Munich Cancer Registry

- Survival
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- Homepage

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C54: Corpus cancer

Year of diagnosis	1998-2012
Patients	7,483
Diseases	7,484
Creation date	03/20/2014
Export date	02/12/2014
Population (females)	2.3 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C54__E.pdf

Global Statements about the statistics on the Internet − Baseline Statistics (grey button), Survival (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.5 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, March 2014

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2013 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	326	4	1.2	30.1	50.9	96.0	
1999	322	4	1.2	25.8	50.6	97.2	
2000	311	7	2.3	22.5	45.7	97.7	
2001	347	17	4.9	26.2	49.9	95.1	
2002	517	22	4.3	22.2	44.5	96.7	#
2003	511	12	2.3	25.6	39.1	94.5	#
2004	518	14	2.7	24.5	40.3	95.0	#
2005	539	11	2.0	23.4	36.7	94.2	#
2006	505	16	3.2	20.8	32.7	93.1	#
2007	618	31	5.0	24.3	36.7	79.3	# ##
2008	622	23	3.7	22.2	31.5	56.9	
2009	607	16	2.6	21.4	27.0	55.5	
2010	576	27	4.7	18.8	25.3	54.7	
2011	605	16	2.6	22.3	19.7	63.3	
2012	560	23	4.1	23.9	15.4	95.9	###
1998-2012	7484	243	3.2	23.3	34.5	81.9	

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.52 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	326	27.7	14.3	20.4	24.7
1999	322	27.1	13.5	19.5	23.6
2000	311	25.9	13.1	18.8	22.8
2001	347	28.5	14.2	20.5	24.9
2002	517	26.4	13.1	18.7	22.5
2003	511	25.9	12.9	18.5	22.2
2004	518	26.2	12.8	18.5	22.3
2005	539	27.1	13.3	18.9	22.5
2006	505	25.1	11.9	17.2	20.9
2007	618	26.8	13.0	18.7	22.5
2008	622	26.8	12.7	18.3	22.0
2009	607	26.1	12.7	18.1	21.6
2010	576	24.6	11.2	16.3	20.1
2011	605	25.6	11.9	17.1	20.8
2012	560	23.7	10.9	15.7	19.1
1998-2012	7484	26.1	12.6	18.1	21.8

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	326	67.5	11.3	28.8	92.1	52.7	59.8	67.7	75.2	82.8
1999	322	68.3	11.3	32.1	96.9	54.5	60.3	68.5	76.5	83.5
2000	311	67.0	11.3	27.2	93.1	52.9	60.0	66.6	75.9	80.5
2001	347	68.2	11.9	26.3	95.5	53.4	60.6	68.5	76.2	83.2
2002	517	68.2	11.4	31.8	96.0	54.4	61.3	67.5	76.6	82.8
2003	511	68.0	11.3	31.2	93.4	53.4	60.2	67.3	76.1	83.0
2004	518	68.1	11.2	32.3	95.3	53.7	60.5	68.0	76.4	82.6
2005	539	68.0	11.4	30.2	98.0	53.1	61.7	67.8	75.1	83.5
2006	505	69.0	11.8	31.9	98.3	53.7	61.7	69.0	77.5	84.3
2007	618	68.1	11.5	36.5	99.2	53.0	60.4	68.2	76.6	82.9
2008	622	68.4	11.5	34.3	97.1	52.9	60.5	69.1	75.9	84.0
2009	607	68.1	11.7	38.1	102	52.8	60.9	68.7	75.3	83.3
2010	576	69.2	11.8	28.5	98.7	52.7	61.4	70.2	77.1	84.4
2011	605	68.6	11.9	29.5	95.5	52.4	60.5	69.7	76.9	84.1
2012	560	69.2	12.1	0.3	97.8	53.2	61.1	70.3	76.9	84.5
1998-2012	7484	68.3	11.6	0.3	102	53.2	60.6	68.7	76.4	83.4

Table 4

Age distribution by 5-year age group for period 1998-2012
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	0	0.0	0.0
10-14	0	0.0	0.0
15-19	0	0.0	0.0
20-24	0	0.0	0.0
25-29	7	0.1	0.1
30-34	16	0.2	0.3
35-39	54	0.7	1.0
40-44	120	1.6	2.6
45-49	259	3.5	6.1
50-54	515	6.9	13.0
55-59	772	10.3	23.3
60-64	1090	14.6	37.9
65-69	1245	16.6	54.5
70-74	1266	16.9	71.4
75-79	899	12.0	83.4
80-84	683	9.1	92.6
85+	557	7.4	100.0
All ages	7484	100.0	

Included in the statistics are 28.0% multiple primaries.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2012

