Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage

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

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

Cancer statistics: Baseline statistics

C19, C20: Rectal cancer

Year of diagnosis	1998-2012
Patients	14,233
Diseases	14,248
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C1920E.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
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	558	18	3.2	22.8	68.6	97.1	
1999	637	25	3.9	20.4	69.4	98.0	
2000	603	22	3.6	23.1	66.3	98.5	
2001	624	22	3.5	25.6	57.7	96.5	
2002	1110	77	6.9	24.1	65.3	98.3	#
2003	1090	65	6.0	22.2	58.8	97.6	#
2004	994	45	4.5	24.2	57.8	96.5	#
2005	1036	45	4.3	22.2	57.9	97.8	#
2006	1076	33	3.1	24.7	53.0	95.2	#
2007	1229	41	3.3	21.8	52.3	85.4	# ##
2008	1141	49	4.3	22.0	45.8	69.1	
2009	1109	49	4.4	20.5	43.9	64.8	
2010	1084	43	4.0	21.8	37.6	62.9	
2011	1047	30	2.9	21.0	29.9	70.6	
2012	910	44	4.8	20.7	22.0	95.3	###
1998-2012	14248	608	4.3	22.4	51.0	86.7	

\# 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	558	313	245	56.1
1999	637	360	277	56.5
2000	603	345	258	57.2
2001	624	358	266	57.4
2002	1110	645	465	58.1
2003	1090	624	466	57.2
2004	994	575	419	57.8
2005	1036	593	443	57.2
2006	1076	643	433	59.8
2007	1229	737	492	60.0
2008	1141	684	457	59.9
2009	1109	680	429	61.3
2010	1084	679	405	62.6
2011	1047	639	408	61.0
2012	910	542	368	59.6
1998-2012	14248	8417	5831	59.1

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	313	245	28.2	20.8	17.2	9.3	25.2	13.9	31.4	17.7
1999	360	277	32.2	23.3	19.4	10.5	28.6	15.6	35.5	20.0
2000	345	258	30.3	21.5	18.0	8.8	26.8	13.4	33.2	17.6
2001	358	266	30.9	21.9	18.4	10.3	26.9	15.0	33.7	18.7
2002	645	465	34.6	23.7	20.0	10.4	29.3	15.5	36.4	19.8
2003	624	466	33.3	23.7	19.0	10.5	27.9	15.5	34.7	19.4
2004	575	419	30.6	21.2	17.0	9.6	24.9	14.1	30.7	17.7
2005	593	443	31.3	22.3	17.4	9.4	25.4	14.0	31.4	17.9
2006	643	433	33.6	21.6	18.2	9.3	26.5	13.6	33.0	17.3
2007	737	492	33.3	21.3	17.8	9.0	26.1	13.4	32.6	17.0
2008	684	457	30.7	19.7	16.2	8.1	23.7	12.1	29.6	15.5
2009	680	429	30.5	18.4	15.7	7.9	23.1	11.7	29.0	14.7
2010	679	405	30.1	17.3	15.6	7.0	22.9	10.5	28.5	13.6
2011	639	408	28.0	17.3	14.3	7.4	20.9	10.7	26.0	13.2
2012	542	368	23.7	15.6	12.0	6.5	17.8	9.6	22.5	12.1
1998-2012	8417	5831	30.7	20.3	16.8	8.7	24.6	12.9	30.6	16.4

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	558	68.2	12.3	30.5	102	53.5	59.4	68.3	77.2	85.1
1999	637	68.4	12.3	34.1	102	52.4	59.3	69.0	77.2	85.6
2000	603	69.5	12.2	33.4	95.9	54.0	60.4	69.1	79.1	86.7
2001	624	68.0	12.1	28.3	97.1	52.9	60.5	67.2	76.8	83.8
2002	1110	68.8	11.7	29.9	104	54.0	61.0	69.2	77.0	83.0
2003	1090	68.9	11.8	27.1	101	53.9	61.2	68.8	77.3	83.8
2004	994	68.2	11.8	21.3	97.3	53.5	60.8	67.9	77.3	83.5
2005	1036	69.1	11.8	19.0	99.6	54.0	61.2	69.0	77.8	84.2
2006	1076	68.7	12.1	21.2	98.7	52.8	62.2	68.6	78.1	83.7
2007	1229	69.3	11.8	30.5	97.5	53.1	62.5	69.3	78.1	84.6
2008	1141	69.7	11.9	28.2	102	53.9	62.4	69.9	78.5	84.7
2009	1109	69.1	12.1	20.7	102	51.9	61.6	70.2	77.7	84.2
2010	1084	69.6	12.6	21.1	101	52.7	61.6	70.9	78.9	85.3
2011	1047	69.0	12.9	20.1	99.1	51.1	60.5	70.2	78.3	85.7
2012	910	69.5	12.5	26.1	99.6	53.2	60.0	70.9	78.4	85.3
1998-2012	14248	69.0	12.1	19.0	104	53.1	61.1	69.4	77.9	84.5

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	313	65.8	11.8	32.6	94.4	51.6	58.2	64.0	74.0	82.9
1999	360	66.3	11.4	34.1	94.2	52.0	58.3	65.6	73.5	82.6
2000	345	66.8	11.5	34.4	95.9	53.0	58.9	65.4	74.8	83.6
2001	358	67.0	10.6	36.4	93.6	53.9	60.6	65.9	73.7	81.1
2002	645	67.1	10.6	32.8	93.0	53.9	60.6	66.8	74.1	81.3
2003	624	67.4	10.7	27.1	93.1	53.9	60.7	67.7	74.6	81.2
2004	575	66.8	10.4	29.9	93.3	54.3	60.7	66.3	74.9	79.8
2005	593	67.1	10.7	19.0	99.6	53.8	60.3	67.2	74.2	80.6
2006	643	67.0	10.8	25.7	94.7	52.8	60.5	67.4	74.6	81.0
2007	737	68.0	10.9	31.1	95.5	53.2	62.1	68.0	75.3	81.9
2008	684	68.0	10.7	28.2	96.0	53.9	62.1	68.5	75.2	80.7
2009	680	68.0	11.2	20.7	95.4	52.1	61.5	69.6	75.4	80.9
2010	679	68.1	12.0	21.1	98.3	52.5	60.6	69.5	76.0	83.1
2011	639	67.8	11.5	26.3	93.6	51.9	60.6	69.5	75.7	81.8
2012	542	68.6	11.6	26.1	99.6	53.5	59.7	69.9	77.0	82.7
1998-2012	8417	67.5	11.1	19.0	99.6	53.2	60.4	67.8	75.0	81.5

