26.1	25.9	25.5
Standardised incidence rate[1,2]	16.1	15.9	15.3
Median age at diagnosis	69	69	

Mortality	2013	2014	2015
	Women	Women	Women
Deaths	2,579	2,472	2,602
Crude mortality rate[1]	6.3	6.0	6.3
Standardised mortality rate[1,2]	3.1	2.9	3.0
Median age at death	76	76	77

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Women	Women
Prevalence	44,000	79,300
Absolute survival rate (2013–2014)[3]	70 (68–72)	58 (55–62)
Relative survival rate (2013–2014)[3]	79 (77–81)	75 (74–79)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

With approximately 10,700 newly diagnosed cases every year, accounting for 4.7% of all malignant neoplasms, malignant uterine (uterine or endometrial) cancer is the fourth most common form of cancer among women and the most common cancer of the female genital organs. Due to the good prognosis, the number of deaths from this cancer (2,600) per year is comparatively low. One in 50 women will develop cancer of the uterus over the course of her life and one in 200 will die. Cancer of the uterus incidence rates have fallen slightly recently, while age-standardised mortality rates remain almost constant. The median age at diagnosis is 69 years. Histologically, cancers of the uterus are mostly endometrial adenocarcinomas (i.e. originating from the lining of the uterus). In approximately 80% of cases, diagnosis occurs at an early stage (T1). Uterine carcinomas have one of the most favourable prognoses. Patients in Germany have a 5-year relative survival rate of approximately 80%. At the end of 2014, there were around 79,000 women alive in Germany, who had developed a uterine carcinoma during the past ten years. Regional differences within Germany concerning incidence and mortality rates are relatively small. By international comparison, Eastern Europe, Scandinavia and the US report higher incidence rates.

Risk factors

About 80% of endometrial carcinomas are hormone-dependent. Long-term oestrogen levels therefore constitute a risk factor. Early first menstrual period (menarche), late onset of menopause (climacterium), childlessness and diseases of the ovaries all increase the risk. Oestrogen monotherapy during menopause also increases the risk, but when combined with progesterone, this effect is reduced. Oral contraceptives (»the pill«), in particular oestrogen-progesterone combinations, reduce the risk. For hormone-dependent tumours, lifestyle risk factors also play a role, particularly overweight and lack of exercise. Women with type 2 diabetes mellitus are more frequently affected. Women with breast cancer who have been treated with tamoxifen also face a higher risk. Gene mutations related to hereditary nonpolyposis colorectal carcinoma (HNPPC) also increase the uterine cancer risk.

For the rarer oestrogen-independent types, advanced age is considered a risk-factor. Exposure of the uterus to radiation can also increase the risk. The role played by lifestyle and genetic factors remains unclear.

Figure 3.17.1a
Age-standardised incidence and mortality rates, ICD-10 C54–C55, Germany 1999–2014/2015
per 100,000 (old European Standard)

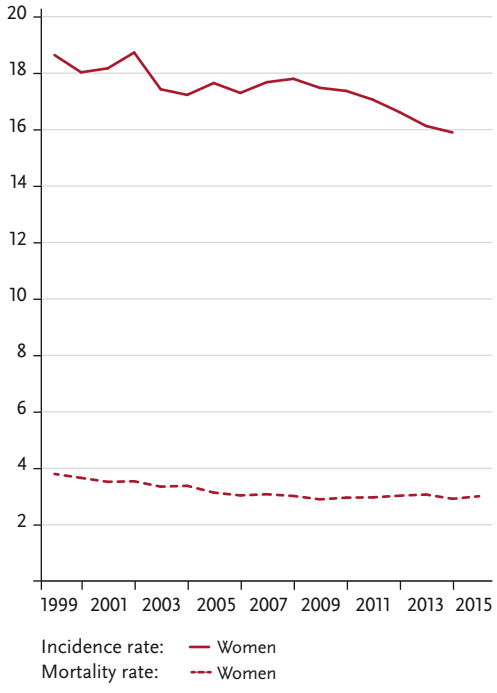


Figure 3.17.1b
Absolute numbers of incident cases and deaths, ICD-10 C54–C55, Germany 1999–2014/2015

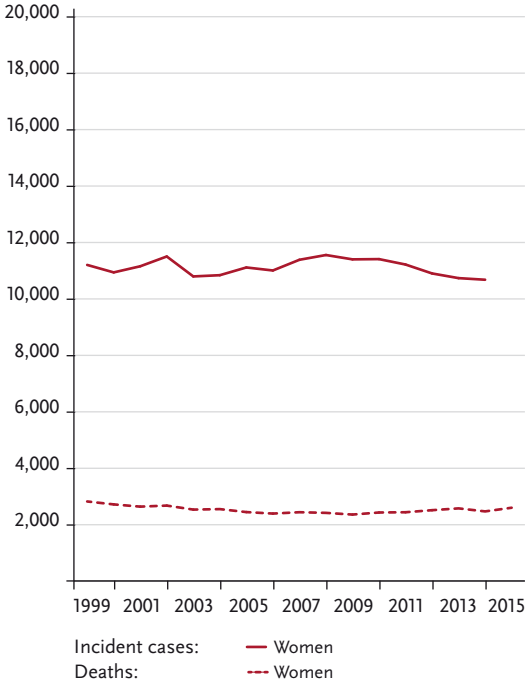


Figure 3.17.2
Age-specific incidence rates, ICD-10 C54–C55, Germany 2013–2014
per 100,000

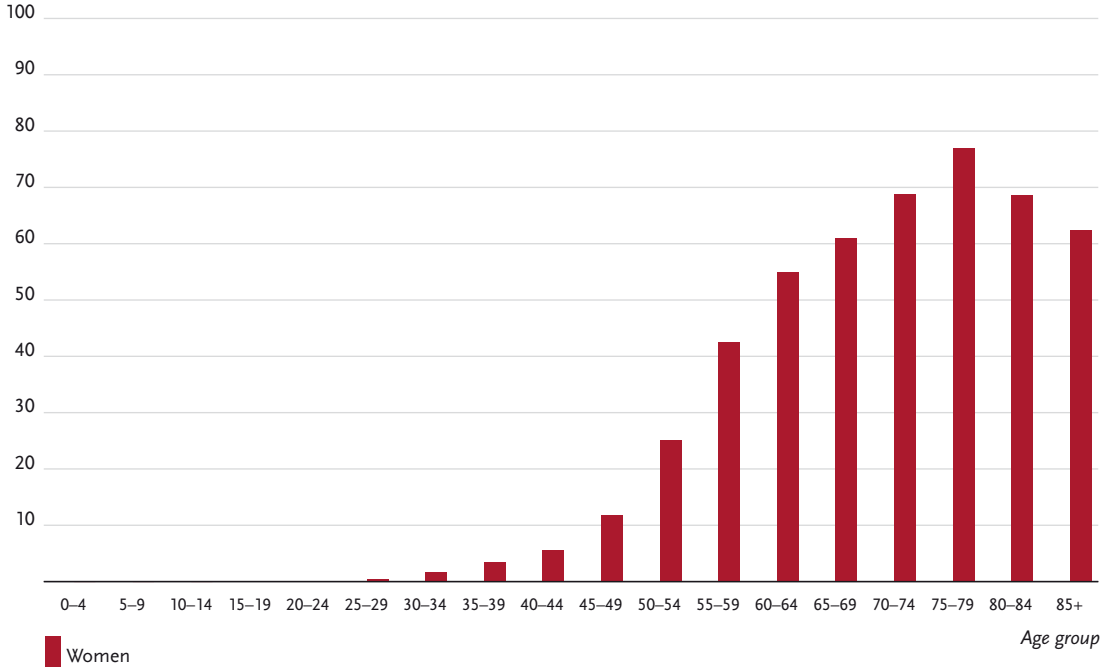


Table 3.17.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C54–C55, database 2014

	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,100)	2.0%	(1 in 50)	<0.1%	(1 in 19,200)	0.5%	(1 in 200)
45 years	0.2%	(1 in 530)	2.0%	(1 in 51)	<0.1%	(1 in 5,600)	0.5%	(1 in 200)
55 years	0.5%	(1 in 210)	1.8%	(1 in 55)	0.1%	(1 in 1,500)	0.5%	(1 in 200)
65 years	0.6%	(1 in 160)	1.4%	(1 in 70)	0.1%	(1 in 790)	0.5%	(1 in 220)
75 years	0.6%	(1 in 160)	0.9%	(1 in 110)	0.2%	(1 in 450)	0.4%	(1 in 260)
Lifetime risk			2.0%	(1 in 50)			0.5%	(1 in 200)

Figure 3.17.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C54–C55, Germany 2013–2014

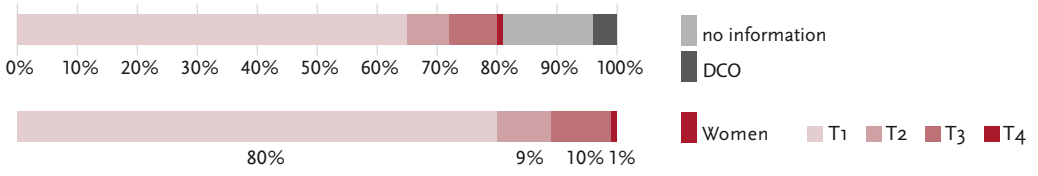


Figure 3.17.4a
Absolute survival rates up to 10 years after first diagnosis,
ICD-10 C54–C55, Germany 2013–2014

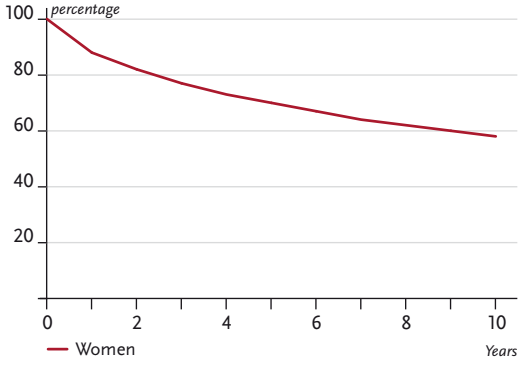


Figure 3.17.4b
Relative survival rates up to 10 years after first diagnosis,
ICD-10 C54–C55, Germany 2013–2014

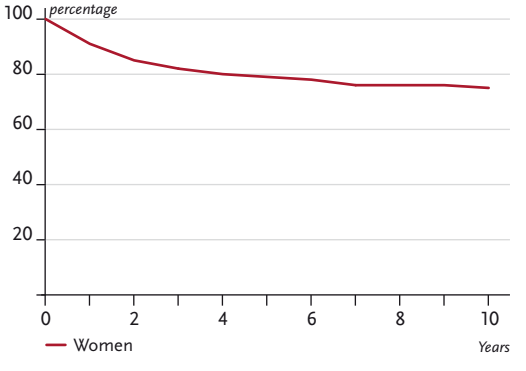


Figure 3.17.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C54–C55, 2013–2014
per 100,000 (old European Standard)

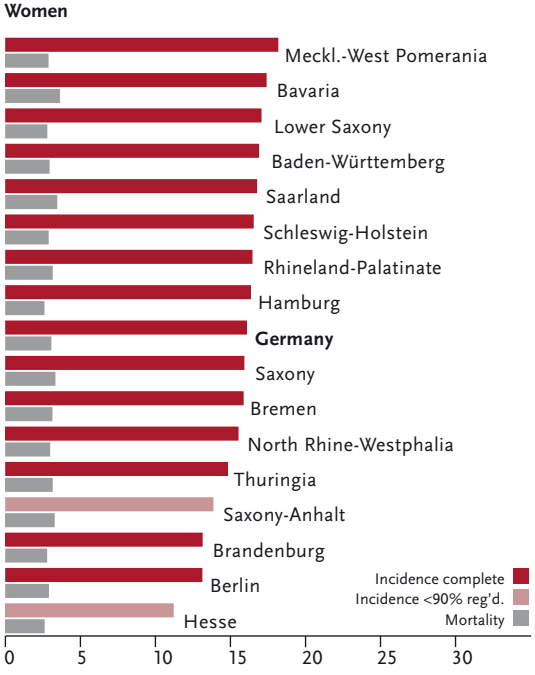
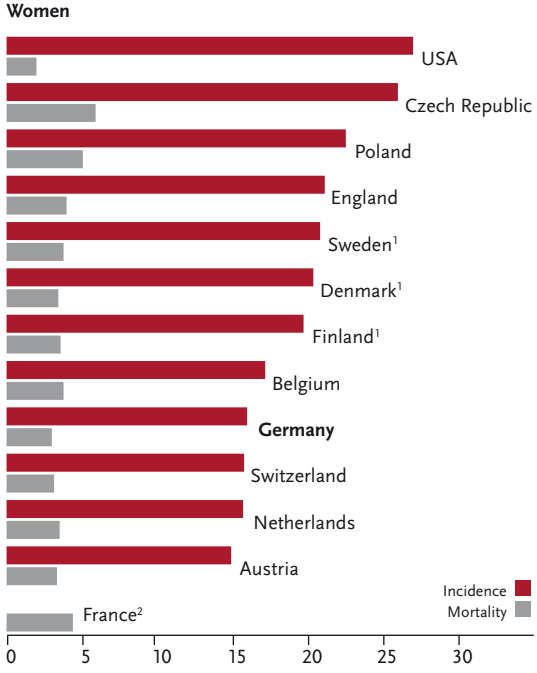


Figure 3.17.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C54–C55, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] incl. C58
[2] no data for incidence

3.18 Ovaries

Table 3.18.1
Overview of key epidemiological parameters for Germany, ICD-10 C56

Incidence	2013	2014	Prediction for 2018
	Women	Women	Women
Incident cases	7,560	7,250	6,900
Crude incidence rate[1]	18.4	17.6	16.5
Standardised incidence rate[1,2]	11.6	11.0	10.1
Median age at diagnosis	69	70	

Mortality	2013	2014	2015
	Women	Women	Women
Deaths	5,466	5,354	5,431
Crude mortality rate[1]	13.3	13.0	13.1
Standardised mortality rate[1,2]	7.1	6.9	6.9
Median age at death	74	74	75

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Women	Women
Prevalence	20,900	33,200
Absolute survival rate (2013–2014)[3]	37 (34–41)	27 (23–30)
Relative survival rate (2013–2014)[3]	41 (37–44)	32 (29–36)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Ovarian cancer accounts for 3.2 % of all malignant neoplasms among women and 5.3 % of all female cancer-related deaths. The incidence rates increase continually up to the age of 85, while the median age at diagnosis is 70. Histologically, malignant tumours of the ovaries are predominantly moderately and poorly differentiated serous adenocarcinomas. Rare forms of ovarian cancer, such as germ cell tumours may already occur in girls and younger women. One in approximately 71 women will develop ovarian cancer over the course of her life. Since the year 2000, incidence and mortality rates in Germany have continued to fall significantly, as have the absolute numbers of new cases. The differences in incidence and mortality rates between German federal states are small. Since diagnosis often only occurs at a late tumour stage (60 % at stage T3), patients with ovarian cancer have relatively unfavourable survival prospects. The 5-year relative survival rate in Germany is currently close to 41 %. In 2014, around 33,000 women lived in Germany, who had been diagnosed with ovarian cancer during the past ten years.

Risk factors

The risk of developing ovarian cancer primarily increases with age. Overweight also plays a role. Moreover, there are important associations with hormonal factors: childlessness and infertility increase the risk of developing ovarian cancer, while several births and longer periods of breast-feeding reduce the risk. The impact on risk of early first menstrual period (menarche) or late menopause (climacterium) is not entirely clear. In women with polycystic ovaries, evidence indicates that hormonal factors potentially also translate into a higher risk of ovarian cancer. Hormone replacement therapy (and in particular oestrogen monotherapy) for women after menopause is a further risk factor. In contrast, hormonal ovulation inhibitors (»the pill«) have a protective effect. Sterilisation by means of tubal ligation also reduces the risk for this cancer.

For women with first-degree relatives diagnosed with breast or ovarian cancer and for women who themselves have been diagnosed with breast, uterine or colorectal cancer, the risk is also higher. Underlying genetic mutations, above all of BRCA1 and BRCA2, considerably increase the risk, but only play a part in one out of ten cases.

Figure 3.18.1a
Age-standardised incidence and mortality rates, ICD-10 C56, Germany 1999–2014/2015
per 100,000 (old European Standard)

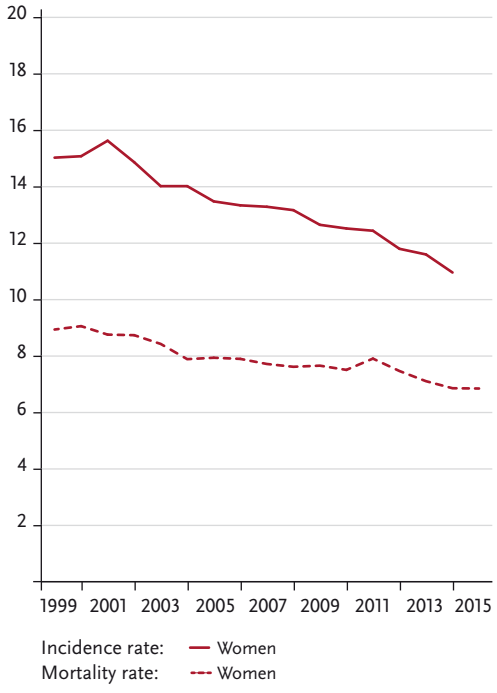


Figure 3.18.1b
Absolute numbers of incident cases and deaths, ICD-10 C56, Germany 1999–2014/2015

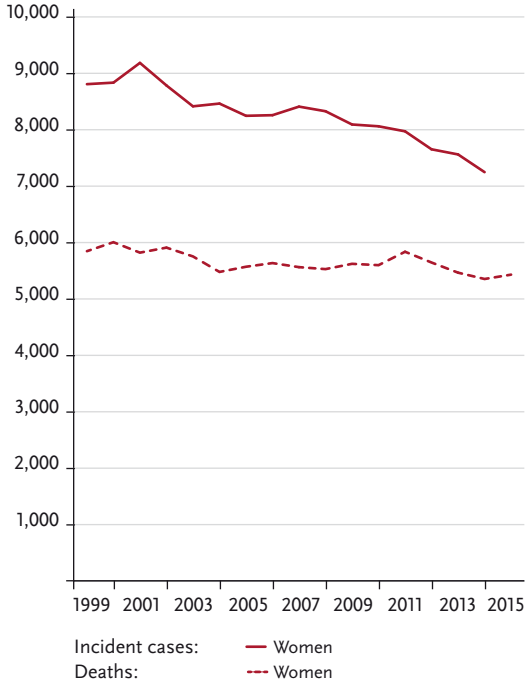


Figure 3.18.2
Age-specific incidence rates, ICD-10 C56, Germany 2013–2014
per 100,000

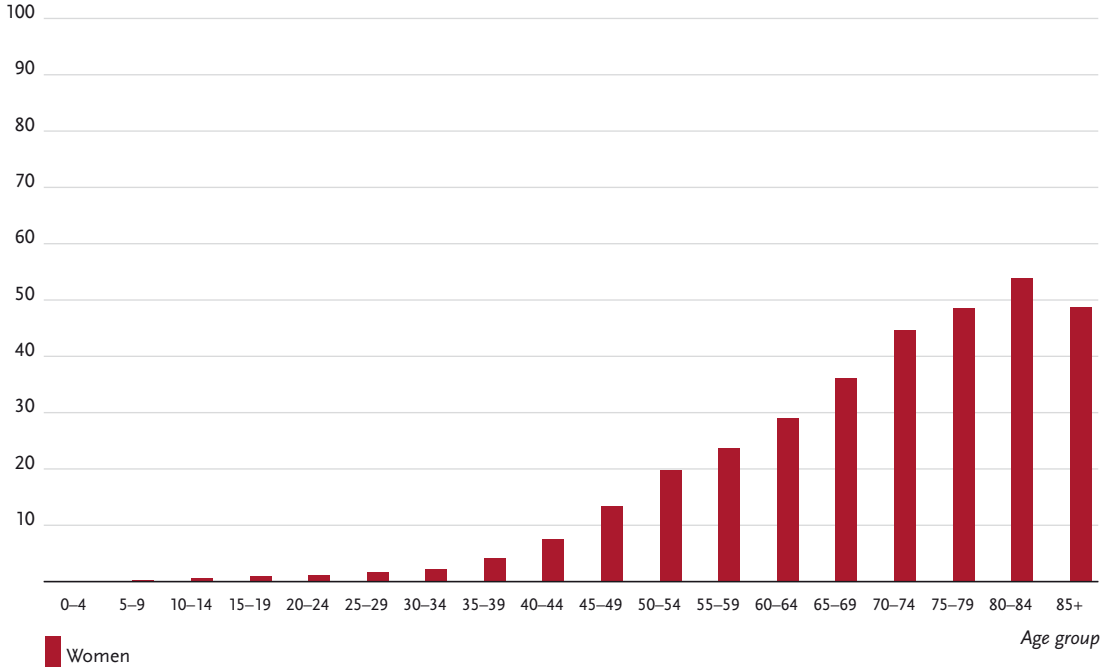


Table 3.18.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C56, database 2014

	Risk of developing cancer				Mortality risk			
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1 %	(1 in 1,600)	1.4 %	(1 in 73)	<0.1 %	(1 in 5,800)	1.1 %	(1 in 95)
45 years	0.2 %	(1 in 600)	1.3 %	(1 in 75)	0.1 %	(1 in 1,500)	1.0 %	(1 in 96)
55 years	0.3 %	(1 in 370)	1.2 %	(1 in 84)	0.1 %	(1 in 670)	1.0 %	(1 in 100)
65 years	0.4 %	(1 in 260)	1.0 %	(1 in 100)	0.3 %	(1 in 330)	0.9 %	(1 in 110)
75 years	0.4 %	(1 in 230)	0.7 %	(1 in 150)	0.4 %	(1 in 240)	0.7 %	(1 in 150)
Lifetime risk			1.4 %	(1 in 71)			1.0 %	(1 in 95)

Figure 3.18.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C56, Germany 2013–2014

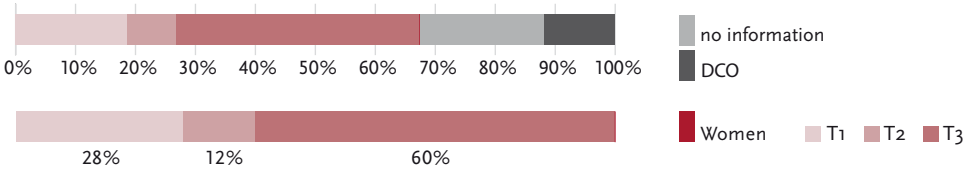


Figure 3.18.4a
Absolute survival rates up to 10 years after first diagnosis,
ICD-10 C56, Germany 2013–2014

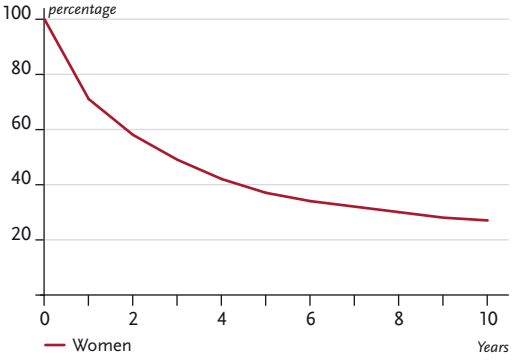


Figure 3.18.4b
Relative survival rates up to 10 years after first diagnosis,
ICD-10 C56, Germany 2013–2014

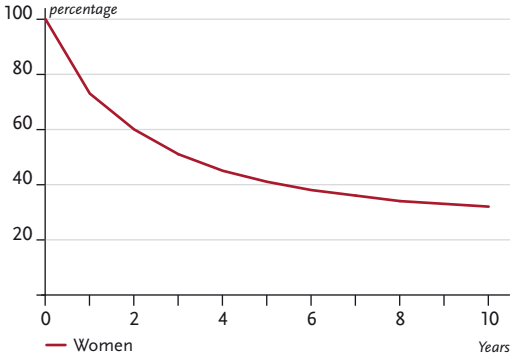


Figure 3.18.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C56, 2013–2014
per 100,000 (old European Standard)

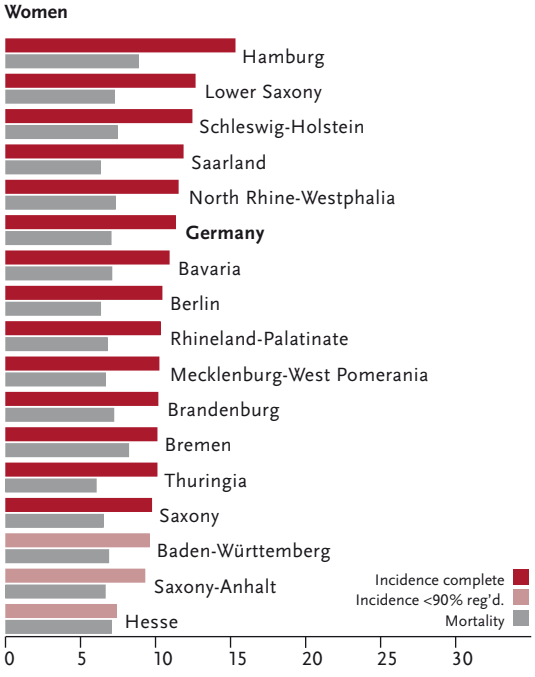
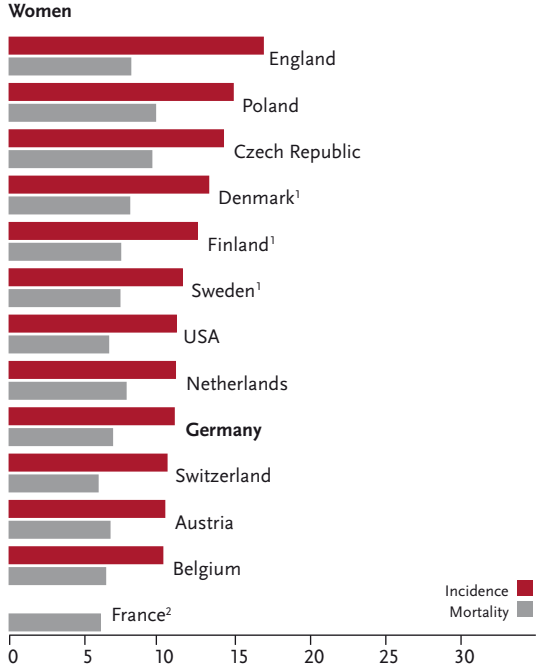


Figure 3.18.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C56, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] incl. C57.0 to C57.4
[2] no data for incidence

3.19 Prostate

Table 3.19.1
Overview of key epidemiological parameters for Germany, ICD-10 C61

Incidence	2013	2014	Prediction for 2018
	Men	Men	Men
Incident cases	60,170	57,370	60,700
Crude incidence rate[1]	152.5	144.5	150.7
Standardised incidence rate[1,2]	99.0	92.7	92.7
Median age at diagnosis	71	72	

Mortality	2013	2014	2015
	Men	Men	Men
Deaths	13,408	13,704	13,900
Crude mortality rate[1]	34.0	34.5	34.6
Standardised mortality rate[1,2]	20.0	19.7	19.4
Median age at death	79	79	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Men	Men
Prevalence	271,800	494,800
Absolute survival rate (2013–2014)[3]	76 (74–78)	59 (57–62)
Relative survival rate (2013–2014)[3]	91 (89–93)	90 (88–92)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, around 57,400 new cases of prostate cancer were registered. After increasing for almost two decades, age-standardised incidence rates have remained largely constant since 2003 and have actually significantly decreased since 2011. Many other western industrialised nations have observed a similar trend, which may be attributable to the increased but now declining use of the prostate-specific antigen test (PSA test) in the late 1980s in screening examinations. By contrast, age-standardised mortality rates dropped continuously until 2007 and then levelled out. Compared to other central European countries, incidence rates in Germany are relatively low.

Prostate cancer patients are seldom younger than 50 years. For a 35-year old man, the risk of being diagnosed with prostate cancer within the next ten years is less than 0.1%, while for a 75-year old man it is approximately 5%.

The 5-year relative survival rate for prostate cancer is 91%. Three out of four tumours are diagnosed at an early stage (T1 or T2).

Risk factors and early detection

Little is known about the causes of prostate carcinoma and the factors influencing the course of the disease. Age is an important risk factor. Moreover, the disease occurs more often among men of black African origin than among European or white North American men and is relatively rare among Asian men. The evidence conclusively shows that clusters of cases among close relatives are a risk factor. The male sex hormone (testosterone) also plays a part. Furthermore, chronic prostate infections and sexually transmitted diseases appear to increase the risk of prostate cancer.

There are few reliable findings regarding lifestyle, diet or the environment. Normal weight and sufficient physical exercise, however, potentially decrease the risk of developing prostate cancer.

For men aged 45 years or older, Germany's statutory screening programme currently recommends a yearly interview focusing on complaints and other health-related changes, an examination of the external sexual organs, as well as a palpation examination of the prostate and the lymph nodes. Statutory screening does not include a PSA blood test, as, to date, there is no sufficient evidence of its additional benefit to justify population-wide PSA tests.

