Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

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	1998-2013
Patients	42,527
Diseases	43,608
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 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 4.64 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, May 2015

[#] 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 2014 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 (ICD-10 2015) used for specifying cancer site

Code	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	1823	97	5.3	24.7	72.6	98.1	
1999	1836	112	6.1	24.3	71.7	97.9	
2000	1687	95	5.6	26.2	70.1	98.2	
2001	1831	118	6.4	26.8	65.3	97.5	
2002	3145	366	11.6	25.1	68.3	97.9	#
2003	3156	298	9.4	25.4	63.5	98.0	
2004	3035	240	7.9	25.3	63.1	97.5	
2005	2959	211	7.1	26.8	62.1	97.1	
2006	3050	155	5.1	27.3	56.1	95.0	
2007	3384	199	5.9	25.0	54.9	85.1	# ##
2008	3334	193	5.8	27.1	51.3	71.0	
2009	3266	172	5.3	26.2	47.6	68.2	
2010	3047	177	5.8	25.9	43.7	66.0	
2011	2960	154	5.2	24.9	39.0	65.6	
2012	2870	163	5.7	24.3	31.5	67.5	
2013	2225	145	6.5	23.7	21.9	98.6	###
1998-2013	43608	2895	6.6	25.6	54.2	86.0	

\# 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	1823	919	904	50.4
1999	1836	940	896	51.2
2000	1687	870	817	51.6
2001	1831	957	874	52.3
2002	3145	1670	1475	53.1
2003	3156	1681	1475	53.3
2004	3035	1623	1412	53.5
2005	2959	1573	1386	53.2
2006	3050	1663	1387	54.5
2007	3384	1868	1516	55.2
2008	3334	1847	1487	55.4
2009	3266	1834	1432	56.2
2010	3047	1717	1330	56.4
2011	2960	1628	1332	55.0
2012	2870	1586	1284	55.3
2013	2225	1280	945	57.5
1998-2013	43608	23656	19952	54.2

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 4.64 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	919	904	82.9	76.8	49.8	32.7	74.9	49.4	97.6	64.7
1999	940	896	84.0	75.5	49.7	32.1	75.2	48.4	98.5	63.1
2000	870	817	76.4	68.0	44.7	27.6	67.7	42.3	87.6	55.8
2001	957	874	82.6	71.8	48.4	30.6	72.5	46.1	92.8	60.2
2002	1670	1475	89.6	75.3	50.0	30.5	75.5	46.3	98.7	60.5
2003	1681	1475	89.7	74.9	49.2	30.5	74.2	46.1	96.6	59.8
2004	1623	1412	86.3	71.4	46.0	29.6	69.5	44.2	91.0	57.0
2005	1573	1386	83.0	69.7	44.1	27.2	66.1	41.2	85.9	54.3
2006	1663	1387	86.8	69.0	45.4	28.1	68.1	41.9	88.4	54.8
2007	1868	1516	84.3	65.6	43.8	26.3	65.4	39.4	85.0	51.2
2008	1847	1487	83.0	64.1	41.6	25.1	62.8	37.8	82.0	49.2
2009	1834	1432	82.2	61.6	40.6	23.8	60.9	36.0	79.8	47.3
2010	1717	1330	76.2	56.8	37.5	21.4	56.2	32.4	73.1	43.0
2011	1628	1332	71.3	56.4	34.6	22.0	51.8	32.9	67.3	42.2
2012	1586	1284	69.4	54.4	33.8	21.9	50.8	32.2	65.7	41.6
2013	1280	945	56.0	40.0	26.8	16.3	40.4	24.0	53.1	30.8
1998-2013	23656	19952	79.6	64.2	41.4	25.7	62.2	38.7	80.8	50.4

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	1823	70.0	12.4	13.2	102	54.1	61.0	71.1	78.7	86.1
1999	1836	70.3	12.4	24.9	102	54.3	61.7	71.1	79.3	86.4
2000	1687	70.6	12.1	24.7	103	55.1	61.8	71.6	79.3	86.8
2001	1831	70.1	12.4	28.3	103	54.5	61.7	70.4	79.3	86.5
2002	3145	71.0	12.1	17.7	104	55.5	62.7	71.9	80.1	86.7
2003	3156	71.0	11.8	8.4	101	56.1	63.1	71.5	79.9	86.1
2004	3035	70.7	12.3	13.8	101	55.2	63.0	71.2	79.9	85.5
2005	2959	71.4	12.2	15.1	99.9	55.6	63.7	71.8	80.4	86.1
2006	3050	70.6	12.1	17.9	102	54.8	63.4	71.0	79.7	85.3
2007	3384	70.8	12.4	15.8	103	54.2	63.9	71.3	80.2	85.7
2008	3334	71.5	12.3	18.9	105	55.3	64.2	72.1	80.4	86.5
2009	3266	71.3	12.3	12.4	102	54.7	64.1	72.1	80.3	86.0
2010	3047	71.5	12.6	14.9	101	54.4	63.7	72.6	81.0	86.4
2011	2960	71.4	12.7	17.1	101	53.6	63.5	72.4	80.9	87.0
2012	2870	71.1	12.9	9.7	101	54.4	63.2	72.6	80.4	86.4
2013	2225	70.7	13.1	15.7	105	52.4	63.0	72.7	79.9	86.0
1998-2013	43608	71.0	12.4	8.4	105	54.7	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	919	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	870	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	1670	69.1	11.0	20.9	98.5	55.6	61.9	69.6	76.7	82.5
2003	1681	69.3	11.1	8.4	99.4	55.5	62.6	69.6	76.6	82.7
2004	1623	69.4	11.0	27.8	101	55.7	62.4	69.3	77.1	83.5
2005	1573	69.3	11.3	19.0	99.6	54.6	62.9	69.5	77.1	83.6
2006	1663	69.1	11.1	17.9	102	54.8	62.6	69.3	77.4	82.9
2007	1868	69.1	11.7	15.8	99.4	54.2	62.9	69.7	77.6	83.0
2008	1847	69.9	11.2	19.3	105	55.0	63.6	70.4	77.9	83.4
2009	1834	69.6	11.4	12.4	99.0	54.3	63.1	71.0	77.9	83.0
2010	1717	69.9	11.7	21.1	98.9	54.0	62.5	70.9	78.2	84.1
2011	1628	70.0	11.7	26.3	97.3	53.7	63.2	71.2	78.3	84.3
2012	1586	70.2	11.4	9.7	101	55.3	62.9	71.4	78.2	84.0
2013	1280	70.1	12.0	19.4	99.6	53.5	62.8	72.1	78.3	84.1
1998-2013	23656	69.4	11.4	8.4	105	54.6	62.3	70.1	77.4	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	904	72.2	12.7	13.2	102	54.7	63.3	74.1	81.5	87.4
1999	896	72.4	13.0	26.9	102	54.3	63.5	74.5	82.1	88.0
2000	817	73.1	12.6	24.7	103	56.3	63.6	75.3	81.9	88.5
2001	874	71.9	13.2	28.3	103	54.8	62.4	74.5	81.1	88.4
2002	1475	73.2	12.9	17.7	104	55.3	63.9	75.3	82.2	88.9
2003	1475	73.1	12.3	23.5	101	56.6	64.2	74.5	82.5	88.5
2004	1412	72.2	13.4	13.8	100	54.7	63.9	74.0	82.8	87.8
2005	1386	73.7	12.8	15.1	99.9	57.0	65.4	75.5	83.3	89.8
2006	1387	72.4	12.9	21.2	98.7	54.9	64.4	74.3	82.4	86.8
2007	1516	72.8	13.0	17.8	103	54.2	65.1	74.3	82.9	87.5
2008	1487	73.4	13.2	18.9	102	55.5	65.2	74.4	83.6	88.6
2009	1432	73.3	13.1	15.9	102	55.7	65.5	75.0	83.3	88.5
2010	1330	73.6	13.3	14.9	101	55.3	66.3	75.7	83.5	88.7
2011	1332	73.0	13.7	17.1	101	53.5	64.0	74.6	84.1	88.9
2012	1284	72.2	14.4	13.7	100	53.4	63.8	74.7	83.1	88.9
2013	945	71.6	14.5	15.7	105	50.3	63.3	74.0	82.4	88.5
1998-2013	19952	72.8	13.2	13.2	105	54.8	64.4	74.7	82.8	88.4

