Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C22: Liver cancer

Year of diagnosis	1998-2012
Patients	5,263
Diseases	5,271
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

BERLIN

GERMANY

BAVARIA

MUNICH

**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
C22.-	Malignant neoplasm of liver and intrahepatic bile ducts
C22.0	Liver cell carcinoma
C22.1	Intrahepatic bile duct carcinoma
C22.2	Hepatoblastoma
C22.3	Angiosarcoma of liver
C22.4	Other sarcomas of liver
C22.7	Other specified carcinomas of liver
C22.9	Liver, unspecified

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	182	67	36.8	9.3	96.7	100.0
1999	212	80	37.7	9.4	96.7	99.1
2000	218	88	40.4	11.0	93.6	100.0
2001	196	69	35.2	14.3	96.9	98.5
2002	351	147	41.9	16.5	98.0	100.0 #
2003	334	134	40.1	16.5	95.8	99.7 #
2004	340	135	39.7	19.1	94.1	98.8 #
2005	351	126	35.9	19.7	95.7	99.1 #
2006	398	127	31.9	20.1	92.0	98.7 #
2007	453	134	29.6	17.7	88.7	96.5 # ##
2008	479	108	22.5	20.5	85.4	91.6
2009	461	111	24.1	20.6	83.1	90.9
2010	445	100	22.5	23.6	83.6	92.1
2011	433	101	23.3	21.2	73.7	87.5
2012	418	111	26.6	23.0	65.8	97.8 ###
1998-2012	5271	1638	31.1	18.6	87.7	95.9

\#   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	182	129	53	70.9
1999	212	141	71	66.5
2000	218	156	62	71.6
2001	196	155	41	79.1
2002	351	252	99	71.8
2003	334	241	93	72.2
2004	340	251	89	73.8
2005	351	254	97	72.4
2006	398	287	111	72.1
2007	453	337	116	74.4
2008	479	353	126	73.7
2009	461	333	128	72.2
2010	445	349	96	78.4
2011	433	328	105	75.8
2012	418	302	116	72.2
1998-2012	5271	3868	1403	73.4

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	129	53	11.6	4.5	7.2	1.9	10.6	2.9	13.6	3.8
1999	141	71	12.6	6.0	7.4	2.4	11.2	3.7	14.6	4.9
2000	156	62	13.7	5.2	8.2	2.1	12.2	3.2	15.2	4.5
2001	155	41	13.4	3.4	7.9	1.7	11.7	2.2	15.2	2.7
2002	252	99	13.5	5.1	7.6	2.0	11.3	3.0	14.5	4.2
2003	241	93	12.9	4.7	6.9	1.8	10.4	2.8	13.9	3.8
2004	251	89	13.3	4.5	7.3	1.9	11.0	2.7	14.2	3.6
2005	254	97	13.4	4.9	7.2	2.1	10.6	2.9	13.5	3.7
2006	287	111	15.0	5.5	7.9	2.2	11.8	3.3	15.1	4.2
2007	337	116	15.2	5.0	8.1	2.1	12.0	3.1	15.4	3.9
2008	353	126	15.9	5.4	8.5	2.4	12.3	3.4	15.4	4.4
2009	333	128	14.9	5.5	7.5	2.1	11.0	3.2	14.2	4.2
2010	349	96	15.5	4.1	7.7	1.5	11.5	2.2	14.7	2.9
2011	328	105	14.4	4.4	7.2	1.9	10.4	2.7	13.5	3.4
2012	302	116	13.2	4.9	6.6	1.9	9.6	2.9	12.3	3.8
1998-2012	3868	1403	14.1	4.9	7.5	2.0	11.1	3.0	14.3	3.9

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	182	68.4	12.1	16.5	92.2	54.9	60.8	68.7	76.8	83.6
1999	212	69.9	11.8	10.8	95.7	57.5	62.4	70.1	78.2	84.0
2000	218	70.2	11.8	25.1	94.3	55.8	63.5	69.7	77.9	86.1
2001	196	68.0	13.5	0.6	98.8	50.5	61.1	69.2	77.2	82.4
2002	351	69.5	11.1	29.3	94.0	55.8	62.4	69.8	77.5	82.3
2003	334	70.1	12.1	10.9	98.8	57.4	63.3	70.8	78.8	83.1
2004	340	69.7	12.0	3.1	93.4	54.6	62.1	70.5	78.1	84.3
2005	351	69.5	12.5	1.0	100	57.1	63.1	68.9	77.8	83.7
2006	398	69.9	11.3	20.4	96.6	54.6	63.0	69.8	78.3	84.6
2007	453	69.4	12.1	0.3	96.7	56.0	62.3	70.5	77.8	84.1
2008	479	68.5	12.4	1.1	97.9	54.5	62.2	69.4	76.8	83.0
2009	461	70.7	10.9	3.7	95.8	57.3	65.1	71.0	77.9	84.1
2010	445	70.9	11.2	0.8	98.5	57.0	64.1	71.4	78.3	85.1
2011	433	69.8	12.9	0.7	98.3	54.8	63.9	71.2	77.7	83.5
2012	418	70.2	11.4	1.5	97.8	55.3	64.6	72.0	77.3	83.3
1998-2012	5271	69.8	11.9	0.3	100	55.8	63.0	70.5	77.9	83.8