Figure 3.19.1a
Age-standardised incidence and mortality rates, ICD-10 C61, Germany 1999–2014/2015
per 100,000 (old European Standard)

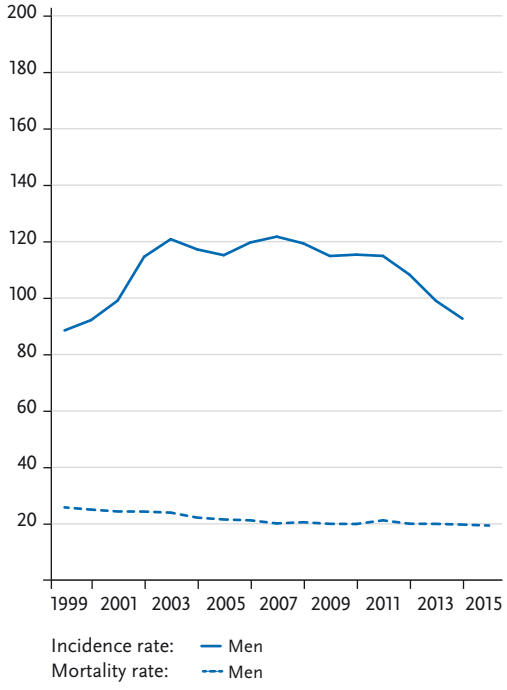


Figure 3.19.1b
Absolute numbers of incident cases and deaths, ICD-10 C61, Germany 1999–2014/2015

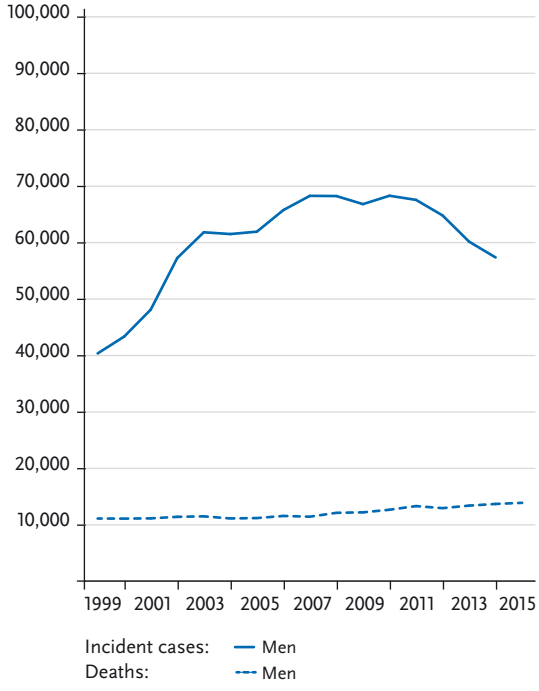


Figure 3.19.2
Age-specific incidence rates, ICD-10 C61, Germany 2013–2014
per 100,000

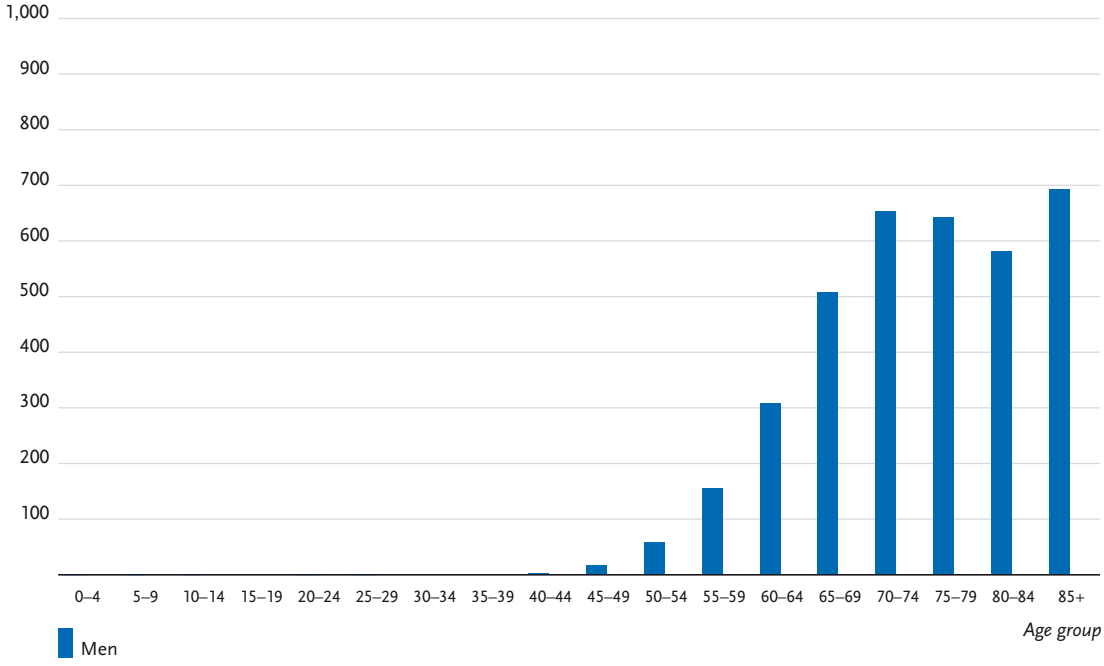


Table 3.19.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C61, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 4,300)	12.1%	(1 in 8)	<0.1%	(1 in 120,000)	3.3%	(1 in 30)
45 years	0.4%	(1 in 230)	12.2%	(1 in 8)	<0.1%	(1 in 4,800)	3.4%	(1 in 30)
55 years	2.3%	(1 in 43)	12.3%	(1 in 8)	0.2%	(1 in 570)	3.5%	(1 in 29)
65 years	5.4%	(1 in 18)	11.2%	(1 in 9)	0.7%	(1 in 150)	3.7%	(1 in 27)
75 years	5.4%	(1 in 19)	7.8%	(1 in 13)	1.9%	(1 in 52)	3.8%	(1 in 27)
Lifetime risk			11.9%	(1 in 8)			3.3%	(1 in 31)

Figure 3.19.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C61, Germany 2013–2014

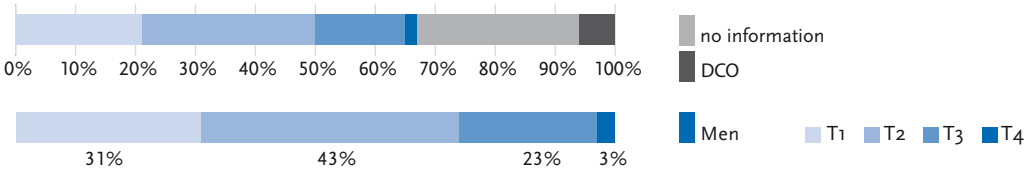


Figure 3.19.4a
Absolute survival rates up to 10 years after first diagnosis, ICD-10 C61, Germany 2013–2014

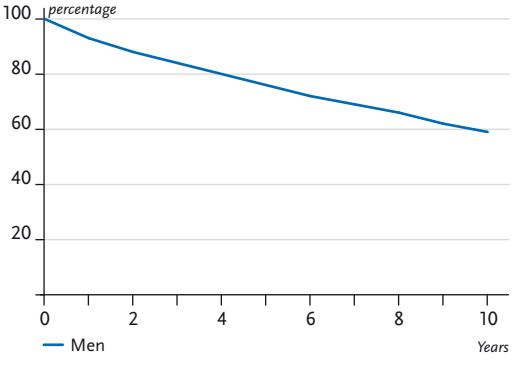


Figure 3.19.4b
Relative survival rates up to 10 years after first diagnosis, ICD-10 C61, Germany 2013–2014

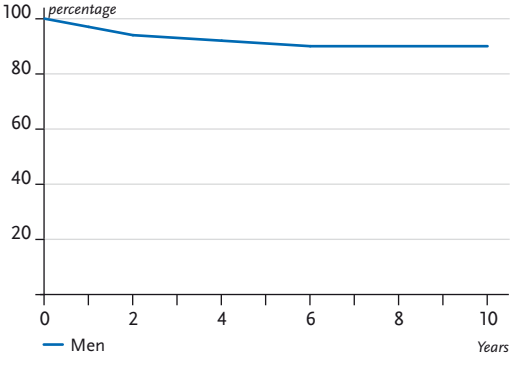


Figure 3.19.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C61, 2013–2014
per 100,000 (old European Standard)

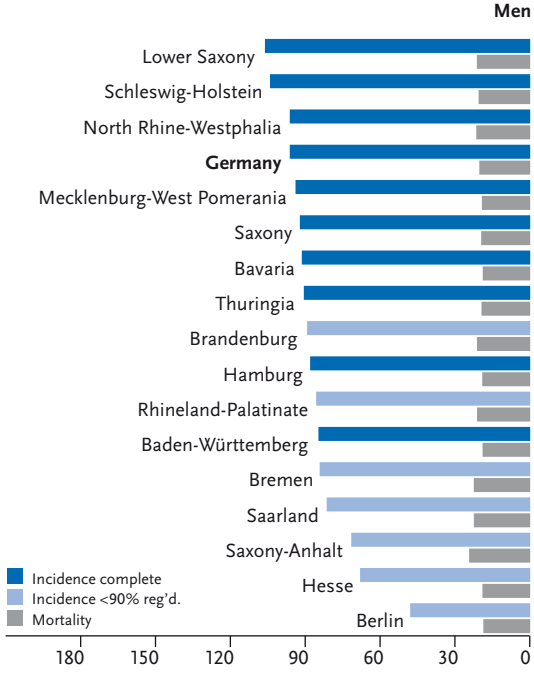
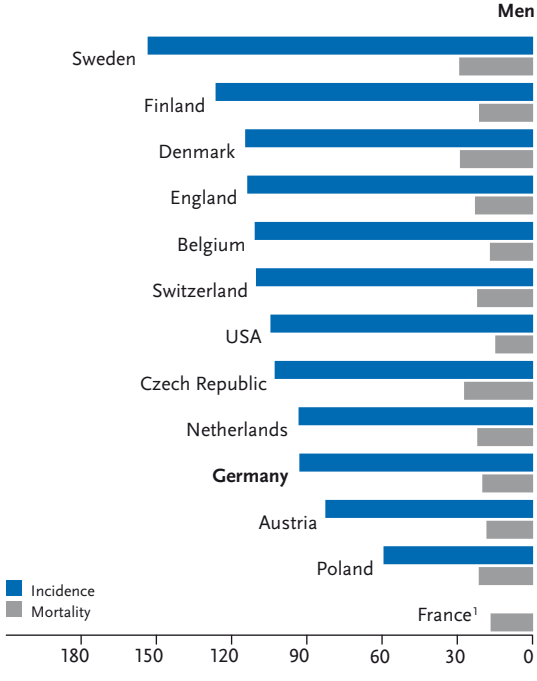


Figure 3.19.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C61, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.20 Testicle

Table 3.20.1
Overview of key epidemiological parameters for Germany, ICD-10 C62

Incidence	2013	2014	Prediction for 2018
	Men	Men	Men
Incident cases	4,200	4,070	4,400
Crude incidence rate[1]	10.7	10.3	10.9
Standardised incidence rate[1,2]	10.7	10.3	11.0
Median age at diagnosis	38	38	

Mortality	2013	2014	2015
	Men	Men	Men
Deaths	158	153	145
Crude mortality rate[1]	0.4	0.4	0.4
Standardised mortality rate[1,2]	0.3	0.3	0.3
Median age at death	49	51	48

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years	after 10 years
	Men	Men
Prevalence	19,700	39,600
Absolute survival rate (2013–2014)[3]	95 (91–96)	92 (90–94)
Relative survival rate (2013–2014)[3]	96 (93–98)	96 (93–97)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, around 4,070 men in Germany were diagnosed with testicular cancer. This is 1.6 % of all cases of cancer in men, making it relatively rare.

In contrast to almost all other types of cancer, most cases are diagnosed at the comparatively young age of 25 to 45 years. In this age group, testicular cancer is the most common malignant tumour in men. Correspondingly, the median age at diagnosis is 38 years.

In Germany and other European countries, age-standardised incidence rates now remain almost constant following decades that saw a steady increase in the number of cases. Over 90 % of testicular tumours are diagnosed in the early stages T1 or T2. Histologically, testicular cancers are predominantly germ cell tumours, of which approximately two thirds are seminomas. Malignant teratoma or mixed seminoma and teratoma tumours make up one in six cases.

Since the introduction of cis-platinum in chemotherapy for testicular cancer over 30 years ago, this disease has become one of the malignant neoplasms with the most favourable prognoses (currently with a 5-year survival rate of 96 %) and a low mortality rate (145 deaths in 2015).

Risk factors and early detection

Even after proper treatment, cryptorchidism (undescended testis) remains a risk factor for testicular cancer. The risk in men, who have already developed cancer or a preliminary stage of cancer in one testicle, of developing a tumour in the other testicle, is also increased. Rare genetic conditions that affect sexual development such as the Klinefelter syndrome also increase the testicular cancer risk.

Genetic predisposition possibly plays a role in a small number of cases. The sons and brothers of testicular cancer patients have a significantly higher risk of developing the disease themselves.

A birth weight below 2,500 g or above 4,500 g as well as being tall in stature are also being discussed as possible risk factors. The reasons behind the observed increase in incidence rates over the past few decades are not fully understood. Current findings suggest that lifestyle and environmental factors have no effect on the development of testicular cancer.

However, evidence clearly indicates that an early diagnosis correlates with a better prognosis. Following puberty, adolescents and men are therefore advised to carry out regular self-examination by palpation of the testes. The statutory early detection programme offers men above 45 an annual examination of the sexual organs.

Figure 3.20.1a
Age-standardised incidence and mortality rates, ICD-10 C62, Germany 1999–2014/2015
per 100,000 (old European Standard)

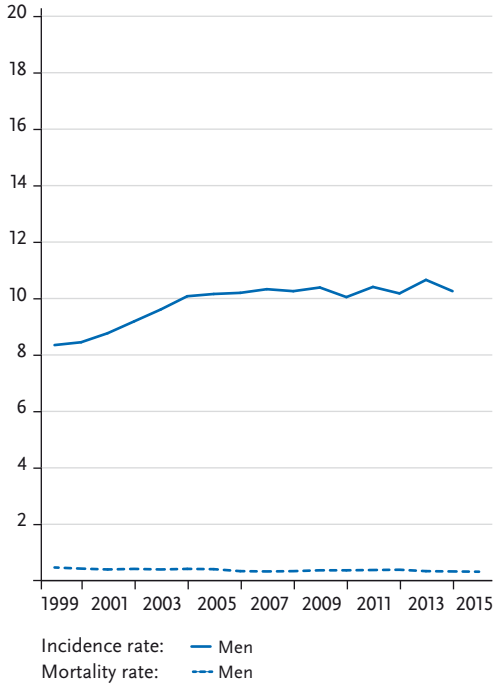


Figure 3.20.1b
Absolute numbers of incident cases and deaths, ICD-10 C62, Germany 1999–2014/2015

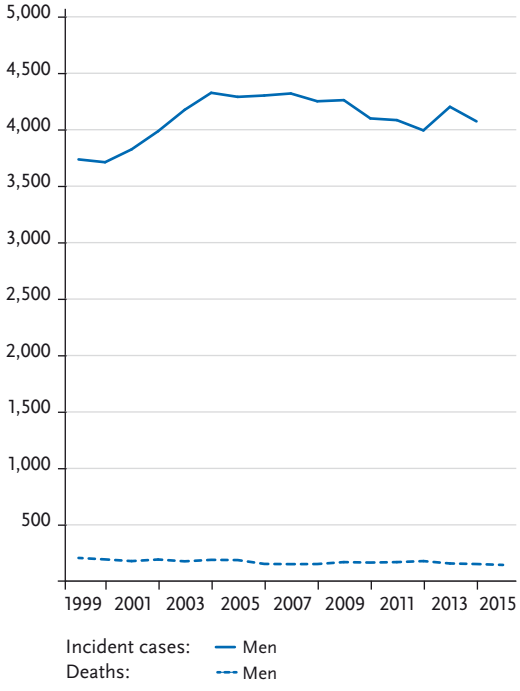


Figure 3.20.2
Age-specific incidence rates, ICD-10 C62, Germany 2013–2014
per 100,000

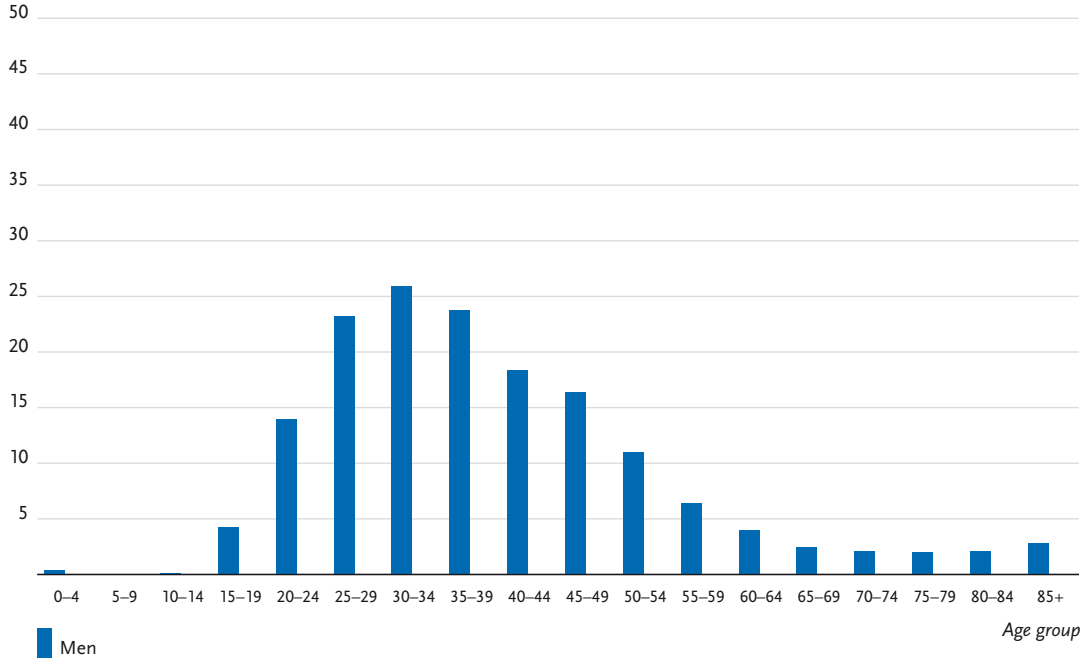


Table 3.20.2
Cancer incidence and mortality risks in Germany by age, ICD-10 C62, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
15 years	0.1%	(1 in 1,000)	0.8%	(1 in 130)	<0.1%	(1 in 57,100)	<0.1%	(1 in 3,400)
25 years	0.2%	(1 in 410)	0.7%	(1 in 150)	<0.1%	(1 in 21,700)	<0.1%	(1 in 3,600)
35 years	0.2%	(1 in 470)	0.4%	(1 in 230)	<0.1%	(1 in 23,500)	<0.1%	(1 in 4,300)
45 years	0.1%	(1 in 740)	0.2%	(1 in 450)	<0.1%	(1 in 19,000)	<0.1%	(1 in 5,200)
55 years	0.1%	(1 in 1,900)	0.1%	(1 in 1,100)	<0.1%	(1 in 21,200)	<0.1%	(1 in 6,900)
65 years	<0.1%	(1 in 4,600)	<0.1%	(1 in 2,400)	<0.1%	(1 in 37,500)	<0.1%	(1 in 9,300)
75 years	<0.1%	(1 in 5,800)	<0.1%	(1 in 3,900)	<0.1%	(1 in 16,400)	<0.1%	(1 in 9,700)
Lifetime risk			0.8%	(1 in 130)			<0.1%	(1 in 3,400)

Figure 3.20.3
Distribution of T-stages at first diagnosis (top: all cases; bottom: only valid reports)
ICD-10 C62, Germany 2013–2014

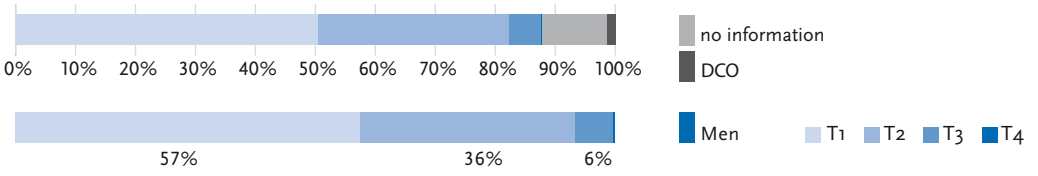


Figure 3.20.4a
Absolute survival rates up to 10 years after first diagnosis, ICD-10 C62, Germany 2013–2014

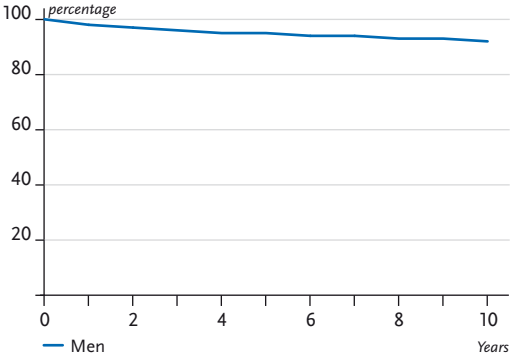


Figure 3.20.4b
Relative survival rates up to 10 years after first diagnosis, ICD-10 C62, Germany 2013–2014

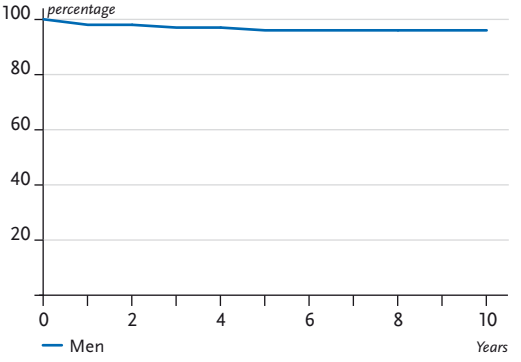


Figure 3.20.5
Registered age-standardised incidence and mortality rates in German federal states, ICD-10 C62, 2013–2014
per 100,000 (old European Standard)

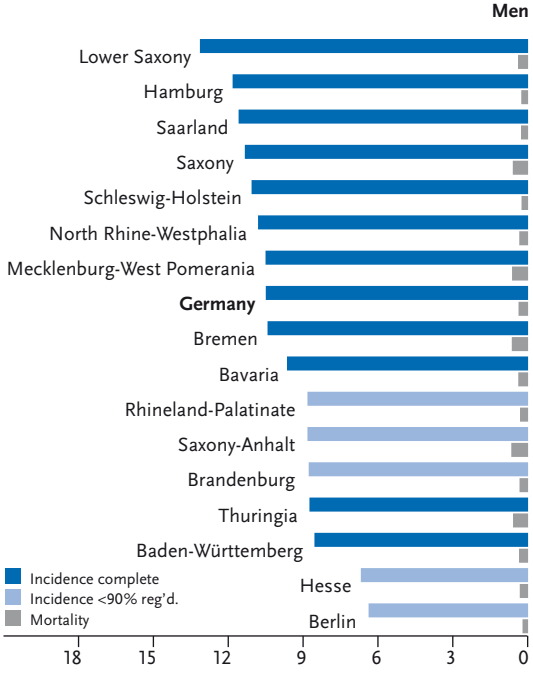
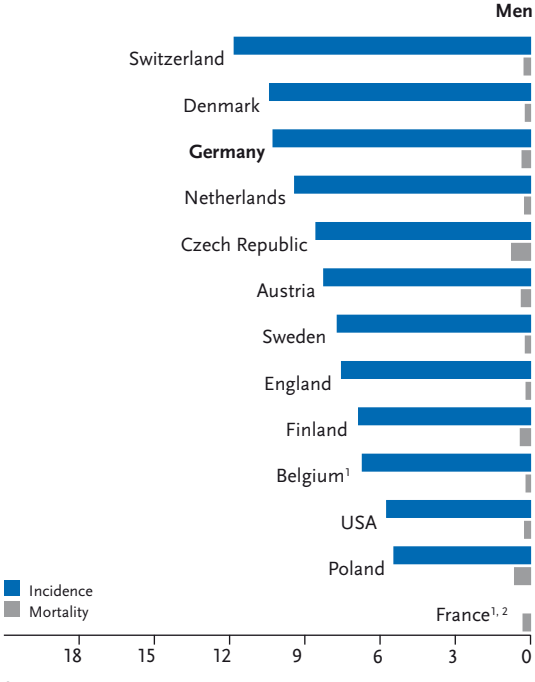


Figure 3.20.6
International comparison of age-standardised incidence and mortality rates, ICD-10 C62, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] mortality only 2013
[2] no data for incidence

3.21 Kidney

Table 3.21.1
Overview of key epidemiological parameters for Germany, ICD-10 C64

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	9,430	5,590	9,480	5,480	9,900	5,200
Crude incidence rate[1]	23.9	13.6	23.9	13.3	24.5	12.6
Standardised incidence rate[1,2]	16.6	8.0	16.5	7.8	16.3	7.3
Median age at diagnosis	68	72	67	72		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	3,358	2,100	3,243	2,035	3,306	2,106
Crude mortality rate[1]	8.5	5.1	8.2	4.9	8.2	5.1
Standardised mortality rate[1,2]	5.4	2.3	5.1	2.2	5.0	2.2
Median age at death	74	78	74	78	75	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	36,200	21,900	61,600	38,000
Absolute survival rate (2013–2014)[3]	66 (63–69)	68 (67–71)	51 (45–55)	53 (52–57)
Relative survival rate (2013–2014)[3]	77 (73–79)	77 (75–80)	70 (63–74)	71 (69–73)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Malignant neoplasms of the kidney develop from various tissues. In adults the most frequent type (96 % of cases) are renal cell carcinomas (hypernephromas). In children, who however only rarely develop the condition, nephroblastomas (Wilms' tumours) are more frequent. Since the end of the 1990s, the absolute number of new cases in men has been rising continuously, while in women the corresponding figure has been dropping since 2009. Age-standardised incidence rates have remained fairly constant for men and women over the whole period, although the incidence rate for men is twice as high as for women. Age-standardised mortality rates for both sexes present a slight downward trend. The median age at diagnosis is 67 years for men and 72 years for women. The prognosis for kidney carcinoma is comparatively favourable, the 5-year relative survival rate for kidney tumours is 77 % for both sexes. Around three-quarters of kidney tumours are diagnosed at a relatively early stage (T1 and T2). In regional and/or international comparison, incidence and mortality rates are comparatively high in the eastern federal states, as well as in the Czech Republic.

Risk factors

Smoking and passive smoking, as well as hypertension and obesity are considered the most important risk factors. Furthermore, a lack of physical activity seems to increase a person's kidney cancer risk. Chronic renal insufficiency, regardless of its cause, generally promotes carcinogenesis in the kidney. Nephrotoxic medications or repeated inflammations of the urinary tract can for example be a cause. Moreover, following kidney transplantation, the immuno-suppressed patient has an increased risk of developing a renal cell carcinoma.

Familial predisposition is probably only a factor in few cases. Approximately 4 % of renal cell carcinomas occur in patients with complex hereditary diseases such as Hippel-Lindau syndrome. Renal cell carcinomas caused by genetic factors are often multifocal and occur more often at a younger age than kidney cancers in patients without a genetic disposition.

Figure 3.21.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C64, Germany 1999–2014/2015
per 100,000 (old European Standard)

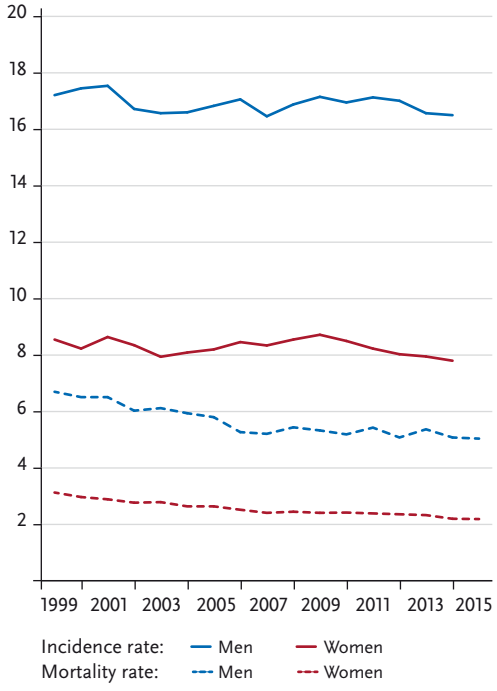


Abbildung 3.21.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C64, Germany 1999–2014/2015

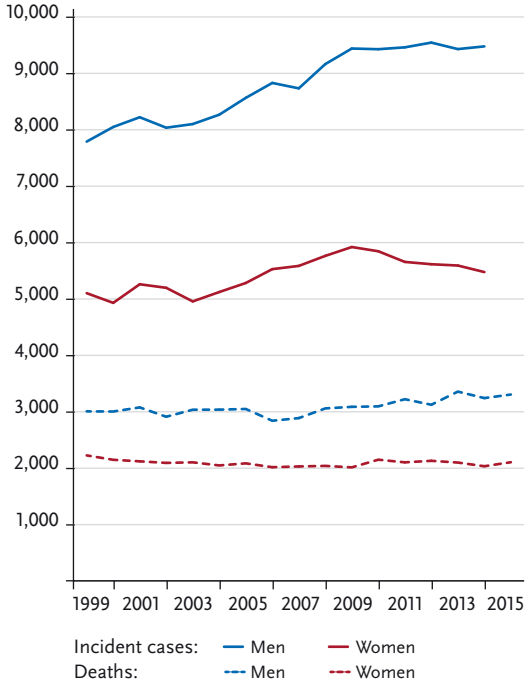


Figure 3.21.2
Age-specific incidence rates by sex, ICD-10 C64, Germany 2013–2014
per 100,000

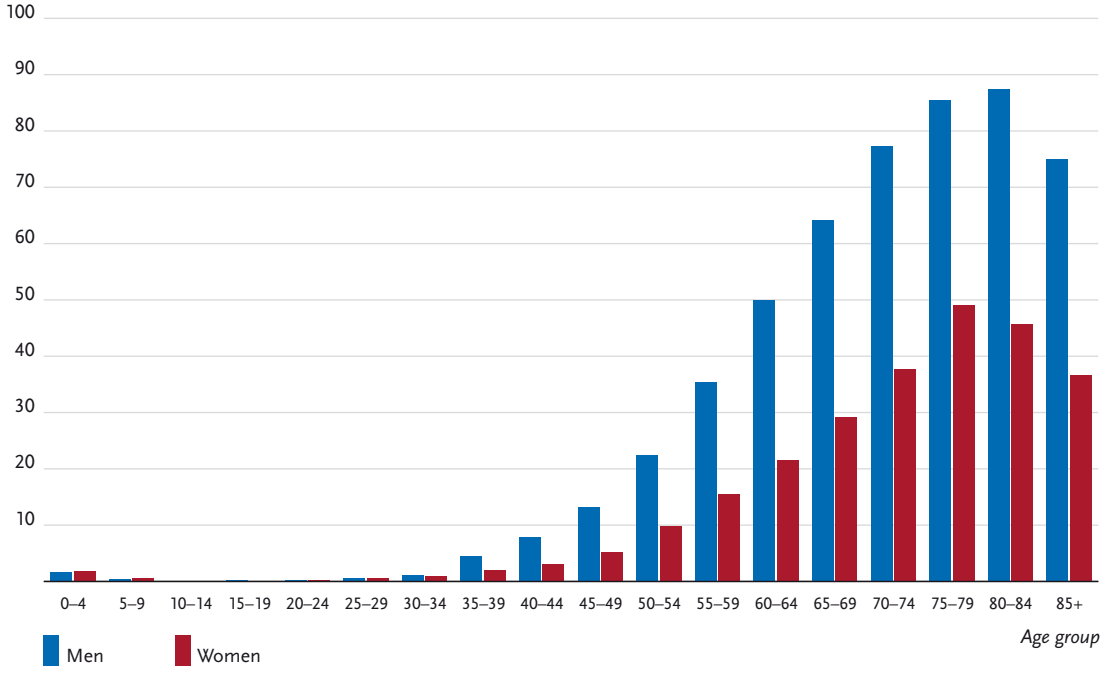


Table 3.21.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C64, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 1,700)	1.8%	(1 in 56)	<0.1%	(1 in 16,400)	0.7%	(1 in 140)
45 years	0.2%	(1 in 560)	1.8%	(1 in 57)	<0.1%	(1 in 3,200)	0.7%	(1 in 140)
55 years	0.4%	(1 in 250)	1.6%	(1 in 61)	0.1%	(1 in 1,000)	0.7%	(1 in 140)
65 years	0.7%	(1 in 150)	1.4%	(1 in 73)	0.2%	(1 in 450)	0.7%	(1 in 150)
75 years	0.7%	(1 in 150)	0.9%	(1 in 110)	0.4%	(1 in 280)	0.6%	(1 in 180)
Lifetime risk			1.8%	(1 in 56)			0.7%	(1 in 140)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 3,800)	1.0%	(1 in 96)	<0.1%	(1 in 51,700)	0.4%	(1 in 240)
45 years	0.1%	(1 in 1,300)	1.0%	(1 in 98)	<0.1%	(1 in 8,700)	0.4%	(1 in 240)
55 years	0.2%	(1 in 540)	1.0%	(1 in 100)	<0.1%	(1 in 2,700)	0.4%	(1 in 240)
65 years	0.3%	(1 in 310)	0.8%	(1 in 120)	0.1%	(1 in 1,100)	0.4%	(1 in 250)
75 years	0.4%	(1 in 250)	0.6%	(1 in 170)	0.2%	(1 in 500)	0.4%	(1 in 280)
Lifetime risk			1.1%	(1 in 95)			0.4%	(1 in 240)

