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

C15-C26: GI cancer

Year of diagnosis	1998-2012
Patients	74,179
Diseases	76,413
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C1526E.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
C15	Oesophagus
C16	Stomach
C17	Small intestine
C18	Colon
C19	Rectosigmoid junction
C20	Rectum
C21	Anus and anal canal
C22	Liver and intrahepatic bile ducts
C23	Gallbladder
C24	Other and unspecified parts of biliary tract
C25	Pancreas
C26	Other and ill-defined digestive organs

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	3201	376	11.7	19.9	79.5	98.6	
1999	3256	408	12.5	20.2	79.1	98.2	
2000	3042	416	13.7	21.9	77.9	98.7	
2001	3335	466	14.0	22.1	75.1	97.9	
2002	5713	1105	19.3	22.2	77.6	98.6	#
2003	5490	880	16.0	22.5	73.2	98.4	#
2004	5538	790	14.3	22.5	72.5	97.8	#
2005	5457	736	13.5	24.7	71.9	97.4	#
2006	5618	603	10.7	24.4	67.6	96.1	#
2007	6324	714	11.3	23.1	66.5	88.6	# ##
2008	6323	695	11.0	24.3	63.6	78.6	
2009	6258	656	10.5	23.9	59.9	76.9	
2010	5976	632	10.6	24.1	57.0	76.5	
2011	5850	607	10.4	24.0	51.1	78.3	
2012	5032	618	12.3	24.3	40.9	97.0	###
1998-2012	76413	9702	12.7	23.2	66.2	90.6	

\# 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	3201	1659	1542	51.8
1999	3256	1719	1537	52.8
2000	3042	1633	1409	53.7
2001	3335	1784	1551	53.5
2002	5713	3068	2645	53.7
2003	5490	2969	2521	54.1
2004	5538	2995	2543	54.1
2005	5457	2959	2498	54.2
2006	5618	3112	2506	55.4
2007	6324	3576	2748	56.5
2008	6323	3548	2775	56.1
2009	6258	3579	2679	57.2
2010	5976	3396	2580	56.8
2011	5850	3320	2530	56.8
2012	5032	2830	2202	56.2
1998-2012	76413	42147	34266	55.2

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 4.52 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	1659	1542	149.7	131.1	90.0	54.7	136.0	83.0	178.3	109.8
1999	1719	1537	153.6	129.5	90.8	53.2	137.6	80.9	180.6	107.3
2000	1633	1409	143.4	117.3	84.2	47.2	127.5	72.6	164.7	96.7
2001	1784	1551	153.9	127.5	90.0	54.2	135.3	81.6	174.3	106.1
2002	3068	2645	164.7	135.1	92.2	53.5	139.2	81.6	181.0	108.1
2003	2969	2521	158.4	128.0	86.9	51.3	131.4	78.0	171.3	102.0
2004	2995	2543	159.2	128.6	85.8	52.8	129.4	79.2	168.6	102.6
2005	2959	2498	156.2	125.5	82.6	49.2	124.1	74.3	161.7	98.0
2006	3112	2506	162.5	124.7	85.3	49.6	127.8	74.8	165.5	97.9
2007	3576	2748	161.4	119.0	84.5	46.8	126.1	70.6	163.3	92.1
2008	3548	2775	159.4	119.6	81.0	46.7	121.4	70.3	157.6	91.7
2009	3579	2679	160.4	115.2	79.6	44.6	119.5	67.2	155.4	88.1
2010	3396	2580	150.7	110.2	74.6	41.7	111.8	63.0	144.5	83.3
2011	3320	2530	145.3	107.2	70.4	41.5	105.4	62.1	137.1	80.3
2012	2830	2202	123.9	93.3	60.5	36.9	90.6	54.8	117.1	70.8
1998-2012	42147	34266	153.5	119.4	80.6	47.2	121.1	71.3	157.1	93.4

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	3201	70.3	12.7	13.2	102	53.4	61.0	71.6	79.4	86.3
1999	3256	70.7	12.6	10.8	102	54.6	62.0	71.6	79.6	86.5
2000	3042	70.6	12.5	21.7	103	54.4	61.8	71.7	79.5	86.9
2001	3335	70.1	12.7	0.6	103	53.9	61.6	70.6	79.5	86.7
2002	5713	71.1	12.3	17.7	104	55.1	62.7	72.1	80.3	87.0
2003	5490	71.1	12.1	10.9	101	55.6	63.1	71.9	80.2	86.3
2004	5538	70.7	12.3	3.1	101	54.7	62.9	71.1	79.9	85.5
2005	5457	71.3	12.3	1.0	100	55.9	63.7	71.6	80.4	86.0
2006	5618	70.8	12.2	12.3	102	54.9	63.2	71.4	80.1	85.6
2007	6324	70.8	12.4	0.3	103	54.3	63.5	71.4	80.2	86.1
2008	6323	71.2	12.4	1.1	105	55.0	63.9	71.9	80.4	86.3
2009	6258	71.2	12.3	3.7	102	54.6	63.9	72.0	80.3	86.3
2010	5976	71.4	12.4	0.8	103	54.5	63.6	72.2	80.8	86.2
2011	5850	71.4	12.6	0.7	101	54.3	64.0	72.5	80.7	86.8
2012	5032	71.2	12.5	0.0	101	54.8	63.6	72.5	80.0	86.2
1998-2012	76413	71.0	12.4	0.0	105	54.7	63.1	71.8	80.2	86.3

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	1659	67.9	12.1	16.5	98.1	52.3	58.9	68.6	76.7	84.0
1999	1719	68.3	11.9	10.8	97.4	53.8	60.2	68.8	76.9	83.6
2000	1633	68.4	11.6	25.1	97.8	53.9	60.4	68.6	76.7	84.3
2001	1784	68.0	11.8	14.5	102	53.5	60.6	67.9	76.7	83.5
2002	3068	69.0	11.3	20.9	98.5	54.4	61.6	69.3	76.8	82.8
2003	2969	69.2	11.3	17.9	99.4	55.0	62.4	69.4	76.9	83.0
2004	2995	69.1	11.3	22.5	101	54.4	62.0	69.2	77.1	83.7
2005	2959	69.2	11.3	19.0	99.6	55.0	62.4	69.3	77.3	83.5
2006	3112	69.0	11.3	12.3	102	54.7	62.2	69.3	77.1	83.0
2007	3576	69.0	11.8	0.3	99.4	53.8	62.0	69.4	77.6	83.3
2008	3548	69.5	11.4	6.5	105	54.5	62.7	70.1	77.7	83.4
2009	3579	69.7	11.4	3.7	102	54.1	62.8	70.8	77.8	83.4
2010	3396	69.7	11.6	0.8	98.9	54.3	62.1	70.6	78.1	83.8
2011	3320	70.1	11.6	0.8	97.3	54.2	63.4	71.4	78.2	84.3
2012	2830	70.0	11.4	0.0	101	55.1	63.0	71.3	77.9	83.7
1998-2012	42147	69.2	11.5	0.0	105	54.2	62.0	69.8	77.4	83.5