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	245	71.2	12.2	30.5	102	55.3	62.2	72.5	78.6	87.7
1999	277	71.1	12.8	38.4	102	52.7	61.5	73.0	79.8	87.5
2000	258	73.0	12.3	33.4	94.7	55.7	62.7	75.0	81.8	88.2
2001	266	69.4	13.8	28.3	97.1	51.7	60.1	70.2	79.6	86.7
2002	465	71.2	12.7	29.9	104	54.5	62.3	72.8	80.3	87.6
2003	466	70.9	12.9	29.2	101	54.3	61.7	71.5	81.2	86.8
2004	419	70.0	13.4	21.3	97.3	51.7	61.3	71.3	80.6	85.9
2005	443	71.8	12.6	32.8	96.8	54.6	63.2	72.1	81.4	87.1
2006	433	71.1	13.4	21.2	98.7	52.8	63.5	72.5	81.2	86.6
2007	492	71.4	12.8	30.5	97.5	53.0	63.6	72.3	81.5	87.0
2008	457	72.2	13.0	29.3	102	53.7	63.4	73.3	82.4	87.9
2009	429	70.8	13.4	29.2	102	51.7	61.8	71.4	80.7	87.2
2010	405	72.0	13.1	23.0	101	52.9	63.4	74.0	82.3	87.1
2011	408	70.8	14.8	20.1	99.1	50.7	60.3	71.7	82.8	89.0
2012	368	70.9	13.7	26.1	97.4	52.4	61.4	72.3	81.7	87.1
1998-2012	5831	71.2	13.2	20.1	104	53.0	62.4	72.4	81.2	87.2

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.%
15-19	1	0.0	0.0	1	0.0	0.0			0.0
20-24	10	0.1	0.1	2	0.0	0.0	8	0.1	0.1
25-29	20	0.1	0.2	8	0.1	0.1	12	0.2	0.3
30-34	46	0.3	0.5	27	0.3	0.5	19	0.3	0.7
35-39	93	0.7	1.2	57	0.7	1.1	36	0.6	1.3
40-44	256	1.8	3.0	146	1.7	2.9	110	1.9	3.2
45-49	489	3.4	6.4	284	3.4	6.2	205	3.5	6.7
50-54	892	6.3	12.7	555	6.6	12.8	337	5.8	12.5
55-59	1398	9.8	22.5	943	11.2	24.0	455	7.8	20.3
60-64	2005	14.1	36.6	1360	16.2	40.2	645	11.1	31.3
65-69	2197	15.4	52.0	1505	17.9	58.1	692	11.9	43.2
70-74	2218	15.6	67.6	1412	16.8	74.8	806	13.8	57.0
75-79	1863	13.1	80.6	1038	12.3	87.2	825	14.1	71.2
80-84	1431	10.0	90.7	622	7.4	94.6	809	13.9	85.0
85+	1329	9.3	100.0	457	5.4	100.0	872	15.0	100.0
All ages	14248	100.0		8417	100.0		5831	100.0	

Included in the statistics are 28.6% multiple primaries in males and 25.5% 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=257 %	Females DCO rate n=350 %	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			0.0	0.0				
15-19	1		0.1	0.0			0.3	
20-24	2	8	0.1	0.5			0.4	1.6
25-29	8	12	0.4	0.6			0.9	1.2
30-34	27	19	1.3	0.9			1.9	1.0
35-39	57	36	2.4	1.6			2.7	1.0
40-44	146	110	6.0	4.8		0.9	4.9	1.9
45-49	284	205	13.2	9.7	0.4	0.5	5.8	2.6
50-54	555	337	30.0	17.8	1.3	0.3	6.9	3.3
55-59	943	455	55.5	25.5	1.2	0.4	7.0	3.6
60-64	1360	644	82.5	37.0	1.2	1.6	6.6	4.0
65-69	1504	691	102.5	43.1	2.5	1.3	5.8	3.9
70-74	1411	805	121.8	58.4	2.3	3.5	5.7	4.8
75-79	1036	825	137.5	75.4	4.0	5.5	5.5	5.1
80-84	621	809	136.8	93.7	5.6	8.5	4.9	5.5
85+	457	872	147.4	106.5	16.6	21.1	5.0	5.4
All ages	8412	5828			3.1	6.0	5.7	4.1
Incidence								
Raw			30.6	20.3				
WS			16.8	8.7				
ES			24.6	12.9				
BRD-S			30.5	16.4				

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 %
C07-C08	Salivary gland	2	0.9	2.3	0.3	8.4		0.5	
C09-C10	Oropharynx	4	4.1	1.0	0.3	2.5		-0.0	
C12-C13	Hypopharynx	3	2.3	1.3	0.3	3.8		0.3	
C15	Oesophagus	11	6.9	1.6	0.8	2.9		1.9	9.1
C16	Stomach	33	16.7	2.0	1.4	2.8	#	7.3	3.0
C17	Small intestine	10	1.8	5.4	2.6	10.0	#	3.7	
C18	Colon	171	39.7	4.3	3.7	5.0	#	59.3	1.2
C19-C20	Rectum	8	22.4	0.4	0.2	0.7	#	-6.5	25.0
C22	Liver	30	10.8	2.8	1.9	4.0	#	8.7	6.7
C23-C24	Bile	8	3.8	2.1	0.9	4.2		1.9	
C25	Pancreas	17	13.9	1.2	0.7	2.0		1.4	17.6
C32	Larynx	5	4.1	1.2	0.4	2.8		0.4	40.0
C33-C34	Lung	81	46.8	1.7	1.4	2.1	#	15.4	9.9
C38,C45	Mesothelioma	3	2.6	1.2	0.2	3.4		0.2	
C43	Malign. melanoma	22	14.9	1.5	0.9	2.2		3.2	
C46,C49	Soft tissue	3	2.0	1.5	0.3	4.3		0.4	
C50	Breast	2	1.0	2.0	0.2	7.3		0.5	
C60	Penis	3	0.9	3.4	0.7	9.8		1.0	
C61	Prostate	182	120.4	1.5	1.3	1.7	#	27.8	4.9
C62	Testis	2	0.8	2.4	0.3	8.6		0.5	
C64	Kidney	30	13.8	2.2	1.5	3.1	#	7.3	6.7
C65	Renal pelvis	3	1.6	1.9	0.4	5.6		0.6	
C66	Ureter	4	0.9	4.6	1.2	11.7	#	1.4	
C67	Bladder	29	17.4	1.7	1.1	2.4	#	5.2	6.9
C70-C72	CNS cancer	14	5.1	2.7	1.5	4.6	#	4.0	21.4
C73	Thyroid	4	2.5	1.6	0.4	4.2		0.7	25.0
C76-C79	CUP	8	6.7	1.2	0.5	2.4		0.6	
C81	Hodgkin lymphoma	2	0.8	2.6	0.3	9.5		0.6	
C82-C85	NHL	19	15.5	1.2	0.7	1.9		1.6	
C90	Mult. myeloma	4	5.0	0.8	0.2	2.0		-0.5	25.0
C91-C96	Leukaemia	12	6.2	1.9	1.0	3.4		2.6	41.7
Other primaries		3	4.3	0.7	0.1	2.0		-0.6	
Not observed		0	4.8	0.0	0.0	0.8	#	-2.1	
All mult. primaries		732	401.4	1.8	1.7	2.0	#	149.3	6.0

Patients	5825
Mean age at second malignancy (years)	71.3
Person-years	22141
Mean observation time (years)	3.8
Median observation time (years)	3.0