Figure 3.21.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports) ICD-10 C64, Germany 2013–2014

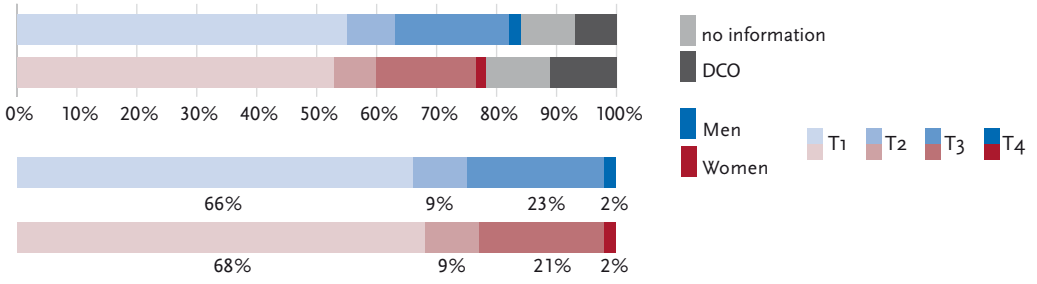


Figure 3.21.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C64, Germany 2013–2014

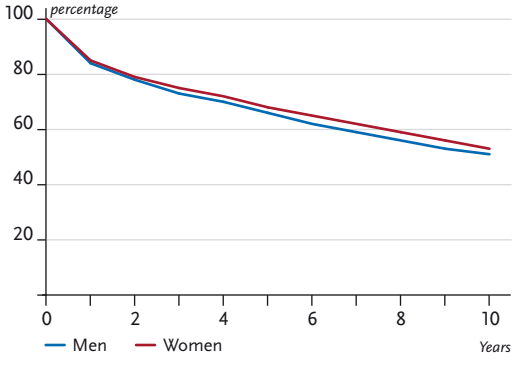


Figure 3.21.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C64, Germany 2013–2014

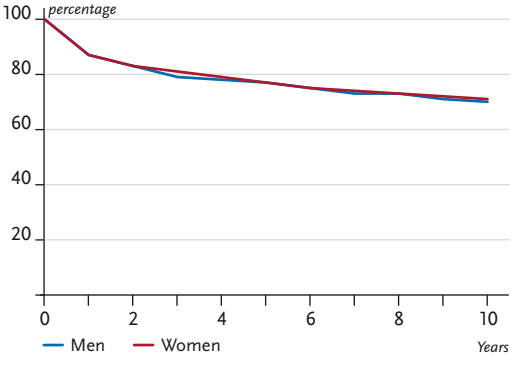


Figure 3.21.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C64, 2013–2014
per 100,000 (old European Standard)

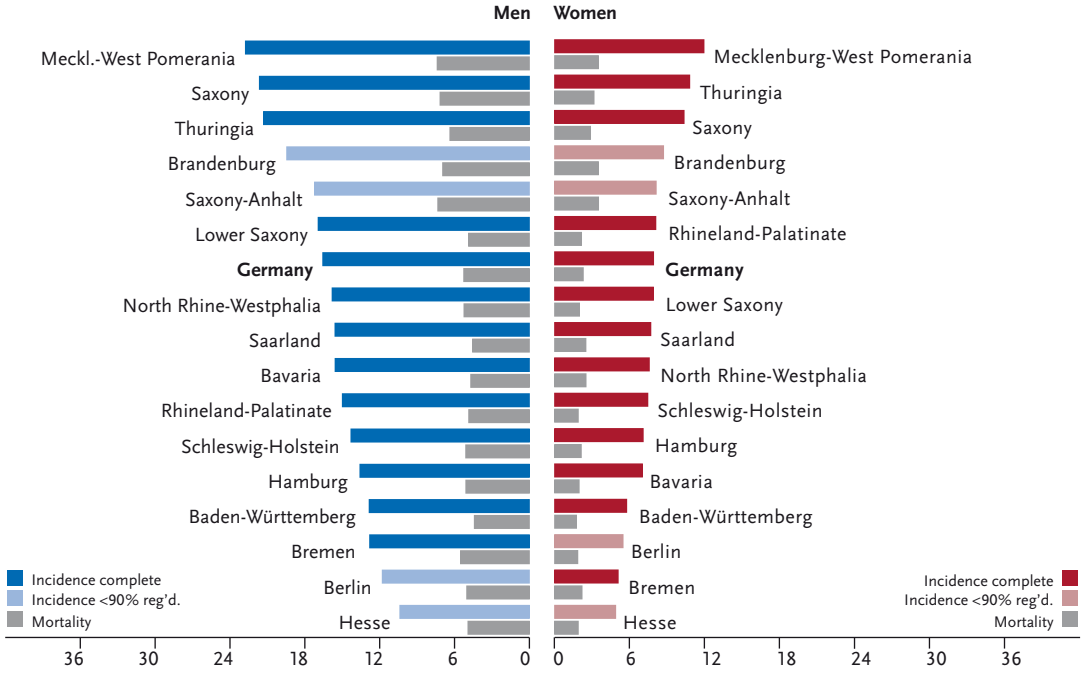
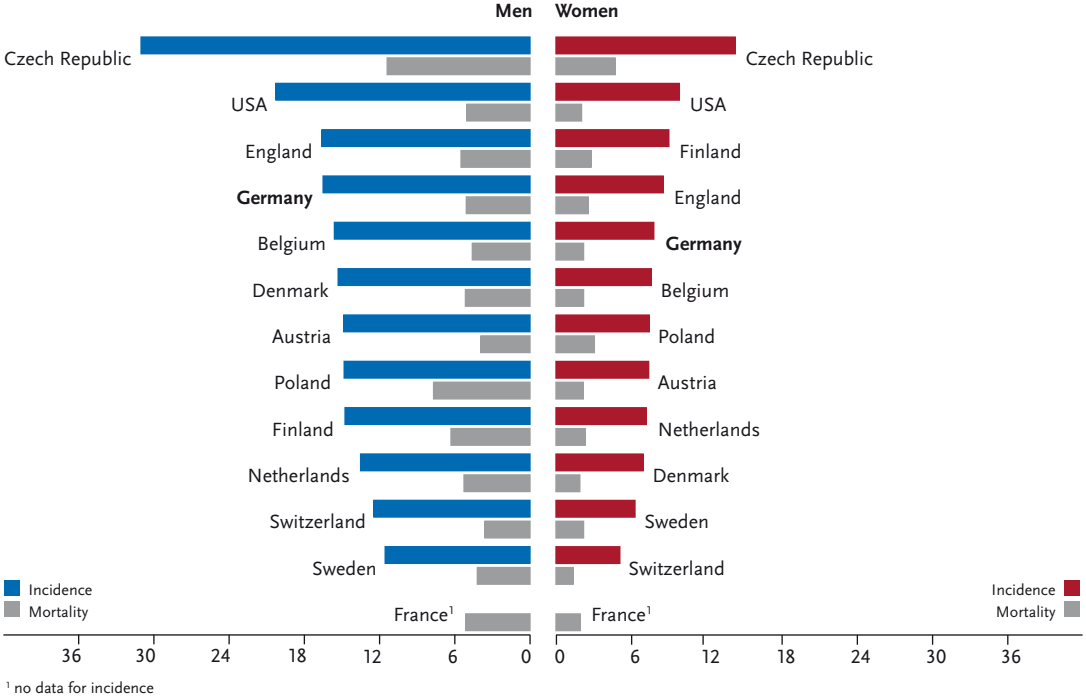


Figure 3.21.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C64, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.22 Bladder

Table 3.22.1
Overview of key epidemiological parameters for Germany, ICD-10 C67

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	12,000 (22,700)[4]	4,290 (7,340)[4]	11,680 (22,430)[4]	4,170 (7,100)[4]	12,200 (23,100)[4]	4,400 (7,600)[4]
Crude incidence rate[1]	30.4 (57.5)[4]	10.4 (17.8)[4]	29.4 (56.5)[4]	10.1 (17.2)[4]	30.2 (57.4)[4]	10.6 (18.2)[4]
Standardised incidence rate[1,2]	19.2 (36.8)[4]	5.1 (9.3)[4]	18.2 (35.5)[4]	4.9 (8.9)[4]	17.7 (34.1)[4]	4.9 (9.5)[4]
Median age at diagnosis	74 (73)[4]	77 (74)[4]	74 (74)[4]	76 (75)[4]		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	3,894	1,863	3,897	1,795	3,963	1,872
Crude mortality rate[1]	9.9	4.5	9.8	4.4	9.9	4.5
Standardised mortality rate[1,2]	6.0	1.8	5.8	1.8	5.7	1.8
Median age at death	78	82	79	82	79	82

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	36,100 (82,500)[4]	11,100 (24,500)[4]	57,200 (133,700)[4]	17,900 (41,200)[4]
Absolute survival rate (2013–2014)[3]	45 (42–51)	38 (35–45)	30 (28–34)	28 (26–34)
Relative survival rate (2013–2014)[3]	57 (54–64)	47 (41–55)	50 (47–56)	44 (37–53)

[3] in percentages (lowest and highest value of the included German federal states)
[4] in parentheses: including in situ tumours and neoplasms of uncertain or unknown behavior (D09.0, D41.1)

Epidemiology

Around 15,800 people, one quarter of them women, were newly diagnosed with an invasive bladder carcinoma in Germany in 2014. In addition, about 13,700 were diagnosed with non-invasive papillary carcinoma or in situ tumours of the bladder. Especially the latter have a high tendency of progression and recurrence. Therefore, they are of particular clinical relevance, even though they are not classified as malignant tumours according to ICD-10. The majority of bladder cancers are carcinomas of the urothelium, which frequently develop simultaneously in multiple sites in the bladder and urinary tract. For men, the age-standardised incidence and mortality rates indicate a clear downward trend since the 1990s, which is probably due to lower levels of tobacco consumption, and, possibly, to a decreased exposure to occupational carcinogens. For women, both rates remained relatively stable over the years although they are significantly lower compared to men. The higher survival rates of men compared to women correlate with a more favourable distribution regarding the stage of the tumour at diagnosis (48 % vs. 35 % T1 tumours).

Risk factors

Smoking, both active and passive, is considered the most important risk factor. Exposure to certain chemicals such as aromatic amines also increases the risk of developing bladder cancer. In Europe, the known hazardous substances have largely been eliminated from industrial processes and workplaces. However, the latency period between exposure and the development of cancer is long, which means that bladder carcinomas caused by occupational exposure to now forbidden chemicals, will continue to be registered. Cytostatic drugs used in chemotherapy and radiation therapy of this part of the body can also increase the bladder cancer risk. Other medicines such as pioglitazone (used to treat diabetics) also appear to cause bladder cancer.

Furthermore, air pollution, as well as arsenic and chlorine in drinking water increase the risk for developing a carcinoma of the bladder. Chronic inflammatory damage to the mucosa of the bladder also increases the risk. Family clusters have been observed. Furthermore, studies indicate that by affecting a patient's sensitivity to carcinogens, genetic factors play a role in the development of bladder cancer.

Figure 3.22.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C67, Germany 1999–2014/2015
per 100,000 (old European Standard)

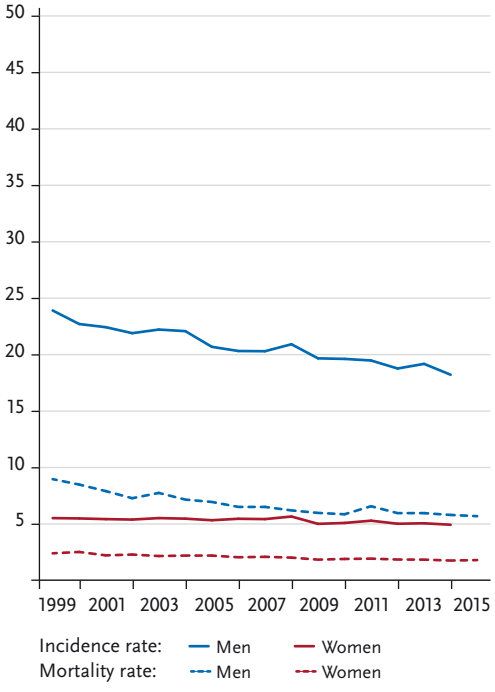


Figure 3.22.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C67, Germany 1999–2014/2015

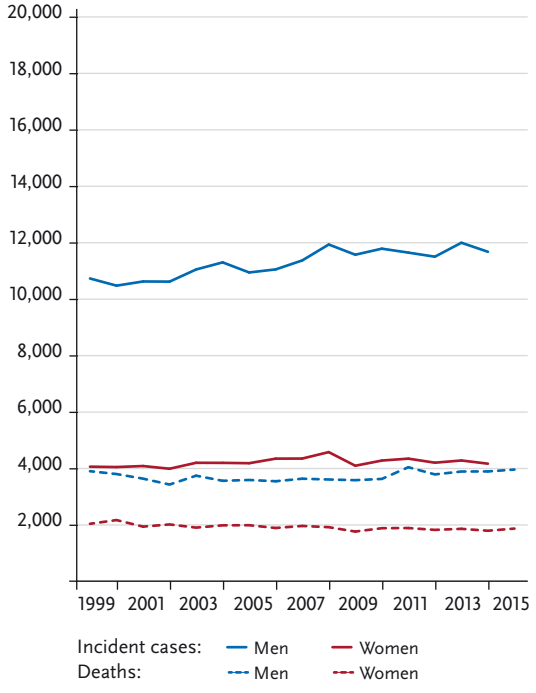


Figure 3.22.2
Age-specific incidence rates by sex, ICD-10 C67, Germany 2013–2014
per 100,000

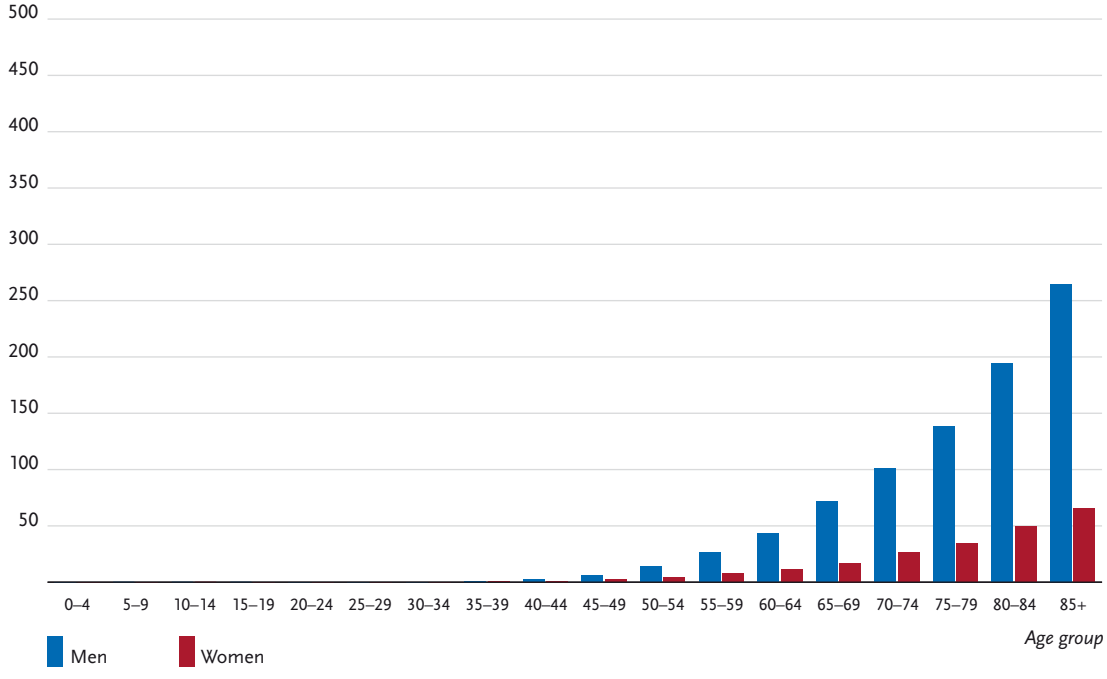


Table 3.22.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C67, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 5,200)	2.6%	(1 in 39)	<0.1%	(1 in 43,600)	1.0%	(1 in 110)
45 years	0.1%	(1 in 940)	2.6%	(1 in 39)	<0.1%	(1 in 5,300)	1.0%	(1 in 100)
55 years	0.4%	(1 in 280)	2.6%	(1 in 39)	0.1%	(1 in 1,600)	1.0%	(1 in 100)
65 years	0.8%	(1 in 130)	2.5%	(1 in 40)	0.2%	(1 in 510)	1.0%	(1 in 99)
75 years	1.3%	(1 in 76)	2.1%	(1 in 47)	0.5%	(1 in 190)	1.0%	(1 in 97)
Lifetime risk			2.5%	(1 in 39)			0.9%	(1 in 110)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 10,200)	0.9%	(1 in 120)	<0.1%	(1 in 57,400)	0.4%	(1 in 250)
45 years	<0.1%	(1 in 2,700)	0.9%	(1 in 120)	<0.1%	(1 in 10,800)	0.4%	(1 in 250)
55 years	0.1%	(1 in 1,000)	0.8%	(1 in 120)	<0.1%	(1 in 4,300)	0.4%	(1 in 250)
65 years	0.2%	(1 in 490)	0.8%	(1 in 130)	0.1%	(1 in 1,700)	0.4%	(1 in 260)
75 years	0.4%	(1 in 280)	0.7%	(1 in 150)	0.2%	(1 in 600)	0.4%	(1 in 270)
Lifetime risk			0.9%	(1 in 120)			0.4%	(1 in 260)

Figure 3.22.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C67, Germany 2013–2014

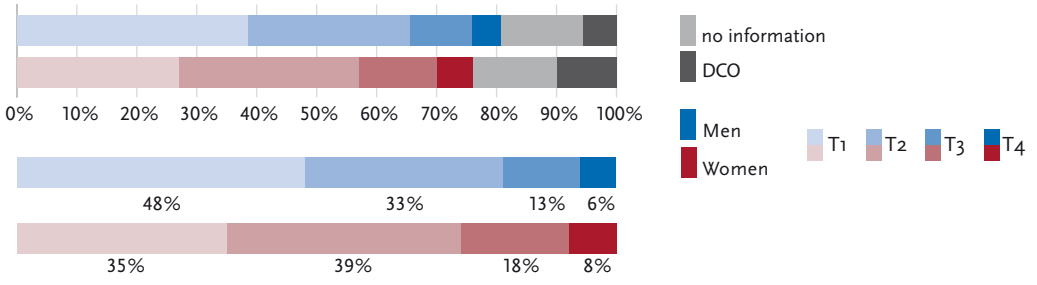


Figure 3.22.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C67, Germany 2013–2014

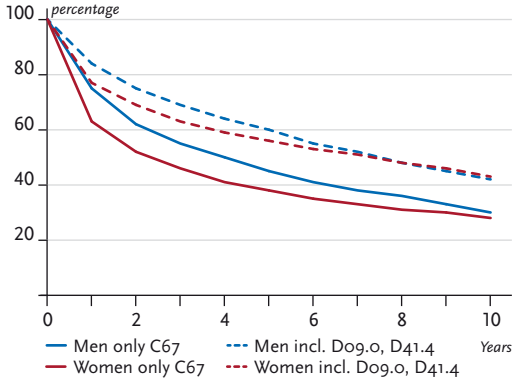


Figure 3.22.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C67, Germany 2013–2014

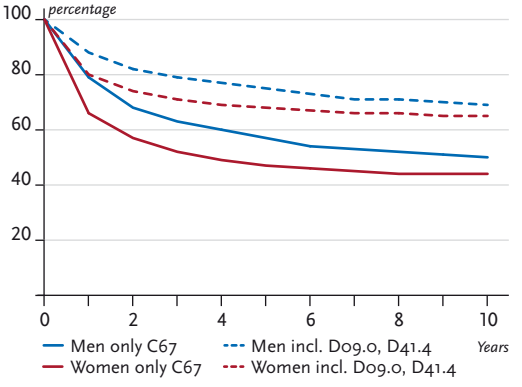


Figure 3.22.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C67, 2013–2014
per 100,000 (old European Standard)

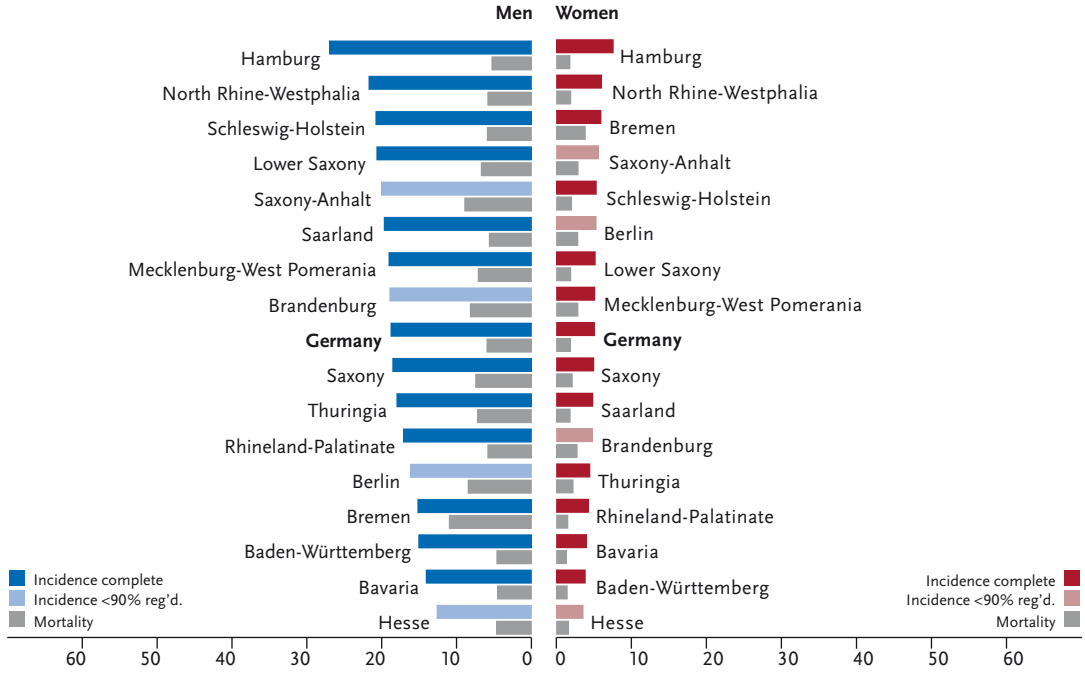
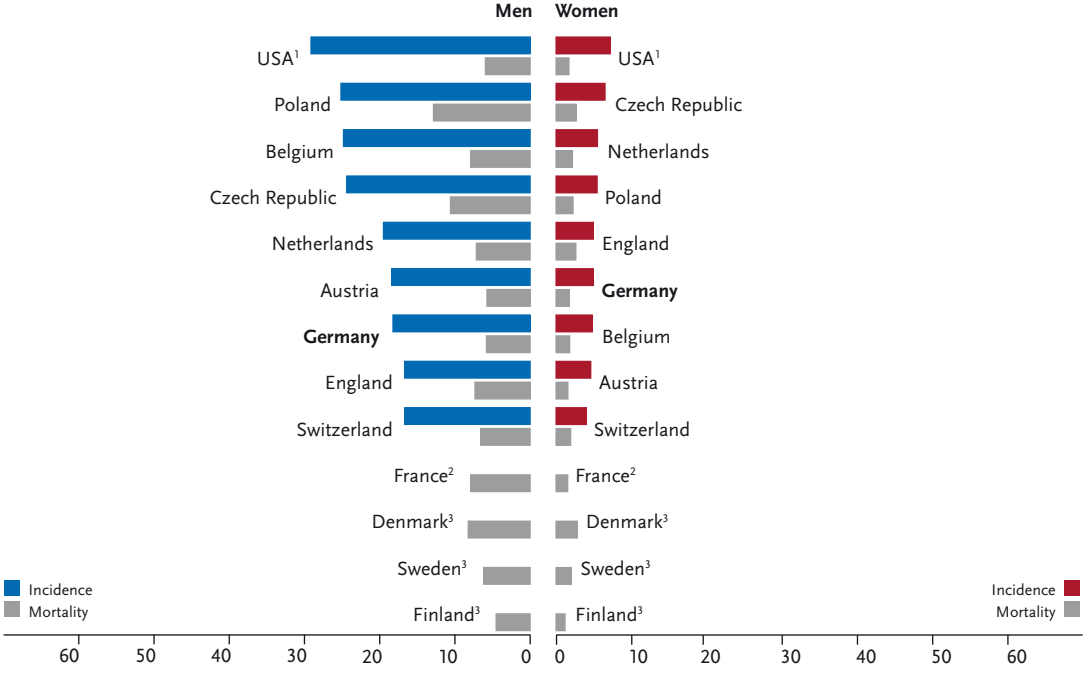


Figure 3.22.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C67, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] incl. D09.0 and D41.4
[2] no data for incidence
[3] no comparable data for incidence

3.23 Central nervous system

Table 3.23.1
Overview of key epidemiological parameters for Germany, ICD-10 C70–C72

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	4,030	3,360	3,880	3,160	4,200	3,500
Crude incidence rate[1]	10.2	8.2	9.8	7.7	10.5	8.5
Standardised incidence rate[1,2]	8.0	5.8	7.6	5.4	8.1	5.8
Median age at diagnosis	63	65	62	66		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	3,252	2,563	3,340	2,765	3,317	2,535
Crude mortality rate[1]	8.2	6.2	8.4	6.7	8.3	6.1
Standardised mortality rate[1,2]	6.0	4.0	6.1	4.1	5.9	3.8
Median age at death	66	70	66	71	66	70

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	7,200	5,700	10,900	8,700
Absolute survival rate (2013–2014)[3]	19 (16–26)	21 (17–29)	14 (11–23)	16 (10–24)
Relative survival rate (2013–2014)[3]	20 (17–27)	23 (18–30)	16 (12–26)	18 (11–26)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

The vast majority (95 %) of cancers of the central nervous system (CNS) occur in the brain. The remaining 5 % concerns cancers of the meninges, cranial nerves and the spinal nerves of the cauda equina. Malignant neoplasms of the central nervous system do not develop out of the nerve cells themselves but originate from glial cells, the nerve sheaths and meninges. Histologically, glioms are the most frequent form found in adults, with approximately three quarters of these being glioblastomas (grade IV astrocytomas). Babies and infants are mostly affected by embryonal tumours. In 2014, around 3,160 women and 3,900 men in Germany developed CNS cancers. Men show higher incidence and mortality rates across all age groups than women and have a median age at diagnosis of 62 years, 4 years earlier than women. CNS tumours can occur at any age. In Germany, since the turn of the millennium, mortality rates have remained constant. However, demographic shifts have led the absolute number of malignant neoplasms to rise. The 5-year relative survival rates for malignant CNS cancer patients have improved slightly and are currently at 20 % (men) and 23 % (women), whereby the rates for glioblastomas of the brain are significantly lower (below 10 %).

Risk factors

The reasons why people develop brain tumours remain largely unclear. The only exceptions are the rare hereditary tumour syndromes, which are associated with a significantly higher brain tumour risk. Patients who have undergone therapeutic radiation of the head have a slightly increased risk of developing a brain tumour after a long latency period. This applies in particular, when such therapy occurs at childhood or adolescent age. CT scans at childhood age potentially also marginally increase the risk of developing a brain tumour.

No conclusive evidence exists for a link between mobile phone usage and brain tumours. However, it is impossible to absolutely rule out an increased risk. This is particularly true for people who use their mobiles and smart phones frequently and over many hours each day. There is no evidence that viruses, toxic substances or lifestyle factors such as smoking or drinking alcohol increase the risk for brain tumours.

First-degree relatives of patients with brain tumours have a slightly higher risk of developing a brain tumour themselves. Genetic factors are therefore presumably also a factor.