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	1542	72.8	12.8	13.2	102	54.5	64.3	75.0	83.0	87.7
1999	1537	73.3	12.9	18.8	102	55.8	64.6	75.1	82.9	88.5
2000	1409	73.2	13.0	21.7	103	55.5	64.1	75.7	82.3	88.5
2001	1551	72.4	13.3	0.6	103	54.9	63.3	74.6	81.8	88.8
2002	2645	73.7	12.8	17.7	104	56.0	65.0	76.0	82.5	89.0
2003	2521	73.4	12.6	10.9	101	56.4	64.5	75.4	82.7	88.6
2004	2543	72.6	13.1	3.1	100	55.1	64.3	74.3	82.8	88.0
2005	2498	73.8	12.9	1.0	100	57.2	65.4	75.5	83.1	89.7
2006	2506	73.1	12.9	20.4	99.2	55.0	64.9	75.0	83.1	87.4
2007	2748	73.3	12.9	17.8	103	55.3	65.6	74.7	83.2	87.7
2008	2775	73.5	13.2	1.1	102	55.4	65.4	74.7	83.7	88.3
2009	2679	73.3	13.1	15.9	102	55.2	65.5	75.0	83.4	88.2
2010	2580	73.6	13.0	14.9	103	55.4	66.4	75.3	83.4	88.2
2011	2530	73.2	13.5	0.7	101	54.5	65.2	74.7	83.6	88.7
2012	2202	72.6	13.6	13.7	101	54.2	65.0	74.3	82.9	88.5
1998-2012	34266	73.2	13.0	0.6	104	55.4	65.0	75.0	83.0	88.4

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.%
0-4	16	0.0	0.0	8	0.0	0.0	8	0.0	0.0
5-9	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
10-14	9	0.0	0.0	4	0.0	0.0	5	0.0	0.0
15-19	32	0.0	0.1	9	0.0	0.1	23	0.1	0.1
20-24	47	0.1	0.1	14	0.0	0.1	33	0.1	0.2
25-29	124	0.2	0.3	55	0.1	0.2	69	0.2	0.4
30-34	253	0.3	0.6	129	0.3	0.5	124	0.4	0.8
35-39	504	0.7	1.3	289	0.7	1.2	215	0.6	1.4
40-44	1081	1.4	2.7	610	1.4	2.7	471	1.4	2.8
45-49	2123	2.8	5.5	1241	2.9	5.6	882	2.6	5.3
50-54	3728	4.9	10.4	2263	5.4	11.0	1465	4.3	9.6
55-59	5986	7.8	18.2	3866	9.2	20.1	2120	6.2	15.8
60-64	8973	11.7	29.9	5792	13.7	33.9	3181	9.3	25.1
65-69	10878	14.2	44.2	7026	16.7	50.6	3852	11.2	36.3
70-74	11923	15.6	59.8	7228	17.1	67.7	4695	13.7	50.0
75-79	11266	14.7	74.5	6101	14.5	82.2	5165	15.1	65.1
80-84	9828	12.9	87.4	4353	10.3	92.5	5475	16.0	81.1
85+	9639	12.6	100.0	3157	7.5	100.0	6482	18.9	100.0
All ages	76413	100.0		42147	100.0		34266	100.0	

Included in the statistics are 27.3% multiple primaries in males and 23.0% 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=4313 %	Females DCO rate n=5261 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	8	8	0.6	0.6	12.5		2.6	3.5
5- 9	2	1	0.1	0.1			1.2	0.9
10-14	4	5	0.3	0.4			2.7	3.1
15-19	9	23	0.6	1.7			2.8	8.6
20-24	14	33	0.9	2.0	21.4		2.5	6.8
25-29	53	69	2.9	3.7		1.4	6.0	6.8
30-34	129	123	6.1	6.0	1.6	2.4	9.1	6.5
35-39	285	214	12.2	9.7	2.1	3.7	13.5	6.1
40-44	608	469	25.1	20.4	2.1	1.3	20.3	8.1
45-49	1228	876	57.0	41.4	3.7	2.5	24.9	11.0
50-54	2233	1457	120.8	77.1	6.2	2.9	27.8	14.3
55-59	3812	2097	224.3	117.7	5.2	3.7	28.2	16.4
60-64	5692	3140	345.4	180.4	6.1	4.6	27.8	19.5
65-69	6892	3805	469.7	237.2	7.3	6.4	26.8	21.5
70-74	7065	4619	609.7	335.0	8.2	8.7	28.8	27.3
75-79	5979	5084	793.5	464.8	12.1	13.8	31.6	31.3
80-84	4241	5388	933.9	623.9	18.2	21.0	33.8	36.4
85+	3097	6397	998.6	781.0	31.6	38.8	33.7	40.0
All ages	41351	33808			10.4	15.6	28.2	23.8
Incidence								
Raw			150.6	117.8				
WS			79.2	46.6				
ES			118.9	70.4				
BRD-S			154.1	92.2				

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	1.7	1.8	0.4	5.3		0.2	
C03-C06	Oral cavity	26	11.0	2.4	1.5	3.5	#	1.9	3.8
C07-C08	Salivary gland	5	3.2	1.6	0.5	3.7		0.2	
C09-C10	Oropharynx	36	13.4	2.7	1.9	3.7	#	2.9	2.8
C12-C13	Hypopharynx	14	7.6	1.9	1.0	3.1	#	0.8	7.1
C15	Oesophagus	47	24.0	2.0	1.4	2.6	#	3.0	12.8
C16	Stomach	125	63.7	2.0	1.6	2.3	#	8.0	8.0
C17	Small intestine	46	6.6	7.0	5.1	9.3	#	5.1	2.2
C18	Colon	388	148.7	2.6	2.4	2.9	#	31.1	3.6
C19-C20	Rectum	177	80.0	2.2	1.9	2.6	#	12.6	2.3
C21	Anus/canal	8	2.7	2.9	1.3	5.7	#	0.7	12.5
C22	Liver	95	39.1	2.4	2.0	3.0	#	7.3	23.2
C23-C24	Bile	31	14.1	2.2	1.5	3.1	#	2.2	12.9
C25	Pancreas	112	51.2	2.2	1.8	2.6	#	7.9	23.2
C32	Larynx	28	14.1	2.0	1.3	2.9	#	1.8	14.3
C33-C34	Lung	350	169.3	2.1	1.9	2.3	#	23.5	15.4
C38,C45	Mesothelioma	12	9.3	1.3	0.7	2.2		0.3	
C43	Malign. melanoma	91	52.5	1.7	1.4	2.1	#	5.0	1.1
C46,C49	Soft tissue	18	7.5	2.4	1.4	3.8	#	1.4	5.6
C48	Peritoneal	3	1.0	3.1	0.6	9.1		0.3	66.7
C50	Breast	10	3.6	2.8	1.3	5.1	#	0.8	40.0
C60	Penis	6	3.3	1.8	0.7	4.0		0.4	
C61	Prostate	655	434.9	1.5	1.4	1.6	#	28.6	9.8
C62	Testis	10	2.9	3.4	1.7	6.3	#	0.9	10.0
C64	Kidney	136	49.1	2.8	2.3	3.3	#	11.3	6.6
C65	Renal pelvis	17	5.9	2.9	1.7	4.6	#	1.4	
C66	Ureter	12	3.3	3.7	1.9	6.4	#	1.1	
C67	Bladder	119	66.6	1.8	1.5	2.1	#	6.8	7.6
C68	Urinary org.	3	0.8	3.9	0.8	11.3		0.3	66.7
C70-C72	CNS cancer	34	18.4	1.8	1.3	2.6	#	2.0	29.4
C73	Thyroid	15	8.3	1.8	1.0	3.0	#	0.9	13.3
C76-C79	CUP	36	25.1	1.4	1.0	2.0	#	1.4	2.8
C81	Hodgkin lymphoma	6	2.6	2.3	0.8	5.0		0.4	16.7
C82-C85	NHL	110	57.3	1.9	1.6	2.3	#	6.9	6.4
C90	Mult. myeloma	30	18.5	1.6	1.1	2.3	#	1.5	23.3
C91-C96	Leukaemia	42	23.7	1.8	1.3	2.4	#	2.4	45.2
Other primaries		14	13.7	1.0	0.6	1.7		0.0	14.3
Not observed		0	1.8	0.0	0.0	2.0		-0.2	
All mult. primaries		2870	1460.7	2.0	1.9	2.0	#	183.3	10.1

