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	1998-2011
Patients	67689
Diseases	69628
Creation date	04/02/2013
Export date	01/03/2013
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, April 2013

[#] 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 2011 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	3190	377	11.8	19.3	78.8	98.6
1999	3251	408	12.5	19.8	78.0	98.3
2000	3037	416	13.7	21.3	77.0	98.6
2001	3332	466	14.0	21.6	73.7	97.9
2002	5705	1106	19.4	21.8	76.4	98.5
2003	5469	878	16.1	21.9	71.8	98.4
2004	5522	791	14.3	21.9	71.2	97.8
2005	5429	737	13.6	24.4	70.6	97.4
2006	5558	605	10.9	23.7	66.0	96.1
2007	6252	714	11.4	22.2	64.7	87.8 ##
2008	6247	698	11.2	23.1	61.2	77.9
2009	6136	665	10.8	22.8	56.9	78.7
2010	5675	640	11.3	22.7	51.5	93.7
2011	4825	589	12.2	21.7	39.4	78.8 ###
1998-2011	69628	9090	13.1	22.2	65.7	91.8

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	3190	1656	1534	51.9
1999	3251	1717	1534	52.8
2000	3037	1630	1407	53.7
2001	3332	1781	1551	53.5
2002	5705	3063	2642	53.7
2003	5469	2962	2507	54.2
2004	5522	2990	2532	54.1
2005	5429	2947	2482	54.3
2006	5558	3090	2468	55.6
2007	6252	3529	2723	56.4
2008	6247	3518	2729	56.3
2009	6136	3524	2612	57.4
2010	5675	3213	2462	56.6
2011	4825	2746	2079	56.9
1998-2011	69628	38366	31262	55.1

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	1656	1534	149.5	130.4	89.8	54.3	135.7	82.5	178.0	109.2
1999	1717	1534	153.4	129.3	90.7	53.0	137.5	80.7	180.4	107.1
2000	1630	1407	143.1	117.1	84.0	47.1	127.2	72.5	164.4	96.5
2001	1781	1551	153.7	127.5	89.8	54.2	135.1	81.6	174.1	106.1
2002	3063	2642	164.4	134.9	92.1	53.4	139.0	81.5	180.7	108.0
2003	2962	2507	158.0	127.3	86.7	51.0	131.1	77.5	170.8	101.5
2004	2990	2532	158.9	128.1	85.6	52.5	129.3	78.8	168.3	102.1
2005	2947	2482	155.6	124.7	82.3	48.8	123.6	73.8	161.1	97.2
2006	3090	2468	161.4	122.9	84.6	48.7	126.9	73.5	164.5	96.3
2007	3529	2723	159.3	117.9	83.3	46.3	124.3	69.9	161.2	91.2
2008	3518	2729	158.1	117.6	80.3	45.8	120.4	69.1	156.4	90.2
2009	3524	2612	157.9	112.3	78.4	43.5	117.7	65.5	153.0	85.9
2010	3213	2462	142.6	105.2	70.7	39.8	105.8	60.2	136.6	79.6
2011	2746	2079	121.8	88.8	59.9	34.9	89.5	52.2	116.0	67.4
1998-2011	38366	31262	152.6	118.8	80.9	47.0	121.5	71.1	157.7	93.3

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	3190	70.3	12.7	13.2	102	53.4	61.1	71.6	79.4	86.4
1999	3251	70.7	12.6	10.8	102	54.6	62.0	71.6	79.6	86.5
2000	3037	70.6	12.5	21.7	103	54.3	61.8	71.7	79.5	86.9
2001	3332	70.1	12.7	0.6	103	53.9	61.6	70.6	79.5	86.7
2002	5705	71.1	12.3	17.7	104	55.1	62.7	72.1	80.3	87.0
2003	5469	71.1	12.1	10.9	101	55.6	63.1	71.9	80.2	86.3
2004	5522	70.7	12.3	3.1	101	54.7	62.9	71.2	80.0	85.5
2005	5429	71.3	12.3	1.0	100	55.9	63.7	71.7	80.4	86.0
2006	5558	70.9	12.2	12.3	102	54.9	63.2	71.4	80.1	85.6
2007	6252	70.9	12.4	0.3	103	54.3	63.5	71.5	80.2	86.1
2008	6247	71.3	12.4	1.1	105	55.0	63.9	71.9	80.4	86.3
2009	6136	71.2	12.2	3.7	102	54.6	63.9	72.0	80.3	86.3
2010	5675	71.3	12.3	0.8	103	54.5	63.6	72.2	80.7	86.1
2011	4825	71.1	12.5	0.7	101	54.0	63.6	72.2	80.2	86.4
1998-2011	69628	71.0	12.4	0.3	105	54.7	63.0	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	1656	67.9	12.1	16.5	98.1	52.3	58.9	68.6	76.7	84.0
1999	1717	68.3	11.9	10.8	97.4	53.9	60.2	68.8	76.9	83.6
2000	1630	68.4	11.6	25.1	97.8	53.9	60.4	68.6	76.7	84.3
2001	1781	68.1	11.8	14.5	102	53.5	60.6	67.9	76.7	83.5
2002	3063	69.0	11.3	20.9	98.5	54.4	61.6	69.3	76.8	82.8
2003	2962	69.2	11.3	17.9	99.4	55.0	62.4	69.4	76.9	83.0
2004	2990	69.1	11.3	22.5	101	54.4	62.0	69.3	77.1	83.7
2005	2947	69.2	11.3	19.0	99.6	55.0	62.5	69.4	77.4	83.5
2006	3090	69.1	11.3	12.3	102	54.8	62.3	69.4	77.1	83.1
2007	3529	69.0	11.7	0.3	99.4	53.9	62.1	69.5	77.6	83.3
2008	3518	69.5	11.4	6.5	105	54.7	62.7	70.1	77.8	83.4
2009	3524	69.7	11.3	3.7	102	54.2	62.8	70.8	77.8	83.4
2010	3213	69.6	11.6	0.8	98.9	54.3	62.0	70.6	78.0	83.8
2011	2746	69.7	11.7	0.8	97.3	53.8	63.0	71.0	77.7	84.0
1998-2011	38366	69.1	11.5	0.3	105	54.2	61.9	69.7	77.3	83.4

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1534	72.9	12.9	13.2	102	54.5	64.3	75.0	83.0	87.7
1999	1534	73.3	12.9	18.8	102	56.0	64.7	75.2	83.0	88.5
2000	1407	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	2642	73.7	12.8	17.7	104	56.0	65.0	76.0	82.5	89.0
2003	2507	73.4	12.6	10.9	101	56.3	64.5	75.4	82.7	88.6
2004	2532	72.6	13.1	3.1	100	55.1	64.3	74.3	82.8	88.0
2005	2482	73.8	12.9	1.0	100	57.3	65.4	75.5	83.2	89.8
2006	2468	73.1	12.9	20.4	99.2	55.1	64.9	75.1	83.1	87.6
2007	2723	73.3	12.8	17.8	103	55.4	65.7	74.8	83.2	87.7
2008	2729	73.5	13.2	1.1	102	55.5	65.5	74.8	83.7	88.3
2009	2612	73.3	13.0	15.9	102	55.2	65.5	75.0	83.3	88.2
2010	2462	73.6	12.9	14.9	103	55.5	66.4	75.3	83.4	88.2
2011	2079	72.9	13.4	0.7	101	54.5	64.8	74.3	83.2	88.4
1998-2011	31262	73.3	13.0	0.6	104	55.5	64.9	75.1	83.0	88.3

