Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C18-C20: Colorectal cancer

Year of diagnosis	1998-2012
Patients	39,888
Diseases	40,858
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C1820E.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.

ICD-10 codes used for specifying cancer site

ICD-10	Description
C18.-	Malignant neoplasm of colon
C18.0	Caecum
C18.1	Appendix
C18.2	Ascending colon
C18.3	Hepatic flexure
C18.4	Transverse colon
C18.5	Splenic flexure
C18.6	Descending colon
C18.7	Sigmoid colon
C18.8	Overlapping lesion of colon
C18.9	Colon, unspecified
C19	Malignant neoplasm of rectosigmoid junction
C20	Malignant neoplasm of rectum

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	1821	97	5.3	24.4	71.2	98.1	
1999	1835	112	6.1	23.8	70.4	97.8	
2000	1684	95	5.6	26.0	68.2	98.2	
2001	1830	118	6.4	26.4	64.1	97.5	
2002	3141	365	11.6	24.6	66.8	97.9	#
2003	3152	299	9.5	25.0	61.9	97.9	#
2004	3033	240	7.9	24.8	61.8	97.4	#
2005	2954	211	7.1	26.4	60.1	96.9	#
2006	3040	154	5.1	26.7	54.2	94.7	#
2007	3378	199	5.9	24.2	52.5	84.3	# ##
2008	3324	194	5.8	26.3	48.6	69.8	
2009	3249	172	5.3	25.6	44.3	67.1	
2010	3027	175	5.8	25.4	39.7	65.6	
2011	2895	152	5.3	24.2	33.3	68.8	
2012	2495	164	6.6	24.6	25.1	96.4	###
1998-2012	40858	2747	6.7	25.2	53.5	87.1	

\# 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 1a

Patient cohorts by year of diagnosis and gender
including DCO cases

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	1821	918	903	50.4
1999	1835	940	895	51.2
2000	1684	868	816	51.5
2001	1830	957	873	52.3
2002	3141	1668	1473	53.1
2003	3152	1680	1472	53.3
2004	3033	1622	1411	53.5
2005	2954	1569	1385	53.1
2006	3040	1659	1381	54.6
2007	3378	1864	1514	55.2
2008	3324	1842	1482	55.4
2009	3249	1825	1424	56.2
2010	3027	1705	1322	56.3
2011	2895	1590	1305	54.9
2012	2495	1375	1120	55.1
1998-2012	40858	22082	18776	54.0

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	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	918	903	82.9	76.8	49.7	32.7	74.8	49.3	97.5	64.7
1999	940	895	84.0	75.4	49.7	32.0	75.2	48.3	98.5	63.0
2000	868	816	76.2	67.9	44.6	27.6	67.6	42.3	87.4	55.8
2001	957	873	82.6	71.8	48.4	30.6	72.5	46.1	92.8	60.1
2002	1668	1473	89.5	75.2	49.9	30.4	75.4	46.2	98.7	60.4
2003	1680	1472	89.6	74.7	49.1	30.5	74.2	46.0	96.6	59.7
2004	1622	1411	86.2	71.4	45.9	29.6	69.5	44.2	90.9	57.0
2005	1569	1385	82.8	69.6	44.0	27.2	66.0	41.2	85.7	54.2
2006	1659	1381	86.6	68.7	45.4	27.9	68.0	41.7	88.1	54.5
2007	1864	1514	84.1	65.6	43.7	26.2	65.3	39.3	84.9	51.1
2008	1842	1482	82.8	63.9	41.5	25.0	62.6	37.7	81.8	49.0
2009	1825	1424	81.8	61.2	40.4	23.7	60.6	35.7	79.3	47.0
2010	1705	1322	75.6	56.5	37.2	21.3	55.8	32.3	72.7	42.7
2011	1590	1305	69.6	55.3	33.7	21.5	50.6	32.1	65.8	41.3
2012	1375	1120	60.2	47.5	29.0	19.0	43.7	28.1	57.0	36.1
1998-2012	22082	18776	80.4	65.4	42.1	26.2	63.3	39.4	82.2	51.4

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1821	70.0	12.4	13.2	102	54.1	61.0	71.1	78.7	86.1
1999	1835	70.3	12.4	24.9	102	54.3	61.7	71.1	79.3	86.4
2000	1684	70.6	12.1	24.7	103	55.1	61.8	71.6	79.3	86.8
2001	1830	70.1	12.4	28.3	103	54.5	61.7	70.4	79.3	86.5
2002	3141	71.0	12.1	17.7	104	55.6	62.7	71.9	80.1	86.7
2003	3152	71.1	11.8	23.5	101	56.2	63.1	71.5	79.9	86.1
2004	3033	70.7	12.3	13.8	101	55.2	63.0	71.2	79.9	85.5
2005	2954	71.4	12.2	15.1	99.9	55.6	63.7	71.8	80.4	86.1
2006	3040	70.6	12.1	17.9	102	54.8	63.4	71.0	79.7	85.3
2007	3378	70.8	12.4	15.8	103	54.3	63.9	71.3	80.2	85.8
2008	3324	71.5	12.2	18.9	105	55.3	64.2	72.1	80.4	86.5
2009	3249	71.3	12.3	12.4	102	54.8	64.1	72.1	80.3	86.0
2010	3027	71.5	12.6	14.9	101	54.4	63.7	72.6	81.0	86.3
2011	2895	71.4	12.7	17.1	101	53.7	63.6	72.4	80.9	87.0
2012	2495	71.3	12.8	13.7	101	54.8	63.4	72.7	80.3	86.4
1998-2012	40858	71.0	12.3	12.4	105	54.9	63.1	71.8	80.1	86.2

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	918	67.9	11.7	31.4	98.1	53.7	59.5	68.3	75.9	84.0
1999	940	68.3	11.5	24.9	95.5	54.4	60.3	69.0	76.6	83.3
2000	868	68.3	11.0	34.4	95.9	54.2	60.3	68.1	76.6	83.1
2001	957	68.4	11.4	31.3	102	54.2	61.2	68.0	76.0	83.6
2002	1668	69.1	11.0	20.9	98.5	55.6	61.9	69.6	76.7	82.5
2003	1680	69.3	11.0	25.7	99.4	55.6	62.6	69.6	76.6	82.7
2004	1622	69.4	11.0	27.8	101	55.7	62.4	69.3	77.1	83.5
2005	1569	69.3	11.3	19.0	99.6	54.6	62.8	69.5	77.1	83.7
2006	1659	69.1	11.1	17.9	102	54.8	62.6	69.3	77.4	82.9
2007	1864	69.1	11.7	15.8	99.4	54.3	62.9	69.7	77.6	83.0
2008	1842	69.9	11.2	19.3	105	55.1	63.6	70.4	77.9	83.4
2009	1825	69.7	11.4	12.4	99.0	54.4	63.1	70.9	77.9	83.1
2010	1705	69.9	11.8	21.1	98.9	54.0	62.5	70.9	78.2	84.1
2011	1590	70.0	11.7	26.3	97.3	53.8	63.3	71.3	78.4	84.3
2012	1375	70.4	11.4	25.8	101	55.5	63.1	71.7	78.3	83.8
1998-2012	22082	69.3	11.3	12.4	105	54.6	62.3	69.9	77.3	83.4