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	129	67.1	11.5	16.5	89.1	55.0	60.6	66.6	74.7	82.6
1999	141	68.0	11.3	10.8	95.7	56.4	61.7	69.0	75.7	79.7
2000	156	69.2	12.2	25.1	94.3	55.5	62.6	68.4	76.0	87.9
2001	155	67.4	11.6	31.6	95.3	50.5	61.0	68.3	75.6	81.6
2002	252	68.2	10.1	36.0	93.8	55.6	62.1	68.0	75.4	81.2
2003	241	68.8	11.2	25.1	92.4	56.6	62.6	68.7	76.8	82.0
2004	251	68.6	10.9	22.5	93.4	54.7	61.2	69.0	75.9	81.9
2005	254	68.2	9.8	34.4	93.0	57.0	62.2	67.5	75.2	80.4
2006	287	68.7	10.4	41.8	96.6	55.0	62.0	69.1	76.2	81.9
2007	337	68.6	11.4	0.3	96.7	56.0	61.8	69.9	76.0	81.1
2008	353	67.8	11.1	6.5	97.9	55.0	61.5	68.8	74.6	80.8
2009	333	69.9	10.6	3.7	94.7	57.2	64.1	70.4	76.6	83.4
2010	349	69.8	10.7	0.8	94.9	56.2	62.9	70.7	77.0	82.6
2011	328	69.3	11.0	0.8	92.3	55.4	63.9	70.6	76.4	81.5
2012	302	69.4	11.0	1.5	91.3	55.3	64.2	71.5	76.4	82.1
1998-2012	3868	68.7	10.9	0.3	97.9	55.6	62.3	69.4	76.0	81.7

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	53	71.5	13.2	34.6	92.2	52.8	64.3	74.9	79.6	87.3
1999	71	73.7	11.9	35.7	94.0	59.5	64.2	75.7	83.3	88.1
2000	62	72.7	10.6	33.9	93.4	60.8	65.6	74.8	80.3	83.6
2001	41	70.4	19.0	0.6	98.8	52.9	63.3	72.8	81.3	91.6
2002	99	72.8	12.6	29.3	94.0	58.3	65.3	76.5	80.7	86.9
2003	93	73.7	13.5	10.9	98.8	60.3	66.4	77.5	81.0	86.0
2004	89	73.0	14.3	3.1	93.4	51.3	65.2	74.3	83.6	89.3
2005	97	73.0	17.3	1.0	100	58.1	65.7	75.7	83.8	90.8
2006	111	73.0	13.0	20.4	95.3	54.2	66.0	73.1	83.1	86.7
2007	116	71.8	13.5	25.9	94.8	54.5	64.5	73.1	82.6	87.1
2008	126	70.5	15.5	1.1	96.7	52.5	64.0	73.4	81.3	86.0
2009	128	73.0	11.3	39.7	95.8	57.5	66.3	73.8	82.0	86.4
2010	96	75.0	11.9	15.6	98.5	60.8	69.0	74.7	85.2	87.7
2011	105	71.3	17.5	0.7	98.3	47.8	65.7	75.4	82.2	88.0
2012	116	72.4	11.9	22.1	97.8	56.3	65.9	74.1	80.3	87.3
1998–2012	1403	72.6	13.8	0.6	100	56.3	65.5	74.5	82.0	87.3

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	15	0.3	0.3	7	0.2	0.2	8	0.6	0.6
5-9	3	0.1	0.3	2	0.1	0.2	1	0.1	0.6
10-14	2	0.0	0.4	1	0.0	0.3	1	0.1	0.7
15-19	4	0.1	0.5	2	0.1	0.3	2	0.1	0.9
20-24	5	0.1	0.6	2	0.1	0.4	3	0.2	1.1
25-29	7	0.1	0.7	4	0.1	0.5	3	0.2	1.3
30-34	14	0.3	0.9	8	0.2	0.7	6	0.4	1.7
35-39	25	0.5	1.4	15	0.4	1.1	10	0.7	2.4
40-44	45	0.9	2.3	30	0.8	1.8	15	1.1	3.5
45-49	120	2.3	4.6	95	2.5	4.3	25	1.8	5.3
50-54	241	4.6	9.1	191	4.9	9.2	50	3.6	8.8
55-59	449	8.5	17.6	373	9.6	18.9	76	5.4	14.3
60-64	689	13.1	30.7	560	14.5	33.4	129	9.2	23.4
65-69	916	17.4	48.1	727	18.8	52.1	189	13.5	36.9
70-74	957	18.2	66.2	749	19.4	71.5	208	14.8	51.7
75-79	786	14.9	81.2	564	14.6	86.1	222	15.8	67.6
80-84	576	10.9	92.1	352	9.1	95.2	224	16.0	83.5
85+	417	7.9	100.0	186	4.8	100.0	231	16.5	100.0
All ages	5271	100.0		3868	100.0		1403	100.0	