Table 4

Age distribution by 5-year age group and gender for period 1998-2011 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	14	0.0	0.0	6	0.0	0.0	8	0.0	0.0
5-9	2	0.0	0.0	1	0.0	0.0	1	0.0	0.0
10-14	7	0.0	0.0	3	0.0	0.0	4	0.0	0.0
15-19	25	0.0	0.1	9	0.0	0.0	16	0.1	0.1
20-24	38	0.1	0.1	13	0.0	0.1	25	0.1	0.2
25-29	103	0.1	0.3	46	0.1	0.2	57	0.2	0.4
30-34	232	0.3	0.6	121	0.3	0.5	111	0.4	0.7
35-39	465	0.7	1.3	274	0.7	1.2	191	0.6	1.3
40-44	989	1.4	2.7	565	1.5	2.7	424	1.4	2.7
45-49	1947	2.8	5.5	1150	3.0	5.7	797	2.5	5.2
50-54	3393	4.9	10.4	2061	5.4	11.1	1332	4.3	9.5
55-59	5473	7.9	18.2	3542	9.2	20.3	1931	6.2	15.7
60-64	8307	11.9	30.2	5356	14.0	34.3	2951	9.4	25.1
65-69	9969	14.3	44.5	6439	16.8	51.1	3530	11.3	36.4
70-74	10739	15.4	59.9	6523	17.0	68.1	4216	13.5	49.9
75-79	10258	14.7	74.6	5532	14.4	82.5	4726	15.1	65.0
80-84	8924	12.8	87.4	3876	10.1	92.6	5048	16.1	81.1
85+	8743	12.6	100.0	2849	7.4	100.0	5894	18.9	100.0
All ages	69628	100.0		38366	100.0		31262	100.0	

Included in the statistics are 25.8% multiple primaries in males and 22.0% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2011

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=4043 %	Females DCO rate n=4932 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	6	8	0.5	0.7			2.1	3.8
5- 9	1	1	0.1	0.1			0.6	1.0
10-14	3	4	0.2	0.3			2.3	2.6
15-19	9	16	0.7	1.3			3.1	6.7
20-24	13	25	0.9	1.7	23.1		2.6	5.7
25-29	44	57	2.6	3.3		1.8	5.5	6.2
30-34	121	110	6.2	5.8	1.7	2.7	9.3	6.3
35-39	270	190	12.4	9.2	2.2	2.6	13.7	5.8
40-44	563	423	25.2	19.9	2.1	1.4	20.4	8.0
45-49	1139	792	58.6	41.4	4.0	2.7	25.4	11.0
50-54	2037	1326	122.0	77.3	6.4	2.9	27.9	14.3
55-59	3495	1910	224.0	116.6	5.5	3.9	28.0	16.2
60-64	5275	2916	346.6	181.9	6.2	4.7	28.0	19.6
65-69	6322	3491	463.9	234.5	7.6	6.5	27.0	21.5
70-74	6381	4150	618.7	336.2	8.6	9.1	29.4	27.6
75-79	5418	4653	801.8	467.9	12.6	14.3	32.2	31.7
80-84	3780	4970	930.6	625.1	18.5	21.5	34.3	36.8
85+	2795	5819	1007.6	783.5	32.8	39.6	33.8	40.0
All ages	37672	30861			10.7	16.0	28.4	23.8
Incidence								
Raw			149.9	117.3				
WS			79.5	46.5				
ES			119.4	70.3				
BRD-S			154.8	92.1				

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 1998-2011
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	1.4	2.1	0.4	6.1		0.2	
C03-C06	Oral cavity	22	10.0	2.2	1.4	3.3	#	1.7	4.5
C07-C08	Salivary gland	5	2.8	1.8	0.6	4.1		0.3	
C09-C10	Oropharynx	33	12.3	2.7	1.8	3.8	#	3.0	3.0
C12-C13	Hypopharynx	13	6.9	1.9	1.0	3.2	#	0.9	7.7
C15	Oesophagus	43	21.5	2.0	1.4	2.7	#	3.1	14.0
C16	Stomach	107	57.9	1.8	1.5	2.2	#	7.0	9.3
C17	Small intestine	40	5.6	7.1	5.1	9.7	#	4.9	2.5
C18	Colon	365	134.8	2.7	2.4	3.0	#	32.9	4.4
C19-C20	Rectum	168	73.0	2.3	2.0	2.7	#	13.6	2.4
C21	Anus/canal	7	2.3	3.0	1.2	6.2	#	0.7	14.3
C22	Liver	84	35.0	2.4	1.9	3.0	#	7.0	25.0
C23-C24	Bile	30	12.6	2.4	1.6	3.4	#	2.5	13.3
C25	Pancreas	106	45.7	2.3	1.9	2.8	#	8.6	24.5
C32	Larynx	23	12.9	1.8	1.1	2.7	#	1.4	8.7
C33-C34	Lung	318	154.2	2.1	1.8	2.3	#	23.4	15.1
C38,C45	Mesothelioma	12	8.3	1.5	0.8	2.5		0.5	
C43	Malign. melanoma	78	46.2	1.7	1.3	2.1	#	4.5	1.3
C46,C49	Soft tissue	16	6.7	2.4	1.4	3.9	#	1.3	6.3
C48	Peritoneal	3	0.8	3.6	0.7	10.4		0.3	66.7
C50	Breast	8	3.2	2.5	1.1	4.9	#	0.7	37.5
C60	Penis	5	2.9	1.7	0.6	4.1		0.3	
C61	Prostate	565	385.3	1.5	1.3	1.6	#	25.7	10.8
C62	Testis	9	2.7	3.4	1.5	6.4	#	0.9	11.1
C64	Kidney	124	44.1	2.8	2.3	3.4	#	11.4	8.1
C65	Renal pelvis	13	5.2	2.5	1.3	4.3	#	1.1	
C66	Ureter	12	2.8	4.2	2.2	7.4	#	1.3	
C67	Bladder	100	58.5	1.7	1.4	2.1	#	5.9	8.0
C68	Urinary org.	3	0.6	4.7	1.0	13.7		0.3	66.7
C70-C72	CNS cancer	33	16.7	2.0	1.4	2.8	#	2.3	30.3
C73	Thyroid	15	7.6	2.0	1.1	3.2	#	1.1	13.3
C76-C79	CUP	31	22.6	1.4	0.9	2.0		1.2	3.2
C81	Hodgkin lymphoma	5	2.2	2.2	0.7	5.2		0.4	20.0
C82-C85	NHL	101	50.8	2.0	1.6	2.4	#	7.2	6.9
C90	Mult. myeloma	25	16.6	1.5	1.0	2.2		1.2	20.0
C91-C96	Leukaemia	39	20.5	1.9	1.4	2.6	#	2.6	43.6
Other primaries		11	10.9	1.0	0.5	1.8		0.0	9.1
Not observed		0	3.0	0.0	0.0	1.2		-0.4	
All mult. primaries		2575	1307.2	2.0	1.9	2.0	#	181.0	10.7