Table 4

Age distribution by 5-year age group and gender for period 1998-2013 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
5-9	2	0.0	0.0	2	0.0	0.0			0.0
10-14	5	0.0	0.0	1	0.0	0.0	4	0.0	0.0
15-19	26	0.1	0.1	5	0.0	0.0	21	0.1	0.1
20-24	35	0.1	0.2	9	0.0	0.1	26	0.1	0.3
25-29	81	0.2	0.3	36	0.2	0.2	45	0.2	0.5
30-34	159	0.4	0.7	82	0.3	0.6	77	0.4	0.9
35-39	279	0.6	1.3	149	0.6	1.2	130	0.7	1.5
40-44	631	1.4	2.8	344	1.5	2.7	287	1.4	3.0
45-49	1197	2.7	5.5	644	2.7	5.4	553	2.8	5.7
50-54	2075	4.8	10.3	1201	5.1	10.5	874	4.4	10.1
55-59	3448	7.9	18.2	2116	8.9	19.4	1332	6.7	16.8
60-64	5143	11.8	30.0	3243	13.7	33.1	1900	9.5	26.3
65-69	6179	14.2	44.2	3949	16.7	49.8	2230	11.2	37.5
70-74	6894	15.8	60.0	4190	17.7	67.5	2704	13.6	51.0
75-79	6444	14.8	74.8	3454	14.6	82.1	2990	15.0	66.0
80-84	5593	12.8	87.6	2476	10.5	92.6	3117	15.6	81.6
85+	5417	12.4	100.0	1755	7.4	100.0	3662	18.4	100.0
All ages	43608	100.0		23656	100.0		19952	100.0	

Included in the statistics are 32.2% multiple primaries in males and 25.6% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2013

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=1136 %	Females DCO rate n=1749 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4			0.0	0.0				
5- 9	2		0.1	0.0			1.1	
10-14	1	4	0.1	0.3			0.6	2.4
15-19	5	21	0.3	1.4			1.4	7.2
20-24	9	26	0.5	1.5	11.1		1.5	4.9
25-29	33	45	1.6	2.2			3.4	4.1
30-34	82	76	3.6	3.4			5.5	3.7
35-39	146	129	5.9	5.4		1.6	6.5	3.5
40-44	341	287	13.0	11.5	0.6	0.3	10.6	4.6
45-49	637	548	27.0	23.7	0.8	1.3	11.9	6.3
50-54	1180	867	58.4	42.2	1.7	0.9	13.7	7.8
55-59	2089	1317	113.9	68.5	1.7	1.4	14.4	9.6
60-64	3198	1878	180.4	100.1	1.8	2.0	14.7	10.9
65-69	3867	2208	245.0	128.0	2.5	2.5	14.1	11.6
70-74	4094	2663	319.6	175.4	3.6	4.2	15.3	14.5
75-79	3384	2949	409.4	248.3	5.5	6.5	16.4	16.8
80-84	2409	3078	481.5	330.0	9.1	10.1	17.7	19.5
85+	1725	3619	505.8	404.9	21.2	27.8	17.3	21.1
All ages	23202	19715			4.9	8.9	14.7	12.9
Incidence								
Raw			78.0	63.5				
WS			40.7	25.5				
ES			61.0	38.2				
BRD-S			79.2	49.8				

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 1998-2013
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	1.4	2.1	0.4	6.1		0.3	
C03-C06	Oral cavity	9	8.6	1.0	0.5	2.0		0.1	
C07-C08	Salivary gland	3	2.6	1.2	0.2	3.4		0.1	
C09-C10	Oropharynx	14	10.3	1.4	0.7	2.3		0.6	
C12-C13	Hypopharynx	7	5.7	1.2	0.5	2.5		0.2	14.3
C15	Oesophagus	38	19.0	2.0	1.4	2.7	#	3.2	13.2
C16	Stomach	117	50.3	2.3	1.9	2.8	#	11.2	6.8
C17	Small intestine	42	5.4	7.8	5.6	10.5	#	6.1	2.4
C18	Colon	321	118.8	2.7	2.4	3.0	#	33.9	1.2
C19-C20	Rectum	151	62.9	2.4	2.0	2.8	#	14.8	2.0
C21	Anus/canal	5	2.2	2.3	0.7	5.3		0.5	
C22	Liver	69	31.1	2.2	1.7	2.8	#	6.4	21.7
C23-C24	Bile	25	11.4	2.2	1.4	3.2	#	2.3	4.0
C25	Pancreas	79	41.5	1.9	1.5	2.4	#	6.3	25.3
C32	Larynx	21	11.0	1.9	1.2	2.9	#	1.7	19.0
C33-C34	Lung	235	134.1	1.8	1.5	2.0	#	16.9	14.0
C38,C45	Mesothelioma	7	7.5	0.9	0.4	1.9		-0.1	
C43	Malign. melanoma	79	42.8	1.8	1.5	2.3	#	6.1	1.3
C46,C49	Soft tissue	14	6.0	2.3	1.3	3.9	#	1.3	
C50	Breast	6	2.9	2.0	0.7	4.4		0.5	16.7
C60	Penis	5	2.6	1.9	0.6	4.5		0.4	
C61	Prostate	535	346.6	1.5	1.4	1.7	#	31.6	5.0
C62	Testis	6	2.1	2.9	1.1	6.3	#	0.7	16.7
C64	Kidney	103	39.0	2.6	2.2	3.2	#	10.7	5.8
C65	Renal pelvis	13	4.9	2.7	1.4	4.6	#	1.4	
C66	Ureter	11	2.7	4.1	2.0	7.3	#	1.4	
C67	Bladder	93	54.2	1.7	1.4	2.1	#	6.5	7.5
C68	Urinary org.	3	0.7	4.3	0.9	12.7		0.4	66.7
C70-C72	CNS cancer	29	14.4	2.0	1.3	2.9	#	2.4	27.6
C73	Thyroid	10	6.5	1.5	0.7	2.8		0.6	20.0
C76-C79	CUP	27	20.0	1.3	0.9	2.0		1.2	3.7
C81	Hodgkin lymphoma	4	2.1	1.9	0.5	4.9		0.3	
C82-C85	NHL	79	46.4	1.7	1.3	2.1	#	5.5	5.1
C90	Mult. myeloma	22	15.0	1.5	0.9	2.2		1.2	22.7
C91-C96	Leukaemia	35	19.3	1.8	1.3	2.5	#	2.6	34.3
Other primaries		8	9.3	0.9	0.4	1.7		-0.2	12.5
Not observed		0	4.1	0.0	0.0	0.9	#	-0.7	
All mult. primaries		2228	1165.5	1.9	1.8	2.0	#	178.2	7.8