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 %
C15	Oesophagus	2	1.1	1.8	0.2	6.6		0.6	
C16	Stomach	10	8.5	1.2	0.6	2.2		0.9	20.0
C17	Small intestine	7	0.9	7.9	3.2	16.2	#	3.8	
C18	Colon	96	22.9	4.2	3.4	5.1	#	45.6	2.1
C19-C20	Rectum	5	9.6	0.5	0.2	1.2		-2.9	20.0
C21	Anus/canal	3	1.1	2.8	0.6	8.3		1.2	
C22	Liver	3	2.4	1.2	0.3	3.6		0.3	66.7
C23-C24	Bile	7	3.3	2.1	0.8	4.3		2.3	14.3
C25	Pancreas	9	9.6	0.9	0.4	1.8		-0.4	22.2
C33-C34	Lung	23	13.8	1.7	1.1	2.5	#	5.7	17.4
C43	Malign. melanoma	18	6.6	2.7	1.6	4.3	#	7.1	
C46,C49	Soft tissue	4	1.1	3.6	1.0	9.1		1.8	
C50	Breast	99	58.0	1.7	1.4	2.1	#	25.6	3.0
C51	Vulva	4	2.1	1.9	0.5	4.8		1.2	25.0
C52	Vagina	4	0.4	9.5	2.6	24.3	#	2.2	25.0
C53	Cervix uteri	5	2.5	2.0	0.6	4.6		1.5	20.0
C54	Corpus uteri	21	11.0	1.9	1.2	2.9	#	6.2	9.5
C55,C57	Fem. genitals un	3	0.6	4.8	1.0	14.0		1.5	
C56	Ovary	24	8.6	2.8	1.8	4.2	#	9.6	20.8
C64	Kidney	13	5.2	2.5	1.3	4.3	#	4.9	15.4
C65	Renal pelvis	3	0.6	4.7	1.0	13.6		1.5	
C67	Bladder	9	4.3	2.1	1.0	4.0		2.9	33.3
C69	Eye melanoma	2	0.3	7.0	0.8	25.2		1.1	
C70-C72	CNS cancer	2	2.8	0.7	0.1	2.5		-0.5	50.0
C73	Thyroid	4	3.1	1.3	0.4	3.3		0.6	
C76-C79	CUP	2	4.0	0.5	0.1	1.8		-1.3	
C82-C85	NHL	7	8.2	0.9	0.3	1.8		-0.7	
C90	Mult. myeloma	6	2.7	2.3	0.8	4.9		2.1	50.0
C91-C96	Leukaemia	8	3.4	2.4	1.0	4.7	#	2.9	50.0
Other primaries		8	2.3	3.5	1.5	7.0	#	3.6	12.5
Not observed		0	4.9	0.0	0.0	0.8	#	-3.0	
All mult. primaries		411	205.9	2.0	1.8	2.2	#	128.0	10.0

Patients	4146
Mean age at second malignancy (years)	74.3
Person-years	16021
Mean observation time (years)	3.9
Median observation time (years)	2.8

The occurrence of second malignancy is statistically significant.