Patients	25761
Mean age at second malignancy (years)	72.3
Person-years	70027
Mean observation time (years)	2.7
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 1998-2011
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	4.2	1.2	0.4	2.8		0.1	
C09-C10	Oropharynx	13	2.6	4.9	2.6	8.4	#	1.8	
C12-C13	Hypopharynx	3	0.7	4.3	0.9	12.6		0.4	
C15	Oesophagus	6	3.9	1.5	0.6	3.3		0.4	
C16	Stomach	68	33.1	2.1	1.6	2.6	#	5.9	27.9
C17	Small intestine	23	3.1	7.5	4.7	11.2	#	3.4	4.3
C18	Colon	247	87.8	2.8	2.5	3.2	#	27.1	7.7
C19-C20	Rectum	89	36.3	2.4	2.0	3.0	#	9.0	9.0
C21	Anus/canal	7	3.9	1.8	0.7	3.7		0.5	
C22	Liver	27	9.1	3.0	1.9	4.3	#	3.0	40.7
C23-C24	Bile	21	12.9	1.6	1.0	2.5	#	1.4	28.6
C25	Pancreas	72	36.1	2.0	1.6	2.5	#	6.1	25.0
C32	Larynx	5	1.3	3.9	1.3	9.0	#	0.6	
C33-C34	Lung	126	50.2	2.5	2.1	3.0	#	12.9	11.9
C43	Malign. melanoma	41	23.5	1.7	1.2	2.4	#	3.0	2.4
C46,C49	Soft tissue	9	4.2	2.1	1.0	4.1		0.8	
C48	Peritoneal	5	2.1	2.4	0.8	5.5		0.5	60.0
C50	Breast	354	212.2	1.7	1.5	1.9	#	24.1	8.2
C51	Vulva	18	8.0	2.3	1.3	3.6	#	1.7	5.6
C52	Vagina	4	1.6	2.5	0.7	6.3		0.4	25.0
C53	Cervix uteri	24	9.3	2.6	1.6	3.8	#	2.5	29.2
C54	Corpus uteri	75	40.3	1.9	1.5	2.3	#	5.9	4.0
C55,C57	Fem. genitals un	5	2.6	1.9	0.6	4.4		0.4	40.0
C56	Ovary	104	32.2	3.2	2.6	3.9	#	12.2	28.8
C64	Kidney	62	19.4	3.2	2.5	4.1	#	7.2	16.1
C65	Renal pelvis	7	2.3	3.0	1.2	6.2	#	0.8	
C67	Bladder	29	16.2	1.8	1.2	2.6	#	2.2	20.7
C70-C72	CNS cancer	15	10.7	1.4	0.8	2.3		0.7	60.0
C73	Thyroid	17	11.0	1.5	0.9	2.5		1.0	11.8
C74-C80	Cancer others	4	4.6	0.9	0.2	2.2		-0.1	75.0
C76-C79	CUP	15	15.2	1.0	0.6	1.6		-0.0	13.3
C82-C85	NHL	57	30.2	1.9	1.4	2.4	#	4.6	19.3
C90	Mult. myeloma	13	9.9	1.3	0.7	2.2		0.5	23.1
C91-C96	Leukaemia	32	12.5	2.6	1.8	3.6	#	3.3	50.0
Other primaries		18	10.4	1.7	1.0	2.7	#	1.3	11.1
Not observed		0	1.8	0.0	0.0	2.1		-0.3	
All mult. primaries		1620	765.8	2.1	2.0	2.2	#	145.2	14.7

Patients	21069
Mean age at second malignancy (years)	74.5
Person-years	58827
Mean observation time (years)	2.8
Median observation time (years)	1.6

The occurrence of second malignancy is statistically significant.