Included in the statistics are 23.2% multiple primaries in males and 20.6% 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=1108 %	Females DCO rate n=527 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	7	8	0.5	0.6			2.3	3.5
5- 9	2	1	0.1	0.1			1.2	0.9
10-14	1	1	0.1	0.1			0.7	0.6
15-19	2	2	0.1	0.1			0.6	0.7
20-24	2	3	0.1	0.2	50.0		0.4	0.6
25-29	4	3	0.2	0.2		33.3	0.5	0.3
30-34	8	6	0.4	0.3	12.5	16.7	0.6	0.3
35-39	15	10	0.6	0.5	6.7		0.7	0.3
40-44	30	15	1.2	0.7	20.0	6.7	1.0	0.3
45-49	95	25	4.4	1.2	21.1	12.0	1.9	0.3
50-54	191	50	10.3	2.6	20.9	16.0	2.4	0.5
55-59	372	76	21.9	4.3	23.4	19.7	2.7	0.6
60-64	560	129	34.0	7.4	23.0	17.8	2.7	0.8
65-69	727	189	49.5	11.8	25.9	22.8	2.8	1.1
70-74	749	207	64.6	15.0	23.4	33.8	3.1	1.2
75-79	563	221	74.7	20.2	32.5	38.0	3.0	1.4
80-84	349	224	76.9	25.9	45.6	49.1	2.8	1.5
85+	186	231	60.0	28.2	63.4	72.7	2.0	1.4
All ages	3863	1401			28.7	37.6	2.6	1.0
Incidence								
Raw			14.1	4.9				
WS			7.5	2.0				
ES			11.1	3.0				
BRD-S			14.2	3.9				

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 %
C03-C06	Oral cavity	3	0.4	7.4	1.5	21.7	#	9.1	
C15	Oesophagus	3	0.9	3.5	0.7	10.1		7.5	
C16	Stomach	4	2.1	1.9	0.5	4.9		6.6	
C17	Small intestine	2	0.2	8.5	1.0	30.7	#	6.2	
C18	Colon	16	5.1	3.2	1.8	5.1	#	38.3	12.5
C19-C20	Rectum	3	2.8	1.1	0.2	3.1		0.6	33.3
C22	Liver	6	1.4	4.3	1.6	9.4	#	16.1	66.7
C23-C24	Bile	3	0.5	6.2	1.3	18.2	#	8.8	33.3
C25	Pancreas	4	1.8	2.3	0.6	5.8		7.9	
C33-C34	Lung	17	6.0	2.8	1.6	4.5	#	38.4	35.3
C61	Prostate	13	15.2	0.9	0.5	1.5		-7.6	30.8
C64	Kidney	9	1.8	5.1	2.3	9.7	#	25.3	11.1
C67	Bladder	7	2.2	3.2	1.3	6.6	#	16.9	
C82-C85	NHL	7	2.0	3.6	1.4	7.3	#	17.6	28.6
C91-C96	Leukaemia	2	0.8	2.5	0.3	9.2		4.2	50.0
Other primaries		10	5.2	1.9	0.9	3.5		16.7	10.0
Not observed		0	2.6	0.0	0.0	1.4		-9.1	
All mult. primaries		109	50.8	2.1	1.8	2.6	#	203.7	21.1

Patients	2091
Mean age at second malignancy (years)	71.6
Person-years	2856
Mean observation time (years)	1.4
Median observation time (years)	0.5

The occurrence of second malignancy is statistically significant.
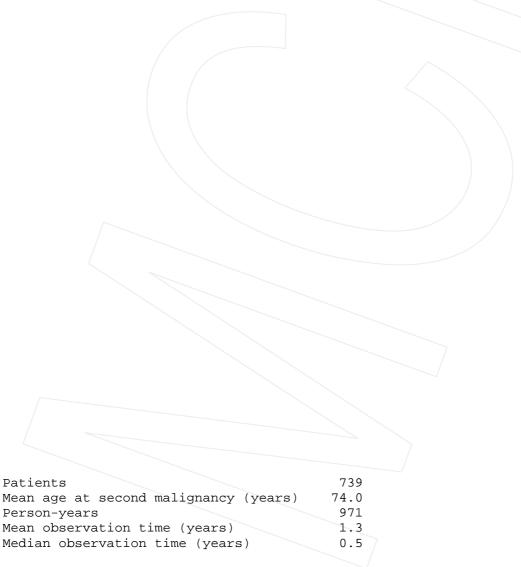
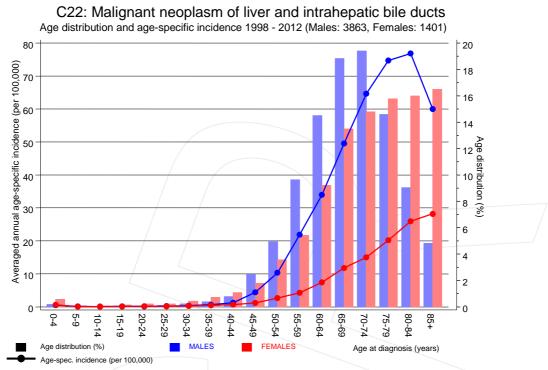Observed second primaries with count 1 are pooled in category "Other primaries".

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 %
C16	Stomach	2	0.4	4.8	0.6	17.4		16.3	
C18	Colon	11	1.2	9.5	4.8	17.1	#	101.4	27.3
C22	Liver	2	0.1	15.3	1.8	55.2	#	19.2	
C23-C24	Bile	2	0.2	12.0	1.4	43.2	#	18.9	
C50	Breast	6	3.4	1.8	0.7	3.9		27.0	16.7
C54	Corpus uteri	2	0.7	3.1	0.4	11.1		13.9	
Other primaries		14	3.3	4.2	2.3	7.1	#	110.1	28.6
Not observed		0	2.1	0.0	0.0	1.8		-21.6	
All mult. primaries		39	11.3	3.5	2.5	4.7	#	285.2	20.5

Patients	739
Mean age at second malignancy (years)	74.0
Person-years	971
Mean observation time (years)	1.3
Median observation time (years)	0.5

The occurrence of second malignancy is statistically significant.