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

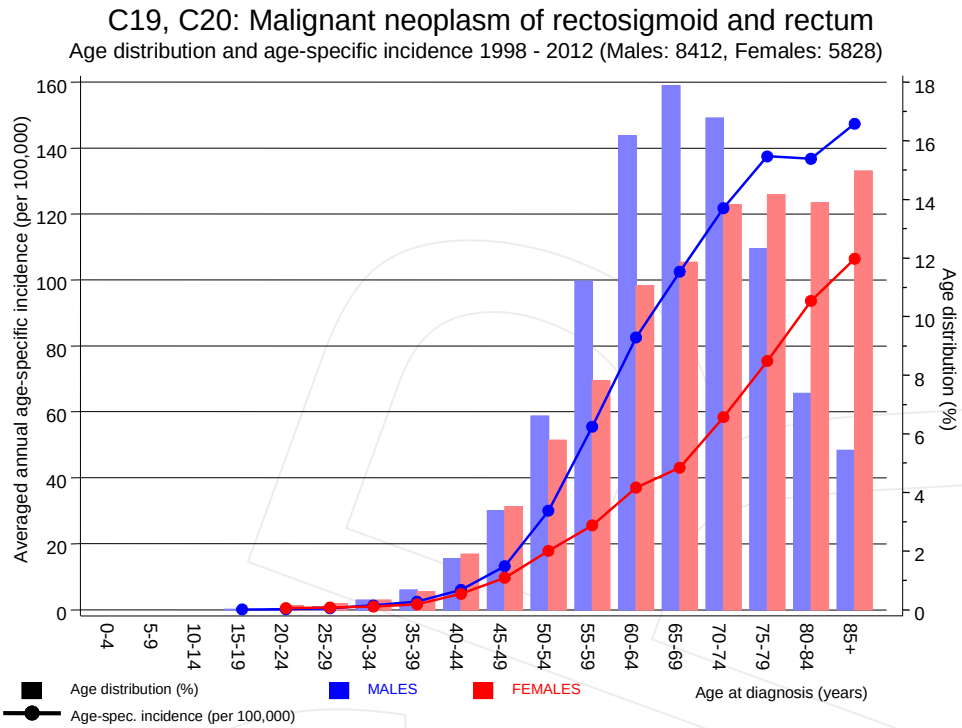


Figure 7. Age distribution and age-specific incidence

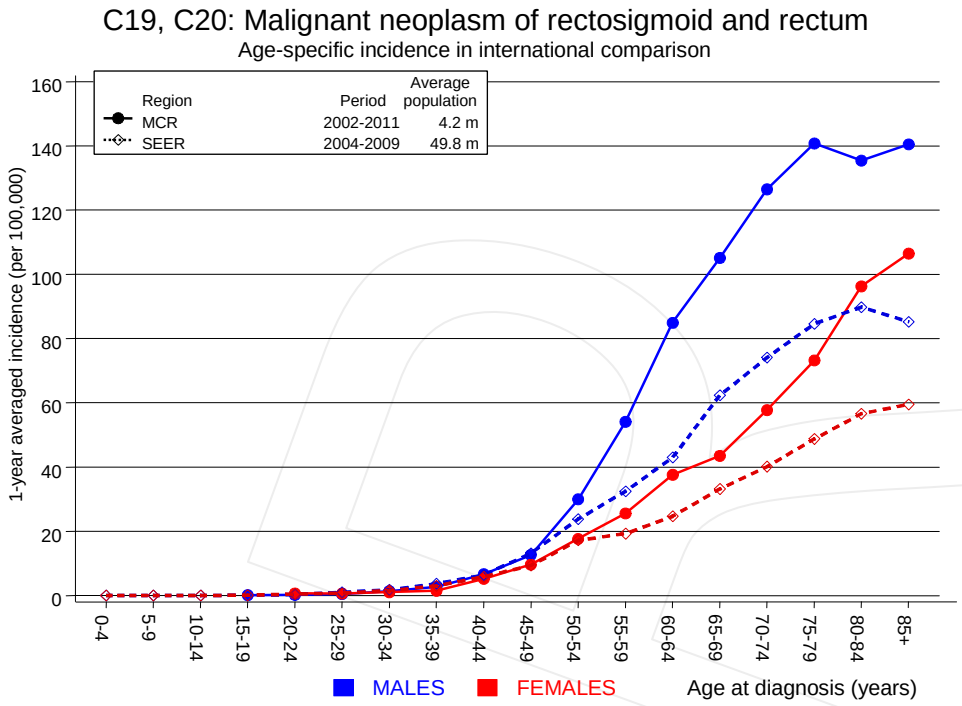


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

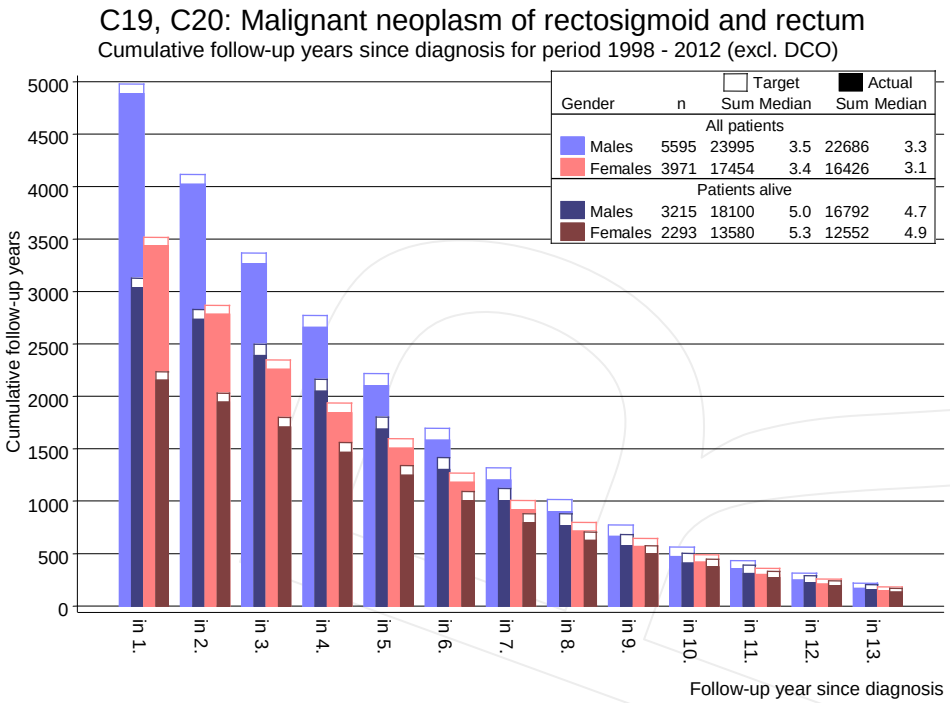
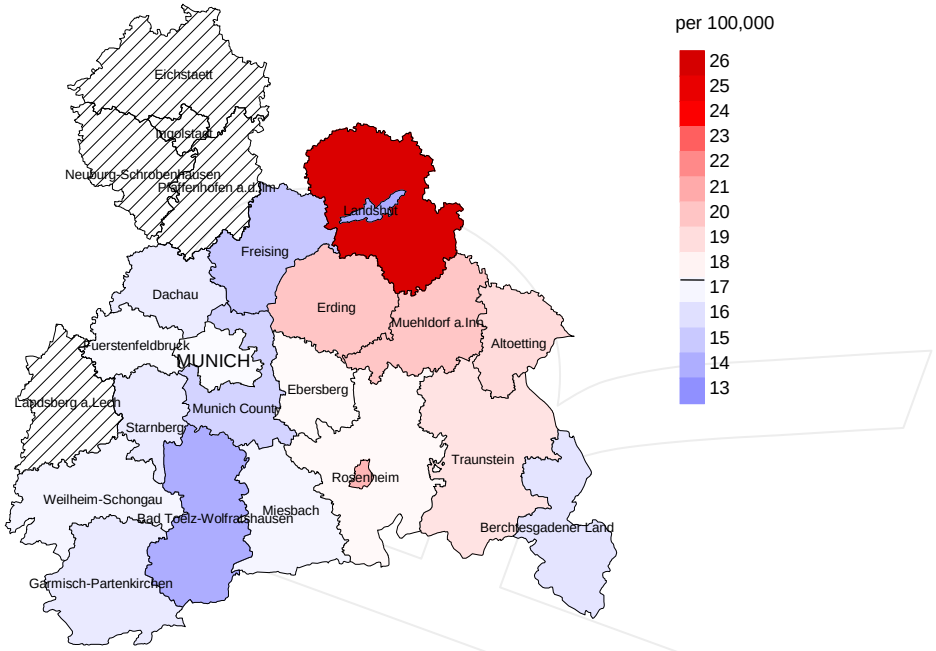


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

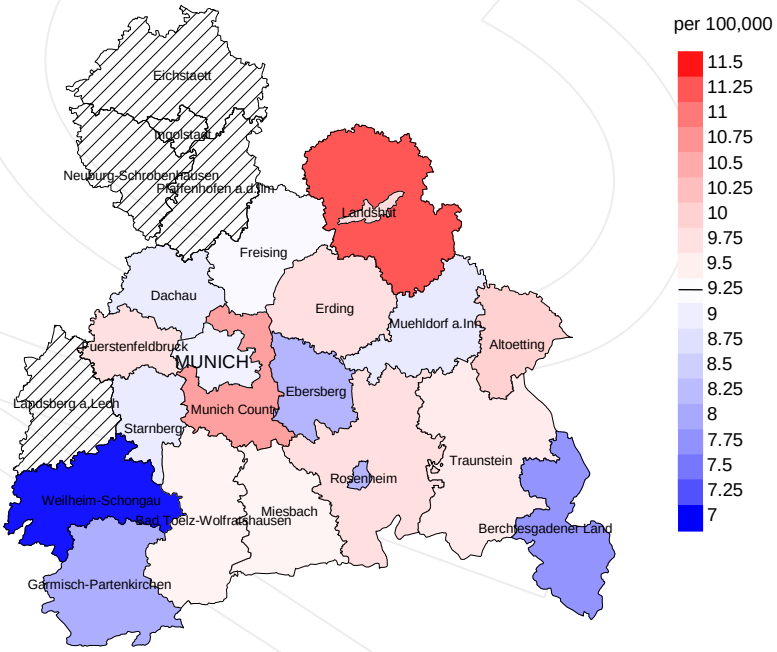
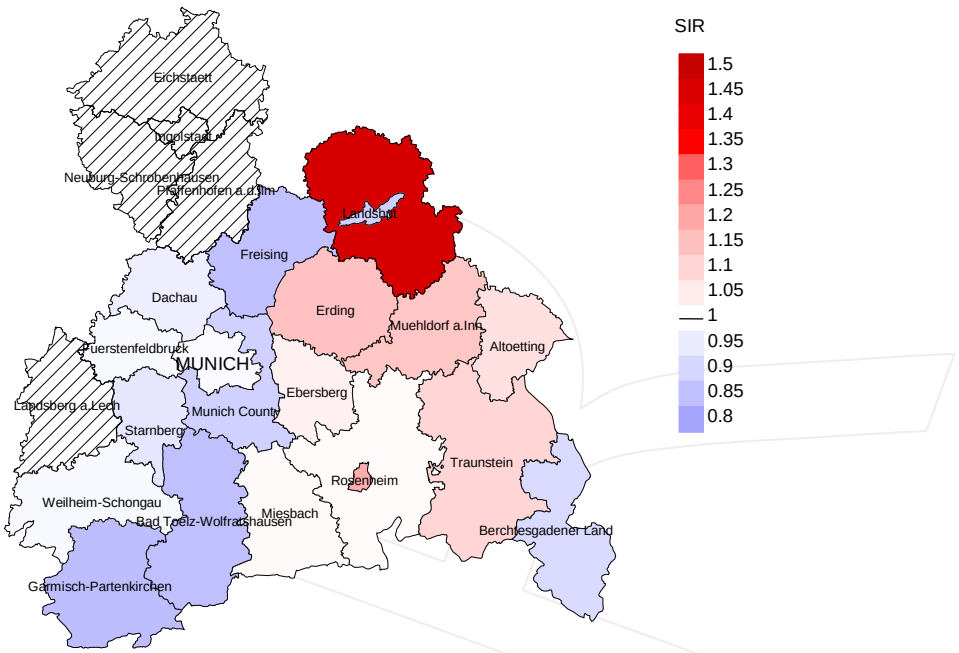