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

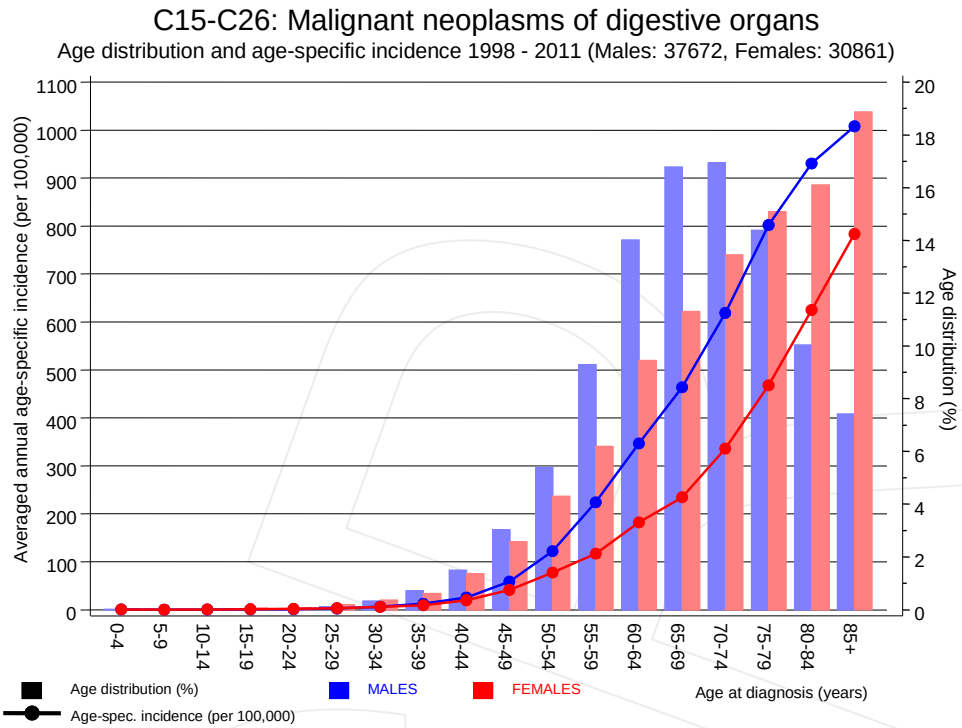


Figure 7. Age distribution and age-specific incidence

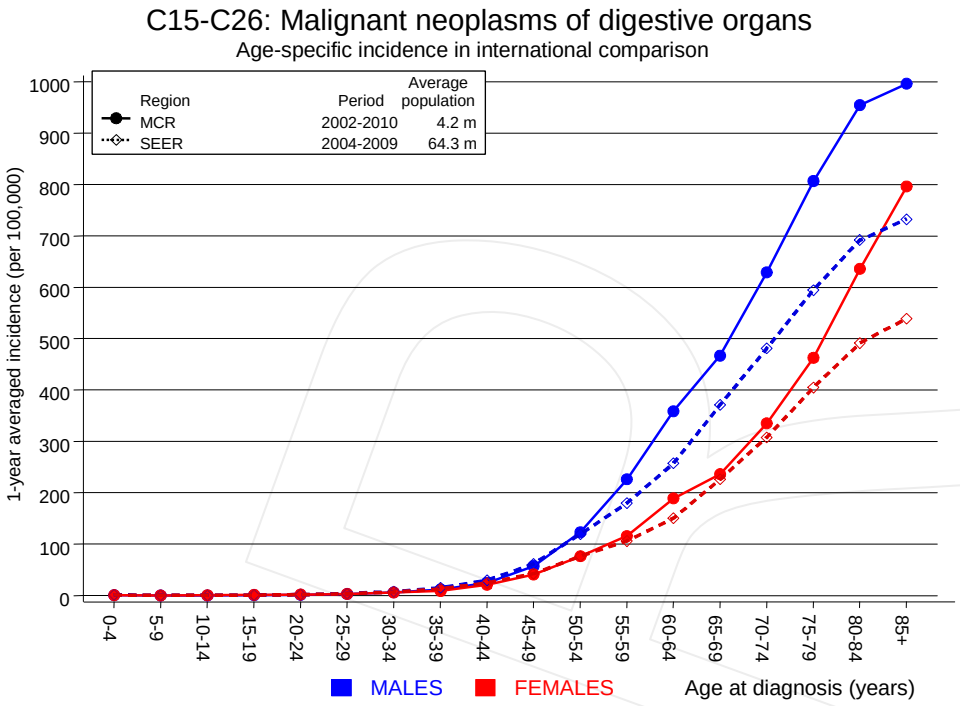


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

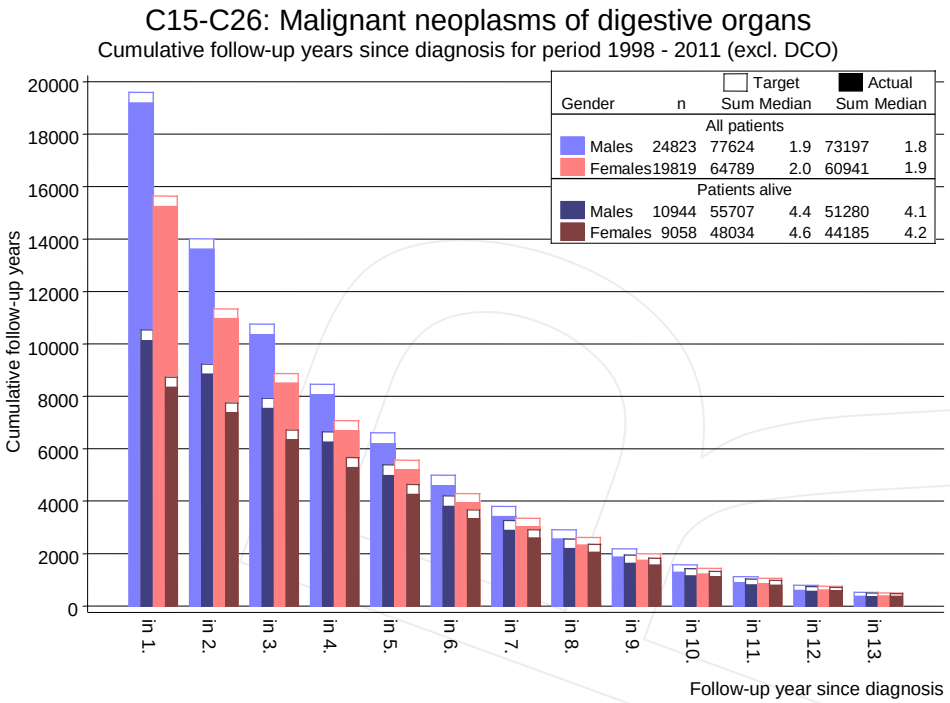
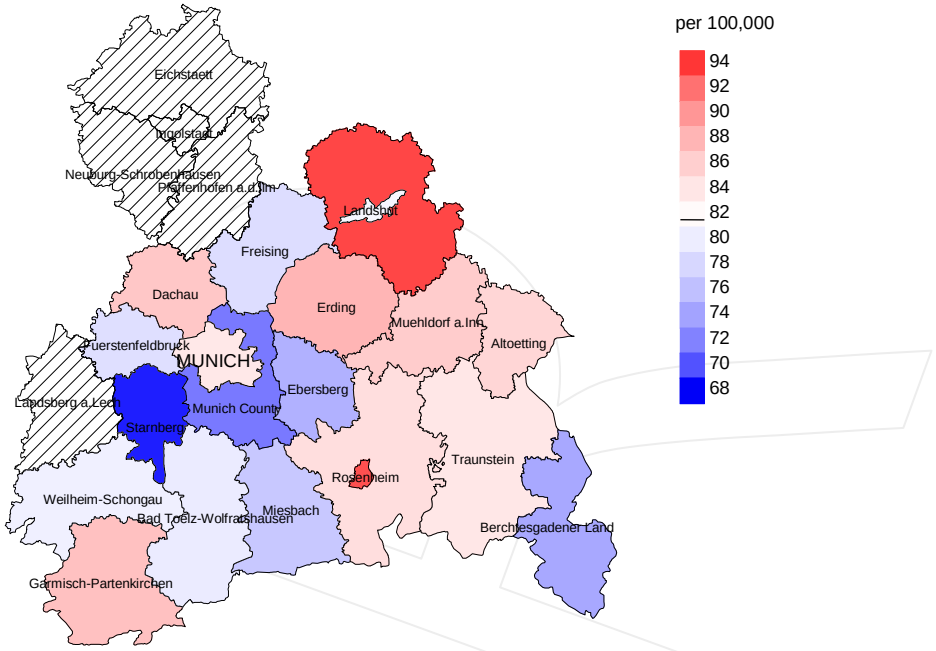


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

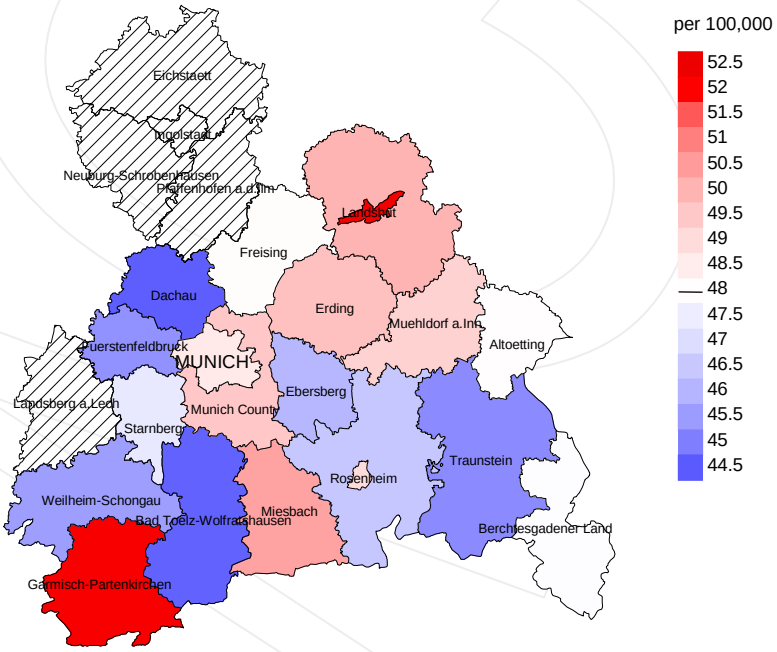
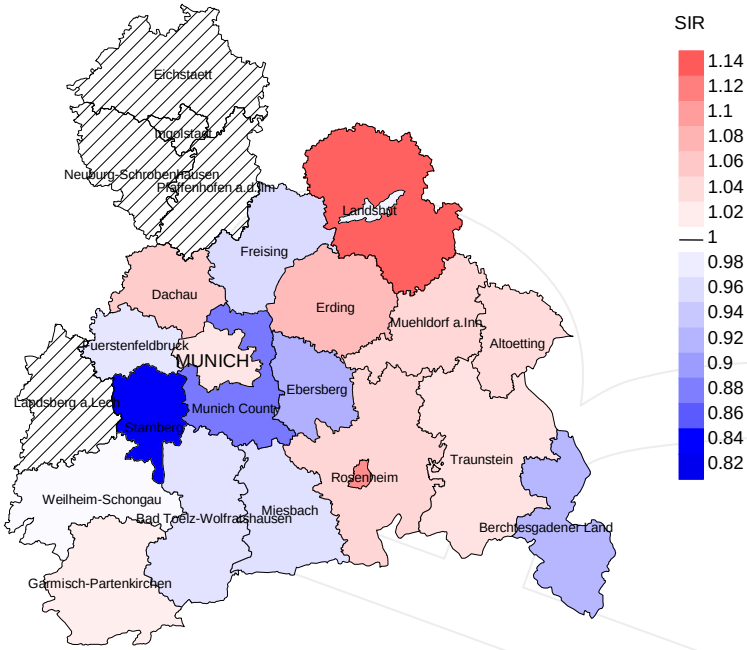