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

C22: Malignant neoplasm of liver and intrahepatic bile ducts
Age distribution and age-specific incidence 1998 - 2012 (Males: 3863, Females: 1401)

Figure 7. Age distribution and age-specific incidence

C22: Malignant neoplasm of liver and intrahepatic bile ducts

Age-specific incidence in international comparison

Region	Period	Average population
MCR	2002-2011	4.2 m
FRG (GEKID extrapol.)	2003-2007	82.4 m
SEER	2004-2009	49.8 m

MALES   FEMALES   Age at diagnosis (years)
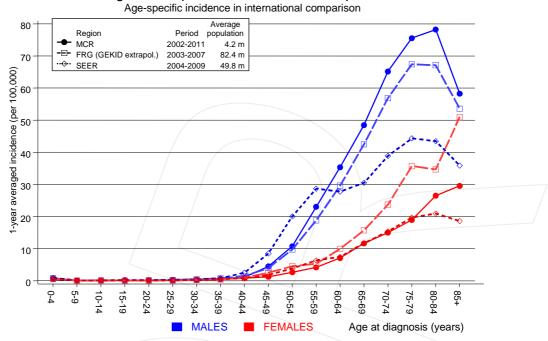
Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
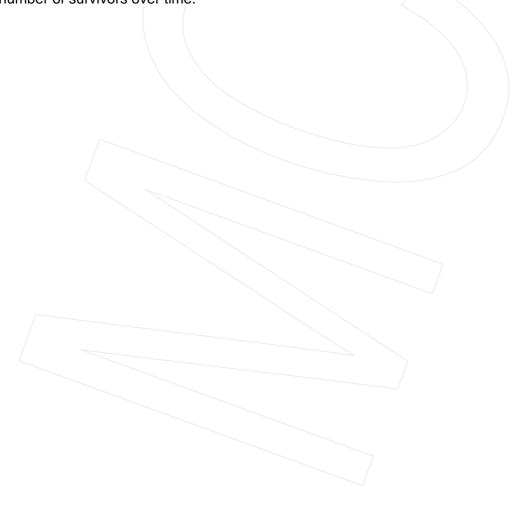
Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2011. http://www.gekid.de. Last access: 05/12/2011

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.
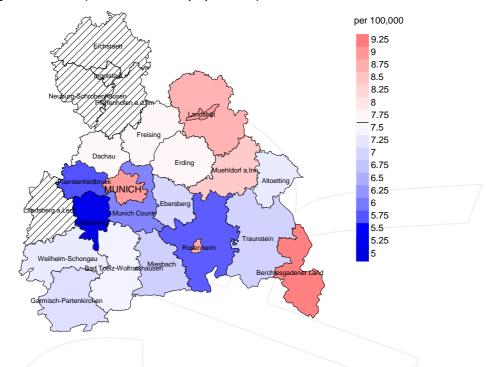
C22: Malignant neoplasm of liver and intrahepatic bile ducts
Cumulative follow-up years since diagnosis for period 1998 - 2012 (excl. DCO)

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
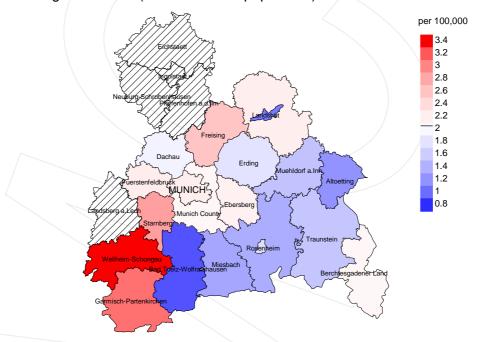

Average incidence (world standard population) 2003 - 2008: Females

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 7.6/100,000 WS N=1,640, females 2.1/100,000 WS N=604). 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 18 women were identified with newly diagnosed liver cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 5.2/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males

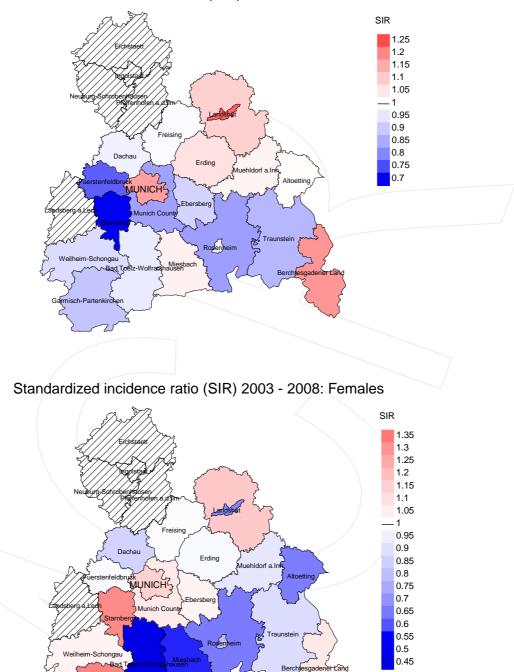## Standardized incidence ratio (SIR) 2003 - 2008: Females