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	903	72.2	12.7	13.2	102	54.7	63.3	74.2	81.5	87.4
1999	895	72.4	13.0	26.9	102	54.3	63.5	74.5	82.1	88.0
2000	816	73.1	12.6	24.7	103	56.3	63.6	75.2	81.9	88.5
2001	873	71.9	13.2	28.3	103	54.8	62.4	74.6	81.1	88.4
2002	1473	73.2	12.9	17.7	104	55.5	63.9	75.3	82.2	88.9
2003	1472	73.1	12.4	23.5	101	56.6	64.2	74.5	82.5	88.5
2004	1411	72.2	13.4	13.8	100	54.7	63.9	74.0	82.7	87.8
2005	1385	73.7	12.8	15.1	99.9	57.0	65.5	75.5	83.3	89.8
2006	1381	72.4	12.9	21.2	98.7	54.9	64.6	74.4	82.4	86.8
2007	1514	72.8	13.0	17.8	103	54.3	65.1	74.4	82.9	87.5
2008	1482	73.5	13.2	18.9	102	55.7	65.3	74.4	83.6	88.6
2009	1424	73.4	13.0	15.9	102	56.0	65.6	75.0	83.3	88.6
2010	1322	73.6	13.3	14.9	101	55.3	66.2	75.6	83.5	88.7
2011	1305	73.1	13.7	17.1	101	53.7	64.1	74.6	84.1	88.9
2012	1120	72.4	14.2	13.7	100	53.7	63.8	74.5	83.2	88.9
1998-2012	18776	72.9	13.1	13.2	104	55.2	64.4	74.7	82.8	88.3

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
10-14	5	0.0	0.0	1	0.0	0.0	4	0.0	0.0
15-19	21	0.1	0.1	4	0.0	0.0	17	0.1	0.1
20-24	29	0.1	0.1	8	0.0	0.1	21	0.1	0.2
25-29	74	0.2	0.3	32	0.1	0.2	42	0.2	0.4
30-34	144	0.4	0.7	78	0.4	0.6	66	0.4	0.8
35-39	260	0.6	1.3	143	0.6	1.2	117	0.6	1.4
40-44	578	1.4	2.7	314	1.4	2.6	264	1.4	2.8
45-49	1086	2.7	5.4	594	2.7	5.3	492	2.6	5.4
50-54	1942	4.8	10.1	1122	5.1	10.4	820	4.4	9.8
55-59	3233	7.9	18.0	1978	9.0	19.4	1255	6.7	16.5
60-64	4890	12.0	30.0	3072	13.9	33.3	1818	9.7	26.2
65-69	5850	14.3	44.3	3741	16.9	50.2	2109	11.2	37.4
70-74	6415	15.7	60.0	3880	17.6	67.8	2535	13.5	50.9
75-79	6000	14.7	74.7	3200	14.5	82.3	2800	14.9	65.8
80-84	5258	12.9	87.6	2294	10.4	92.7	2964	15.8	81.6
85+	5073	12.4	100.0	1621	7.3	100.0	3452	18.4	100.0
All ages	40858	100.0		22082	100.0		18776	100.0	

Included in the statistics are 31.5% multiple primaries in males and 25.3% in females.

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=1078 %	Females DCO rate n=1659 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4			0.0	0.0				
5- 9			0.0	0.0				
10-14	1	4	0.1	0.3			0.7	2.5
15-19	4	17	0.3	1.2			1.3	6.4
20-24	8	21	0.5	1.3	12.5		1.4	4.3
25-29	30	42	1.6	2.2			3.4	4.1
30-34	78	65	3.7	3.2			5.5	3.4
35-39	140	116	6.0	5.2		1.7	6.6	3.3
40-44	312	264	12.9	11.5	0.6	0.4	10.4	4.5
45-49	588	488	27.3	23.1	0.9	1.4	11.9	6.1
50-54	1102	813	59.6	43.0	1.8	1.0	13.7	8.0
55-59	1953	1243	114.9	69.8	1.6	1.4	14.4	9.7
60-64	3031	1797	183.9	103.3	1.9	2.0	14.8	11.1
65-69	3665	2089	249.8	130.3	2.6	2.5	14.3	11.8
70-74	3794	2497	327.4	181.1	3.6	4.5	15.5	14.8
75-79	3142	2763	417.0	252.6	5.7	6.6	16.6	17.0
80-84	2236	2925	492.4	338.7	9.0	10.3	17.8	19.8
85+	1594	3414	514.0	416.8	21.7	27.5	17.4	21.3
All ages	21678	18558			5.0	8.9	14.8	13.0
Incidence								
Raw			79.0	64.7				
WS			41.4	25.9				
ES			62.1	39.0				
BRD-S			80.7	50.8				

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 6a

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	1.2	2.5	0.5	7.2		0.3	
C03-C06	Oral cavity	7	7.9	0.9	0.4	1.8		-0.2	
C07-C08	Salivary gland	3	2.4	1.3	0.3	3.7		0.1	
C09-C10	Oropharynx	12	9.6	1.3	0.6	2.2		0.4	
C12-C13	Hypopharynx	7	5.4	1.3	0.5	2.7		0.3	14.3
C15	Oesophagus	36	17.6	2.0	1.4	2.8	#	3.3	13.9
C16	Stomach	107	47.2	2.3	1.9	2.7	#	10.8	6.5
C17	Small intestine	38	4.8	7.9	5.6	10.8	#	6.0	2.6
C18	Colon	296	110.3	2.7	2.4	3.0	#	33.6	1.0
C19-C20	Rectum	138	58.9	2.3	2.0	2.8	#	14.3	2.2
C21	Anus/canal	4	2.0	2.0	0.5	5.1		0.4	
C22	Liver	63	28.8	2.2	1.7	2.8	#	6.2	22.2
C23-C24	Bile	21	10.4	2.0	1.2	3.1	#	1.9	
C25	Pancreas	71	37.9	1.9	1.5	2.4	#	6.0	25.4
C32	Larynx	18	10.3	1.8	1.0	2.8	#	1.4	16.7
C33-C34	Lung	218	124.7	1.7	1.5	2.0	#	16.9	13.3
C38,C45	Mesothelioma	7	6.9	1.0	0.4	2.1		0.0	
C43	Malign. melanoma	70	38.5	1.8	1.4	2.3	#	5.7	1.4
C46,C49	Soft tissue	12	5.5	2.2	1.1	3.8	#	1.2	
C50	Breast	6	2.7	2.3	0.8	4.9		0.6	16.7
C60	Penis	5	2.4	2.1	0.7	4.8		0.5	
C61	Prostate	499	321.3	1.6	1.4	1.7	#	32.2	5.2
C62	Testis	6	2.0	3.0	1.1	6.6	#	0.7	16.7
C64	Kidney	96	36.1	2.7	2.2	3.2	#	10.8	6.3
C65	Renal pelvis	12	4.4	2.7	1.4	4.8	#	1.4	
C66	Ureter	10	2.4	4.1	2.0	7.5	#	1.4	
C67	Bladder	89	49.6	1.8	1.4	2.2	#	7.1	7.9
C68	Urinary org.	3	0.6	5.1	1.1	14.9	#	0.4	66.7
C70-C72	CNS cancer	27	13.5	2.0	1.3	2.9	#	2.4	25.9
C73	Thyroid	9	6.0	1.5	0.7	2.8		0.5	22.2
C76-C79	CUP	26	18.6	1.4	0.9	2.0		1.3	3.8
C81	Hodgkin lymphoma	3	1.9	1.6	0.3	4.6		0.2	
C82-C85	NHL	74	42.4	1.7	1.4	2.2	#	5.7	4.1
C90	Mult. myeloma	22	13.7	1.6	1.0	2.4	#	1.5	22.7
C91-C96	Leukaemia	31	17.6	1.8	1.2	2.5	#	2.4	38.7
Other primaries		7	7.0	1.0	0.4	2.1		-0.0	14.3
Not observed		0	5.2	0.0	0.0	0.7	#	-0.9	
All mult. primaries		2056	1077.8	1.9	1.8	2.0	#	177.0	7.7

Patients	14952
Mean age at second malignancy (years)	73.0
Person-years	55258
Mean observation time (years)	3.7
Median observation time (years)	2.8

The occurrence of second malignancy is statistically significant.