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 81.6/100,000 WS N=17,763, females 48.0/100,000 WS N=14,552). 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 388 women were identified with newly diagnosed GI cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 46.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 39.6 and 53.7/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

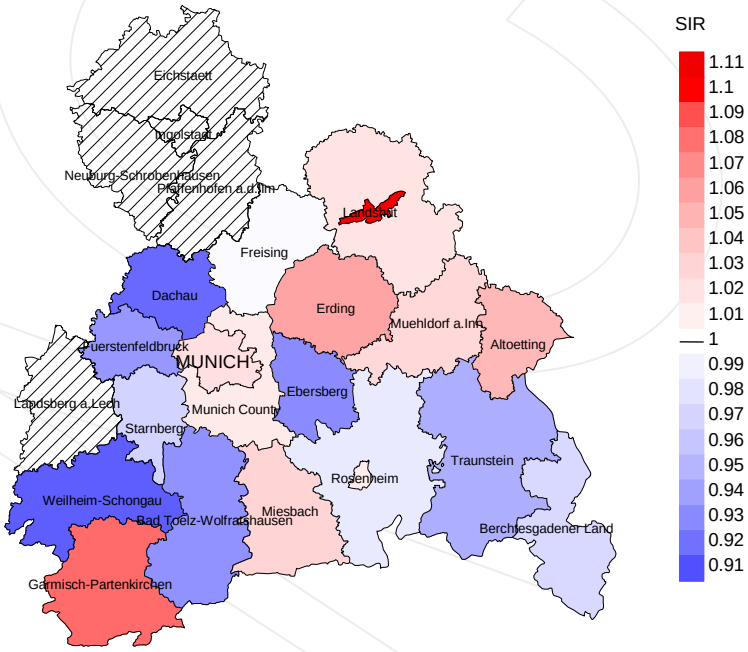


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=17,763, females N=14,552). 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 388 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	3190	98.6	11.8	2514	78.8	93.6
1999	3251	98.3	12.5	2537	78.0	94.7
2000	3037	98.6	13.7	2340	77.0	96.6
2001	3332	97.9	14.0	2457	73.7	96.5
2002	5705	98.5	19.4	4361	76.4	97.8
2003	5469	98.4	16.1	3926	71.8	98.2
2004	5522	97.8	14.3	3931	71.2	97.9
2005	5429	97.4	13.6	3835	70.6	98.5
2006	5558	96.1	10.9	3671	66.0	98.8
2007	6252	87.8	11.4	4043	64.7	98.8
2008	6247	77.9	11.2	3824	61.2	98.7
2009	6136	78.7	10.8	3494	56.9	98.7
2010	5675	93.7	11.3	2924	51.5	98.2
2011	4825	78.8	12.2	1900	39.4	97.7
1998-2011	69628	91.8	13.1	45757	65.7	97.7

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	3190	2177	92.5	938	29.4
1999	3251	2261	92.2	979	30.1
2000	3037	2204	95.1	881	29.0
2001	3332	2352	95.6	969	29.1
2002	5705	3370	98.2	1970	34.5
2003	5469	3454	97.8	1678	30.7
2004	5522	3513	98.1	1613	29.2
2005	5429	3713	97.0	1605	29.6
2006	5558	3867	97.8	1610	29.0
2007	6252	4086	98.1	1755	28.1
2008	6247	4246	98.7	1833	29.3
2009	6136	4311	98.8	1717	28.0
2010	5675	4422	98.9	1674	29.5
2011	4825	3985	98.6	1345	27.9
1998-2011	69628	47961	97.4	20567	29.5

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	2352	78.4	21.6	91.0
2002	3370	82.9	17.1	91.8
2003	3454	81.9	18.1	91.2
2004	3513	83.4	16.6	91.0
2005	3713	81.3	18.7	89.1
2006	3867	81.4	18.6	89.6
2007	4086	80.8	19.2	89.2
2008	4246	81.3	18.7	88.5
2009	4311	79.7	20.3	87.5
2010	4422	78.1	21.9	86.5
2011	3985	77.0	23.0	85.9
1998-2011	47961	80.4	19.6	89.3

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	1791	71.6	70.3	78.2	71.0
2003	1884	71.8	70.5	77.8	71.3
2004	1878	72.7	71.5	79.3	72.1
2005	2028	72.1	70.7	79.0	71.3
2006	2149	73.0	71.5	79.6	72.3
2007	2273	73.0	71.6	79.0	72.3
2008	2372	73.1	71.7	79.7	72.2
2009	2425	72.9	71.5	78.5	72.1
2010	2459	73.5	71.9	79.6	72.7
2011	2288	73.3	71.5	79.9	72.4
1998-2011	26212	72.6	71.1	78.8	71.9

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	1130	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	1635	77.5	76.1	83.9	76.8
2005	1685	77.5	75.9	83.8	76.6
2006	1718	77.9	76.5	84.5	77.2
2007	1813	77.3	75.5	84.8	76.2
2008	1874	78.0	76.1	85.3	76.9
2009	1886	78.1	76.1	85.3	76.8
2010	1963	78.3	76.1	85.5	77.0
2011	1697	78.6	76.1	86.0	77.0
1998-2011	21749	77.7	75.9	84.6	76.8