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 17.4/100,000 WS N=3,660, females 9.3/100,000 WS N=2,583). 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 60 women were identified with newly diagnosed rectal cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 8.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 5.6 and 11.6/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

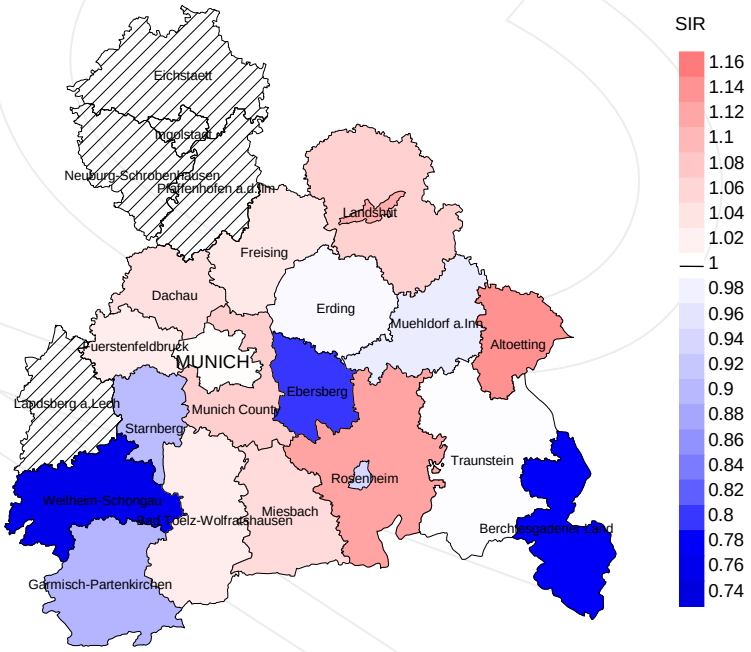


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,660, females N=2,583). 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 60 women were identified with newly diagnosed rectal cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.80. Though, the value of this parameter may vary with an underlying probability of 99% between 0.56 and 1.11, 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	558	97.1	3.2	383	68.6	93.0
1999	637	98.0	3.9	442	69.4	93.7
2000	603	98.5	3.6	400	66.3	95.5
2001	624	96.5	3.5	360	57.7	96.9
2002	1110	98.3	6.9	725	65.3	96.4
2003	1090	97.6	6.0	641	58.8	97.7
2004	994	96.5	4.5	575	57.8	98.6
2005	1036	97.8	4.3	600	57.9	98.0
2006	1076	95.2	3.1	570	53.0	97.4
2007	1229	85.4	3.3	643	52.3	98.3
2008	1141	69.1	4.3	523	45.8	98.1
2009	1109	64.8	4.4	487	43.9	97.1
2010	1084	62.9	4.0	408	37.6	97.3
2011	1047	70.6	2.9	313	29.9	97.4
2012	910	95.3	4.8	200	22.0	97.0
1998-2012	14248	86.7	4.3	7270	51.0	97.0

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	558	337	88.7	61	10.9
1999	637	372	88.7	85	13.3
2000	603	350	93.4	76	12.6
2001	624	392	95.7	75	12.0
2002	1110	557	97.5	189	17.0
2003	1090	584	97.8	145	13.3
2004	994	598	98.2	122	12.3
2005	1036	614	96.1	141	13.6
2006	1076	701	97.6	163	15.1
2007	1229	712	97.9	170	13.8
2008	1141	775	99.0	158	13.8
2009	1109	794	99.5	159	14.3
2010	1084	825	99.0	173	16.0
2011	1047	820	97.8	146	13.9
2012	910	773	99.4	147	16.2
1998-2012	14248	9204	97.2	2010	14.1

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	337	71.2	28.8	87.6
1999	372	75.8	24.2	89.7
2000	350	75.4	24.6	87.8
2001	392	71.2	28.8	86.9
2002	557	78.1	21.9	88.4
2003	584	77.1	22.9	89.5
2004	598	75.3	24.7	88.1
2005	614	73.3	26.7	85.8
2006	701	76.7	23.3	85.8
2007	712	74.7	25.3	85.8
2008	775	73.8	26.2	83.3
2009	794	72.8	27.2	85.1
2010	825	69.6	30.4	81.5
2011	820	71.3	28.7	83.8
2012	773	69.1	30.9	80.6
1998-2012	9204	73.5	26.5	85.4

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	179	72.5	70.4	77.4	72.2
1999	220	71.1	70.2	74.2	71.4
2000	198	72.4	70.1	79.3	71.5
2001	213	72.3	69.6	79.0	71.7
2002	321	72.6	70.6	78.6	71.6
2003	315	70.9	68.8	78.3	70.3
2004	338	73.7	72.2	78.6	73.0
2005	356	72.9	70.9	78.8	71.5
2006	426	73.8	72.0	80.4	72.7
2007	422	73.5	71.9	78.6	72.7
2008	456	74.3	72.3	80.4	73.0
2009	459	73.0	71.0	78.6	72.2
2010	491	74.4	72.1	80.1	73.3
2011	499	74.3	72.0	80.8	73.3
2012	475	75.4	73.2	80.4	74.0
1998-2012	5368	73.4	71.4	79.3	72.5

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	158	77.2	74.2	85.2	77.3
1999	152	76.4	74.3	81.8	76.6
2000	152	77.6	75.9	82.8	76.7
2001	179	76.7	73.4	84.7	75.4
2002	236	78.7	77.6	83.7	78.1
2003	269	78.2	76.2	84.6	77.4
2004	260	78.3	76.5	83.3	77.4
2005	258	79.1	77.6	82.9	78.2
2006	275	78.9	77.1	84.4	77.9
2007	290	78.2	75.8	84.4	77.1
2008	319	78.9	76.5	84.6	77.4
2009	335	78.3	74.9	86.4	76.5
2010	334	79.8	76.9	85.7	78.0
2011	321	79.5	76.9	84.9	78.0
2012	298	80.0	76.6	87.6	77.9
1998-2012	3836	78.6	76.2	84.8	77.4