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

Table 6b

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10	Oropharynx	6	2.1	2.8	1.0	6.1	#	0.8	
C12-C13	Hypopharynx	3	0.6	5.2	1.1	15.3	#	0.5	33.3
C15	Oesophagus	5	3.4	1.5	0.5	3.5		0.3	
C16	Stomach	56	27.8	2.0	1.5	2.6	#	5.9	23.2
C17	Small intestine	27	2.7	10.0	6.6	14.6	#	5.1	3.7
C18	Colon	199	73.9	2.7	2.3	3.1	#	26.2	1.5
C19-C20	Rectum	76	30.4	2.5	2.0	3.1	#	9.5	2.6
C21	Anus/canal	6	3.3	1.8	0.7	4.0		0.6	
C22	Liver	21	7.8	2.7	1.7	4.1	#	2.8	47.6
C23-C24	Bile	15	10.8	1.4	0.8	2.3		0.9	26.7
C25	Pancreas	58	30.8	1.9	1.4	2.4	#	5.7	20.7
C33-C34	Lung	96	42.0	2.3	1.9	2.8	#	11.3	13.5
C38,C45	Mesothelioma	3	1.2	2.5	0.5	7.4		0.4	
C43	Malign. melanoma	41	20.0	2.0	1.5	2.8	#	4.4	
C46,C49	Soft tissue	8	3.5	2.3	1.0	4.5		0.9	
C48	Peritoneal	4	1.9	2.1	0.6	5.4		0.4	25.0
C50	Breast	288	175.0	1.6	1.5	1.8	#	23.6	4.5
C51	Vulva	14	6.9	2.0	1.1	3.4	#	1.5	7.1
C52	Vagina	5	1.4	3.7	1.2	8.6	#	0.8	20.0
C53	Cervix uteri	14	7.7	1.8	1.0	3.1		1.3	14.3
C54	Corpus uteri	75	33.4	2.2	1.8	2.8	#	8.7	2.7
C55,C57	Fem. genitals un	4	2.2	1.8	0.5	4.7		0.4	25.0
C56	Ovary	76	26.5	2.9	2.3	3.6	#	10.4	27.6
C64	Kidney	48	16.2	3.0	2.2	3.9	#	6.7	14.6
C65	Renal pelvis	7	2.0	3.4	1.4	7.1	#	1.0	
C67	Bladder	31	14.1	2.2	1.5	3.1	#	3.5	19.4
C70-C72	CNS cancer	10	8.8	1.1	0.5	2.1		0.3	60.0
C73	Thyroid	13	8.8	1.5	0.8	2.5		0.9	7.7
C74-C80	Cancer others	3	3.8	0.8	0.2	2.3		-0.2	66.7
C76-C79	CUP	6	13.2	0.5	0.2	1.0	#	-1.5	
C82-C85	NHL	42	25.7	1.6	1.2	2.2	#	3.4	19.0
C90	Mult. myeloma	14	8.4	1.7	0.9	2.8		1.2	28.6
C91-C96	Leukaemia	25	10.8	2.3	1.5	3.4	#	3.0	44.0
Other primaries		18	12.0	1.5	0.9	2.4		1.3	5.6
Not observed		0	1.6	0.0	0.0	2.2		-0.3	
All mult. primaries		1317	640.3	2.1	1.9	2.2	#	141.5	11.2

Patients	12903
Mean age at second malignancy (years)	75.0
Person-years	47810
Mean observation time (years)	3.7
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

Observed second malignancies with count 1 to 2 are pooled in category "Other primaries".

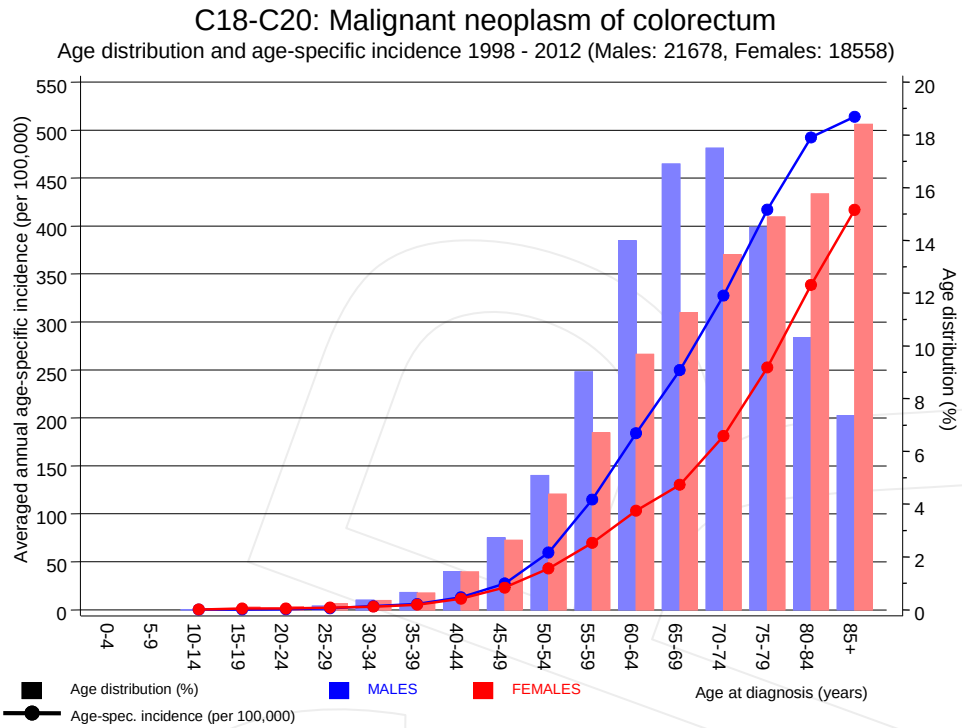


Figure 7. Age distribution and age-specific incidence

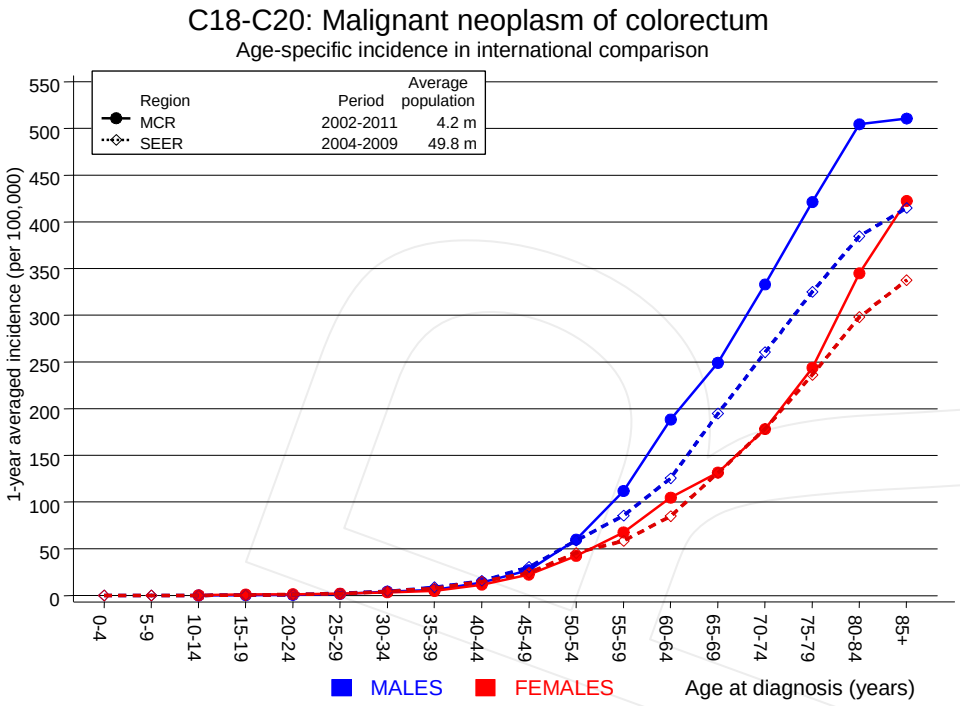


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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.