Patients	15418
Median age at second malignancy (years)	73.6
Person-years	59607
Mean observation time (years)	3.9
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 1998-2013
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	3.8	1.3	0.4	3.1		0.2	
C09-C10	Oropharynx	6	2.3	2.6	1.0	5.8		0.7	
C12-C13	Hypopharynx	3	0.6	4.9	1.0	14.4	#	0.5	33.3
C15	Oesophagus	7	3.7	1.9	0.8	3.9		0.6	14.3
C16	Stomach	61	29.5	2.1	1.6	2.7	#	6.1	21.3
C17	Small intestine	28	3.0	9.4	6.3	13.6	#	4.9	3.6
C18	Colon	206	78.8	2.6	2.3	3.0	#	24.7	1.5
C19-C20	Rectum	80	32.2	2.5	2.0	3.1	#	9.3	2.5
C21	Anus/canal	8	3.5	2.3	1.0	4.5		0.9	
C22	Liver	23	8.5	2.7	1.7	4.1	#	2.8	47.8
C23-C24	Bile	18	11.6	1.5	0.9	2.4		1.2	22.2
C25	Pancreas	63	33.4	1.9	1.4	2.4	#	5.7	20.6
C33-C34	Lung	107	45.4	2.4	1.9	2.8	#	11.9	15.9
C38,C45	Mesothelioma	3	1.3	2.4	0.5	6.9		0.3	
C43	Malign. melanoma	43	21.9	2.0	1.4	2.7	#	4.1	
C46,C49	Soft tissue	8	3.9	2.1	0.9	4.1		0.8	
C48	Peritoneal	6	2.2	2.7	1.0	5.9		0.7	16.7
C50	Breast	307	188.6	1.6	1.5	1.8	#	23.0	4.6
C51	Vulva	14	7.5	1.9	1.0	3.2	#	1.3	7.1
C52	Vagina	5	1.4	3.5	1.1	8.2	#	0.7	20.0
C53	Cervix uteri	14	8.1	1.7	0.9	2.9		1.1	14.3
C54	Corpus uteri	78	36.0	2.2	1.7	2.7	#	8.1	3.8
C55,C57	Fem. genitals un	4	2.3	1.8	0.5	4.5		0.3	25.0
C56	Ovary	76	28.1	2.7	2.1	3.4	#	9.3	27.6
C64	Kidney	51	17.5	2.9	2.2	3.8	#	6.5	13.7
C65	Renal pelvis	7	2.2	3.2	1.3	6.5	#	0.9	
C66	Ureter	3	1.1	2.8	0.6	8.0		0.4	
C67	Bladder	33	15.2	2.2	1.5	3.0	#	3.4	18.2
C70-C72	CNS cancer	11	9.2	1.2	0.6	2.1		0.3	54.5
C73	Thyroid	13	9.4	1.4	0.7	2.4		0.7	7.7
C74-C80	Cancer others	3	4.0	0.8	0.2	2.2		-0.2	66.7
C76-C79	CUP	9	14.2	0.6	0.3	1.2		-1.0	
C82-C85	NHL	43	27.7	1.6	1.1	2.1	#	3.0	18.6
C90	Mult. myeloma	15	9.1	1.7	0.9	2.7		1.1	33.3
C91-C96	Leukaemia	26	11.8	2.2	1.4	3.2	#	2.8	42.3
Other primaries		15	8.1	1.9	1.0	3.1	#	1.3	6.7
Not observed		0	1.8	0.0	0.0	2.1		-0.3	
All mult. primaries		1402	688.8	2.0	1.9	2.1	#	138.3	11.2

Patients	13303
Median age at second malignancy (years)	76.0
Person-years	51572
Mean observation time (years)	3.9
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