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

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

Table 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	0.52	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	1485	79.7	0.49	43.9	0.48	67.5	0.49	89.4	0.50
2003	1566	83.5	0.54	44.7	0.52	69.1	0.54	93.0	0.55
2004	1581	84.0	0.54	43.3	0.51	67.7	0.53	92.5	0.56
2005	1683	88.9	0.58	45.3	0.56	69.6	0.57	94.3	0.60
2006	1752	91.5	0.58	45.6	0.55	71.0	0.57	96.2	0.60
2007	1859	83.9	0.54	41.1	0.50	63.7	0.52	86.5	0.55
2008	1972	88.6	0.58	42.6	0.54	66.4	0.57	90.5	0.59
2009	1959	87.8	0.57	42.3	0.55	64.9	0.56	85.9	0.57
2010	1946	86.3	0.62	40.1	0.58	61.9	0.60	83.7	0.63
2011	1791	79.5	0.66	37.7	0.64	57.9	0.66	76.5	0.67
1998-2011	21327	84.9	0.57	43.2	0.54	66.8	0.56	89.8	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	0.54	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	0.56	41.1	0.57	56.0	0.59
2001	862	70.9	0.56	26.7	0.50	42.1	0.52	57.2	0.54
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	0.50
2004	1348	68.2	0.54	23.8	0.46	37.8	0.49	51.9	0.52
2005	1336	67.1	0.55	23.9	0.50	37.5	0.51	50.7	0.53
2006	1400	69.7	0.58	23.8	0.49	37.6	0.52	52.1	0.55
2007	1450	62.8	0.54	22.5	0.49	34.9	0.51	47.3	0.53
2008	1482	63.9	0.55	22.1	0.49	34.7	0.51	47.0	0.53
2009	1479	63.6	0.57	21.7	0.51	34.0	0.53	46.4	0.55
2010	1508	64.4	0.62	21.7	0.55	34.0	0.57	46.1	0.59
2011	1280	54.7	0.62	18.6	0.54	29.0	0.56	39.2	0.59
1998-2011	17245	65.5	0.56	23.1	0.50	36.3	0.52	49.5	0.54

Table 13

Age distribution of age at death (cancer-related) for period 1998-2011
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	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	2	0.0	0.0	2	0.0	0.0			0.0
20-24	8	0.0	0.0	5	0.0	0.0	3	0.0	0.0
25-29	29	0.1	0.1	10	0.0	0.1	19	0.1	0.1
30-34	65	0.2	0.3	33	0.1	0.2	32	0.2	0.3
35-39	160	0.4	0.7	90	0.4	0.6	70	0.4	0.7
40-44	376	0.9	1.6	236	1.1	1.7	140	0.8	1.5
45-49	776	1.9	3.5	469	2.1	3.8	307	1.7	3.2
50-54	1442	3.6	7.1	926	4.2	7.9	516	2.9	6.1
55-59	2566	6.4	13.5	1730	7.8	15.7	836	4.7	10.8
60-64	4018	10.0	23.5	2721	12.2	27.9	1297	7.3	18.0
65-69	5277	13.1	36.6	3527	15.8	43.7	1750	9.8	27.8
70-74	6126	15.2	51.9	3780	16.9	60.6	2346	13.1	40.9
75-79	6467	16.1	68.0	3633	16.3	76.9	2834	15.9	56.8
80-84	6131	15.3	83.2	2832	12.7	89.6	3299	18.5	75.3
85+	6736	16.8	100.0	2316	10.4	100.0	4420	24.7	100.0
All ages	40183	100.0		22312	100.0		17871	100.0	

Included in the statistics are 25.8% multiple primaries in males and 22.0% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**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	0.0		0.1	0.13		4.5
5- 9	1		0.1	1.00	0.0		3.2	
10-14	1	1	0.1	0.33	0.1	0.25	3.4	4.2
15-19	2		0.2	0.22	0.0		5.3	
20-24	5	3	0.3	0.38	0.2	0.12	6.3	7.0
25-29	10	19	0.6	0.22	1.1	0.33	11.5	18.6
30-34	33	32	1.7	0.27	1.7	0.29	19.6	15.8
35-39	90	70	4.1	0.33	3.4	0.37	24.7	15.3
40-44	236	140	10.6	0.42	6.6	0.33	31.1	14.0
45-49	469	307	24.1	0.41	16.0	0.39	30.5	17.7
50-54	926	516	55.5	0.45	30.1	0.39	32.7	19.7
55-59	1730	836	110.9	0.49	51.0	0.43	33.6	20.5
60-64	2721	1297	178.8	0.51	80.9	0.44	35.3	23.3
65-69	3527	1750	258.8	0.55	117.6	0.50	34.0	24.8
70-74	3780	2346	366.5	0.58	190.1	0.56	34.2	29.3
75-79	3633	2834	537.6	0.66	285.0	0.60	33.3	31.6
80-84	2832	3299	697.2	0.73	414.9	0.65	32.3	34.5
85+	2316	4420	835.0	0.81	595.1	0.75	32.5	38.8
All ages	22312	17871					33.3	29.3
Mortality								
Raw			88.8	0.58	67.9	0.57		
WS			45.0	0.56	23.8	0.51		
ES			69.8	0.57	37.5	0.53		
BRD-S			94.1	0.60	51.2	0.55		
PYLL-70								
per 100,000			392.0		216.8			
ES			344.4		185.0			
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 1998-2011
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	120	2.0	88	73.3	10	8.3	22	18.3
C09-C10 Oropharynx	136	2.3	85	62.5	17	12.5	34	25.0
C12-C13 Hypopharynx	73	1.2	49	67.1	8	11.0	16	21.9
C15 Oesophagus	58	1.0			6	10.3	52	89.7
C16 Stomach	146	2.4			30	20.5	116	79.5
C18 Colon	384	6.4			139	36.2	245	63.8
C19-C20 Rectum	198	3.3			108	54.5	90	45.5
C22 Liver	135	2.3			29	21.5	106	78.5
C25 Pancreas	185	3.1			40	21.6	145	78.4
C32 Larynx	136	2.3	105	77.2	10	7.4	21	15.4
C33-C34 Lung	704	11.8	166	23.6	133	18.9	405	57.5
C43 Malign. melanoma	228	3.8	158	69.3	3	1.3	67	29.4
C44 Skin others	292	4.9	169	57.9	28	9.6	95	32.5
C61 Prostate	1420	23.7	921	64.9	114	8.0	385	27.1
C64 Kidney	272	4.5	145	53.3	53	19.5	74	27.2
C67 Bladder	489	8.2	291	59.5	40	8.2	158	32.3
C70-C72 CNS cancer	97	1.6	37	38.1	9	9.3	51	52.6
C76-C79 CUP	76	1.3	28	36.8	18	23.7	30	39.5
C82-C85 NHL	227	3.8	110	48.5	39	17.2	78	34.4
C90 Mult. myeloma	64	1.1	25	39.1	9	14.1	30	46.9
C91-C96 Leukaemia	128	2.1	33	25.8	17	13.3	78	60.9
Other primaries	420	7.0	170	40.5	43	10.2	207	49.3
All mult. primaries	5988	100.0	2580	43.1	903	15.1	2505	41.8