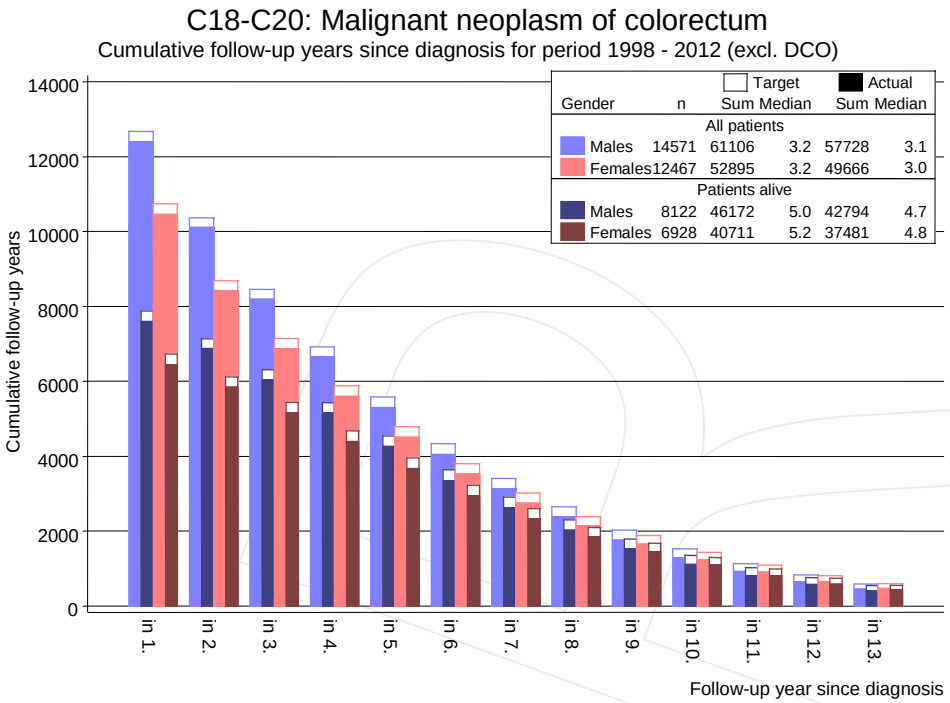
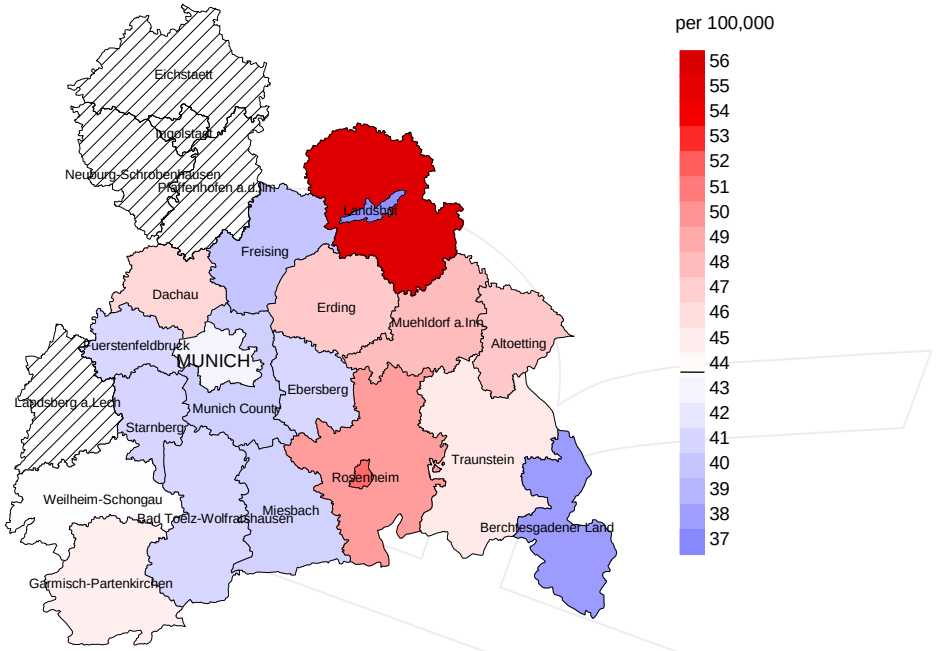


Figure 8. Cumulative follow-up years depending on time since diagnosis

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: Males



Average incidence (world standard population) 2003 - 2008: Females

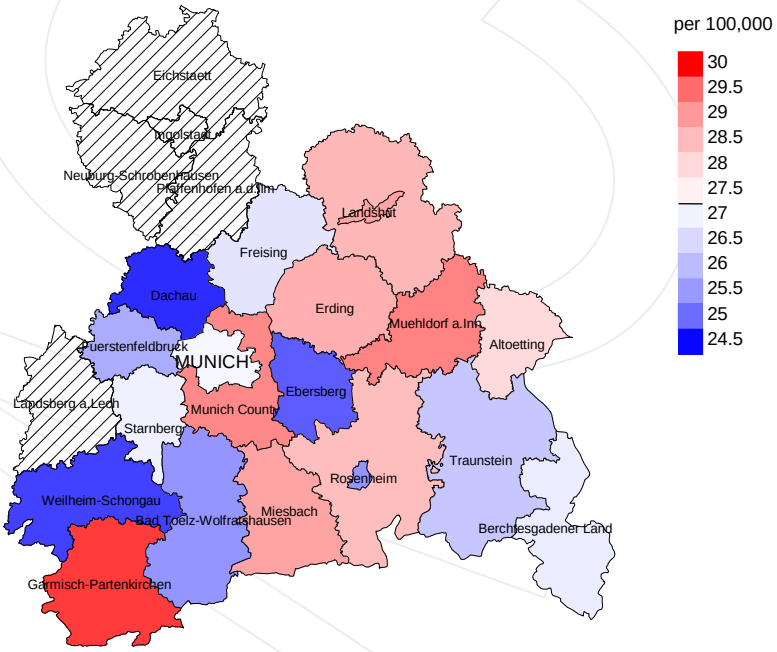
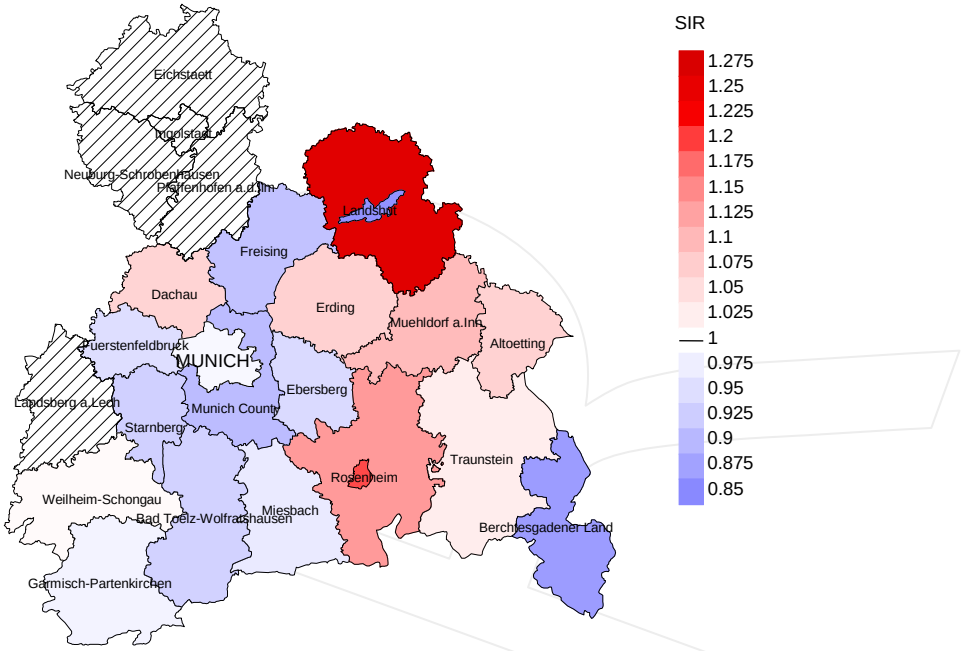