Patients	26987
Mean age at second malignancy (years)	72.5
Person-years	76889
Mean observation time (years)	2.8
Median observation time (years)	1.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 2 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 %
C03-C06	Oral cavity	5	4.7	1.1	0.3	2.5		0.0	
C09-C10	Oropharynx	14	2.9	4.8	2.6	8.1	#	1.7	
C12-C13	Hypopharynx	4	0.8	5.1	1.4	13.1	#	0.5	25.0
C15	Oesophagus	7	4.5	1.6	0.6	3.2		0.4	14.3
C16	Stomach	71	36.6	1.9	1.5	2.4	#	5.3	28.2
C17	Small intestine	30	3.6	8.3	5.6	11.8	#	4.1	3.3
C18	Colon	279	97.5	2.9	2.5	3.2	#	27.9	7.5
C19-C20	Rectum	96	40.3	2.4	1.9	2.9	#	8.6	8.3
C21	Anus/canal	7	4.4	1.6	0.6	3.3		0.4	
C22	Liver	28	10.3	2.7	1.8	3.9	#	2.7	42.9
C23-C24	Bile	26	14.3	1.8	1.2	2.7	#	1.8	23.1
C25	Pancreas	83	40.6	2.0	1.6	2.5	#	6.5	24.1
C32	Larynx	5	1.4	3.6	1.2	8.4	#	0.6	
C33-C34	Lung	153	56.4	2.7	2.3	3.2	#	14.9	11.8
C38,C45	Mesothelioma	3	1.6	1.9	0.4	5.5		0.2	
C43	Malign. melanoma	49	26.9	1.8	1.3	2.4	#	3.4	
C46,C49	Soft tissue	11	4.7	2.4	1.2	4.2	#	1.0	
C48	Peritoneal	7	2.6	2.7	1.1	5.6	#	0.7	42.9
C50	Breast	399	235.9	1.7	1.5	1.9	#	25.1	8.0
C51	Vulva	20	9.0	2.2	1.4	3.4	#	1.7	5.0
C52	Vagina	5	1.8	2.8	0.9	6.5		0.5	20.0
C53	Cervix uteri	26	10.4	2.5	1.6	3.7	#	2.4	26.9
C54	Corpus uteri	90	44.9	2.0	1.6	2.5	#	6.9	4.4
C55,C57	Fem. genitals un	5	2.8	1.8	0.6	4.1		0.3	40.0
C56	Ovary	110	35.5	3.1	2.5	3.7	#	11.5	29.1
C64	Kidney	69	21.6	3.2	2.5	4.0	#	7.3	15.9
C65	Renal pelvis	7	2.7	2.6	1.0	5.3	#	0.7	
C67	Bladder	36	18.5	2.0	1.4	2.7	#	2.7	19.4
C70-C72	CNS cancer	17	11.7	1.4	0.8	2.3		0.8	52.9
C73	Thyroid	19	12.1	1.6	0.9	2.5		1.1	10.5
C74-C80	Cancer others	4	4.9	0.8	0.2	2.1		-0.1	75.0
C76-C79	CUP	15	17.4	0.9	0.5	1.4		-0.4	6.7
C82-C85	NHL	70	34.1	2.1	1.6	2.6	#	5.5	17.1
C90	Mult. myeloma	17	11.1	1.5	0.9	2.4		0.9	23.5
C91-C96	Leukaemia	37	14.3	2.6	1.8	3.6	#	3.5	43.2
Other primaries		17	10.1	1.7	1.0	2.7		1.1	11.8
Not observed		0	2.0	0.0	0.0	1.8		-0.3	
All mult. primaries		1841	855.1	2.2	2.1	2.3	#	151.7	14.0

Patients	22139
Mean age at second malignancy (years)	74.7
Person-years	64992
Mean observation time (years)	2.9
Median observation time (years)	1.6

The occurrence of second malignancy is statistically significant.