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	124	11.2	0.40	6.5	0.38	10.1	0.40	13.4	0.43
1999	172	15.4	0.48	8.9	0.46	13.8	0.48	18.8	0.53
2000	148	13.0	0.43	7.4	0.41	11.5	0.43	15.1	0.45
2001	152	13.1	0.42	7.5	0.41	11.6	0.43	15.2	0.45
2002	241	12.9	0.37	7.1	0.35	10.8	0.37	14.2	0.39
2003	245	13.1	0.39	7.2	0.38	10.8	0.39	14.0	0.40
2004	257	13.7	0.45	6.8	0.40	10.8	0.44	15.1	0.49
2005	266	14.0	0.45	7.1	0.41	10.9	0.43	14.6	0.47
2006	331	17.3	0.51	8.7	0.48	13.6	0.51	18.3	0.55
2007	324	14.6	0.44	7.1	0.40	11.0	0.42	14.9	0.46
2008	345	15.5	0.50	7.3	0.45	11.5	0.49	15.8	0.53
2009	343	15.4	0.51	7.5	0.48	11.4	0.49	14.8	0.51
2010	350	15.5	0.52	7.0	0.45	10.9	0.48	15.1	0.53
2011	368	16.1	0.58	7.4	0.52	11.4	0.55	15.2	0.59
2012	329	14.4	0.61	6.5	0.54	10.2	0.57	14.0	0.62
1998-2012	3995	14.6	0.47	7.3	0.44	11.3	0.46	15.2	0.50

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	116	9.9	0.47	3.9	0.41	6.0	0.43	8.3	0.47
1999	110	9.3	0.40	3.5	0.33	5.5	0.35	7.5	0.38
2000	116	9.7	0.45	3.6	0.41	5.6	0.42	7.4	0.42
2001	127	10.4	0.48	4.3	0.42	6.6	0.44	8.7	0.46
2002	194	9.9	0.42	3.3	0.32	5.3	0.34	7.5	0.38
2003	205	10.4	0.44	3.7	0.36	5.9	0.38	7.9	0.41
2004	193	9.8	0.46	3.4	0.35	5.3	0.38	7.4	0.42
2005	184	9.2	0.42	3.0	0.31	4.8	0.34	6.9	0.38
2006	207	10.3	0.48	3.3	0.35	5.4	0.39	7.8	0.45
2007	208	9.0	0.42	3.3	0.36	5.1	0.38	6.9	0.41
2008	227	9.8	0.50	3.3	0.41	5.2	0.43	7.0	0.45
2009	235	10.1	0.55	3.7	0.46	5.6	0.48	7.5	0.51
2010	224	9.6	0.55	3.1	0.45	5.0	0.47	6.8	0.50
2011	217	9.2	0.53	2.9	0.40	4.7	0.44	6.4	0.48
2012	205	8.7	0.56	2.9	0.44	4.5	0.47	6.1	0.51
1998-2012	2768	9.6	0.47	3.4	0.38	5.3	0.41	7.2	0.44

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	2	0.0	0.0			0.0	2	0.1	0.1
25-29	2	0.0	0.1	1	0.0	0.0	1	0.0	0.1
30-34	5	0.1	0.1	4	0.1	0.1	1	0.0	0.1
35-39	24	0.4	0.5	15	0.4	0.5	9	0.3	0.5
40-44	58	0.9	1.3	40	1.0	1.5	18	0.7	1.1
45-49	123	1.8	3.2	64	1.6	3.1	59	2.1	3.3
50-54	236	3.5	6.6	157	3.9	7.0	79	2.9	6.1
55-59	430	6.4	13.0	303	7.6	14.6	127	4.6	10.7
60-64	709	10.5	23.5	503	12.6	27.2	206	7.4	18.1
65-69	880	13.0	36.5	626	15.7	42.8	254	9.2	27.3
70-74	1109	16.4	52.9	734	18.4	61.2	375	13.5	40.8
75-79	1077	15.9	68.8	662	16.6	77.7	415	15.0	55.8
80-84	1018	15.0	83.8	474	11.9	89.6	544	19.6	75.5
85+	1096	16.2	100.0	417	10.4	100.0	679	24.5	100.0
All ages	6769	100.0		4000	100.0		2769	100.0	

Included in the statistics are 28.6% multiple primaries in males and 25.5% 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	0.0		0.1	0.25		4.3
25-29	1	1	0.1	0.13	0.1	0.08	1.0	0.9
30-34	4	1	0.2	0.15	0.0	0.05	2.3	0.5
35-39	15	9	0.6	0.26	0.4	0.25	3.9	1.8
40-44	40	18	1.7	0.27	0.8	0.16	4.9	1.7
45-49	64	59	3.0	0.23	2.8	0.29	3.8	3.1
50-54	157	79	8.5	0.28	4.2	0.23	5.1	2.7
55-59	303	127	17.8	0.32	7.1	0.28	5.5	2.9
60-64	503	206	30.5	0.37	11.8	0.32	6.0	3.4
65-69	626	254	42.7	0.42	15.8	0.37	5.6	3.3
70-74	734	375	63.3	0.52	27.2	0.47	5.9	4.2
75-79	662	415	87.9	0.64	37.9	0.50	5.5	4.2
80-84	474	544	104.4	0.76	63.0	0.67	4.8	5.2
85+	417	679	134.5	0.91	82.9	0.78	5.2	5.4
All ages	4000	2769					5.4	4.1
Mortality								
Raw			14.6	0.48	9.6	0.47		
WS			7.3	0.44	3.4	0.38		
ES			11.3	0.46	5.3	0.41		
BRD-S			15.2	0.50	7.2	0.44		
PYLL-70								
per 100,000			60.9		30.3			
ES			53.2		25.8			
AYLL-70			8.8		9.8			

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	22	1.4	19	86.4			3	13.6
C15 Oesophagus	21	1.4	3	14.3	4	19.0	14	66.7
C16 Stomach	64	4.2	18	28.1	10	15.6	36	56.3
C17 Small intestine	12	0.8	1	8.3	2	16.7	9	75.0
C18 Colon	244	15.9	55	22.5	114	46.7	75	30.7
C22 Liver	37	2.4	1	2.7	5	13.5	31	83.8
C23-C24 Bile	13	0.8					13	100.0
C25 Pancreas	45	2.9	2	4.4	8	17.8	35	77.8
C32 Larynx	20	1.3	15	75.0	1	5.0	4	20.0
C33-C34 Lung	151	9.9	21	13.9	19	12.6	111	73.5
C38,C45 Mesothelioma	11	0.7			1	9.1	10	90.9
C43 Malign. melanoma	68	4.4	44	64.7			24	35.3
C44 Skin others	71	4.6	33	46.5	8	11.3	30	42.3
C61 Prostate	336	21.9	180	53.6	33	9.8	123	36.6
C64 Kidney	53	3.5	25	47.2	16	30.2	12	22.6
C67 Bladder	116	7.6	46	39.7	8	6.9	62	53.4
C70-C72 CNS cancer	29	1.9	9	31.0	2	6.9	18	62.1
C76-C79 CUP	12	0.8	2	16.7	3	25.0	7	58.3
C82-C85 NHL	57	3.7	27	47.4	7	12.3	23	40.4
C90 Mult. myeloma	16	1.0	7	43.8			9	56.3
C91-C96 Leukaemia	29	1.9	9	31.0	4	13.8	16	55.2
Other primaries	104	6.8	47	45.2	9	8.7	48	46.2
All mult. primaries	1531	100.0	564	36.8	254	16.6	713	46.6