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 43.8/100,000 WS N=9,564, females 27.2/100,000 WS N=8,165). 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 205 women were identified with newly diagnosed colorectal cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 24.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 20.2 and 30.6/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

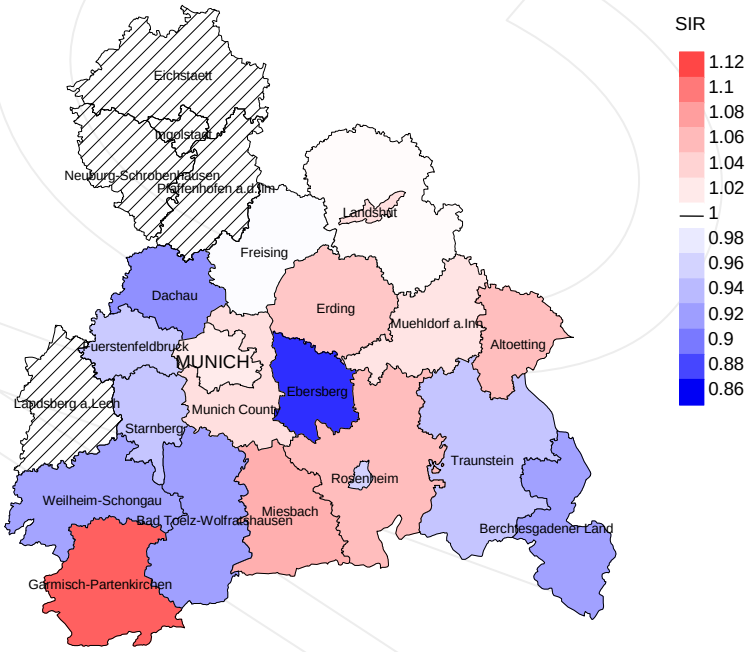


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=9,564, females N=8,165). 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 205 women were identified with newly diagnosed colorectal cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.73 and 1.04, 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	1821	98.1	5.3	1296	71.2	93.5
1999	1835	97.8	6.1	1292	70.4	94.3
2000	1684	98.2	5.6	1148	68.2	95.9
2001	1830	97.5	6.4	1173	64.1	96.8
2002	3141	97.9	11.6	2097	66.8	97.4
2003	3152	97.9	9.5	1950	61.9	97.9
2004	3033	97.4	7.9	1873	61.8	97.7
2005	2954	96.9	7.1	1775	60.1	98.2
2006	3040	94.7	5.1	1649	54.2	98.7
2007	3378	84.3	5.9	1772	52.5	98.4
2008	3324	69.8	5.8	1614	48.6	98.3
2009	3249	67.1	5.3	1438	44.3	98.1
2010	3027	65.6	5.8	1203	39.7	97.8
2011	2895	68.8	5.3	963	33.3	97.5
2012	2495	96.4	6.6	627	25.1	96.2
1998-2012	40858	87.1	6.7	21870	53.5	97.3

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	1821	1041	90.3	297	16.3
1999	1835	1074	91.0	312	17.0
2000	1684	1044	93.8	282	16.7
2001	1830	1111	95.6	286	15.6
2002	3141	1581	98.1	690	22.0
2003	3152	1697	97.8	594	18.8
2004	3033	1707	98.3	552	18.2
2005	2954	1807	96.5	541	18.3
2006	3040	1870	97.6	508	16.7
2007	3378	1983	97.6	573	17.0
2008	3324	2074	98.6	605	18.2
2009	3249	2113	98.6	537	16.5
2010	3027	2179	98.7	522	17.2
2011	2895	2176	98.7	505	17.4
2012	2495	2111	99.1	469	18.8
1998-2012	40858	25568	97.3	7273	17.8

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	1041	71.9	28.1	86.9
1999	1074	73.6	26.4	86.6
2000	1044	73.6	26.4	86.0
2001	1111	69.4	30.6	84.8
2002	1581	75.3	24.7	87.2
2003	1697	73.8	26.2	86.7
2004	1707	76.2	23.8	86.6
2005	1807	71.6	28.4	81.8
2006	1870	71.7	28.3	82.9
2007	1983	71.9	28.1	83.6
2008	2074	71.6	28.4	82.0
2009	2113	69.5	30.5	79.8
2010	2179	66.6	33.4	78.7
2011	2176	66.9	33.1	78.6
2012	2111	65.6	34.4	77.7
1998-2012	25568	70.9	29.1	82.7

Table 11a

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

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	510	73.4	71.6	78.0	73.0
1999	530	73.0	71.3	77.7	72.4
2000	546	74.0	71.7	80.8	73.1
2001	538	73.3	70.9	79.4	72.3
2002	818	73.6	71.6	79.9	72.6
2003	874	73.7	71.8	79.6	72.9
2004	881	74.9	73.3	80.3	74.2
2005	945	74.4	72.2	80.4	72.8
2006	1028	75.1	73.0	80.7	73.8
2007	1084	75.2	73.5	80.2	74.2
2008	1164	75.5	73.6	81.0	74.2
2009	1122	75.0	73.2	79.4	73.9
2010	1185	75.7	73.4	80.9	74.6
2011	1203	75.5	73.0	81.4	74.3
2012	1166	76.5	74.1	81.3	75.1
1998-2012	13594	74.9	72.8	80.3	73.8

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 11b

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

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	531	77.3	75.0	83.2	77.3
1999	544	78.3	76.2	84.0	78.2
2000	498	78.6	76.5	84.2	77.7
2001	573	79.0	76.0	85.3	77.8
2002	763	79.4	77.5	84.9	78.7
2003	823	79.0	76.7	85.0	77.8
2004	826	78.8	77.0	84.5	77.7
2005	862	79.7	77.5	84.7	78.4
2006	842	80.0	77.8	85.7	78.8
2007	899	79.4	76.7	85.5	77.8
2008	910	80.1	77.4	85.9	78.6
2009	991	79.9	76.9	86.4	78.0
2010	994	80.3	77.1	86.1	78.5
2011	973	81.1	77.7	86.9	79.0
2012	945	81.0	77.3	87.5	78.8
1998-2012	11974	79.6	77.0	85.6	78.3