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

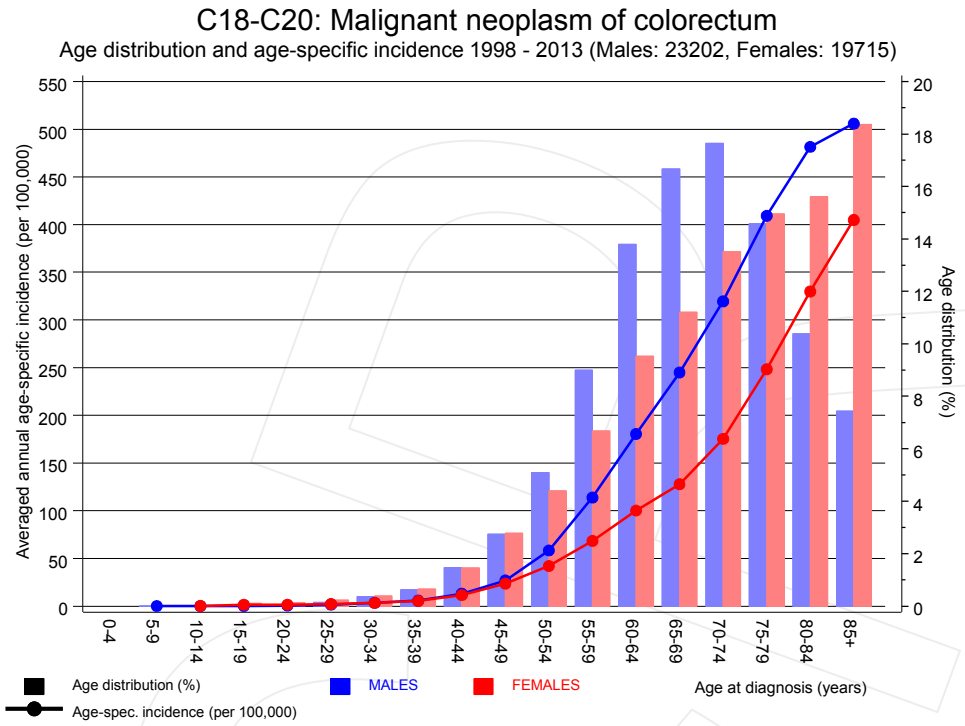


Figure 7. Age distribution and age-specific incidence

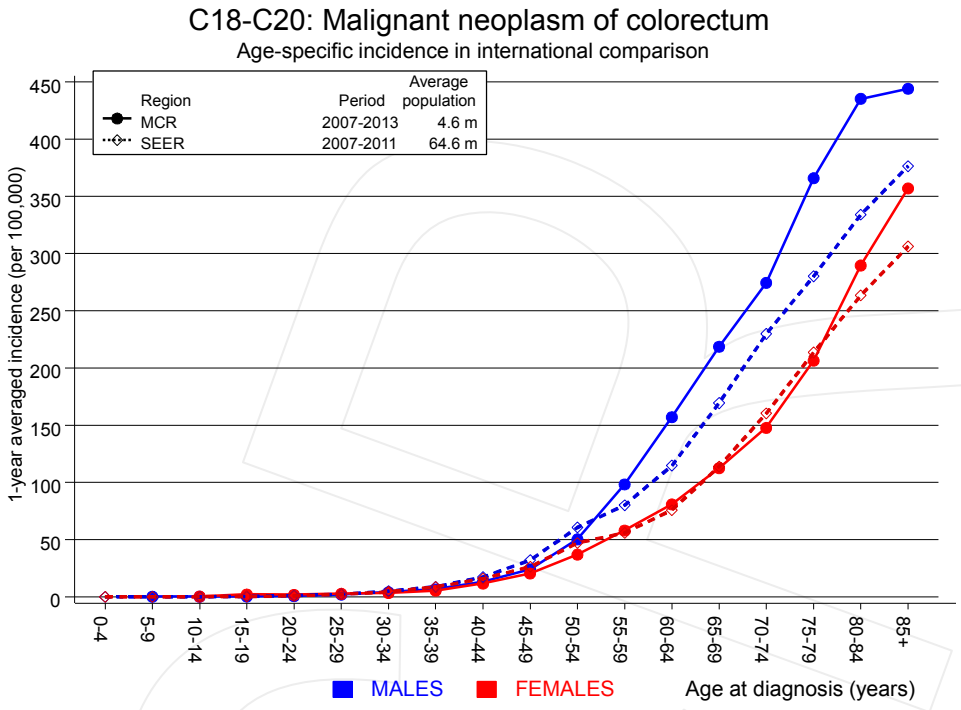


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

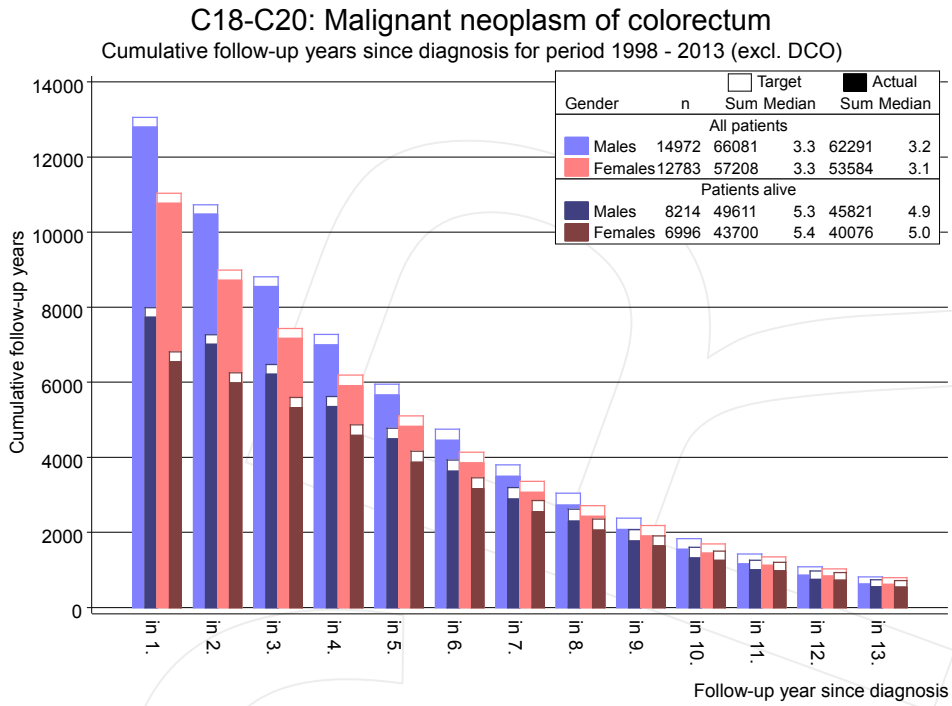
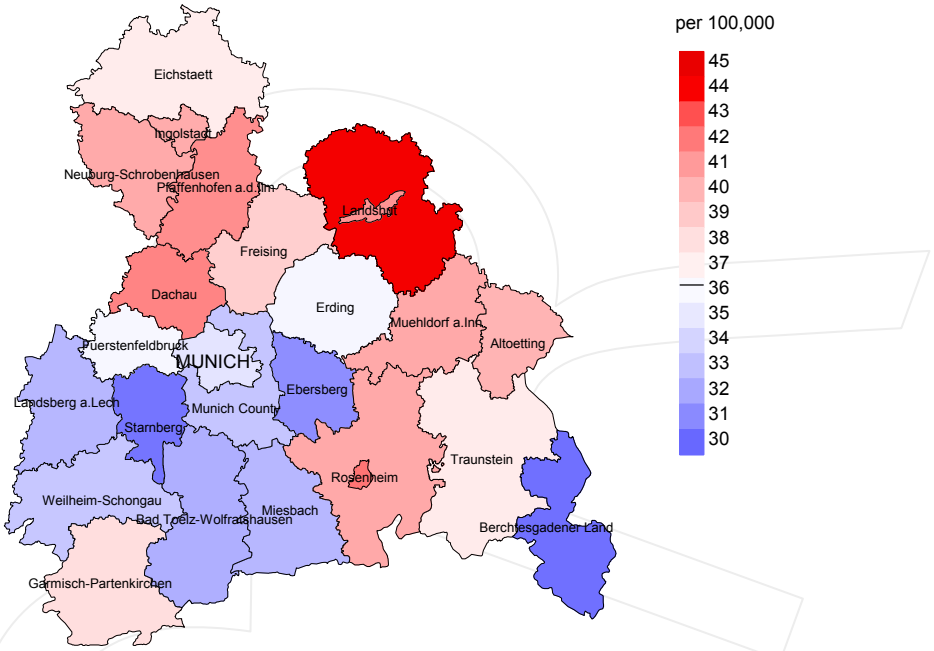