Figure 3.23.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C70–C72, Germany 1999–2014/2015
per 100,000 (old European Standard)

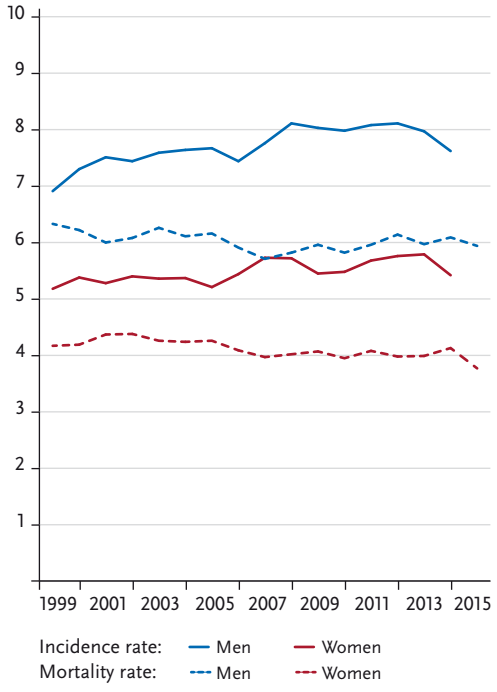


Figure 3.23.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C70–C72, Germany 1999–2014/2015

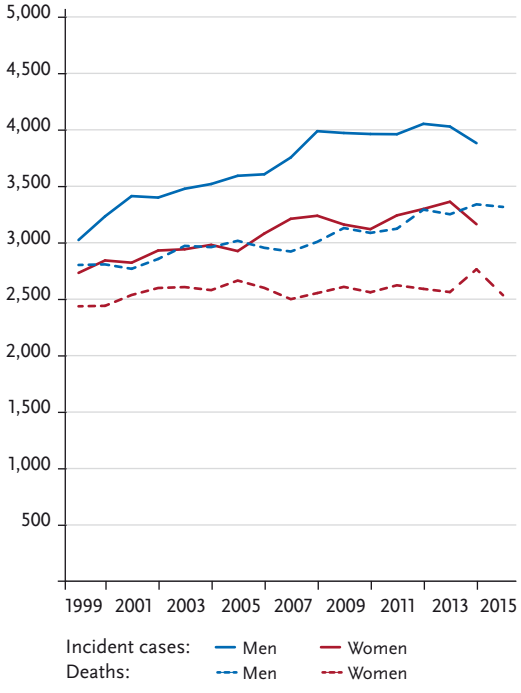


Figure 3.23.2
Age-specific incidence rates by sex, ICD-10 C70 – C72, Germany 2013–2014
per 100,000

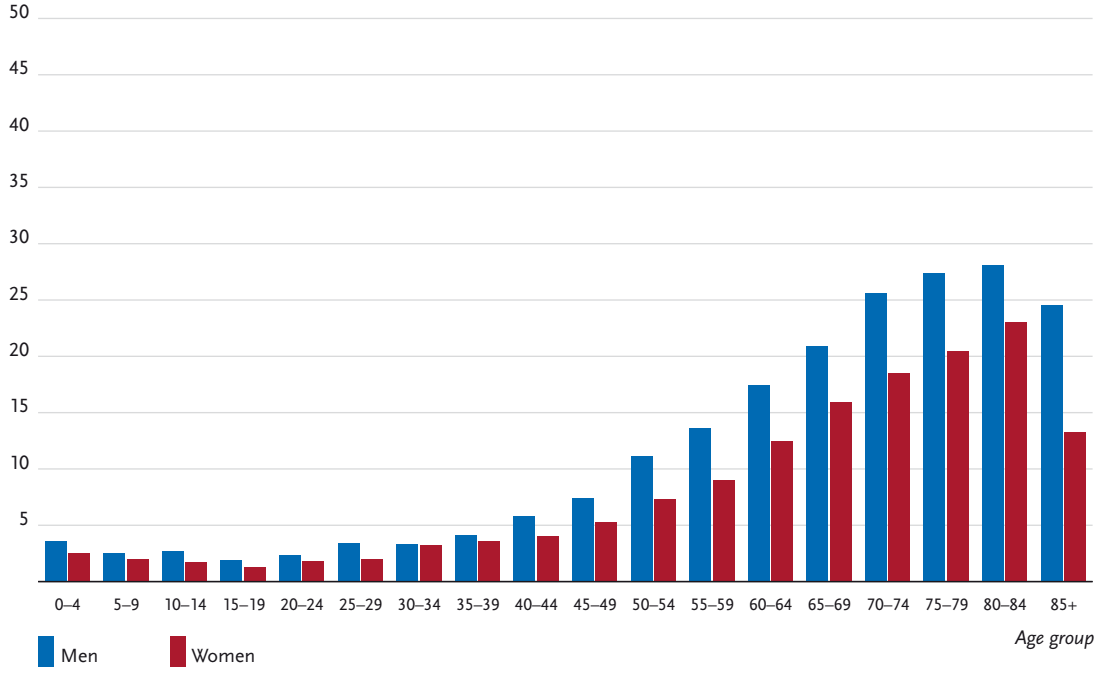
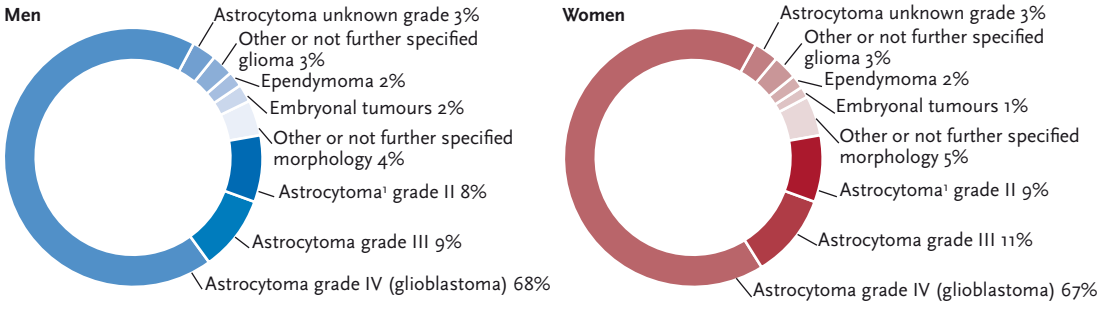


Table 3.23.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C70–C72, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,100)	0.7%	(1 in 150)	<0.1%	(1 in 3,100)	0.6%	(1 in 170)
45 years	0.1%	(1 in 1,100)	0.6%	(1 in 160)	0.1%	(1 in 1,400)	0.6%	(1 in 180)
55 years	0.2%	(1 in 660)	0.6%	(1 in 180)	0.1%	(1 in 810)	0.5%	(1 in 200)
65 years	0.2%	(1 in 470)	0.5%	(1 in 220)	0.2%	(1 in 510)	0.4%	(1 in 230)
75 years	0.2%	(1 in 440)	0.3%	(1 in 330)	0.2%	(1 in 460)	0.3%	(1 in 340)
Lifetime risk			0.8%	(1 in 130)			0.6%	(1 in 160)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,600)	0.6%	(1 in 180)	<0.1%	(1 in 5,100)	0.5%	(1 in 220)
45 years	0.1%	(1 in 1,500)	0.5%	(1 in 190)	<0.1%	(1 in 2,200)	0.4%	(1 in 230)
55 years	0.1%	(1 in 910)	0.5%	(1 in 210)	0.1%	(1 in 1,100)	0.4%	(1 in 250)
65 years	0.2%	(1 in 590)	0.4%	(1 in 260)	0.1%	(1 in 740)	0.3%	(1 in 300)
75 years	0.2%	(1 in 550)	0.2%	(1 in 410)	0.2%	(1 in 640)	0.2%	(1 in 440)
Lifetime risk			0.6%	(1 in 160)			0.5%	(1 in 210)

Figure 3.23.3
Distribution of histologic types in malignant brain tumours according to WHO-classification (2016), Germany 2013–2014, by sex (DCO cases excluded)



[1] incl. oligodendrogliomas. Astrocytomas grade I are histologically benign tumours and are therefore not included.

Figure 3.23.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C70–C72, Germany 2013–2014

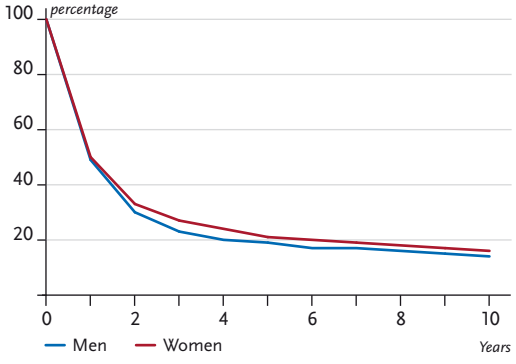


Figure 3.23.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C70–C72, Germany 2013–2014

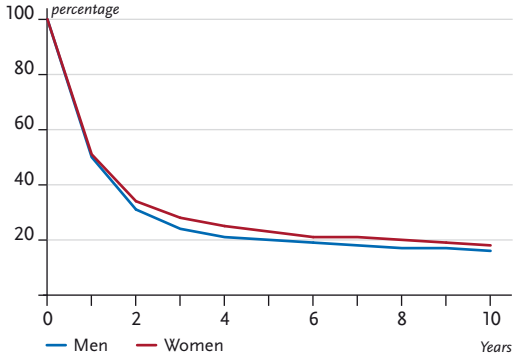


Figure 3.23.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C70–C72, 2013–2014
per 100,000 (old European Standard)

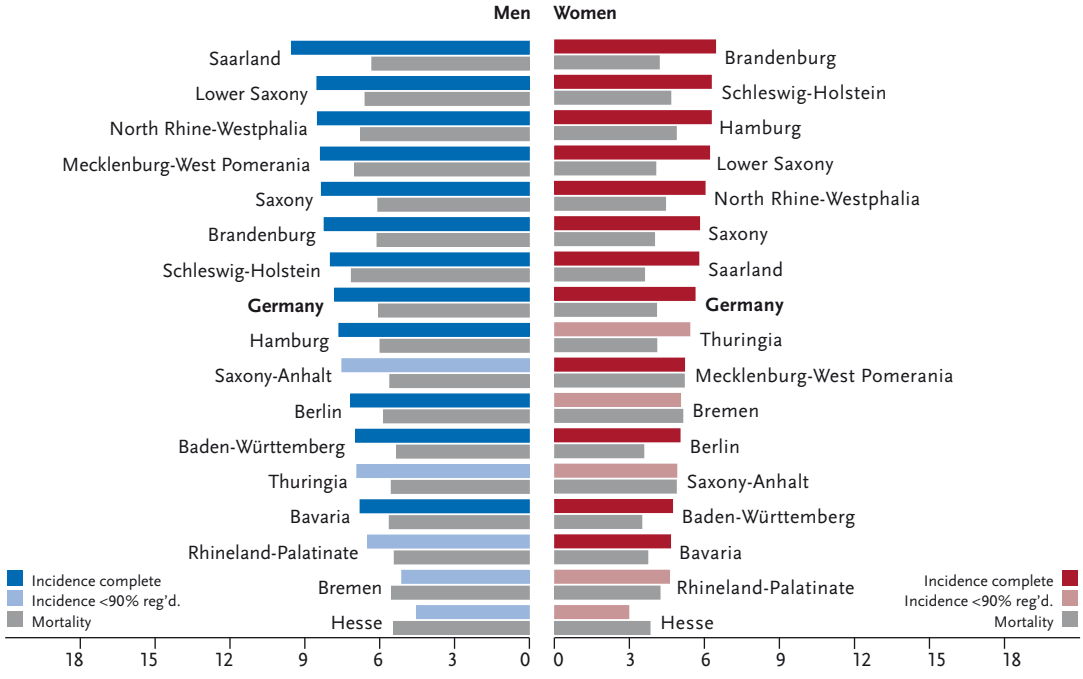
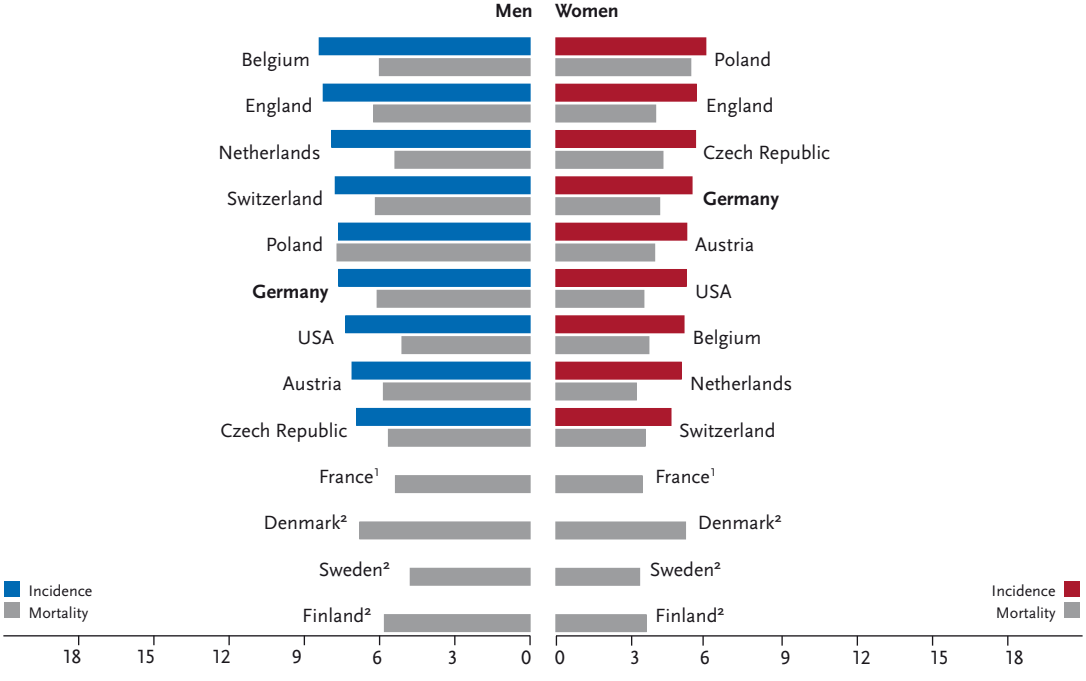


Figure 3.23.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C70–C72, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence
[2] no comparable data for incidence

3.24 Thyroid gland

Table 3.24.1
Overview of key epidemiological parameters for Germany, ICD-10 C73

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	1,960	4,230	1,840	4,280	2,200	4,500
Crude incidence rate[1]	5.0	10.3	4.6	10.4	5.5	10.8
Standardised incidence rate[1,2]	4.1	8.9	3.8	9.2	4.6	9.8
Median age at diagnosis	55	52	55	51		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	297	479	342	390	300	416
Crude mortality rate[1]	0.8	1.2	0.9	0.9	0.8	1.0
Standardised mortality rate[1,2]	0.5	0.5	0.6	0.4	0.5	0.4
Median age at death	74	78	73	79	73	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	8,000	20,200	14,100	37,600
Absolute survival rate (2013–2014)[3]	81 (71–92)	90 (82–94)	71 (61–80)	84 (74–90)
Relative survival rate (2013–2014)[3]	87 (77–98)	94 (87–97)	84 (75–93)	92 (84–98)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, approximately 4,280 women and 1,840 men were diagnosed with thyroid cancer. The median age at diagnosis was 51 years for women and 55 for men.

Between 1999 and 2014, whilst the age-standardised incidence rates for both sexes increased significantly, mortality rates in Germany for both men and women decreased slightly. However, this applied exclusively to papillary carcinomas with a generally favourable prognosis and predominantly younger adults. Mostly, this is attributed to the increased use of diagnostic imaging techniques and improved examination methods, which are also used to diagnose additional diseases. In Germany, Bavaria and North Rhine-Westphalia record the highest incidence rates for both sexes and, internationally, rates are highest in the USA and Austria in the selected group of countries.

The majority of thyroid gland cancers are diagnosed at an early stage (T1, 63 % women and 52 % men) and have a favourable prognosis with 5-year relative survival rate of 94 % among women and 87 % among men (exception: 5-year survival with anaplastic carcinoma approximately 10 %).

Risk factors

Ionizing radiation has been established as a risk factor for thyroid cancer. In particular, in children, the thyroid gland is radiation-sensitive. The risk for thyroid cancer increases, if the thyroid gland is in the radiation field during radiotherapy. Consumption of radioactive iodine for example in the wake of the Chernobyl disaster, also translated into a higher risk of developing thyroid cancer in the affected former Soviet Republics.

There is no conclusive evidence concerning the role of further dietary, or lifestyle factors, or environmental risks. Furthermore, it remains unclear as to why the incidence among women is higher than among men. Many patients have a history of iodine deficiency or benign thyroid diseases such as struma (goitre) and adenoma, which increase the risk for thyroid carcinomas. About a fifth of patients with rare medullary thyroid carcinoma have autosomal dominant hereditary genetic mutations. Medullary thyroid carcinomas also occur in combination with other endocrine tumours - as part of a so-called type 2 multiple endocrine neoplasia (MEN 2). A genetic component is also suspected for papillary thyroid carcinomas.

Figure 3.24.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C73, Germany 1999–2014/2015
per 100,000 (old European Standard)

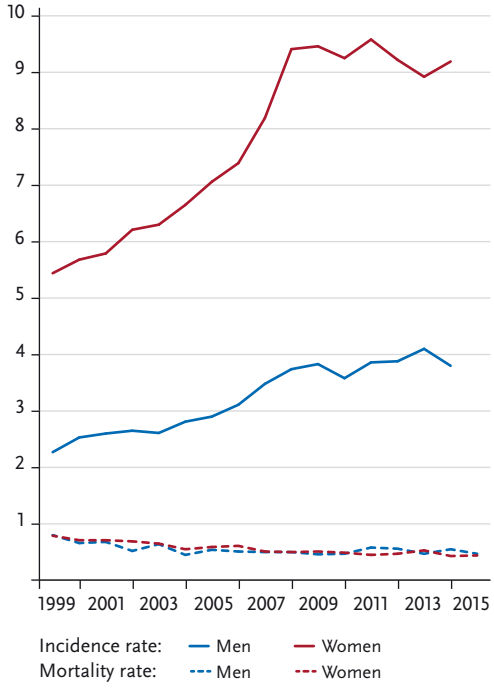


Figure 3.24.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C73, Germany 1999–2014/2015

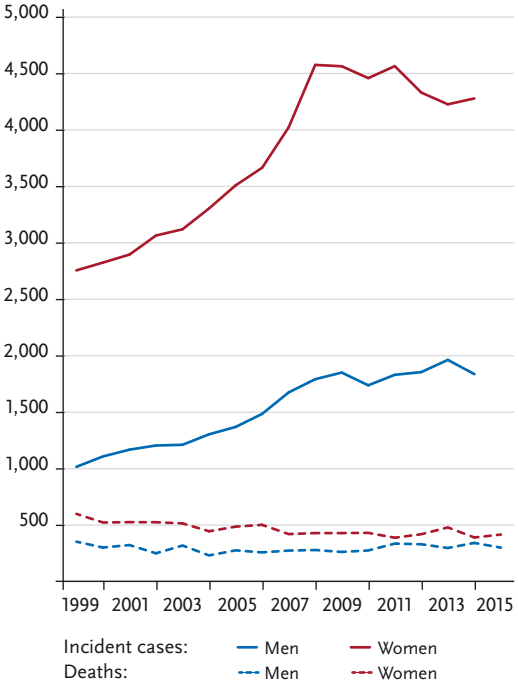


Figure 3.24.2
Age-specific incidence rates by sex, ICD-10 C73, Germany 2013–2014
per 100,000

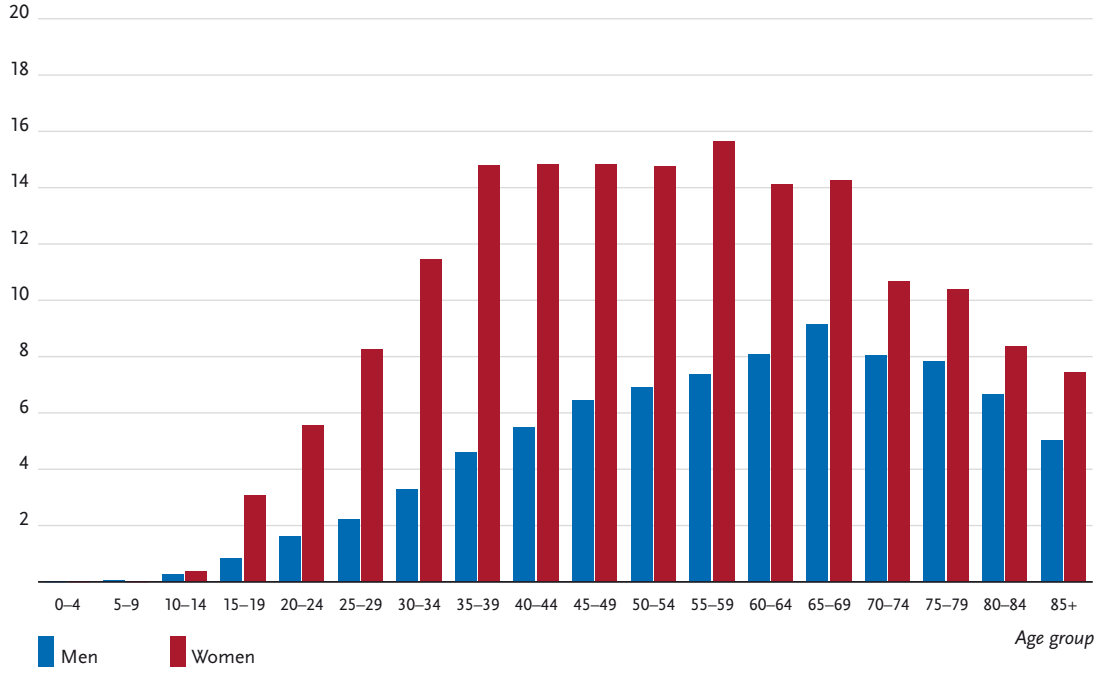


Table 3.24.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C73, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
25 years	<0.1%	(1 in 3,200)	0.3%	(1 in 290)	<0.1%	(1 in 582,200)	0.1%	(1 in 1,600)
35 years	0.1%	(1 in 1,900)	0.3%	(1 in 320)	<0.1%	(1 in 140,200)	0.1%	(1 in 1,600)
45 years	0.1%	(1 in 1,500)	0.3%	(1 in 380)	<0.1%	(1 in 38,300)	0.1%	(1 in 1,600)
55 years	0.1%	(1 in 1,300)	0.2%	(1 in 490)	<0.1%	(1 in 11,600)	0.1%	(1 in 1,600)
65 years	0.1%	(1 in 1,300)	0.1%	(1 in 700)	<0.1%	(1 in 5,000)	0.1%	(1 in 1,700)
75 years	0.1%	(1 in 1,600)	0.1%	(1 in 1,200)	<0.1%	(1 in 2,900)	0.1%	(1 in 2,000)
Lifetime risk			0.4%	(1 in 280)			0.1%	(1 in 1,600)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
25 years	0.1%	(1 in 1,000)	0.7%	(1 in 140)	<0.1%	(1 in 490,000)	0.1%	(1 in 1,000)
35 years	0.1%	(1 in 710)	0.6%	(1 in 160)	<0.1%	(1 in 200,000)	0.1%	(1 in 1,000)
45 years	0.1%	(1 in 700)	0.5%	(1 in 200)	<0.1%	(1 in 33,000)	0.1%	(1 in 1,000)
55 years	0.1%	(1 in 690)	0.4%	(1 in 280)	<0.1%	(1 in 13,000)	0.1%	(1 in 1,000)
65 years	0.1%	(1 in 850)	0.2%	(1 in 440)	<0.1%	(1 in 4,300)	0.1%	(1 in 1,100)
75 years	0.1%	(1 in 1,100)	0.1%	(1 in 800)	<0.1%	(1 in 2,200)	0.1%	(1 in 1,300)
Lifetime risk			0.8%	(1 in 130)			0.1%	(1 in 1,000)

Figure 3.24.3
Distribution of T-stages at first diagnosis by sex (top: all cases; bottom: only valid reports)
ICD-10 C73, Germany 2013–2014

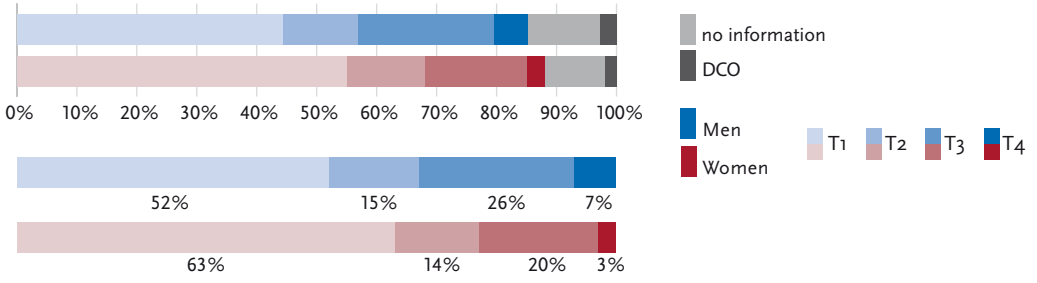


Figure 3.24.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C73, Germany 2013–2014

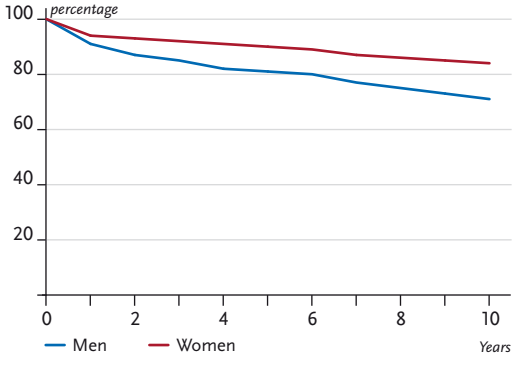


Figure 3.24.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C73, Germany 2013–2014

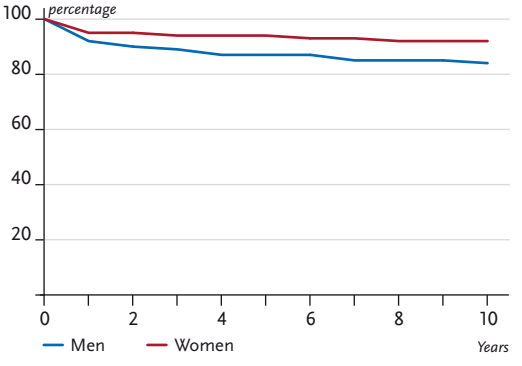


Figure 3.24.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C73, 2013–2014
per 100,000 (old European Standard)

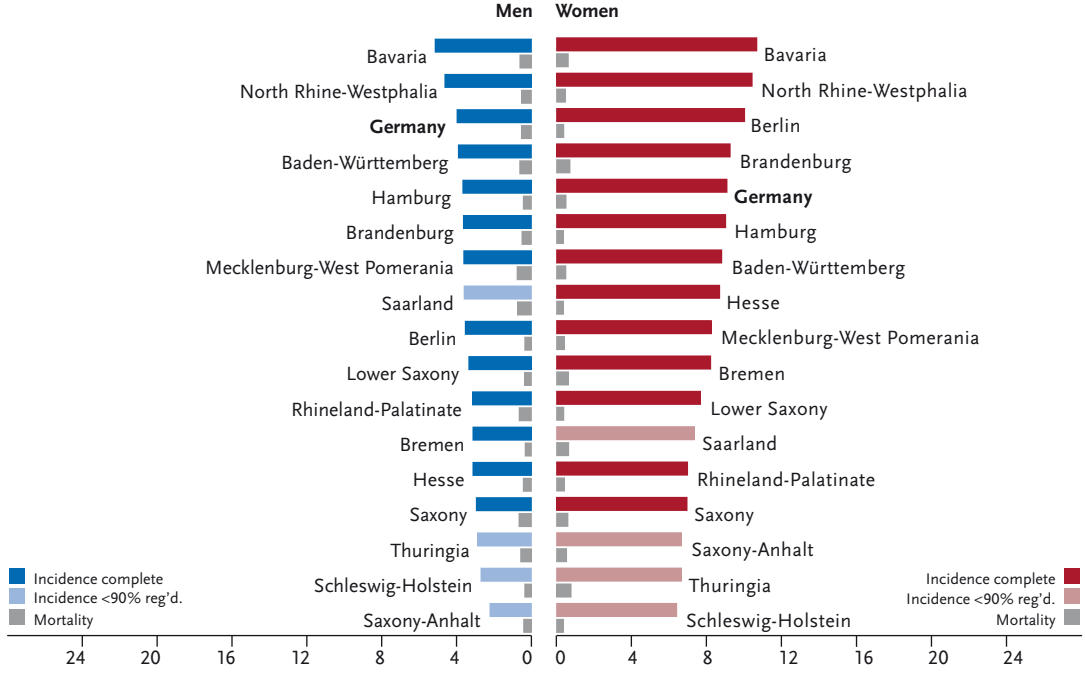
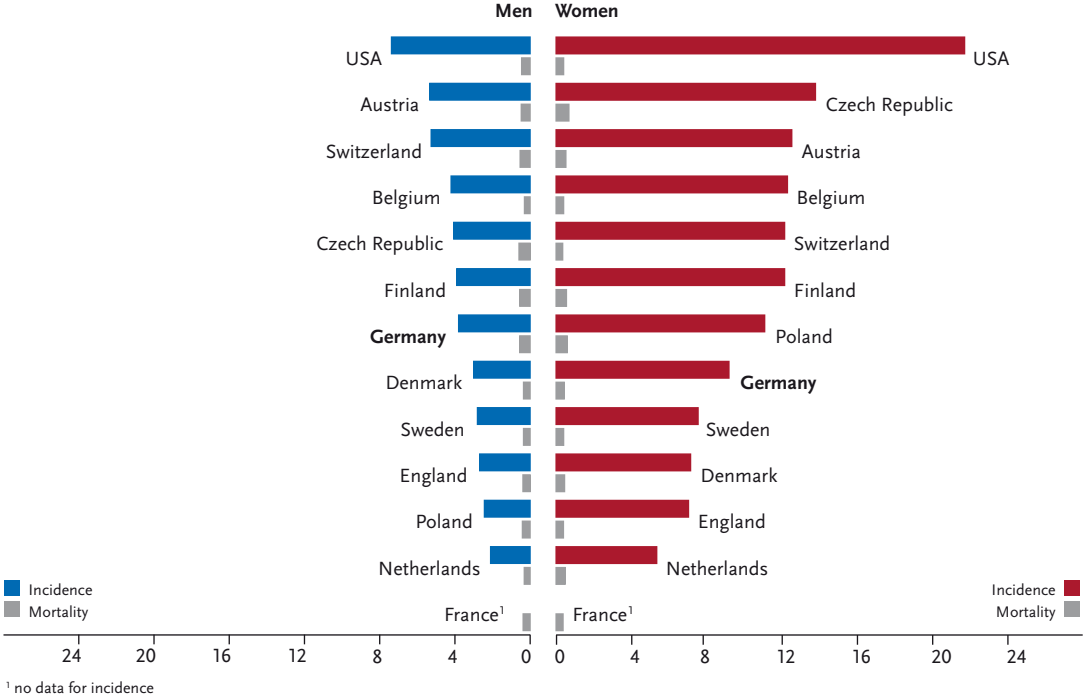


Figure 3.24.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C73, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence

3.25 Hodgkin's lymphoma

Table 3.25.1
Overview of key epidemiological parameters for Germany, ICD-10 C81

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	1,360	1,030	1,340	1,030	1,500	1,100
Crude incidence rate[1]	3.5	2.5	3.4	2.5	3.6	2.7
Standardised incidence rate[1,2]	3.2	2.4	3.1	2.4	3.2	2.6
Median age at diagnosis	44	42	49	45		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	185	171	183	150	180	132
Crude mortality rate[1]	0.5	0.4	0.5	0.4	0.5	0.3
Standardised mortality rate[1,2]	0.3	0.2	0.3	0.2	0.3	0.2
Median age at death	74	77	72	75	70	76

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	5,500	4,300	9,900	7,700
Absolute survival rate (2013–2014)[3]	80 (75–84)	82 (76–86)	71 (67–74)	76 (67–82)
Relative survival rate (2013–2014)[3]	84 (79–87)	85 (81–90)	78 (76–82)	81 (74–87)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

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

Hodgkin's lymphoma is a rare disease. In 2014, in Germany, around 1,340 men and 1,030 women were diagnosed with Hodgkin's lymphoma. While the disease can occur at any age, about one in ten patients was under 20 at diagnosis. The risk of developing Hodgkin's lymphoma at any stage in life is 0.2 % for women and 0.3 % for men.

Since around 2006, Hodgkin lymphoma incidence rates, as well as the absolute number of new cases, have been rising slowly, while a decreasing number of people die of the disease. In 2014, just over 300 patients died from Hodgkin's lymphoma, which was almost 200 less than ten years ago. Correspondingly, the disease has a favourable prognosis, with about 85 % of women and 84 % of men still alive 5 years after diagnosis. Due to the chronic, relapsing nature of the disease, the side effects of therapy (including secondary tumours) are an important factor in long-term prognoses.

Risk factors

Hodgkin's lymphoma risk factors are not completely understood. Congenital or acquired immunodeficiency disorders, such as an HIV infection, apparently increase the risk of developing Hodgkin lymphoma.

EBV infections and glandular fever (infectious mononucleosis) may potentially be involved in the development of Hodgkin's lymphoma. However, this presumably only applies to a small number of cases of Hodgkin lymphoma. The role of lifestyle-related risk factors and environmental hazards in Hodgkin's lymphoma development remains unclear. Possibly, a long-term cigarette smoking habit is related to a higher Hodgkin lymphoma risk.

The risk of children and siblings of Hodgkin lymphoma patients of developing the disease is slightly increased. The factors involved are not fully understood and research is ongoing.

For the majority of cases, there is no clearly identifiable cause and numerous factors presumably are at play before a Hodgkin lymphoma develops.