Multiple primaries with number of cases n<50 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 1998-2011
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	108	2.5			16	14.8	92	85.2
C18	Colon	273	6.3			79	28.9	194	71.1
C19-C20	Rectum	121	2.8			59	48.8	62	51.2
C22	Liver	40	0.9			7	17.5	33	82.5
C25	Pancreas	151	3.5			30	19.9	121	80.1
C33-C34	Lung	243	5.6	53	21.8	30	12.3	160	65.8
C43	Malign. melanoma	134	3.1	106	79.1	7	5.2	21	15.7
C44	Skin others	116	2.7	72	62.1	13	11.2	31	26.7
C50	Breast	1275	29.5	946	74.2	90	7.1	239	18.7
C51	Vulva	43	1.0	27	62.8	2	4.7	14	32.6
C53	Cervix uteri	153	3.5	117	76.5	13	8.5	23	15.0
C54	Corpus uteri	282	6.5	210	74.5	17	6.0	55	19.5
C56	Ovary	295	6.8	116	39.3	69	23.4	110	37.3
C64	Kidney	125	2.9	72	57.6	26	20.8	27	21.6
C67	Bladder	161	3.7	104	64.6	9	5.6	48	29.8
C70-C72	CNS cancer	78	1.8	37	47.4	11	14.1	30	38.5
C73	Thyroid	54	1.2	37	68.5	4	7.4	13	24.1
C76-C79	CUP	49	1.1	18	36.7	13	26.5	18	36.7
C82-C85	NHL	134	3.1	70	52.2	17	12.7	47	35.1
C90	Mult. myeloma	50	1.2	15	30.0	7	14.0	28	56.0
C91-C96	Leukaemia	85	2.0	19	22.4	11	12.9	55	64.7
Other primaries		357	8.3	155	43.4	68	19.0	134	37.5
All mult. primaries		4327	100.0	2174	50.2	598	13.8	1555	35.9

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 1998-2011
(**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	0.0		0.1	0.13		4.5
5- 9	1		0.1	1.00	0.0		3.4	
10-14	1	1	0.1	0.33	0.1	0.25	3.4	4.3
15-19	2		0.2	0.22	0.0		5.7	
20-24	4	3	0.3	0.33	0.2	0.12	5.3	7.7
25-29	10	18	0.6	0.24	1.0	0.33	12.3	18.8
30-34	32	29	1.6	0.27	1.5	0.28	19.5	16.2
35-39	84	63	3.8	0.33	3.0	0.35	24.6	15.1
40-44	221	128	9.9	0.41	6.0	0.33	31.6	14.7
45-49	434	277	22.3	0.41	14.5	0.38	31.0	18.3
50-54	832	449	49.8	0.45	26.2	0.38	33.5	20.2
55-59	1522	727	97.6	0.49	44.4	0.44	34.0	21.0
60-64	2348	1085	154.3	0.51	67.7	0.43	36.1	23.6
65-69	2941	1475	215.8	0.56	99.1	0.50	34.9	25.7
70-74	3077	1921	298.3	0.59	155.6	0.56	34.9	29.9
75-79	2799	2291	414.2	0.67	230.4	0.59	33.4	31.7
80-84	2149	2665	529.0	0.75	335.2	0.64	32.2	34.8
85+	1776	3646	640.3	0.82	490.9	0.74	32.3	39.5
All ages	18233	14779					33.7	29.7
Mortality								
Raw			72.5	0.58	56.2	0.56		
WS			37.4	0.56	19.9	0.50		
ES			57.3	0.57	31.2	0.52		
BRD-S			76.2	0.60	42.4	0.54		
PYLL-70								
per 100,000			348.1		189.3			
ES			306.3		161.9			
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 1998-2011
(**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	0.0		0.1	0.13		4.5
5- 9	1		0.1	1.00	0.0		3.6	
10-14	1	1	0.1	0.33	0.1	0.25	3.4	4.5
15-19	2		0.2	0.22	0.0		5.7	
20-24	4	3	0.3	0.33	0.2	0.12	5.7	8.3
25-29	9	18	0.5	0.23	1.0	0.33	12.0	20.0
30-34	31	28	1.6	0.27	1.5	0.28	19.5	17.2
35-39	82	59	3.8	0.33	2.9	0.33	25.2	15.5
40-44	216	124	9.7	0.41	5.8	0.33	32.5	15.5
45-49	419	267	21.6	0.41	13.9	0.38	32.0	19.6
50-54	800	436	47.9	0.45	25.4	0.39	35.3	21.8
55-59	1455	686	93.3	0.50	41.9	0.44	35.7	22.2
60-64	2179	1023	143.2	0.51	63.8	0.43	37.8	25.5
65-69	2700	1362	198.1	0.55	91.5	0.49	37.0	27.8
70-74	2741	1774	265.8	0.58	143.7	0.54	36.9	32.5
75-79	2453	2103	363.0	0.64	211.5	0.58	36.0	34.5
80-84	1809	2431	445.3	0.67	305.7	0.61	33.8	37.7
85+	1502	3324	541.5	0.73	447.6	0.69	33.5	41.6
All ages	16404	13640					35.5	31.8
Mortality								
Raw			65.3	0.56	51.8	0.55		
WS			34.0	0.54	18.6	0.49		
ES			51.8	0.55	29.0	0.51		
BRD-S			68.1	0.57	39.2	0.53		
PYLL-70								
per 100,000			331.0		180.5			
ES			291.6		154.6			
AYLL-70			9.5		10.2			

* See corresponding tables with multiple primaries.

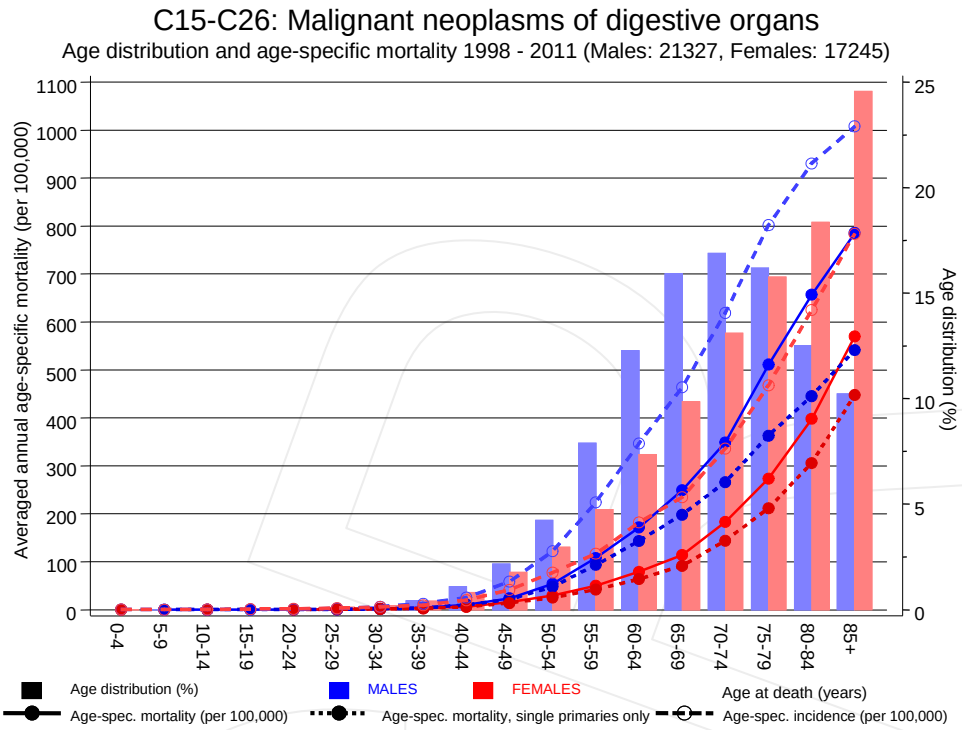
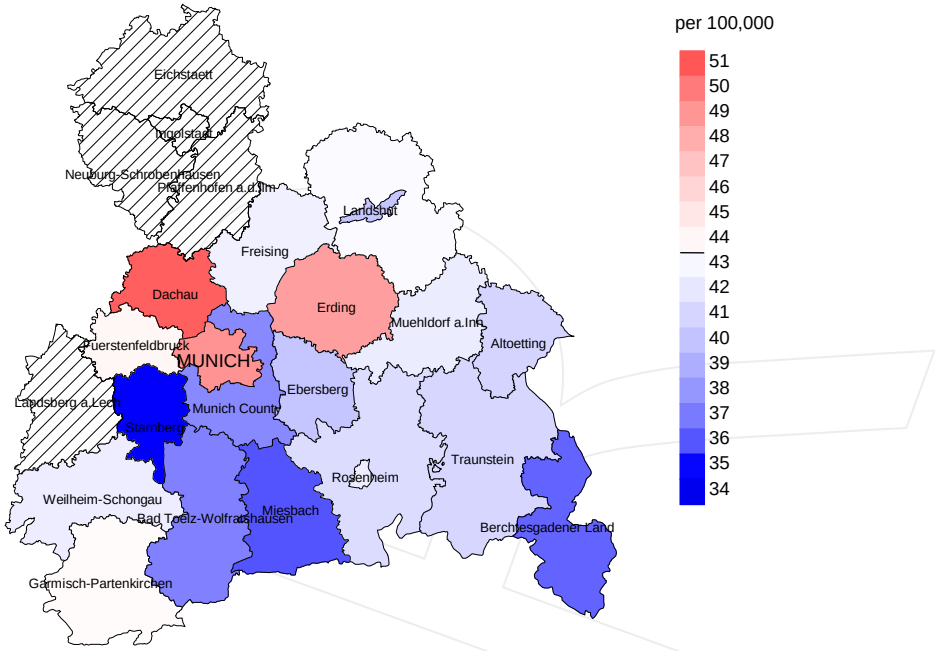