Figure 8. Cumulative follow-up years depending on time since diagnosis

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) 2007 - 2013: Males



Average incidence (world standard population) 2007 - 2013: Females

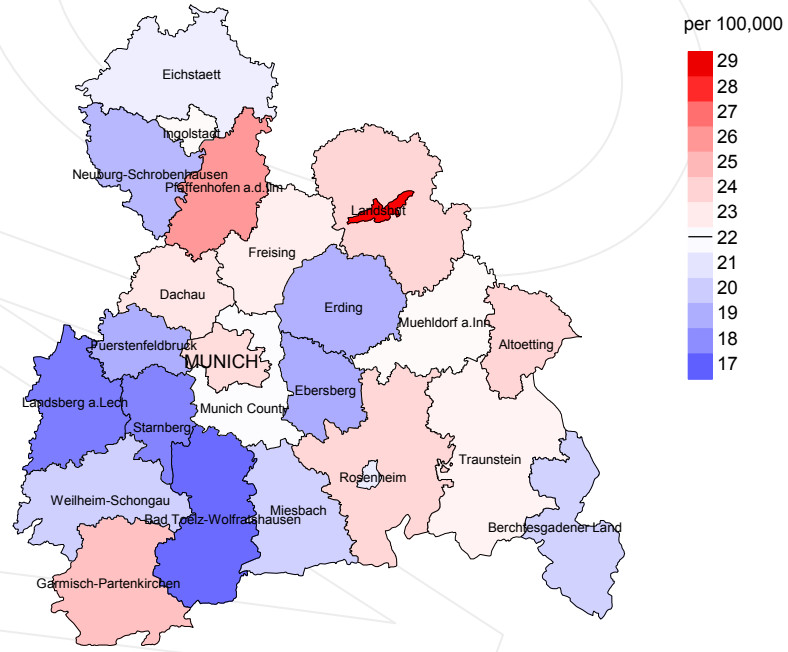
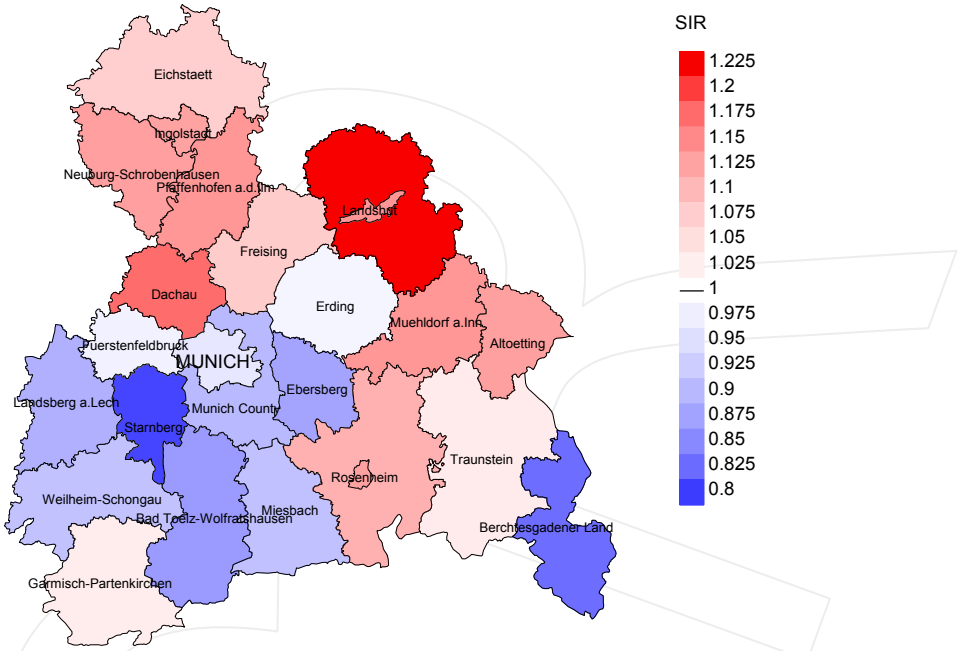


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 36.2/100,000 WS N=11,473, females 22.2/100,000 WS N=9,189).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 188 women were identified with newly diagnosed colorectal cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 18.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 15.1 and 23.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

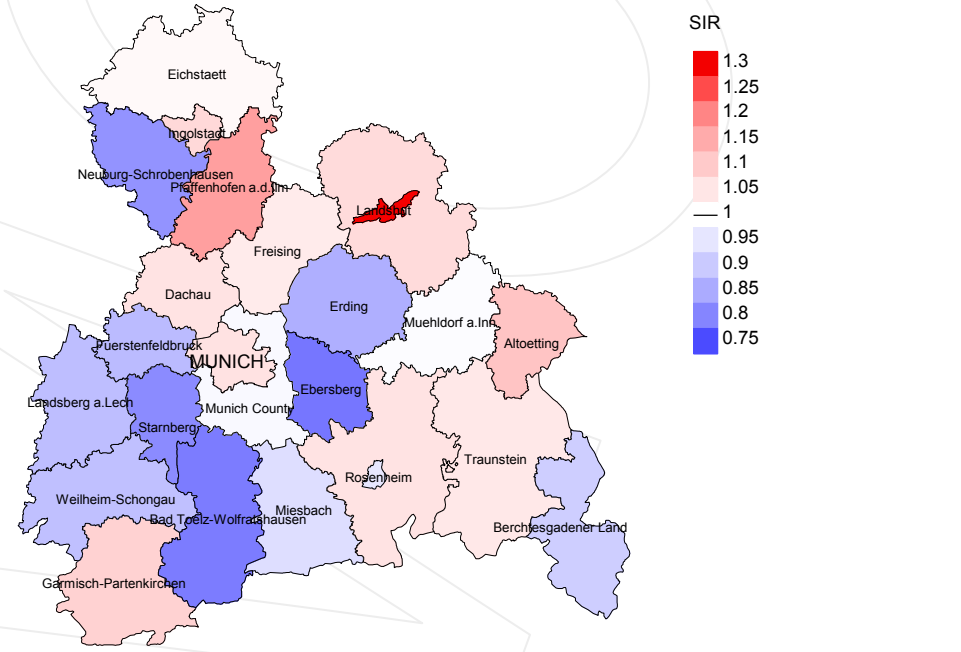


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=11,473, females N=9,189).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 188 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 0.78. Though, the value of this parameter may vary with an underlying probability of 99% between 0.64 and 0.94.

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 4.64 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	1823	98.1	5.3	1324	72.6	93.3
1999	1836	97.9	6.1	1316	71.7	94.5
2000	1687	98.2	5.6	1183	70.1	95.4
2001	1831	97.5	6.4	1195	65.3	96.9
2002	3145	97.9	11.6	2149	68.3	97.4
2003	3156	98.0	9.4	2003	63.5	97.9
2004	3035	97.5	7.9	1914	63.1	97.7
2005	2959	97.1	7.1	1837	62.1	97.5
2006	3050	95.0	5.1	1710	56.1	98.4
2007	3384	85.1	5.9	1859	54.9	97.7
2008	3334	71.0	5.8	1712	51.3	97.8
2009	3266	68.2	5.3	1554	47.6	97.7
2010	3047	66.0	5.8	1333	43.7	97.4
2011	2960	65.6	5.2	1153	39.0	97.1
2012	2870	67.5	5.7	905	31.5	95.6
2013	2225	98.6	6.5	487	21.9	89.7
1998-2013	43608	86.0	6.6	23634	54.2	96.9

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 4.64 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	1823	1041	90.3	297	16.3
1999	1836	1075	90.9	312	17.0
2000	1687	1044	93.8	282	16.7
2001	1831	1111	95.6	286	15.6
2002	3145	1581	98.1	690	21.9
2003	3156	1697	97.8	594	18.8
2004	3035	1707	98.3	552	18.2
2005	2959	1807	96.5	541	18.3
2006	3050	1872	97.5	508	16.7
2007	3384	1984	97.6	573	16.9
2008	3334	2074	98.6	605	18.1
2009	3266	2113	98.7	536	16.4
2010	3047	2181	98.6	523	17.2
2011	2960	2185	98.3	511	17.3
2012	2870	2187	98.6	519	18.1
2013	2225	2040	98.2	373	16.8
1998-2013	43608	27699	97.3	7702	17.7

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-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 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	1041	71.9	28.1	86.9
1999	1075	73.5	26.5	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	1872	71.6	28.4	82.9
2007	1984	71.9	28.1	83.6
2008	2074	71.6	28.4	82.0
2009	2113	69.6	30.4	79.8
2010	2181	66.5	33.5	78.7
2011	2185	66.9	33.1	78.6
2012	2187	66.2	33.8	78.2
2013	2040	62.2	37.8	73.4
1998-2013	27699	70.3	29.7	82.0

Table 11a

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	510	73.8	71.5	79.5	73.2
1999	531	73.4	71.4	78.7	72.8
2000	546	74.7	72.3	82.2	73.8
2001	538	74.2	71.2	80.9	72.6
2002	818	74.2	72.1	80.8	73.3
2003	874	75.0	72.7	80.8	73.9
2004	881	75.7	74.3	81.0	75.1
2005	945	75.5	73.1	81.3	73.7
2006	1029	76.5	74.4	81.0	75.4
2007	1084	76.0	73.9	80.9	74.6
2008	1164	76.7	74.6	82.1	75.5
2009	1122	76.4	73.6	81.2	74.4
2010	1186	76.8	74.4	82.1	75.4
2011	1207	76.5	73.3	82.6	75.2
2012	1204	77.4	75.4	82.3	76.2
2013	1106	78.8	76.3	83.4	77.1
1998-2013	14745	76.2	73.7	81.6	74.8