Figure 3.25.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C81, Germany 1999–2014/2015
per 100,000 (old European Standard)

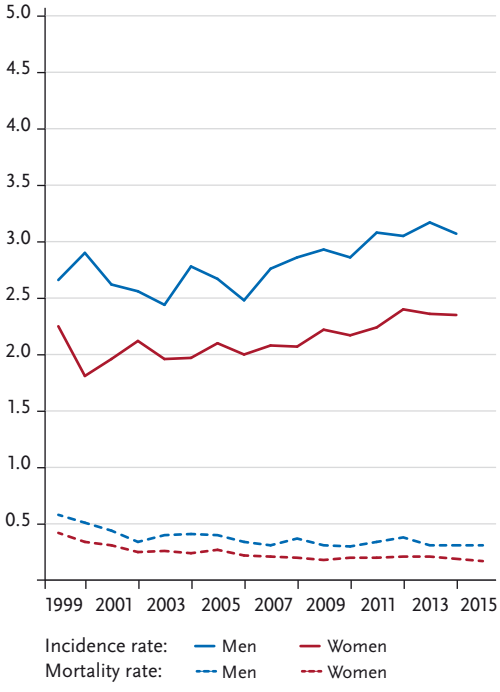


Figure 3.25.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C81, Germany 1999–2014/2015

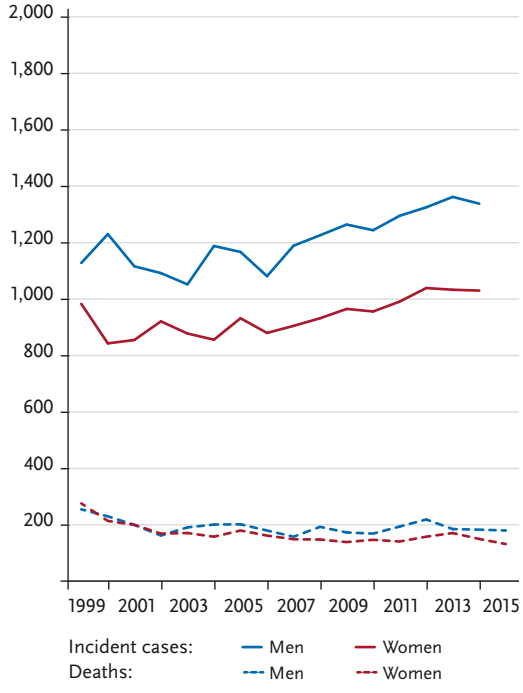


Figure 3.25.2
Age-specific incidence rates by sex, ICD-10 C81, Germany 2013–2014
per 100,000

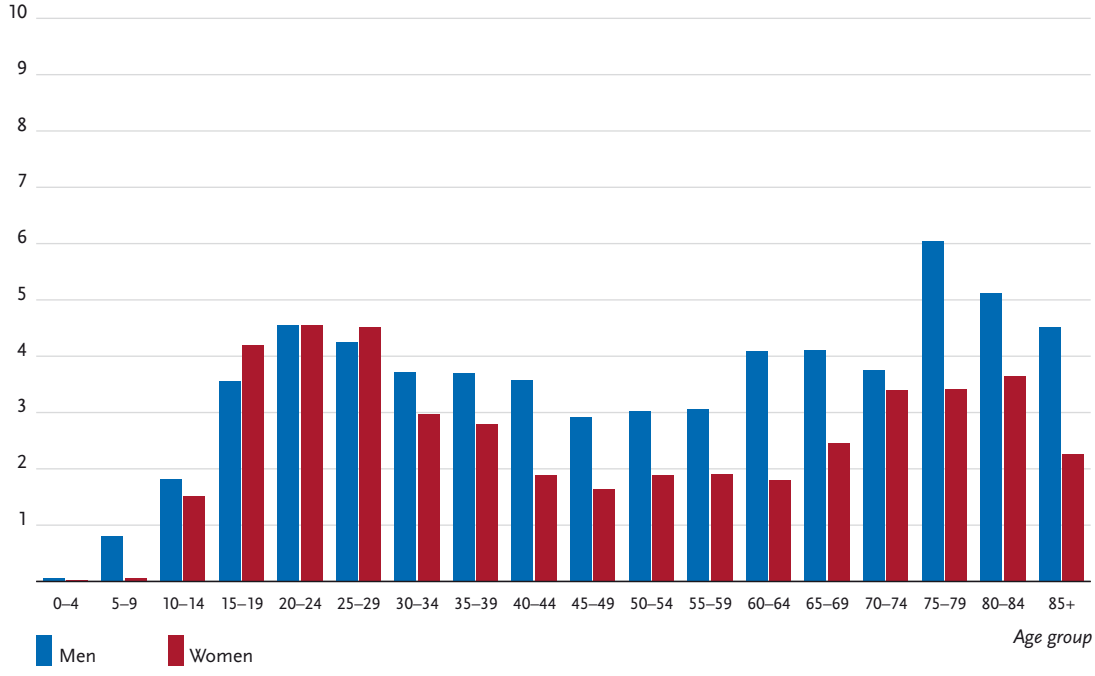


Table 3.25.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C81, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
15 years	<0.1%	(1 in 2,600)	0.2%	(1 in 410)	<0.1%	(1 in 150,000)	<0.1%	(1 in 2,500)
25 years	<0.1%	(1 in 2,500)	0.2%	(1 in 480)	<0.1%	(1 in 76,000)	<0.1%	(1 in 2,500)
35 years	<0.1%	(1 in 2,500)	0.2%	(1 in 590)	<0.1%	(1 in 63,000)	<0.1%	(1 in 2,600)
45 years	<0.1%	(1 in 3,200)	0.1%	(1 in 770)	<0.1%	(1 in 52,000)	<0.1%	(1 in 2,600)
55 years	<0.1%	(1 in 3,100)	0.1%	(1 in 970)	<0.1%	(1 in 29,000)	<0.1%	(1 in 2,700)
Lifetime risk			0.3%	(1 in 380)			<0.1%	(1 in 2,500)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
15 years	<0.1%	(1 in 2,200)	0.2%	(1 in 510)	<0.1%	(1 in 250,000)	<0.1%	(1 in 2,900)
25 years	<0.1%	(1 in 2,500)	0.2%	(1 in 660)	<0.1%	(1 in 230,000)	<0.1%	(1 in 3,000)
35 years	<0.1%	(1 in 4,600)	0.1%	(1 in 890)	<0.1%	(1 in 73,000)	<0.1%	(1 in 3,000)
45 years	<0.1%	(1 in 6,300)	0.1%	(1 in 1,100)	<0.1%	(1 in 70,000)	<0.1%	(1 in 3,100)
55 years	<0.1%	(1 in 5,700)	0.1%	(1 in 1,300)	<0.1%	(1 in 25,000)	<0.1%	(1 in 3,200)
Lifetime risk			0.2%	(1 in 470)			<0.1%	(1 in 3,000)

Figure 3.25.3
Distribution of T-stages at first diagnosis by sex
T-stages are not defined for Hodgkin's lymphoma.

Figure 3.25.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C81, Germany 2013–2014

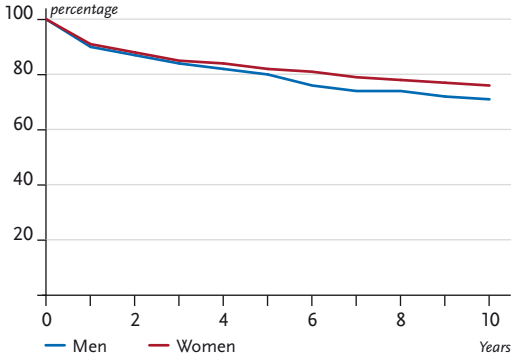


Figure 3.25.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C81, Germany 2013–2014

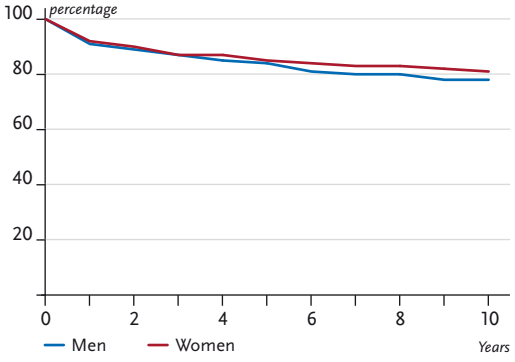


Figure 3.25.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C81, 2013–2014
per 100,000 (old European Standard)

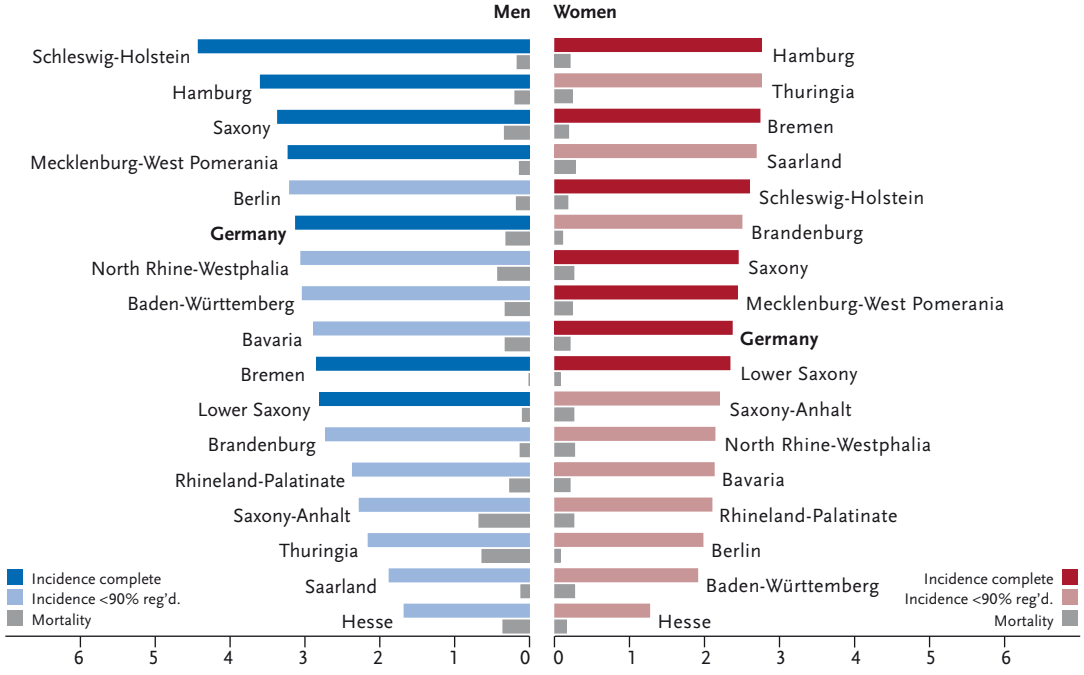
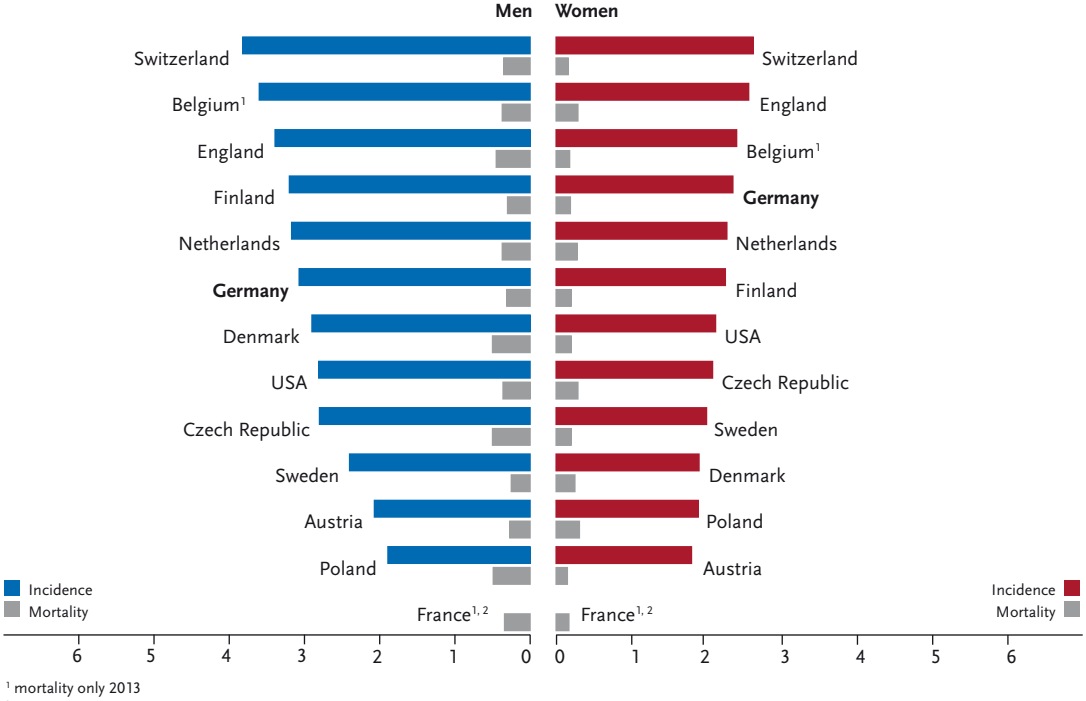


Figure 3.25.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C81, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] mortality only 2013
[2] no data for incidence

3.26 Non-Hodgkin lymphomas

Table 3.26.1
Overview of key epidemiological parameters for Germany, ICD-10 C82–C88

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	9,140	8,010	9,160	7,880	9,700	8,600
Crude incidence rate[1]	23.2	19.5	23.1	19.1	23.9	20.6
Standardised incidence rate[1,2]	16.1	11.7	15.9	11.2	16.0	11.8
Median age at diagnosis	70	72	70	73		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	3,507	2,992	3,560	2,949	3,619	2,975
Crude mortality rate[1]	8.9	7.3	9.0	7.1	9.0	7.2
Standardised mortality rate[1,2]	5.5	3.3	5.5	3.1	5.4	3.1
Median age at death	75	78	75	79	76	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	31,400	28,100	51,100	46,800
Absolute survival rate (2013–2014)[3]	57 (56–60)	62 (59–64)	41 (40–45)	48 (45–53)
Relative survival rate (2013–2014)[3]	67 (65–70)	71 (65–73)	57 (55–60)	63 (56–70)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Non-Hodgkin lymphomas grow from the cells of the lymphatic system, and thereby most commonly from B-lymphocytes. Indolent (slow growth) and aggressive (fast growth) types are distinguished. In 2014, around 17,000 new cases of non-Hodgkin lymphoma were registered. While it may occur at childhood age, the disease usually develops at older age. For men, the median age at diagnosis is 70 and 73 for women.

The significant increases in age-standardised incidence rates should be seen within the context of falling leukaemia rates, since clinically, doctors now tend to classify chronic lymphatic leukaemia as indolent non-Hodgkin lymphoma. Around half of all cases are non-follicular lymphomas.

Age-standardised mortality rates have seen a downward trend in both men and women since the turn of the millennium and, while lower for women compared to men, now remain at a nearly constant level. They approximately correspond to international figures.

With a 5-year relative survival rate of 67 % for men and 71 % for women, the prognosis for non-Hodgkin lymphomas is generally favourable. Treatment of some forms, even some of the highly aggressive ones, can now result in a permanent cure.

Risk factors

There are no identifiable general risk factors for non-Hodgkin lymphoma. Immunodeficiency (congenital or acquired), radiation, chemotherapy and some rare autoimmune diseases increase a person's risk of developing certain lymphomas. Some viruses and other pathogens are considered a risk factor in specific lymphomas. For example, an infection with the Epstein-Barr virus (EBV, glandular fever) is associated with the Burkitt's lymphoma, which is endemic to Africa. Chronic infection of the stomach with Helicobacter pylori is a factor in lymphoma of the gastric mucosa (MALT lymphoma).

Benzenes and related substances can promote the development of certain non-Hodgkin lymphomas. Other environmental pollutants, as well as lifestyle factors are also being discussed as causes of lymphomas. Patients from families that have a higher rate of lymphomas, have a slightly higher risk of developing a lymphoma. The exact links remain unclear.

In many patients, the definite cause of a lymphoma is not identifiable. Presumably, multiple factors are involved in the development of a non-Hodgkin lymphoma.

Figure 3.26.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C82–C88, Germany 1999–2014/2015
per 100,000 (old European Standard)

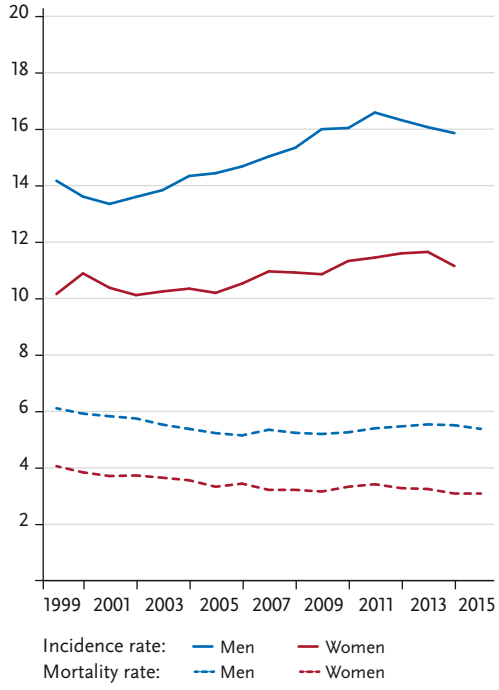


Figure 3.26.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C82–C88, Germany 1999–2014/2015

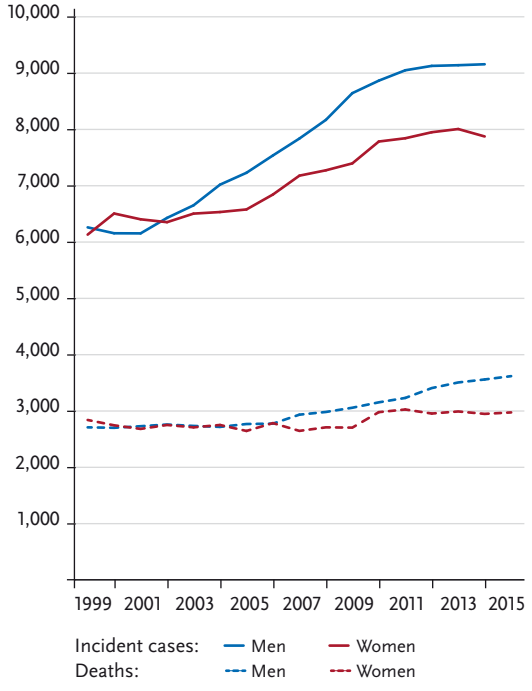


Figure 3.26.2
Age-specific incidence rates by sex, ICD-10 C82–C88, Germany 2013–2014
per 100,000

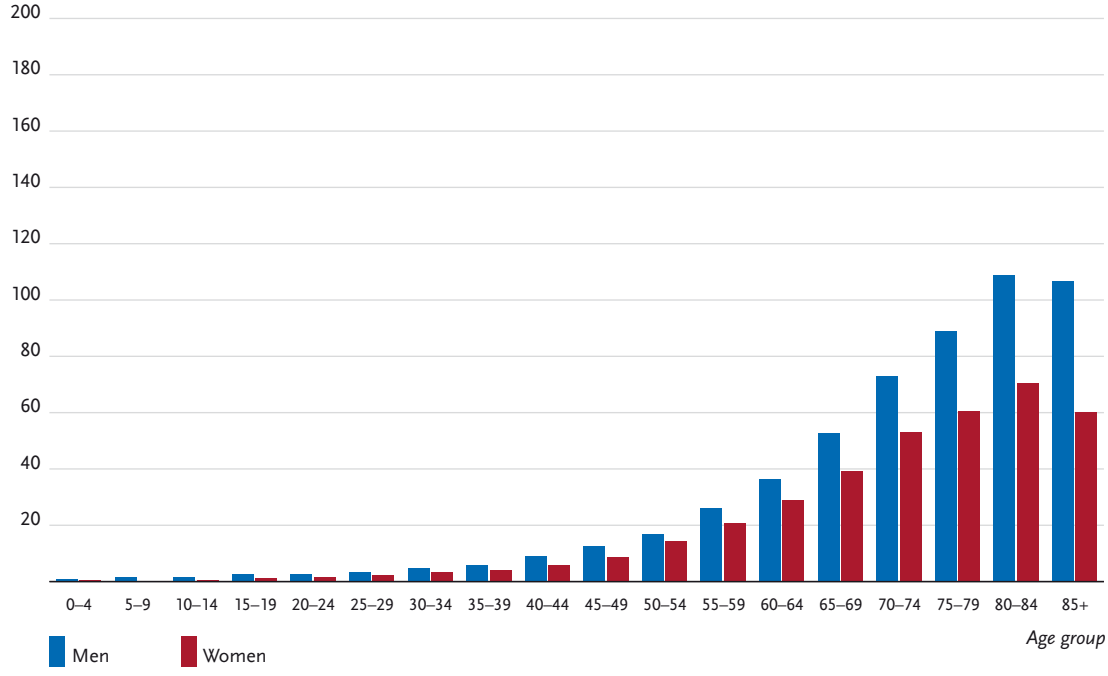


Table 3.26.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C82–C88, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 1,300)	1.7%	(1 in 57)	<0.1%	(1 in 9,900)	0.8%	(1 in 130)
45 years	0.1%	(1 in 670)	1.7%	(1 in 59)	<0.1%	(1 in 3,800)	0.8%	(1 in 130)
55 years	0.3%	(1 in 330)	1.6%	(1 in 63)	0.1%	(1 in 1,300)	0.8%	(1 in 130)
65 years	0.6%	(1 in 170)	1.4%	(1 in 69)	0.2%	(1 in 450)	0.8%	(1 in 130)
75 years	0.8%	(1 in 130)	1.1%	(1 in 91)	0.4%	(1 in 240)	0.7%	(1 in 150)
Lifetime risk			1.8%	(1 in 55)			0.8%	(1 in 130)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	0.1%	(1 in 1,800)	1.5%	(1 in 68)	<0.1%	(1 in 17,600)	0.6%	(1 in 170)
45 years	0.1%	(1 in 860)	1.4%	(1 in 70)	<0.1%	(1 in 6,700)	0.6%	(1 in 170)
55 years	0.3%	(1 in 400)	1.3%	(1 in 74)	<0.1%	(1 in 2,300)	0.6%	(1 in 170)
65 years	0.4%	(1 in 230)	1.2%	(1 in 86)	0.1%	(1 in 730)	0.6%	(1 in 170)
75 years	0.5%	(1 in 190)	0.8%	(1 in 120)	0.3%	(1 in 340)	0.5%	(1 in 200)
Lifetime risk			1.5%	(1 in 66)			0.6%	(1 in 170)

Figure 3.26.3
Distribution of T-stages at first diagnosis by sex
T-stages are not defined for non-Hodgkin lymphomas.

Table 3.26.3
Proportion of the various non-Hodgkin lymphomas for all new diagnoses C82–C88, by sex, Germany 2013–2014

	C82[1]	C83[2]	C84[3]	C85[4]	C86[5]	C88[6]
Men	16%	50%	8%	18%	2%	6%
Women	21%	45%	6%	19%	2%	8%

1 Follicular lymphoma
2 Non-follicular lymphoma
3 Mature T/NK-cell lymphomas
4 Other and unspecified types of non-Hodgkin lymphoma
5 Other specified types of T/NK-cell lymphoma
6 Malignant immunoproliferative diseases

Figure 3.26.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C82–C88, Germany 2013–2014

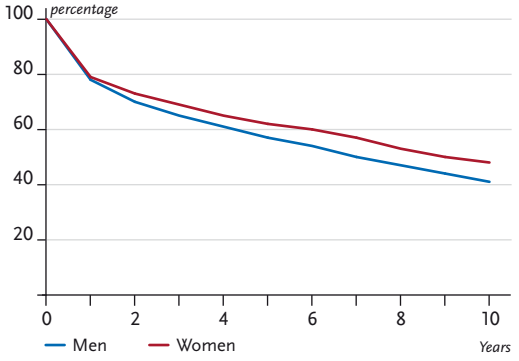


Figure 3.26.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C82–C88, Germany 2013–2014

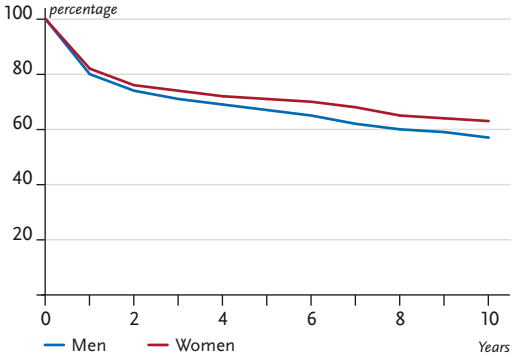


Figure 3.26.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C82 – C88, 2013 – 2014
per 100,000 (old European Standard)

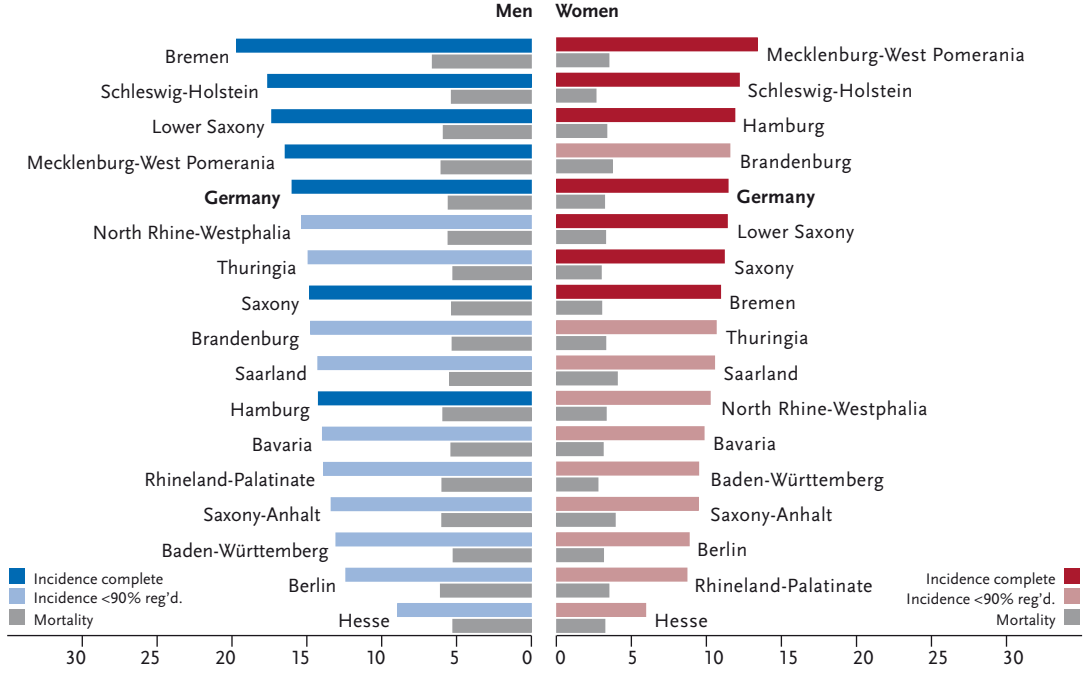
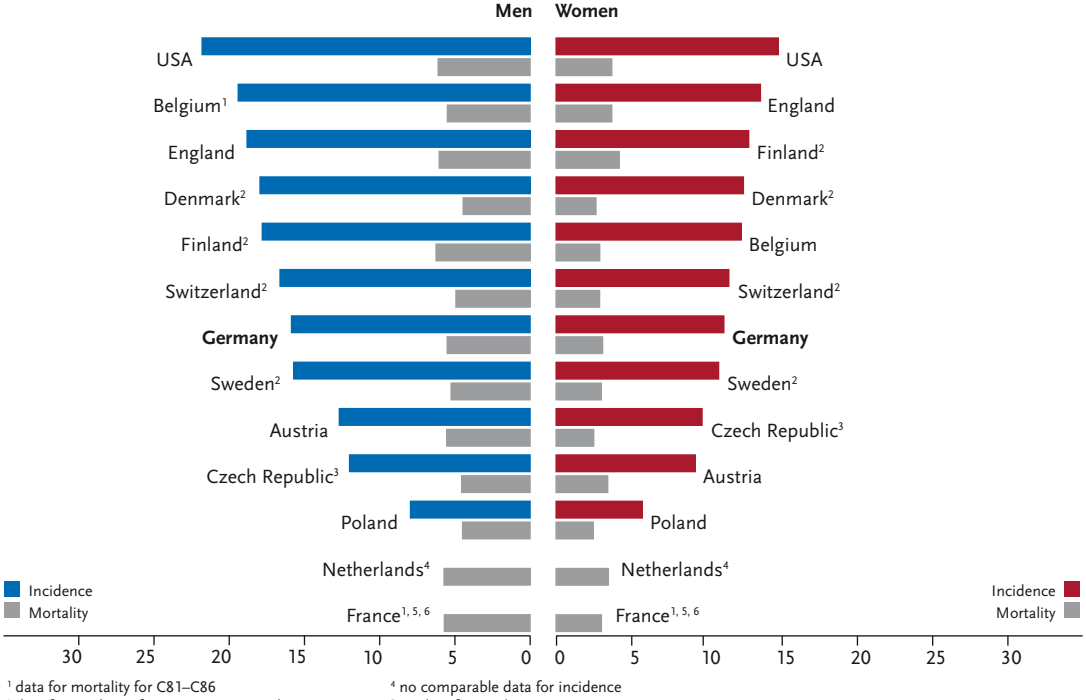


Figure 3.26.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C82 – C88, 2013 – 2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] data for mortality for C81–C86
[2] data for incidence for C82–C85/C86 and C96
[3] data for incidence for C82–C85 and C96
[4] no comparable data for incidence
[5] no data for incidence
[6] mortality only 2013

3.27 Multiple myeloma

Table 3.27.1
Overview of key epidemiological parameters for Germany, ICD-10 C90

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	3,670	2,940	3,550	2,960	3,900	3,100
Crude incidence rate[1]	9.3	7.1	9.0	7.2	9.7	7.5
Standardised incidence rate[1,2]	6.0	3.9	5.7	3.8	6.0	3.9
Median age at diagnosis	72	74	72	74		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	2,146	1,835	2,071	1,910	2,149	1,950
Crude mortality rate[1]	5.4	4.5	5.2	4.6	5.4	4.7
Standardised mortality rate[1,2]	3.3	2.1	3.1	2.1	3.1	2.1
Median age at death	75	77	76	77	76	77

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	11,100	9,200	15,500	13,300
Absolute survival rate (2013–2014)[3]	41 (34–45)	41 (36–51)	21 (17–29)	24 (20–31)
Relative survival rate (2013–2014)[3]	49 (40–54)	47 (41–58)	30 (24–39)	32 (27–40)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

Multiple myeloma (or plasmacytoma) is a malignant growth of anti-body-producing plasma cells. Usually, the disease will start in the bone marrow, form multiple myeloma and produce complications such as bone fractures, bone pain and changes in the blood count. In only 1% of cases approximately, the condition is diagnosed in organs not associated with bone marrow (extramedullary plasmacytoma).

In 2014, approximately 3,550 men and 2,960 women were newly diagnosed with the illness in Germany. The risk of developing the disease increases significantly at an older age and patients aged under 45 years are extremely rare (only about 2% of all cases). Standardised for age, the incidence rates for women and men are now almost constant, whereas the trend in mortality rates has seen a slight decline for both genders.

Considering a 5-year relative survival rate of approximately 47% for women and 49% for men, the prognosis is rather unfavourable. Even following high-dose therapy and autologous stem cell transplantation, no permanent cure can be expected. However, in some cases the condition may be asymptomatic for a relatively long period, and temporary remissions during therapy are possible.

Risk factors

The causes of plasmacytomas (multiple myeloma) remain largely unclear. A monoclonal gammopathy of undetermined significance (MGUS) is considered a precursor stage of multiple myeloma. Further recognised risk factors for multiple myeloma include advanced age, male gender and a family predisposition.

While familial clustering has been observed, there is no conclusive evidence of the role played by hereditary factors. Nonetheless, variations in incidence rates within different population groups could still be related to genetic factors.