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

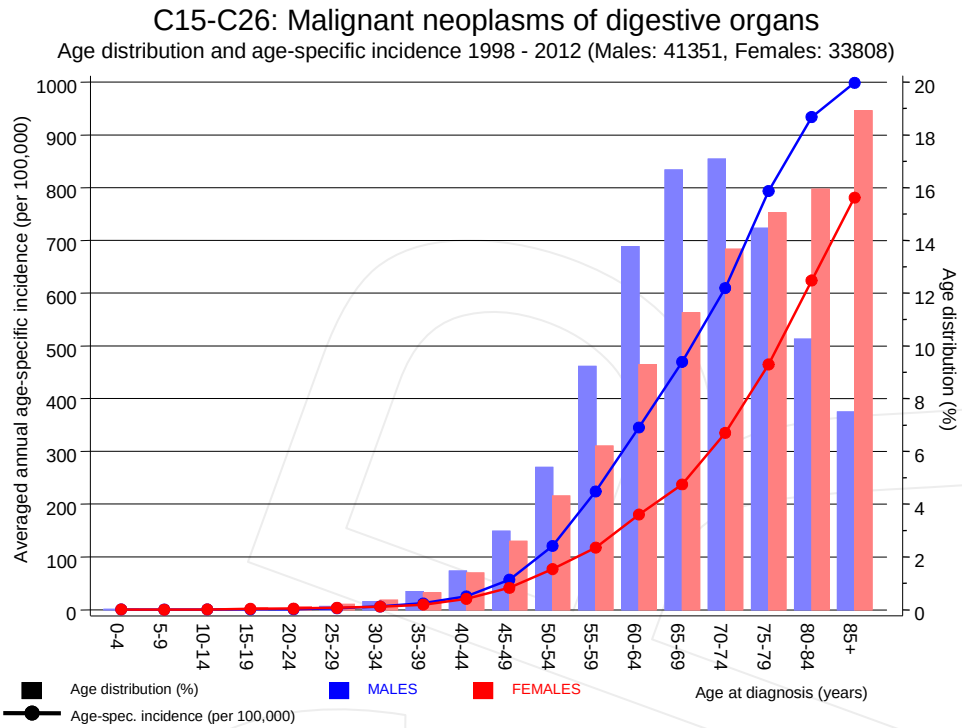


Figure 7. Age distribution and age-specific incidence

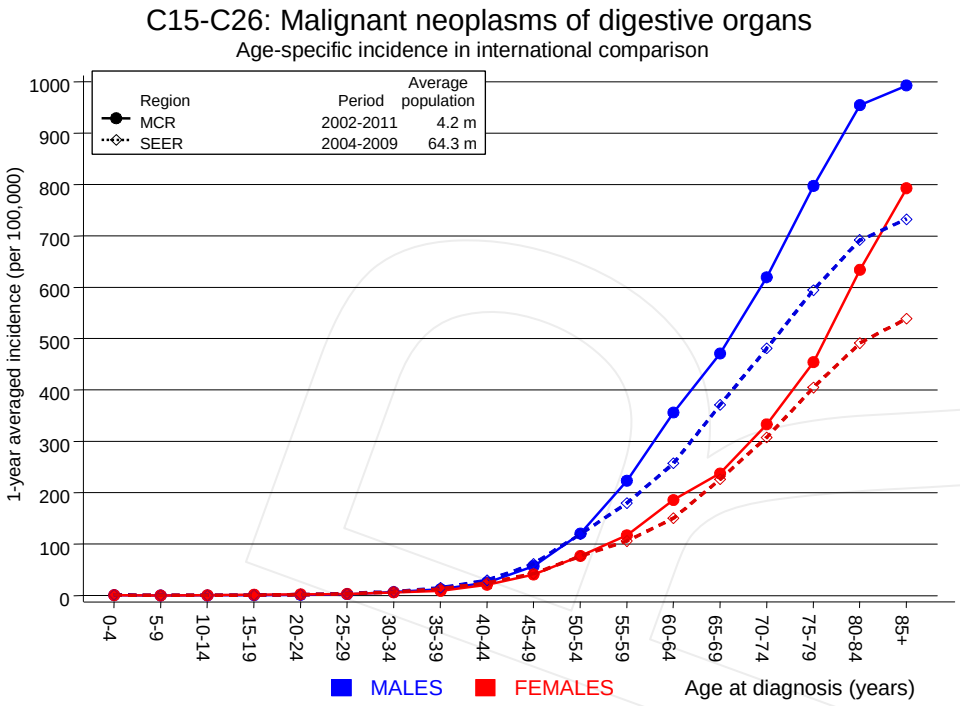


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

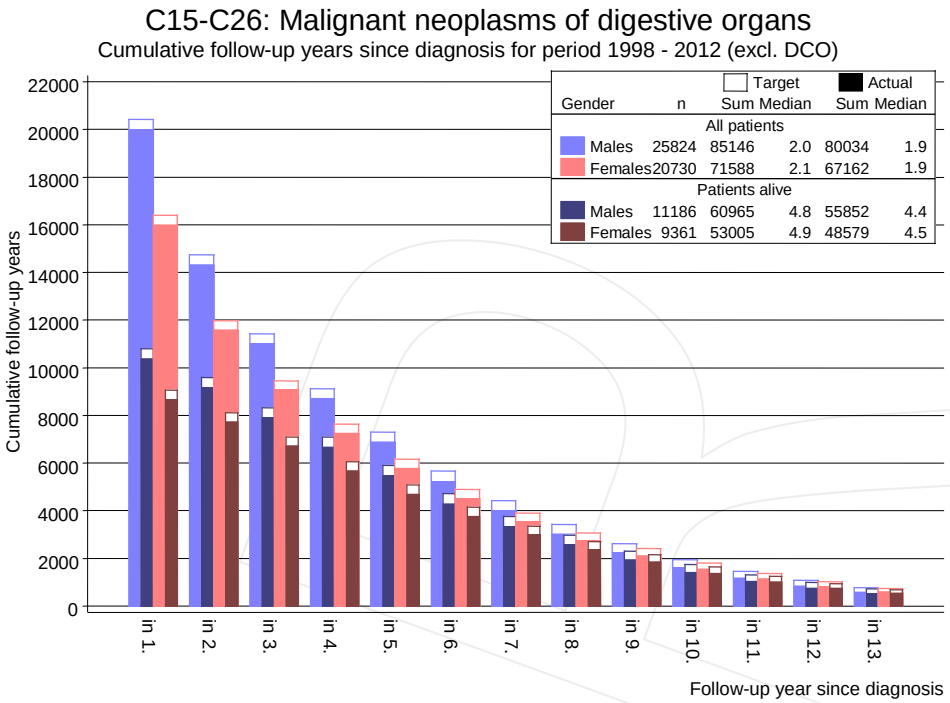
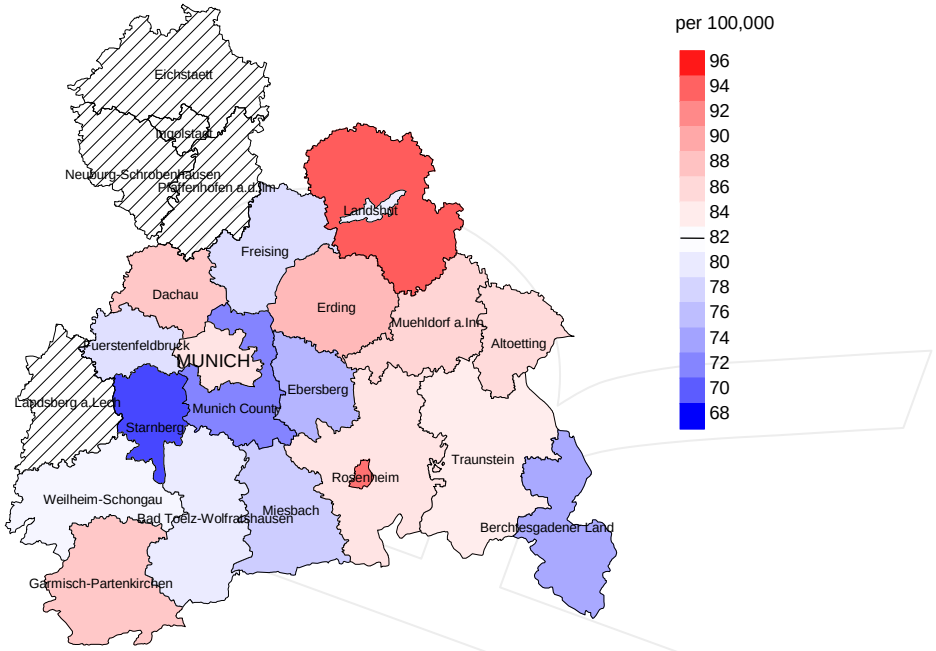


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

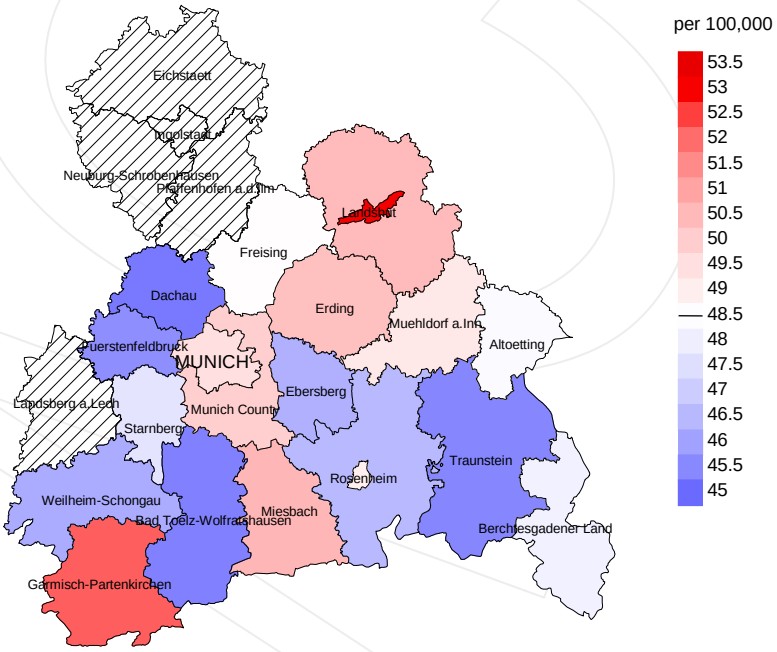
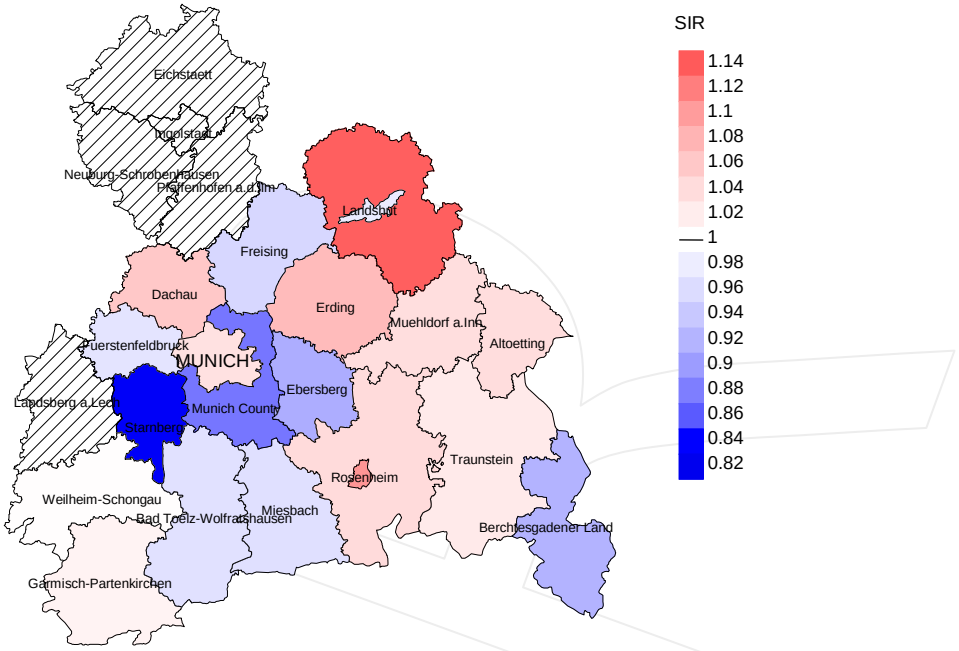