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

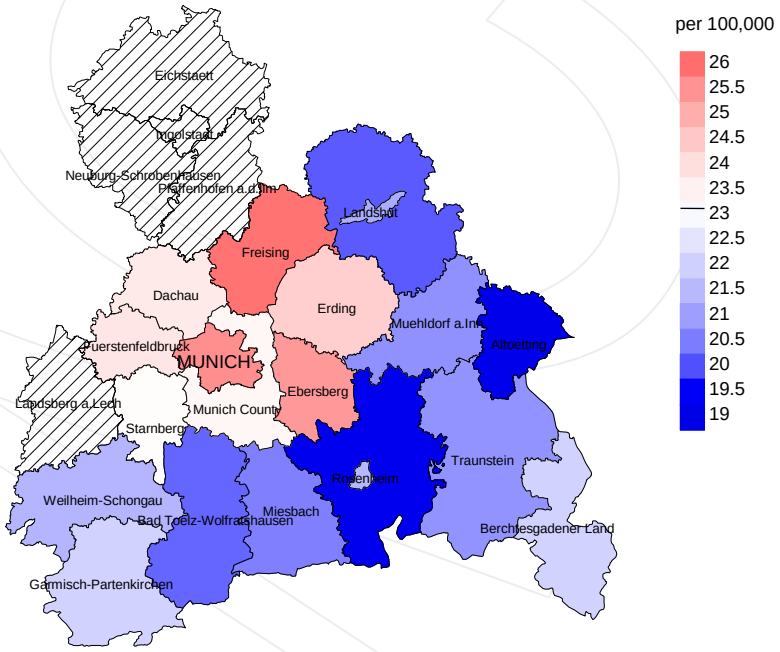
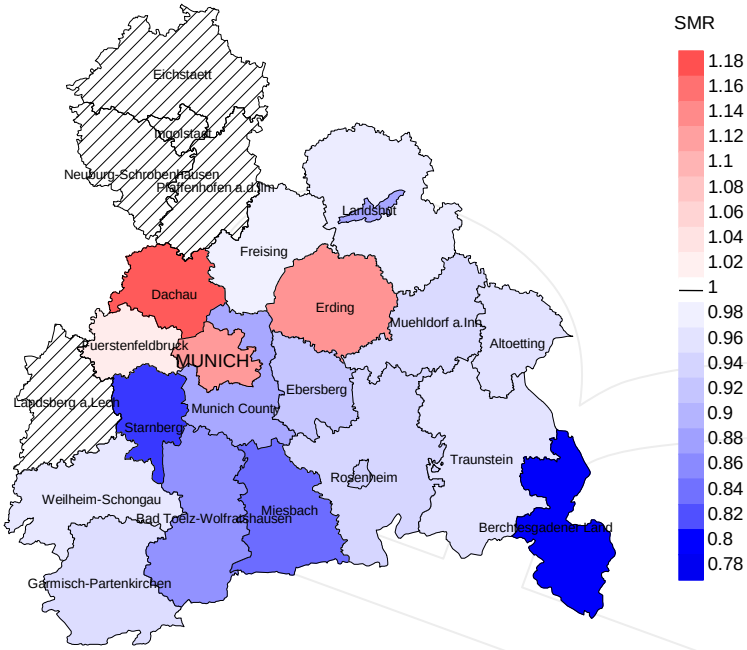


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 43.5/100,000 WS N=9,946, females 23.2/100,000 WS N=7,950). 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

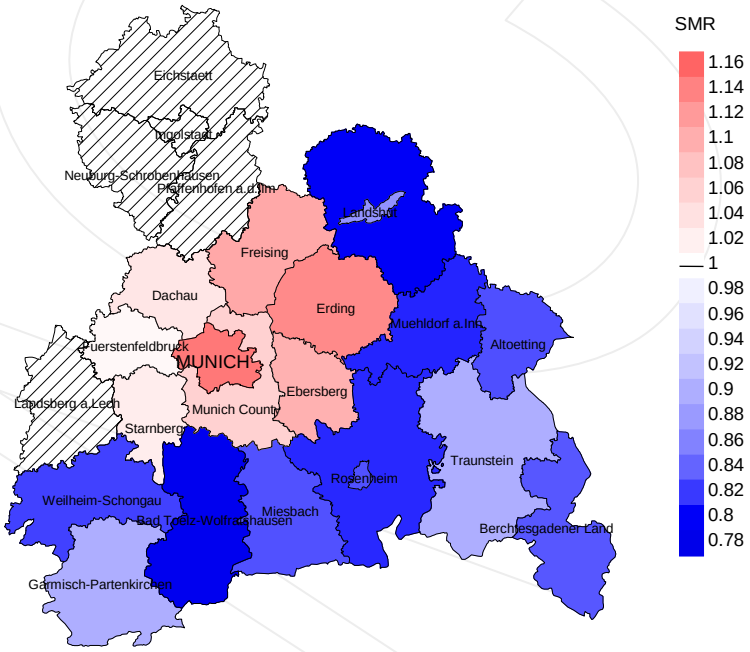


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=9,946, females N=7,950). 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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