Chronic infections such as HIV or hepatitis C are associated with an increased risk of multiple myeloma. According to data from recent studies, obesity is linked to an increased risk, too.

Whether lifestyle factors and exposure to environmental toxins or radiation have a significant impact on a person's myeloma risk has been assessed with conflicting results.

Figure 3.27.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C90, Germany 1999–2014/2015
per 100,000 (old European Standard)

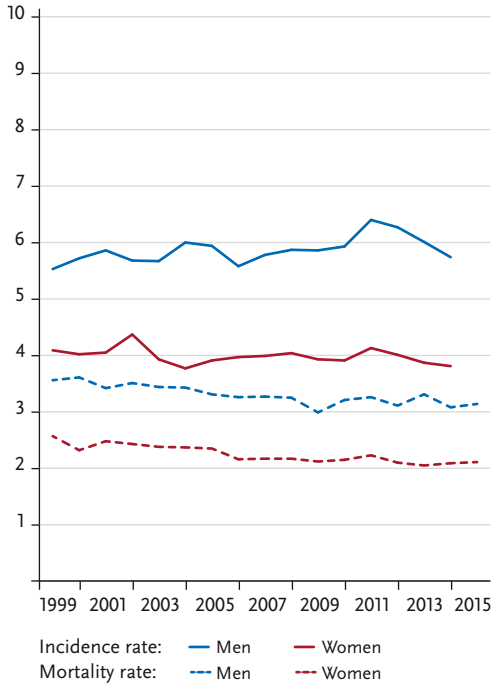


Figure 3.27.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C90, Germany 1999–2014/2015

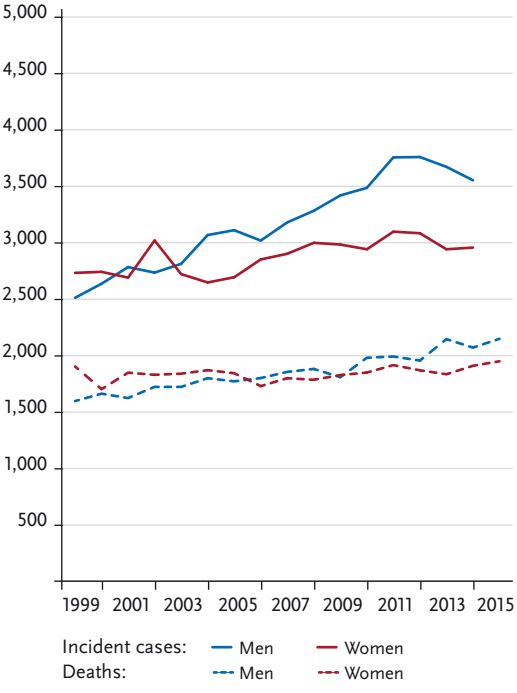


Figure 3.27.2
Age-specific incidence rates by sex, ICD-10 C90, Germany 2013–2014
per 100,000

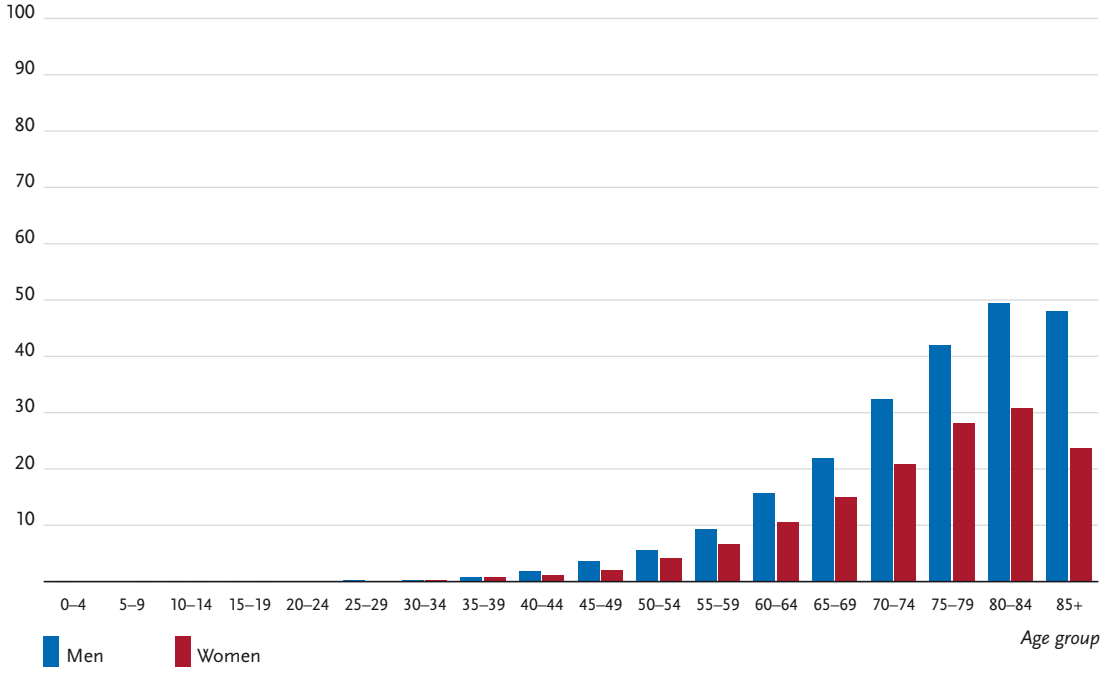


Table 3.27.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C90, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 7,300)	0.7%	(1 in 140)	<0.1%	(1 in 72,000)	0.5%	(1 in 220)
45 years	<0.1%	(1 in 2,200)	0.7%	(1 in 140)	<0.1%	(1 in 6,600)	0.5%	(1 in 210)
55 years	0.1%	(1 in 820)	0.7%	(1 in 140)	<0.1%	(1 in 2,000)	0.5%	(1 in 210)
65 years	0.3%	(1 in 400)	0.7%	(1 in 150)	0.1%	(1 in 670)	0.5%	(1 in 210)
75 years	0.4%	(1 in 280)	0.5%	(1 in 200)	0.3%	(1 in 380)	0.4%	(1 in 250)
Lifetime risk			0.7%	(1 in 140)			0.5%	(1 in 220)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 10,000)	0.6%	(1 in 180)	<0.1%	(1 in 71,000)	0.4%	(1 in 270)
45 years	<0.1%	(1 in 3,100)	0.6%	(1 in 180)	<0.1%	(1 in 11,000)	0.4%	(1 in 270)
55 years	0.1%	(1 in 1,200)	0.5%	(1 in 190)	<0.1%	(1 in 3,000)	0.4%	(1 in 270)
65 years	0.2%	(1 in 580)	0.5%	(1 in 210)	0.1%	(1 in 1,000)	0.4%	(1 in 290)
75 years	0.2%	(1 in 420)	0.3%	(1 in 290)	0.2%	(1 in 560)	0.3%	(1 in 350)
Lifetime risk			0.6%	(1 in 180)			0.4%	(1 in 280)

Figure 3.27.3
Distribution of T-stages at first diagnosis by sex
T-stages are not defined for multiple myeloma.

Figure 3.27.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C90, Germany 2013–2014

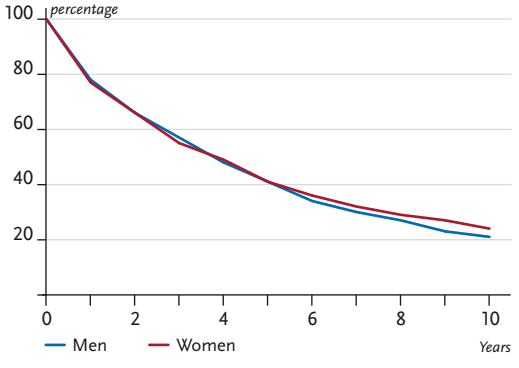


Figure 3.27.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C90, Germany 2013–2014

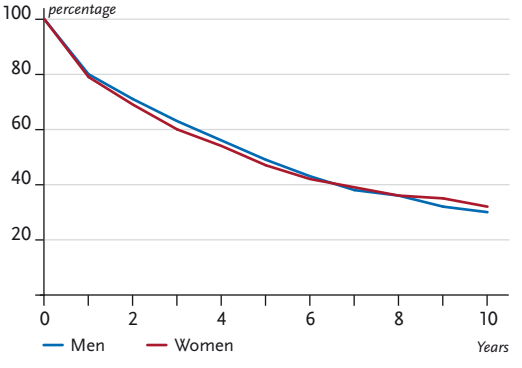


Figure 3.27.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C90, 2013–2014
per 100,000 (old European Standard)

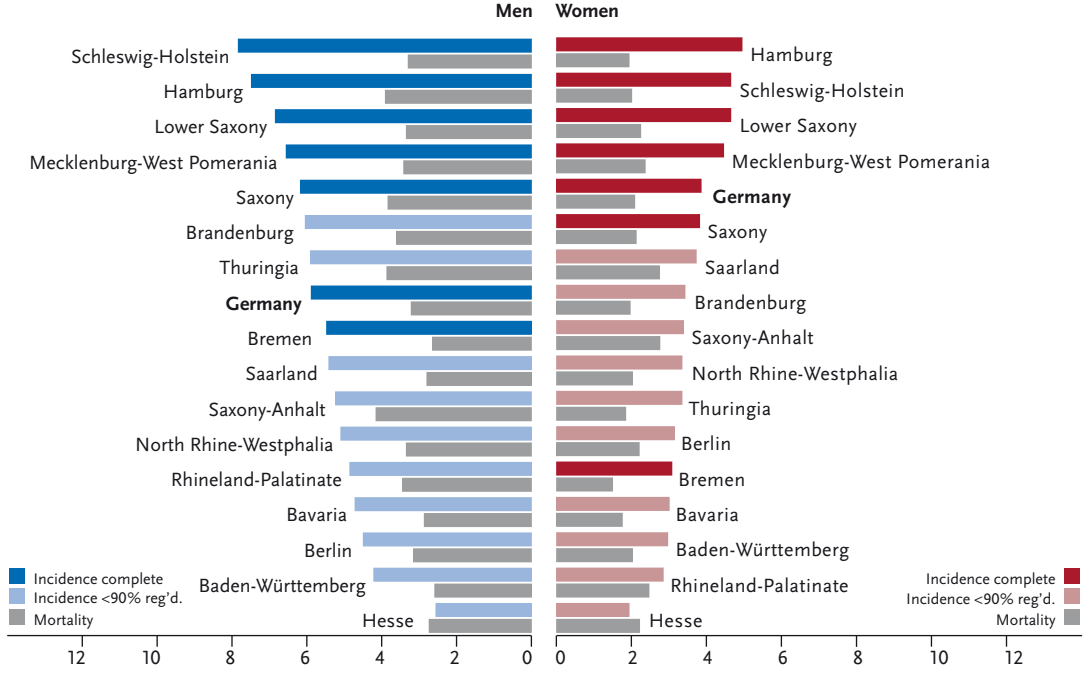
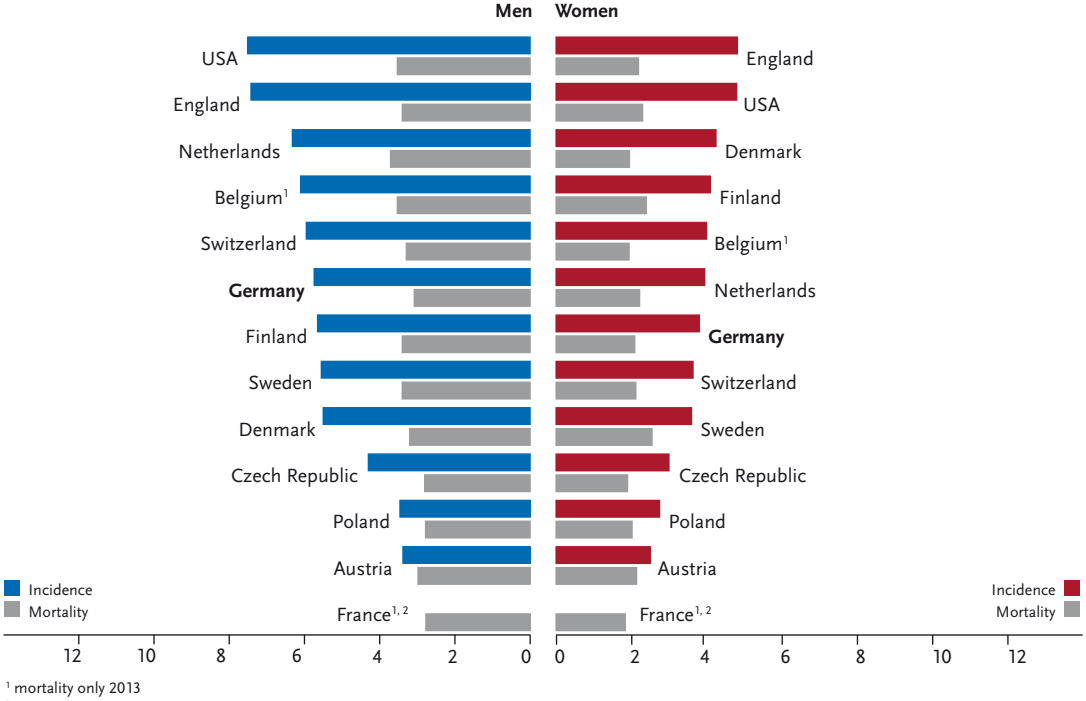


Figure 3.27.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C90, 2013–2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] mortality only 2013
[2] no data for incidence

3.28 Leukaemias

Table 3.28.1
Overview of key epidemiological parameters for Germany, ICD-10 C91–C95

Incidence	2013		2014		Prediction for 2018	
	Men	Women	Men	Women	Men	Women
Incident cases	7,660	5,960	7,640	6,060	8,200	6,400
Crude incidence rate[1]	19.4	14.5	19.3	14.7	20.4	15.5
Standardised incidence rate[1,2]	13.8	8.9	13.6	8.9	13.9	9.1
Median age at diagnosis	71	73	71	73		

Mortality	2013		2014		2015	
	Men	Women	Men	Women	Men	Women
Deaths	4,395	3,560	4,168	3,575	4,290	3,579
Crude mortality rate[1]	11.1	8.7	10.5	8.7	10.7	8.6
Standardised mortality rate[1,2]	7.0	4.1	6.4	4.0	6.5	3.9
Median age at death	75	78	76	78	76	79

[1] per 100,000 persons [2] age-standardised (old European Standard)

Prevalence and survival rates	after 5 years		after 10 years	
	Men	Women	Men	Women
Prevalence	21,400	16,000	34,500	26,500
Absolute survival rate (2013–2014)[3]	50 (44–58)	51 (47–57)	34 (27–42)	37 (34–45)
Relative survival rate (2013–2014)[3]	59 (51–68)	58 (53–65)	47 (36–58)	48 (43–59)

[3] in percentages (lowest and highest value of the included German federal states)

Epidemiology

In 2014, some 13,700 people in Germany were diagnosed with leukaemia, 4% of whom were under 15 years of age. The risk of leukaemia for children and young adults decreases with age. Beyond the age of 30, however, the risk increases continuously, and incidence rates are higher for men than for women. One in 64 men and one in 85 women will develop leukaemia during their lifetime. While age-standardised incidence rates remained relatively stable between 1999 and 2014, age-standardised mortality rates have decreased. Around 40% of newly diagnosed leukaemias were chronic lymphocytic leukaemias (CLL) and around 21% acute myeloid leukaemia (AML). The prognosis depends on the type of leukaemia and the age of a patient at diagnosis. Childhood forms of leukaemia have by far the most favourable prognoses, whereas its acute forms in adults continue to have a poor prognosis. Overall, about a third of adult patients are still alive ten years after diagnosis. However, a permanent cure for chronic leukaemia, for example through a risky stem cell transplantation, is rarely achieved.

Risk factors

For the group of all leukaemias no universal risk factor has been identified. However, some factors do increase the risk of certain types of leukaemia. Risk factors for acute leukaemia include ionising radiation and cytostatic drugs. Occupational exposure to benzenes or 1,3-butadiene can be the rationale for acceptance of a leukaemia as an occupational disease. A number of rare genetic mutations, such as trisomy 21, can increase the risk of leukaemia. With the exception of the T-lymphotropic virus (HTLV), which is extremely rare in Europe, no further viruses have so far been identified as increasing the risk of leukaemia. Several additional risk factors are currently being examined as causes of leukaemia. This includes environmental and lifestyle factors such as smoking or overweight. So far, however, there is no conclusive evidence for such a link.

For most leukaemia patients, it is not possible to clearly identify the cause. Several factors likely need to interact in order for leukaemia to develop.

Figure 3.28.1a
Age-standardised incidence and mortality rates, by sex, ICD-10 C91 – C95, Germany 1999 – 2014/2015
per 100,000 (old European Standard)

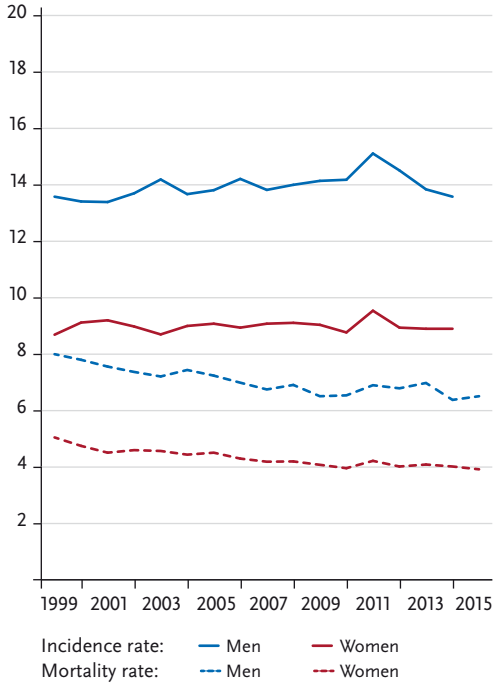


Figure 3.28.1b
Absolute numbers of incident cases and deaths, by sex, ICD-10 C91 – C95, Germany 1999 – 2014/2015

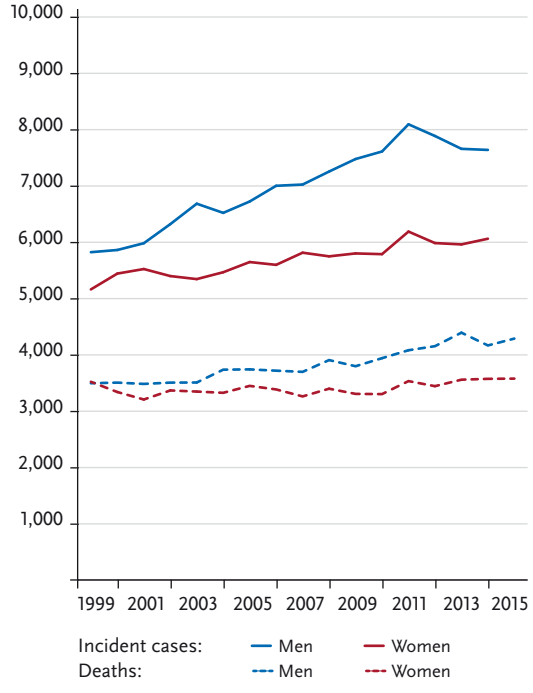


Figure 3.28.2
Age-specific incidence rates by sex, ICD-10 C91 – C95, Germany 2013 – 2014
per 100,000

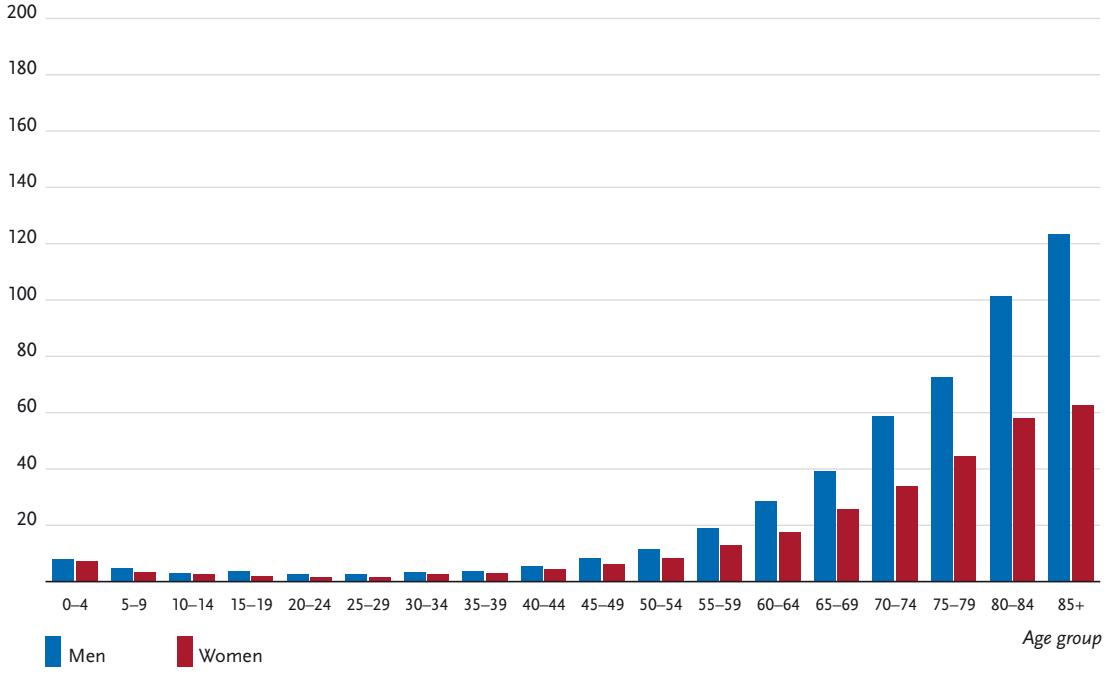


Table 3.28.2
Cancer incidence and mortality risks in Germany by age and sex, ICD-10 C91–C95, database 2014

	Risk of developing cancer				Mortality risk			
Men aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,100)	1.5%	(1 in 68)	<0.1%	(1 in 6,800)	1.0%	(1 in 110)
45 years	0.1%	(1 in 980)	1.4%	(1 in 70)	<0.1%	(1 in 3,300)	1.0%	(1 in 110)
55 years	0.2%	(1 in 440)	1.4%	(1 in 72)	0.1%	(1 in 1,100)	1.0%	(1 in 100)
65 years	0.4%	(1 in 220)	1.3%	(1 in 78)	0.3%	(1 in 390)	1.0%	(1 in 100)
75 years	0.7%	(1 in 150)	1.1%	(1 in 95)	0.5%	(1 in 190)	0.9%	(1 in 110)
Lifetime risk			1.6%	(1 in 64)			1.0%	(1 in 100)
Women aged	**in the next ten years**		**ever**		**in the next ten years**		**ever**	
35 years	<0.1%	(1 in 2,500)	1.1%	(1 in 93)	<0.1%	(1 in 10,400)	0.7%	(1 in 140)
45 years	0.1%	(1 in 1,400)	1.0%	(1 in 95)	<0.1%	(1 in 4,800)	0.7%	(1 in 140)
55 years	0.2%	(1 in 650)	1.0%	(1 in 100)	0.1%	(1 in 1,800)	0.7%	(1 in 140)
65 years	0.3%	(1 in 360)	0.9%	(1 in 110)	0.1%	(1 in 690)	0.7%	(1 in 150)
75 years	0.4%	(1 in 240)	0.7%	(1 in 140)	0.3%	(1 in 310)	0.6%	(1 in 170)
Lifetime risk			1.2%	(1 in 85)			0.7%	(1 in 140)

Figure 3.28.3
Distribution of T-stages at first diagnosis by sex
T-stages are not defined for leukaemias.

Table 3.28.3
Proportion of the various leukaemia forms for all new diagnoses C91–C95, by sex, Germany 2013–2014

	ALL[1]	CLL[2]	AML[3]	CML[4]	others[5]
Men	7%	42%	19%	7%	24%
Women	7%	38%	22%	8%	25%

1 Acute lymphatic leukaemia (C91.0)
2 Chronic lymphatic leukaemia (C91.1)
3 Acute myeloid leukaemia (C92.0)
4 Chronic myeloid leukaemia (C92.1)
5 incl. unspecified leukaemia forms

Figure 3.28.4a
Absolute survival rates up to 10 years after first diagnosis, by sex, ICD-10 C91–C95, Germany 2013–2014

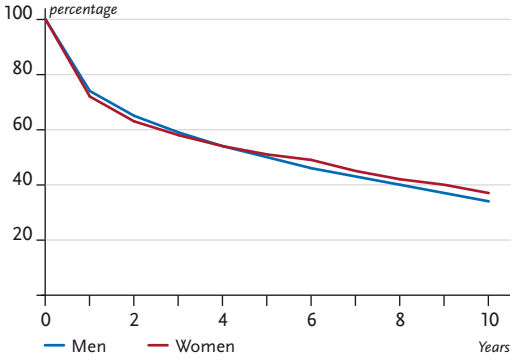


Figure 3.28.4b
Relative survival rates up to 10 years after first diagnosis, by sex, ICD-10 C91–C95, Germany 2013–2014

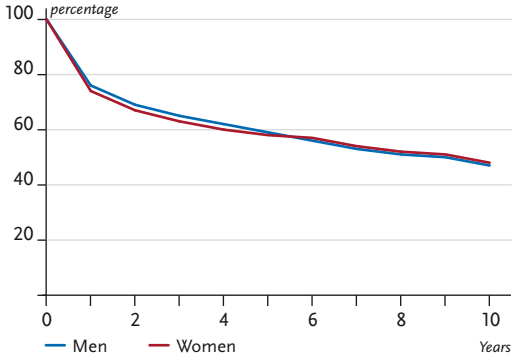


Figure 3.28.5
Registered age-standardised incidence and mortality rates in German federal states, by sex, ICD-10 C91 – C95, 2013 – 2014
per 100,000 (old European Standard)

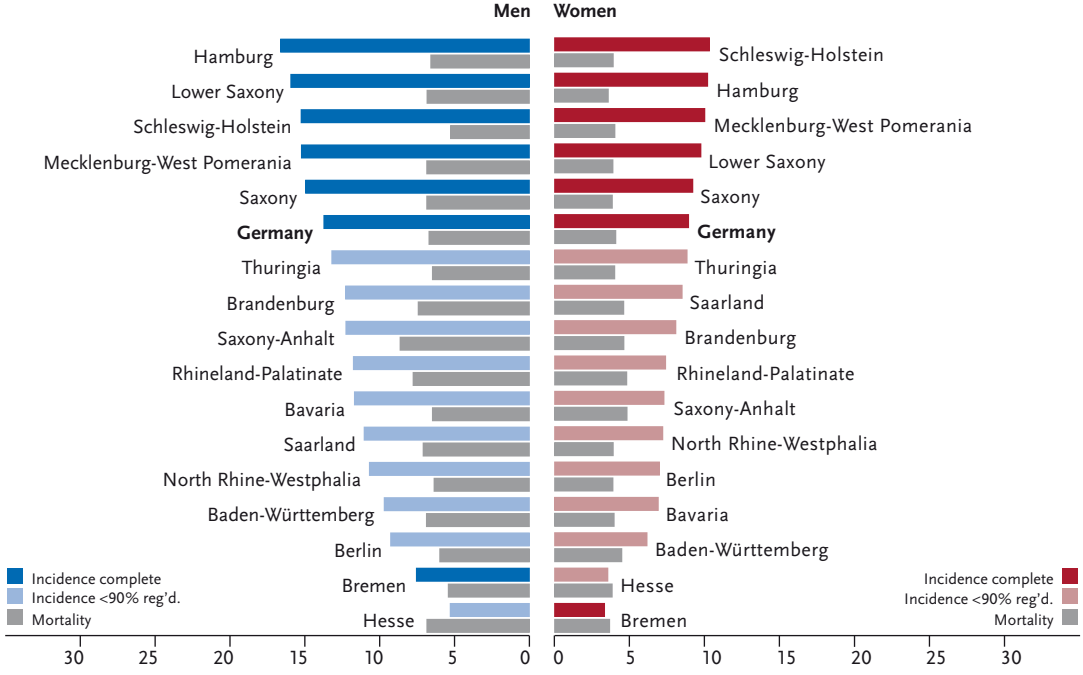
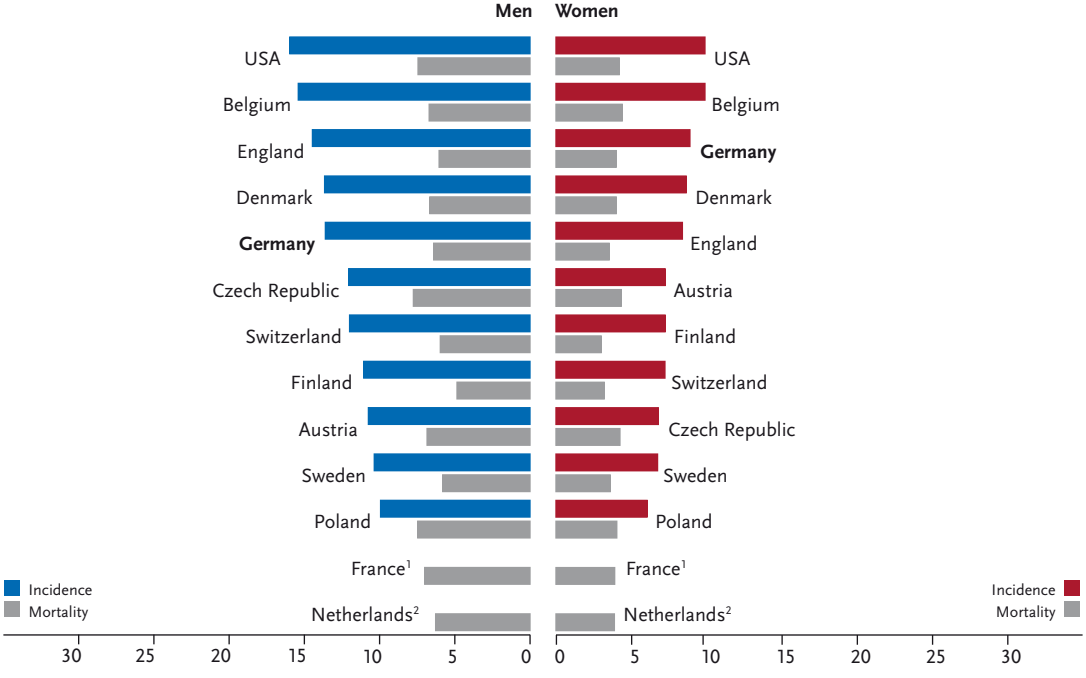


Figure 3.28.6
International comparison of age-standardised incidence and mortality rates, by sex, ICD-10 C91 – C95, 2013 – 2014 or latest available year (details and sources, see appendix)
per 100,000 (old European Standard)



[1] no data for incidence
[2] no comparable data for incidence

3.29 Rare cancer sites and non-melanoma skin cancer

Rare malignant tumours

Around 5 % of all malignant neoplasms (excluding non-melanoma skin cancer) affect sites not covered in the preceding chapters. Of these, approximately half again are malignant tumours of unspecified site (C80) or other and ill-defined sites (C26, C76). All others are presented in Table 3.29.1. For detailed figures for estimated nationwide incidence and mortality rates, for instance by age group and year of diagnosis see: www.krebsdaten.de/database.