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=1,640, females N=604). 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 18 women were identified with newly diagnosed liver cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.52 and 1.85, 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	182	100.0	36.8	176	96.7	96.0
1999	212	99.1	37.7	205	96.7	97.1
2000	218	100.0	40.4	204	93.6	95.6
2001	196	98.5	35.2	190	96.9	95.8
2002	351	100.0	41.9	344	98.0	98.0
2003	334	99.7	40.1	320	95.8	97.5
2004	340	98.8	39.7	320	94.1	97.8
2005	351	99.1	35.9	336	95.7	98.5
2006	398	98.7	31.9	366	92.0	99.2
2007	453	96.5	29.6	402	88.7	98.0
2008	479	91.6	22.5	409	85.4	98.5
2009	461	90.9	24.1	383	83.1	99.2
2010	445	92.1	22.5	372	83.6	98.9
2011	433	87.5	23.3	319	73.7	99.4
2012	418	97.8	26.6	275	65.8	98.5
1998-2012	5271	95.9	31.1	4621	87.7	98.1

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	182	171	97.1	112	61.5
1999	212	197	95.4	134	63.2
2000	218	193	97.4	129	59.2
2001	196	186	96.8	111	56.6
2002	351	266	98.1	222	63.2
2003	334	273	98.2	199	59.6
2004	340	257	98.1	188	55.3
2005	351	287	96.2	197	56.1
2006	398	334	98.5	234	58.8
2007	453	317	98.1	228	50.3
2008	479	352	98.9	234	48.9
2009	461	355	98.3	230	49.9
2010	445	359	98.9	211	47.4
2011	433	361	99.2	207	47.8
2012	418	361	99.4	226	54.1
1998-2012	5271	4269	98.1	2862	54.3

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	171	83.0	17.0	95.8
1999	197	87.8	12.2	96.3
2000	193	91.7	8.3	95.2
2001	186	93.0	7.0	99.4
2002	266	92.5	7.5	98.1
2003	273	92.7	7.3	98.1
2004	257	93.4	6.6	98.0
2005	287	90.6	9.4	97.1
2006	334	94.3	5.7	98.5
2007	317	90.2	9.8	95.5
2008	352	90.3	9.7	96.0
2009	355	94.4	5.6	98.3
2010	359	89.7	10.3	93.8
2011	361	88.9	11.1	94.4
2012	361	85.6	14.4	94.4
1998-2012	4269	90.7	9.3	96.5

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	123	68.9	69.2	67.0	69.5
1999	133	69.9	69.3	73.2	70.0
2000	130	71.1	71.1	71.5	71.3
2001	144	68.7	68.4	72.3	68.9
2002	181	68.1	68.1	68.6	68.1
2003	207	69.5	69.9	65.3	69.9
2004	187	69.6	69.5	70.7	69.5
2005	204	68.3	68.2	68.9	68.4
2006	252	69.5	69.3	72.5	69.8
2007	245	70.5	70.3	72.2	70.5
2008	262	68.7	68.8	68.0	68.7
2009	258	70.4	70.2	73.8	70.5
2010	266	71.0	70.8	72.4	70.9
2011	277	70.5	70.6	69.3	70.7
2012	273	71.2	71.3	70.2	71.1
1998-2012	3142	69.8	69.8	70.3	69.9

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	48	72.9	71.3	81.0	72.7
1999	64	74.5	74.2	78.5	75.6
2000	63	73.7	73.8	73.3	73.8
2001	42	72.7	71.3	90.2	72.9
2002	85	73.1	72.9	75.5	73.2
2003	66	71.4	71.0	78.2	71.4
2004	70	75.6	75.2	83.2	75.5
2005	83	74.6	75.0	69.9	74.9
2006	82	73.5	73.1	79.7	73.5
2007	72	74.2	74.2	75.1	75.4
2008	90	74.3	74.7	71.8	74.8
2009	97	73.2	73.2	72.6	73.3
2010	93	75.5	75.7	73.4	75.6
2011	84	73.5	73.7	71.6	73.7
2012	88	73.9	74.1	73.0	74.5
1998-2012	1127	73.8	73.7	75.2	74.1

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	102	9.2	0.79	5.5	0.76	8.3	0.79	11.0	0.80
1999	114	10.2	0.81	6.0	0.80	9.2	0.82	12.4	0.85
2000	120	10.5	0.77	6.0	0.74	9.3	0.76	12.3	0.81
2001	134	11.6	0.86	6.8	0.86	10.1	0.87	13.1	0.86
2002	167	9.0	0.67	5.0	0.66	7.5	0.66	9.8	0.68
2003	190	10.1	0.79	5.5	0.79	8.3	0.79	10.9	0.79
2004	173	9.2	0.69	5.0	0.68	7.6	0.69	9.7	0.69
2005	183	9.7	0.72	5.2	0.72	7.6	0.73	9.9	0.74
2006	237	12.4	0.83	6.4	0.82	9.6	0.82	12.4	0.82
2007	220	9.9	0.65	5.0	0.62	7.6	0.63	10.1	0.66
2008	239	10.7	0.68	5.6	0.66	8.3	0.68	10.8	0.71
2009	243	10.9	0.73	5.4	0.73	8.2	0.74	10.4	0.73
2010	238	10.6	0.68	5.0	0.65	7.6	0.66	10.3	0.70
2011	244	10.7	0.74	5.1	0.72	7.7	0.74	10.1	0.75
2012	233	10.2	0.77	4.7	0.72	7.1	0.74	9.5	0.77
1998-2012	2837	10.3	0.73	5.3	0.71	8.0	0.73	10.6	0.74