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 82.1/100,000 WS N=17,875, females 48.5/100,000 WS N=14,694). 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 391 women were identified with newly diagnosed GI cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 46.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 39.9 and 53.9/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

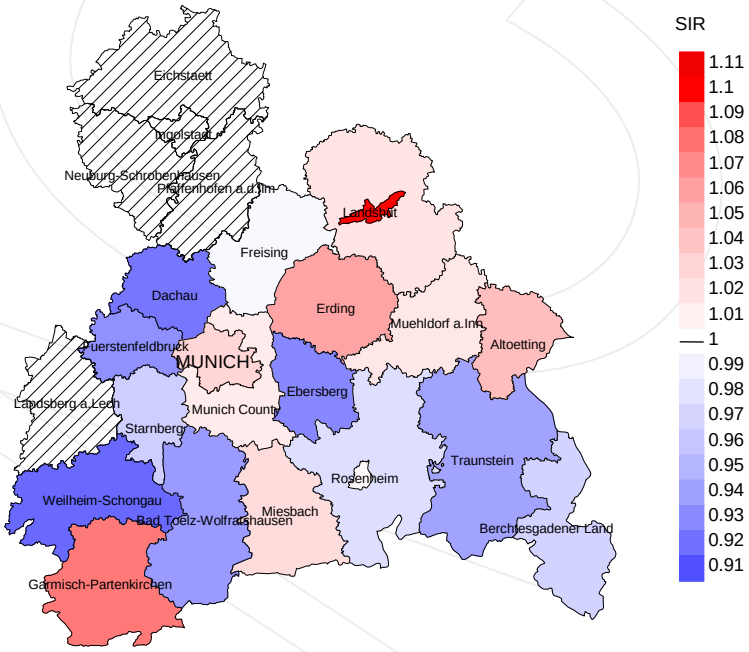


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=17,875, females N=14,694). 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 391 women were identified with newly diagnosed GI cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.81 and 1.06, 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	3201	98.6	11.7	2545	79.5	93.7
1999	3256	98.2	12.5	2575	79.1	94.6
2000	3042	98.7	13.7	2370	77.9	96.4
2001	3335	97.9	14.0	2505	75.1	96.2
2002	5713	98.6	19.3	4435	77.6	97.7
2003	5490	98.4	16.0	4018	73.2	98.1
2004	5538	97.8	14.3	4015	72.5	97.7
2005	5457	97.4	13.5	3925	71.9	98.5
2006	5618	96.1	10.7	3796	67.6	98.7
2007	6324	88.6	11.3	4208	66.5	98.7
2008	6323	78.6	11.0	4020	63.6	98.6
2009	6258	76.9	10.5	3751	59.9	98.7
2010	5976	76.5	10.6	3407	57.0	98.4
2011	5850	78.3	10.4	2988	51.1	98.2
2012	5032	97.0	12.3	2056	40.9	96.6
1998-2012	76413	90.6	12.7	50614	66.2	97.6

Table 10b

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

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	3201	2177	92.5	938	29.3
1999	3256	2261	92.2	979	30.1
2000	3042	2204	95.1	881	29.0
2001	3335	2353	95.6	969	29.1
2002	5713	3373	98.2	1968	34.4
2003	5490	3456	97.8	1679	30.6
2004	5538	3516	98.1	1613	29.1
2005	5457	3715	97.0	1606	29.4
2006	5618	3866	97.8	1609	28.6
2007	6324	4091	98.1	1759	27.8
2008	6323	4253	98.7	1832	29.0
2009	6258	4315	98.7	1714	27.4
2010	5976	4428	98.8	1673	28.0
2011	5850	4461	98.7	1700	29.1
2012	5032	4314	99.3	1565	31.1
1998-2012	76413	52783	97.6	22485	29.4

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	2177	76.3	23.7	91.3
1999	2261	80.0	20.0	91.6
2000	2204	81.7	18.3	91.2
2001	2353	78.4	21.6	91.0
2002	3373	82.9	17.1	91.8
2003	3456	81.9	18.1	91.2
2004	3516	83.4	16.6	91.0
2005	3715	81.3	18.7	89.1
2006	3866	81.4	18.6	89.6
2007	4091	80.8	19.2	89.2
2008	4253	81.3	18.7	88.5
2009	4315	79.7	20.3	87.5
2010	4428	78.1	21.9	86.5
2011	4461	77.9	22.1	86.7
2012	4314	76.8	23.2	85.6
1998-2012	52783	80.1	19.9	89.0

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	1103	71.7	70.2	76.5	71.5
1999	1183	71.5	70.2	76.9	71.2
2000	1157	72.1	70.5	79.3	71.3
2001	1222	71.3	69.9	77.2	70.7
2002	1794	71.6	70.3	78.2	71.0
2003	1886	71.8	70.5	77.8	71.3
2004	1879	72.7	71.5	79.3	72.1
2005	2029	72.1	70.8	78.9	71.3
2006	2149	73.0	71.5	79.6	72.3
2007	2277	73.0	71.6	79.0	72.3
2008	2375	73.1	71.7	79.7	72.2
2009	2427	72.9	71.5	78.5	72.1
2010	2463	73.5	71.9	79.6	72.7
2011	2554	73.6	71.9	80.0	72.8
2012	2433	74.2	72.4	80.1	73.1
1998-2012	28931	72.7	71.3	78.9	72.0

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	1074	76.6	74.8	82.3	76.7
1999	1078	77.4	75.8	83.5	77.5
2000	1047	77.2	75.9	83.1	76.8
2001	1131	77.7	75.5	84.7	77.0
2002	1579	77.6	76.2	84.5	77.1
2003	1570	77.3	75.5	84.5	76.4
2004	1637	77.5	76.1	83.9	76.8
2005	1686	77.5	75.9	83.8	76.6
2006	1717	77.9	76.5	84.5	77.2
2007	1814	77.3	75.5	84.8	76.2
2008	1878	78.0	76.1	85.3	76.9
2009	1888	78.1	76.1	85.3	76.8
2010	1965	78.3	76.1	85.5	77.0
2011	1907	78.4	76.2	85.7	77.0
2012	1881	78.4	75.9	86.4	76.8
1998-2012	23852	77.8	75.9	84.7	76.9