Table 3.29.1
Frequency, median age at diagnosis and survival rates for rare malignant tumours in Germany (2014)

Cancer site	ICD-10	Incident cases		Deaths		age at diagnosis [1]		rel. 5-Y-SR [2]
		Men	Women	Men	Women	Men	Women	total
Small intestine	C17	1,240	1,030	309	274	68	71	59
Nasal cavity, nasal sinuses and middle ear	C30–C31	550	350	128	63	64	65	54
Mediastinum and other intrathoracic organs	C37–C39	290	210	195	119	65	69	42
Bone and articular cartilage	C40–C41	430	340	252	175	55	56	63
Vagina and other female genital organs	C52, C57, C58		1,190		456		71	52
Penis and other male genital organs	C60, C63	950		197		70		71
Urinary tract excl. kidney and bladder	C65, C66, C68	1,730	1,040	2,584	1,193	74	75	42
Eye	C69	460	390	139	118	67	65	79
Adrenal gland and other endocrine glands	C74, C75	230	240	407	327	57	63	54
Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue	C96	100	80	27	16	50	59	78

1 Median 2 relative 5-year survival rate in percentage, men and women, period 2013–2014

Non-melanoma skin cancer

Most non-melanoma skin cancers are either basal cell carcinomas or squamous-cell carcinomas, both of which occur predominantly at advanced age (Table 3.29.2). In both types, the most important risk factor is the long-term effect of the ultraviolet part of sunlight, which is why they regularly occur on the face or the head and neck.

Basal cell carcinomas only metastasise in very exceptional circumstances, and they are therefore usually not life threatening. However, their growth can have a destructive effect on surrounding tissue and, given an unfavourable site, therefore considerably reduce a patient's quality of life. The relative survival rate of over 100 % for basal cell carcinomas is most likely explained by the detection of tumours in older, otherwise healthy people.

Squamous-cell carcinomas are slightly more likely to metastasise, prognoses are nonetheless generally good. An acquired immune-deficiency and/or immuno-suppression, for example following transplant surgery, can encourage the development of this tumour.

Rare forms of skin cancer include Merkel-cell tumours, fibrosarcoma and carcinoma of the sebaceous and sweat glands. Cause of death statistics do not differentiate between the different forms of non-melanoma skin cancer.

Table 3.29.2
Frequency, median age at diagnosis and survival rates for types of non-melanoma skin cancer in Germany (2014)

Cancer site	ICD-O-3	Incident cases		Deaths		age at diagnosis [1]		rel. 5-Y-SR [2]
		Men	Women	Men	Women	Men	Women	total
Basaliomas	8090–8110	85,400	83,700			73	71	104
Squamous cell carcinomas	8050–8084	29,300	20,100			77	79	96
Unspecific histology	8000–8035	600	600			75	75	83
Other types		1,200	900			76	75	81
Total		116,500	105,300	435	351	74	73	102

1 Median 2 relative 5-year survival rate in percentage, men and women, period 2013–2014

4 Cancer in children

Since taking up its work in 1980, 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. From the outset, the GCCR was conceived to enable close cooperation with the Society for Paediatric Oncology and Haematology (GPOH) and its associated hospitals. This feature of the registry distinguishes it from adult oncology and has allowed it to become a nationwide epidemiologic childhood cancer registry with a high level of data quality and over 95 % coverage (since about 1987) has been built up covering the whole of Germany. The GCCR thus meets the international standards for an epidemiological cancer registry. A further feature of the GCCR is its active, open-ended, long-term follow-up observation of patients into adulthood. The registry therefore also provides a basis for researching late effects and secondary tumours, as well as studies with long-term survivors in general.

The registry includes children who have been diagnosed with a malignant disease or a histologically benign brain tumour before their 15th birthday and are part of the German resident population at diagnosis. The GCCR also registers cancer cases in eastern Germany since 1991. Since 1 January 2009, the GCCR has been registering all children and adolescents up to the age of 18 years (i. e. those, who receive their diagnosis before their 18th birthday) on the basis of the Guideline of the Joint Federal Committee on Quality-Assurance Measures for the In-Patient Care of Children and Adolescents with Haemato-Oncological Diseases. 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.

Currently, the data pool contains the data of around 57,000 patients.

Childhood cancer incidence

Germany registers around 1,750 cases of cancer in children aged under the age of 15 every year. With around 11 million children under 15, this translates into an incidence rate of about 6.8 per 100,000 children for this age group. For a child, the likelihood of developing a malignant cancer within the first 15 years of his/her life is 0.2 %. Roughly, one in 410 children is diagnosed with a malignant cancer before their 15th birthday. Since 2009, when registration of all children and adolescents up to the age of 18 began, an additional 360 cases aged between 15 and 17 years have been registered on average each year. 1,253 patients were diagnosed with a further cancer (subsequent cancer) within the first 30 years after their initial diagnosis, a rate of 6.6 % of patients (cumulative incidence).

Survival probability

Less than 1 % of all cancer patients are children aged under 15. Nonetheless, malignant neoplasms are the second most common cause of death for children. Luckily, survival prospects have improved over the past 30 years, in particular due to significantly more differentiated diagnoses and multimodal therapies. Whereas in the early 1980s, the five-year relative survival rate of children with cancer was 67 %; this figure has now risen to 85 %. Regarding the total number of patients included in the registry and diagnosed with cancer and subsequently followed up between 2004 and 2013, the five-year rate was 85 %, the ten-year rate 83 % and the fifteen-year rate 82 %.

Gradually, the encouraging rise in the number of long-term survivors has shifted the focus on the long-

Figure 4.1
Cancer in children (determined for the period 2004–2015)

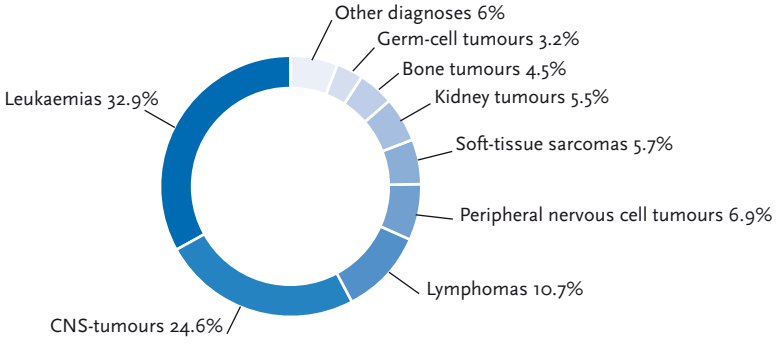
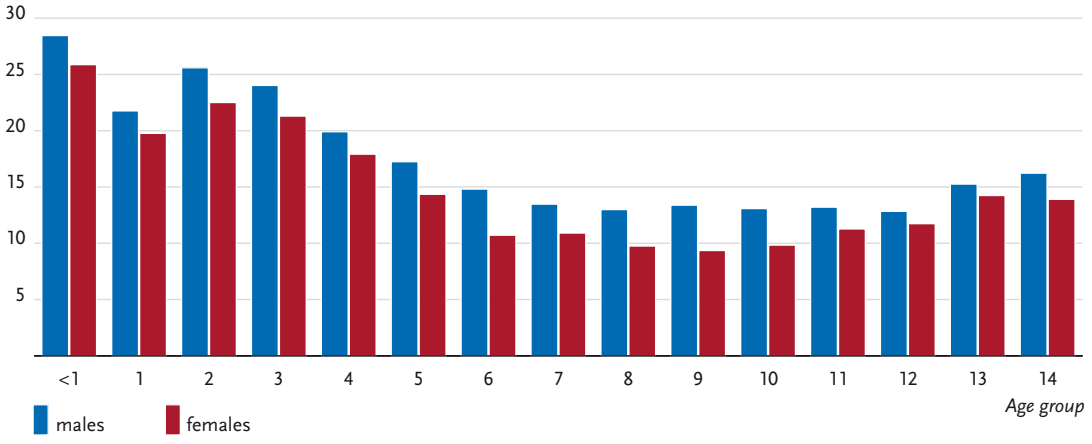


Figure 4.2
Incident cases by age and sex, all childhood malignancies
Number of cases per 100,000 by age group, determined for the period 2004–2015



term observation of former paediatric cancer patients. The GCCR database is in this regard an ideal basis for studying long-term survivors. As the above figures reveal, already today, statements on long-term survival (for example after 15 years or more), as well as estimates regarding the risk of developing a second neoplasia after suffering cancer in childhood, are now possible. Further potential research fields include the incidence of other long-term impacts, such as the possible consequences of therapy on fertility, or studies that examine the health risks of descendants or cardiovascular implications of therapy at later stages of life. About 35,000 of the more than 46,000 patients currently known to be alive have been registered for at least five years. The majority of these former patients are now aged 18 or over.

Range of diagnoses

Compared to adults, children present a very different range of cancers. Most children develop embryonal tumours (neuroblastomas, retinoblastomas, nephroblastomas, medulloblastomas, embryonic rhabdomyosarcomas or germ-cell tumours). Carcinomas, by contrast, are very rare in children (accounting for only about 3 % of all malignant cancers). Diagnostically, the most important groups of cancer in children are leukaemias (32.9 %), CNS tumours (24.6 %) and lymphomas (10.7 %). Cancer incidence rates for children aged under five are about twice as high as in the 5 to 14 age group. The median age at onset for children aged under fifteen is five years, ten months. Boys are diagnosed with cancer 1.2 times more frequently than girls.

Figure 4.3
Incident cases by age and sex, childhood acute lymphatic leukaemia (ALL)
Number of cases per 100,000 by age group, determined for the period 2004–2015

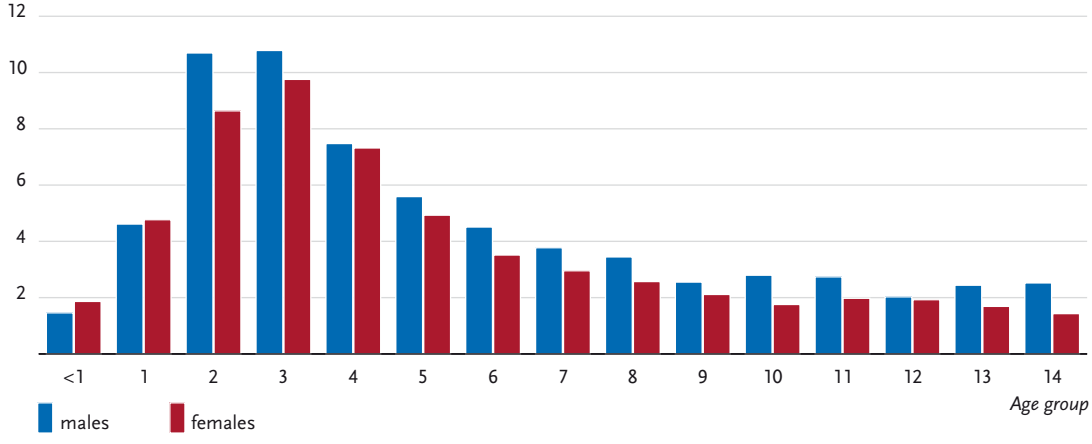


Figure 4.4
Trends of incidence of selected diagnostic groups and for all childhood malignancies
Number of cases per 100,000 (age standardised), including eastern Germany since 1991

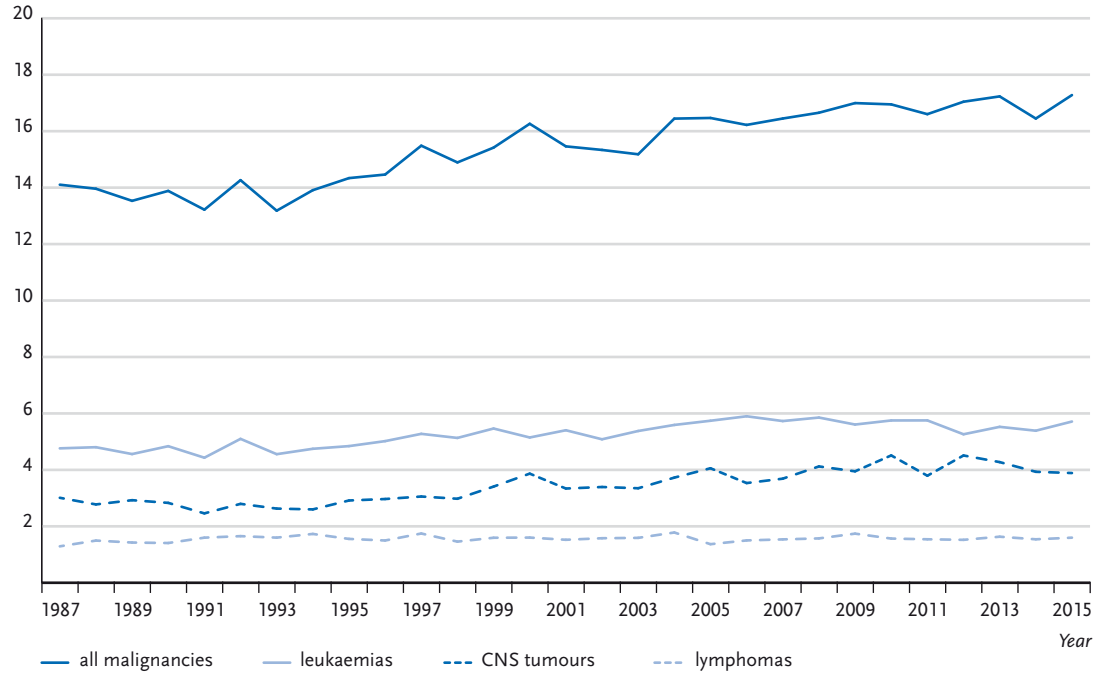
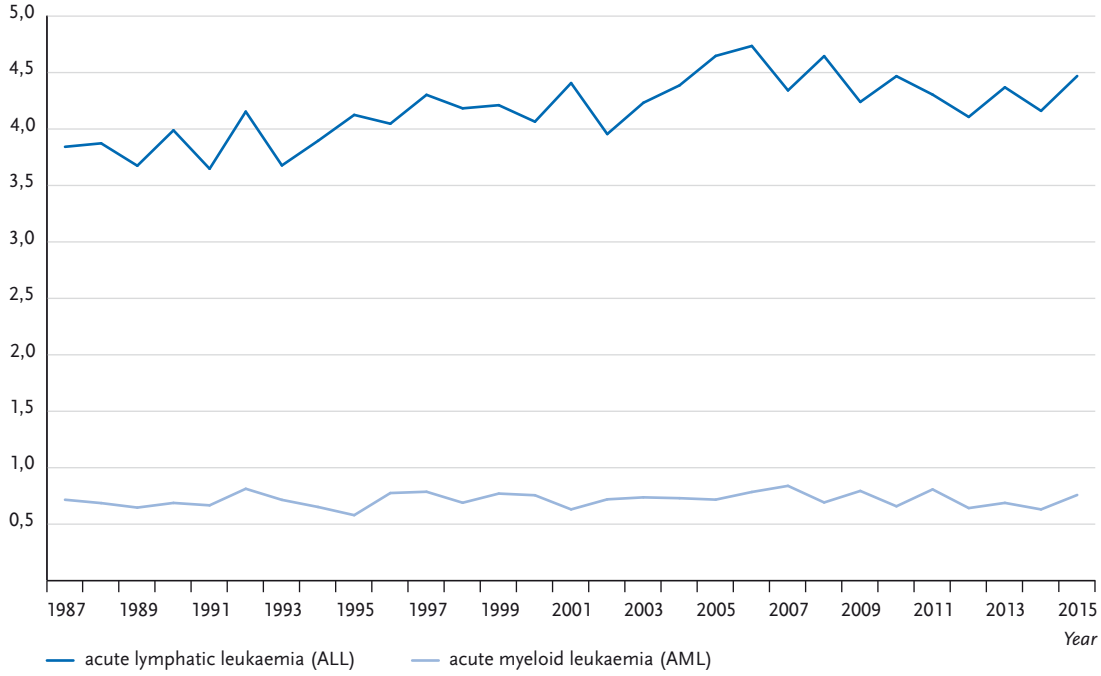


Figure 4.5
Trends of incidence of childhood leukaemias, myeloproliferative and myelodysplastic disorders
Number of cases per 100,000 (age standardised), including eastern Germany since 1991



Leukaemias

Among under 15 year olds, leukaemia accounts for about one third of all cancer cases. The most common single diagnosis overall (25.8 %) is lymphatic leukaemia (LL). It occurs more than twice as frequently among children under the age of five as in all other age groups. 4.3 % 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 significantly lower than for LL. About 11 % of all subsequent neoplasms are AML.

The causes of childhood leukaemia still remain largely unclear today. For a long time, environmental factors were suspected as playing a role in the development of leukaemia at childhood age. In the meantime, it has however become quite clear that the number of cases related to environmental factors (such as low-dose ionising radiation, non-ionising radiation and pesticides) is quite small, even though a loose association of these factors with childhood leukaemia cannot be ruled out. A number of facts have given greater weight to hypotheses that assign a key role to infections and the immune system in childhood leukaemia. Increasingly, genetic causes continue to be researched and discussed for all childhood neoplasia.

Lymphomas

The most common lymphomas are non-Hodgkin lymphomas (NHL), including Burkitt's lymphoma (6.3 %) and Hodgkin's lymphomas (4.5 %). The chances of survival for patients with Hodgkin's lymphoma are among the best in paediatric oncology. Unfortunately, with more than 13 % the frequency of subsequent cancer (within 30 years after diagnosis) following a Hodgkin's lymphoma is particularly high. Children with congenital or acquired immunodeficiency and those who have had immunosuppressive therapy are at increased risk of developing NHL.

CNS tumours

The most commonly diagnosed CNS tumours are astrocytomas (11.5 %), intracranial and intraspinal embryonal tumours (4.4 %) and ependymomas (1.9 %). 23 % of subsequent neoplasms are CNS tumours. Potentially, the increase in the incidence rates of CNS tumours observed in a number of western countries over the past few decades are related to better registration and also with general changes in environmental factors and related exposures. For example, a number of epidemiological studies is investigating the influence of ionising radiation, electromagnetic fields, pesticides, the mother's diet, as well as of genetic aspects.

Other common malignant diseases

Other common malignant cancers in childhood include neuroblastomas (nerve-cell tumours), nephroblastomas (kidney tumours), germ-cell tumours, bone tumours and rhabdomyosarcomas (tumours of the skeletal muscle). The prognosis for children with nephroblastoma or germ-cell tumour is much more favourable than for the other tumours. Skin tumours and thyroid cancer and breast cancer among young women are other frequent subsequent cancers.

Table 4.1
Incidence and survival rates for the most common diagnoses, determined for the period 2004–2013

Cancer cites	Incidence[1]	Survival rate in %[2]		
		after 5 years	after 10 years	after 15 years
Hodgkin's lymphomas	0.6	99	98	97
Retinoblastomas	0.4	97	97	97
Germ-cell tumours	0.5	94	93	93
Nephroblastomas	1	94	93	93
Lymphoid leukaemias	4.4	92	91	90
Non-Hodgkin lymphomas	0.7	89	88	86
Astrocytomas	1.8	82	79	78
Neuroblastomas and ganglioneuroblastomas	1.4	80	78	77
Rhabdomyosarcomas	0.7	74	73	73
Acute myeloid leukaemias	0.5	74	72	71
Osteosarcomas	0.3	76	71	70
Intracranial and intraspinale embryonal tumours	0.7	67	60	57
All malignancies	16.8	85	83	82

1 Related to 100,000 children under the age of 15, age standardised (standard: Segi world population), children diagnosed 2006–2015
2 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 cancer in children

Berthold F, Spix C, Kaatsch P, Lampert F. Incidence, Survival, and Treatment of Localized and Metastatic Neuroblastoma in Germany 1979–2015. Paediatr Drugs 2017.

Spix C, Grosche B, Bleher M, Kaatsch P, Scholz-Kreisel P, Blettner M. Background gamma radiation and childhood cancer in Germany: an ecological study. Radiat Environ Biophys 2017; 56(2): 127–38.

Kaatsch P, Grabow D, Spix C (2016) German Childhood Cancer Registry – Annual Report 2016 (1980–2015). Institut für Medizinische Biometrie, Epidemiologie und Informatik at the University Medical Center of the Johannes Gutenberg University Mainz, Mainz

Langer T, Kaatsch P, Steinmann D, Calaminus G. Spätfolgen von Tumoren im Kindesalter. Der Onkologe 2016; 22(12): 970–7.

Tulla M, Berthold F, Graf N, Rutkowski S, von Schweinitz D, Spix C, Kaatsch P. Incidence, Trends, and Survival of Children With Embryonal Tumors. Pediatrics 2015; 136(3): e623–32.

Krille L, Dreger S, Schindel R, Albrecht T, Asmussen M, Barkhausen J, Berthold JD, Chavan A, Claussen C, Forsting M, Gianicolo EA, Jablonka K, Jahnen A, Langer M, Laniado M, Lotz J, Mentzel HJ, Queisser-Wahrendorf A, Rompel O, Schlick I, Schneider K, Schumacher M, Seidenbusch M, Spix C, Spors B, Staatz G, Vogl T, Wagner J, Weisser G, Zeeb H, Blettner M. Risk of cancer incidence before the age of 15 years after exposure to ionising radiation from computed tomography: results from a German cohort study. Radiation and environmental biophysics 2015; 54(1): 1–12.

Kratz CP, Franke L, Peters H, Kohlschmidt N, Kazmierczak B, Finckh U, Bier A, Eichhorn B, Blank C, Kraus C, Kohlhase J, Pauli S, Wildhardt G, Kutsche K, Auber B, Christmann A, Bachmann N, Mitter D, Cremer FW, Mayer K, Daumer-Haas C, Nevinny-Stickel-Hinzpeter C, Oeffner F, Schluter G, Gencik M, Uberlacker B, Lissewski C, Schanze I, Greene MH, Spix C, Zenker M. Cancer spectrum and frequency among children with Noonan, Costello, and cardio-facio-cutaneous syndromes. British journal of cancer 2015; 112(8): 1392–7.

Hjorth L, Haupt R, Skinner R, Grabow D, Byrne J, Karner S, Levitt G, Michel G, van der Pal H, Bardi E, Beck JD, de Vathaire F, Essig S, Frey E, Garwicz S, Hawkins M, Jakab Z, Jankovic M, Kazanowska B, Kepak T, Kremer L, Lackner H, Sugden E, Terenziani M, Zaletel LZ, Kaatsch P, PanCare N. Survivorship after childhood cancer: PanCare: A European Network to promote optimal long-term care. Eur J Cancer 2015; 51(10): 1203–11.

Gatta G, Botta L, Rossi S, Aareleid T, Bielska-Lasota M, Clavel J, Dimitrova N, Jakab Z, Kaatsch P, Lacour B, Mallone S, Marcos-Gragera R, Minicozzi P, Sanchez-Perez MJ, Sant M, Santaquilani M, Stiller C, Tavilla A, Trama A, Visser O, Peris-Bonet R, Group EW. Childhood cancer survival in Europe 1999–2007: results of EUROCARE-5--a population-based study. The lancet oncology 2014; 15(1): 35–47.

Hennewig U, Kaatsch P, Blettner M, Spix C. Local radiation dose and solid second malignant neoplasms after childhood cancer in Germany: a nested case-control study. Radiation and environmental biophysics 2014; 53(3): 485–93.

Calaminus G, Kaatsch P, Creutzig U, Langer T. Erste Basiserhebung zu Lebenssituation, Gesundheitszustand und Lebensqualität bei Überlebenden nach Krebs im Kindesalter in Deutschland (»VIVE«). Monatsschr Kinderh 2013; 161: 1071–2.

Michaelis J, Kaatsch P. Deutsches Kinderkrebsregister. Der Onkologe 2013; 19(12): 1058–64.

Spix C, Kaatsch P, Schüz J. Umweltfaktoren bei Leukämieerkrankungen im Kindesalter. pädiat prax. 2013; 80: 233–54.

Roman E, Lightfoot T, Smith AG, Forman MR, Linet MS, Robison L, et al. Childhood acute lymphoblastic leukaemia and birthweight: Insights from a pooled analysis of case-control data from Germany, the United Kingdom and the United States. Eur J Cancer. 2012.

Kaatsch P. Epidemiology of childhood cancer. Cancer Treat Rev. 2010; 36(4): 277–85.

Kaatsch PS, C.; Jung, I.; Blettner, M. Leukämien bei unter 5-jährigen Kindern in der Umgebung deutscher Kernkraftwerke – Schlusswort. Dtsch Ärztebl. 2009; 106 (23): 394.

Brenner H, Spix C. Combining cohort and period methods for retrospective time trend analyses of long-term cancer patient survival rates. Br J Cancer. 2003; 89(7): 1260–5.

5 Appendix

5.1 The German Centre for Cancer Registry Data at the Robert Koch Institute (Zentrum für Krebsregisterdaten, ZfKD)

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 at the beginning of 2010 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 anonymised data submitted by the epidemiological (population-based) state cancer registries
- to create, maintain and update a dataset from the data transmitted by the state cancer registries and checked by the ZfKD
- to further enhance methods and standards for data collection and data transfer, and to analyse the data together with the state cancer registries
- to regularly estimate and analyse cancer incidence, mortality, survival rates, stage distribution at diagnosis, and other indicators, particularly prevalence, the risk of developing and dying of the disease, and how these indicators change over time
- to examine regional differences in selected cancer sites
- to provide a dataset for evaluating health-policy measures for cancer prevention, cancer screening, cancer treatment and healthcare
- to conduct analyses and studies on cancer and to publish the results in national and international journals
- to conduct a nationwide record linkage for the detection of duplicate notifications and to inform the cancer registries accordingly
- to publish a report on cancer incidence and trends in Germany in consultation with the state cancer registries every two years (»Cancer in Germany«)
- to write a comprehensive report on cancer in Germany every five years; the first edition was published in November 2016
- to complement classic print-products with interactive analysis tools based on annually updated data and an expanded presence on the Internet
- to use additional data sources to describe all aspects of cancer in Germany
- to engage in international cooperations
- to collaborate in scientific bodies as well as European and international organizations dedicated to cancer registration and cancer epidemiology (e. g. active participation in working groups of the German National Cancer Plan, in the Association of Population-based Cancer Registries in Germany (GEKID), International Association of Cancer Registries (IACR) membership)

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 grant permission for the dataset at the German Centre for Cancer Registry Data to be made available to third parties if a justified and, in particular, scientific interest can be substantiated. Further information on the application process as well as the German Centre for Cancer Registry Data is available on the Internet at www.krebsdaten.de/english.

Staff of the German Centre for Cancer Registry Data:
Dr Klaus Kraywinkel (section head)
Dr Benjamin Barnes (deputy section head)
Nina Buttmann-Schweiger
Dr Stefan Dahm
Julia Fiebig
Manuela Franke
Dr Jörg Haberland
André Kötschau
Stefan Meisegeier
Ina Schönfeld
Katrin Werth
Antje Wienecke

5.2 Association of Population-based Cancer Registries in Germany

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 especially in working groups preparing the uniform data set for clinical and epidemiological cancer registration.

The association's primary task is to standardise 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« a few years ago. Together with the Association of German Tumour Centers (ADT), this manual is currently being updated and expanded to include elements of clinical cancer registration.

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. GEKID is a member of the European Network of Cancer Registries (ENCR) and the International Association of Cancer Registries (IACR).

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 to the (professional) public 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

Essential results of the GEKID activities in the past years:

- Enhancement of the interactive GEKID-Atlas regarding actual cancer incidence, mortality and survival in the federal states; the GEKID-Atlas made significant contributions to the scientific usage of cancer registry data and is available via the GEKID-Homepage
- Enhancement of the uniform minimum data format for the report to a registry as well as an interchange format for the forwarding of data according to the place of residence and for the data exchange with the German Centre for Cancer Registry Data at the RKI
- Evaluation and publication of results of survival analyses in Germany together with German Cancer Research Centre, supported by German Cancer Aid

Information on GEKID can be obtained on the Inter-net at www.gekid.de/home or from the respective regional member registries (see address section, appendix 5.4).

Contacts for the Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V., GEKID) (see address section, appendix 5.4):

Prof Dr Alexander Katalinic
(Chair of GEKID, Schleswig-Holstein Cancer Registry)
Dr Stefan Hentschel
(1st Vice-chair, Hamburg Cancer Registry)
Roland Stabenow
(2nd Vice-chair, Joint Cancer Registry)

5.3 KID – The Cancer Information Service provided by the German Cancer Research Centre

The Cancer Information Service »KID« was founded in 1986 to provide personal telephone contacts for patients, their relatives and the interested public with questions regarding cancer. Today, doctors provide up-to-date, scientifically sound answers to around 35,000 questions every year by phone, by e-mail and in consultations in both Heidelberg and Dresden. Even representatives from occupational groups involved in the care of cancer patients turn to the Cancer Information Service. The information on offer is individually tailored to the needs of the various target groups:

- Patients as well as their relatives and friends are interested primarily in detailed information relating to diagnosis and treatment options, living with the disease and additional points of contact within the healthcare system. For interested citizens, the main focus is on risk factors, cancer prevention and early detection or on current cancer research. The comprehensive information of the Cancer Information Service strengthens the health literacy of individuals and creates the basis for communicating at eye-level with physicians, so that those affected can engage in an informed decision-making process.
- Professionals in occupations concerned with cancer receive pertinent information on the telephone and via email quickly, reliably, competently, and based on the best available scientific evidence. The clear preparation of research results and the individual compilation of relevant sources generate direct added value for patient care.

Via its website www.krebsinformationsdienst.de the Cancer Information Service conveys the latest knowledge about cancer, useful addresses, additional contacts and tips on further links and information material. 700,000 individual visitors per month used this facility in 2016. On the social networking site Facebook, the service posts breaking news and invites discussion. For professionals, the website offers relevant information on medical research and provides links to further scientific sources. Newsletters for medical professionals, especially for psycho-oncologists, convey current information about cancer.

The Cancer Information Service is provided by the German Cancer research Centre (DKFZ) in Heidelberg, the largest bio-medical research establishment in Germany. The service is financed by funds from the Federal Ministry of Education and Research (BMBF), the State of Baden-Württemberg's Ministry of Science, Research and Art (MWK) and the Federal Ministry of Health. As a result, the service provides information independently, free from conflicts of interest and free of charge. In its capacity as national reference centre for cancer information, the Cancer Information Service is committed to providing the highest possible standard of information. Through its accompanying research, the Service also provides feedback on how cancer patients and their relatives experience the health care situation in Germany.