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=243 %	Prop. all cancers n=142297 %
0- 4	1	0.1	100.0	0.4
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29	7	0.4		0.7
30-34	16	0.8		0.8
35-39	54	2.4		1.5
40-44	120	5.2	0.8	2.1
45-49	259	12.2	1.2	3.2
50-54	515	27.3	0.2	5.1
55-59	772	43.3	0.1	6.0
60-64	1090	62.6	0.4	6.8
65-69	1244	77.6	0.9	7.0
70-74	1266	91.8	1.8	7.5
75-79	899	82.2	4.4	5.5
80-84	683	79.1	6.4	4.6
85+	557	68.0	20.5	3.5
All ages	7483		3.2	5.3
Incidence				
Raw		26.1		
WS		12.6		
ES		18.1		
BRD-S		21.8		

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

Table 6

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2012

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	2	1.7	1.2	0.1	4.3		0.1	
C15	Oesophagus	2	1.6	1.3	0.2	4.6		0.2	
C16	Stomach	10	10.7	0.9	0.4	1.7		-0.3	30.0
C17	Small intestine	7	1.3	5.4	2.2	11.2	#	2.4	
C18	Colon	68	29.7	2.3	1.8	2.9	#	16.3	10.3
C19-C20	Rectum	18	12.9	1.4	0.8	2.2		2.1	16.7
C22	Liver	7	3.3	2.1	0.9	4.4		1.6	14.3
C23-C24	Bile	8	4.3	1.9	0.8	3.7		1.6	12.5
C25	Pancreas	23	12.6	1.8	1.2	2.7	#	4.4	34.8
C26	GI cancer	3	0.5	5.9	1.2	17.2	#	1.1	66.7
C33-C34	Lung	48	19.9	2.4	1.8	3.2	#	11.9	18.8
C38,C45	Mesothelioma	3	0.5	5.6	1.1	16.3	#	1.0	
C43	Malign. melanoma	13	9.5	1.4	0.7	2.3		1.5	
C46,C49	Soft tissue	6	1.6	3.8	1.4	8.4	#	1.9	
C48	Peritoneal	5	0.9	5.3	1.7	12.4	#	1.7	
C50	Breast	193	84.8	2.3	2.0	2.6	#	45.9	4.7
C51	Vulva	5	2.7	1.8	0.6	4.3		1.0	
C52	Vagina	5	0.6	9.1	3.0	21.2	#	1.9	
C53	Cervix uteri	18	3.6	5.0	3.0	8.0	#	6.1	33.3
C55,C57	Fem. genitals un	2	0.7	2.9	0.4	10.5		0.6	100.0
C56	Ovary	135	12.1	11.1	9.3	13.2	#	52.1	8.1
C64	Kidney	13	7.3	1.8	0.9	3.0		2.4	7.7
C65	Renal pelvis	4	0.9	4.5	1.2	11.6	#	1.3	
C67	Bladder	7	5.4	1.3	0.5	2.7		0.7	14.3
C70-C72	CNS cancer	8	4.1	2.0	0.9	3.9		1.7	25.0
C73	Thyroid	8	4.7	1.7	0.7	3.3		1.4	
C76-C79	CUP	12	5.1	2.4	1.2	4.1	#	2.9	8.3
C81	Hodgkin lymphoma	2	0.5	4.0	0.5	14.3		0.6	
C82-C85	NHL	22	11.1	2.0	1.2	3.0	#	4.6	4.5
C90	Mult. myeloma	2	3.6	0.6	0.1	2.0		-0.7	50.0
C91-C96	Leukaemia	9	4.5	2.0	0.9	3.8		1.9	22.2
Other primaries		6	3.5	1.7	0.6	3.7		1.0	
Not observed		0	20.2	0.0	0.0	0.2	#	-8.6	
All mult. primaries		674	286.5	2.4	2.2	2.5	#	164.4	10.5

Patients	5324
Mean age at second malignancy (years)	70.8
Person-years	23576
Mean observation time (years)	4.4
Median observation time (years)	3.6

The occurrence of second malignancy is statistically significant.

Observed second malignancies with count 1 are pooled in category "Other primaries".