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 12a

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

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	366	33.0	0.40	19.2	0.39	30.3	0.41	41.1	0.42
1999	391	34.9	0.42	20.1	0.41	31.7	0.43	44.1	0.45
2000	407	35.7	0.47	20.0	0.45	31.8	0.47	43.8	0.50
2001	385	33.2	0.41	18.8	0.39	29.4	0.41	39.4	0.43
2002	622	33.4	0.38	18.0	0.36	28.2	0.38	38.1	0.39
2003	658	35.1	0.40	18.3	0.38	28.9	0.39	40.1	0.42
2004	679	36.1	0.42	17.9	0.40	28.8	0.42	40.7	0.45
2005	693	36.6	0.45	18.1	0.42	28.4	0.44	39.4	0.47
2006	741	38.7	0.46	18.7	0.42	30.0	0.45	41.8	0.49
2007	802	36.2	0.44	16.9	0.39	27.0	0.42	37.9	0.45
2008	867	39.0	0.48	17.8	0.44	28.6	0.47	40.3	0.51
2009	789	35.4	0.44	16.3	0.41	25.7	0.43	35.2	0.45
2010	812	36.0	0.49	15.8	0.44	25.1	0.46	35.4	0.50
2011	841	36.8	0.54	16.6	0.50	25.9	0.52	35.1	0.54
2012	778	34.1	0.58	14.9	0.53	23.9	0.56	33.1	0.60
1998-2012	9831	35.8	0.45	17.4	0.42	27.6	0.44	38.2	0.47

Table 12b

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

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	383	32.6	0.43	12.3	0.38	19.4	0.40	27.1	0.42
1999	400	33.7	0.45	11.9	0.37	19.2	0.40	26.5	0.42
2000	361	30.1	0.45	10.8	0.39	17.2	0.41	23.1	0.42
2001	386	31.7	0.45	11.6	0.38	18.4	0.40	25.3	0.42
2002	570	29.1	0.39	9.8	0.32	15.7	0.34	21.8	0.36
2003	596	30.3	0.41	10.6	0.35	16.8	0.37	23.0	0.39
2004	621	31.4	0.45	10.5	0.36	16.9	0.39	23.7	0.42
2005	600	30.2	0.44	9.9	0.37	15.9	0.39	22.0	0.41
2006	601	29.9	0.44	9.5	0.34	15.4	0.37	22.0	0.41
2007	626	27.1	0.42	9.3	0.36	14.6	0.38	20.2	0.40
2008	620	26.7	0.42	8.6	0.35	13.8	0.37	19.1	0.39
2009	679	29.2	0.48	9.7	0.41	15.2	0.43	20.8	0.45
2010	641	27.4	0.49	8.8	0.42	13.9	0.44	18.9	0.45
2011	618	26.2	0.48	8.1	0.38	13.0	0.41	17.9	0.44
2012	606	25.7	0.55	8.2	0.44	13.1	0.47	17.9	0.50
1998-2012	8308	28.9	0.45	9.7	0.37	15.4	0.40	21.3	0.42

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
20-24	4	0.0	0.0	2	0.0	0.0	2	0.0	0.0
25-29	13	0.1	0.1	5	0.0	0.1	8	0.1	0.1
30-34	24	0.1	0.2	16	0.2	0.2	8	0.1	0.2
35-39	64	0.3	0.6	33	0.3	0.5	31	0.4	0.6
40-44	155	0.8	1.4	89	0.9	1.4	66	0.8	1.3
45-49	269	1.4	2.8	138	1.4	2.8	131	1.5	2.9
50-54	564	3.0	5.8	337	3.3	6.1	227	2.7	5.5
55-59	1004	5.4	11.2	635	6.2	12.3	369	4.3	9.8
60-64	1630	8.7	19.9	1096	10.7	23.0	534	6.2	16.1
65-69	2225	11.9	31.7	1489	14.6	37.6	736	8.6	24.7
70-74	2803	14.9	46.7	1733	17.0	54.6	1070	12.5	37.2
75-79	3134	16.7	63.4	1804	17.7	72.2	1330	15.6	52.8
80-84	3172	16.9	80.3	1527	15.0	87.2	1645	19.2	72.0
85+	3705	19.7	100.0	1309	12.8	100.0	2396	28.0	100.0
All ages	18766	100.0		10213	100.0		8553	100.0	

Included in the statistics are 31.5% multiple primaries in males and 25.3% in females.

Table 14

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2	2	0.1	0.25	0.1	0.10	2.4	4.3
25-29	5	8	0.3	0.16	0.4	0.19	5.2	7.3
30-34	16	8	0.8	0.21	0.4	0.12	9.1	3.8
35-39	33	31	1.4	0.23	1.4	0.26	8.6	6.2
40-44	89	66	3.7	0.28	2.9	0.25	11.0	6.2
45-49	138	131	6.4	0.23	6.2	0.27	8.1	7.0
50-54	337	227	18.2	0.30	12.0	0.28	11.0	7.9
55-59	635	369	37.4	0.32	20.7	0.29	11.5	8.3
60-64	1096	534	66.5	0.36	30.7	0.29	13.1	8.8
65-69	1489	736	101.5	0.40	45.9	0.35	13.2	9.6
70-74	1733	1070	149.6	0.45	77.6	0.42	14.0	11.9
75-79	1804	1330	239.4	0.56	121.6	0.48	14.9	13.5
80-84	1527	1645	336.3	0.67	190.5	0.55	15.4	15.7
85+	1309	2396	422.1	0.81	292.5	0.69	16.3	19.0
All ages	10213	8553					13.8	12.8
Mortality								
Raw			37.2	0.46	29.8	0.46		
WS			18.1	0.43	9.9	0.38		
ES			28.6	0.45	15.8	0.40		
BRD-S			39.7	0.48	21.9	0.43		
PYLL-70								
per 100,000			134.5		85.3			
ES			117.2		72.6			
AYLL-70			8.7		9.9			

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

Table 15a

Multiple primaries in deaths in period 1998-2012
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	43	1.1	33	76.7	2	4.7	8	18.6
C09-C10	Oropharynx	30	0.8	15	50.0	3	10.0	12	40.0
C15	Oesophagus	57	1.5	8	14.0	13	22.8	36	63.2
C16	Stomach	207	5.4	57	27.5	50	24.2	100	48.3
C17	Small intestine	37	1.0	3	8.1	15	40.5	19	51.4
C18	Colon	296	7.7			105	35.5	191	64.5
C19-C20	Rectum	164	4.3			98	59.8	66	40.2
C22	Liver	112	2.9	4	3.6	28	25.0	80	71.4
C23-C24	Bile	31	0.8			3	9.7	28	90.3
C25	Pancreas	136	3.6	9	6.6	24	17.6	103	75.7
C32	Larynx	61	1.6	44	72.1	1	1.6	16	26.2
C33-C34	Lung	416	10.9	68	16.3	56	13.5	292	70.2
C43	Malign. melanoma	144	3.8	84	58.3	3	2.1	57	39.6
C44	Skin others	170	4.4	88	51.8	17	10.0	65	38.2
C61	Prostate	845	22.1	471	55.7	73	8.6	301	35.6
C64	Kidney	153	4.0	71	46.4	35	22.9	47	30.7
C67	Bladder	300	7.8	134	44.7	24	8.0	142	47.3
C70-C72	CNS cancer	69	1.8	21	30.4	4	5.8	44	63.8
C76-C79	CUP	44	1.2	9	20.5	8	18.2	27	61.4
C82-C85	NHL	154	4.0	63	40.9	25	16.2	66	42.9
C90	Mult. myeloma	41	1.1	13	31.7	5	12.2	23	56.1
C91-C96	Leukaemia	84	2.2	24	28.6	8	9.5	52	61.9
Other primaries		229	6.0	94	41.0	16	7.0	119	52.0
All mult. primaries		3823	100.0	1313	34.3	616	16.1	1894	49.5

Multiple primaries with number of cases n<30 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 15b