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	40	3.4	0.77	1.5	0.79	2.2	0.79	3.0	0.81
1999	59	5.0	0.83	1.9	0.79	3.0	0.81	4.1	0.83
2000	57	4.7	0.92	1.8	0.84	2.8	0.87	4.1	0.92
2001	39	3.2	0.95	1.5	0.89	2.2	0.97	2.7	1.01
2002	79	4.0	0.80	1.6	0.79	2.4	0.79	3.3	0.78
2003	63	3.2	0.68	1.4	0.73	2.0	0.72	2.7	0.69
2004	67	3.4	0.75	1.2	0.63	1.9	0.69	2.6	0.73
2005	77	3.9	0.79	1.5	0.69	2.2	0.76	2.9	0.78
2006	78	3.9	0.70	1.6	0.72	2.3	0.70	3.0	0.70
2007	66	2.9	0.57	1.1	0.53	1.6	0.53	2.1	0.54
2008	79	3.4	0.63	1.3	0.53	2.0	0.58	2.6	0.60
2009	92	4.0	0.72	1.5	0.72	2.3	0.71	3.1	0.72
2010	84	3.6	0.88	1.2	0.77	1.9	0.83	2.7	0.92
2011	77	3.3	0.74	1.2	0.65	1.9	0.71	2.4	0.72
2012	76	3.2	0.66	1.2	0.63	1.8	0.63	2.4	0.63
1998-2012	1033	3.6	0.74	1.4	0.69	2.1	0.71	2.8	0.73

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	1	0.0	0.0			0.0	1	0.1	0.1
5-9	1	0.0	0.1	1	0.0	0.0			0.1
10-14	2	0.1	0.1	1	0.0	0.1	1	0.1	0.2
15-19	2	0.1	0.2	1	0.0	0.1	1	0.1	0.3
20-24	1	0.0	0.2	1	0.0	0.1			0.3
25-29	3	0.1	0.3	1	0.0	0.2	2	0.2	0.5
30-34	11	0.3	0.5	5	0.2	0.4	6	0.6	1.1
35-39	18	0.5	1.0	9	0.3	0.7	9	0.9	1.9
40-44	30	0.8	1.8	23	0.8	1.5	7	0.7	2.6
45-49	76	2.0	3.7	59	2.1	3.6	17	1.6	4.3
50-54	150	3.9	7.6	121	4.3	7.8	29	2.8	7.1
55-59	291	7.5	15.1	238	8.4	16.2	53	5.1	12.2
60-64	501	12.9	28.0	404	14.2	30.4	97	9.4	21.5
65-69	647	16.7	44.7	522	18.4	48.8	125	12.1	33.6
70-74	700	18.1	62.8	548	19.3	68.0	152	14.7	48.3
75-79	646	16.7	79.4	472	16.6	84.6	174	16.8	65.1
80-84	466	12.0	91.4	283	10.0	94.6	183	17.7	82.8
85+	332	8.6	100.0	154	5.4	100.0	178	17.2	100.0
All ages	3878	100.0		2843	100.0		1035	100.0	

Included in the statistics are 23.2% multiple primaries in males and 20.6% 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	0.0		0.1	0.13		4.3
5- 9	1		0.1	0.50	0.0		2.9	
10-14	1	1	0.1	1.00	0.1	1.00	3.0	3.6
15-19	1	1	0.1	0.50	0.1	0.50	2.4	2.9
20-24	1		0.1	0.50	0.0		1.2	
25-29	1	2	0.1	0.25	0.1	0.67	1.0	1.8
30-34	5	6	0.2	0.63	0.3	1.00	2.8	2.8
35-39	9	9	0.4	0.60	0.4	0.90	2.3	1.8
40-44	23	7	0.9	0.77	0.3	0.47	2.8	0.7
45-49	59	17	2.7	0.62	0.8	0.68	3.5	0.9
50-54	121	29	6.5	0.63	1.5	0.58	3.9	1.0
55-59	238	53	14.0	0.64	3.0	0.70	4.3	1.2
60-64	404	97	24.5	0.72	5.6	0.75	4.8	1.6
65-69	522	125	35.6	0.72	7.8	0.66	4.6	1.6
70-74	548	152	47.3	0.73	11.0	0.73	4.4	1.7
75-79	472	174	62.6	0.84	15.9	0.78	3.9	1.8
80-84	283	183	62.3	0.80	21.2	0.82	2.9	1.8
85+	154	178	49.7	0.83	21.7	0.77	1.9	1.4
All ages	2843	1035					3.8	1.5

Mortality					
Raw	10.4	0.74	3.6	0.74
WS	5.4	0.71	1.4	0.69
ES	8.1	0.73	2.1	0.71
BRD-S	10.6	0.74	2.8	0.73