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	846	76.4	0.51	44.8	0.50	69.7	0.52	94.2	0.53
1999	956	85.4	0.56	49.6	0.55	77.1	0.57	104.6	0.59
2000	949	83.3	0.59	47.6	0.57	74.3	0.59	99.9	0.61
2001	982	84.7	0.56	48.5	0.55	75.2	0.56	99.0	0.58
2002	1487	79.8	0.49	44.0	0.48	67.6	0.49	89.5	0.50
2003	1567	83.6	0.54	44.7	0.52	69.2	0.53	93.0	0.55
2004	1582	84.1	0.54	43.4	0.51	67.8	0.53	92.6	0.56
2005	1682	88.8	0.58	45.2	0.56	69.6	0.57	94.2	0.60
2006	1752	91.5	0.58	45.6	0.55	71.0	0.57	96.2	0.59
2007	1860	84.0	0.53	41.1	0.50	63.8	0.52	86.5	0.54
2008	1972	88.6	0.57	42.6	0.54	66.4	0.56	90.5	0.59
2009	1960	87.8	0.56	42.4	0.54	64.9	0.55	85.9	0.56
2010	1949	86.5	0.59	40.1	0.55	62.0	0.57	83.8	0.59
2011	2017	88.3	0.62	41.1	0.59	63.2	0.61	83.9	0.62
2012	1888	82.6	0.69	37.8	0.64	58.5	0.67	79.1	0.70
1998-2012	23449	85.4	0.57	43.0	0.54	66.5	0.56	89.5	0.58

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	817	69.5	0.53	26.9	0.50	42.0	0.51	57.5	0.53
1999	855	72.1	0.56	26.3	0.50	41.7	0.52	57.7	0.54
2000	853	71.0	0.61	25.9	0.55	41.1	0.57	56.0	0.59
2001	863	70.9	0.56	26.7	0.50	42.2	0.52	57.2	0.55
2002	1311	67.0	0.50	23.8	0.45	37.5	0.47	51.4	0.48
2003	1264	64.2	0.51	23.5	0.46	36.9	0.48	50.1	0.49
2004	1350	68.3	0.54	23.9	0.46	37.8	0.48	52.0	0.51
2005	1337	67.2	0.54	23.9	0.49	37.5	0.51	50.7	0.53
2006	1399	69.6	0.57	23.7	0.48	37.6	0.51	52.1	0.54
2007	1450	62.8	0.53	22.5	0.49	34.9	0.50	47.3	0.52
2008	1486	64.0	0.54	22.1	0.48	34.8	0.50	47.2	0.52
2009	1480	63.6	0.56	21.7	0.49	34.1	0.51	46.4	0.53
2010	1510	64.5	0.59	21.7	0.53	34.0	0.55	46.1	0.56
2011	1461	61.9	0.59	20.8	0.51	32.4	0.53	44.0	0.56
2012	1428	60.5	0.66	20.8	0.57	32.4	0.60	43.6	0.63
1998-2012	18864	65.7	0.56	23.1	0.49	36.2	0.51	49.4	0.54

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.%
0-4	2	0.0	0.0	1	0.0	0.0	1	0.0	0.0
5-9	1	0.0	0.0	1	0.0	0.0			0.0
10-14	2	0.0	0.0	1	0.0	0.0	1	0.0	0.0
15-19	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
20-24	9	0.0	0.0	5	0.0	0.0	4	0.0	0.0
25-29	32	0.1	0.1	10	0.0	0.1	22	0.1	0.1
30-34	68	0.2	0.3	35	0.1	0.2	33	0.2	0.3
35-39	168	0.4	0.6	94	0.4	0.6	74	0.4	0.7
40-44	396	0.9	1.5	248	1.0	1.6	148	0.8	1.5
45-49	843	1.9	3.5	509	2.1	3.7	334	1.7	3.2
50-54	1569	3.6	7.0	1000	4.1	7.8	569	2.9	6.1
55-59	2797	6.3	13.4	1876	7.6	15.4	921	4.7	10.8
60-64	4367	9.9	23.3	2958	12.1	27.5	1409	7.2	18.0
65-69	5731	13.0	36.3	3828	15.6	43.1	1903	9.7	27.7
70-74	6796	15.4	51.7	4186	17.1	60.1	2610	13.4	41.1
75-79	7097	16.1	67.8	4011	16.3	76.5	3086	15.8	56.9
80-84	6772	15.4	83.1	3190	13.0	89.5	3582	18.3	75.2
85+	7438	16.9	100.0	2587	10.5	100.0	4851	24.8	100.0
All ages	44091	100.0		24542	100.0		19549	100.0	

Included in the statistics are 27.3% multiple primaries in males and 23.0% 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	1	1	0.1	0.13	0.1	0.13	3.2	4.3
5- 9	1		0.1	0.50	0.0		2.9	
10-14	1	1	0.1	0.25	0.1	0.20	3.0	3.6
15-19	2	1	0.1	0.22	0.1	0.04	4.8	2.9
20-24	5	4	0.3	0.36	0.2	0.12	6.0	8.5
25-29	10	22	0.5	0.18	1.2	0.32	10.4	20.2
30-34	35	33	1.7	0.27	1.6	0.27	19.9	15.5
35-39	94	74	4.0	0.33	3.3	0.34	24.5	14.9
40-44	248	148	10.2	0.41	6.4	0.31	30.6	13.8
45-49	509	334	23.6	0.41	15.8	0.38	30.0	17.8
50-54	1000	569	54.1	0.44	30.1	0.39	32.6	19.8
55-59	1876	921	110.4	0.49	51.7	0.43	33.9	20.7
60-64	2958	1409	179.5	0.51	81.0	0.44	35.5	23.3
65-69	3828	1903	260.9	0.54	118.7	0.49	34.1	24.7
70-74	4186	2610	361.3	0.58	189.3	0.56	33.9	29.0
75-79	4011	3086	532.3	0.66	282.1	0.60	33.2	31.3
80-84	3190	3582	702.5	0.73	414.8	0.65	32.2	34.3
85+	2587	4851	834.2	0.82	592.3	0.75	32.2	38.5
All ages	24542	19549					33.2	29.2
Mortality								
Raw			89.4	0.58	68.1	0.57		
WS			44.8	0.56	23.8	0.50		
ES			69.5	0.57	37.4	0.52		
BRD-S			93.8	0.60	51.1	0.55		
PYLL-70								
per 100,000			388.7		217.3			
ES			340.9		185.2			
AYLL-70			9.1		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	136	2.0	101	74.3	11	8.1	24	17.6
C09-C10 Oropharynx	152	2.2	98	64.5	18	11.8	36	23.7
C12-C13 Hypopharynx	86	1.3	54	62.8	10	11.6	22	25.6
C15 Oesophagus	61	0.9			6	9.8	55	90.2
C16 Stomach	165	2.4			37	22.4	128	77.6
C18 Colon	431	6.4			163	37.8	268	62.2
C19-C20 Rectum	221	3.3			117	52.9	104	47.1
C22 Liver	150	2.2			37	24.7	113	75.3
C25 Pancreas	204	3.0			47	23.0	157	77.0
C32 Larynx	154	2.3	117	76.0	11	7.1	26	16.9
C33-C34 Lung	762	11.2	177	23.2	147	19.3	438	57.5
C43 Malign. melanoma	265	3.9	186	70.2	4	1.5	75	28.3
C44 Skin others	349	5.1	207	59.3	29	8.3	113	32.4
C61 Prostate	1630	24.0	1069	65.6	127	7.8	434	26.6
C64 Kidney	298	4.4	162	54.4	57	19.1	79	26.5
C67 Bladder	572	8.4	334	58.4	45	7.9	193	33.7
C70-C72 CNS cancer	108	1.6	42	38.9	10	9.3	56	51.9
C76-C79 CUP	91	1.3	37	40.7	20	22.0	34	37.4
C82-C85 NHL	259	3.8	128	49.4	42	16.2	89	34.4
C90 Mult. myeloma	77	1.1	28	36.4	13	16.9	36	46.8
C91-C96 Leukaemia	140	2.1	41	29.3	16	11.4	83	59.3
Other primaries	471	6.9	194	41.2	47	10.0	230	48.8
All mult. primaries	6782	100.0	2975	43.9	1014	15.0	2793	41.2