Multiple primaries in deaths in period 1998-2012
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	147	5.3	44	29.9	31	21.1	72	49.0
C18	Colon	185	6.6			56	30.3	129	69.7
C19-C20	Rectum	105	3.8			61	58.1	44	41.9
C21	Anus/canal	21	0.8	7	33.3	7	33.3	7	33.3
C22	Liver	33	1.2	2	6.1	8	24.2	23	69.7
C23-C24	Bile	35	1.3	9	25.7	5	14.3	21	60.0
C25	Pancreas	117	4.2	9	7.7	18	15.4	90	76.9
C33-C34	Lung	172	6.2	30	17.4	14	8.1	128	74.4
C43	Malign. melanoma	68	2.4	45	66.2	5	7.4	18	26.5
C44	Skin others	71	2.5	36	50.7	7	9.9	28	39.4
C50	Breast	713	25.6	468	65.6	54	7.6	191	26.8
C51	Vulva	24	0.9	12	50.0	2	8.3	10	41.7
C53	Cervix uteri	102	3.7	76	74.5	10	9.8	16	15.7
C54	Corpus uteri	184	6.6	121	65.8	10	5.4	53	28.8
C56	Ovary	196	7.0	64	32.7	50	25.5	82	41.8
C64	Kidney	64	2.3	32	50.0	11	17.2	21	32.8
C67	Bladder	102	3.7	48	47.1	3	2.9	51	50.0
C70-C72	CNS cancer	52	1.9	23	44.2	8	15.4	21	40.4
C73	Thyroid	28	1.0	16	57.1	3	10.7	9	32.1
C76-C79	CUP	23	0.8	7	30.4	5	21.7	11	47.8
C82-C85	NHL	80	2.9	31	38.8	10	12.5	39	48.8
C90	Mult. myeloma	39	1.4	9	23.1	3	7.7	27	69.2
C91-C96	Leukaemia	58	2.1	9	15.5	7	12.1	42	72.4
Other primaries		170	6.1	66	38.8	25	14.7	79	46.5
All mult. primaries		2789	100.0	1164	41.7	413	14.8	1212	43.5

Multiple primaries with number of cases n<20 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	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2	2	0.1	0.25	0.1	0.10	2.6	4.7
25-29	5	8	0.3	0.18	0.4	0.20	5.6	7.8
30-34	15	8	0.7	0.20	0.4	0.13	8.7	4.3
35-39	30	25	1.3	0.23	1.1	0.23	8.4	5.6
40-44	84	61	3.5	0.28	2.6	0.25	11.2	6.5
45-49	131	118	6.1	0.24	5.6	0.26	8.5	7.3
50-54	297	194	16.1	0.29	10.3	0.27	11.1	8.0
55-59	555	326	32.7	0.31	18.3	0.30	11.6	8.7
60-64	939	444	57.0	0.35	25.5	0.29	13.4	9.0
65-69	1233	624	84.0	0.41	38.9	0.35	13.5	10.0
70-74	1392	858	120.1	0.46	62.2	0.42	14.2	12.0
75-79	1355	1044	179.8	0.57	95.4	0.47	14.7	13.2
80-84	1126	1283	248.0	0.68	148.6	0.54	15.2	15.4
85+	976	1929	314.7	0.83	235.5	0.68	15.9	19.0
All ages	8140	6924					13.7	12.7
Mortality								
Raw			29.7	0.46	24.1	0.44		
WS			14.6	0.42	8.2	0.37		
ES			23.0	0.45	13.0	0.39		
BRD-S			31.3	0.48	17.8	0.41		
PYLL-70								
per 100,000			118.5		74.3			
ES			103.4		63.3			
AYLL-70			8.9		10.1			

* 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	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2	2	0.1	0.25	0.1	0.10	2.7	5.0
25-29	5	8	0.3	0.19	0.4	0.20	6.0	8.2
30-34	15	7	0.7	0.21	0.3	0.12	9.0	4.1
35-39	29	23	1.2	0.23	1.0	0.21	8.5	5.6
40-44	82	60	3.4	0.28	2.6	0.26	11.5	7.0
45-49	126	110	5.8	0.24	5.2	0.26	8.8	7.5
50-54	281	186	15.2	0.30	9.8	0.27	11.5	8.6
55-59	508	303	29.9	0.32	17.0	0.30	11.6	9.0
60-64	839	399	50.9	0.35	22.9	0.28	13.5	9.2
65-69	1070	542	72.9	0.40	33.8	0.34	13.6	10.2
70-74	1138	746	98.2	0.43	54.1	0.39	13.8	12.3
75-79	1092	907	144.9	0.52	82.9	0.44	14.6	13.6
80-84	860	1096	189.4	0.58	126.9	0.49	14.6	15.7
85+	731	1668	235.7	0.66	203.6	0.61	14.8	19.0
All ages	6778	6057					13.5	13.0
Mortality								
Raw			24.7	0.42	21.1	0.42		
WS			12.4	0.40	7.3	0.35		
ES			19.2	0.41	11.5	0.37		
BRD-S			25.8	0.44	15.6	0.39		
PYLL-70								
per 100,000			109.5		69.1			
ES			95.8		59.1			
AYLL-70			9.2		10.3			

* See corresponding tables with multiple primaries.

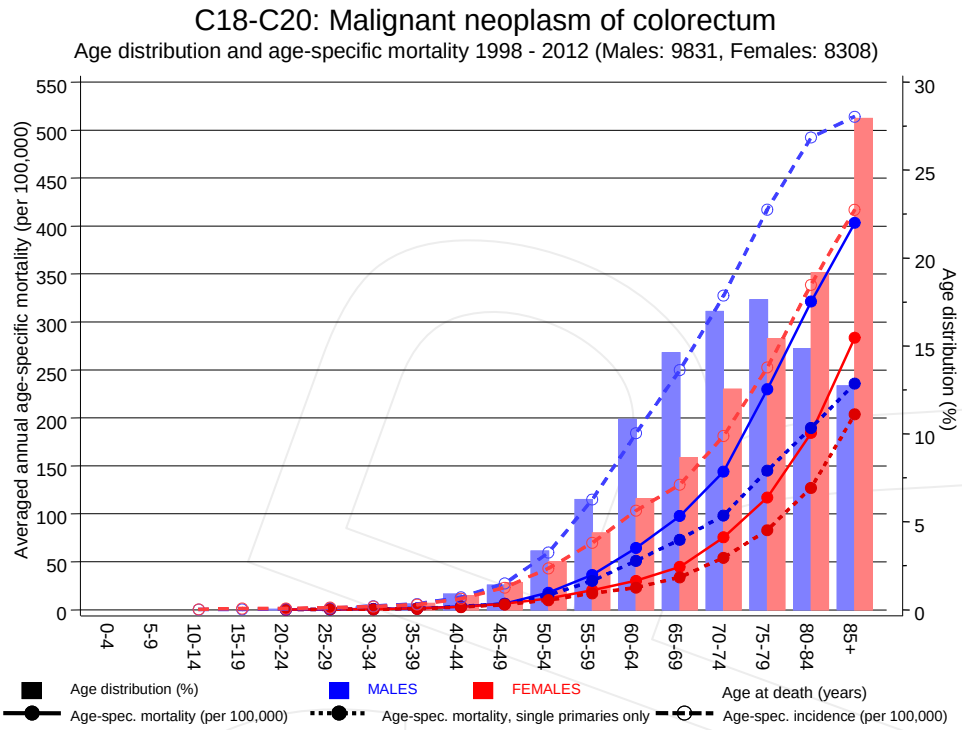
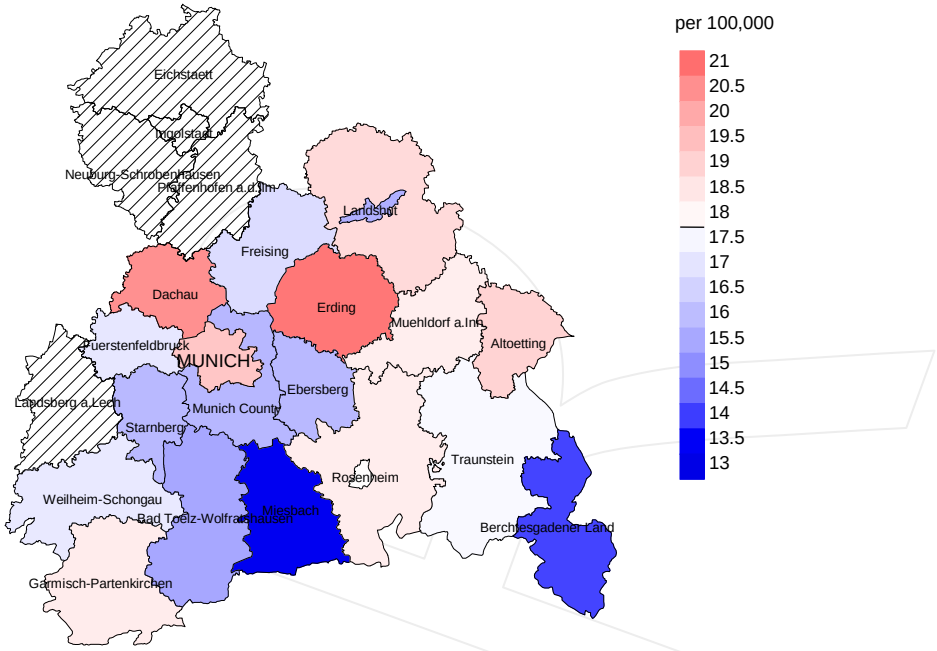