PYLL-70		
per 100,000	49.0	14.5
ES	43.2	12.7
AYLL-70	8.8	10.2

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	20	3.2	16	80.0	2	10.0	2	10.0
C09-C10 Oropharynx	15	2.4	13	86.7	2	13.3		
C12-C13 Hypopharynx	9	1.4	7	77.8	2	22.2		
C15 Oesophagus	14	2.3	6	42.9	6	42.9	2	14.3
C16 Stomach	20	3.2	11	55.0	7	35.0	2	10.0
C18 Colon	79	12.7	53	67.1	22	27.8	4	5.1
C19-C20 Rectum	38	6.1	28	73.7	6	15.8	4	10.5
C22 Liver	6	1.0			4	66.7	2	33.3
C25 Pancreas	8	1.3	1	12.5	5	62.5	2	25.0
C32 Larynx	15	2.4	13	86.7	2	13.3		
C33-C34 Lung	51	8.2	17	33.3	15	29.4	19	37.3
C43 Malign. melanoma	22	3.5	19	86.4			3	13.6
C44 Skin others	31	5.0	24	77.4			7	22.6
C61 Prostate	122	19.6	101	82.8	8	6.6	13	10.7
C62 Testis	8	1.3	7	87.5			1	12.5
C64 Kidney	35	5.6	21	60.0	8	22.9	6	17.1
C67 Bladder	48	7.7	34	70.8	3	6.3	11	22.9
C70-C72 CNS cancer	8	1.3	7	87.5			1	12.5
C76-C79 CUP	7	1.1	4	57.1	1	14.3	2	28.6
C82-C85 NHL	18	2.9	11	61.1	5	27.8	2	11.1
C90 Mult. myeloma	9	1.4	4	44.4	3	33.3	2	22.2
Other primaries	38	6.1	25	65.8	7	18.4	6	15.8
All mult. primaries	621	100.0	422	68.0	108	17.4	91	14.7

Multiple primaries with number of cases n<6 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	6	2.8	5	83.3	1	16.7		
C16	Stomach	8	3.7	4	50.0	2	25.0	2	25.0
C18	Colon	24	11.2	15	62.5	6	25.0	3	12.5
C19-C20	Rectum	6	2.8	5	83.3	1	16.7		
C22	Liver	2	0.9					2	100.0
C23-C24	Bile	3	1.4	1	33.3	1	33.3	1	33.3
C33-C34	Lung	6	2.8	4	66.7			2	33.3
C43	Malign. melanoma	4	1.9	4	100.0				
C44	Skin others	9	4.2	3	33.3	1	11.1	5	55.6
C50	Breast	56	26.2	50	89.3	3	5.4	3	5.4
C51	Vulva	4	1.9	4	100.0				
C53	Cervix uteri	6	2.8	5	83.3			1	16.7
C54	Corpus uteri	14	6.5	11	78.6	2	14.3	1	7.1
C56	Ovary	7	3.3	5	71.4	1	14.3	1	14.3
C64	Kidney	9	4.2	4	44.4	2	22.2	3	33.3
C67	Bladder	7	3.3	5	71.4	2	28.6		
C69	Eye melanoma	3	1.4	3	100.0				
C70-C72	CNS cancer	4	1.9	2	50.0			2	50.0
C73	Thyroid	7	3.3	5	71.4	1	14.3	1	14.3
C76-C79	CUP	5	2.3	1	20.0	3	60.0	1	20.0
C81	Hodgkin lymphoma	2	0.9	2	100.0				
C82-C85	NHL	9	4.2	8	88.9	1	11.1		
C90	Mult. myeloma	2	0.9	1	50.0	1	50.0		
C91-C96	Leukaemia	2	0.9	1	50.0	1	50.0		
Other primaries		9	4.2	5	55.6	3	33.3	1	11.1
All mult. primaries		214	100.0	153	71.5	32	15.0	29	13.6

Multiple primaries with number of cases n<2 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	0.0		0.1	0.13		4.3
5- 9	1		0.1	0.50	0.0		3.0	
10-14	1	1	0.1	1.00	0.1	1.00	3.0	3.8
15-19	1	1	0.1	0.50	0.1	0.50	2.6	3.2
20-24	1		0.1	0.50	0.0		1.3	
25-29	1	2	0.1	0.25	0.1	0.67	1.1	1.9
30-34	5	3	0.2	0.63	0.1	0.75	2.9	1.6
35-39	9	9	0.4	0.60	0.4	0.90	2.5	2.0
40-44	22	7	0.9	0.73	0.3	0.50	2.9	0.7
45-49	54	16	2.5	0.61	0.8	0.73	3.5	1.0
50-54	109	24	5.9	0.63	1.3	0.53	4.1	1.0
55-59	215	46	12.7	0.65	2.6	0.69	4.5	1.2
60-64	360	86	21.8	0.73	4.9	0.75	5.1	1.7
65-69	450	110	30.7	0.72	6.9	0.69	4.9	1.8
70-74	458	128	39.5	0.76	9.3	0.75	4.7	1.8
75-79	369	141	49.0	0.87	12.9	0.79	4.0	1.8
80-84	219	152	48.2	0.82	17.6	0.81	2.9	1.8
85+	127	144	41.0	0.84	17.6	0.75	2.1	1.4
All ages	2402	871					4.0	1.6
Mortality								
Raw			8.8	0.74	3.0	0.74		
WS			4.6	0.72	1.2	0.69		
ES			6.9	0.73	1.8	0.71		
BRD-S			8.9	0.75	2.4	0.73		
PYLL-70								
per 100,000			44.3		12.8			
ES			39.1		11.2			
AYLL-70			8.9		10.2			

* See corresponding tables with multiple primaries.