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 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	35	3.9	16	45.7	3	8.6	16	45.7
C18	Colon	152	16.8	46	30.3	70	46.1	36	23.7
C25	Pancreas	34	3.8	3	8.8	4	11.8	27	79.4
C33-C34	Lung	44	4.9	5	11.4	2	4.5	37	84.1
C43	Malign. melanoma	20	2.2	12	60.0	1	5.0	7	35.0
C44	Skin others	21	2.3	8	38.1	2	9.5	11	52.4
C50	Breast	213	23.5	135	63.4	17	8.0	61	28.6
C53	Cervix uteri	50	5.5	40	80.0	2	4.0	8	16.0
C54	Corpus uteri	65	7.2	43	66.2			22	33.8
C56	Ovary	50	5.5	16	32.0	12	24.0	22	44.0
C64	Kidney	22	2.4	12	54.5	4	18.2	6	27.3
C67	Bladder	34	3.8	16	47.1	2	5.9	16	47.1
C70-C72	CNS cancer	15	1.7	5	33.3	5	33.3	5	33.3
C73	Thyroid	10	1.1	7	70.0	1	10.0	2	20.0
C82-C85	NHL	18	2.0	5	27.8	4	22.2	9	50.0
C90	Mult. myeloma	17	1.9	4	23.5	1	5.9	12	70.6
C91-C96	Leukaemia	15	1.7	3	20.0	2	13.3	10	66.7
Other primaries		90	9.9	25	27.8	16	17.8	49	54.4
All mult. primaries		905	100.0	401	44.3	148	16.4	356	39.3

Multiple primaries with number of cases n<9 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	0.0		0.1	0.25		4.7
25-29	1	1	0.1	0.14	0.1	0.08	1.1	1.0
30-34	4	1	0.2	0.15	0.0	0.05	2.3	0.5
35-39	14	9	0.6	0.25	0.4	0.26	3.9	2.0
40-44	39	17	1.6	0.28	0.7	0.17	5.2	1.8
45-49	62	54	2.9	0.23	2.6	0.28	4.0	3.3
50-54	145	70	7.8	0.28	3.7	0.23	5.4	2.9
55-59	264	114	15.5	0.31	6.4	0.29	5.5	3.0
60-64	438	177	26.6	0.36	10.2	0.32	6.2	3.6
65-69	537	222	36.6	0.43	13.8	0.39	5.9	3.6
70-74	601	305	51.9	0.54	22.1	0.45	6.1	4.3
75-79	498	339	66.1	0.64	31.0	0.50	5.4	4.3
80-84	366	444	80.6	0.78	51.4	0.68	4.9	5.3
85+	324	544	104.5	0.96	66.4	0.76	5.3	5.3
All ages	3293	2299					5.6	4.2
Mortality								
Raw			12.0	0.47	8.0	0.47		
WS			6.1	0.43	2.8	0.38		
ES			9.4	0.45	4.4	0.40		
BRD-S			12.4	0.49	6.0	0.43		
PYLL-70								
per 100,000			54.8		27.2			
ES			47.9		23.2			
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 1998-2012
(**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	0.0		0.1	0.25		5.0
25-29	1	1	0.1	0.14	0.1	0.08	1.2	1.0
30-34	4	1	0.2	0.15	0.0	0.05	2.4	0.6
35-39	13	9	0.6	0.24	0.4	0.26	3.8	2.2
40-44	37	17	1.5	0.28	0.7	0.18	5.2	2.0
45-49	59	51	2.7	0.23	2.4	0.28	4.1	3.5
50-54	139	64	7.5	0.28	3.4	0.22	5.7	2.9
55-59	238	104	14.0	0.30	5.8	0.28	5.5	3.1
60-64	406	159	24.6	0.37	9.1	0.31	6.5	3.7
65-69	476	188	32.4	0.43	11.7	0.36	6.0	3.5
70-74	485	269	41.9	0.49	19.5	0.43	5.9	4.4
75-79	409	300	54.3	0.58	27.4	0.48	5.5	4.5
80-84	272	384	59.9	0.63	44.5	0.62	4.6	5.5
85+	243	483	78.4	0.76	59.0	0.70	4.9	5.5
All ages	2782	2032					5.5	4.3
Mortality								
Raw			10.1	0.43	7.1	0.44		
WS			5.3	0.40	2.5	0.36		
ES			8.0	0.42	3.9	0.38		
BRD-S			10.4	0.45	5.4	0.41		
PYLL-70								
per 100,000			50.9		25.1			
ES			44.5		21.5			
AYLL-70			9.2		10.3			

* See corresponding tables with multiple primaries.

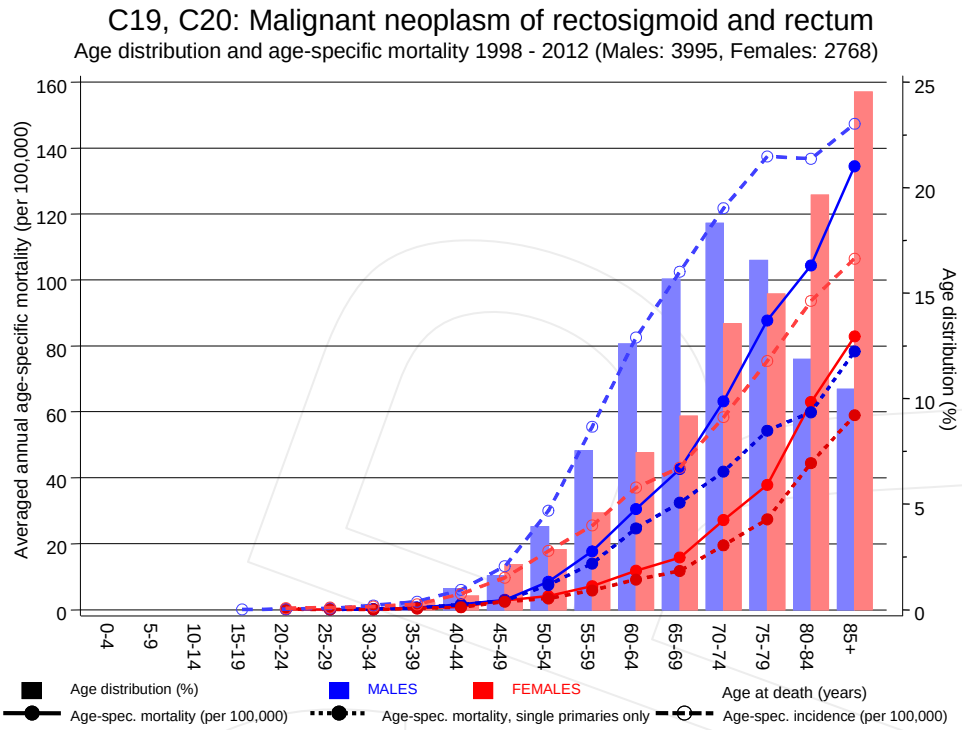
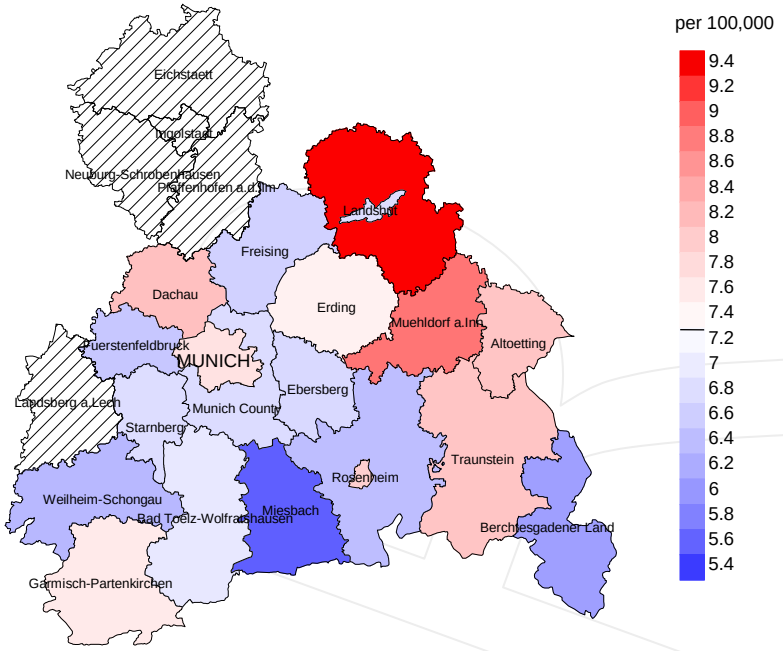