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2003 - 2008: Males



Average mortality (world standard population) 2003 - 2008: Females

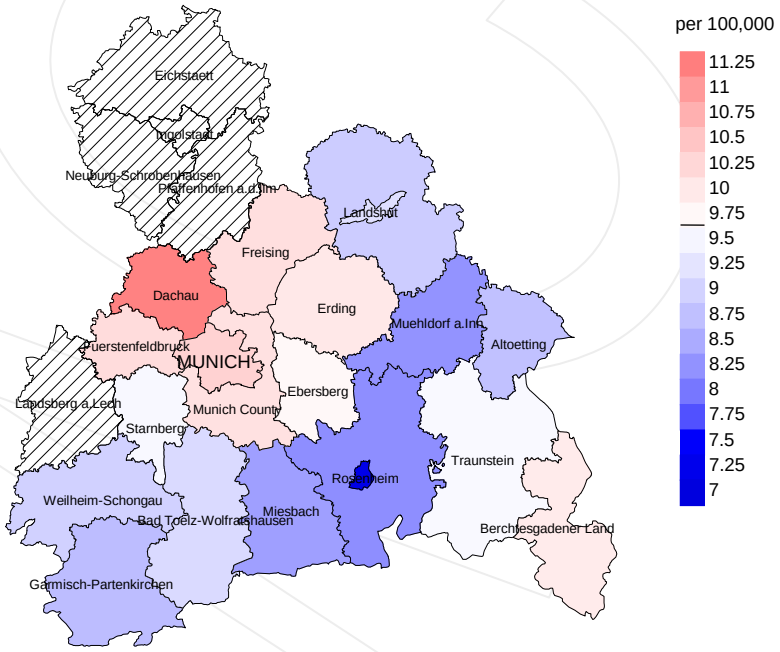
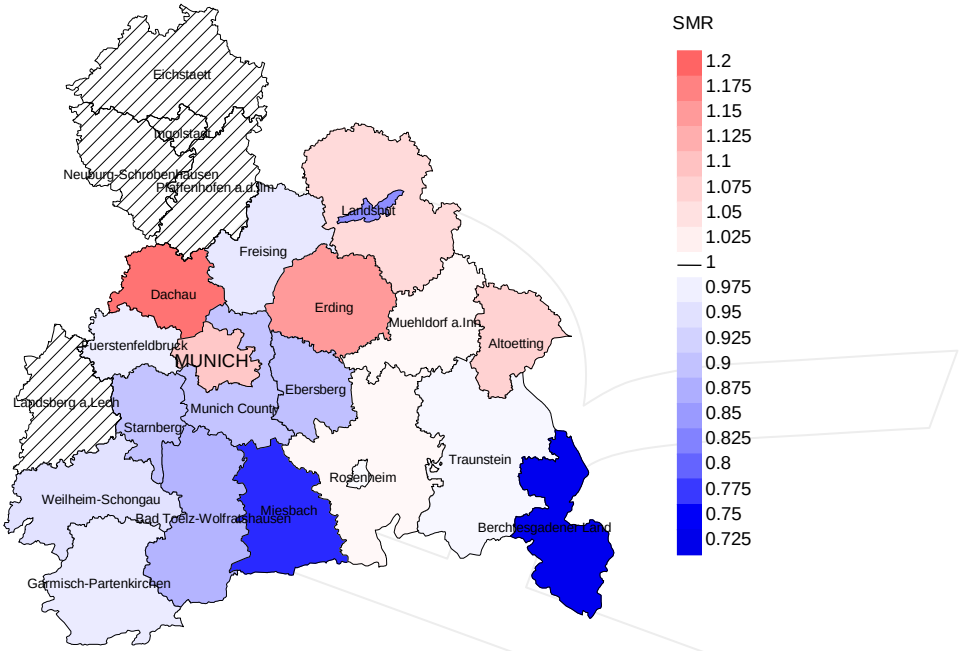


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 17.8/100,000 WS N=4,225, females 9.7/100,000 WS N=3,513). 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 101 women died from colorectal cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 9.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 7.1 and 13.4/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

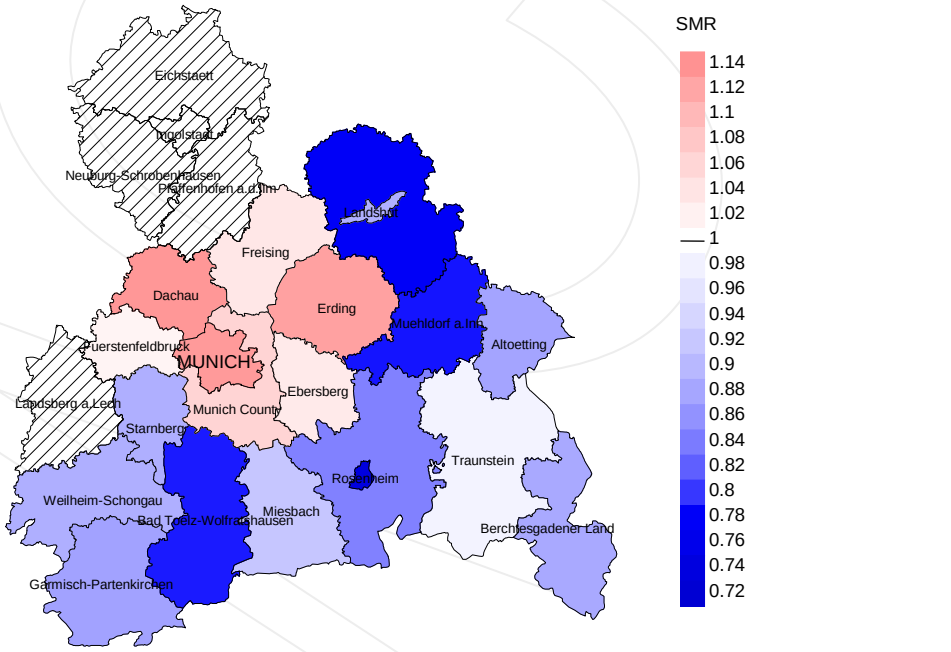


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=4,225, females N=3,513). 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 101 women died from colorectal cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.03. Though, the value of this parameter may vary with an underlying probability of 99% between 0.79 and 1.33, 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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