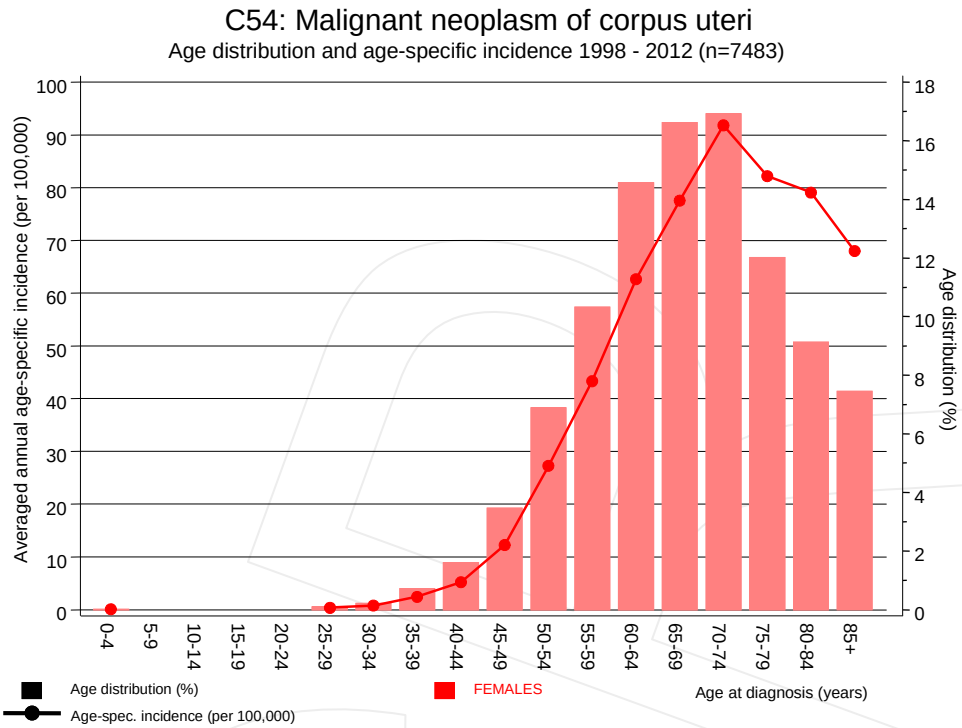

Figure 7. Age distribution and age-specific incidence

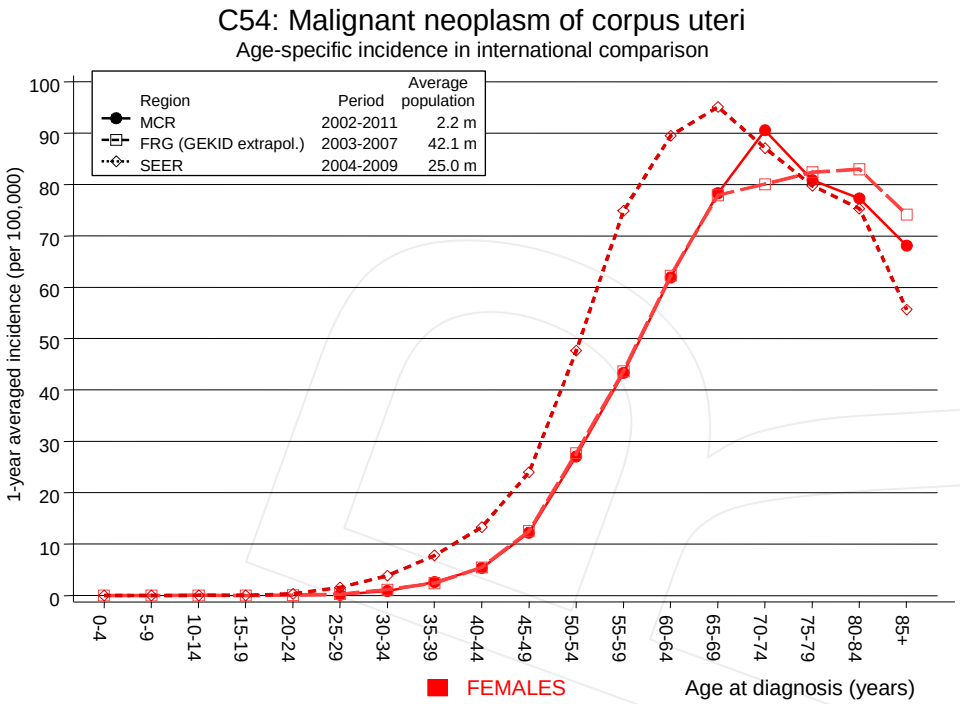

Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2011. http://www.gekid.de. Last access: 05/12/2011