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at rectal 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

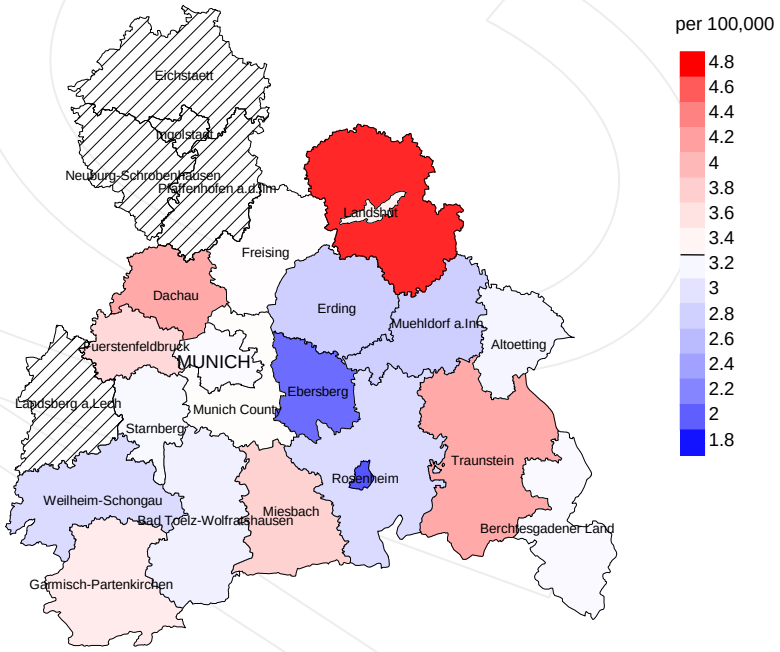
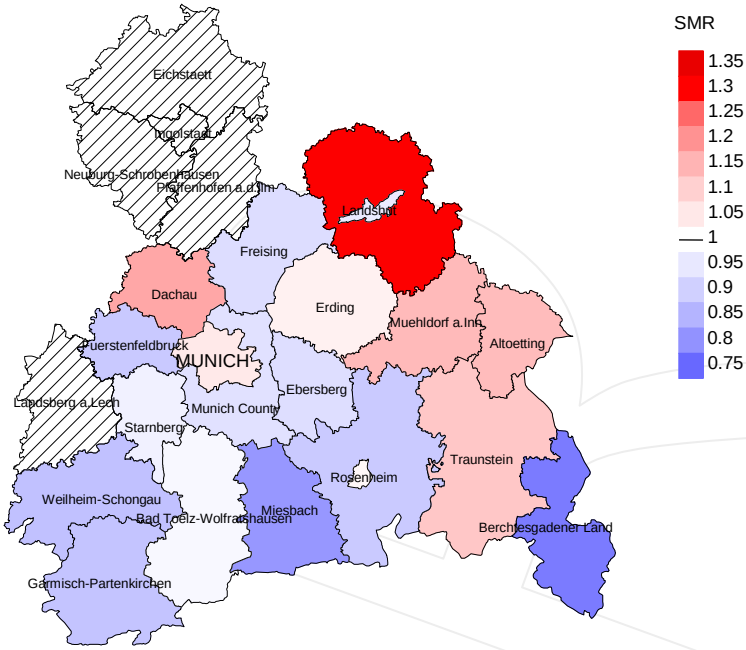


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 7.3/100,000 WS N=1,679, females 3.3/100,000 WS N=1,166). 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 22 women died from rectal cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.0 and 3.9/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

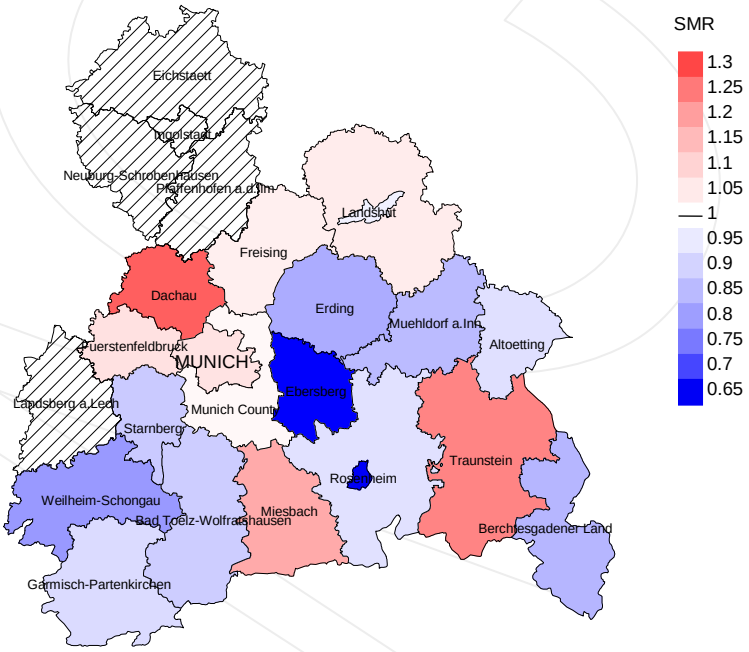


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,679, females N=1,166). 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 22 women died from rectal cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.67. Though, the value of this parameter may vary with an underlying probability of 99% between 0.36 and 1.14, 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

Recommended Citation

Munich Cancer Registry. Baseline statistics C19, C20: Rectal cancer [Internet]. 2014 [updated 2014 Mar 20; cited 2014 May 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C1920E.pdf

Copyright

Disclaimer

Index of figures and tables