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

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	531	78.6	76.5	84.8	78.4
1999	544	79.9	78.4	85.9	79.7
2000	498	80.6	78.8	86.5	79.6
2001	573	80.9	78.0	87.1	79.9
2002	763	81.0	79.6	86.5	80.6
2003	823	81.3	78.9	85.9	80.3
2004	826	81.3	79.3	85.2	80.1
2005	862	81.9	80.0	85.2	80.7
2006	843	82.0	79.7	86.2	80.6
2007	900	82.1	79.3	86.6	80.6
2008	910	82.6	80.1	86.5	81.1
2009	991	82.8	79.2	87.5	80.5
2010	995	83.3	79.9	87.2	81.6
2011	978	83.6	79.6	88.1	81.4
2012	983	83.9	79.3	88.5	81.2
2013	934	84.1	79.1	88.5	81.3
1998-2013	12954	82.1	79.3	86.9	80.6

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	742	38.7	0.46	18.7	0.42	30.0	0.45	41.9	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	790	35.4	0.44	16.3	0.41	25.7	0.43	35.2	0.45
2010	812	36.0	0.49	15.8	0.43	25.1	0.46	35.4	0.50
2011	843	36.9	0.53	16.6	0.49	26.0	0.51	35.1	0.53
2012	813	35.6	0.53	15.6	0.48	25.0	0.51	34.5	0.54
2013	717	31.4	0.58	13.4	0.52	21.6	0.55	30.5	0.60
1998-2013	10587	35.6	0.46	17.1	0.42	27.2	0.45	37.7	0.48

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	0.44	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	0.44	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	680	29.2	0.48	9.7	0.41	15.3	0.43	20.8	0.45
2010	641	27.4	0.49	8.8	0.42	13.9	0.43	18.9	0.45
2011	621	26.3	0.48	8.2	0.38	13.0	0.40	18.0	0.43
2012	635	26.9	0.50	8.6	0.40	13.7	0.43	18.9	0.46
2013	554	23.5	0.60	7.6	0.48	12.1	0.51	16.4	0.54
1998-2013	8895	28.6	0.45	9.5	0.37	15.2	0.40	21.0	0.42

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013
(**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	14	0.1	0.1	6	0.1	0.1	8	0.1	0.1
30-34	27	0.1	0.2	17	0.2	0.2	10	0.1	0.2
35-39	65	0.3	0.5	34	0.3	0.5	31	0.3	0.6
40-44	161	0.8	1.3	94	0.9	1.4	67	0.7	1.3
45-49	291	1.4	2.8	152	1.4	2.8	139	1.5	2.8
50-54	603	3.0	5.8	359	3.3	6.0	244	2.7	5.5
55-59	1072	5.3	11.1	677	6.1	12.2	395	4.3	9.8
60-64	1743	8.6	19.7	1160	10.5	22.7	583	6.4	16.1
65-69	2369	11.7	31.5	1578	14.3	37.0	791	8.6	24.8
70-74	3012	14.9	46.4	1871	17.0	54.0	1141	12.4	37.2
75-79	3376	16.7	63.1	1951	17.7	71.7	1425	15.5	52.8
80-84	3409	16.9	80.0	1668	15.1	86.9	1741	19.0	71.8
85+	4035	20.0	100.0	1447	13.1	100.0	2588	28.2	100.0
All ages	20181	100.0		11016	100.0		9165	100.0	

Included in the statistics are 32.2% multiple primaries in males and 25.6% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**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	0.22	0.1	0.08	2.2	3.9
25-29	6	8	0.3	0.17	0.4	0.18	5.6	7.0
30-34	17	10	0.7	0.21	0.5	0.13	9.1	4.4
35-39	34	31	1.4	0.23	1.3	0.24	8.5	6.0
40-44	94	67	3.6	0.27	2.7	0.23	11.0	5.9
45-49	152	139	6.4	0.24	6.0	0.25	8.4	6.9
50-54	359	244	17.8	0.30	11.9	0.28	10.9	7.9
55-59	677	395	36.9	0.32	20.5	0.30	11.5	8.3
60-64	1160	583	65.4	0.36	31.1	0.31	13.0	8.9
65-69	1578	791	100.0	0.40	45.8	0.35	13.2	9.5
70-74	1871	1141	146.1	0.45	75.2	0.42	13.8	11.5
75-79	1951	1425	236.1	0.56	120.0	0.48	14.8	13.3
80-84	1668	1741	333.4	0.67	186.6	0.56	15.4	15.5
85+	1447	2588	424.3	0.82	289.6	0.71	16.3	18.9
All ages	11016	9165					13.7	12.7
Mortality								
Raw			37.0	0.47	29.5	0.46		
WS			17.8	0.43	9.8	0.38		
ES			28.3	0.45	15.6	0.40		
BRD-S			39.2	0.49	21.6	0.43		
PYLL-70								
per 100,000			132.5		84.2			
ES			115.5		71.6			
AYLL-70			8.7		9.8			

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

Table 15a

Multiple primaries in deaths in period 1998-2013
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	47	1.1	36	76.6	2	4.3	9	19.1
C15	Oesophagus	66	1.6	11	16.7	14	21.2	41	62.1
C16	Stomach	226	5.4	61	27.0	54	23.9	111	49.1
C17	Small intestine	45	1.1	5	11.1	18	40.0	22	48.9
C18	Colon	325	7.7			121	37.2	204	62.8
C19-C20	Rectum	186	4.4			113	60.8	73	39.2
C22	Liver	121	2.9	5	4.1	28	23.1	88	72.7
C25	Pancreas	148	3.5	9	6.1	27	18.2	112	75.7
C32	Larynx	67	1.6	47	70.1	1	1.5	19	28.4
C33-C34	Lung	451	10.7	72	16.0	62	13.7	317	70.3
C43	Malign. melanoma	162	3.8	98	60.5	3	1.9	61	37.7
C44	Skin others	208	4.9	105	50.5	19	9.1	84	40.4
C61	Prostate	932	22.1	528	56.7	77	8.3	327	35.1
C64	Kidney	162	3.8	73	45.1	38	23.5	51	31.5
C67	Bladder	329	7.8	148	45.0	27	8.2	154	46.8
C70-C72	CNS cancer	74	1.8	23	31.1	4	5.4	47	63.5
C76-C79	CUP	48	1.1	9	18.8	9	18.8	30	62.5
C82-C85	NHL	164	3.9	67	40.9	29	17.7	68	41.5
C90	Mult. myeloma	48	1.1	16	33.3	6	12.5	26	54.2
C91-C96	Leukaemia	94	2.2	27	28.7	9	9.6	58	61.7
Other primaries		316	7.5	119	37.7	26	8.2	171	54.1
All mult. primaries		4219	100.0	1459	34.6	687	16.3	2073	49.1