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

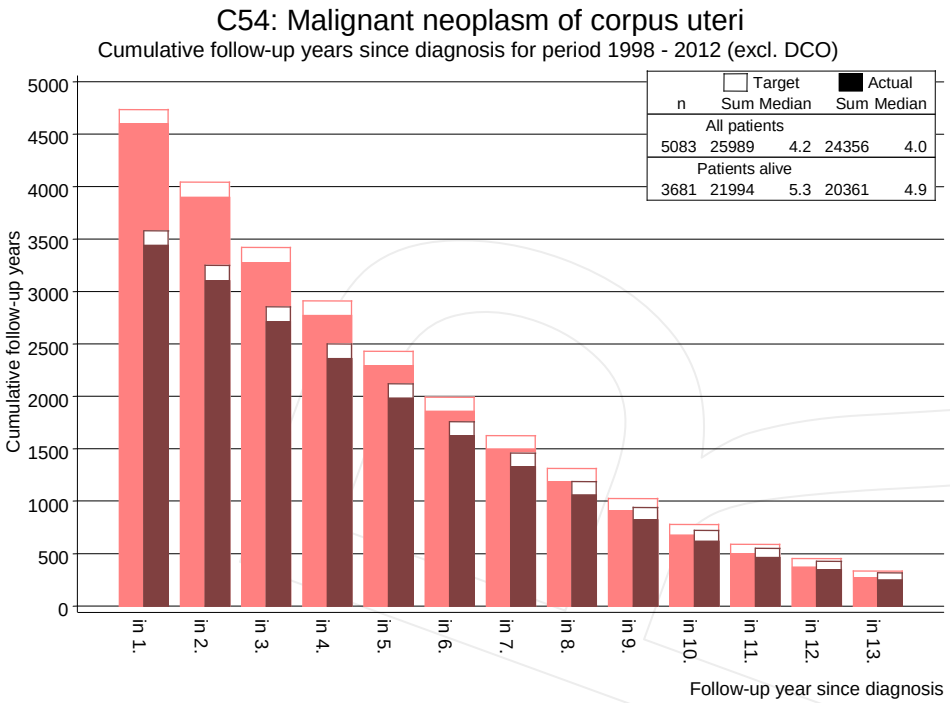

Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.

Average incidence (world standard population) 2003 - 2008

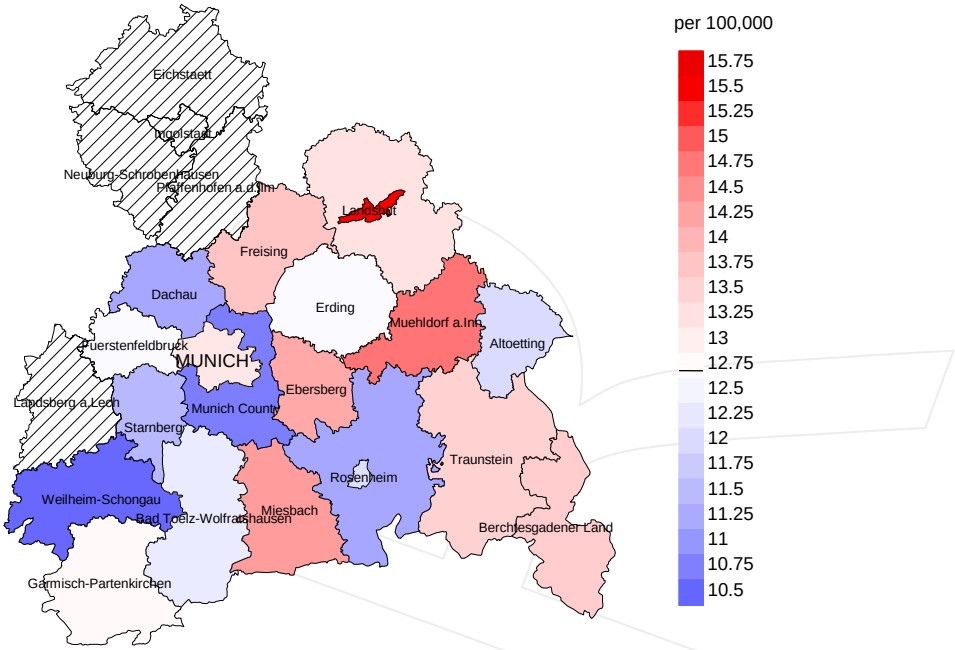

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (12.7/100,000 WS N=3,156). Since cancer data are not available in some counties until 2007, the local incidence rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 106 women were identified with newly diagnosed corpus cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 14.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.7 and 18.4/100,000.