Multiple primaries with number of cases n<60 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 ←%
C03-C06	Oral cavity	41	0.8	29	70.7	3	7.3	9	22.0
C09-C10	Oropharynx	42	0.9	25	59.5	7	16.7	10	23.8
C16	Stomach	116	2.4			18	15.5	98	84.5
C18	Colon	293	6.1			91	31.1	202	68.9
C19-C20	Rectum	131	2.7			66	50.4	65	49.6
C22	Liver	42	0.9			8	19.0	34	81.0
C23-C24	Bile	40	0.8			10	25.0	30	75.0
C25	Pancreas	167	3.5			33	19.8	134	80.2
C33-C34	Lung	284	5.9	64	22.5	34	12.0	186	65.5
C43	Malign. melanoma	144	3.0	114	79.2	7	4.9	23	16.0
C44	Skin others	146	3.0	91	62.3	13	8.9	42	28.8
C50	Breast	1432	29.7	1057	73.8	102	7.1	273	19.1
C51	Vulva	47	1.0	28	59.6	2	4.3	17	36.2
C53	Cervix uteri	166	3.4	127	76.5	13	7.8	26	15.7
C54	Corpus uteri	306	6.3	227	74.2	18	5.9	61	19.9
C56	Ovary	314	6.5	126	40.1	71	22.6	117	37.3
C64	Kidney	139	2.9	80	57.6	29	20.9	30	21.6
C67	Bladder	182	3.8	114	62.6	10	5.5	58	31.9
C70-C72	CNS cancer	92	1.9	47	51.1	13	14.1	32	34.8
C73	Thyroid	61	1.3	43	70.5	4	6.6	14	23.0
C76-C79	CUP	58	1.2	22	37.9	16	27.6	20	34.5
C82-C85	NHL	158	3.3	82	51.9	22	13.9	54	34.2
C90	Mult. myeloma	58	1.2	17	29.3	9	15.5	32	55.2
C91-C96	Leukaemia	92	1.9	21	22.8	12	13.0	59	64.1
Other primaries		276	5.7	122	44.2	53	19.2	101	36.6
All mult. primaries		4827	100.0	2436	50.5	664	13.8	1727	35.8

Multiple primaries with number of cases n<40 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	1	1	0.1	0.13	0.1	0.13	3.8	4.3
5- 9	1		0.1	0.50	0.0		3.0	
10-14	1	1	0.1	0.25	0.1	0.20	3.0	3.8
15-19	2	1	0.1	0.22	0.1	0.05	5.1	3.2
20-24	4	4	0.2	0.31	0.2	0.12	5.1	9.3
25-29	10	21	0.5	0.20	1.1	0.32	11.1	20.4
30-34	34	29	1.6	0.27	1.4	0.25	19.8	15.5
35-39	88	66	3.8	0.33	3.0	0.32	24.5	14.7
40-44	233	136	9.6	0.40	5.9	0.32	31.1	14.6
45-49	471	300	21.9	0.41	14.2	0.37	30.7	18.5
50-54	894	490	48.4	0.44	25.9	0.38	33.3	20.2
55-59	1638	802	96.4	0.48	45.0	0.44	34.1	21.3
60-64	2540	1178	154.1	0.51	67.7	0.44	36.1	23.8
65-69	3183	1601	216.9	0.56	99.8	0.50	34.9	25.7
70-74	3399	2136	293.3	0.60	154.9	0.56	34.7	29.8
75-79	3069	2485	407.3	0.67	227.2	0.59	33.3	31.4
80-84	2389	2882	526.1	0.75	333.7	0.64	32.2	34.7
85+	1971	3991	635.5	0.83	487.3	0.74	32.2	39.2
All ages	19928	16124					33.6	29.6
Mortality								
Raw			72.6	0.58	56.2	0.57		
WS			37.0	0.55	19.9	0.50		
ES			56.8	0.57	31.1	0.52		
BRD-S			75.4	0.60	42.2	0.54		
PYLL-70								
per 100,000			343.8		189.1			
ES			301.8		161.5			
AYLL-70			9.4		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	1	1	0.1	0.13	0.1	0.13	4.0	4.3
5- 9	1		0.1	0.50	0.0		3.1	
10-14	1	1	0.1	0.25	0.1	0.20	3.0	4.2
15-19	2	1	0.1	0.22	0.1	0.05	5.1	3.8
20-24	4	4	0.2	0.31	0.2	0.12	5.5	10.0
25-29	9	21	0.5	0.19	1.1	0.32	10.7	21.6
30-34	33	28	1.6	0.27	1.4	0.25	19.8	16.6
35-39	86	62	3.7	0.33	2.8	0.31	25.1	15.1
40-44	228	132	9.4	0.41	5.7	0.32	32.1	15.4
45-49	455	288	21.1	0.41	13.6	0.38	31.7	19.8
50-54	858	477	46.4	0.44	25.3	0.39	35.1	21.9
55-59	1560	753	91.8	0.49	42.3	0.44	35.8	22.5
60-64	2361	1109	143.3	0.51	63.7	0.44	38.0	25.7
65-69	2929	1480	199.6	0.56	92.3	0.50	37.2	27.9
70-74	3027	1962	261.2	0.58	142.3	0.55	36.8	32.4
75-79	2694	2282	357.5	0.64	208.6	0.58	36.1	34.2
80-84	2013	2623	443.3	0.68	303.7	0.61	34.1	37.6
85+	1654	3642	533.3	0.73	444.7	0.70	33.4	41.5
All ages	17916	14866					35.6	31.8
Mortality								
Raw			65.3	0.57	51.8	0.55		
WS			33.6	0.54	18.5	0.49		
ES			51.2	0.56	28.9	0.51		
BRD-S			67.4	0.58	39.0	0.53		
PYLL-70								
per 100,000			326.8		180.1			
ES			287.1		154.1			
AYLL-70			9.5		10.1			

* See corresponding tables with multiple primaries.