Multiple primaries with number of cases 1 to 38 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 1998-2013
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	154	5.1	45	29.2	33	21.4	76	49.4
C18	Colon	205	6.8			66	32.2	139	67.8
C19-C20	Rectum	116	3.8			67	57.8	49	42.2
C22	Liver	35	1.2	2	5.7	9	25.7	24	68.6
C23-C24	Bile	40	1.3	9	22.5	6	15.0	25	62.5
C25	Pancreas	126	4.2	10	7.9	19	15.1	97	77.0
C33-C34	Lung	191	6.3	31	16.2	17	8.9	143	74.9
C43	Malign. melanoma	75	2.5	50	66.7	5	6.7	20	26.7
C44	Skin others	81	2.7	41	50.6	7	8.6	33	40.7
C50	Breast	774	25.5	514	66.4	58	7.5	202	26.1
C53	Cervix uteri	108	3.6	80	74.1	10	9.3	18	16.7
C54	Corpus uteri	204	6.7	135	66.2	10	4.9	59	28.9
C56	Ovary	208	6.9	68	32.7	51	24.5	89	42.8
C64	Kidney	67	2.2	33	49.3	12	17.9	22	32.8
C67	Bladder	110	3.6	52	47.3	3	2.7	55	50.0
C70-C72	CNS cancer	56	1.8	23	41.1	8	14.3	25	44.6
C82-C85	NHL	89	2.9	39	43.8	10	11.2	40	44.9
C90	Mult. myeloma	44	1.4	13	29.5	3	6.8	28	63.6
C91-C96	Leukaemia	63	2.1	12	19.0	7	11.1	44	69.8
Other primaries		289	9.5	116	40.1	43	14.9	130	45.0
All mult. primaries		3035	100.0	1273	41.9	444	14.6	1318	43.4

Multiple primaries with number of cases 1 to 29 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 1998-2013
(**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	0.22	0.1	0.08	2.4	4.3
25-29	6	8	0.3	0.20	0.4	0.18	6.1	7.3
30-34	16	10	0.7	0.20	0.5	0.14	8.8	5.0
35-39	31	25	1.2	0.23	1.1	0.20	8.3	5.4
40-44	89	62	3.4	0.27	2.5	0.23	11.3	6.2
45-49	145	124	6.1	0.25	5.4	0.25	8.9	7.2
50-54	315	209	15.6	0.29	10.2	0.27	10.9	8.0
55-59	591	347	32.2	0.31	18.0	0.30	11.6	8.7
60-64	991	483	55.9	0.35	25.7	0.30	13.3	9.1
65-69	1304	669	82.6	0.41	38.8	0.36	13.5	10.0
70-74	1486	910	116.0	0.46	59.9	0.41	13.9	11.6
75-79	1451	1115	175.6	0.56	93.9	0.46	14.6	13.0
80-84	1231	1357	246.0	0.70	145.5	0.54	15.2	15.3
85+	1067	2067	312.9	0.84	231.3	0.69	15.9	18.8
All ages	8725	7388					13.7	12.6
Mortality								
Raw			29.3	0.46	23.8	0.45		
WS			14.4	0.42	8.0	0.37		
ES			22.5	0.45	12.8	0.39		
BRD-S			30.8	0.48	17.5	0.42		
PYLL-70								
per 100,000			116.7		73.2			
ES			101.8		62.3			
AYLL-70			9.0		10.0			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**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	0.22	0.1	0.08	2.5	4.5
25-29	6	8	0.3	0.21	0.4	0.18	6.5	7.8
30-34	16	9	0.7	0.21	0.4	0.13	9.1	4.9
35-39	30	23	1.2	0.23	1.0	0.19	8.4	5.4
40-44	87	61	3.3	0.28	2.5	0.24	11.6	6.7
45-49	140	116	5.9	0.25	5.0	0.24	9.1	7.5
50-54	299	201	14.8	0.30	9.8	0.28	11.5	8.6
55-59	541	322	29.5	0.31	16.7	0.30	11.7	9.0
60-64	886	432	50.0	0.35	23.0	0.29	13.5	9.3
65-69	1133	581	71.8	0.40	33.7	0.34	13.5	10.2
70-74	1211	785	94.5	0.42	51.7	0.39	13.6	12.0
75-79	1162	968	140.6	0.52	81.5	0.44	14.5	13.4
80-84	935	1159	186.9	0.59	124.2	0.49	14.6	15.6
85+	800	1787	234.6	0.68	199.9	0.62	14.8	18.9
All ages	7248	6454					13.4	12.9
Mortality								
Raw			24.4	0.43	20.8	0.42		
WS			12.2	0.40	7.1	0.35		
ES			18.8	0.42	11.3	0.37		
BRD-S			25.3	0.44	15.3	0.39		
PYLL-70								
per 100,000			108.0		68.0			
ES			94.4		58.0			
AYLL-70			9.2		10.3			

* See corresponding tables with multiple primaries.

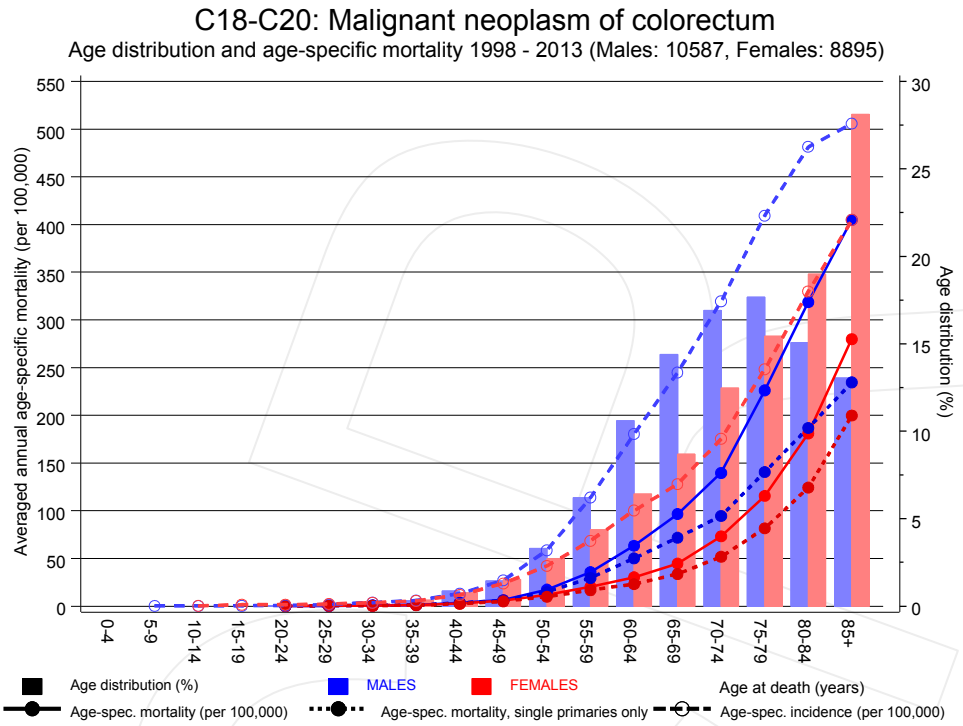
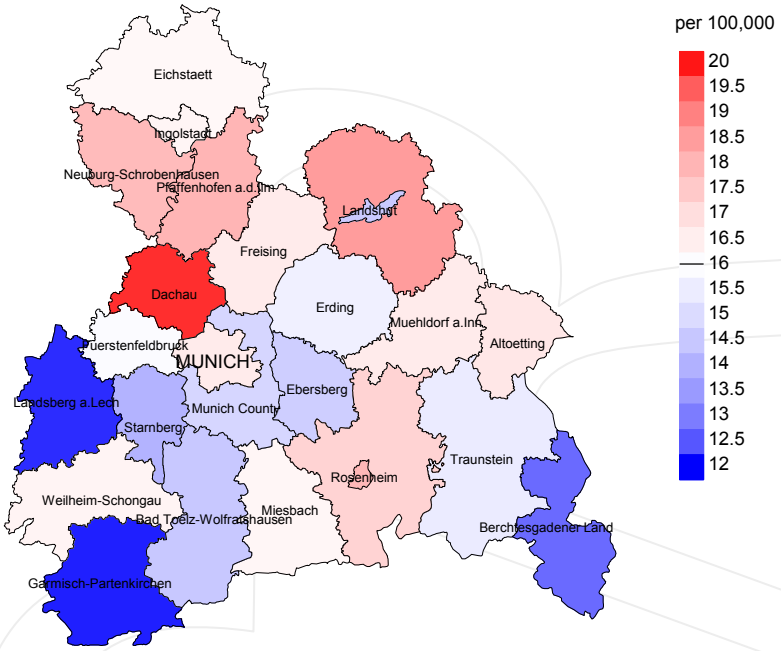