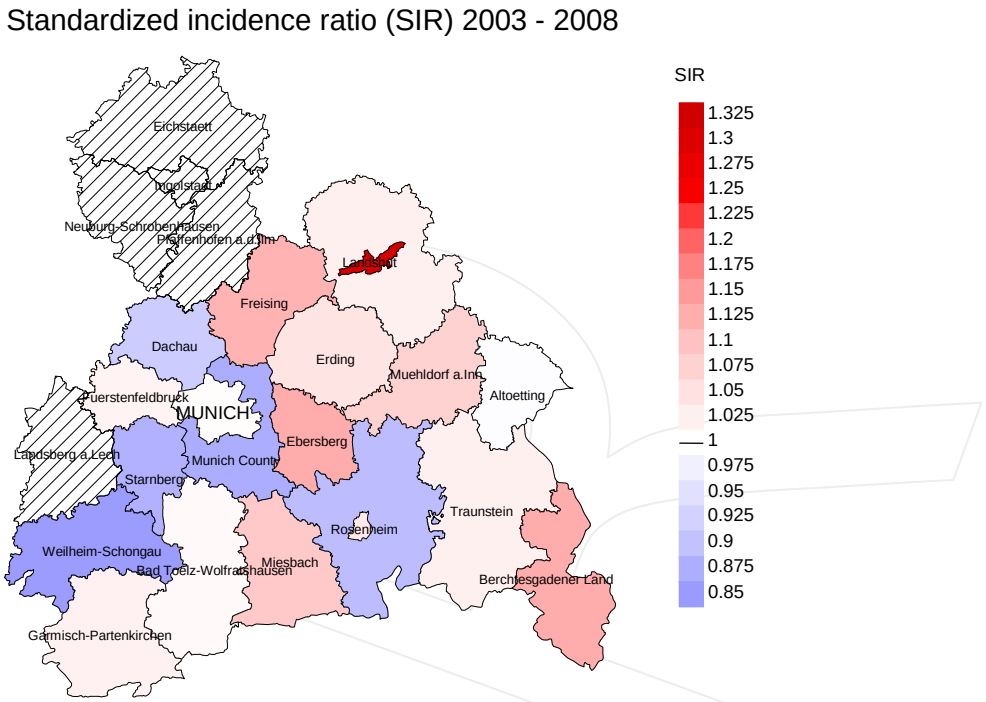

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=3,156). Since cancer data are not available in some counties until 2007, the local SIR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 106 women were identified with newly diagnosed corpus cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.13. Though, the value of this parameter may vary with an underlying probability of 99% between 0.87 and 1.44, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	326	96.0	1.2	166	50.9	91.6
1999	322	97.2	1.2	163	50.6	93.9
2000	311	97.7	2.3	142	45.7	94.4
2001	347	95.1	4.9	173	49.9	96.0
2002	517	96.7	4.3	230	44.5	97.8
2003	511	94.5	2.3	200	39.1	96.5
2004	518	95.0	2.7	209	40.3	96.2
2005	539	94.2	2.0	198	36.7	97.0
2006	505	93.1	3.2	165	32.7	99.4
2007	618	79.3	5.0	227	36.7	97.8
2008	622	56.9	3.7	196	31.5	98.5
2009	607	55.5	2.6	164	27.0	98.2
2010	576	54.7	4.7	146	25.3	95.9
2011	605	63.3	2.6	119	19.7	98.3
2012	560	95.9	4.1	86	15.4	95.3
1998-2012	7484	81.9	3.2	2584	34.5	96.6

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	326	130	90.8	21	6.4
1999	322	140	92.9	17	5.3
2000	311	167	92.8	26	8.4
2001	347	155	92.3	26	7.5
2002	517	253	96.4	43	8.3
2003	511	291	96.9	36	7.0
2004	518	253	96.8	36	6.9
2005	539	276	94.2	34	6.3
2006	505	273	96.7	35	6.9
2007	618	342	98.0	59	9.5
2008	622	318	99.1	43	6.9
2009	607	340	99.1	42	6.9
2010	576	355	98.9	50	8.7
2011	605	402	96.8	50	8.3
2012	560	374	99.2	56	10.0
1998-2012	7484	4069	96.8	574	7.7

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
1998	130	54.6	45.4	69.5
1999	140	56.4	43.6	66.2
2000	167	53.3	46.7	64.5
2001	155	43.9	56.1	65.7
2002	253	58.5	41.5	73.0
2003	291	60.1	39.9	71.3
2004	253	62.5	37.5	71.4
2005	276	58.7	41.3	68.5
2006	273	56.8	43.2	67.4
2007	342	58.2	41.8	68.1
2008	318	57.2	42.8	66.0
2009	340	55.6	44.4	63.5
2010	355	59.4	40.6	67.8
2011	402	57.5	42.5	68.6
2012	374	56.1	43.9	64.4
1998-2012	4069	57.2	42.8	67.7

Table 11

Means of age at death according to the grouping in Table 10

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	130	76.9	72.8	81.8	74.7
1999	140	79.1	76.0	83.0	76.8
2000	167	78.6	75.5	82.2	76.6
2001	155	79.1	75.3	82.1	77.6
2002	253	78.7	75.5	83.2	76.9
2003	291	78.2	75.2	82.6	76.0
2004	253	77.7	74.9	82.4	75.6
2005	276	78.8	75.6	83.2	76.6
2006	273	79.0	75.3	83.9	76.6
2007	342	80.1	76.4	85.4	77.8
2008	318	79.3	74.6	85.6	76.1
2009	340	79.8	75.7	84.9	76.8
2010	355	80.3	76.8	85.4	77.9
2011	402	79.7	76.1	84.5	77.1
2012	374	80.5	76.8	85.2	77.5
1998-2012	4069	79.3	75.7	84.0	76.8