Further information on the mission and methods of the Cancer Information Service can be found by following the link: www.krebsinformationsdienst.de/info/german-cancer-information-service-2017.pdf

Cancer Information Service (KID)
Telephone: + 49 (0)800 – 420 30 40,
(Free within Germany) Daily from 08:00 to 20:00
E-Mail: krebsinformationsdienst@dkfz.de,
Answers usually within 2 working days
Internet: www.krebsinformationsdienst.de and
www.facebook.com/krebsinformationsdienst

Cancer Information Service.med
Telephone: +49 (0)800 – 430 40 50,
(Free within Germany) Daily from 08.00 to 20.00
E-Mail: kid.med@dkfz.de,
Answers usually within 2 working days
Internet: www.krebsinformationsdienst.de/fachkreise

Contact partners at the Cancer Information Service KID (also see address section, appendix 5.4):

Dr. Susanne Weg-Remers
Head of the Cancer Information Service (KID)
Dr. Andrea Penzkofer
Head of the Working Group »Knowledge Management« at KID

5.4 Addresses

Krebsregister **Baden-Württemberg** (Baden-Württemberg Cancer Registry)
Epidemiologisches Krebsregister (Population-based Cancer Registry)
Deutsches Krebsforschungszentrum Heidelberg (German Cancer Research Centre)
Im Neuenheimer Feld 581
69120 Heidelberg
Telephone: +49 (0)6221/42 42 20
E-Mail: ekr-bw@dkfz.de
Internet: www.krebsregister-bw.de

Krebsregister Baden-Württemberg (Baden-Württemberg Cancer Registry)
Vertrauensstelle (Baden-Württemberg Confidentiality Unit)
bei der Deutschen Rentenversicherung (German Pension Insurance) Baden-Württemberg
Gartenstraße 105
76135 Karlsruhe
Telephone: +49 (0)721/82 57 90 00 Telefax: +49 (0)721/82 59 97 90 99
E-Mail: vs@drv-bw.de
Internet: www.krebsregister-bw.de

Klinische Landesregisterstelle des Krebsregisters Baden-Württemberg (Clinical State Registration Unit) bei der Baden-Württembergischen Krankenhausgesellschaft e.V. (Baden-Württemberg Hospital Association)
Birkenwaldstraße 145
70191 Stuttgart
Telephone: +49 (0)711/2 57 77 70 Telefax: +49 (0)711/2 57 77 79
E-Mail: info@klr-krbw.de
Internet: www.krebsregister-bw.de

Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit (Bavarian Health and Food Safety Authority)
Zentrum für Krebsfrüherkennung und Krebsregistrierung (Registration Unit)
Schweinauer Hauptstraße 80
90441 Nürnberg
Telephone: +49 (0)9131/68 08 29 20 Telefax: +49 (0)9131/68 08 29 05
E-Mail: zkfr@lgl.bayern.de
Internet: www.krebsregister-bayern.de

Bevölkerungsbezogenes Krebsregister Bayern (Bavaria Population-based Cancer Registry)
Vertrauensstelle (Confidentiality Unit), Klinikum Nürnberg-Nord
Professor-Ernst-Nathan-Straße 1
90419 Nürnberg
Telephone: +49 (0)911/3 78 67 38 Telefax: +49 (0)911/3 78 76 19
E-Mail: vertrauensstelle@klinikum-nuernberg.de
Internet: www.krebsregister-bayern.de

Gemeinsames Krebsregister der Länder **Berlin, Brandenburg, Mecklenburg-Vorpommern, Sachsen-Anhalt** und der Freistaaten **Sachsen** und **Thüringen** (GKR)
(Joint Cancer Registry of Berlin, Brandenburg, Mecklenburg-West Pomerania, Saxony-Anhalt, Saxony)
Brodauer Straße 16–22
12621 Berlin
Telephone: +49 (0)30/56 58 11 00 (R) Telefax: +49 (0)30/56 58 11 99 (R)
+49 (0)30/56 58 12 00 (V) +49 (0)30/56 58 12 99 (V)
E-Mail: registerstelle@gkr.berlin.de vertrauensstelle@gkr.berlin.de
Internet: www.krebsregister.berlin.de

Bremer Krebsregister Auswertungsstelle (Bremen Cancer Registry)
Leibniz-Institut für Präventionsforschung und Epidemiologie – BIPS GmbH
(Leibniz Institute for Prevention Research and Epidemiology)
Achterstraße 30
28359 Bremen
Telephone: +49 (0)421/21 85 69 61 Telefax: +49 (0)421/21 85 68 21
E-Mail: krebsregister@leibniz-bips.de
Internet: www.krebsregister.bremen.de

(R) = Registerstelle (Registry Unit) (V) = Vertrauensstelle (Confidentiality Unit)

Vertrauensstelle des Bremer Krebsregisters (Confidentiality Unit)
Kassenärztliche Vereinigung Bremen
Achterstraße 30
28359 Bremen
Telephone: +49 (0)421/21 85 69 99
E-Mail: vbkr.kvhb@t-online.de

Hamburgisches Krebsregister (Hamburg Cancer Registry)
Behörde für Gesundheit und Verbraucherschutz (State Ministry of Health and Consumer Protection)
Billstraße 80
20539 Hamburg
Telephone: +49 (0)40/4 28 37 22 11 Telefax: +49 (0)40/4 27 31 00 94
E-Mail: hamburgischeskrebsregister@bgv.hamburg.de
Internet: www.hamburg.de/krebsregister

Hessisches Landesprüfungs- und Untersuchungsamt im Gesundheitswesen
Landesauswertungsstelle des Hessischen Krebsregisters
Walter-Möller-Platz 1
60439 Frankfurt am Main
Telephone: +49 (0)69/1 56 77 12 Telefax: +49 (0)69/1 56 77 16
E-Mail: Ernst-Alfred.Burkhardt@hlpug.hessen.de
Internet: www.hlpug.de

Vertrauensstelle des Hessischen Krebsregisters (Confidentiality Unit of Hesse Cancer Registry)
bei der Landesärztekammer Hessen
Im Vogelsgesang 3
60488 Frankfurt/Main
Telephone: +49 (0)69/7 89 04 50 Telefax: +49 (0)69/78 90 45 29
E-Mail: vertrauensstelle@laekh.de
Internet: www.laekh.de

Epidemiologisches Krebsregister **Niedersachsen** (Lower Saxony Population-based Cancer Registry)
OFFIS CARE GmbH
Industriestraße 9
26121 Oldenburg
Telephone: +49 (0)441/36 10 56 12 Telefax: +49 (0)441/36 10 56 10
E-Mail: registerstelle@krebsregister-niedersachsen.de
Internet: www.krebsregister-niedersachsen.de

Niedersächsisches Landesgesundheitsamt (Lower Saxony Local Health Authority)
Vertrauensstelle Epidemiologisches Krebsregister Niedersachsen
(Confidentiality Unit of Lower Saxony Population-based Cancer Registry)
Andreaestraße 7
30159 Hannover
Telephone: +49 (0)511/4 50 53 80 Telefax: +49 (0)511/4 50 51 32
E-Mail: vertrauensstelle.ekn@nlga.niedersachsen.de
Internet: www.krebsregister-niedersachsen.de

Landeskrebsregister **Nordrhein-Westfalen** gGmbH
(North Rhine-Westphalia Population-based Cancer Registry)
Gesundheitscampus 10
44801 Bochum
Telephone: +49 (0)234/54509-000 Telefax: +49 (0)234/54509-499
+49 (0)234/54509-111 (Zentrale Servicerufnummer=Hotline)
E-Mail: info@krebsregister.nrw.de
Internet: www.krebsregister.nrw.de

Krebsregister **Rheinland-Pfalz** gGmbH (Rhineland-Palatinate Cancer Registry)
Große Bleiche 46
55116 Mainz
Zentrale: +49 (0)6131/9 71 75 0 Telefax: +49 (0)6131/9 71 75 90
E-Mail: info@krebsregister-rlp.de
Internet: www.krebsregister-rlp.de

Krebsregister **Saarland** (Saarland Cancer Registry)
Ministerium für Soziales, Gesundheit, Frauen und Familie
(Ministry of Social Affairs, Health, Women and Family)
Präsident-Baltz-Straße 5
66119 Saarbrücken
Telephone: +49 (0)681/5 01 58 05 (R) Telefax: +49 (0)681/5 01 59 98
+49 (0)681/5 01 45 38 (V)
E-Mail: koordinierungsstelle@krebsregister.saarland.de
Internet: www.krebsregister.saarland.de

Krebsregister **Schleswig-Holstein** (Schleswig-Holstein Cancer Registry)
Registerstelle (Registry Unit)
Institut für Krebsepidemiologie e. V. (Institute for Cancer Epidemiology)
Ratzeburger Allee 160, Haus 50
23562 Lübeck
Telephone: +49 (0)451/50 05 21 01 Telefax: +49 (0)451/50 05 21 04
E-Mail: info@krebsregister-sh.de
Internet: www.krebsregister-sh.de

Vertrauensstelle des Krebsregisters (Confidentiality Unit of Schleswig-Holstein Cancer Registry)
bei der Ärztekammer Schleswig-Holstein (at Schleswig-Holstein Medical Council)
Bismarckallee 8–12
23795 Bad Segeberg
Telephone: +49 (0)4551/80 38 52
E-Mail: krebsregister-sh@aeksh.de

Deutsches Kinderkrebsregister (German Childhood Cancer Registry)
Institut für Medizinische Biometrie, Epidemiologie und Informatik (IMBEI)
(Institute of Medical Biostatistics, Epidemiology and Informatics)
Obere Zahlbacher Str. 69
55131 Mainz
Telephone: +49 (0)6131/17 31 11 Telefax: +49 (0)6131/17 44 62
E-Mail: info@kinderkrebsregister.de
Internet: www.kinderkrebsregister.de

Krebsinformationsdienst (KID) (Cancer Information Service)
Deutsches Krebsforschungszentrum (German Cancer Research Centre)
Im Neuenheimer Feld 280
69120 Heidelberg
Telephone: +49 (0)6221/42 28 90 (secretariat)
E-Mail: krebsinformationsdienst@dkfz.de
Internet: www.krebsinformationsdienst.de

Further contacts

Zentrum für Krebsregisterdaten im Robert Koch-Institut
(German Centre for Cancer Registry Data at the Robert Koch Institute)
General-Pape-Straße 62–66
12101 Berlin
Telephone: +49 (0)30/1 87 54 33 81
E-Mail: krebsdaten@rki.de
Internet: www.krebsdaten.de/english

Bundesministerium für Gesundheit (Federal Ministry of Health)
53107 Bonn
Referat 311 Telephone: +49 (0)228/9 94 41 15 10 Telefax: +49 (0)228/9 94 41 49 62
Referat 315 Telephone: +49 (0)228/9 94 41 31 08 Telefax: +49 (0)228/9 94 41 49 38
E-Mail: poststelle@bmg.bund.de
Internet: www.bmg.bund.de

(R) = Registerstelle (Registry Unit) (V) = Vertrauensstelle (Confidentiality Unit)

5.5 Sources for international comparison of cancer incidence and mortality rates

(for the years 2013–2014, if not otherwise stated. Access date: July to October 2017)

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

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

Poland: Zakład Epidemiologii i Prewencji Nowotworów Centrum Onkologii-Instytut
http://onkologia.org.pl/raporty/#tabela_nowotwor

Czech Republic: SVOD Web Portal
http://www.svod.cz/?sec=aktuality&lang=en
Data for all cancer (C00–C97 w/o. C44) and for Leukaemias (C91–95):
Institute of Health Information and Statistics of the Czech Republic (UZIS)
Cancer Incidence in the Czech Republic, 2014
http://www.uzis.cz/

Belgium: Incidence: Belgian Cancer Registry
http://www.kankerregister.org/
Mortality: Eurostat, Statistical office of European Union
http://ec.europa.eu/eurostat/web/health/causes-death/data/database

France: Incidence data for 2013/2014 not available by editorial deadline
Mortality: Eurostat, Statistical office of European Union
http://ec.europa.eu/eurostat/web/health/causes-death/data/database

USA: Incidence: National Cancer Institute Surveillance, Epidemiology, and End Results (SEER) Program
http://seer.cancer.gov/canques/incidence.html
Mortality: http://seer.cancer.gov/canques/mortality.html and
United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS),
Underlying Cause of Death 1999–2015 on CDC WONDER Online Database, released 2016.

England: Office for National Statistics (GB)
https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases

Switzerland: NICER – National Institute for Cancer Epidemiology and Registration
http://www.nicer.org/de/statistiken-atlas/

Austria: STATISTIK AUSTRIA, Austrian Cancer Registry. Access date: 15th November 2016

Further information/data for mortality for individually diagnoses and countries:
WHO mortality database
http://apps.who.int/healthinfo/statistics/mortality/causeofdeath_query/

5.6 Recent publications related to cancer registration in Germany

Arndt V, Koch-Gallenkamp L, Jansen L, Bertram H, Eberle A, Holleczek B, Schmid-Höpfner S, Waldmann A, Zeissig SR, Brenner H (2017) Quality of life in long-term and very long-term cancer survivors versus population controls in Germany. Acta Oncol. 56 (2): 190–197.

Baras N, Dahm S, Haberland J, Janz M, Emrich K, Kraywinkel K, Salama A (2017) Subsequent malignancies among long-term survivors of Hodgkin lymphoma and non-Hodgkin lymphoma: a pooled analysis of German cancer registry data (1990–2012). Br J Haematol 177 (2): 226–242.

Becker C, Blettner M, Kaatsch P, Ressing M, Zeißig S (2016) Welche Daten zu Krebs und zur Mortalität findet man in Deutschland? Strahlenschutz Praxis 2: 34–38.

Bertz J, Buttmann-Schweiger, Kraywinkel K (2017) Epidemiologie bösartiger Hodentumoren in Deutschland. Onkologe 23 (2): 90–95.

Blettner M, Schlag PM (2017) Moderne Onkologie – Prägung durch klinische und epidemiologische Krebsregister. Onkologe 23 (4): 252–254.

Bokhof B, Heindel W, Weigel S (2017) Brustkrebsfrüherkennung durch Mammographiescreening – Qualitätssicherung als Basis messbarer Effektivität. Onkologe 23 (9): 710–710.

Brenner H, Castro FA, Eberle A, Emrich K, Holleczek B, Katalinic A, Jansen L; GEKID Cancer Survival Workgroup (2016) Death certificate only proportions should be age adjusted in studies comparing cancer survival across populations and over time. Eur J Cancer 52: 102–8.

Brenner H, Jansen L (2015) Restriction to period of interest improves informative value of death certificate only proportions in period analysis of cancer survival. J Clin Epidemiol 68 (12): 1432–9.

Brenner H, Jansen L (2016) Timely disclosure of progress in long-term cancer survival: the boomerang method substantially improved estimates in a comparative study. J Clin Epidemiol 70: 224–32.

Brenner H, Weberpals J, Jansen L (2017) Epidemiologische Forschung mit Krebsregisterdaten. Onkologe 23 (4): 272–279.

Brunssen A, Waldmann A, Eisemann N, Katalinic A (2017) Impact of skin cancer screening and secondary prevention campaigns on skin cancer incidence and mortality: A systematic review. J Am Acad Dermatol 76 (1): 129–139.

Buttmann-Schweiger N, Deleré Y, Klug SJ, Kraywinkel K (2017) Cancer incidence in Germany attributable to human papillomavirus in 2013. BMC Cancer 16; 17 (1): 682.

Chen T, Brenner H, Fallah M, Jansen L, Castro FA, Geiss K, Holleczek B, Katalinic A, Luttmann S, Sundquist K, Ressing M, Xu L, Hemminki K; GEKID Cancer Survival Working Group (2017) Risk of second primary cancers in women diagnosed with endometrial cancer in German and Swedish cancer registries. Int J Cancer 141 (11): 2270–2280.

Chen T, Fallah M, Brenner H, Jansen L, Mai EK, Castro FA, Katalinic A, Emrich K, Holleczek B, Geiss K, Eberle A, Sundquist K, Hemminki K; GEKID Cancer Survival Working Group (2016) Risk of Second Primary Cancers in Multiple Myeloma Survivors in German and Swedish Cancer Registries. Sci Rep 24; 6: 22084.

Chen T, Fallah M, Jansen L, Castro FA, Krilavicuite A, Katalinic A, Eisemann N, Emrich K, Holleczek B, Geiss K, Eberle A, Sundquist J, Brenner H, Hemminki K; GEKID Cancer Survival Working Group (2015) Distribution and risk of the second discordant primary cancers combined after a specific first primary cancer in German and Swedish cancer registries. Cancer Lett 369 (1): 152–66.

Eisemann N, Jansen L, Castro FA, Chen T, Eberle A, Nennecke A, Zeissig SR, Brenner H, Katalinic A; GEKID Cancer Survival Working Group (2016) Survival with nonmelanoma skin cancer in Germany. Br J Dermatol 174 (4): 778–85.

Emrich K, Schmidtmann I, Zeissig SR, Blettner M (2017) Statistische Methoden für Krebsregister. Onkologe 23 (4): 255–263.

Hoeppner J, Glatz T, Claus R, Fischer A, Kraywinkel K, Brunner T (2017) Das Adenokarzinom des Ösophagus – Bestandsaufnahme einer drastisch zunehmenden Erkrankung. Dtsch Med Wochenschr 142 (19): 1453–1460.

Holleczek B, Brenner H (2016) Implications from Underreporting at Lifetime, Death Certificate Notifications and Trace-back on the Recorded Incidence of a »Newly« Established Population-based Cancer Registry. Methods Inf Med 55 (2): 182–92.

Holleczek B, Katalinic A (2017) Toward a comprehensive cancer registration in Germany. Eur J Cancer Prev 26: 132–138.

Hübner J, Waldmann A, Geller AC, Weinstock MA, Eisemann N, Noftz M, Bertram S, Nolte S, Volkmer B, Greinert R, Breitbart E, Katalinic A (2017) Interval cancers after skin cancer screening: incidence, tumour characteristics and risk factors for cutaneous melanoma. Br J Cancer 116 (2): 253–259.

Keller AK, Uter W, Pfahlberg AB, Radespiel-Tröger M, Mayer I, Gefeller O (2015) Replacing surrogate measures by direct quantification of ultraviolet radiation exposure in registry-based analyses of seasonality of melanoma diagnoses. Melanoma Res 25 (6): 543–9.

Klinkhammer-Schalke M, Gerken M (2017) Bedeutung von Krebsregistern für die Versorgungsforschung. Onkologe 23 (4): 280–287.

Koch-Gallenkamp L, Bertram H, Eberle A, Holleczek B, Schmid-Höpfner S, Waldmann A, Zeissig SR, Brenner H, Arndt V (2016) Fear of recurrence in long-term cancer survivors-Do cancer type, sex, time since diagnosis, and social support matter? Health Psychol. 35 (12): 1329–33.

Koch-Gallenkamp L, Bertram H, Eberle A, Holleczek B, Schmid-Höpfner S, Waldmann A, Zeissig SR, Brenner H, Arndt V (2017) Progredienzangst ≥5 Jahre nach Krebsdiagnose – Ergebnisse der krebsregisterbasierten, bevölkerungsbasierten CAESAR-Studie. Onkologe 23 (4): 295–299.

Kraywinkel K, Barnes B (2017) Epidemiologie des kleinzelligen Lungenkarzinoms in Deutschland. Onkologe 23 (5): 334–337.

Kraywinkel K, Spix C (2017) Epidemiologie akuter Leukämien in Deutschland. Onkologe 23 (7): 499–503.

Lehnert M, Kraywinkel K, Heinze E, Wiethege T, Johnen G, Fiebig J, Brüning T, Taeger D (2017) Incidence of malignant mesothelioma in Germany 2009–2013. Cancer Causes Control 28 (2): 97–105.

Leiter U, Keim U, Eigentler T, Katalinic A, Holleczek B, Martus P, Garbe C (2017) Incidence, Mortality, and Trends of Nonmelanoma Skin Cancer in Germany. J Invest Dermatol 137 (9): 1860–1867.

Merz M, Jansen L, Castro FA, Hillengass J, Salwender H, Weisel K, Scheid C, Luttmann S, Emrich K, Holleczek B, Katalinic A, Nennecke A, Straka C, Langer C, Engelhardt M, Einsele H, Kröger N, Beelen D, Dreger P, Brenner H, Goldschmidt H; GEKID Cancer Survival Working Group and the DRST (2016) Survival of elderly patients with multiple myeloma-Effect of upfront autologous stem cell transplantation. Eur J Cancer 62: 1–8.

Peller M, Katalinic A, Wollenberg B, Teudt IU, Meyer JE (2016) Epidemiology of laryngeal carcinoma in Germany, 1998–2011. Eur Arch Otorhinolaryngol 273 (6): 1481–7.

Pietzner K, Buttmann-Schweiger N, Sehouli J, Kraywinkel K (2017) Incidence Patterns and Survival of Gynecological Sarcoma in Germany: Analysis of Population-Based Cancer Registry Data on 1066 Women. Int J Gynecol Cancer Oct 17 [Epub ahead of print]

Pritzkuleit R, Katalinic A, Gieseler F (2017) Krebsregister und Gesundheitswesen. Onkologe 23 (4): 264–271.

Pulte D, Jansen L, Castro FA, Krilaviciute A, Katalinic A, Barnes B, Ressing M, Holleczek B, Luttmann S, Brenner H; GEKID Cancer Survival Working Group (2016) Survival in patients with acute myeloblastic leukemia in Germany and the United States: Major differences in survival in young adults. Int J Cancer 15; 139 (6): 1289–96.

Pulte D, Weberpals J, Jansen L, Luttmann S, Holleczek B, Nennecke A, Ressing M, Katalinic A, Brenner H; GEKID Cancer Survival Working Group (2017) Survival for patients with rare haematologic malignancies: Changes in the early 21st century. Eur J Cancer 84: 81–87.

Siegert Y, Jiang X, Krieg V, Bartholomäus S (2016) Classification-Based Record Linkage With Pseudonymized Data for Epidemiological Cancer Registries. IEEE Transactions on Multimedia 18 (10): 1929–1941.

Simbrich A, Wellmann I, Heidrich J, Heidinger O, Hense HW (2016) Trends in advanced breast cancer incidence rates after implementation of a mammography screening program in a German population. Cancer Epidemiol 44: 44–51.

Singer S, Zeissig SR, Emrich K, Holleczek B, Kraywinkel K, Ressing M (2017) Incidence of lip malignancies in Germany-data from nine population-based cancer registries. J Oral Pathol Med 46 (9): 780–785.

Sirri E, Castro FA, Kieschke J, Jansen L, Emrich K, Gondos A, Holleczek B, Katalinic A, Urbschat I, Vohmann C, Brenner H (2016) Recent Trends in Survival of Patients With Pancreatic Cancer in Germany and the United States. Pancreas 45 (6): 908–14.

Stang A, Garbe C, Autier P, Jöckel KH (2016) The many unanswered questions related to the German skin cancer screening programme. Eur J Cancer 64: 83–8.

Stang A, Jöckel KH (2016) Does skin cancer screening save lives? A detailed analysis of mortality time trends in Schleswig-Holstein and Germany. Cancer 122 (3): 432–7.

Stang A, Kowall B, Rusner C, Trabert B, Bray F, Schüz J, McGlynn KA, Kuss O (2016) A novel method for identifying settings for well-motivated ecologic studies of cancer. Int J Cancer 15; 138 (8): 1887–93.

Weberpals J, Pulte D, Jansen L, Luttmann S, Holleczek B, Nennecke A, Ressing M, Katalinic A, Merz M, Brenner H; GEKID Cancer Survival Working Group (2017) Survival of patients with lymphoplasmacytic lymphoma and solitary plasmacytoma in Germany and the United States of America in the early 21st century. Haematologica 102 (6): e229–e232.

Weigel S, Heindel W, Heidrich J, Hense HW, Heidinger O (2017) Digital mammography screening: sensitivity of the programme dependent on breast density. Eur Radiol 27 (7): 2744–2751.

Winter A, Sirri E, Jansen L, Wawroschek F, Kieschke J, Castro FA, Krilaviciute A, Holleczek B, Emrich K, Waldmann A, Brenner H; Association of Population-based Cancer Registries in Germany (GEKID) Cancer Survival Working Group (2017) Comparison of prostate cancer survival in Germany and the USA: can differences be attributed to differences in stage distributions? BJU Int. 119 (4): 550–559.

Zeissig SR, Arndt V, Kraywinkel K (2017) Neue Rubrik Epidemiologie. Onkologe 23 (2): 89.

5.7 Further Literature

Bray F, Colombet M, Mery L, Piñeros M, Znaor A, Zanetti R and Ferlay J, editors (2017). Cancer Incidence in Five Continents, Vol. XI (electronic version). Lyon: International Agency for Research on Cancer (http://ci5.iarc.fr, aufgerufen am 24.10.2017).

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 only. 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.

Buttmann-Schweiger N, Klug SJ, Luyten A, Holleczek B, Heitz F, du Bois A, Kraywinkel K (2015) Incidence Patterns and Temporal Trends of Invasive Nonmelanotic Vulvar Tumors in Germany 1999–2011. A Population-Based Cancer Registry Analysis. PloS One 10 (5): e0128073.

De Angelis R, Sant M, Coleman MP, Francisci S, Baili P, Pierannunzio D, Trama A, Visser O, Brenner H, Ardanaz E (2014) Cancer survival in Europe 1999–2007 by country and age: results of EUROCARE-5-a population-based study the EUROCARE-5 Working Group. Lancet Oncology 15: 23–34.

DevCan (2017) Probability of Developing or Dying of Cancer Software, Version 6.7.5, Statistical Research and Applications Branch, National Cancer Institute, USA.

Gesundheitsberichterstattung des Bundes (www.gbe-bund.de).

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

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.

Jansen L, Castro FA, Gondos A, Krilaviciute A, Barnes B, Eberle A, Emrich K, Hentschel S, Holleczek B, Katalinic A, Brenner H; GEKID Cancer Survival Working Group (2015) Recent cancer survival in Germany: An analysis of common and less common cancers. International Journal of Cancer 136 (11): 2649–2658.

Jansen L, Eberle A, Emrich K, Gondos A, Holleczek B, Kajuter H, Maier W, Nennecke A, Pritzkuleit R, Brenner H; GEKID Cancer Survival Working Group (2014) Socioeconomic deprivation and cancer survival in Germany: An ecological analysis in 200 districts in Germany. International Journal of Cancer 134 (12): 2951–2960.

Kraywinkel K, Barnes B, Dahm S, Haberland J, Nennecke A, Stabenow R (2014) Von regionalen Daten zu bundesweiten Aussagen. Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz 57 (1): 13–21.

Hense HW, Barlag H, Bartholomäus S, Giersiepen K, Krähling T, Langner I, Wellmann I (2017) Machbarkeitsstudien zur Evaluation der Brustkrebs-assoziierten Sterblichkeit im deutschen Mammographie-Screening-Programm (Abschlussbericht) Ressortforschungsberichte zum Strahlenschutz. (https://doris.bfs.de/jspui/handle/urn:nbn:de:0221-2017050314273, aufgerufen am 24.10.2017).

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.

Kooperationsgemeinschaft Mammographie (2017) Jahresbericht Evaluation 2015. Deutsches Mammographie-Screening-Programm. (http://fachservice.mammoprogramm.de/publikationen-und-stellungnahmen, aufgerufen am 24.10.2017).

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.

Lüken F, Batz D, Kutschmann M (2016) Evaluation der Screeninguntersuchungen auf Hautkrebs gemäß Krebsfrüherkennungs-Richtlinie des Gemeinsamen Bundesausschusses, Abschlussbericht der Jahre 2011 – 2013 (https://www.g-ba.de/downloads/17-98-4300/2016-12-16_BQS-HKS-Abschlussbericht-2011-2013.pdf, aufgerufen am 24.10.2017).

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.

Parkin DM et al. (1994) Comparability and Quality Control in Cancer Registration. International Agency for Research on Cancer. Technical Report No. 19, Lyon.

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.

Robert Koch-Institut (Hrsg) (2016) Bericht zum Krebsgeschehen in Deutschland 2016. RKI, Berlin.

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.

Statistisches Bundesamt (2017) Amtliche Todesursachenstatistik für Deutschland (https://www.destatis.de/DE/ZahlenFakten/GesellschaftStaat/Gesundheit/Todesursachen/Methoden/Todesursachenstatistik).

Urbschat I, Heidinger O (2014) Ermittlung der Rate von Intervallkarzinomen im deutschen Mammographie-Screening-Programm mit Hilfe epidemiologischer Krebsregister. Bundesgesundheitsblatt-Gesundheitsforschung-Gesundheitsschutz 57 (1): 68–76.

Wienecke A, Barnes B, Lampert T, Kraywinkel K (2013) Changes in cancer incidence attributable to tobacco smoking in Germany, 1999–2008. International Journal of Cancer 134 (3): 682–691.

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 on request at the editors (RKI, German Centre for Cancer Registry Data).

Acknowledgements

This report would not have been possible without the information provided by physicians about diagnosed cases of cancer and the processing of this data in the regional population-based cancer registries. We are grateful to these colleagues and to all patients whose data we were able to use for our evaluations. We are also grateful to the staff of the German Childhood Cancer Registry and the Cancer Information Service for their contributions.

Imprint

Cancer in Germany in 2013/2014, Robert Koch Institute, 2018

Published by
Robert Koch Institute
Nordufer 20
13353 Berlin, Germany

Association of Population-based Cancer Registries in Germany
Ratzeburger Allee 160, Haus 50
23538 Lübeck, Germany

Authors
Dr. Peter Kaatsch, Dr. Claudia Spix (German Childhood Cancer Registry, Chapter 4)
Prof. Dr. Alexander Katalinic, Dr. Stefan Hentschel, Dr. Sabine Luttmann, Christa Stegmaier, Dr. Mechthild Waldeyer-Sauerland, PD Dr. Annika Waldmann (GEKID, Sections 1.1, 1.2, appendix 5.2)

Dr. Sandra Caspritz, Dr. Monika Christ, Dr. Anke Ernst, Dr. Juliane Folkerts, Dr. Jutta Hansmann, Dr. Stefanie Klein, Dr. Kristine Kranzhöfer, Dr. Beatrice Kunz, Dr. Katrin Manegold, Dr. Andrea Penzkofer, Dr. Kornelia Treml, Dr. Susanne Weg-Remers, Dr. Kerstin Wittenberg (Cancer Information Service, German Cancer Research Centre, Sections on risk factors and early detection in Chapter 3)

Dr. Benjamin Barnes, Dr. Joachim Bertz, Nina Buttmann-Schweiger, Dr. Stefan Dahm, Julia Fiebig, Dr. Jörg Haberland, Dr. Klaus Kraywinkel, Antje Wienecke, Dr. Ute Wolf

Editorial assistance
Stefan Meisegeier, Manuela Franke, Katrin Werth

Translation
Txtpress, Berlin

Graphics/Typesetting
fotosatz voigt, Berlin

Cover foto
Katty2016 – Fotolia.com

Printed by
Ruksaldruck, Berlin

Sources
www.krebsdaten.de/english E-Mail: krebsdaten@rki.de
www.gekid.de/home and the cancer registries of the German federal states (see appendix 5.4)

How to quote this publication
Cancer in Germany in 2013/2014. 11th edition. Robert Koch Institute (ed.) and the Association of Population-based Cancer Registries in Germany (ed). Berlin, 2018
ISBN: 978-3-89606-289-5
DOI: 10.17886/rkipubl-2017-008

Bibliographic information of the Deutsche Bibliothek
The Deutsche Bibliothek records this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at http://dnb.d-nb.de

The Robert Koch-Institute is a Federal Institute within the portfolio of the Federal Ministry of Health.

Every two years the Association of Population-based Cancer Registries in Germany (GEKID) and the German Centre for Cancer Registry Data (ZfKD) at the Robert Koch Institute jointly publish the Cancer in Germany report. The results presented in this 11th edition are based on epidemiological cancer registry data up to the year 2014. According to ZfKD estimates, there were around 476,000 new cases of cancer in Germany that year. In women, breast cancer continues to be most common (around 69,200 cases), whereas in men the most common form is prostate cancer (around 57,400 cases). Between 2004 and 2014 it was mainly the demographic shifts of an ageing society that led the number of new cancer cases to increase. Standardised for age, the figures show the rates for men have actually decreased by 10 % and those for women by 3 %. Beyond the results included in this edition, further analyses are available at: www.krebsdaten.de/english.