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2007 - 2013: Males



Average mortality (world standard population) 2007 - 2013: Females

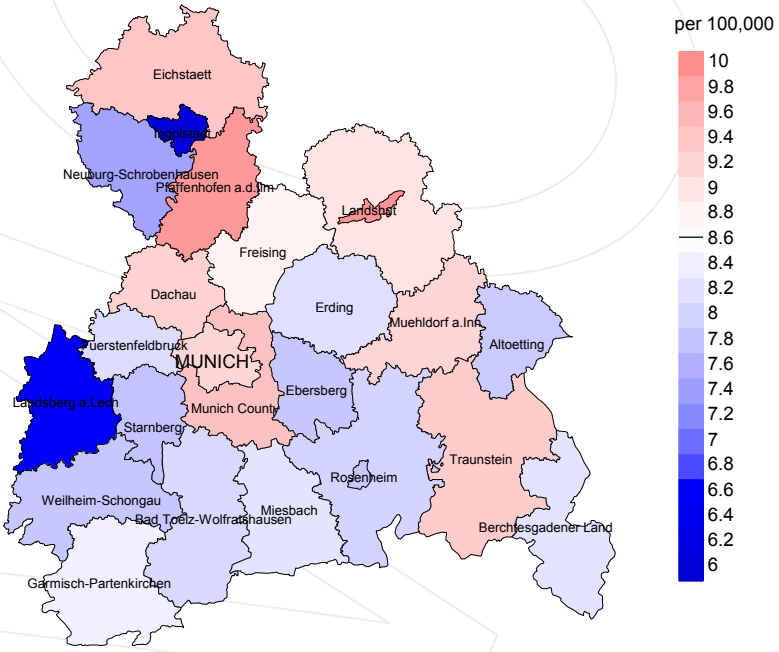


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 16.0/100,000 WS N=5,596, females 8.6/100,000 WS N=4,334).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 96 women died from colorectal cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 7.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 5.6 and 11.0/100,000.

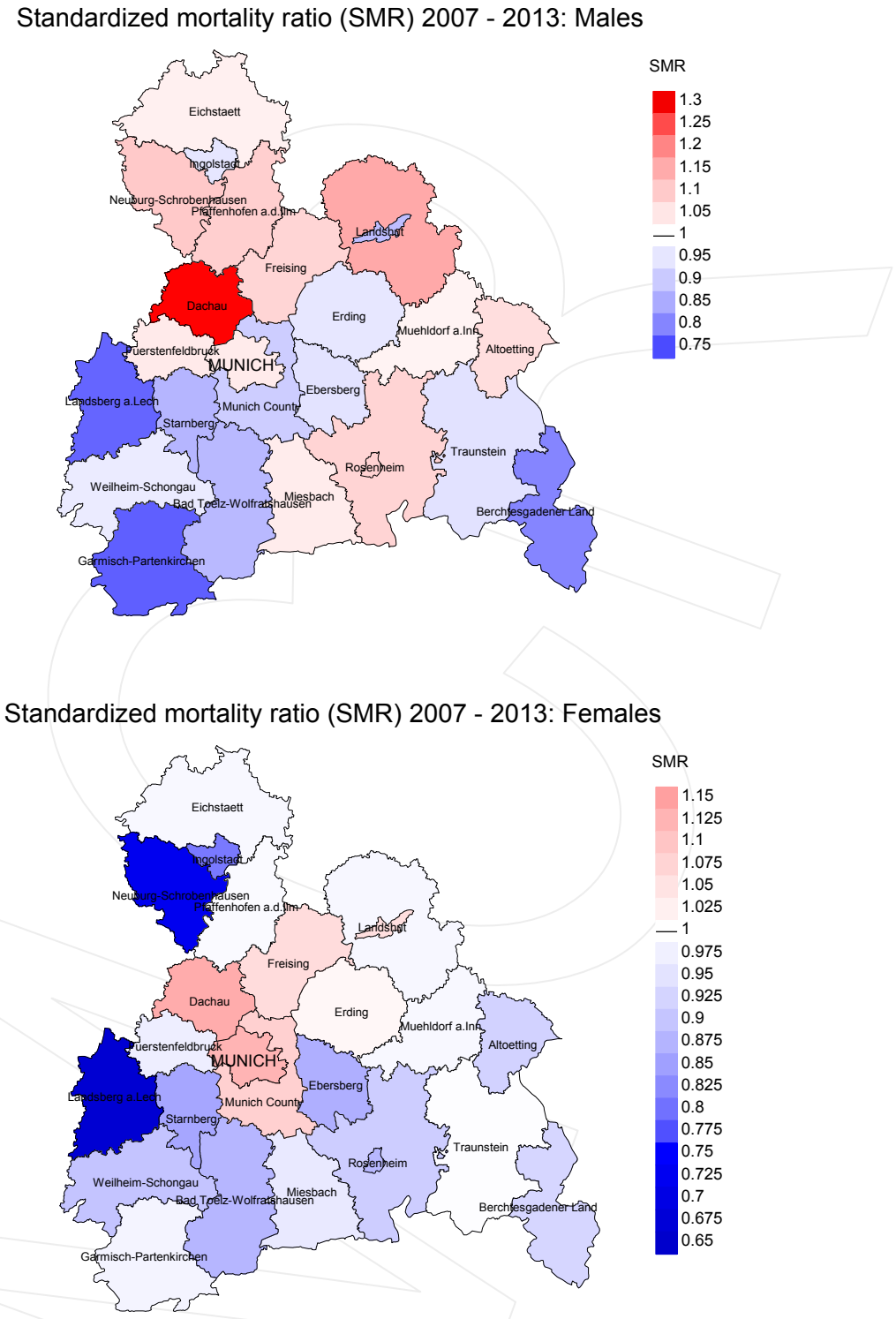


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=5,596, females N=4,334).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 96 women died from colorectal cancer. Therefore, the mean standardized mortality ratio (SMR) 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 0.66 and 1.13, 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 cancer-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

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
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)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

Recommended Citation

Munich Cancer Registry. Baseline statistics C18-C20: Colorectal cancer [Internet]. 2015 [updated 2015 May 19; cited 2015 Jul 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C1820E.pdf

Copyright

Disclaimer

Index of figures and tables