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 12

Mortality measures (cancer-related death) and mortality-incidence-index by year of death

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	71	6.0	0.22	2.7	0.19	3.9	0.19	5.0	0.20
1999	79	6.7	0.25	2.5	0.19	3.9	0.20	5.5	0.23
2000	89	7.4	0.29	2.7	0.20	4.3	0.23	6.2	0.27
2001	68	5.6	0.20	2.1	0.15	3.3	0.16	4.6	0.18
2002	148	7.6	0.29	2.8	0.21	4.3	0.23	6.0	0.26
2003	175	8.9	0.34	3.3	0.26	5.3	0.28	7.2	0.32
2004	158	8.0	0.31	3.0	0.24	4.7	0.25	6.2	0.28
2005	162	8.1	0.30	2.9	0.22	4.5	0.24	6.0	0.27
2006	155	7.7	0.31	2.7	0.23	4.3	0.25	6.0	0.29
2007	199	8.6	0.32	2.9	0.23	4.6	0.25	6.3	0.28
2008	182	7.8	0.29	2.9	0.22	4.4	0.24	6.1	0.28
2009	189	8.1	0.31	2.8	0.22	4.4	0.24	6.0	0.28
2010	211	9.0	0.37	2.9	0.26	4.6	0.28	6.4	0.32
2011	231	9.8	0.38	3.3	0.28	5.2	0.30	7.0	0.34
2012	210	8.9	0.38	2.9	0.26	4.6	0.29	6.4	0.33
1998-2012	2327	8.1	0.31	2.9	0.23	4.5	0.25	6.2	0.28

Table 13

Age distribution of age at death (cancer-related) for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
25-29	1	0.0	0.0
30-34	3	0.1	0.2
35-39	2	0.1	0.3
40-44	16	0.7	0.9
45-49	29	1.2	2.2
50-54	53	2.3	4.5
55-59	85	3.7	8.1
60-64	169	7.3	15.4
65-69	304	13.1	28.4
70-74	381	16.4	44.8
75-79	393	16.9	61.7
80-84	399	17.1	78.9
85+	492	21.1	100.0
All ages	2327	100.0	

Included in the statistics are 28.0% multiple primaries.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29	1	0.1	0.14	0.9
30-34	3	0.1	0.19	1.4
35-39	2	0.1	0.04	0.4
40-44	16	0.7	0.13	1.5
45-49	29	1.4	0.11	1.5
50-54	53	2.8	0.10	1.8
55-59	85	4.8	0.11	1.9
60-64	169	9.7	0.16	2.8
65-69	304	19.0	0.24	4.0
70-74	381	27.6	0.30	4.2
75-79	393	35.9	0.44	4.0
80-84	399	46.2	0.58	3.8
85+	492	60.1	0.88	3.9
All ages	2327			3.5
Mortality				
Raw		8.1	0.31	
WS		2.9	0.23	
ES		4.5	0.25	
BRD-S		6.2	0.28	
PYLL-70				
per 100,000		21.7		
ES		18.1		
AYLL-70		8.1		

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15

Multiple primaries in deaths in period 1998-2012

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	41	3.3	3	7.3	2	4.9	36	87.8
C18	Colon	123	9.8	33	26.8	11	8.9	79	64.2
C19-C20	Rectum	68	5.4	24	35.3			44	64.7
C22	Liver	14	1.1	1	7.1	2	14.3	11	78.6
C23-C24	Bile	18	1.4					18	100.0
C25	Pancreas	45	3.6	1	2.2	1	2.2	43	95.6
C33-C34	Lung	100	7.9	7	7.0	3	3.0	90	90.0
C43	Malign. melanoma	27	2.1	16	59.3			11	40.7
C44	Skin others	40	3.2	19	47.5	4	10.0	17	42.5
C50	Breast	320	25.4	170	53.1	28	8.8	122	38.1
C51	Vulva	18	1.4			1	5.6	17	94.4
C52	Vagina	12	1.0	1	8.3	3	25.0	8	66.7
C53	Cervix uteri	31	2.5	17	54.8	4	12.9	10	32.3
C55,C57	Fem. genitals un	12	1.0	3	25.0	1	8.3	8	66.7
C56	Ovary	126	10.0	10	7.9	76	60.3	40	31.7
C64	Kidney	24	1.9	7	29.2	3	12.5	14	58.3
C67	Bladder	47	3.7	8	17.0	6	12.8	33	70.2
C70-C72	CNS cancer	27	2.1	8	29.6	1	3.7	18	66.7
C76-C79	CUP	23	1.8	3	13.0			20	87.0
C82-C85	NHL	22	1.7	6	27.3	1	4.5	15	68.2
C91-C96	Leukaemia	37	2.9	5	13.5	2	5.4	30	81.1
Other primaries		84	6.7	25	29.8	9	10.7	50	59.5
All mult. primaries		1259	100.0	367	29.2	158	12.5	734	58.3