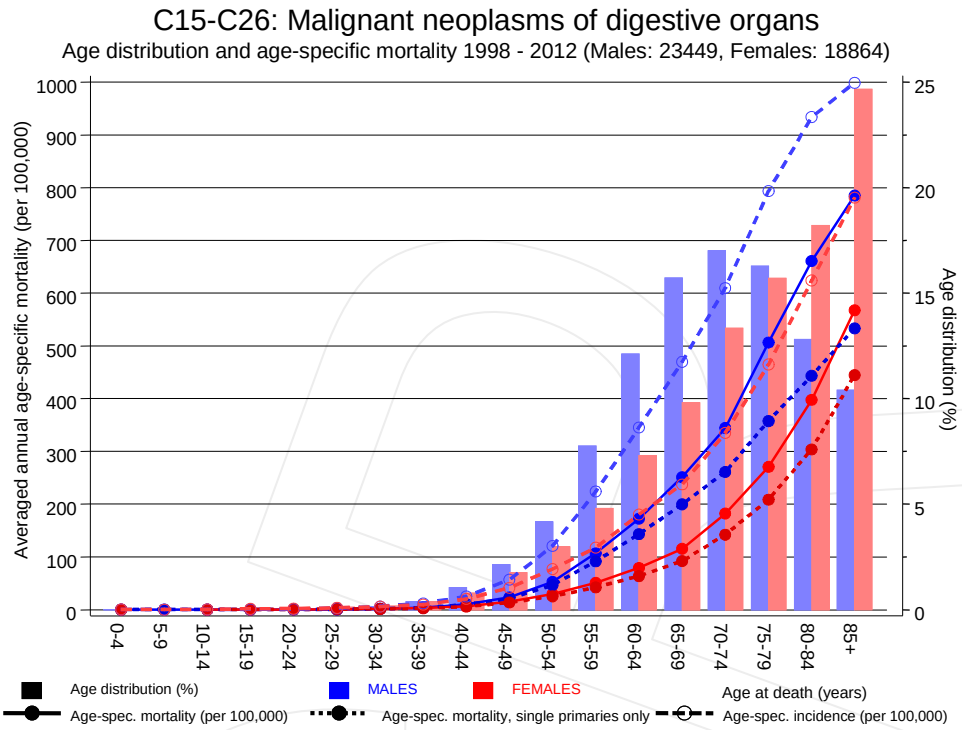
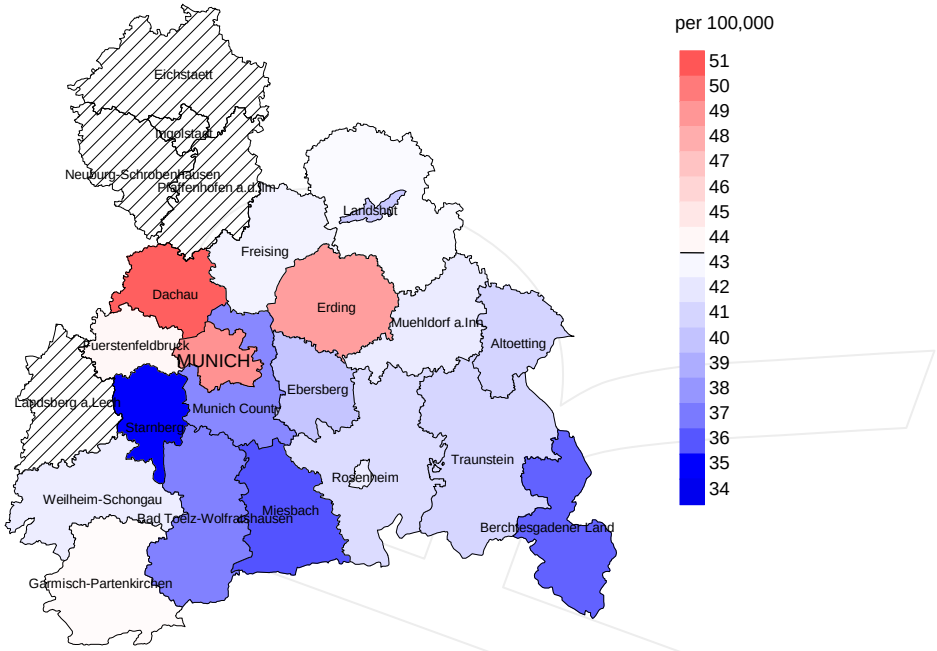


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

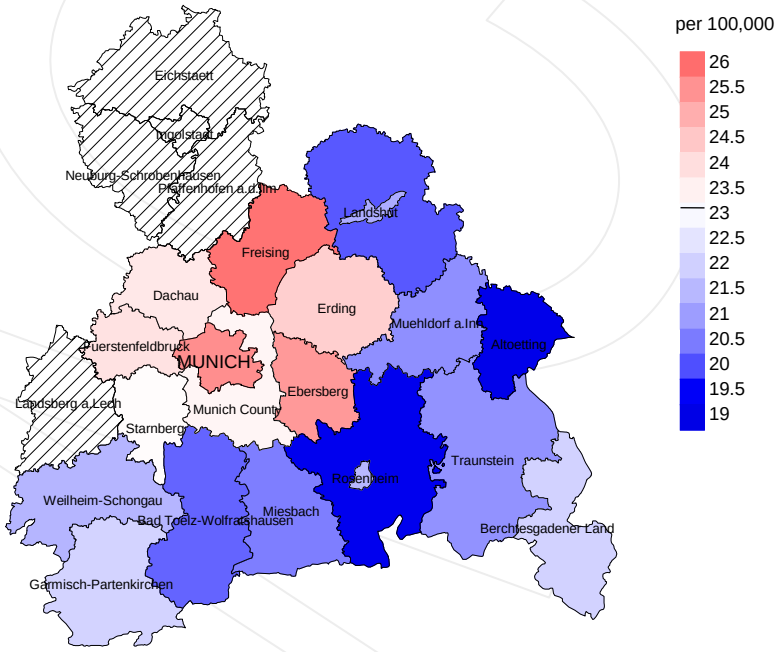
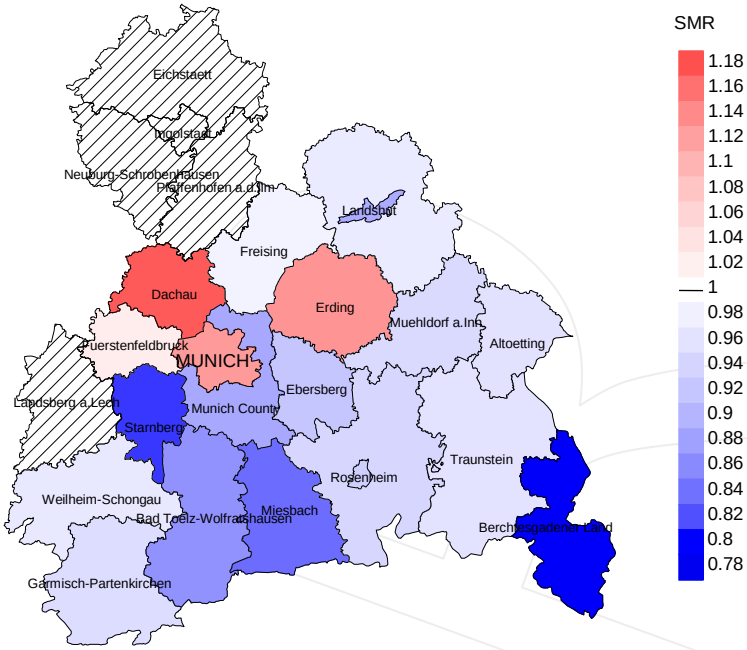


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 43.5/100,000 WS N=9,948, females 23.2/100,000 WS N=7,954). 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 245 women died from GI cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 25.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 20.9 and 30.9/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

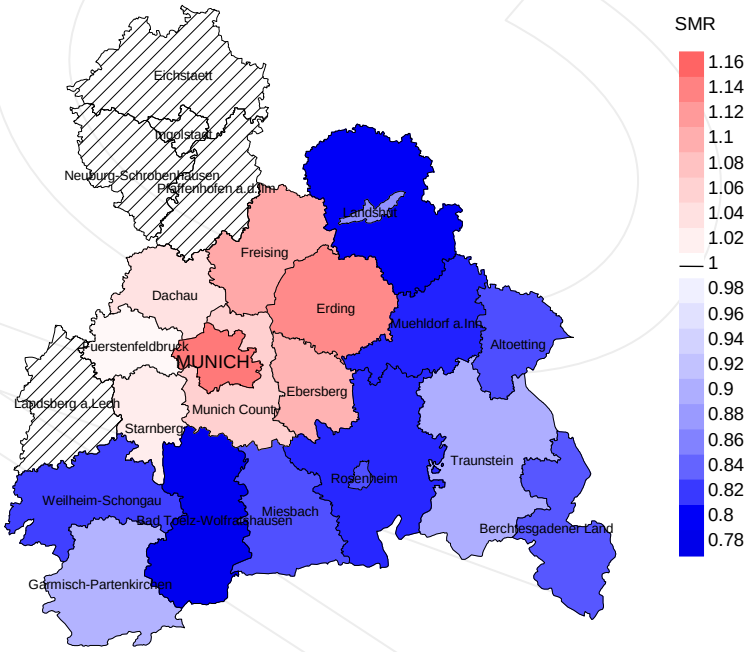


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=9,948, females N=7,954). 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 245 women died from GI cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.92 and 1.29, 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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