Table 17
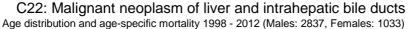
Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Single primaries only ***)

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	0.0		0.1	0.13		4.3
5- 9	1		0.1	0.50	0.0		3.1	
10-14	1	1	0.1	1.00	0.1	1.00	3.0	4.2
15-19	1	1	0.1	0.50	0.1	0.50	2.6	3.8
20-24	1		0.1	0.50	0.0		1.4	
25-29	1	2	0.1	0.25	0.1	0.67	1.2	2.1
30-34	5	3	0.2	0.63	0.1	0.75	3.0	1.8
35-39	9	9	0.4	0.64	0.4	0.90	2.6	2.2
40-44	22	7	0.9	0.73	0.3	0.50	3.1	0.8
45-49	53	15	2.5	0.60	0.7	0.68	3.7	1.0
50-54	109	24	5.9	0.64	1.3	0.57	4.5	1.1
55-59	211	43	12.4	0.65	2.4	0.68	4.8	1.3
60-64	348	84	21.1	0.73	4.8	0.77	5.6	1.9
65-69	440	109	30.0	0.73	6.8	0.69	5.6	2.1
70-74	440	124	38.0	0.75	9.0	0.75	5.4	2.1
75-79	358	136	47.5	0.86	12.4	0.78	4.8	2.0
80-84	208	148	45.8	0.82	17.1	0.81	3.5	2.1
85+	122	141	39.3	0.84	17.2	0.75	2.5	1.6
All ages	2330	848					4.6	1.8

Mortality						
Raw		8.5	0.74	3.0	0.74
WS		4.5	0.72	1.2	0.69
ES		6.7	0.73	1.7	0.71
BRD-S		8.6	0.75	2.3	0.73

PYLL-70			
per 100,000	43.6	12.5
ES	38.5	10.9
AYLL-70	9.0	10.2

* See corresponding tables with multiple primaries.

C22: Malignant neoplasm of liver and intrahepatic bile ducts
Age distribution and age-specific mortality 1998 - 2012 (Males: 2837, Females: 1033)
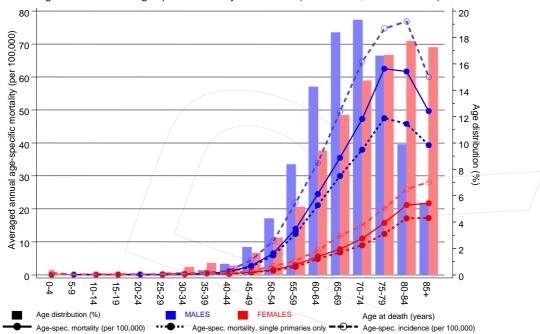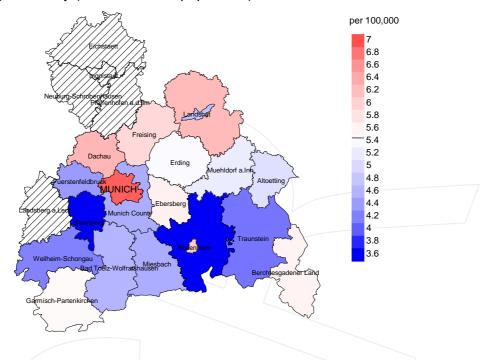
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at liver 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
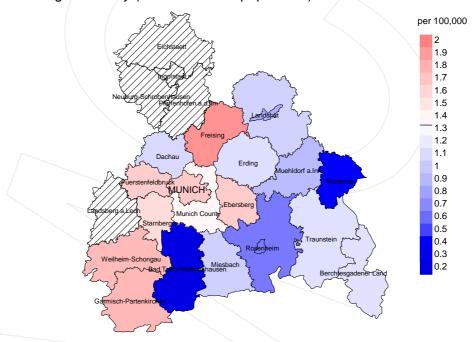
Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 5.5/100,000 WS N=1,197, females 1.3/100,000 WS N=421). 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 16 women died from liver cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 3.5/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

Standardized mortality ratio (SMR) 2003 - 2008: Females
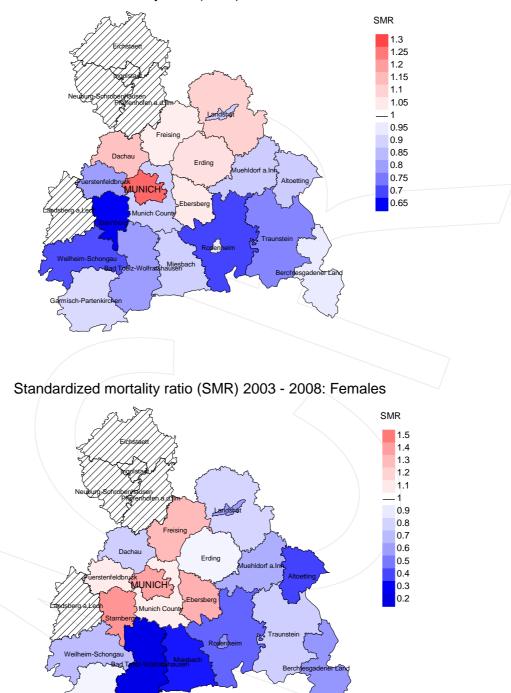
Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,197, females N=421). 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 16 women died from liver cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.33. Though, the value of this parameter may vary with an underlying probability of 99% between 0.63 and 2.46, 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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Index of figures and tables