Multiple primaries with number of cases n<10 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Singular primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29	1	0.1	0.17	1.0
30-34	1	0.0	0.07	0.5
35-39	2	0.1	0.04	0.4
40-44	12	0.5	0.11	1.3
45-49	25	1.2	0.11	1.5
50-54	39	2.1	0.09	1.6
55-59	71	4.0	0.10	1.9
60-64	136	7.8	0.14	2.7
65-69	242	15.1	0.22	3.9
70-74	312	22.6	0.30	4.4
75-79	317	29.0	0.43	4.0
80-84	313	36.2	0.57	3.8
85+	396	48.3	0.91	3.9
All ages	1867			3.4
Mortality				
Raw		6.5	0.30	
WS		2.3	0.21	
ES		3.6	0.23	
BRD-S		4.9	0.27	
PYLL-70				
per 100,000		17.2		
ES		14.3		
AYLL-70		8.0		

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Single primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29	1	0.1	0.17	1.0
30-34	1	0.0	0.07	0.6
35-39	2	0.1	0.04	0.5
40-44	11	0.5	0.11	1.3
45-49	22	1.0	0.10	1.5
50-54	33	1.7	0.08	1.5
55-59	56	3.1	0.09	1.7
60-64	113	6.5	0.13	2.6
65-69	183	11.4	0.19	3.4
70-74	219	15.9	0.23	3.6
75-79	221	20.2	0.34	3.3
80-84	189	21.9	0.38	2.7
85+	271	33.1	0.66	3.1
All ages	1322			2.8
Mortality				
Raw		4.6	0.23	
WS		1.7	0.17	
ES		2.6	0.19	
BRD-S		3.5	0.21	
PYLL-70				
per 100,000		14.4		
ES		12.0		
AYLL-70		8.4		

* See corresponding tables with multiple primaries.

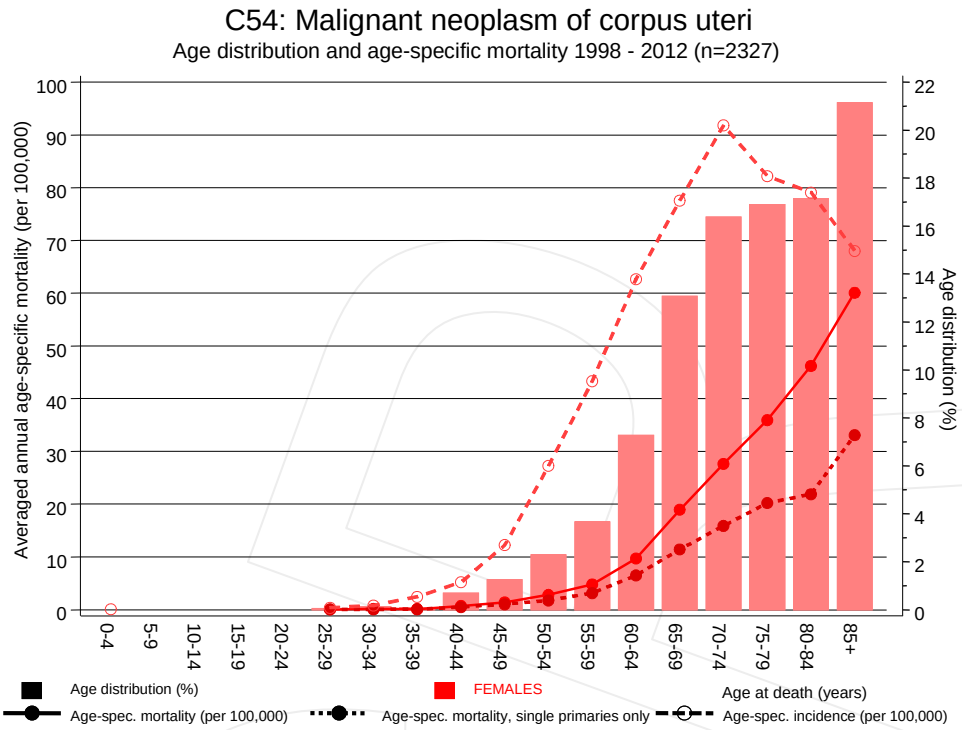

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at corpus cancer-related death (see Table 10) should be considered.

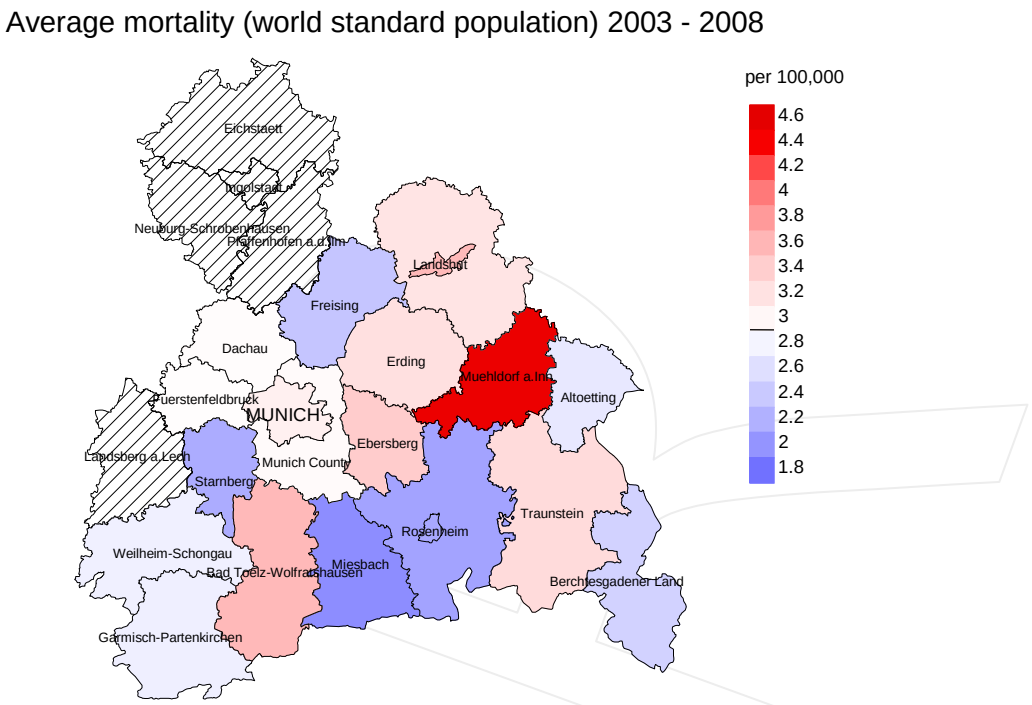

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (2.9/100,000 WS N=978). Since cancer data are not available in some counties until 2007, the local mortality rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 38 women died from corpus cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.1 and 5.5/100,000.

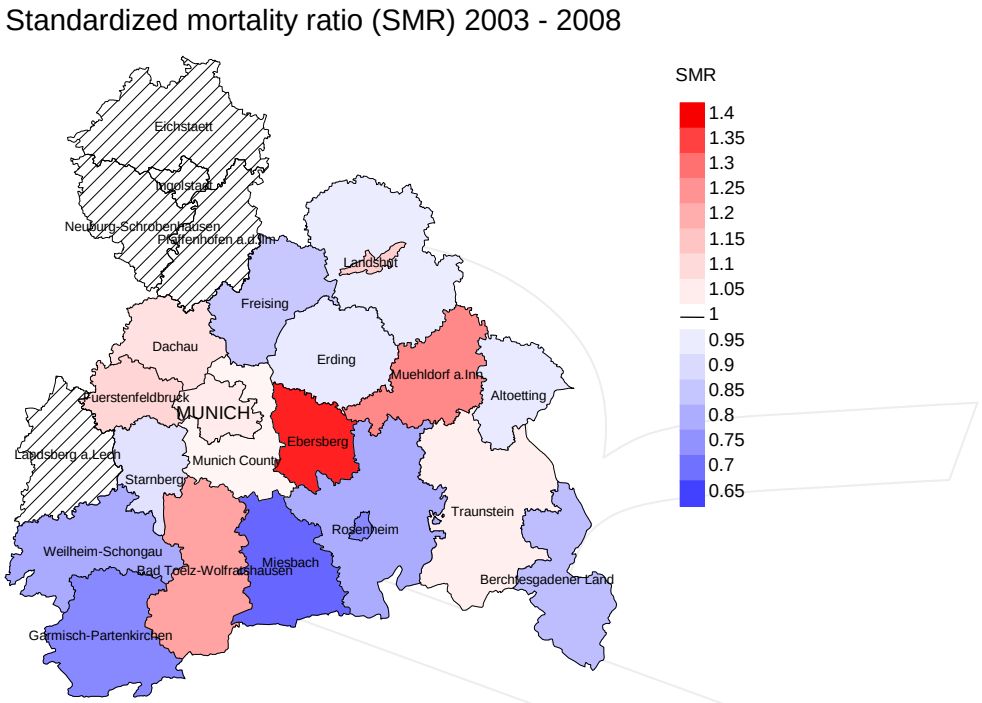

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=978). Since cancer data are not available in some counties until 2007, the local SMR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 38 women died from corpus cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.37. Though, the value of this parameter may vary with an underlying probability of 99% between 0.86 and 2.05, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the tumor-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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